Prepared for

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FINAL REMEDIAL DESIGN REPORT

Operable Unit 4, Source Areas

CORTESE LANDFILL SITE

NARROWSBURG, NEW YORK

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LIST OF ABBREVIATIONS AND ACRONYMS

ARARs	applicable or relevant and appropriate requirements
AS	air sparging
atm-m^3/mol	atmospheres per cubic meter per mole
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene and total xylenes
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
cfm	cubic feet per minute
cm/sec	centimeters per second
COC	constituent of concern
CPVC	chlorinated polyvinyl chloride
DO	dissolved oxygen
FS	feasibility study
ft/ft	feet per foot
HDPE	high density polyethylene
IDDA	Intact Drum Disposal Area
in H_2O	inches of water
ISCO	in situ chemical oxidation
LNAPL	light non-aqueous phase liquid
MCL	maximum contaminant level
MCLG	maximum contaminant level goals
MEK	methyl ethyl ketone or 2-Butanone
mg/L	milligram per liter
MIBK	methyl isobutyl ketone or 4-Methyl-2-pentanone
MNA	monitored natural attenuation
MSW	municipal solid waste
mV	millivolt
NAPL	non-aqueous phase liquid
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NYCRR	New York Codes, Rules and Regulations
NYSOPRHP	New York State Office of Parks, Recreation and Historic Preservation
O&M	operation and maintenance
ORP	oxidation-reduction potential
OU	operable unit
PAH	polynuclear aromatic hydrocarbon
PCE	tetrachloroethene
PRG	preliminary remediation goals
RAO	remedial action objectives
RCRA	Resource Conservation and Recovery Act
RI	remedial investigation
ROD	record of decision
RWE	Remedial Work Element

SDWA	Safe Drinking Water Act
S-ISCO™	surfactant enhanced in situ chemical oxidation
SVE	soil vapor extraction
SVOC	semi-volatile organic compound
TAL	target analyte list
TBC	criteria, advisories, or guidance to be considered
TCA	trichloroethane
TCE	trichloroethene
TCL	target compound list
TPH	total petroleum hydrocarbons
UIC	underground injection control
USEPA	United States Environmental Protection Agency
VC	vinyl chloride
VGAC	vapor-phase granular activated carbon
VOC	volatile organic compound
µg/kg	micrograms per kilogram
µg/L	micrograms per liter

1. INTRODUCTION

1.1 Purpose

On behalf of the Cortese Landfill Respondents (the Respondents), Geosyntec Consultants (Geosyntec) has prepared this Final Remedial Design (RD) Report for Operable Unit (OU) 4, Source Areas, at the Cortese Landfill Site (the Site) in Narrowsburg, New York. This Final RD Report addresses agency review comments, received December 27, 2011, as well as follow up comments provided by telephone, on the Pre-Final RD Report dated August 2011. OU 4 addresses the remaining source contamination present below the water table beneath former source areas. This Final RD Report is required as part of the RD pursuant to the Remedial Design Administrative Order on Consent ("RD AOC") and Paragraph VIII.A of the attached Statement of Work (SOW) (U.S. Environmental Protection Agency [USEPA], 2011).

The previous source control requirements of the 1994 Record of Decision ([ROD], USEPA, 1994a) issued by USEPA comprise OU 1 (drum removal) and OU 2 (landfill cap) and were previously implemented pursuant to a 1995 Consent Decree for Remedial Design/Remedial Action (USEPA, 1995) as Remedial Work Element I (RWE I). OU 3 involved the groundwater contamination at and downgradient of the landfill and was designated RWE II in the 1995 Consent Decree. RWE II included groundwater extraction and ex-situ treatment at the downgradient edge of the landfill and natural attenuation of downgradient groundwater.

The 2010 ROD and amendment to the 1994 ROD (hereinafter the "2010 ROD/ROD Amendment", USEPA, 2010) selected in situ source treatment for the remaining source areas (OU 4) together with monitored natural attenuation (MNA) for groundwater downgradient of the landfill (OU 3). In addition, the 2010 ROD/ROD Amendment converted the groundwater extraction and ex-situ treatment component of RWE II to the contingent remedy.

This Final RD Report addresses the remedial design of the in situ source treatment at OU 4. The remedial design for MNA of downgradient groundwater at OU 3 is presented separately in the draft *Monitored Natural Attenuation Remedial Design, Operable Unit 3* ([MNA Plan], Geosyntec, 2011b).

1.2 Report Organization

The remainder of this report is organized into the following sections:

- Section 2 – Site Conceptual Model;
- Section 3 – Technical Approach;
- Section 4 – Design Approach;

- Section 5 – System Description;
- Section 6 – Environmental Permit Equivalencies;
- Section 7 – Construction;
- Section 8 – Operation, Maintenance and Monitoring;
- Section 9 – Schedule; and
- Section 10 – References.
- Supporting information is provided in tables, figures, and appendices.

2. SITE CONCEPTUAL MODEL

2.1 Site Description

The Site is located in Narrowsburg, Sullivan County, New York (see **Figure 1**). The landfill is located on the floodplain of the Delaware River and is bounded to the northeast by a steep bedrock escarpment and to the southwest by a railroad embankment (see **Figure 2**). The northern edge of the landfill lies approximately 70 feet south of the Narrowsburg Waste Water Treatment Plant. The Delaware River is approximately 400 feet southwest of the landfill, separated from the Site by the railroad embankment. Seven residences are located along the river across the railroad embankment from the Site.

The Site property boundary encompasses approximately 3.75 acres of land owned by Mr. John Cortese and another 1.53 acres along the northern margin of the Cortese property owned by the Town of Tusten (Town), which purchased the property from Mr. Cortese in 1973.

2.2 Site History

The Site received municipal solid waste (MSW) from approximately July 1970 to July 1981 at an estimated rate of approximately 3,000 cubic yards per year. Disposal practices were poorly documented, such that records about the types and volume of wastes received are essentially non-existent. The extent of MSW has been assessed based upon geophysical surveys and test pits.

For a six-month period in 1973, the Site received industrial wastes including paint thinners, sludge, solvents, dyes, waste oil, and other petroleum products. Disposal of these wastes included the burial of drums in trenches. According to depositional testimony of the former landfill owner/operator and landfill employees, drums were disposed in three areas in the landfill. Initially, drums were emptied and/or crushed or mixed with MSW in a trench located in the northwest corner of the landfill. Subsequently, drums were segregated from MSW and were disposed intact in the main drum disposal area located in the center of the landfill, referred to as IDDA 1. Drums were also disposed intact in another area just beyond the southern end of the landfill referred to as IDDA 2. Two septage lagoons, which also received industrial wastes, were located outside of the southern end of the landfill adjacent to IDDA 2. The locations of the former source areas are shown on **Figure 3**.

A Remedial Investigation (RI) was completed in January 1994 (Golder, 1994a) and a FS was completed in August 1994 (Golder, 1994b). Results of the RI indicated that groundwater affected by the landfill and the former septage lagoons flows to the west/southwest toward the Delaware River, mostly via a shallow sand and gravel unit, and discharges to the Delaware River. On September 30, 1994, the USEPA signed the ROD that addresses the landfill, IDDA 1 and 2, groundwater contamination, and surface water quality at the Site. A Removal Action,

including a source removal component for COCs at the former septage lagoons, was completed during 1995 pursuant to a 1994 Administrative Order on Consent (USEPA, 1994b). The 1994 ROD specifies a series of remedial components to address other constituent source areas that were not the subject of the 1994 Removal Action, as well as landfill closure systems, and mitigation of affected groundwater. The requirements of the ROD are being implemented pursuant to a 1995 Consent Decree for Remedial Design/Remedial Action (USEPA, 1995) that grouped the ROD remedy components into two Remedial Work Elements, RWE I and RWE II.

RWE I was conducted in accordance with the requirements of the Remedial Design Work Plan (Golder, 1996) and the Final (100 Percent) Design Report for RWE I (Golder, 1997). A storm water run-on diversion channel was constructed in 1995 as part of the Removal Action to reduce infiltration into the waste mass, facilitating subsequent drum removal measures. Three IDDAs and the two septage lagoons were excavated during 1995 and 1996. The locations of the former IDDA and septage lagoon source areas are shown on **Figure 3**.

The low permeability landfill closure cover was designed in 1997 and construction was completed in October 1998 with the regulatory approval of the Remedial Action Report for landfill closure. Long-term operation, maintenance and monitoring of the landfill closure systems, as well as their potential affect in improving groundwater and surface water quality, has been on-going since that time. Annual Operation and Maintenance (O&M) Reports describing the results of the long term monitoring program, including groundwater, surface water, and landfill gas data, have been submitted annually to USEPA since 1998.

Since RWE I completion, the Respondents have completed the remedial design of the groundwater extraction and treatment component of RWE II with the submittal of the *Preliminary (30 Percent) Design Report* (Golder, 2006) and the *Final (100 Percent) Design Report* (CRA, 2010). Concurrently, the Respondents evaluated a number of remedial alternatives to the groundwater extraction and treatment component of RWE II. A shallow groundwater hot spot investigation along the downgradient perimeter of the landfill was performed in 2001 using direct-push drilling technology and groundwater grab samples (Golder, 2001). This effort served to further improve the site conceptual model for shallow groundwater COC migration pathways and was instrumental in refining the understanding of the lateral plume configuration. Data from a source area investigation performed in 2004 (Golder, 2004) showed an area beneath former IDDA 1b containing previously-undocumented sorbed-phase and residual-phase (i.e., non-mobile, non-aqueous phase liquid [NAPL]) VOC contamination. Additional source characterization was conducted in 2007 to better evaluate the horizontal and vertical extent of the new source area and to provide data to support the selection and design of potential in situ source area treatment technologies (Golder 2007a-c, Golder 2008). Additional samples of soil, groundwater and light non-aqueous phase liquid (LNAPL) were collected in February 2009 for the purpose of surfactant enhanced in situ chemical oxidation (S-ISCO^{TM}) bench scale treatability testing. In 2010, the Former Source Areas FS (Geosyntec, 2010) evaluated remedial alternatives for the

residual source materials beneath the former source areas at the Site. In situ source treatment in combination with MNA was selected as the remedial action for groundwater and the former sources areas by USEPA in the 2010 ROD/ROD Amendment. USEPA also amended the groundwater portion of the 1994 ROD to make the groundwater extraction and treatment component of RWE II (presented as Alternative 2 in the Former Source Areas FS) the contingency remedy should the selected remedy not attain the cleanup goals and performance standards specified in the 2010 ROD/ROD Amendment.

2.3 Geology/Hydrogeology

2.3.1 Site Geology

The geology and hydrogeology of the Site and surrounding areas were presented in the Phase III RI Report (Golder 1994b), updated with additional data and information collected since 1994, and is summarized below. In the vicinity of the Site, a deep channel has been incised by the Delaware River into the Upper Devonian sandstone bedrock of the Catskill Formation. The Delaware River Member of the Catskill Formation outcrops along the Delaware River in the Site vicinity (Davis, 1979). It is composed of cyclic sequences of gray, planar-bedded and cross-bedded, fine- to medium-grained sandstone with some thin red siltstone and clay stone layers. The Delaware River Member is up to 2800 feet thick. Joints in the rock are common. The Catskill Formation outcrops observed along the edge of the escarpment closely match the regional description of the Delaware River Member of the Catskill Formation. Specifically, gray, cross-bedded, medium-grained sandstone was noted with abundant joints, bedding plane partings, steep slopes, and flagstone-shaped talus. Depth to bedrock ranges from 0 feet to 138 feet below ground surface (bgs).

Pleistocene sediments of glacial origin were deposited and reworked in the river valley, resulting in channel, bar and over bank deposits typical of this depositional environment. The resulting lithofacies consist of unconsolidated, densely packed sands with intervals and lenses locally rich in either silty clay or gravel. A thin mantle of silt, resulting from post-glacial flooding of the valley, overlies the coarser deposits at the present land surface.

At the Site, the surficial clayey silt layer averages less than 10 feet in thickness and might have been locally removed during initial landfill trench and fill operations. This silt layer is underlain by sands and gravels/river cobbles to a depth of approximately 30 to 40 feet bgs, forming the ‘upper sand and gravel unit’ described in the Phase I RI report (Golder, 1987). These deposits are generally underlain by discontinuous intervals (facies) of “intermediate” fine sands and silty clay. Additional sand and gravel units occur between the intermediate sands/silty clay, and the top of bedrock (see **Figures 4, 5, 12, and 13**).

The former IDDA 1b source area has been the subject of additional investigation (Golder, 2008). Hydrogeological cross sections near the former IDDA 1b source area are presented on **Figures 4 and 5** based on the *Source Characterization Report* (Golder, 2008). The locations of the cross sections and borings are shown on **Figure 6**. The uppermost unit encountered during drilling within the limits of the landfill consisted of waste (typically plastic, glass, metal, paper, cloth, carpet, and/or wood) and reddish brown silty fine sand and silt backfill in the former IDDA 1b excavation to a depth of between approximately 14 feet and 25 feet bgs. The uppermost unit encountered during drilling of the borings located outside of the landfill (B-4 and B-5) consisted of reddish brown sandy silt to a depth of approximately 15 feet bgs, interpreted to be floodplain silts.

At IDDA 1b, the upper sand and gravel unit, encountered in all the borings, varied from approximately 9 feet to 22 feet in thickness. The upper sand and gravel unit was encountered at its shallowest depth in boring B-11/MW-14 at approximately 14 feet bgs, and extended to a maximum depth of approximately 41 feet bgs in boring B-12. Within the upper sand and gravel unit, there were many individual layers of varying proportions of silty sand, sandy silt, fine to coarse sand, fine to coarse gravel and cobbles (trace). The individual layers ranged in thickness from 0.2 to 7.5 feet. In general, fine-grained lenses (silty clay and clayey silt) were not observed within the upper sand and gravel unit. The transition from the upper sand and gravel unit to the deeper fine sand and silt unit varied from a sharp contrast in some borings to a more gradual transition zone in others. The deeper fine sand and silt unit was encountered in all the IDDA 1b borings except B-12. Bedrock was encountered at depths ranging from 38 feet to 78 feet bgs in the vicinity of former IDDA 1b.

The geology beneath former IDDA 2 and the former septage lagoons is similar to that beneath former IDDA 1b as shown in the hydrogeological cross section on **Figure 7**. The upper sand and gravel unit is encountered at approximately 15 to 20 ft bgs with a thickness of approximately 20 feet. It is overlain by silty sand and clayey silt. Top of bedrock rises from approximately 75 feet bgs at MW-1A to approximately 40 feet bgs at MW-8A/B.

2.3.2 Site Hydrogeology

Results from the aquifer pumping tests conducted during the Phase II RI hydrogeologic characterization (Golder, 1988) indicate that the overburden deposits in the study area behave as a single hydrogeologic unit. Throughout the entire thickness of unconsolidated sediments, groundwater occurs under water table conditions, such that the unit acts as an unconfined aquifer. Bedrock forms a second, deeper hydrogeologic unit. Groundwater flows from the source areas to the southwest toward, but oblique to, the Delaware River. Groundwater flows from the vicinity of former IDDA 1b toward monitoring well MW-6B near the Delaware River and from former IDDA 2 and the former septage lagoons toward MW-7B and MW-2B and the Delaware River embayment (see **Figures 2 and 3**). Horizontal hydraulic gradients between the

landfill and the Delaware River are typically approximately 0.003 feet per foot (ft/ft), but have been as high as 0.009 ft/ft during previous monitoring. Vertical hydraulic gradients are variable with season and location within the valley, but are typically less than 0.1 ft/ft in both upward and downward directions (Golder, 2006). There are no bedrock piezometers at the Site. However, bedrock groundwater is expected to recharge in the hilltop above the Site, and discharge into the unconsolidated sediments in the river valley. From the results of falling head and rising head tests performed during the Phase II RI (Golder, 1988), hydraulic conductivities for all monitoring wells at the Site range from 9.9×10^{-2} centimeters per second (cm/sec) to 2.8×10^{-5} cm/sec, with a geometric mean of 2.4×10^{-3} cm/sec. Calculated hydraulic conductivities for monitoring wells screened exclusively in the upper sand and gravel unit range from 1.2×10^{-3} cm/sec to 8.6×10^{-2} cm/sec, with a geometric mean of 1.6×10^{-2} cm/sec. These values correspond well with the results of the aquifer pumping test on nearby Town of Tusten water supply well #1 (TTW-01) (Golder, 1988). Laboratory hydraulic conductivity tests performed on two Shelby tube samples of fine-grained sediments collected beneath the upper sand and gravel unit yielded hydraulic conductivities of 6.0×10^{-6} cm/sec and 6.4×10^{-5} cm/sec.

The water table in the vicinity of former IDDA1b occurs between a maximum recorded seasonal high of 20 ft bgs and an approximate seasonal low of 25 ft bgs. A more normal seasonal high is approximately 23 feet bgs. The water table in the vicinity of former IDDA 2 and the septage lagoons occurs between a maximum recorded seasonal high of 18 ft bgs and an approximate seasonal low of 28 ft bgs as measured as MW-9 (Geosyntec, 2011a).

A conceptual groundwater flow system was developed for the Site area during the RI. Groundwater flows through fractures in the bedrock from the topographic highs (the escarpment) and discharges into the unconsolidated sediments of the Delaware River floodplain where it mixes with groundwater recharged along the floodplain, and then discharges at the topographic low (the river). Groundwater flow in the overburden sediments in the Site vicinity is predominantly horizontal toward the river, but may have a vertical component at some locations on a seasonal basis. The calculated average groundwater velocity is 165 feet per year based upon a hydraulic conductivity of 1.6×10^{-2} cm/sec, a horizontal gradient of 0.003 (but ranging up to 0.009), and an assumed porosity of 30 percent. Using the maximum horizontal gradient, groundwater flow velocities can be as high as 500 feet per year on a short-term basis.

2.4 Nature and Extent of Contamination

2.4.1 Groundwater

Groundwater samples were collected from monitoring wells at the Site during January 1987 (Phase I RI), October 1987 through January 1988 (Phase II RI), July 1989, April 1993 (Phase III RI), and three times per year beginning in October 1995 and continuing annually to date. Strong seasonal variations in constituent concentrations have been detected.

2.4.1.1 Former Source Areas

Wells EX-1, S-1 and S-2 in the vicinity of former IDDA 1b have been monitored three times per year (along with the other wells) since they were installed in 2003 and 2004. MW-10 is slightly sidegradient of former IDDA 1b and has been monitored since 1988. The other wells installed at former IDDA 1b in 2007 (MW-11 through MW-15) were sampled in 2007. Target Compound List (TCL) VOCs and semi-volatile organic compounds (SVOCs) have been detected in groundwater samples from within the source area beneath former IDDA 1b (Geosyntec, 2011a). Some of these constituent concentrations also exceed Safe Drinking Water Act Maximum Contaminant Levels (MCLs). All of these data are summarized in tabular and graphic format in the most recent annual monitoring report, *2010 Annual Environmental Monitoring Report for Remedial Work Element I* (Geosyntec, 2011a).

Chlorinated aliphatic hydrocarbons, chlorinated aromatic hydrocarbons, non-chlorinated aromatic hydrocarbons (benzene, toluene, ethylbenzene and total xylenes, collectively referred to as BTEX) and ketones are the prevalent TCL VOCs in groundwater beneath the former source areas. In 2007, monitoring wells MW-12, MW-13, MW-15, S-1, and S-2 had the highest concentrations of VOCs at the Site (Golder, 2008). Monitoring wells S-1 and S-2 continue to be among the wells with the highest concentrations of VOCs (Geosyntec, 2011a). TCL SVOCs are monitored at the former IDDA 1b source area wells EX-1, MW-10, MW-11, S-1, and S-2. SVOCs consistently detected in the source area wells are chlorinated benzenes, phenolic compounds (phenol and various methylphenol and dimethylphenol isomers), phthalate compounds, polynuclear aromatic hydrocarbon (PAHs), and 1,4-dioxane. Monitoring wells EX-1, S-1, and S-2 had the highest total SVOC concentrations during the most recent monitoring (Geosyntec, 2011a).

Much lower concentrations of the same VOCs detected at former IDDA 1b were detected in groundwater samples from MW-1B, MW-1C, and MW-9 in 2010 and from the 2001 transect of direct push groundwater samples at the former septage lagoons and IDDA 2. TCL SVOCs have not been detected in groundwater samples from MW-9 located at the former septage lagoons and IDDA 2. These data suggest that the source strength is lower in this area compared to former IDDA 1b and IDDA 2.

2.4.1.2 Downgradient Areas

The types of TCL VOCs detected in groundwater samples downgradient of the Site include aromatic hydrocarbons, chlorinated aromatic hydrocarbons, and chlorinated aliphatic hydrocarbons. Chlorinated aliphatic hydrocarbons are the most prevalent VOCs in the downgradient wells (MW-2B, MW-6A, MW-6B, and MW-7B), with the highest VOC concentrations present in MW-6A. Chlorinated aromatic hydrocarbons and BTEX were also detected in downgradient wells but BTEX constitutes a smaller fraction of total VOCs compared to

the source areas, likely due to anaerobic biodegradation along transport pathways toward the downgradient wells. TCL SVOCs historically have not been detected at downgradient monitoring wells near the river (Golder, 1994a) and were not included on the list of analytes for these wells as part of the long-term environmental monitoring program for RWE I. More recently, in April 2011, these wells were sampled for SVOCs, gasoline-range organics (GRO) and diesel-range organics (DRO). SVOCs were not detected with the exception of the detection of 1,4-dioxane. Very little GRO and no DRO were detected.

Target Analyte List (TAL) metals, including arsenic, iron and manganese, were detected at concentrations above MCLs in the same monitoring wells where VOCs and SVOCs were detected in groundwater in both the source areas and downgradient of the landfill. Iron and manganese are more soluble under lower redox conditions, and are likely being mobilized from naturally occurring iron and manganese oxide minerals in the aquifer when lower redox conditions become established by municipal solid waste (MSW) leachate constituents (Baedecker and Back, 1979) and/or petroleum hydrocarbons from the additional source materials beneath the landfill and the lagoons. Other TAL metals such as arsenic are adsorbed to the surfaces of these iron and manganese oxides (Rose et al., 1979), and are therefore mobilized in groundwater when the iron and manganese oxides dissolve.

The concentrations of arsenic, iron and manganese have changed very little since the beginning of the annual monitoring program. The redox-induced mobilization of iron, manganese, and arsenic is not expected to change until most of the reduced organic carbon from MSW leachate and residual NAPL that is present in the sediments beneath the groundwater table at the source areas has been depleted. Although the concentrations of these metals decrease toward the river, they are still present at relatively high concentrations compared to the historical results from background well MW-4B and sidegradient wells MW-3A/B and MW-8A/B.

Monitoring data indicate that TCL VOCs and SVOCs occur in groundwater in an approximately 1,300-foot wide zone between the landfill and the Delaware River, but the direct-push hot spot groundwater investigation (Golder, 2001) indicated that much higher concentrations (i.e., greater than 1,000 micrograms per liter [µg/L] total VOCs) were present in a 500-foot wide zone along the centerline of the affected area, directly downgradient from former IDDA 1b, between permanent monitoring wells MW-1B and MW-10 (**Figure 8**). Near the source areas, TCL VOCs and SVOCs are generally confined to shallow zones of the aquifer which also have a higher hydraulic conductivity compared to the deeper zones. Therefore, the overall extent of VOCs and SVOCs indicate that most of the mass flux of VOCs toward the Delaware River should be within the upper sand and gravel unit near the source area. However, it should be noted that higher VOC concentrations were detected in samples from MW-6A, which is screened in the deeper portion of the saturated zone near the Delaware River, downgradient from former IDDA 1b. These higher concentrations might be due to stronger downward gradients in the vicinity of former IDDA 1b (compared to well nest MW-1A/1B/1C) and/or geologic heterogeneities that

provide preferential migration pathways toward deeper zones at MW-6A. Data from proposed wells MW-18A/B/C and MW-7M should help to resolve the pathway to MW-6A.

2.4.2 Source Areas

The source areas targeted for treatment are shown on **Figure 3** and include areas beneath the landfill at former IDDA 1b near the center of the landfill, and beneath the former septage lagoons and IDDA 2 southeast of the landfill. The nature and extent of contamination beneath the former IDDA 1b have been presented previously (Golder, 1994b, 2008) and are summarized in the following sections. The area beneath the former septage lagoons and former IDDA 2 have not been characterized since their excavation as part of the 1995 Removal Action. Further characterization of remaining source materials in that area are planned as part of the remedial system installation.

2.4.2.1 Source Area beneath Former IDDA 1b

The source area below former IDDA 1b was identified in 2004 (Golder, 2004) during analysis of soil samples collected at and below the groundwater table from two soil borings (S-1 and S-2). Its horizontal and vertical extents were characterized in 2007 by the installation of soil borings and monitoring wells through the existing geosynthetic landfill cap (Golder, 2008).

The VOCs detected in at least one soil sample included:

Aromatic Hydrocarbons	BTEX and naphthalene;
Chlorinated Aromatics	1,2,4- trichlorobenzene, 1,2-dichlorobenzene, and 1,4-dichlorobenzene;
Chloromethanes	Carbon tetrachloride and chloroform;
Chlorinated Ethanes	1,1,1-Trichloroethane (1,1,1-TCA);
Chlorinated Ethenes	Tetrachloroethene (PCE), trichloroethene (TCE), cis-1,2-dichloroethene, and vinyl chloride (VC); and
Ketones	Acetone, 2-butanone (MEK), and 4-methyl-2-pentanone (MIBK).

The VOC detections in each soil sample were evaluated for the potential presence of residual (non-mobile) non-aqueous phase liquid (NAPL) (Golder, 2008). The potential presence of a multi-component residual NAPL was indicated within borings B-1, B-2, B-7, B-8, B-9, B-10, S-1 and S-2 as shown on **Table 1**. The depth of the potential residual NAPL varies by boring. Aromatic hydrocarbons, chlorinated aromatics and chlorinated ethenes were the compound classes for which residual NAPL is most likely present based on the number of times compounds

in those classes of compounds were predicted to be present as NAPL in comparison with the other classes of compounds. The depth interval where residual NAPL is likely to occur is from 15 feet to 40 feet bgs, primarily between 23 feet and 30 feet bgs. The plan view of the estimated source area for TCL VOCs based on the potential presence of NAPL is shown in **Figure 6**. Boring B-10 is not included within the estimated source area because NAPL is potentially present only at 18 ft bgs. This is above the seasonal high water table at former IDDA 1b of 20 ft bgs and is therefore not likely to leach to groundwater given the presence of the geosynthetic cap. The estimated source area at IDDA 1b is approximately 21,000 square feet (0.5 acre). Since 2004, free-phase NAPL has been intermittently detected at wells MW-13, S-1 and S-2 within the estimated source area with thicknesses up 0.74 feet but more often at thicknesses less than 0.2 feet. These measurements indicate that there is a smear zone of free-phase and residual NAPL at the depth of groundwater table fluctuation.

Soil samples from a subset of the 2007 borings were collected and submitted to a fixed laboratory for TCL SVOCs and TAL metals analyses. TCL SVOCs were detected at borings B-1, B-2, B-3, B-4, B-5, and B-6 with the highest concentrations at B-7. However, TCL SVOCs historically have not been detected above MCLs in downgradient groundwater, suggesting TCL SVOCs within the residual source material at former IDDA 1b are less mobile than the TCL VOCs.

TAL metals arsenic, iron, and manganese were detected in all soil samples submitted for analysis at concentrations within background concentrations. This is consistent with detection of these metals in former source area and downgradient groundwater due to mobilization from naturally-occurring sediments beneath the landfill under lower redox conditions.

Soil samples were collected from the soil boring for MW-16 in February 2009 and the homogenized samples were analyzed for TCL VOCs and total petroleum hydrocarbons (TPH) gasoline and diesel range organics (VeruTEK, 2009). The total TCL VOC concentration detected in the homogenized soil samples was 259,200 micrograms per kilogram (µg/kg). The most abundant VOCs detected were total xylenes (100,000 µg/kg), toluene (79,000 µg/kg), and tetrachloroethene (44,000 µg/kg). The TPH (GRO) concentration detected in the soil was 1,600,000 µg/kg. The TPH (DRO) concentration detected in the soil was 3,000,000 µg/kg. TPH was not analyzed in the 2007 source characterization samples and therefore not included in the total source mass estimates. The TPH data for this sample suggest that TCL VOCs and SVOCs comprise a minor percentage of the total contaminant mass and therefore TPH must be accounted for in evaluating the design of any in situ treatment technology. However, it should be noted that very little GRO, and no DRO or ORO, were detected in downgradient groundwater samples when evaluated during 2011 sampling events. Therefore, the more soluble and easily biodegraded GRO is likely attenuating rapidly, and the less soluble DRO and ORO are probably immobile under existing conditions.

2.4.2.2 Additional Source beneath Former Septage Lagoons and IDDA 2

The former septage lagoons and IDDA 2 were excavated in 1995 as part of the Removal Action. Soil samples collected from the bottom of the eastern septage lagoon excavation at the groundwater table suggested that residual material was likely to be present below the depth of excavation. No post-excavation soil samples were collected at IDDA 2. Post-excavation soil samples at the two former septage lagoons indicated that VOCs, particularly toluene, were present at the base of the excavation that extended to the groundwater table, at the eastern lagoon. Much lower concentrations of VOCs, which were below the soil cleanup standard for the lagoon excavations, were detected in post-excavation soil samples from the excavation of the western lagoon. Therefore, it is expected that the in situ source treatment in this area will focus upon the footprint of former IDDA 2 and the eastern lagoon.

2.4.3 Constituent Transport, Fate and Persistence

Former source areas in the unsaturated (vadose) zone at the Site (i.e., buried drums and the septage lagoon sediments) have been either removed or effectively contained by the low permeability landfill cap. COCs continue to be detected in the Site groundwater monitoring wells due to the additional source area detected at and below the groundwater table. Parent compounds (e.g., PCE, TCE, 1,1,1-TCA, and carbon tetrachloride) have been detected in both soil and groundwater samples from S-1 and S-2, but are not detected at downgradient well EX-1, indicating very rapid attenuation (via anaerobic reductive dechlorination reactions) beneath the landfill. This interpretation is further supported by relatively high concentrations of the ultimate daughter products, ethane and ethene, in groundwater samples collected both before, and several years after landfill cap construction (Golder, 1997, 2000, and 2011 sampling events).

The upper sand and gravel unit was likely in a quasi-equilibrium steady state condition with respect to sorption prior to construction of the source control measures because the COC plume had reached the Delaware River by the late 1980s. There is currently an overall trend of declining COC mass in the source areas (i.e., including both the groundwater and the aquifer solids) at the Site as constituents dissolve and desorb from additional source areas in the aquifer solids below the former source areas and are transported by groundwater advective flow toward the Delaware River. However, the groundwater concentrations have re-equilibrated at concentrations greater than cleanup goals after slight declines in response to the previous source control measures. The absence of VOC detections in deep soil beneath the former IDDA 1b source area (boring B-1) and the detection of VOCs in soil at greater depths downgradient in soil at borings B-4 and B-5, and in groundwater at deep well MW-6A, indicate a diving flow path toward MW-6A is possible, but the additional source areas are at shallow depths.

Natural attenuation processes have caused significant mass reduction (approximately 99 percent) along the groundwater advective transport pathway prior to reaching the river. However, redox

conditions do not rebound to background (aerobic) conditions prior to discharge of shallow groundwater to the Delaware River and some COCs, especially chlorinated aromatic hydrocarbons, persist in off-site groundwater. As summarized in the 2010 ROD/ROD Amendment, since completion of the 1994 ROD's landfill cap and drum removal components, surface water applicable or relevant and appropriate requirements (ARARs) have been consistently attained in the Delaware River and the Site never posed a potential ecological risk. In addition, the vapor intrusion pathway to residences between the source areas and the Delaware River were determined by USEPA not to constitute a significant risk to human health or the environment. Therefore, there are currently no complete exposure pathways to the source areas and affected groundwater.

3. TECHNICAL APPROACH

3.1 OU 4 Performance Criterion

The 2010 ROD/ROD Amendment and the SOW specify the following Remedial Action Objectives (RAOs) for the OU 3 and OU 4 remedial actions based on results of the risk assessment and the determination of ARARs for the Site:

- Reduction or elimination of the potential for source areas to release contaminants to groundwater;
- Reduction or elimination of the potential for migration of contaminants downgradient of the former landfill; and
- Restoration of the aquifer downgradient of the landfill as a potential source of drinking water by reducing contaminant levels to the federal and state MCLs.

The in situ source treatment at OU 4 will be designed to remove COCs from groundwater at or beneath the former source areas and thereby enhance the rate of dissolution of residual source material. The enhanced dissolution will reduce or eliminate the potential for releases from the former source areas and for contaminant migration. The reduction or elimination of the mass discharge from the former source areas will ultimately promote the restoration of the aquifer downgradient of the landfill in conjunction with MNA of downgradient groundwater (OU 3). Cleanup levels for downgradient groundwater, as specified in the 2010 ROD/ROD Amendment, are presented in **Table 2.**

The Performance Criterion for OU 4 in situ source treatment is based on a reduction in the mass discharge of COCs from the source areas (ITRC, 2010). Monitoring wells form two mass discharge transects downgradient of the in situ source treatment areas. One transect is located near the source areas and the other transect is located farther downgradient as shown in **Figure 9**. If appropriate, modification of the location of the two transects might be proposed to the agencies for approval based upon evaluation of data from new groundwater monitoring wells. Prior to the initiation of active treatment, baseline concentrations and mass discharge estimates will be developed in both transects. The concentrations and mass discharge at the transect closer to the treatment areas will be compared to that in the downgradient transect in order to evaluate the pre-treatment natural attenuation capacity of the downgradient aquifer between the two transects. The Performance Criterion for the OU 4 remedy will be to achieve a 90% reduction in the baseline mass discharge of total TCL VOCs at the transect closer to the treatment areas. Pre-treatment concentrations for each COC at each well will be established using USEPA-approved statistical measures such as upper confidence limits, tolerance limits, or prediction intervals (USEPA, 2009) for monitoring data generated since 2004 and then used in the pre-treatment mass discharge calculations. The pre-treatment mass discharge through the aquifer at the vertical

plane through the wells closer to the source areas will be calculated in accordance with ITRC (2010). The pre-treatment concentrations established for each COC at each well, and the overall mass discharge through the aquifer, will be specified in the O&M Manual.

Once the Performance Criterion has been achieved, active treatment of the former source areas will be discontinued and the remedy will transition to the stabilization component and then the MNA component described in Section 3.2.4 and the MNA Plan, respectively. Dissolution of residual source material will continue after cessation of active source treatment and will be addressed by natural attenuation processes. An additional step of active treatment by in-situ chemical oxidation (ISCO) is included, if necessary, between the stabilization component and the MNA component.

3.2 Remedial Components

The following sections describe the technical approach for implementation of the remedial components for in situ source treatment at OU 4. The remedy for both OU 3 and OU 4 as specified in the 2010 ROD/ROD Amendment includes the following components:

- Air sparging (AS) of the source areas for approximately seven years to remove a significant quantity of the petroleum hydrocarbons and other VOCs;
- Collection and discharge to the atmosphere after aboveground treatment, if necessary, of the extracted vapors from the AS wells using soil vapor extraction (SVE) wells;
- Amendment additions, such as ozone, to the AS/SVE system for the final phase of the AS/SVE period;
- Subsurface-stabilization period for up to five years after the air-sparging program has been completed;
- Subsequent (post-stabilization) application of ISCO, if necessary, potentially including a surfactant enhancement, to address the remaining more recalcitrant source materials;
- Natural attenuation of remaining source material;
- MNA of the groundwater downgradient from the landfill perimeter; and
- Long-term monitoring.

The remedial components for in situ source treatment at OU 4 are:

- Air sparging;
- Soil vapor extraction and off-gas treatment;
- Amendment additions (e.g., ozone);

- Stabilization; and
- Post-stabilization ISCO application, if necessary.

As summarized in **Table 3**, implementation will be guided by the Performance Criterion that will determine the transition between remedial components set out in the 2010 ROD/ROD Amendment and other steps, if necessary, to improve their performance. The technical approach for MNA of downgradient groundwater at OU 3 is presented separately in the MNA Plan (Geosyntec, 2011b). The technical approach for long-term monitoring of OU 4 will be presented in the O&M Manual to be developed following approval of the RD.

3.2.1 Air Sparging

AS will be used throughout the source areas to remove a significant component of the petroleum hydrocarbons and other VOCs by volatilization, a physical treatment technology. AS consists of injecting air below the water table in order to volatilize dissolved VOCs and partition them into soil gas in the vadose zone. AS will also introduce oxygen into the groundwater at the source area which should promote aerobic biodegradation processes, although biodegradation is not being relied upon as the primary removal mechanism. As VOCs are removed from the aqueous phase, dissolution of the source material is accelerated. Dissolved VOCs with a pure compound Henry's Law constant greater than 2×10^{-3} atmospheres per cubic meter per mole (atm-m^3/mol) are considered to be amenable to volatilization by AS (USACOE, 2008). **Table 4** lists the pure compound Henry's Law constants (at 10°C) and possible aerobic biodegradation mechanisms for the VOCs prevalent in groundwater downgradient of the landfill. Eighteen VOCs have pure compound Henry's Law constants (at 10°C) sufficiently high enough that they are conducive to removal by AS. Of the remaining VOCs (chloroaromatics, ketones, naphthalene, chloroform, methylene chloride), most are expected to be conducive to aerobic bioremediation/co-metabolism as shown in **Table 4**.

AS will begin upon completion of system installation and start-up/shake down. The initial system operation will be started slowly (lower pressure, lower air flow rate, fewer wells operating at one time and for fewer hours per day than the designed long-term operating conditions) to limit the potential for COC concentration increases downgradient from the former source areas. Such increases might occur due to physical disturbance of mixed NAPL in the source area by the AS operation. The potential for such increases should be mitigated by recovery of free-phase LNAPL from existing monitoring wells (e.g., MW-13, S-1, and S-2) during construction.

Concentration increases in performance monitoring wells downgradient of the treatment system during system startup should be acceptable as long as the concentrations are not greater than the maximum pre-remedial concentrations detected at the Site. If maximum pre-remedial concentrations are exceeded, then AS operations may be modified to mitigate the increase by

reducing the air injection flow rate, reducing the number of AS wells operating at a given time, reducing the daily duration of sparging, or other appropriate measures. If concentrations exceed twice the maximum pre-remedial concentration, then the system will be shut down and the operator will consult with the Respondents and then the agencies to discuss a plan for system modifications. Otherwise, operation of the system will be slowly transitioned to the design operating conditions.

Groundwater monitoring data will be used to evaluate changes in the geochemical environment in the treatment zones. Based upon the field-measured dissolved oxygen (DO) and oxidation-reduction potential (ORP) responses during the AS/SVE pilot test (Appendix A), it is expected that the AS systems will be able to modify the existing geochemical environment in the source area from anaerobic to aerobic. Such a change should arrest the redox-based dissolution of iron and manganese oxides from the aquifer solids that produces the high dissolved iron and manganese concentrations in groundwater. In this manner, iron and manganese oxides should precipitate out of solution in the source area during system start up but no further iron and manganese oxide precipitation would occur and iron fouling of the sparge points would be of less concern.

If AS alone cannot change the geochemical environment to aerobic conditions, then there is a possibility of ongoing iron floc formation around the sparge wells with associated reduction in system performance and increased O&M costs. There is not a definitive concentration of DO, ORP, or dissolved concentration of iron and manganese above or below which these processes would be problematic. However, there should be detectable DO in the treatment zone groundwater, the ORP should increase to greater than +100 millivolts (mV), and filtered iron concentrations should be less than 10 milligrams per liter (mg/L). If these target geochemical conditions are not achieved, then injection of a strong oxidant such as hydrogen peroxide or persulfate will be considered in order to “shock” the system and temporarily establish an aerobic geochemical environment around the AS well screens with the expectation that AS will be able to maintain an aerobic condition around the well screens from that point forward. Once injected, monitoring data should be reviewed to evaluate whether AS is able to maintain the targeted geochemical environment once established by the amendment injection. Alternatively, ozone amendment could begin earlier than planned.

Based on the use of AS/SVE at other VOC-impacted sites where several years of system operation were required to adequately treat the residual NAPL source material, and the relatively large source mass at the Site compared to other sites, it is assumed that AS will treat BTEX (the most abundant TCL aromatic hydrocarbons in the source area), as well as some TCL chlorinated VOCs (e.g. trichloroethene and chlorobenzene), and the GRO petroleum hydrocarbons within approximately seven years. Some incidental treatment of the DRO petroleum hydrocarbons and possibly some of the heavier oil-range organic petroleum hydrocarbons might also occur to some degree, although treatment of those constituents is not a remedial goal. If some parts of the

system achieve the Performance Criterion earlier than other parts of the system, then operation of the air sparging might be discontinued in those areas while air sparging continues treatment in the other areas.

The decision to terminate air sparging in one or more parts of the treatment zone(s) will be based upon performance monitoring data. If air sparging alone achieves the overall Performance Criterion for active treatment in some or all areas of the treatment zone(s), then it will be shut down in those areas and monitoring will continue. Alternatively, if air sparging alone does not achieve the overall Performance Criterion for active treatment in some or all areas of the treatment zone(s), but the system treatment efficiency has declined significantly, the Respondents will evaluate whether additional treatment by air sparging is likely to be effective and efficient compared to the amendments (including ozone sparging) described in Section 3.2.3 below.

Upon AS shutdown, the monitoring frequency will increase from two times per year (semi-annual) to three times per year because it is possible that concentrations of one or more COCs in groundwater downgradient from the treatment zone might increase (i.e. rebound) in one or more wells. If the concentration of any COC in any well rebounds by at least 20 percent compared to the reduction that had been achieved through treatment, then the data will be evaluated to decide whether air sparging should be restarted. During evaluation of the data after AS shutdown, the mass discharge in the aquifer near the source area treatment system will be calculated for the last two consecutive monitoring events. If the mass discharge has rebounded by an amount that is more than 20 percent of the overall mass discharge decline that had been achieved by treatment for both consecutive monitoring events, and if it exceeds the natural attenuation capacity of the downgradient aquifer, then the well(s) in question will be resampled to confirm the increased concentration. If the increase is confirmed, then the active sparging treatment may be resumed, if appropriate. Resumed air sparging operation, if appropriate, would continue and cessation of air sparging operation would be evaluated as described above. Pursuant to Section 3.2.3 below, the Respondents might also evaluate whether addition of one or more amendments is appropriate in addition to, or in lieu of, restarting the air sparging system.

3.2.2 Soil Vapor Extraction and Treatment

SVE wells will be installed in the vadose zone to collect the VOC vapors coming off the water table due to AS. In addition, the vacuum applied above the water table is expected to volatilize residual VOCs sorbed in the vadose zone and capillary fringe even though these materials are contained by the landfill cap and are not targeted for treatment. It is anticipated that methane has accumulated in the landfill. SVE will be operated prior to the start of AS operations in order to remove the accumulated methane. Based upon the age and thickness of the waste, and the design flow rate for the SVE system, the methane concentrations are expected to decline. The extracted soil gas will be treated prior to discharge to the atmosphere, if necessary, in order to be in

compliance with Federal, State and local air emissions regulations. Based on the pilot test results (Appendix A), it is expected that the VOC concentrations in the SVE air stream will initially require treatment but will decrease over time, and that the relative proportion of various VOCs to each other will also change because reductive dechlorination reactions will be inhibited during AS and hence daughter products such as VC will not be produced or will be present in much lower concentrations. Therefore it is possible that treatment of the SVE off-gas may not be necessary as the AS/SVE operation continues. The SVE discharge will be monitored prior to and after treatment and the monitoring data will be compared to the Guidelines for the Control of Toxic Ambient Air Contaminants ([DAR-1] NYSDEC, 1997). If off-gas concentrations fall below these targets, off-gas treatment may be discontinued but off-gas monitoring would continue. If off-gas concentrations subsequently increase above DAR-1 guidelines, off-gas treatment would resume. Details of the off-gas monitoring program and criteria for VGAC change out will be included in the O&M Manual.

3.2.3 Amendment Additions

It is currently planned that ozone will be used as an amendment during the latter part of the air sparging period. The decision to apply ozone, and/or other amendments, will be proposed to the agencies by the Respondents based upon performance monitoring data, in particular the types of constituents requiring additional treatment and the ability of amendments to effectively and efficiently treat those constituents. Groundwater monitoring downgradient of the treatment areas will be used to evaluate changes in concentration and the mass discharge of individual VOCs over time. It is expected that AS will preferentially remove the VOCs that are more volatile and/or amenable to aerobic biodegradation (**Table 4**), possibly decreasing the mass discharge of these VOCs to the levels necessary to achieve the OU 4 Performance Criterion. Conversely, some of the petroleum hydrocarbons and chlorinated VOCs may not be adequately treated by AS alone due to limited volatility or treatability by aerobic biodegradation (**Table 4**). It is currently planned that ozone will be added as an AS amendment for the final phase of the AS program if the decreases in the mass discharge of the less volatile or less aerobically biodegradable constituents are not showing adequate progress toward achieving the Performance Criterion. It is also possible that the concentrations of VOCs in the downgradient aquifer and in the SVE off-gas will decrease over time to an asymptotic limit as the AS/SVE removal rate becomes limited by the rate of dissolution but the mass discharge will remain above the Performance Criterion. This would be determined by evaluation of the downgradient groundwater and SVE off-gas monitoring data. If the AS/SVE removal rates become mass-transfer limited, then ozone may be applied. The need for and timing of the addition of ozone to the AS program will be determined by the performance monitoring data.

If monitoring data indicate that use of other suitable amendments besides ozone are appropriate, they will be proposed by the Respondents and discussed with the agencies prior to application. Other amendments that may be considered will depend upon the types of COCs that require

treatment. The specific amendment program would be developed and proposed to the agencies at that time and might include ISCO, biostimulation, bioaugmentation, or other technologies that may emerge after this RD has been prepared. The amendment program will discuss whether more than one amendment application should be considered and the appropriate timeframe to achieve the Performance Criterion. Other suitable amendments may or may not be compatible with air sparging. Hence air sparging might cease prior to introduction of other suitable amendments. Upon agency approval, the Respondents will proceed with the amendment application(s).

3.2.4 Stabilization

Prior to stabilization, the mass discharge through the aquifer at the vertical plane through the wells closer to the source areas will have decreased by at least 90 percent compared to pre-treatment conditions. If the concentrations do not rebound by at least 20 percent, or if the mass discharge does not rebound by at least 20 percent, for two consecutive events, then the Respondents may propose to the agencies that the stabilization period may begin. However, active treatment will not extend for more than 10 years from air sparging startup without written approval of EPA. The stabilization period may last up to five years to allow the active treatment components to subside and for groundwater redox conditions to re-equilibrate. During the stabilization period, performance monitoring will continue in order to assess groundwater quality downgradient of the source treatment systems. It is possible that concentrations might increase temporarily during stabilization, but stable or decreasing concentrations should be established within five years.

3.2.5 Post-Stabilization ISCO Application (If Necessary)

If the OU4 Performance Criterion described above is not achieved by the end of the stabilization period, or if site-specific MNA performance monitoring criteria established consistent with *Performance Monitoring for MNA Remedies for VOCs in Groundwater* (EPA/600/R-04/027, dated April 2004) are not achieved, then the post-stabilization ISCO application, potentially including a surfactant enhancement, to address the remaining more recalcitrant source materials will be applied and monitoring of downgradient groundwater will continue. Multiple applications of the post-stabilization ISCO amendment might be considered if the Performance Criterion is not achieved after the first application. The Respondents might also petition the agencies for permission to apply other amendments after the post-stabilization ISCO, if appropriate.

If the post-stabilization ISCO application achieves the Performance Criterion, downgradient groundwater will continue to be monitored pursuant to the MNA Plan and then compliance demonstration monitoring will be performed. Otherwise, the contingent remedy will be considered.

3.2.6 Monitored Natural Attenuation

While MNA has been specified as a remedial component for downgradient groundwater (OU 3) as presented in the MNA Plan, it is likely that natural attenuation processes will also function as a final polishing step in the source areas after active in situ treatment. Residual source material potentially remaining after the stabilization period should continue to dissolve into groundwater within the source areas but the mass discharge from these areas should decrease with time.

4. DESIGN APPROACH

4.1 Applicable or Relevant and Appropriate Requirements

Section 121(d)(2)(A) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requires that Superfund remedial actions must comply with Federal or more stringent State environmental standards, requirements, criteria, or limitations that are determined to be ARARs. Applicable requirements are those that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a Superfund site. Relevant and appropriate requirements address problems or situations sufficiently similar to those encountered at the site that their use is well suited to the remedial action. Guidance, policy and other non-promulgated criteria or advisories are not ARARs but rather to be considered (TBC).

ARARs are categorized into three distinctive groups: chemical-specific, location-specific and action-specific requirements. Chemical-specific ARARs are typically health-based numerical criteria that establish acceptable concentrations or amounts of a constituent that is either present in or may be discharged to the environment, such as drinking water standards. Location-specific ARARs are restrictions placed on the concentration of hazardous substances, pollutants or contaminants or the activities conducted because the Site is in a specific location, such as wetland or floodplain. Action-specific ARARs pertain to the specific remedial actions that are proposed at the Site and include promulgated design standards. A summary of the ARARs and TBCs which will be complied with during implementation of the selected remedy and the amended 1994 ROD groundwater remedy (i.e. OU 3 and OU 4) is presented below.

- Clean Air Act, National Ambient Air Quality Standards (40 Code of Federal Regulations (CFR) 50);
- Groundwater Quality Regulations (6 New York Codes, Rules and Regulations [NYCRR] Parts 700-705);
- National Primary Drinking Water Standards (MCLs and non-zero maximum contaminant level goals [MCLGs]) (40 CFR 141);
- National Environmental Policy Act (40 CFR 1500 to 1508);
- National Emissions Standards for Hazardous Air Pollutants (40 CFR Parts 51, 52, 60, and 61);
- New York State Department of Health Drinking Water Standards (10 NYCRR Part 5);
- New York State Regulations for Prevention and Control of Air Contamination and Air Pollution (6 NYCRR Part 200);
- New York State Drinking Water Standards (10 NYCRR Part 5);

- New York State Air Cleanup Criteria, January 1990;
- New York State Department of Environmental Conservation Guidelines for the Control of Toxic Ambient Air Contaminants, DAR-1, November 12, 1997 New York Air Quality Standards (6 NYCRR Part 257);
- New York State Department of Environmental Conservation, Technical and Operational Guidance Series 1.1.1, November 1991; and
- Safe Drinking Water Act (SDWA) MCLs and nonzero MCLGs.

Chemical-specific ARARs and TBCs for groundwater at the Site are listed in **Table 5**. According to the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), remedial actions at Superfund sites whose groundwater is a current or potential source of drinking water are required to meet the non-zero MCLGs provided in the Federal SDWA (40 CFR Part 141.50-141.52) when applicable or relevant and appropriate. When MCLGs are not ARAR, MCLs (40 CFR Parts 141.11-141.16 and 141.60-141.63) should be met. USEPA and NYSDOH have promulgated health based protective MCLs (40 CFR Part 141, and 10 NYCRR Part 5) which are enforceable standards for various drinking water contaminants. Non-zero MCLGs and MCLs would be applicable at the point-of-use downgradient from the site because they regulate drinking water at the point of use in public water supply systems serving more than 25 persons for over 60 days per year. However, no such systems exist downgradient of the Site. Local Law #1 passed in 1996 restricts groundwater use in the vicinity of the Site to monitoring purposes only. Local Law #4 passed in 1998 requires drinking water connections for properties located downgradient from the Site and within the Narrowsburg Sewer and Water District. Nevertheless, the aquifer class is GA (6 NYCRR 701.18), meaning that it is designated as a potable water supply. Therefore, although they might not currently be applicable, MCLs and non-zero MCLGs are relevant and appropriate for the goal of groundwater restoration.

The cleanup goals for downgradient groundwater (OU 3) are listed on **Table 5**. Cleanup goals for OU 3 groundwater are the most stringent of the various groundwater ARARs listed above. These values have been updated from the groundwater cleanup goals presented in the 1994 ROD (USEPA, 1994). Note that the Performance Criterion for OU 4 is based upon reduction in groundwater mass discharge and is therefore, in contrast to downgradient groundwater in OU 3, not based upon promulgated chemical-specific ARARs.

Chemical-specific ARARs and TBCs for air are action-specific to the operation of the SVE system. Emissions controls for the SVE system would be required to comply with technical requirements of the Federal and State air regulations (40 CFR Part 50, 51, 52, 60, and 61 and 6 NYCRR Parts 200 and, 257) applicable to SVE off-gases.

Potential environmental effects on threatened or endangered species, wetlands, floodplains and historic properties have been evaluated in consideration of the National Environmental Policy

Act. According to information received from the New York Natural Heritage Program as part of the 1994 FS (Golder, 1994a), no threatened or endangered species or threatened or endangered species habitats are located on the site. Consistent with the Environmental Evaluation Plan (TetraTech, 1992), critical habitats and federal and state threatened or endangered species which are located within ½ mile radius of the Site were identified. No threatened or endangered species or critical habitats were found within this area.

Actions at the Site may be subject to requirements of Executive Order 11990 (Protection of Wetlands) because wetlands have been identified in the RI/FS study area and more specifically at the former septage lagoons and former IDDA 2. Executive Order 11990 is classified as a TBC because it is Federal policy not a promulgated law or regulation. Wetlands delineation was performed by Tetra Tech (1994) as part of the Environmental Evaluation. It was determined that the wetlands at former IDDA 2 and the septage lagoons are not in hydraulic connection with the Delaware River and that they are isolated. Therefore, they are not water of the United States and are not under the jurisdiction of the U.S. Army Corps of Engineers. The wetlands are smaller than five acres and therefore are not regulated by the state of New York. Therefore, no permit equivalencies will be required for activities that may impact the wetlands.

The area of land located between the Delaware River and the railroad embankment and downriver from MW-7A/B is located within a 100-year floodplain. The 500-year floodplain includes some Site areas east of the railroad embankment specifically the former septage lagoons and IDDA 2 (see **Figures 2 and 3**). Actions taken within this area may be subject to requirements of Executive Order 11988 (Floodplain Management). Executive Order 11988 is classified as TBC because it is a federal policy not a promulgated law or regulation. Construction activities in the vicinity of the former septage lagoons and IDDA 2 will not alter floodplain management. However, the potential for flooding will be considered in the design of remedial components in these areas.

Information concerning the possible location of historic properties within the Town of Tusten or the Hamlet of Narrowsburg was requested from the New York State Office of Parks, Recreation and Historic Preservation (NYSOPRHP) as part of the 1994 FS (Golder, 1994b). The NYSOPRHP responded that based upon reported resources, the project area may contain an archaeological site. The NYSOPRHP recommended that "unless substantial ground disturbance can be documented, an archaeological survey is warranted". Based upon a telephone conversation with Mr. Jim Warren of the NYSOPRHP Project Review Unit, a landfill would be considered as substantial ground disturbance. Based upon the review of the Cultural Resources Survey included in the RWE I design (Golder, 1997), the Site is in compliance with the Federal Section 106 and/or state Section 14.09 Preservation Laws. The Narrowsburg Methodist Church is the only historic building near the Site.

4.2 Design Basis

An AS/SVE Pilot Test was performed in the vicinity of former IDDA 1b in order to collect site-specific data for the remedial design of the AS, SVE and aboveground treatment systems. Data collected in the vicinity of former IDDA 1b is applied to the remedial design for the former IDDA 2 and septage lagoons because the lithology and hydrogeology are similar to that of former IDDA 1b with the exception of the compacted drum excavation backfill. A report describing the pilot test program, work performed, results and conclusions is provided as Appendix A. The design basis for ozone (or other suitable amendments), as well as the post-stabilization ISCO application, if necessary, will be the groundwater concentrations detected at that time. The following sections present the design basis for in-situ source area treatment including AS, SVE, off-gas treatment, ozone amendment and the post-stabilization ISCO application, if necessary, based on the data available to date.

4.2.1 Air Sparging

Based on the observed increases in dissolved oxygen concentrations and oxidation-reduction potential during steady-state air injection during the AS/SVE Pilot Test (Appendix A), the design radius of influence (ROI) for AS is 15 feet. The design air injection flow rate is 15 standard cubic feet per minute (scfm) with a design injection pressure of 13.5 pounds per square inch gauge (psig) based on the air injection step test. These design parameters are summarized in **Table 6**.

Air injection into the AS wells will be conducted in cycles as recommended in the *Air Sparging Paradigm* (Leeson et al., 2002). This has the major benefit of reducing the size of the compressor needed for AS operations and the corresponding energy use. Pulsed operation has also been shown to provide moderate improvement in removal rate. In addition, dissolved oxygen will still be available for aerobic biodegradation for a period following the sparge cycle, as shown by post-injection monitoring of dissolved oxygen during the pilot test. The groundwater pressure response during AS startup and shutdown measured during the pilot test indicated a two-hour period to reach steady-state air injection and a two-hour period for the groundwater pressure to return to initial conditions. Air injection will be conducted in each AS well for a maximum of four hours per cycle with a planned four hour recovery period between sparging cycles such that each individual sparge well will operate for three cycles per day. Operation of each AS well will be controlled individually which will allow flexibility in grouping AS wells to operate in the same cycle. As a design basis for sizing the air compressors, the AS wells in each treatment area have been grouped into two zones with air injection alternating between them.

If aerobic groundwater conditions are not established based on groundwater geochemistry monitoring within the treatment areas, injection of a strong oxidant such as hydrogen peroxide or

persulfate will be considered in order to establish an aerobic geochemical environment around the AS well screens, or addition of amendments such as ozone may begin sooner than planned. Appendix B presents the calculation of the necessary dose of hydrogen peroxide to meet the historical chemical oxygen demand in the vicinity of the AS well screen at former IDDA 1b. For hydrogen peroxide solutions of 3 to 10% by weight, the dosing time for one AS well would be 77 to 22 minutes, respectively, at an injection rate of 4 liters per minute.

4.2.2 Soil Vapor Extraction and Treatment

Due to the varying lithology of the vadose zone following the drum removal and backfilling conducted as part of the IDDA 1b removal action, SVE tests were performed in both the compacted drum excavation backfill and the surrounding waste/sand layer. Data collected from the sand/waste layer in the vicinity of former IDDA 1b is assumed to be applicable to the former IDDA 2 and septage lagoons because the soil descriptions are similar in the two areas. SVE step rate tests were conducted to determine the achievable extraction rates and corresponding vacuum level. Data from SVE constant rate tests were used to calculate site-specific air permeability and air-filled porosity for each vadose zone lithology (see Appendix B for the calculation package). The air-filled porosity was used to determine the time for a vadose zone pore volume to be filled during air injection within the ROI of an AS well (15 feet). This time for pore volume exchange was then used to determine the SVE rate necessary to remove that pore volume and the corresponding SVE ROI. These design parameters are summarized in **Table 6** and include an SVE ROI of 37.5 feet. Because the pore volume filled by air injection and evacuated by SVE are in the same lithology, the SVE ROI is a function of flow rate alone. The difference in air permeability requires more vacuum to extract the same volume from the backfill. Due to the difference in the calculated air permeability and air-filled porosity for the compacted backfill and for the sand/waste layer, a similar ROI can be achieved at different SVE flow rates. A design flow rate of up to 50 cfm is achievable in both the compacted backfill and the sand/waste layer and will collect the soil gas produced from approximately three AS wells.

Samples of soil gas collected with and without AS from the SVE well in the compacted backfill, the moisture separator and after treatment through vapor-phase granular activated carbon (VGAC) units during the pilot test were analyzed for VOCs. **Table 7** compares the VOCs that have been detected in groundwater to the State of New York Annual Guideline Concentrations (AGCs) and Short-term Concentration Guidelines (SGCs) for non-criteria air pollutants (NYSDEC, 1997). As shown in **Table 7**, the VOCs detected in soil gas prior to treatment exceeded the AGCs and in most cases, the SGCs. Therefore, aboveground treatment of the SVE off-gas will be necessary prior to discharge to the atmosphere at a minimum during initial operation of the SVE systems. It is expected that concentrations will decline after initial operation and therefore off-gas treatment might no longer be necessary. If so, off-gas monitoring would continue and treatment would resume if concentrations increase above the guidelines.

Based on the VOC composition of the SVE off-gas samples collected during the Pilot Test, VGAC has been selected as the off-gas treatment technology. The SVE off-gas from each SVE system will flow through two (2) 5,000-pound VGAC units connected in series for treatment and discharge to the atmosphere. VOC concentrations in the discharge will be at or below the AGCs and SGCs. VGAC usage may vary between treatment areas and is expected to decline as reductive dechlorination reaction the source areas are suppressed by AS operations. Change out of the VGAC will be determined by monitoring of the VGAC influent and effluent. Additional details on off-gas monitoring and VGAC change out will be provided in the O&M Manual.

4.2.3 Ozone Amendment Addition

If ozone is selected by the Respondents as an amendment, commercial ozone generators using an air or oxygen stream usually generate ozone within the 2–10 wt% range (ITRC, 2005). The necessary ozone dose required for the AS wells will be determined at the time when ozone addition is considered necessary as discussed in Section 3.2.3. The ozone stream will be added to the air injection stream at the AS wellhead. The air from the AS system as well the balance gas in the ozone stream will transport the ozone beyond the well screen. The preliminary volumetric ratio of the air stream to the ozone stream is anticipated to be 2:1 based on operation of ozone sparging systems at other sites. If performance monitoring data indicate that amendments other than ozone are appropriate, the Respondents will proposed them to the agencies for consideration.

4.2.4 Post-Stabilization ISCO Application (If Necessary)

In the event that additional active treatment is necessary after the stabilization period, post-stabilization ISCO will be applied. The post-stabilization ISCO amendment will likely be delivered using the existing SVE well infrastructure because the existing AS well infrastructure would not be conducive for delivery of liquids to the entire volume of the treatment zone. Aqueous solutions of oxidant (e.g., peroxide, persulfate) are denser than water and the AS wells are to be screened at the bottom of the treatment zone. Therefore, if the AS wells were used, post-stabilization ISCO amendment would not be delivered to the treatment zone above the AS well screens. The selection of post-stabilization ISCO amendments will take into account the SVE well materials and the potential for contact of oxidant with solid waste in the vadose zone. The Respondents might also petition the agencies for permission to apply other amendments after the post-stabilization ISCO, if appropriate.

5. SYSTEM DESCRIPTION

5.1 Air Sparging Systems

Two separate AS systems will be installed in the former IDDA 1b and former IDDA 2 and septage lagoon source areas. Each AS system will consist of an air compressor, a dryer, filters, air distribution piping and a network of AS wells. As shown in **Figures 10** and **11**, AS wells are laid out in a triangular grid that optimizes well spacing while providing treatment within the former source areas, as shown by circles representing the AS ROI. Based on a 15-foot AS ROI and 25-foot well spacing, 37 AS wells are planned for the former IDDA 1b as shown in **Figure 10**. The extent of the former IDDA 2 and septage lagoon source areas are approximate and will be determined during construction. It is assumed that 11 AS wells will be installed at former IDDA 2 and 13 AS wells for the former septage lagoons as shown in **Figure 11**. The final size of the AS well network in the former IDDA 2 and septage lagoons treatment area will be based on the extent of the source areas. Investigation into the horizontal and vertical extent of additional source materials beneath the former septage lagoons and former IDDA 2 will be completed concurrent with AS/SVE system installation. At this time, it is planned that soil samples at and below the groundwater table will be collected during installation of AS wells in those areas and analyzed by a mobile laboratory. The results will be analyzed for the potential presence of NAPL similar to the data presented in **Table 1**. This approach will provide real-time information in the field during AS well installation to define the necessary horizontal and vertical extent of the AS system.

The AS wells will be constructed using a two-foot long two-inch diameter wire-wrapped stainless steel screen and two-inch diameter Schedule 80 chlorinated polyvinyl chloride (CPVC) riser. These materials have been selected in anticipation of ozone addition following the initial AS/SVE phase of operation. A minimum of ten feet of water above the top of the screened interval is recommended for the sparging zone (Leeson et al., 2002). The water table in the vicinity of former IDDA1b occurs between a maximum recorded seasonal high of 20 ft bgs and an approximate seasonal low of 25 ft bgs. A more normal seasonal high is approximately 23 feet bgs (Geosyntec, 2011a). Therefore the target screened interval will be between 35 and 40 ft bgs. The water table in the vicinity of former IDDA 2 and the septage lagoons occurs between a maximum recorded seasonal high of 18 ft bgs and an approximate seasonal low of 28 ft bgs as measured as MW-9 (Geosyntec, 2011a). The final screened interval will be confirmed in the field by checking the water level observed in the borehole such that a minimum of ten feet of water column will be above the top of screen and is intended to be at the contact between the upper sand and gravel unit and the underlying silty sand. The AS wells will be completed with minimum two-foot stickup to connect to aboveground AS distribution piping. AS distribution piping will be installed aboveground to avoid trenching through the landfill cap at former IDDA 1b and to mitigate impacts to the wetlands as well as keep piping above the level of spring flooding at former IDDA 2 and the septage lagoons. AS wells that penetrate the landfill cap will

be fitted with a high density polyethylene (HDPE) boot and skirt that will be welded to the existing geosynthetic cap. In addition, penetrations of the landfill cap due to previous soil borings and well installations will be repaired.

Each of the two AS well networks will be grouped initially into two groups of AS wells to allow for alternating cycles of air injection. In the former IDDA 1b source area, one group will consist of 19 wells located in the center of the source area that was backfilled and the other bank will consist of 18 wells on the perimeter of the source area. Based on the current estimate of their size, the AS well networks in the former IDDA 2 and the former septage lagoons will be separate groups.

Each AS system will have a rotary-screw type air compressor of sufficient capacity to supply the design flow rate of 15 scfm to each AS well within a treatment area during a sparge cycle. For the former IDDA 1b, the minimum capacity of the compressor is 285 scfm to supply 19 wells, or approximately 50% of the AS wells in the former IDDA 1b source area. For the former IDDA 2 and septage lagoons, the minimum capacity of the compressor is 195 scfm to supply 13 wells, or approximately 50% of the AS wells in the former IDDA 2 and septage lagoon source areas. The compressors will be sized at 120-150% of the minimum capacity as a factor of safety so that they do not have to operate a full capacity. Final sizing of the compressors will be based on the number of AS wells installed in each source area.

The discharge from each compressor will pass through a refrigerated dryer to remove moisture and cool the compressed air and then through fine coalescing and activated carbon filters to remove oil droplets and oil vapors, respectively. The discharge will then be delivered to the AS wells through air distribution piping. Dedicated piping with a pressure regulator to control pressure and a needle valve to control flow to each AS well. Operation of each AS well will be controlled individually by an air-actuated ball valve. The air-actuated ball valve will also prevent potential backflow of ozone from coming into contact with flow measurement and pressure regulating devices. The compressor, dryer, filters and headers will be housed in an AS/SVE trailer located in the vicinity of each source area. Outside of the AS/SVE trailer, dedicated air distribution piping will be installed aboveground and connected to each AS well. Piping has been sized as to reduce the friction losses in the piping due to the length of pipe and associated fittings (see calculation package in Appendix B). In addition to the connection to the AS system, each AS wellhead will be fitted with a tee for future connection to the ozone amendment system. Materials for the AS wellhead that may come in contact with ozone were selected for compatibility with ozone.

5.2 Soil Vapor Extraction System

Two separate SVE systems will be installed in the former IDDA 1b and former IDDA 2 and septage lagoon source areas. Each SVE system will consist of a network of SVE wells, soil gas

collection piping, a moisture separator, a SVE blower, and an air-cooled heat exchanger. As shown in **Figures 10 and 11**, SVE wells are laid out in a triangular grid that optimizes well spacing while providing collection of the soil vapor that will be generated by air injection, as shown by circles representing the SVE ROI. For the former IDDA 1b source area, 13 SVE wells will be installed with an SVE ROI of 37.5 ft and SVE flow rate of 50 cfm per well (**Table 6)**. Because of the difference in air permeability between the compacted backfill and the surrounding sand/waste layer in the vicinity of the former IDDA 1b, the SVE wells in this area will be grouped according to the lithology in which they are completed with four wells installed in the compacted backfill and nine wells installed in the sand/waste, as shown in **Figure 10**. The extent of the former IDDA 2 and septage lagoon source areas are approximate and will be determined during construction. It is assumed that five SVE wells will be installed at former IDDA 2 and six SVE wells for the former septage lagoons, as shown in **Figure 11,** with an SVE ROI of 29 ft and SVE flow rate of 40 cfm per well (**Table 6)**. The final size of the SVE well network in former IDDA 2 and septage lagoons treatment area will be based on the actual extent of the source areas and the AS well network installed in those areas.

Each SVE well will be constructed using a four-inch diameter flush threaded Schedule 80 CPVC casing and four-inch diameter wire-wrapped stainless steel screen. The screen will be five feet long with wire wrapped 0.010-inch openings. The wire wrapped screen has a larger percent opening area than a machine slotted screen and is recommended in *Soil Vapor Extraction and Bioventing, Engineering Manual EM 1110-1-4001* (USACOE, 2002). The SVE vents will be installed to a targeted depth of two feet below the seasonal high water table (approximately 18 to 23 feet bgs, see **Figures 12 and 13**). This will allow for the SVE wells to be used potentially for the post-stabilization ISCO application, if necessary. In addition, the SVE wells will be flanged at the top in order to allow for the mounting of an ISCO injection manifold as described in Section 5.5. The SVE wells will be completed with minimum two-foot stickup to connect to aboveground AS distribution piping. SVE distribution piping will be installed aboveground to avoid trenching through the landfill cap at former IDDA 1b and to mitigate impacts to the wetlands as well as keep piping above the level of spring flooding at former IDDA 2 and the septage lagoons. SVE wells that penetrate the landfill cap will be fitted with a HDPE boot and skirt that will be welded to the existing geosynthetic cap. In addition, penetrations of the landfill cap due previous soil borings will be repaired.

Soil gas collection piping will be installed aboveground to connect the SVE wells to the SVE equipment installed in the vicinity of each source area. Piping will be of smaller diameter than the SVE well and sloped toward the SVE well in order to reduce the potential for entrainment of liquids. Piping from the wells will be connected to a common header. The header piping has been sized as to reduce the friction losses in the piping due to the length of pipe and associated fittings (see calculation package in Appendix B). The SVE equipment will include a moisture separator to capture any entrained liquids, a positive displacement blower to provide vacuum, and an air-cooled heat exchanger to cool the off-gas prior to treatment and discharge to the

atmosphere. Separate SVE blowers and moisture separators will be required in the former IDDA 1b source area in order to provide the necessary vacuum for SVE in both the compacted backfill and sand/waste layer. A single SVE blower, moisture separator and air-cooled heat exchanger will be used for SVE in the former IDDA 2 and septage lagoons source area. Each blower will be sized to extract 50 cfm at each SVE well at former IDDA 1b and 40 cfm at former IDDA 2 and the septage lagoons. The necessary vacuum is based on the results of the vacuum step rate test conducted each lithology as part of the Pilot Test (Appendix A). For the compacted backfill, the minimum capacity is 200 cfm to extract from four wells at 55 inches of water (in H_2O) vacuum. For the eleven SVE wells completed in the sand/waste layer in former IDDA 1b, the design capacity is 550 cfm at 9 in H_2O vacuum. The discharge from the SVE blowers will be combined before passing through a common air-cooled heat exchanger prior to off-gas treatment. For the former IDDA 2 and septage lagoons source area, the design minimum of the SVE blower is 440 cfm to extract from eleven SVE wells at 7 in H_2O vacuum. The SVE blowers and moisture separators will be housed in an AS/SVE trailer located in the vicinity of each treatment area. The air-cooled heat exchangers will be housed outside and adjacent to the AS/SVE trailers.

5.3 Off-Gas Treatment

Based on the VOC composition of the SVE off-gas samples collected during the Pilot Test, VGAC has been selected as the off-gas treatment technology. The SVE off-gas from each SVE system will flow through two (2) 5,000-pound VGAC units connected in series for treatment and discharge to the atmosphere. VOC concentrations in the discharge will be at or below the AGCs and SGCs. The initial estimate of total VGAC usage for both areas is 710 pounds per day based on a total discharge flow rate of 1180 scfm and are limited by the concentration of VC in the off-gas discharge. The initial frequency of VGAC change out is estimated to be approximately every four weeks based on the results of the pilot test sample analysis and VGAC unit size. VGAC usage may vary between treatment areas and is expected to decline as reductive dechlorination reactions in the source areas are suppressed by AS operations. Change out of the VGAC will be determined by monitoring of the VGAC influent and effluent.

5.4 Ozone Amendment

If ozone is utilized as an amendment, separate trailers will house the ozone generation equipment for each treatment area. The ozone trailers will be constructed and delivered to the Site after performance monitoring indicates that ozone is needed to supplement AS in order to remove the chlorinated solvents that are not amenable to volatilization and/or aerobic biodegradation. Each ozone trailer will be located adjacent to the AS/SVE trailer for that treatment area and will likely contain an air compressor, oxygen concentrator, an ozone generator and a manifold to deliver ozone to each AS well as needed. The required dosing of ozone will be determined based on the groundwater quality at the time of ozone generator installation. Dedicated Teflon tubing will be used to connect the ozone lines in the ozone trailer to the appropriate AS wellhead.

5.5 Post-Stabilization In-Situ Chemical Oxidation (If Necessary)

The post-stabilization ISCO application, if necessary will make use of the existing SVE well network to deliver an oxidant to address the recalcitrant VOCs and SVOCs. The oxidant will be selected based on the groundwater conditions at the time and might include a surfactant, if appropriate. An ISCO injection manifold will be attached to the flange at the top of a SVE well. The manifold will consist of two-inch diameter drop tube of sufficient length to reach the screened interval of the SVE well. The drop tube will be terminated with a five-foot long two-inch diameter wire-wrapped stainless steel screen. The drop tube material will be compatible with the selected oxidant. Above the flange, the manifold will be equipped with piping and valves for oxidant delivery by gravity using a pump, a vent and pressure gauges.

5.6 Groundwater Monitoring Network

The groundwater monitoring network used to evaluate in-situ source area treatment performance will include existing downgradient wells along with up to nine additional wells to be installed (**Figure 9**). **Table 8** provides the construction details of these wells. The installation of additional monitoring wells will be conducted in phases beginning with the installation of a triplet of monitoring wells (MW-18A/B/C) along Delaware Drive and downgradient of former IDDA 1b, an intermediate depth well in the vicinity of MW-7A/B (MW-7M), and shallow and intermediate wells downgradient of MW-9 (MW-20A/B). After installation and well development, these wells will be purged and sampled initially for TCL VOCs, SVOCs, and metals. The analytical results will be used to select the screen interval for the additional monitoring wells MW-21 and, if VOCs are detected above cleanup goals at MW-18A/B/C and/or MW-7M, installation of MW-19 and/or MW-22, respectively, will be considered.

The existing and newly installed monitoring wells will form two mass discharge transects, as shown on **Figure 9**. If appropriate, modification of the location of the two transects might be proposed to the agencies for approval based upon evaluation of data from new groundwater monitoring wells. The first transect, shown in cross section on **Figure 14**, will be used to monitor the mass discharge from the former source areas. The second transect, shown in cross section on **Figure 15**, will be used to monitor the mass discharge through the downgradient aquifer for comparison to the mass discharge from the former source areas. The mass discharge through the first transect will be used to evaluate progress toward the Performance Criterion for in situ source treatment during active treatment and the stabilization period. In addition, existing monitoring wells within the treatment areas will be monitored for pH, DO, ORP and possibly iron at the beginning of AS/SVE operations and periodically thereafter to monitor for the expected changes in groundwater geochemistry.

The groundwater monitoring network will also be used to monitor the progress of MNA (OU 3) toward meeting the RAO of restoration of the downgradient groundwater aquifer. The

compliance monitoring network for MNA is described in the MNA Plan. It should be noted that there is significant overlap between the monitoring networks for OU 3 and OU 4. The natural attenuation capacity of the downgradient aquifer might change over time and can be evaluated by comparing the mass discharge through the two transects. Other measures of the aquifer's natural attenuation capacity might be proposed to USEPA and NYSDEC for consideration at a later date, if appropriate.

6. ENVIRONMENTAL PERMIT EQUIVALENCIES

As shown in **Table 7**, the anticipated VOC concentrations in the extracted soil vapors are initially expected to exceed the New York State AGCs and SGCs based on the AS/SVE pilot test results. Aboveground off-gas treatment is planned to remove VOC concentrations above the AGCs and SGCs prior to discharge until such concentrations are reduced to levels below the AGCs and SGCs. A permit equivalency from NYSDEC for the treatment and discharge of SVE off-gas will not be needed.

7. CONSTRUCTION

7.1 Construction Implementation and Oversight

The in situ technologies will be implemented in phases beginning with AS/SVE. The timing of each subsequent phase will be triggered by the results of performance monitoring. Construction, therefore, will similarly be implemented in phases beginning with the construction of the AS and SVE systems, including off-gas treatment and the associated monitoring network. The construction specifications and engineering plans and drawings for the AS and SVE systems are included in Appendix C. Specifications and engineering plans for the subsequent ozone amendment and post-stabilization ISCO application, if necessary, are included to the extent that they can be developed at the outset of the remedial action. The construction specifications describe the nature of the work necessary to construct the first phase of the remedial action, including site works, civil, mechanical, and electrical systems, and any infrastructure that will be necessary for future phases. The construction drawings and plans show the various remediation system components and configuration within the system. Additional specifications and plans, such as sizing of the ozone amendment system and selection of the ISCO oxidant, if necessary, will be developed later based on the groundwater conditions at the time. Site preparation activities will include recovery of light non-aqueous phase liquid (LNAPL) that has been detected in monitoring wells at IDDA 1b, the removal of investigation derived waste and an ex-situ constructed treatment wetland pilot test system and site improvements such as access roads, concrete pads for the AS/SVE trailers, fences and gates.

The construction of each phase of the remedial action will be implemented by a general environmental contractor who will subcontract portions of the work. Construction quality assurance (CQA) will be provided by an Engineer of Record who will implement the Construction Quality Assurance Project Plan (CQAPP) included as Appendix D with the support of a Resident Engineer and CQA monitors. The CQAPP details the approach to CQA during construction activities at the Site and describes the roles and responsibilities of the parties responsible for the CQA program during the construction phase of the project. The CQAPP describes the testing, monitoring and documentation to be performed during remedial construction.

A Green Remediation Plan (Appendix E) details how construction will satisfy the green remediation requirements as defined in the RD AOC SOW.

7.2 Contractor Selection

The Respondents will use the specifications and plans/drawings of the USEPA approved Final RD Report to establish the scope for the bid in order to select the environmental contractor(s) for

each phase of construction. In addition, general conditions of the contract will include the following requirements:

- Safety qualification;
- Insurance limits;
- Schedule; and
- Form of Bid.

Typically, bids are solicited from three to five general contractors. A pre-bid meeting will be held at the Site. Key subcontracts will likely include:

- Geosynthetic installation and repair;
- Drilling and well installation;
- Remediation equipment supplier(s); and
- Electrical and instrumentation.

The Respondents will solicit and review bids for each phase of construction.

8. OPERATION, MAINTENANCE AND MONITORING

O&M of the AS/SVE systems and subsequent ozone amendment systems, and post-stabilization ISCO application, if necessary, will be conducted by an O&M contractor to be retained by the Respondents following construction. The O&M contractor will be responsible for ensuring that these systems are operated and maintained in accordance with the RD and the O&M Manual to be submitted after the first phase of construction. The O&M Manual will be updated following subsequent phases of construction.

The O&M Manual will also specify the type and frequency of performance monitoring to ensure that the remedial components are performing as designed. Performance monitoring data will include operational data as well as groundwater monitoring data. Operational data will include monitoring of the SVE discharge following off-gas treatment to demonstrate compliance with New York State air emission regulations and guidelines. Groundwater monitoring will be conducted to evaluate progress toward the in-situ treatment Performance Criterion. It will overlap significantly with groundwater monitoring specified in the MNA Plan for MNA of downgradient groundwater at OU 3. Groundwater data will be used to determine the achievement of the Performance Criterion.

A Green Remediation Plan (Appendix E) details how O&M will satisfy the green remediation requirements as defined in the RD AOC SOW, including the purchase of Renewable Energy Certificates, which USEPA has agreed may be used by Respondents to satisfy the renewable energy requirement of the Policy.

9. SCHEDULE

The schedule for the implementation, construction, and startup of the AS and SVE systems is presented on **Figure 14**. The schedule for the construction of subsequent remedial components, if required, will be determined based on the intermediate performance metrics presented in **Table 3** and the results of performance monitoring.

Construction will be performed during the normal construction season(s). Consequently, the schedule may be impacted due to the timing of USEPA approvals, delays in entry of the Consent Decree for Remedial Action, or delays in securing property access and/or construction permits. Installation of systems in the former IDDA 2 and septage lagoon areas will be dependent on ground conditions (e.g. dissipation of spring flooding prior to drilling).

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TABLES

TABLE 1
SUMMARY OF LIKELY RESIDUAL PRODUCT FOR EACH BORING WITHIN THE FORMER IDDA 1b

Cortese Landfill
Narrowsburg, New York

		B-1	B-2	B-3	B-4	B-5	B-6	B-7	B-8	B-9	B-10	B-11	B-12	B-13	S-1	S-2
Top Depth (ft bgs)	**Bottom Depth**	**Likely NAPL?[2]**														
1	2															
2	3															
3	4															
4	5															
5	6															
6	7															
7	8															
8	9															
9	10															
10	11				ND	ND	**No**	ND	ND	ND						
11	12															
12	13															
13	14															
14	15											ND				
15	16		**No**													
16	17				ND	ND										**Yes**
17	18						ND	**Yes**								
18	19	**Yes**							ND	**Yes**	**Yes**				**No**	
19	20											ND				
20	21		**No**	**No**	ND	ND					**No**					**No**
21	22															
22	23														**Yes**	
23	24								**Yes**	**Yes**						
24	25															
25	26		**Yes**	**No**		ND		**Yes**					**No**		**Yes**	
26	27				ND		**No**				**No**	**No**		ND		**No**
27	28												ND			
28	29															
29	30														**No**	
30	31		**No**	**No**	**No**											
31	32							**Yes**	**No**	**Yes**	ND		ND	ND		**No**
32	33					**No**						**No**				
33	34		**No**												**No**	
34	35	**No**					**No**									
35	36			**No**	**No**											
36	37		**No**					**No**	**Yes**	ND				ND	**No**	**No**
37	38												ND			
38	39			ND	**No**											**No**
39	40					**No**										
40	41												ND			
41	42															
42	43	**No**	ND		ND			**No**								
43	44															
44	45															
45	46										**No**					
46	47															
47	48	ND														
48	49															
49	50										ND					

TABLE 1
SUMMARY OF LIKELY RESIDUAL PRODUCT FOR EACH BORING WITHIN THE FORMER IDDA 1b

Cortese Landfill
Narrowsburg, New York

		B-1	B-2	B-3	B-4	B-5	B-6	B-7	B-8	B-9	B-10	B-11	B-12	B-13	S-1	S-2
Top Depth (ft bgs)	**Bottom Depth**	**Likely NAPL?[2]**														
50	51	**No**														
51	52															
52	53															
53	54															
54	55															
55	56	ND														
56	57															
57	58															
58	59															
59	60															
60	61	ND														
61	62															
62	63															
63	64															
64	65															
65	66	ND														
66	67															
67	68															
68	69															
69	70															
70	71	ND														
71	72															
72	73															
73	74															
74	75															
75	76	ND														
76	77															
77	78															
78	79															
79	80															

Notes:

1. Table adapted from Table 8 in *Source Characterization Report, Cortese Landfill Site, Narrowburg, New York* , Golder Associates, Inc., (January, 2008).
2. Methods used to calculate the potential presence of NAPL are presented in Appendix F of the *Source Characterization Report*

ND: VOCs Not Detected
Yes: Residual product is likely in this sample (see Section 2.6 of the *Source Characterization Report* (Golder, 2008) for details)
No: Residual product is not likely in this sample (see Section 2.6 of the *Source Characterization Report* (Golder, 2008) for details)
No soil borings have been completed at former IDDA 2 or the former septage lagoons. Source delineation in these areas will completed as part of the Remedial Action
IDDA Intact Drum Disposal Area

TABLE 2
CLEANUP LEVELS FOR DOWNGRADIENT GROUNDWATER CHEMICALS OF CONCERN

Cortese Landfill Site
Narrowsburg, New York

Chemical of Concern	Cleanup Level	Basis for Cleanup Level
Benzene	1 µg/L (ppb)	New York State Water Quality Standards [1]
1,4-Dichlorobenzene	3 µg/L (ppb)	New York State Water Quality Standards [1]
Tetrachloroethene	5 µg/L (ppb)	Federal MCL
Trichloroethene	5 µg/L (ppb)	Federal MCL
Vinyl chloride	2 µg/L (ppb)	Federal MCL
Arsenic	10 µg/L (ppb)	Federal MCL
Manganese	300 µg/L (ppb)	New York State Water Quality Standards [1]

Notes:
Based upon ROD Table 6
MCL – maximum contaminant level, Federal Safe Drinking Water Act
ppb – parts per billion
µg/L – micrograms per liter

[1] New York State Water Quality Standards for Class GA (Groundwater), New York Codes, Rules, and Regulations (NYCRR), Title 6, Part 701-703.

TABLE 3
SOURCE AREA (OU4) REMEDY COMPONENTS, FUNCTION, DECISIONS AND ACTION LEVELS

Cortese Landfill Site
Narrowsburg, New York

Remedy Component	Component/Decision	Description	Action
1	Air Sparging (AS)	1. Physical removal of VOCs from source areas below the groundwater table through volatilization. Accomplished by mass transfer of VOCs from shallow groundwater in the source area to the overlying vadose zone. 2. In situ aerobic biodegradation of hydrocarbons in groundwater by mass transfer of oxygen from sparge gas into groundwater will likely occur but is not being relied upon. Both processes achieve source treatment by increasing the dissolution rate of the residual source materials.	Operate system, monitor changes to source area geochemical environment and downgradient groundwater mass discharge.
	Decision No. 1 Redox Adjustment	Should redox amendments be applied to achieve target groundwater geochemical environment in source area and reduce the potential for iron fouling (see rationale in Remedy Component 1A below)?	Continue AS/SVE operation with or without implementing Remedy Component 1A below.
1A	Initial Redox Amendment (optional)	Consider use of redox amendment in the source area if initial AS operation does not raise the oxidation-reduction potential (ORP) of groundwater in the source area to approximately +100 mV, achieve a detectable dissolved oxygen (DO) concentration in groundwater, or reduce dissolved iron concentrations to less than 10 mg/L. Achieving these geochemical conditions should mitigate the dissolution of iron from aquifer solids in the source area that otherwise has the potential to affect AS/SVE operation by excessive long-term precipitation of iron oxides on or near the sparge wells.	Deliver redox amendment to source area. Continue AS operations and evaluate if they are able to maintain the higher ORP established by the optional amendment delivery and hence mitigate the iron dissolution process. If not, consider other amendments including early start to ozone sparging.
2	Soil Vapor Extraction (SVE)	Collect VOCs transferred to the vadose zone by the AS process using SVE wells. The collected VOCs will be monitored and initially treated prior to discharge to the atmosphere.	Operate system initially with SVE off-gas treatment and monitor changes to gas stream quality.
	Decision No. 2 Discontinue SVE Off-Gas Treatment	Should treatment of SVE off-gas be discontinued? Treatment will be necessary during initial system operation but SVE gas stream concentrations might decrease to the point where off-gas treatment is no longer necessary.	Discontinue SVE off-gas treatment if concentrations fall below the NYSDEC DAR-1 guidelines but continue to monitor SVE off gas and resume treatment if concentrations increase above DAR-1 guidelines.
	Decision No. 3 Amendment Addition	Should Remedy Component 3, Amendment Addition (such as ozone), begin?	Consider beginning Amendment Addtition if the decreases in the mass discharge of the less volatile or less aerobically biodegradable constituents are not showing adequate progress toward achieving the Performance Criterion and the AS/SVE removal rate becomes mass transfer limited.

TABLE 3
SOURCE AREA (OU4) REMEDY COMPONENTS, FUNCTION, DECISIONS AND ACTION LEVELS

Cortese Landfill Site
Narrowsburg, New York

Remedy Component	Component/Decision	Description	Action
3	Amendment Addition (e.g. Ozone)	Ozone sparging will likely be used as an amendment addition for treatment of recalcitrant compounds in the source areas that are not treated effectively by air sparging in Remedy Component 1. It is also expected to mitigate the redox-based dissolution of manganese from aquifer solids in the source area. Other amendments, or more than one amendment, with or without concurrent air sparging, may be considered by the Respondents, if appropriate.	If necessary, apply amendment(s) and monitor changes to downgradient groundwater mass discharge.
	Decision No. 4 Discontinue Active Treatment	Should active treatment operations be discontinued?	Discontinue active treatment when downgradient groundwater mass discharge indicates that the Performance Criterion (see Note 2) has been achieved for total VOC COCs.
	Decision No. 5 Resumption of active treatment operations	Should active treatment operations be resumed due to rebound in VOC concentrations?	Monitor groundwater concentrations downgradient from the source area. If the concentration of a constituent rebounds by more than 20% compared to the reduction that has been achieved through treatment, then the data will be evaluated to decide whether active treatment should re-started. The mass discharge will be calculated for the last two monitoring events. If the mass discharge has rebounded by an amount that is more than 20 percent of the decline in mass discharge that has been achieved through treatment for both consecutive monitoring events, and it exceeds the natural attenuation capacity of the downgradient aquifer, the well in question will be resampled to confirm the rebound. If the increase is confirmed, active treatment will be re-started. Otherwise monitoring will continue.
	Decision No. 6 Begin Stablization Period	Should Stabilization Period begin?	If the Performance Criterion has been achieved and rebounding concentrations remain below the thresholds in Decision No. 5 for two consecutive monitoring efvents, the Stabilization Period will begin at the discretion of the Respondents.
4	Stabilization	Upon discontinuation of AS and amendment addition operations, the source areas and downgradient groundwater will be allowed to re-equilibrate for a period of up to five years.	Groundwater monitoring will be used to track the re-equilibration and evaluate groundwater quality and the groundwater mass discharge with respect to the Performance Criterion.
	Decision No. 7 Post-Stabilization ISCO Application (if necessary)	Should the post-stabilization ISCO application be invoked?	If the Performance Criterion has not been achieved during the five-year Stabilization Period, or if site-specific MNA performance monitoring criteria established consistent with Performance Monitoring for MNA Remedies for VOCs in Groundwater (EPA/600/R-04/027, dated April 2004) are not achieved, the post-stabilization ISCO Application will be conducted.

TABLE 3
SOURCE AREA (OU4) REMEDY COMPONENTS, FUNCTION, DECISIONS AND ACTION LEVELS

Cortese Landfill Site
Narrowsburg, New York

Remedy Component	Component/Decision	Description	Action
5	Post Stabilization ISCO Application	ISCO amendments, potentially including a surfactant enhancement, will be used to facilitate additional active treatment of the remaining source areas, if necessary. The nature, dose, and delivery method for those ISCO amendments will be based upon the types and concentrations of constituents that exceed the Performance Criterion.	Deliver ISCO amendments and monitor downgradient groundwater for possible rebound or concentration decreases. Multiple ISCO amendments and injections may be necessary to achieve the Performance Criterion. The Respondents might petition the agencies for permission to apply other amendments after the post-stabilization ISCO application, if appropriate.
	Decision No. 8 Consider Contingent Remedy	Should the Contingent Remedy be considered?	The Respondents can consider invoking the contingent remedy (groundwater extraction and treatment) at any step listed above. If the Performance Criterion cannot be achieved following implementation of the post stabilization ISCO application, then the contingency remedy will be considered. The Respondents might petition the agencies for permission to utilize other innovative approaches that might have been developed since the time the ROD was signed, if appropriate.
	Decision No. 9, Remedy Completion	Has the Performance Criterion been achieved and have groundwater concentrations stabilized?	If the Performance Criterion has been achieved and groundwater concentrations have stabilized (i.e. no rebound above the thresholds in Decision No. 5), then active source treatment at OU 4 will have been completed. Restoration of downgradient groundwater quality will continue as part of the Monitored Natural Attenuation at OU 3 (see Note 1).

Notes:

1. Monitored natural attenuation is the remedy component for groundwater (OU3) in areas downgradient of the source areas throughout the remedial timeframe while active treatment technologies are being implemented in the source areas and thereafter. A separate MNA Plan describes the OU 3 performance standards.
2. The source treatment Performance Criterion is a 90 percent reduction in the pre-treatment mass discharge of total VOC COCs through the near-source vertical plane (C-C').

TABLE 4
HENRY'S LAW CONSTANTS AND AEROBIC BIODEGRADATION MECHANISMS FOR VOCs IN GROUNDWATER

Cortese Landfill Site
Narrowsburg, New York

Compound	Compound Class	Henry's Law Constant H (atm-m3/mol) @ 10°C		Aerobic Biodegradation Half-Life (days)		Aerobic Biodegradation Mechanism Comments		General Biodegradability		AS/SVE	Biosparging
1,1,1-Trichloroethane	Chlorinated Ethane	**7.78E-03**	1			aerobic oxidation (cometabolic)	3	moderate	5	✓	✓
1,1,2-Trichloroethane	Chlorinated Ethane	4.16E-04	1					moderate	5		
1,1-Dichloroethane	Chlorinated Ethane	**3.24E-03**	1			aerobic oxidation (direct, cometabolism)	3,4	moderate	5	✓	✓
1,1-Dichloroethene	Chlorinated Ethene	**1.67E-02**	1			aerobic oxidation (cometabolic)	3	moderate	5	✓	✓
1,2-4-Trichlorobenzene	Chlorinated Aromatic	1.20E-03	1	28-180	2			moderate to high	5		✓
1,2-Dichlorobenzene	Chlorinated Aromatic	9.57E-04	1	28-180	2			moderate to high	5		✓
1,2-Dichloroethane	Chlorinated Ethane	6.48E-04	1			aerobic oxidation (direct)	3	moderate	5		✓
1,3-Dichlorobenzene	Chlorinated Aromatic	**2.15E-03**	1					moderate to high	5	✓	
1,4-Dichlorobenzene	Chlorinated Aromatic	1.76E-03	1	28-180	2			moderate to high	5		✓
2-Butanone [methyl ethyl ketone (MEK)]	Ketone	3.02E-05	1	0.7 - 2.5	6						✓
4-Methyl-2-pentanone (MIBK)	Ketone	3.15E-04	1			aerobic oxidation likely	6				✓
Acetone	Ketone	1.86E-05	1	0.14 - 71	6						✓
Benzene	BTEX	**2.85E-03**	1	1-408	2			moderate to high	5	✓	✓
Carbon Tetrachloride	Chlorinated Aliphatic	**1.42E-02**	1			aerobic degradation not documented	4			✓	
Chlorobenzene	Chlorinated Aromatic	**2.05E-03**	1	69-150	2			moderate to high	5	✓	✓
Chloroethane	Chlorinated Ethane	**4.54E-03**	1			aerobic oxidation (direct, cometabolism)	4	moderate	5	✓	✓
Chloroform (Trichloromethane)	Chlorinated Aliphatic	1.79E-03	1			aerobic oxidation (cometabolic)	3	moderate	5		✓
cis-1,2-Dichloroethene	Chlorinated Ethene	**2.39E-03**	1			aerobic oxidation (cometabolic)	3	moderate	5	✓	✓
Ethylbenzene	BTEX	**3.41E-03**	1	2.3-238	2			high	5	✓	✓
Methylene Chloride	Chlorinated Aliphatic	1.15E-03	1			aerobic oxidation (direct, cometabolic)	3	moderate	5		✓
Naphthalene	PAH	2.74E-04	1			aerobic oxidation					✓
Tetrachloroethene	Chlorinated Ethene	**8.30E-03**	1			does not typically undergo aerobic degradation during EISB	3	moderate	5	✓	
Toluene	BTEX	**2.96E-03**	1	2.3-238	2			high		✓	✓
trans-1,2-Dichloroethene	Chlorinated Ethene	**4.50E-03**	1			aerobic oxidation (cometabolic)	3	moderate	5	✓	✓
Trichloroethene	Chlorinated Ethene	**3.91E-03**	1			aerobic oxidation (cometabolic)	3	moderate	5	✓	✓
Vinyl Chloride	Chlorinated Ethene	**1.97E-02**	1			aerobic oxidation (direct, cometabolic)	3	moderate	5	✓	✓
o-Xylene	BTEX	**2.22E-03**	1	1-238	2			high	5	✓	✓
m-Xylene	BTEX	**3.23E-03**	1	0.35-238	2			high	5	✓	✓
p-Xylene	BTEX	**3.20E-03**	1	0.35-238	2			high	5	✓	✓

Notes:
[1] Henry's Law Constants were derived from the National Institute of Standards and Technology Chemistry WebBook http://webbook.nist.gov/chemistry/name-ser.html in units of mol/kg-bar (kH) and converted to H in atm-m3/mol using the equation:
H atm-m3/mol = (1 / kH mol/kg-bar) * (1 atm / 1.01325 bar) * (m3 / 998.23 kg)
Values of H shown in **bold** are greater 2 x 10–3 atmospheres per cubic meter per mole (atm-m3/mol) and are considered to be amenable to volatilization (USACOE, 2008).
[2] USGS. 2006. Description, Properties, and Degradation of Selected Volatile Organic Compounds Detected in Ground Water - A Review of Selected Literature
[3] EPA. 2000. Engineered Approaches to In Situ Bioremediation of Chlorinated Solvents: Fundamentals and Field Applications
[4] ESTCP. 2004. Principles and Practice of Enhanced Anaerobic Bioremediation of Chlorinated Solvents
[5] EPA. 1998. Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Ground Water
[6] SRC, 1999. Aerobic Biodegradation of Organic Chemicals in Environmental Media: A Summary of Field and Laboratory Studies. SRC TR 99-002
BTEX - benzene, ethylbenzene, toluene and xylenes
PAH - polynuclear aromatic hydrocarbon

TABLE 5
CHEMICAL SPECIFIC GROUNDWATER ARARs AND TBCs

Cortese Landfill Site
Narrowsburg, New York

Constituent Information		Federal Safe Drinking Water Act		New York State Water Quality Standards for Class GA (Groundwater)	New York Public Water Supply Regulations	Cleanup Goal[(1)]	Maximum Concentration Greater than Cleanup Goal ?
Parameter	Range of Detections in Groundwater Since 2000	MCL	MCLG	NYCRR, Title 6 Part 701-703	NYCRR, Title 10 Part 5-1		
VOCs							
1,1,1-Trichloroethane	ND-7300	200	200	5 (POC)	5 (POC)	5	Y
1,1,2,2-Tetrachloroethane	ND-31			5 (POC)	5 (POC)	5	Y
1,1,2-Trichloroethane	ND-28	5	3	1	5 (POC)	1	Y
1,1-Dichloroethane	ND-98000				5 (POC)	5	Y
1,1-Dichloroethene	ND-600	7	7		5 (POC)	5	Y
1,2,4-Trichlorobenzene	ND-8000	70	70	5 (POC)	5 (POC)	5	Y
1,2-Dichlorobenzene	ND-9400	75	75	3	5 (POC)	3	Y
1,2-Dichloroethane	ND-3600	5	zero	0.6	5 (POC)	0.6	Y
1,2-Dichloropropane	ND-1100	5	zero	1	5 (POC)	1	Y
1,3-Dichlorobenzene	ND-4000			3	5 (POC)	3	Y
1,4-Dichlorobenzene	ND-31000	600	600	3	5 (POC)	3	Y
1,4-Dioxane	ND-530				50 (UOC)	50	Y
2-Butanone	ND-69000				50 (UOC)	50	Y
2-Hexanone	ND-300				50 (UOC)	50	Y
4-Methyl-2-pentanone	ND-12000				50 (UOC)	50	Y
Acetone	ND-12000				50 (UOC)	50	Y
Benzene	ND-11000	5	zero	1	5 (POC)	1	Y
Carbon disulfide	ND-21				50 (UOC)	50	Y
Carbon tetrachloride	ND-120	5	zero	5	5 (POC)	5	Y
Chlorobenzene	ND-27000	100	100	5 (POC)	5 (POC)	5	Y
Chloroethane	ND-43000			5 (POC)	5 (POC)	5	Y
Chloroform	ND-3900			7	5 (POC)	5	Y
Chloromethane	ND-1.6			5 (POC)	5 (POC)	5	Y
cis-1,2-Dichloroethene	ND-120000	70	70	5 (POC)	5 (POC)	5	Y
Dichlorobromomethane	ND-5.5				5 (POC)	5	Y
Ethyl benzene	ND-50000	700	700	5 (POC)	5 (POC)	5	Y
Methylene Chloride	ND-12000	5	zero	5 (POC)	5 (POC)	5	Y
Tetrachloroethene	ND-10000	5	zero	5 (POC)	5 (POC)	5	Y

TABLE 5
CHEMICAL SPECIFIC GROUNDWATER ARARs AND TBCs

Cortese Landfill Site
Narrowsburg, New York

Constituent Information		Federal Safe Drinking Water Act		New York State Water Quality Standards for Class GA (Groundwater)	New York Public Water Supply Regulations	Cleanup Goal[(1)]	Maximum Concentration Greater than Cleanup Goal ?
Parameter	Range of Detections in Groundwater Since 2000	MCL	MCLG	NYCRR, Title 6 Part 701-703	NYCRR, Title 10 Part 5-1		
Toluene	ND-550000	1000	1000	5 (POC)	5 (POC)	5	Y
Total Xylenes	ND-130000	10,000	10,000	5 (POC)	5 (POC)	5	Y
trans-1,2-Dichloroethene	ND-140	100	100	5 (POC)	5 (POC)	5	Y
Trichloroethene	ND-67000	5	zero	5 (POC)	5 (POC)	5	Y
Vinyl chloride	ND-22000	2	zero	2	2	2	Y
SVOCs							
2,4,5-Trichlorophenol	ND-1				5 (POC)	5	N
2,4-Dichlorophenol	ND-1.9			1	5 (POC)	1	Y
2,4-Dimethylphenol	ND-4000			1	5 (POC)	1	Y
2-Chlorophenol	ND-1.2				5 (POC)	5	Y
2-Methylnaphthalene	ND-5000				50 (UOC)	50	Y
2-Methylphenol	ND-3000				50 (UOC)	50	Y
3,3'-Dichlorobenzidine	ND-0.4			5 (POC)	5 (POC)	5	N
4-Chloro-3-methylphenol	ND-800				5 (POC)	5	Y
4-Chloroaniline	ND-10			5 (POC)	5 (POC)	5	Y
4-Methylphenol	ND-4000				50 (UOC)	50	Y
4-Nitroaniline	ND			5 (POC)	5 (POC)	5	N
4-Nitrophenol	ND-1				5 (POC)	5	Y
Acenaphthene	ND-18				50 (UOC)	50	Y
Acenaphthylene	ND-0.3				50 (UOC)	50	N
Anthracene	ND-19				50 (UOC)	50	N
Benzo(a)anthracene	ND-0.47				50 (UOC)	50	N
Benzo(a)pyrene	ND-0.2	0.2	zero	zero	50 (UOC)	0.2	N
Benzo(b)fluoranthene	ND-0.08				50 (UOC)	50	N
Benzo(g,h,i)perylene	ND-0.2				50 (UOC)	50	N
Benzo(k)fluoranthene	ND-0.09				50 (UOC)	50	N
Benzoic acid	ND-2800				50 (UOC)	50	Y
Benzyl alcohol	ND-21				50 (UOC)	50	N

TABLE 5
CHEMICAL SPECIFIC GROUNDWATER ARARs AND TBCs

Cortese Landfill Site
Narrowsburg, New York

Constituent Information		Federal Safe Drinking Water Act		New York State Water Quality Standards for Class GA (Groundwater)	New York Public Water Supply Regulations	Cleanup Goal[(1)]	Maximum Concentration Greater than Cleanup Goal ?
Parameter	**Range of Detections in Groundwater Since 2000**	**MCL**	**MCLG**	**NYCRR, Title 6 Part 701-703**	**NYCRR, Title 10 Part 5-1**		
bis(2-Chloroethyl) ether	ND-45			1	5 (POC)	1	Y
bis(2-Ethylhexyl) phthalate	ND-82			5	50 (UOC)	5	Y
Carbazole	ND-15				50 (UOC)	50	N
Chrysene	ND-6				50 (UOC)	50	N
Dibenzofuran	ND-5				50 (UOC)	50	N
Diethylphthalate	ND-2000				50 (UOC)	50	Y
Dimethylphthalate	ND-45				50 (UOC)	50	N
Di-n-butylphthalate	ND-10000				50 (UOC)	50	Y
Di-n-octylphthalate	ND-10000				50 (UOC)	50	Y
Fluoranthene	ND-6				50 (UOC)	50	N
Fluorene	ND-8				50 (UOC)	50	N
Hexachlorobenzene	ND-1	1	zero	0.04	1	0.04	Y
Hexachlorobutadiene	ND-2			0.5	5 (POC)	0.5	Y
Isophorone	ND-380				50 (UOC)	50	Y
Naphthalene	ND-17000				50 (UOC)	50	Y
N-Nitrosodiphenylamine/Diphenylamine	ND-2				5 (POC)	5	N
Pentachlorophenol	ND-11	1	zero	1	1	1	Y
Phenanthrene	ND-12				50 (UOC)	50	N
Phenol	ND-110			1	5 (POC)	5	Y
Pyrene	ND-4				50 (UOC)	50	N
Metals							
Arsenic	ND-131	10	zero	25	10	10	Y
Iron	ND-126,000			300	300	300	Y
Iron and Manganese	211-135,540			500	500	500	Y
Manganese	161-37,900			300	300	300	Y

TABLE 5
CHEMICAL SPECIFIC GROUNDWATER ARARs AND TBCs

Cortese Landfill Site
Narrowsburg, New York

Constituent Information		Federal Safe Drinking Water Act		New York State Water Quality Standards for Class GA (Groundwater)	New York Public Water Supply Regulations	Cleanup Goal[(1)]	Maximum Concentration Greater than Cleanup Goal ?
Parameter	Range of Detections in Groundwater Since 2000	MCL	MCLG	NYCRR, Title 6 Part 701-703	NYCRR, Title 10 Part 5-1		
Wet Chemistry							
Ammonia	ND-18,300			2,000		2,000	Y
Ammonia Nitrogen	ND-13,200			2,000		2,000	Y
Nitrate	ND-4,100	10,000	10,000	10,000	10,000	10,000	N
Nitrate-Nitrite	ND			10,000	10,000	10,000	N
Sulfate	ND-83,600			250,000	250,000	250,000	N
Total Dissolved Solids	38,000-265,000			500,000		500,000	N

Notes:

(1) Cleanup Goal is the most stringent of the ARARs listed.
ARARs - Applicable or Relevant and Appropriate Requirements
MCL - maximum contaminant level, Federal standard unless indicated otherwise
MCLG - maximum contaminant level goal
ND - Non-Detect
NYCRR - New York Codes, Rules, and Regulations
POC - principal organic contaminant
SVOCs - semi-volatile organic compounds
UOC - unspecified organic contaminant
VOCs - volatile organic compounds
µg/L - micrograms per liter
TBC - to be considered

Metals are unfiltered.
All values are given in µg/L.

TABLE 6
AS/SVE DESIGN PARAMETERS

Cortese Landfill
Narrowsburg, New York

Design Parameter	Value
Air Sparging	
Injection Flow Rate (scfm)	15
Injection Pressure (psig)	13.5
ROI (ft)	15
SVE IDDA 1b Backfill	
Extraction flow rate (cfm)	50
Extraction Vacuum (in H_2O)	55
ROI (ft)	37.5
SVE IDDA 1b Sand/Waste, IDDA 2 and Septage Lagoons [1]	
Extraction Flow Rate (cfm)	50
Extraction Vacuum (in H_2O)	9
ROI (ft)	37.5
SVE Off-gas Quality	
Off-gas Treatment	Required initially[2]

Notes:

The data collected in former IDDA 1b sand/waste layer are assumed to be applicable to the former IDDA 2 and former septage lagoon source areas since the materials have similar soil classification.

SVE off-gas treatment may not be required if concentrations decrease through time below DAR-1 guidelines (NYSDEC, 1997).

ROI - radius of influence
scfm - standard cubic feet per minute
psig - pounds per square inch, gauge
ft - feet
cfm - cubic feet per minute
in H_2O inches of water column

TABLE 7
SUMMARY OF AS/SVE PILOT TEST
SVE OFF-GAS DATA

Cortese Landfill
Narrowsburg, New York

Sample ID	SVE-SP1	SVE-SP2	SVE-SP3	AS-SP1	AS-SP2	AS-SP3	*Guideline Concentrations*	
Lab Sample Number	200-4315-1	200-4315-2	200-4315-3	200-4315-4	200-4315-5	200-4315-6		
Sampling Date	3/9/2011	3/9/2011	3/9/2011	3/15/2011	3/15/2011	3/15/2011		
Sampling Time	16:38	16:37	16:39	15:55	15:55	15:55		
Matrix	AIR	AIR	AIR	AIR	AIR	AIR		
Dilution Factor	15300	6860	1	14000	6900	3.97		
Units	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3		
Parameter							*SGC*	*AGC*
1,1,1-Trichloroethane	**330000**	**120000**	1.1 U	**440000**	**220000**	4.3 U	*9000*	*5000*
1,1,2,2-Tetrachloroethane	21000 U	9400 U	1.4 U	19000 U	9500 U	5.5 U		*16*
1,1,2-Trichloroethane	17000 U	7500 U	1.1 U	15000 U	7500 U	4.3 U		*1.4*
1,1-Dichloroethane	**79000**	**29000**	0.81 U	**77000**	**38000**	3.2 U		*0.63*
1,1-Dichloroethene	12000 U	5400 U	0.79 U	11000 U	5500 U	3.1 U		*70*
1,2,4-Trichlorobenzene	57000 U	25000 U	3.7 U	52000 U	26000 U	15 U	*3700*	
1,2-Dichloroethane	12000 U	5600 U	0.81 U	11000 U	5600 U	3.2 U		*0.04*
1,2-Dichloropropane	14000 U	6300 U	0.92 U	13000 U	6400 U	3.7 U		*4*
1,4-Dichlorobenzene	18000 U	8200 U	1.2 U	17000 U	8300 U	4.8 U		*0.09*
1,4-Dioxane	280000 U	120000 U	18 U	250000 U	120000 U	72 U	*3000*	*0.13*
Benzene	**12000**	4400 U	0.64 U	**15000**	**7500**	2.5 U	*1300*	*0.13*
Bromoform	32000 U	14000 U	2.1 U	29000 U	14000 U	8.2 U		*0.91*
Bromomethane	12000 U	5300 U	0.78 U	11000 U	5400 U	3.1 U	*3900*	*5*
Carbon disulfide	24000 U	11000 U	1.6 U	22000 U	11000 U	6.2 U	*6200*	*700*
Carbon tetrachloride	19000 U	8600 U	1.3 U	18000 U	8700 U	5 U	*1900*	*0.17*
Chlorobenzene	14000 U	6300 U	0.92 U	13000 U	6300 U	3.6 U		*110*
Chloroethane	**20000**	9100 U	1.3 U	**26000**	**13000**	5.2 U		*10000*
Chloroform	**19000**	6700 U	0.98 U	14000 U	6700 U	3.9 U	*150*	*0.04*
Chloromethane	16000 U	7100 U	**9**	14000 U	7100 U	**7.8**	*22000*	*90*
Ethylbenzene	13000 U	6000 U	0.87 U	**21000**	**9600**	3.4 U	*54000*	*1000*
Hexachlorobutadiene	33000 U	15000 U	2.1 U	30000 U	15000 U	8.5 U		*0.05*
Methylene Chloride	**85000**	29000	1.7 U	**46000**	**22000**	6.9 U	*14000*	*2.10*
Naphthalene	40000 U	18000 U	2.6 U	37000 U	18000 U	10 U	*7900*	*3*
Styrene	13000 U	5800 U	0.85 U	12000 U	5900 U	3.4 U	*17000*	*1000*
Tetrachloroethene	**55000**	**19000**	1.4 U	**67000**	**33000**	5.4 U	*1000*	*1*
Toluene	**680000**	**240000**	**2.4**	**750000**	**370000**	**3.3**	*37000*	*5000*
Trichloroethene	**2300000**	**810000**	5.8	**1400000**	**690000**	11	*14000*	*0.5*
Vinyl chloride	**150000**	**50000**	0.51 U	**100000**	**52000**	300	*180000*	*0.11*
Xylene (total)	**41000**	**17000**	0.87 U	**75000**	**33000**	3.4 U	*4300*	*100*

Notes:

All values are in µg/m^3
Air Samples were analyzed by GC/MS VOA - TO15 method.
U - Indicates the analyte was analyzed for but not detected, reporting limit is provided.
SGC - Short-Term Guideline Concentrations (NYSDEC, 1997)
AGC- Annual Guideline Concentrations (NYSDEC, 1997)
Bolding indicates detection of parameter
Light gray shading indicates exceedence of AGC only.
Dark gray shading indicates exeedance of both AGC and SGC.
µg/m^3 - micrograms per cubic meter

TABLE 8
PERFORMANCE MONITORING NETWORK WELL CONSTRUCTION DETAILS

Cortese Landfill Site
Narrowsburg, New York

Treatment Zone Mass Discharge Transect													
Location		MW-5	MW-19	MW-18A	MW-18B	MW-18C	MW-1A	MW-1B	MW-1C	MW-20A	MW-20B	MW-8A	MW-8B
Well Construction	**Screen Interval Length (ft)**	15.5	10	10	10	10	10	10	10	10	10	15.5	5
	Bottom of Screen Depth (ft bgs)	33.1	TBD (63)	82	55	28	73.7	43.1	25.5	63	30	28.1	33.3

Downgradient Mass Discharge Transect										
Location		MW-6B	MW-6A	MW-21	MW-7B	MW-7M	MW-7A	MW-22	MW-2B	MW-2A
Well Construction	**Screen Interval Length (ft)**	14.5	10	10	10	10	10	10	12	10
	Bottom of Screen Depth (ft bgs)	31.9	80	TBD (63)	21.2	63	98.2	TBD (47)	18.9	86.7

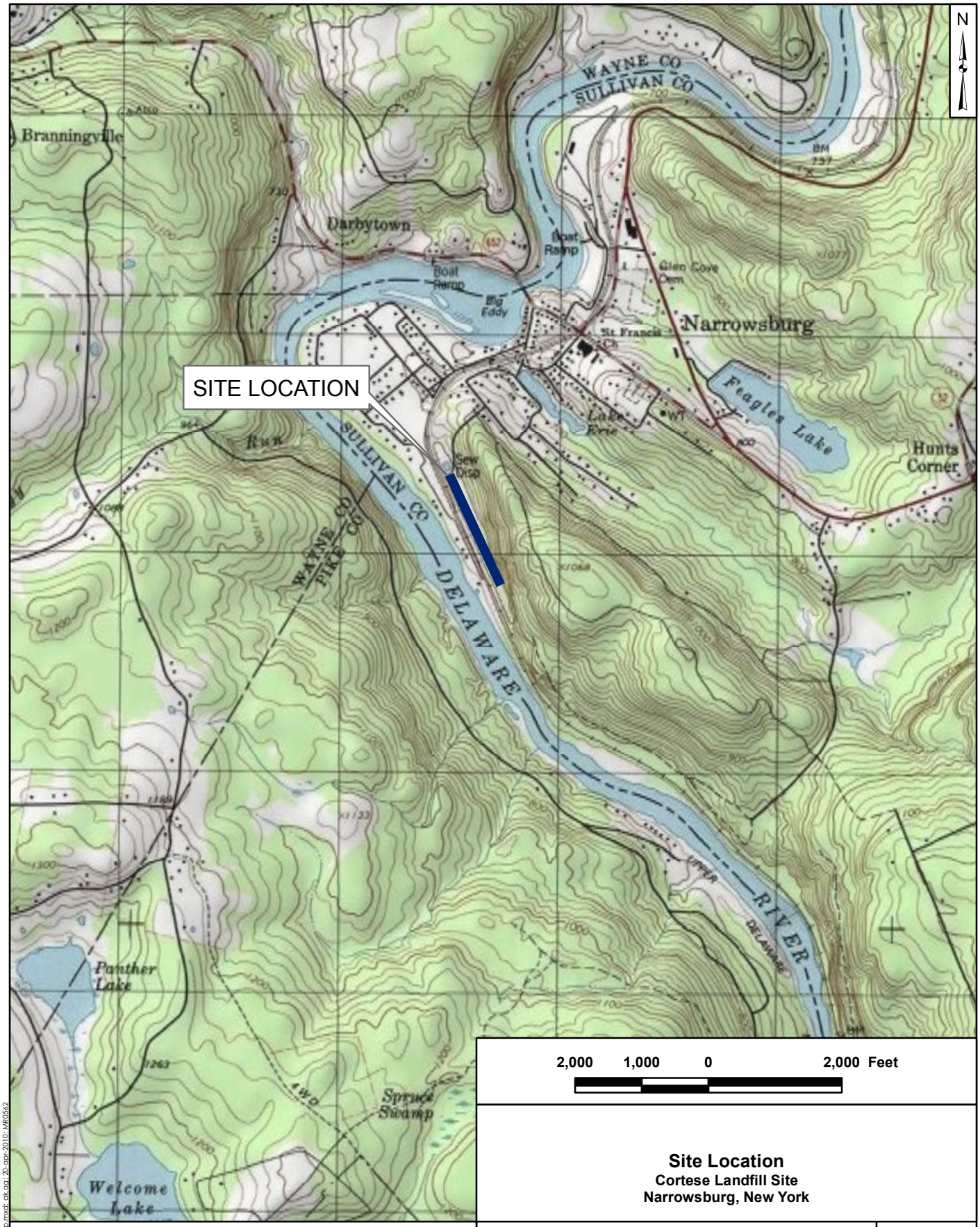
Notes:

1. Depths for proposed wells are subject to change during installation, wells listed as TBD will be installed during a second well installation event. Their depth will be determined based on results from the first well installation event.
2. The inclusion of MW-19 and MW-22 will be determined after obtaining their initial analytical results.

TBD to be determined, tentative depth given in parentheses

All wells are two-inches in diameter.

FIGURES



Site Location
Cortese Landfill Site
Narrowsburg, New York

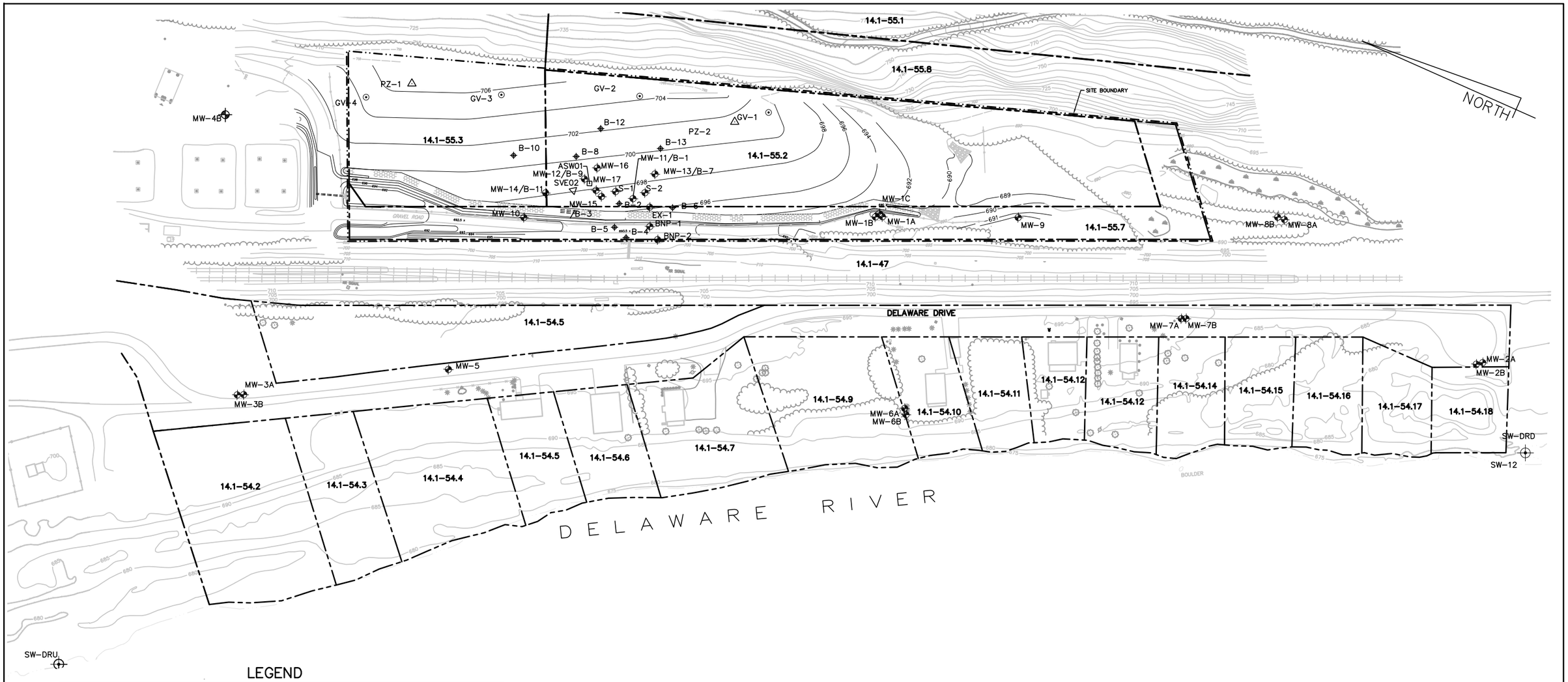
Notes
USGS 7.5' Topographic Quadrangle Narrowsburg, New York

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Columbia, Maryland | August 2011

Figure 1

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LEGEND

- PROPERTY BOUNDARY
- SITE BOUNDARY
- FENCE
- 704 — ELEVATION CONTOUR
- GV–1 — PASSIVE GAS VENT
- MW–10 — MONITORING WELL
- SW–DRU — SURFACE WATER SAMPLE POINT
- PZ–1 — PIEZOMETER
- B–10 — SOIL BORING AT IDDA 1b
- **14.1–54.3** — TAX LOT AND BLOCK NUMBER OF THE PARCEL

NOTE:

1.) ALL COORDINATES SHOWN ON THIS MAP REFLECT THE NORTH AMERICAN DATUM 1983 (NAD 83) AS DERIVED USING THE NATIONAL GEODETIC SURVEY SHIFT OF N 05°05'25" AND E A DISTANCE OF 426,246.03' AS APPLIED TO THE NATIONAL GEODETIC SURVEY DATUM OF 1927 (NAD 27). ALL ELEVATIONS SHOWN ON THIS MAP REFLECT THE NORTH AMERICAN VERTICAL DATUM OF 1988, AS DERIVED USING THE NATIONAL GEODETIC SURVEY SHIFT OF –0.5479' AS APPLIED TO THE NATIONAL GEODETIC VERTICAL DATUM OF 1929.

2.) TOPOGRAPHY AND SURFACE FEATURES EAST OF DELAWARE DRIVE WERE ORIGINALLY PREPARED BY FIELD METHODS BY OM P. POPLI P.E., L.S. P.C. CONSULTING ENGINEERS & SURVEYORS, ROCHESTER, NEW YORK, MARCH 1995. TOPOGRAPHY CHANGES SINCE MARCH 1995 PREPARED BY ENVIRONMENTAL RESEARCH, INC. ON DECEMBER 12, 1996. TOPOGRAPHY AND SURFACE FEATURES WEST OF DELAWARE DRIVE WERE DIGITIZED FROM AN ELECTRONICALLY SCANNED FILE OF THE TOPOGRAPHIC BASE MAP PREPARED BY ROBINSON AERIAL SURVEYS, INC., BY PHOTOGRAMMETRIC METHODS FROM PHOTOGRAPH TAKEN APRIL 18, 1985.

3.) PROPERTY LINES EAST OF DELAWARE DRIVE WERE DETERMINED FROM A SURVEY MAP ENTITLED "CORTESE LAND FILL SITE" DATED MAY 7, 1985, PREPARED BY GARY PACKER, P.L.S. AND "TAX MAP, TOWN OF TUSTEN, SULLIVAN COUNTY, NY," DATED 11/20/92 AND REVISED 12/18/08. PROPERTY OWNERSHIP DATA WERE DERIVED FROM THE SULLIVER COUNTY MAP VIEWER (HTTP://WEBAPPS.SCGNET.US/SCIMAP/MAIN.ASP). LANDFILL PROPERTY BOUNDARY TAKEN FROM BASELINE–PROPERTY BOUNDARY–CONTROL, CORTESE LANDFILL SITE, TOWN OF TUSTEN, SULLIVAN COUNTY, NY, MAY 7, 1985, BY GARY PARKER, P.L.S.

4.) REFERENCE: DRAWING DEVELOPED FROM FIGURE 2, "SITE PLAN" OF THE SOURCE CHARACTERIZATION REPORT BY GOLDER ASSOCIATES, INC., DATED 24 JANUARY 2008.

150 75 0 150

SCALE: 1" = 150'

SITE PLAN
CORTESE LANDFILL SITE
NARROWSBURG, NEW YORK

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COLUMBIA, MARYLAND

DATE:	FEBRUARY 2012
PROJECT NO.	MR0562B
DOCUMENT NO.	MD11173
FILE NO.	0562f516r1
FIGURE NO.	2

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NORTH

PZ-1

FORMER LOCATION OF INTACT DRUM DISPOSAL AREA 1b

FORMER LOCATION OF INTACT DRUM DISPOSAL AREA 1A

MW-4A
MW-4B

PZ-2

FORMER LOCATION OF INTACT DRUM DISPOSAL AREA 2

FORMER SEPTAGE LAGOONS

MW-1C
MW-1B
MW-1A
MW-9
MW-10

GRAVEL ROAD

Steps

RR SIGNAL

CONRAIL RAILROAD

TANK

MW-5

MW-3B
MW-3A

DELAWARE DRIVE

MW-7A
MW-7B

MW-6A
MW-6B

DELAWARE RIVER

BOULDER

E 338,000
E 337,000
E 337,500
N 1,009,000
N 1,008,500
N 1,008,000

LEGEND

- LANDFILL PROPERTY BOUNDARY
- 750 TOPOGRAPHIC CONTOUR
- MW-10 MONITORING WELL
- PZ-1 PIEZOMETER

100 0 100
SCALE FEET

NOTES

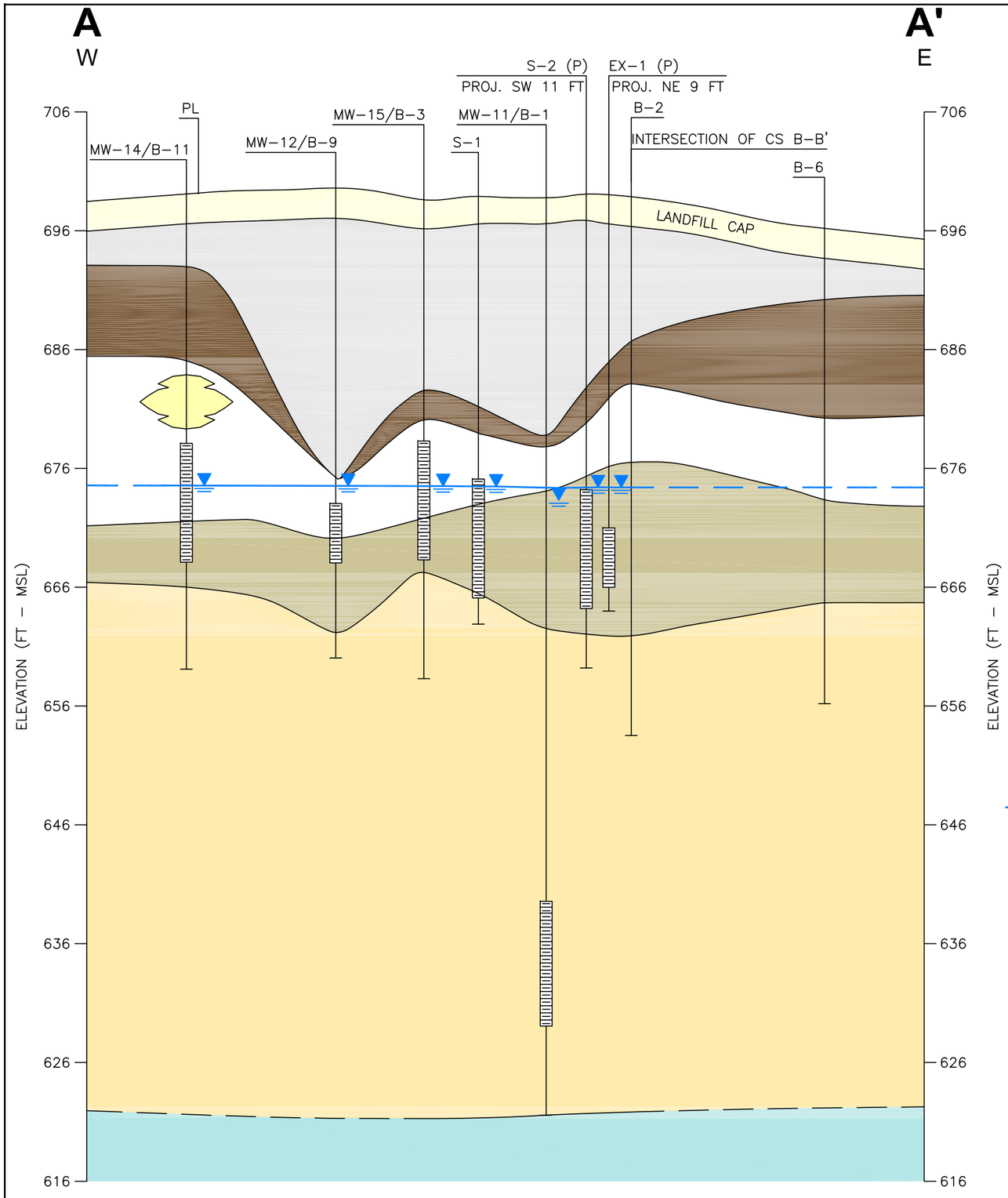
REFERENCE: FIGURE DEVELOPED FROM FIGURE 4A OF THE SHALLOW GROUNDWATER HOT SPOT INVESTIGATION, REMEDIAL WORK ELEMENT II, CORTESE LANDFILL SITE, NARROWSBURG, NEW YORK (GOLDER ASSOCIATES, INC.; 2001).

FORMER SOURCE AREAS
CORTESE LANDFILL SITE
NARROWSBURG, NEW YORK

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DATE:	AUGUST 2011
PROJECT NO.	MR0562B
DOCUMENT NO.	MD11173
FILE NO.	0562f503
FIGURE NO.	3

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LEGEND

B-6 — BORING/MONITORING WELL IDENTIFICATION

SCREEN INTERVAL

LANDFILL CAP

SAND / SILT FILL
REDDISH-BROWN SILTY FINE SAND AND SILT FILL

WASTE

UPPER SAND AND GRAVEL UNIT

SAND
BROWN TO GRAY SILTY, GRAVELLY, FINE TO COARSE SAND

SILT AND GRAVEL
BROWN TO LIGHT BROWN SANDY SILT AND GRAVEL

SAND AND GRAVEL
BROWN TO GREENISH GRAY SILTY, FINE TO COARSE SAND AND FINE TO COARSE GRAVEL

SAND AND SILT
BROWN TO GREENISH GRAY FINE TO MEDIUM SAND AND SILT. SMALLSCALE, DISCONTINUOUS FACIES OF GRAVEL ARE ALSO PRESENT IN THIS UNIT BUT NOT SHOWN

BEDROCK

GROUNDWATER TABLE (DASHED WHERE INFERRED)

GROUNDWATER ELEVATION IN MONITORING WELLS – OCTOBER 18, 2007 (SEE NOTE 4)

E	EAST
FT	FEET
MSL	MEAN SEA LEVEL
NE	NORTHEAST
SW	SOUTHWEST
W	WEST

50 0 50
HORIZONTAL SCALE FEET

10 0 10
VERTICAL SCALE FEET

5X = VERTICAL EXAGGERATION

NOTES

1.) EX-1 (INSTALLED AUGUST 2003), S-1 AND S-2 (INSTALLED MAY 2004) WERE ADVANCED USING HOLLOW STEM AUGER DRILLING TECHNIQUES, THE BORING LOGS FOR THESE WELLS WERE NOT USED IN THE DEVELOPMENT OF THE CROSS-SECTION.

2.) ALL OTHER BORINGS/MONITORING WELLS (INSTALLED IN SEPTEMBER 2007) WERE ADVANCED USING ROTO-SONIC DRILLING TECHNIQUES.

3.) ALL EXISTING MONITORING WELLS AND ALL SOIL BORINGS COMPLETED IN SEPTEMBER AND OCTOBER 2007, WERE (RE)SURVEYED BY TECTONIC ENGINEERING OF MOUNTAINVILLE, NY. THESE LOCATIONS AND ELEVATIONS WERE TIED TO THE NORTH AMERICAN DATUM OF 1983 (NAD 83) AND NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88) UTILIZING GLOBAL POSITIONING SYSTEM (GPS) DATA. MINOR DISCREPANCIES NOTED BETWEEN PREVIOUS SURVEYS NAD 83 DATA AND THE NEW SURVEY NAD 83 DATA WERE RESOLVED BY ADJUSTING KNOWN FIXED POINTS FROM BOTH SETS OF DATA UNTIL THEY WERE ALIGNED. DISCREPANCIES WERE ALSO NOTED BETWEEN PREVIOUS SURVEYS NAVD 88 DATA AND THE NEW SURVEY NAVD 88 DATA. THE NEW SURVEY NAVD 88 DATA WAS USED TO DEVELOP THE GEOLOGIC CROSS SECTIONS IN THIS REPORT.

4.) REFERENCE: FIGURE TAKEN FROM FIGURE 4B, "HYDROGEOLOGIC CROSS SECTION A-A'," OF THE 2008 SOURCE CHARACTERIZATION REPORT BY GOLDER ASSOCIATES, INC.

5.) VERTICAL AXES WERE ADJUSTED BY 6 FEET DUE TO DISCREPANCIES BETWEEN THE SURVEYED ELEVATIONS AND PREVIOUS SURVEYS DURING THE PHASE III RI INVESTIGATION.

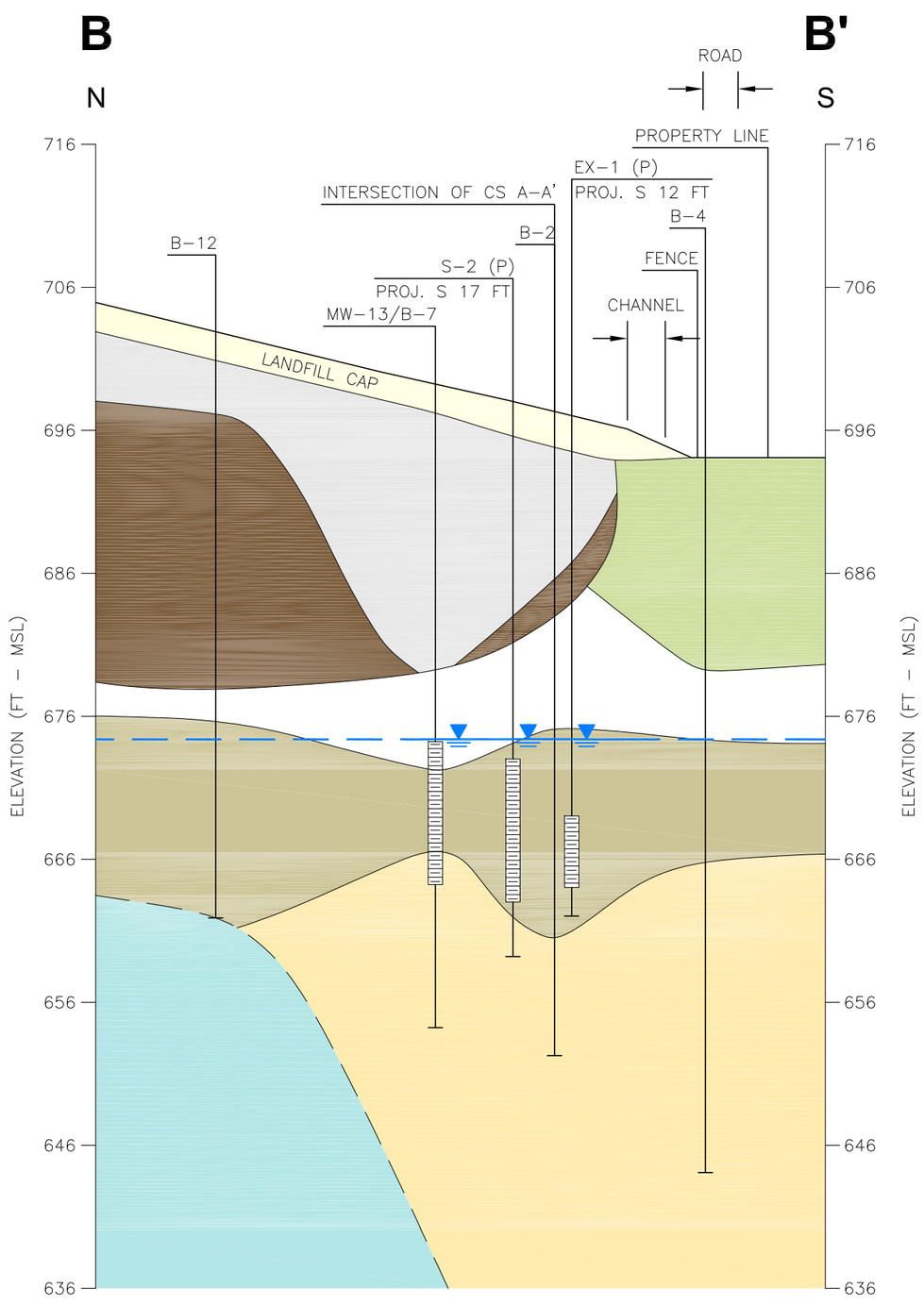
6.) SEE FIGURE 7 FOR CROSS-SECTION LOCATION.

FORMER IDDA1b HYDROGEOLOGIC CROSS SECTION A-A'

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DATE:	AUGUST 2011
PROJECT NO.	MR0562B
DOCUMENT NO.	MD11173
FILE NO.	0562f504
FIGURE NO.	4

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LEGEND

B-6 — BORING/MONITORING WELL IDENTIFICATION

SCREEN INTERVAL

LANDFILL CAP

SAND / SILT FILL
REDDISH-BROWN SILTY FINE SAND AND SILT FILL

WASTE

SILT
REDDISH-BROWN SANDY, CLAYEY SILT

UPPER SAND AND GRAVEL UNIT

SAND
BROWN TO GRAY SILTY, GRAVELLY, FINE TO COARSE SAND

SILT AND GRAVEL
BROWN TO LIGHT BROWN SANDY SILT AND GRAVEL

SAND AND GRAVEL
BROWN TO GREENISH GRAY SILTY, FINE TO COARSE SAND AND FINE TO COARSE GRAVEL

SAND AND SILT
BROWN TO GREENISH GRAY FINE TO MEDIUM SAND AND SILT. SMALLSCALE, DISCONTINUOUS FACIES OF GRAVEL ARE ALSO PRESENT IN THIS UNIT BUT NOT SHOWN

BEDROCK

GROUNDWATER TABLE (DASHED WHERE INFERRED)

GROUNDWATER ELEVATION IN MONITORING WELLS – OCTOBER 18, 2007 (SEE NOTE 4)

FT	FEET
MSL	MEAN SEA LEVEL
N	NORTH
S	SOUTH

50 0 50
HORIZONTAL SCALE FEET

10 0 10
VERTICAL SCALE FEET

5X = VERTICAL EXAGGERATION

NOTES

1.) EX-1 (INSTALLED AUGUST 2003), S-1 AND S-2 (INSTALLED MAY 2004) WERE ADVANCED USING HOLLOW STEM AUGER DRILLING TECHNIQUES, THE BORING LOGS FOR THESE WELLS WERE NOT USED IN THE DEVELOPMENT OF THE CROSS-SECTION.

2.) ALL OTHER BORINGS/MONITORING WELLS (INSTALLED IN SEPTEMBER 2007) WERE ADVANCED USING ROTO-SONIC DRILLING TECHNIQUES.

3.) ALL EXISTING MONITORING WELLS AND ALL SOIL BORINGS COMPLETED IN SEPTEMBER AND OCTOBER 2007, WERE (RE)SURVEYED BY TECTONIC ENGINEERING OF MOUNTAINVILLE, NY. THESE LOCATIONS AND ELEVATIONS WERE TIED TO THE NORTH AMERICAN DATUM OF 1983 (NAD 83) AND NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88) UTILIZING GLOBAL POSITIONING SYSTEM (GPS) DATA. MINOR DISCREPANCIES NOTED BETWEEN PREVIOUS SURVEYS NAD 83 DATA AND THE NEW SURVEY NAD 83 DATA WERE RESOLVED BY ADJUSTING KNOWN FIXED POINTS FROM BOTH SETS OF DATA UNTIL THEY WERE ALIGNED. DISCREPANCIES WERE ALSO NOTED BETWEEN PREVIOUS SURVEYS NAVD 88 DATA AND THE NEW SURVEY NAVD 88 DATA. THE NEW SURVEY NAVD 88 DATA WAS USED TO DEVELOP THE GEOLOGIC CROSS SECTIONS IN THIS REPORT.

4.) REFERENCE: FIGURE TAKEN FROM FIGURE 4B, "HYDROGEOLOGIC CROSS SECTION B-B'," OF THE 2008 SOURCE CHARACTERIZATION REPORT BY GOLDER ASSOCIATES, INC.

5.) VERTICAL AXES WERE ADJUSTED BY 6 FEET DUE TO DISCREPANCIES BETWEEN THE SURVEYED ELEVATIONS AND PREVIOUS SURVEYS DURING THE PHASE III RI INVESTIGATION.

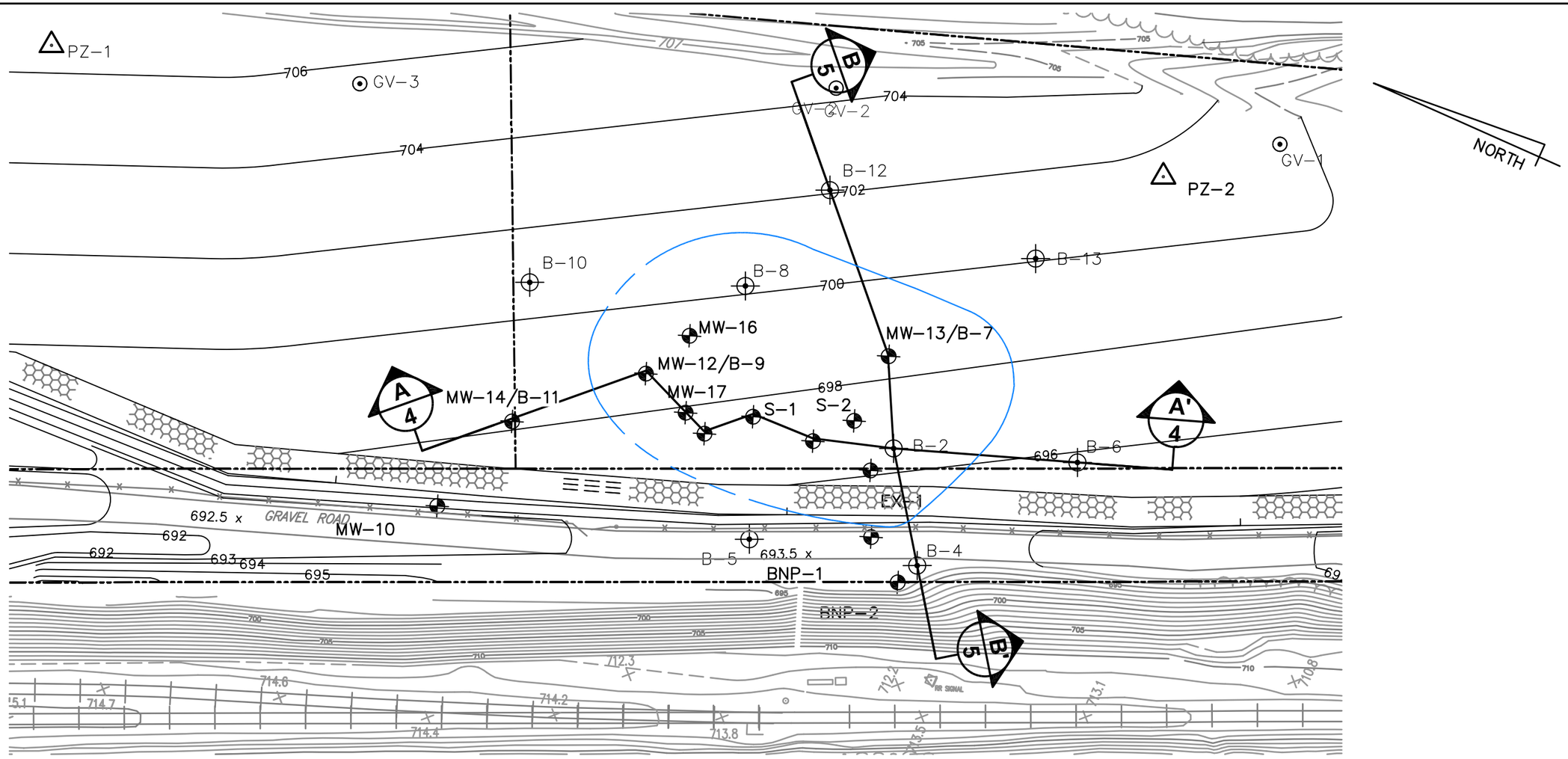
6.) SEE FIGURE 7 FOR CROSS-SECTION LOCATION.

FORMER IDDA1b HYDROGEOLOGIC CROSS SECTION B-B'

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DATE:	AUGUST 2011
PROJECT NO.	MR0562B
DOCUMENT NO.	MD11173
FILE NO.	0562f505
FIGURE NO.	5

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LEGEND

- LANDFILL PROPERTY BOUNDARY (SEE REFERENCE 2)
- APPROXIMATE LOCATION OF PROPERTY BOUNDARY (SEE REFERENCE 2)
- FENCE
- 695 — LANDFILL COVER ELEVATION CONTOUR
- 700 — PRE–EXISTING TOPOGRAPHY ELEVATION CONTOUR
- ESTIMATED SOURCE AREA (DASHED WHERE INFERRED)
- A / 4 — DETAIL OR CROSS SECTION DESIGNATION / FIGURE No. WHERE DETAIL OR CROSS SECTION IS PRESENTED
- GV–1 — PASSIVE GAS VENT
- MW–10 — MONITORING WELL
- PZ–1 — PIEZOMETER

NOTES

1.) ALL COORDINATES SHOWN ON THIS MAP REFLECT THE NORTH AMERICAN DATUM 1983 (NAD 83) AS DERIVED USING THE NATIONAL GEODETIC SURVEY SHIFT OF N 05°05'25" AND E A DISTANCE OF 426,246.03' AS APPLIED TO THE NATIONAL GEODETIC SURVEY DATUM OF 1927 (NAD 27). ALL ELEVATIONS SHOWN ON THIS MAP REFLECT THE NORTH AMERICAN VERTICAL DATUM OF 1988, AS DERIVED USING THE NATIONAL GEODETIC SURVEY SHIFT OF –0.5479' AS APPLIED TO THE NATIONAL GEODETIC VERTICAL DATUM OF 1929.

2.) TOPOGRAPHY AND SURFACE FEATURES EAST OF DELAWARE DRIVE WAS ORIGINALLY PREPARED BY FIELD METHODS BY OM P. POPLI P.E., L.S. P.C. CONSULTING ENGINEERS & SURVEYORS, ROCHESTER, NEW YORK, MARCH 1995. TOPOGRAPHY CHANGES SINCE MARCH 1995 PREPARED BY ENVIRONMENTAL RESEARCH, INC. ON DECEMBER 12, 1996. PROPERTY LINES EAST OF DELAWARE DRIVE WERE DETERMINED FROM A SURVEY MAP ENTITLED "CORTESE LAND FILL SITE" DATED MAY 7, 1985, PREPARED BY GARY PACKER, P.L.S. AND "TAX MAP, TOWN OF TUSTEN, SULLIVAN COUNTY, NY," DATED 11/20/92. LANDFILL PROPERTY BOUNDARY TAKEN FROM BASELINE–PROPERTY BOUNDARY–CONTROL, CORTESE LANDFILL SITE, TOWN OF TUSTEN, SULLIVAN COUNTY, NY, MAY 7, 1985, BY GARY PARKER, P.L.S. TOPOGRAPHY AND SURFACE FEATURES WEST OF DELAWARE DRIVE WERE DIGITIZED FROM AN ELECTRONICALLY SCANNED FILE OF THE TOPOGRAPHIC BASE MAP PREPARED BY ROBINSON AERIAL SURVEYS, INC., BY PHOTOGRAMMETRIC METHODS FROM PHOTOGRAPH TAKEN APRIL 18, 1985.

3.) ALL EXISTING MONITORING WELLS AND ALL SOIL BORINGS COMPLETED IN SEPTEMBER AND OCTOBER 2007, WERE (RE)SURVEYED BY TECTONIC ENGINEERING OF MOUNTAINVILLE, NY. THESE LOCATIONS AND ELEVATIONS WERE TIED TO THE NORTH AMERICAN DATUM OF 1983 (NAD 83) AND NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88) UTILIZING GLOBAL POSITIONING SYSTEM (GPS) DATA. MINOR DISCREPANCIES NOTED BETWEEN PREVIOUS SURVEYS NAD 83 DATA AND THE NEW SURVEY NAD 83 DATA WERE RESOLVED BY ADJUSTING KNOWN FIXED POINTS FROM BOTH SETS OF DATA UNTIL THEY WERE ALIGNED. DISCREPANCIES WERE ALSO NOTED BETWEEN PREVIOUS SURVEYS NAVD 88 DATA AND THE NEW SURVEY NAVD 88 DATA. THE NEW SURVEY NAVD 88 DATA WAS USED TO DEVELOP THE GEOLOGIC CROSS SECTIONS IN THIS REPORT.

4.) THE ESTIMATED EXTENT OF THE SOURSE AREA IS BASED ON THE DIRECT OBSERVATION OF NAPL OR THE POTENTIAL PRESENCE OF RESIDUAL NAPL BASED ON DETECTIONS OF VOC'S IN SOIL.

5.) REFERENCE: FIGURE DEVELOPED FROM FIGURE 6G OF THE SOURCE CHARACTERIZATION REPORT, CORTESE LANDFILL SITE, NARROWSBURG, NEW YORK (GOLDER ASSOCIATES, JANUARY 2008).

50 25 0 50

SCALE: 1" = 50'

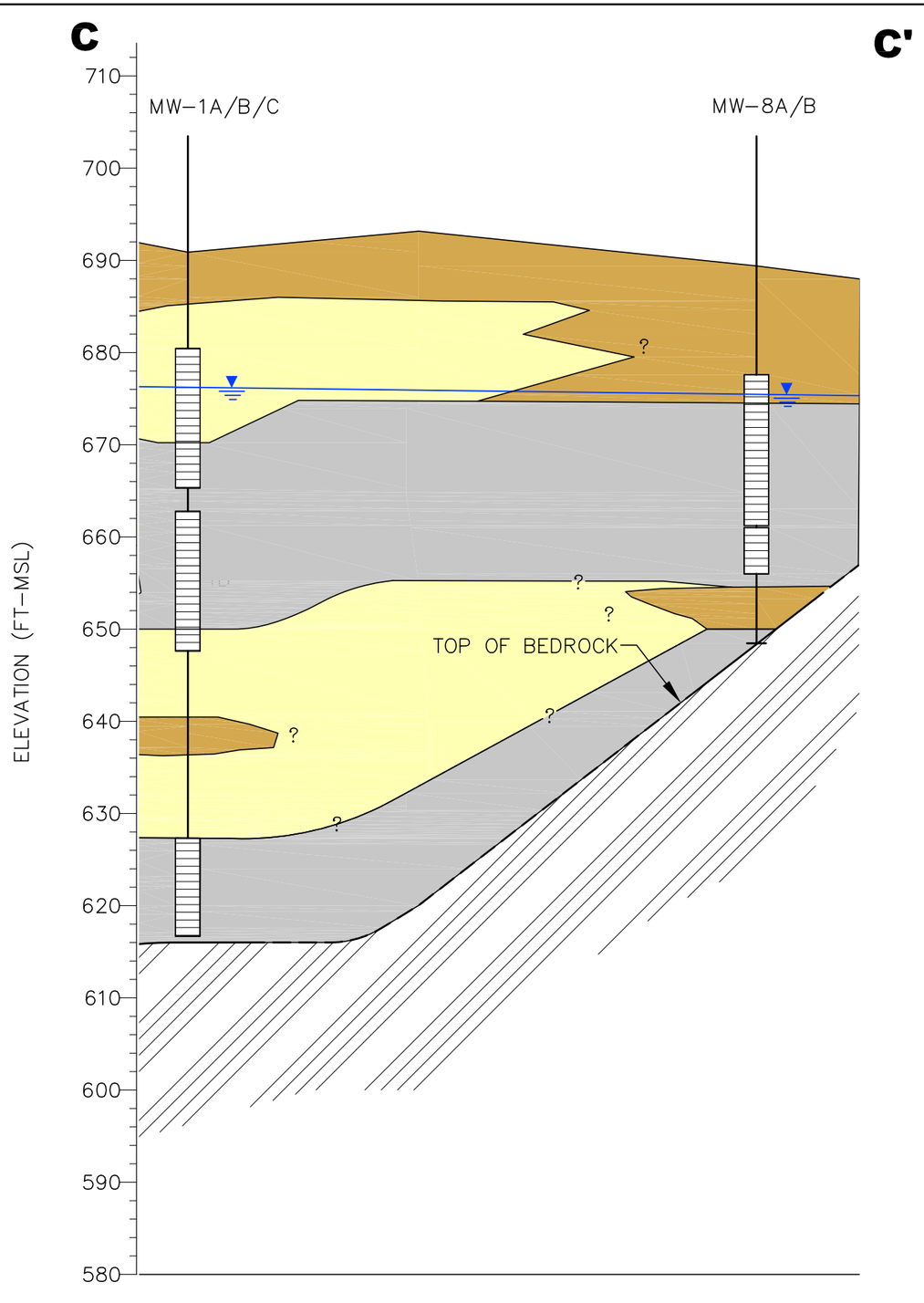
ESTIMATED EXTENT OF FORMER IDDA 1b SOURCE AREA

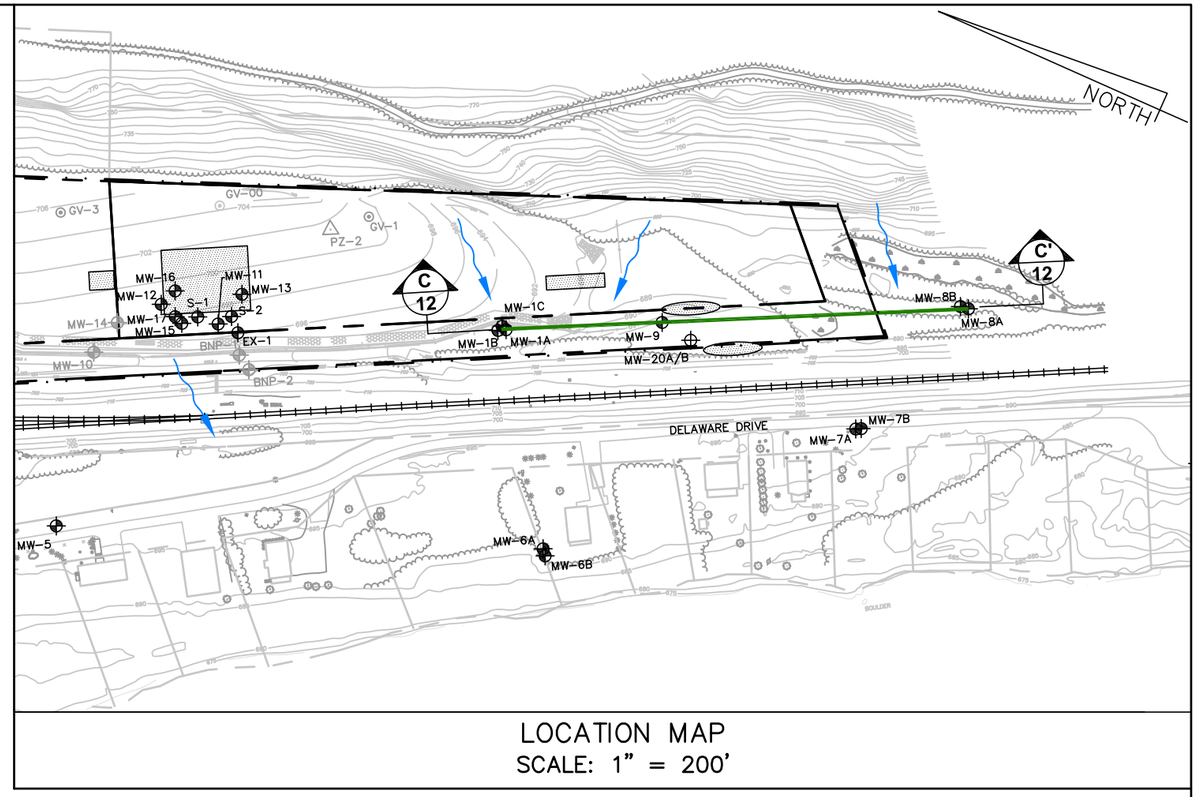
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DATE:	AUGUST 2011
PROJECT NO.	MR0562B
DOCUMENT NO.	MD11173
FILE NO.	0562f506
FIGURE NO.	6

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LOCATION MAP
SCALE: 1" = 200'

LEGEND

- WELL/SCREEN LOCATION
- MEASURED WATER TABLE
- GRAVEL AND SAND
- SILTY SAND
- CLAYEY SILT

150 75 0 150
HORIZONTAL SCALE: 1" = 150'

15 7.5 0 15
VERTICAL SCALE: 1" = 15'

NOTE:

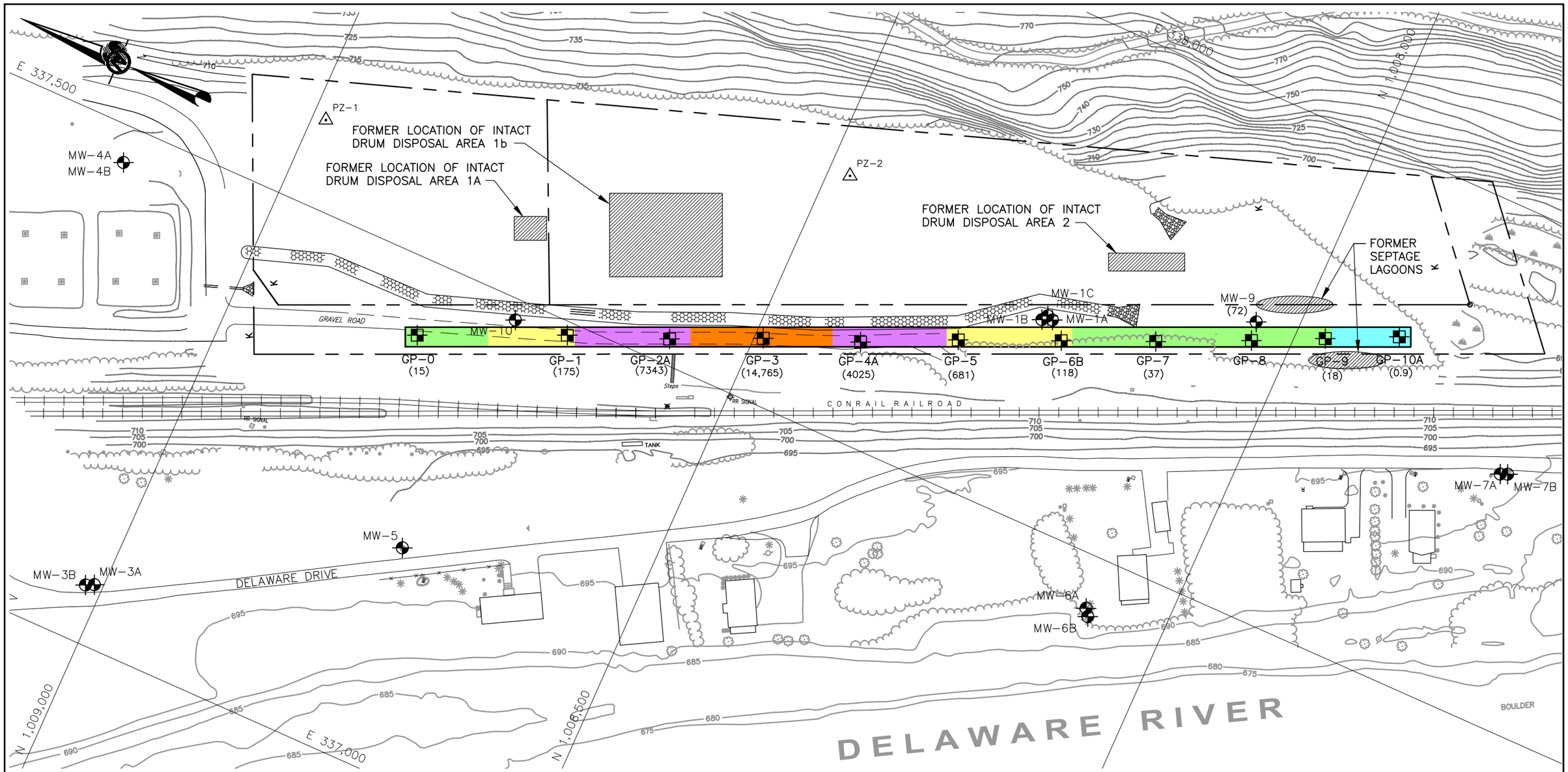
1. WELL CLUSTERS ARE SEPARATE COMPLETIONS IN SEPARATE BOREHOLES BUT SHOWN ON ONE WELL SYMBOL FOR CLARITY.
2. GEOLOGIC AND EXISTING WELL CONSTRUCTION DATA FROM GOLDER (1994).
3. FACIES TRANSITIONS QUERRIED (?) WHERE UNCERTAIN.

HYDROGEOLOGICAL CROSS SECTION OF FORMER IDDA 2 AND SEPTAGE LAGOONS

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DATE:	AUGUST 2011
PROJECT NO.	MR0562B
DOCUMENT NO.	MD11173
FILE NO.	0562f527
FIGURE NO.	7

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LEGEND

- LANDFILL PROPERTY BOUNDARY
- 750 — TOPOGRAPHIC CONTOUR
- MW-10 — MONITORING WELL
- PZ-1 — PIEZOMETER
- GP-1 — GEOPROBE BOREHOLE
- (15.23) — TOTAL VOLATILE ORGANIC COMPOUND CONCENTRATION (µg/L)

- < 10 µg/L
- 11 µg/L to 100 µg/L
- 101 µg/L to 1000 µg/L
- 1001 µg/L to 10,000 µg/L
- > 10,001 µg/L

100 0 100
SCALE FEET

NOTES

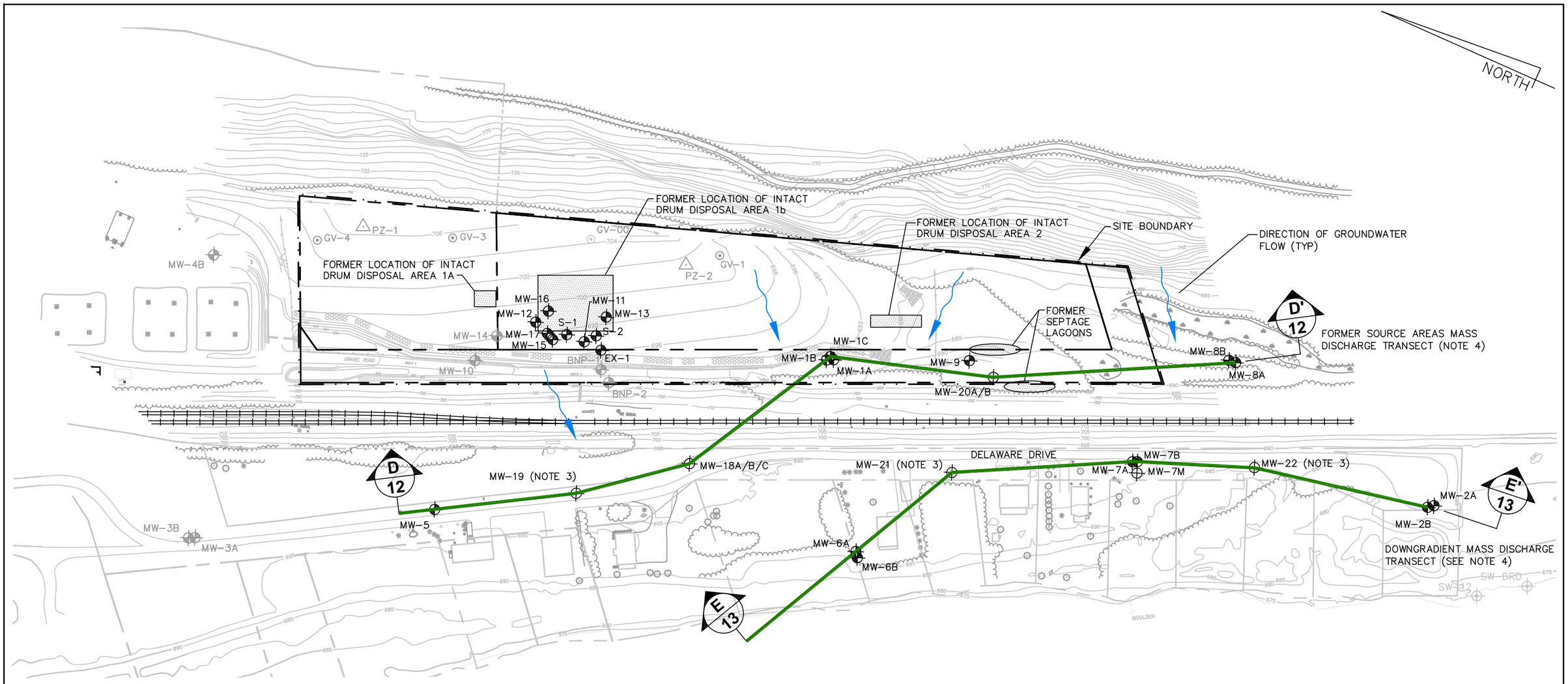
REFERENCE: FIGURE TAKEN FROM FIGURE 4A OF THE SHALLOW GROUNDWATER HOT SPOT INVESTIGATION, REMEDIAL WORK ELEMENT II, CORTESE LANDFILL SITE, NARROWSBURG, NEW YORK (GOLDER ASSOCIATES, INC.; 2001).

TOTAL GROUNDWATER VOC PROFILE
SHALLOW/MIDDLE ZONE
UPPER SAND AND GRAVEL UNIT

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FILE NO.	0562f517
FIGURE NO.	8

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NOTES:

1. SEE FIGURE 2 FOR GENERAL SITE DETAILS.
2. IN-SITU SOURCE TREATMENT WILL FOCUS ON THE FORMER IDDA1b, IDDA 2 AND THE EASTERN SEPTAGE LAGOON. SEE TEXT FOR DETAILS
3. MONITORING WELLS MW-19, MW-21, AND MW-22 WILL BE INSTALLED FOLLOWING THE INSTALLATION AND SAMPLING OF MW-18A/B/C AND MW-7M IN ORDER TO SELECT THE APPROPRIATE SCREENED INTERVAL.
4. MONITORING ALONG THE MASS DISCHARGE TRANSECTS WILL BE SAMPLED AND THE RESULTS WILL BE USED TO DETERMINE THE MASS DISCHARGE THROUGH THE PLANE FORMED BY THE TRANSECT.
5. MONITORING WELLS IN THE VICINITY OF THE FORMER SOURCE AREAS AND WITHIN THE TREATMENT ZONE MAY BE USED TO MONITOR CHARGE IN THE GROUND WATER GEOCHEMISTRY DURING TREATMENT.

LEGEND

- PROPERTY BOUNDARY
- APPROXIMATE EDGE OF DELAWARE RIVER
- FENCE
- 750 — PRE-EXISTING TOPOGRAPHY ELEVATION CONTOUR
- GV-1 — PASSIVE GAS VENT
- MW-10 — MONITORING WELL
- SW-DRU — SURFACE WATER SAMPLE POINT
- PZ-1 — PIEZOMETER
- MW-21 — PROPOSED MONITORING WELL

150 75 0 150

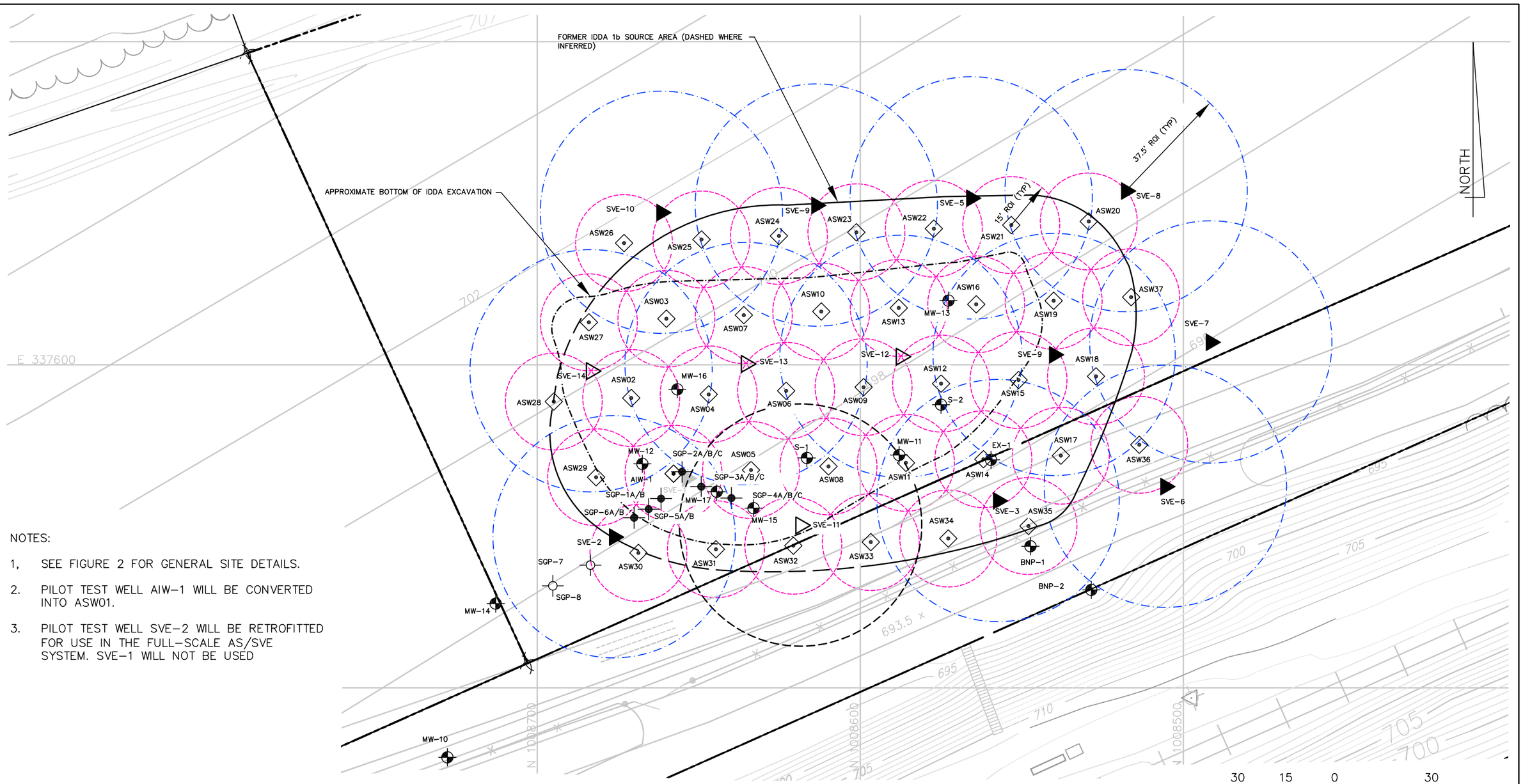
SCALE: 1" = 150'

GROUNDWATER MONITORING NETWORK
CORTESE LANDFILL SITE
NARROWSBURG, NEW YORK

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COLUMBIA, MARYLAND

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DOCUMENT NO.	MD11173
FILE NO.	0562f508
FIGURE NO.	9

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NOTES:

1, SEE FIGURE 2 FOR GENERAL SITE DETAILS.

2. PILOT TEST WELL AIW-1 WILL BE CONVERTED INTO ASW01.

3. PILOT TEST WELL SVE-2 WILL BE RETROFITTED FOR USE IN THE FULL-SCALE AS/SVE SYSTEM. SVE-1 WILL NOT BE USED

30 15 0 30

SCALE IN FEET

LEGEND

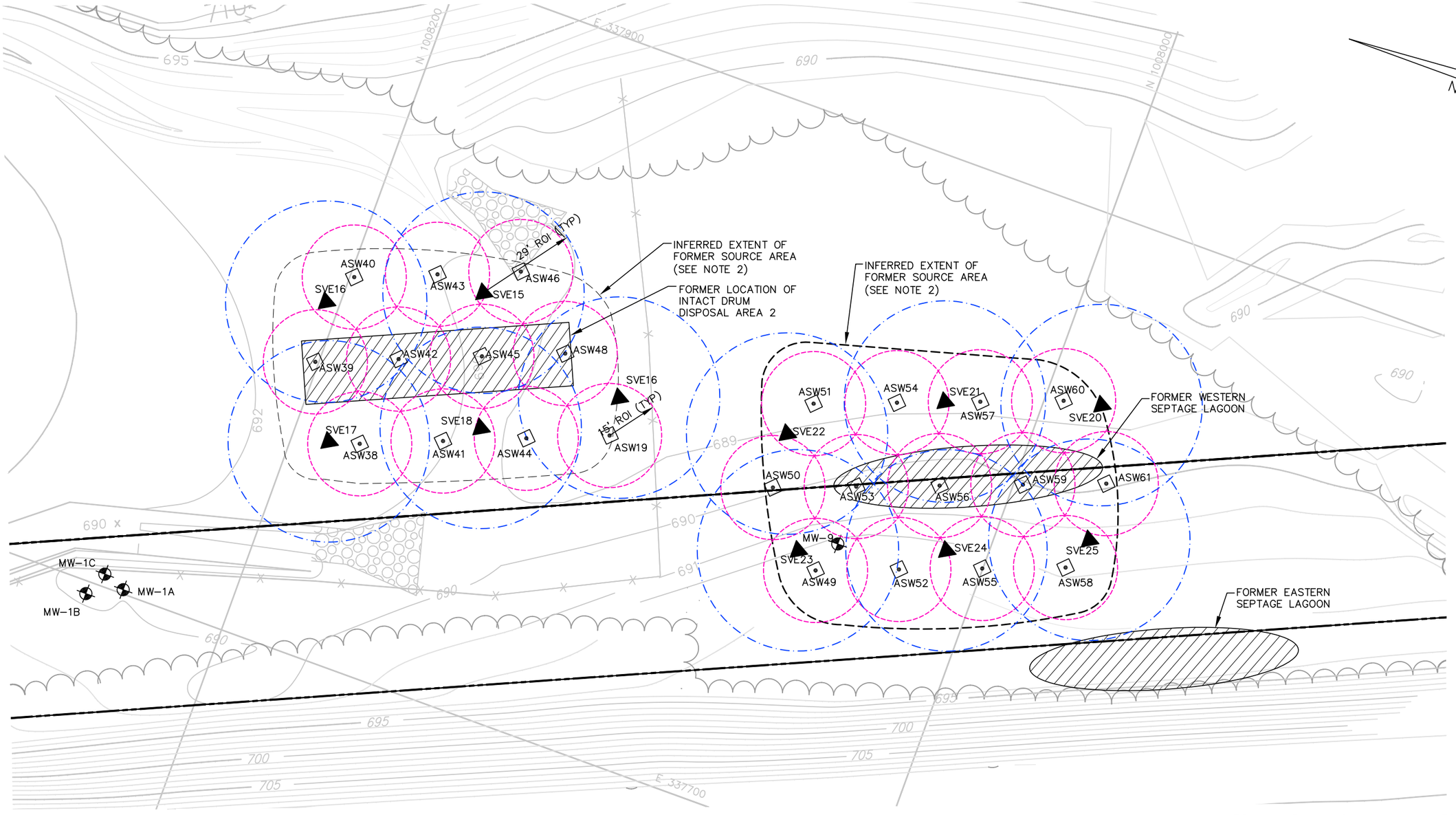
- PROPERTY BOUNDARY
- FENCE
- 750 EXISTING GROUND ELEVATION CONTOUR
- MW-10 GROUNDWATER MONITORING WELL
- AIW-1 AIR SPARGE WELL
- SOIL VAPOR EXTRACTION WELL IN BACKFILL
- SOIL VAPOR EXTRACTION WELL IN SAND/WASTE
- SINGLE SOIL GAS PROBE
- NESTED SOIL GAS PROBE
- AIR SPARGING RADIUS OF INFLUENCE (ROI)
- SOIL VAPOR EXTRACTION RADIUS OF INFLUENCE (ROI)

PLAN VIEW OF TARGET TREATMENT AREA
FORMER IDDA1b

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PROJECT NO.	MR0562B
DOCUMENT NO.	MD111723
FILE NO.	0562f515
DRAWING NO.	10

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NOTES:

1. SEE FIGURE 2 FOR GENERAL SITE DETAILS.
2. THE EXTENT OF THE FORMER SOURCE AREAS TO BE TREATED WILL BE DETERMINED DURING WELL INSTALLATION.
3. IN SITU SOURCE TREATMENT IS NOT ANTICIPATED IN THE FORMER EASTERN SEPTAGE LAGOON. BASED ON POST-EXCAVATION SOIL SAMPLE RESULTS AND EXCAVATED SOIL ANALYSES.

LEGEND

- PROPERTY BOUNDARY
- FENCE
- 750 — EXISTING GROUND ELEVATION CONTOUR
- MW-10 — GROUNDWATER MONITORING WELL
- AIW-1 — AIR SPARGE WELL
- ▶ — SOIL VAPOR EXTRACTION WELL
- AIR SPARGING RADIUS OF INFLUENCE (ROI)
- SOIL VAPOR EXTRACTION RADIUS OF INFLUENCE (ROI)

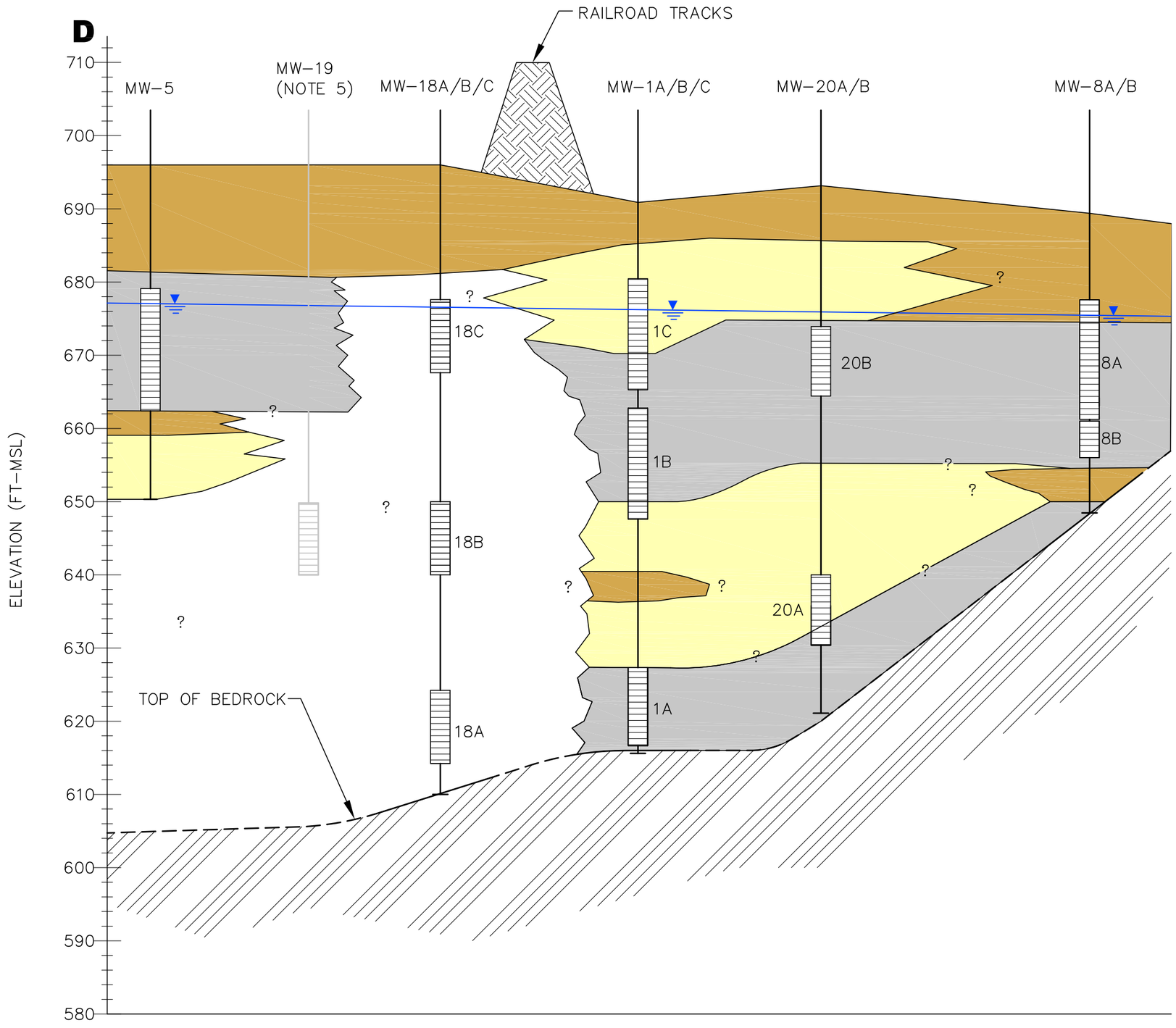
30 15 0 30
SCALE IN FEET

PLAN VIEW OF TARGET TREATMENT AREA
FORMER IDDA 2 AND SEPTAGE LAGOONS

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DATE:	AUGUST 2011
PROJECT NO.	MR0562
DOCUMENT NO.	MD11173
FILE NO.	0562f512
DRAWING NO.	11

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LEGEND

- WELL/SCREEN LOCATION
- MEASURED WATER TABLE
- GRAVEL AND SAND
- SILTY SAND
- CLAYEY SILT

NOTE:

1. LOCATION OF CROSS SECTION SHOWN ON FIGURE 9.
2. WELL CLUSTERS ARE SEPARATE COMPLETIONS IN SEPARATE BORE HOLES BUT SHOWN ON ONE WELL SYMBOL FOR CLARITY.
3. GEOLOGIC AND EXISTING WELL CONSTRUCTION DATA FROM GOLDER (1994).
4. WELLS MW–18, MW–19, AND MW–20 ARE PROPOSED. ACTUAL SCREEN DEPTH WILL BE BASED UPON MATERIALS ENCOUNTERED DURING INSTALLATION.
5. MW–19 WILL ONLY BE INSTALLED IF DEEMED APPROPRIATE BASED ON INITIAL RESULTS AT MW–18.
6. FACIES TRANSITIONS QUERRIED (?) WHERE UNCERTAIN.
7. CONDITIONS MAY VARY FROM THAT SHOWN BETWEEN EXISTING BORINGS.

150 75 0 150
HORIZONTAL SCALE: 1" = 150'

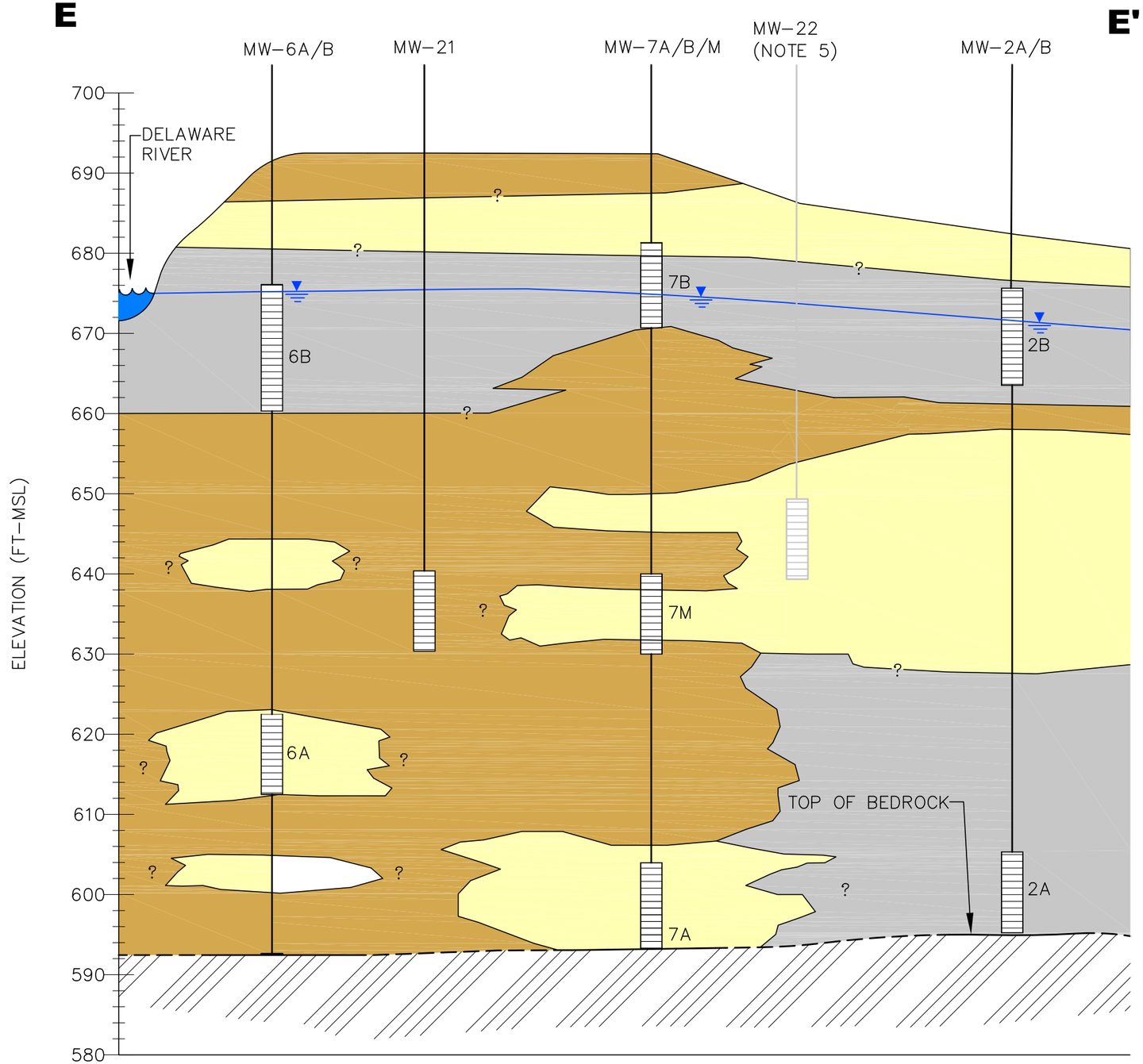
15 7.5 0 15
VERTICAL SCALE: 1" = 15'

CROSS SECTION OF FORMER SOURCE AREAS MASS DISCHARGE TRANSECT

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DATE:	AUGUST 2011
PROJECT NO.	MR0562B
DOCUMENT NO.	MD11173
FILE NO.	0562f510
FIGURE NO.	12

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LEGEND

- WELL/SCREEN LOCATION
- MEASURED WATER TABLE
- GRAVEL AND SAND
- SILTY SAND
- CLAYEY SILT

NOTE:

1. LOCATION OF CROSS SECTION SHOWN ON FIGURE 9.
2. WELL CLUSTERS ARE SEPARATE COMPLETIONS IN SEPARATE BOREHOLES BUT SHOWN ON ONE WELL SYMBOL FOR CLARITY.
3. GEOLOGIC AND EXISTING WELL CONSTRUCTION DATA FROM GOLDER (1994).
4. WELLS MW-21, MW-22, AND MW-7M ARE PROPOSED. ACTUAL SCREEN DEPTH WILL BE BASED UPON MATERIALS ENCOUNTERED DURING INSTALLATION. THE NEED FOR, AND SCREEN DEPTH OF, MW-22 WILL BE BASED ON INITIAL SAMPLE RESULTS AT MW-18A/B/C AND MW-7M.
5. MW-22 WILL ONLY BE INSTALLED IF DEEMED APPROPRIATE BASED ON INITIAL RESULTS AT MW-7M.
6. FACIES TRANSITIONS QUERRIED (?) WHERE UNCERTAIN.
7. CONDITIONS MAY VARY FROM THAT SHOWN BETWEEN EXISTING BORINGS

150 75 0 150
HORIZONTAL SCALE: 1" = 150'

15 7.5 0 15
VERTICAL SCALE: 1" = 15'

CROSS SECTION OF DOWNGRADIENT MASS DISCHARGE TRANSECT

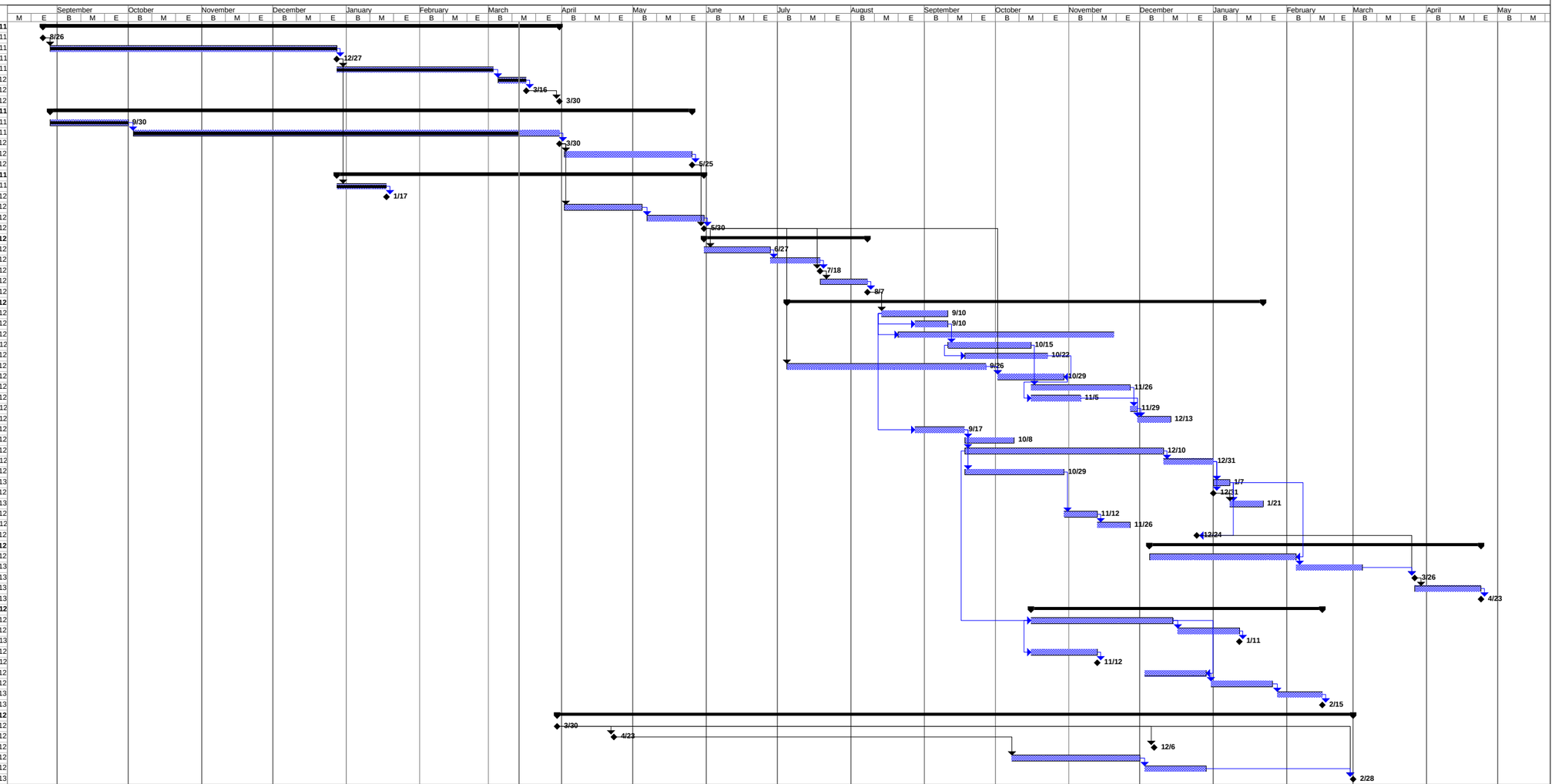
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DATE:	AUGUST 2011
PROJECT NO.	MR0562B
DOCUMENT NO.	MD11173
FILE NO.	0562f510
FIGURE NO.	13

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Figure 14: Remedial Action Schedule

ID	Task Name	Duration	Start
1	**Remedial Design**	**156 days**	**Fri 8/26/11**
2	Submit Pre-Final Remedial Design to EPA/NYSDEC	0 days	Fri 8/26/11
3	EPA/NYSDEC Review	87 days	Mon 8/29/11
4	EPA Conditional Approval of Design	0 days	Tue 12/27/11
5	Address Approval Conditions	48 days	Wed 12/28/11
6	PRP Group Review and Revision	10 days	Mon 3/5/12
7	Submit Final Remedial Design to EPA/NYSDEC	0 days	Fri 3/16/12
8	EPA/NYSDEC Approval	0 days	Fri 3/30/12
9	**RD/RA Consent Decree**	**195 days**	**Mon 8/29/11**
10	Prepare SOW and Consent Decree Amendment	25 days	Mon 8/29/11
11	Agencies Secure Signatures	130 days	Mon 10/3/11
12	Lodge with Court	0 days	Fri 3/30/12
13	Court Review and Public Comment	40 days	Mon 4/2/12
14	Entry of Consent Decree	0 days	Fri 5/25/12
15	**Procurement**	**111 days**	**Wed 12/28/11**
16	Develop Short List Contractors	15 days	Wed 12/28/11
17	Issue List of Contractors to EPA	0 days	Tue 1/17/12
18	Issue RFP and Receive Bids	25 days	Mon 4/2/12
19	Review Bids	18 days	Mon 5/7/12
20	Award Contract	0 days	Wed 5/30/12
21	**Remedial Action Work Plan**	**49 days**	**Thu 5/31/12**
22	Prepare and Submit Remedial Action Work Plan	20 days	Thu 5/31/12
23	PRP Group Review and Revision	15 days	Thu 6/28/12
24	Submit to EPA/NYSDEC	0 days	Wed 7/18/12
25	EPA/NYSDEC Review	14 days	Thu 7/19/12
26	EPA/NYSDEC Approval	0 days	Tue 8/7/12
27	**Remedial Action**	**143 days**	**Thu 7/5/12**
28	Mobilization and Characterize IDW	20 days	Tue 8/14/12
29	IDW Removal Work	10 days	Tue 8/28/12
30	IDDA 1b LNAPL Recovery	65 days	Tue 8/21/12
31	IDDA 1b AS and SVE Well Installation	25 days	Tue 9/11/12
32	IDDA 1b Site Improvement Work	25 days	Tue 9/18/12
33	IDDA 1b AS/SVE Trailer Construction	60 days	Thu 7/5/12
34	IDDA 1b AS/SVE Trailer Delivery	20 days	Tue 10/2/12
35	IDDA 1b AS/SVE Piping	30 days	Tue 10/16/12
36	Electrical Service	15 days	Tue 10/16/12
37	IDDA 1b VGAC Delivery	3 days	Tue 11/27/12
38	IDDA 1b AS/SVE Start Up	10 days	Fri 11/30/12
39	IDDA 2/Lagoon AS and SVE Well Installation	15 days	Tue 8/28/12
40	IDDA 2/Lagoon Site Improvement Work	15 days	Tue 9/18/12
41	IDDA 2/Lagoon Trailer Construction	60 days	Tue 9/18/12
42	IDDA 2/Lagoon Trailer Delivery	15 days	Tue 12/11/12
43	IDDA2/Lagoon AS/SVE Piping	30 days	Tue 9/18/12
44	IDDA 2/Lagoon Electrical	5 days	Tue 1/1/13
45	IDDA 2/Lagoon VGAC Delivery	0 days	Mon 12/31/12
46	IDDA 2/Lagoon AS/SVE System Start Up	10 days	Tue 1/8/13
47	Road Paving	10 days	Tue 10/30/12
48	Revegetation	10 days	Tue 11/13/12
49	Pre-Final Inspection (assume approved)	0 days	Mon 12/24/12
50	**RA Report**	**100 days**	**Wed 12/5/12**
51	Prepare Interim Source Area RA Report	44 days	Wed 12/5/12
52	PRP Group Review and Revision	20 days	Tue 2/5/13
53	Submit to EPA/NYSDEC	0 days	Tue 3/26/13
54	EPA/NYSDEC Review and Approval	20 days	Wed 3/27/13
55	AS/SVE PCOR	0 days	Tue 4/23/13
56	**O&M**	**89 days**	**Tue 10/16/12**
57	Prepare O&M Manual	44 days	Tue 10/16/12
58	PRP Group Review and Revision	20 days	Mon 12/17/12
59	Submit O&M Manual to EPA/NYSDEC	0 days	Fri 1/11/13
60	Develop Short List of O&M Contractors	20 days	Tue 10/16/12
61	Submit List of O&M Contractors to EPA	0 days	Mon 11/12/12
62	Develop O&M Procurement Docs	20 days	Mon 12/3/12
63	Preparation of O&M Bids	20 days	Mon 12/31/12
64	Review O&M Bids	15 days	Mon 1/28/13
65	Award O&M Contract	0 days	Fri 2/15/13
66	**MNA**	**240 days**	**Fri 3/30/12**
67	EPA/NYSDEC Approval of OU 3 MNA Plan	0 days	Fri 3/30/12
68	Begin MNA Monitoring	0 days	Mon 4/23/12
69	Pre-Final Inspection	0 days	Thu 12/6/12
70	Prepare Interim Groundwater RA Report	40 days	Mon 10/8/12
71	PRP Group Review and Revision	20 days	Mon 12/3/12
72	Submit to EPA/NYSDEC	0 days	Thu 2/28/13



Date: Wed 3/14/12

Task | Milestone | Project Summary | External Milestone | Inactive Milestone | Manual Task | Manual Summary Rollup | Start-only | Progress

Split | Summary | External Tasks | Inactive Task | Inactive Summary | Duration-only | Manual Summary | Finish-only | Deadline

Schedule contingent on agency approval of deliverables on first submittal & entry of the Consent Decree prior to Construction Contract award. Agency reviews or CD entry greater than shown will delay successor tasks an equivalent amount of time.

APPENDIX A

AS/SVE Pilot Test Report

Prepared for

Cortese Landfill Technical Committee
c/o SCA Services, Inc.
425 Perinton Parkway
Fairport, NY 14450

DRAFT
AIR SPARGING/SOIL VAPOR EXTRACTION PILOT TEST REPORT

CORTESE LANDFILL SITE

NARROWSBURG, NEW YORK

Prepared by

Geosyntec consultants
10220 Old Columbia Road, Suite A
Columbia, Maryland 21046

Project Number MR0562B
Document Number MD11251

AUGUST 2011

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Appendix F Calculation Package for Air Permeability and Air-Filled Porosity

1. INTRODUCTION

On behalf of the Cortese Landfill Respondents (the Respondents), Geosyntec Consultants (Geosyntec) has prepared this Air Sparging/Soil Vapor Extraction (AS/SVE) Pilot Test Report (Report). The data presented in this Report will be used to support the design of an in situ treatment system to address remaining source materials beneath former source areas at the Cortese Landfill Site (Site) located in Narrowsburg, New York (see **Figures 1 and 2**). The former source areas are former Intact Drum Disposal Area (IDDA) 1b, former IDDA 2, and the former septage lagoons (see **Figure 3**). In Situ Source Treatment has been presented as a remedial alternative in the Former Source Areas Feasibility Study Report (FS) (Geosyntec, 2010a) and was selected by the United States Environmental Protection Agency (USEPA) in the Record of Decision (ROD) and ROD Amendment to the 1994 ROD (USEPA, 1994) issued on 5 October 2010 (hereinafter, "2010 ROD/ROD Amendment") (USEPA, 2010). In Situ Source Treatment will begin with AS/SVE to remove constituents of concern (COCs) through volatilization and/or aerobic biodegradation. A more detailed discussion of the Site background and the overall remedial approach is presented in Pre-Final Remedial Design Report (Geosyntec, 2011a). This Report presents the results of the AS/SVE Pilot Test that was implemented in accordance with the approved Pilot Test Work Plan (Geosyntec, 2010b). The data collected are used to present a design basis for a full-scale AS/SVE system.

The remainder of this Report is organized into the following sections:

- Section 2 – Pilot Test Objectives;
- Section 3 – Pilot System Overview;
- Section 4 – Pilot Test Program;
- Section 5 – Results and Discussion;
- Section 6 – Basis of Design; and
- Section 7 – References.

2. PILOT TEST OBJECTIVES

The purpose of the AS/SVE pilot test was to collect site-specific data to support the design of a system for delivering air to the subsurface for the purposes of (1) stripping volatile and semi-volatile COCs from the groundwater and soil into the overlying soil gas; (2) extracting and treating COCs contained in the soil gas; and (3) promoting aerobic in situ biodegradation of residual COCs in soil and groundwater. The pilot-test data will be used as a basis to design a full-scale system. The specific objectives of the pilot test program were as follows:

1. Determine baseline conditions in the pilot test area (PTA) in order to provide understanding of the conditions prior to testing;
2. Determine the achievable SVE air flow rates and vacuums in order to size the SVE blower;
3. Determine the air permeability of the vadose zone (both IDDA 1b mineral soil backfill and surrounding municipal solid waste) below the cover cap and the spatial distribution of airflow within the zone of influence of the extraction well in order to determine the appropriate spacing and number of soil vents;
4. Determine achievable air injection flow rates and pressures in order to size the AS air compressor;
5. Determine general characteristics and dynamics of induced air distribution in the saturated zone, such as the time required to achieve steady-state as needed to assess the viability of a pulsed sparging design;
6. Determine the lateral extent of air distribution in the saturated zone in order to determine the appropriate spacing and number of vertical sparge wells, or the number and spacing of screened intervals for horizontal sparge wells;
7. Determine whether SVE vents screened in the IDDA 1b backfill can adequately control and collect the air sparge off gas that enters the more permeable underlying natural sediments, to support design of the full-scale system SVE vent screen depths;
8. Determine the potential chemical composition of the off gas collected by the SVE system and evaluate degree of volatilization of COCs due to AS; and
9. Determine the quantity and composition of liquids collected by the SVE system during the process.

A description of the pilot system and its operation are provided in the following two sections.

3. PILOT SYSTEM OVERVIEW

3.1 Pilot System Layout

The AS/SVE pilot system was located within the limits of the Former IDDA 1b area as shown in **Figure 4** and in greater detail in **Figure 5**. The pilot test layout was situated in the area where drums were previously excavated and removed from IDDA 1b and a sand/silt backfill was placed. A geosynthetic landfill closure cover was subsequently constructed over the backfilled excavation and the former landfill at the Site. As shown on the cross-section in **Figures 6** and **7**, this excavated and backfilled area occupies a large portion of the Former IDDA 1b area and is representative of the conditions in which the central portion of the full-scale system will operate.

The pilot system consisted of a single air sparge well (AIW-1) and two SVE vents. As shown in **Figure 6**, the pilot test system was situated so that existing groundwater monitoring wells (MW-12, MW-15, and MW-16) could be utilized during the air injection portion of the pilot test to measure groundwater elevations, pressure, and quality in the vicinity of AIW-1. One additional groundwater monitoring well (MW-17) was installed at a distance of approximately 15 feet from AIW-1, between AIW-1 and MW-15. Six nested soil gas monitoring probe (SGP) clusters were also installed throughout the PTA for the purpose of monitoring soil gas concentrations and vacuum in the vadose zone during the pilot test.

3.2 Well and SGP Installation

The PTA was cleared for underground utilities before the start of the drilling program. Prior to installation of the boreholes, the closure cap geosynthetics (approximately 2.5 feet below ground surface [ft bgs]) were accessed by hand digging and cut by hand to prevent drill tooling from pushing down on and stretching, or otherwise damaging the systems. The wells, SVE vents, and SGPs were installed by the environmental drilling firm Parrat-Wolf, Inc. over a two week period starting on 29 November 2010 and ending 10 December 2010. Boreholes for the wells and SVE vents were advanced using hollow-stem auger (HSA) drilling techniques, while smaller diameter boreholes for SGPs were advanced using direct-push technology (DPT). Since subsurface volatile organic compound (VOC) impacts have been documented at the Site, ambient air quality was monitored during borehole advancement and installation of all wells and SGPs with a MiniRAE 3000 photoionization detector (PID). The PID was also used to periodically scan the soil samples and/or borehole cuttings to further evaluate subsurface impacts and health and safety hazards. Construction details for each well, SVE vent, and SGP are summarized in **Table 1** and detailed on the boring logs provided in **Appendix A**. Upon the completion of each borehole, the geomembrane was resealed with grout/concrete to maintain the integrity of the landfill cap. The newly installed wells (i.e. AIW-1 and MW-17) were developed on 9-10 December 2010 using a "purge and surge" method to promote communication between the well

screen, filter pack and the surrounding aquifer. Well development logs are provided in **Appendix B**.

AIW-1 was installed between MW-12 and MW-15 (**Figure 5**) on 6-7 December 2010 in the central portion of the former IDDA 1b area. To ensure that AIW-1 was screened in the desired sand and gravel layer, split spoon samples were taken near the targeted screened interval during borehole advancement. AIW-1 was constructed using a 1.5 foot long two-inch diameter wire-wrapped stainless steel screen and two-inch diameter Schedule 80 polyvinyl chloride (PVC) riser. These materials were selected in anticipation of ozone addition following the initial AS/SVE phase of operation. The well was constructed with the screened interval (35.5-37 ft bgs) at the contact between the upper sand and gravel unit and the underlying silty sand so that a minimum of ten feet of water column was above the top of screen. Groundwater elevations were based on the gauging of surrounding groundwater monitoring wells prior to the construction of AIW-1.

Groundwater monitoring well MW-17 was installed on 8 December 2010 between MW-15 and AIW-1 in order to provide groundwater monitoring data to support the determination of the AS radius of influence (ROI). MW-17 was screened from 26-31 ft bgs (similar to other wells in the PTA) with two-inch diameter 0.010-inch machined PVC screen.

SVE vents were installed on 7-9 December 2010 at the locations shown on **Figure 5**. SVE-1 was installed approximately five feet horizontally from the AS location and was screened from 10.5-15 ft bgs in the backfill (**Figure 6)**. SVE-2 was installed near the boundary of the former IDDA 1b area and was screened from 13.5 to 18.5 ft bgs in the sand/waste material that occurs adjacent to and/or below the backfill (**Figure 7)**. Both SVE vents were constructed using four-inch diameter flush-threaded Schedule 80 PVC casing and screen with wire-wrapped 0.010-inch openings. Each vent was completed as a stickup with a 10-inch outer casing to provide room to work with attachments to the vent.

Six nested groups of SGPs were installed in the PTA between 29 November 2010 and 6 December 2010 as shown on **Figure 5** to monitor soil gas concentrations and vacuum in the vadose zone during pilot test activities. At each nested SGP location, probes were installed at two or three different depths. The shallow SGP (A-level) in each set was installed two feet below the geosynthetic components in order to monitor the pressure beneath the liner. The intermediate SGP (B-level) was installed at the same depth as the SVE vent (**Figure 6**) in order to monitor vacuum and soil gas quality within the backfill material. A-level and B-level SGPs were installed inside separate adjacent 2.5 inch diameter open boreholes that were created using DPT. Each A and B-level SGPs consisted of 1/4 inch Nylaflow tubing connected to a stainless steel vapor implant with a compression fitting. A sand filter pack was placed in the annulus to a

height of 1 ft above the bottom of the borehole with the implant placed in the center. Granular bentonite and water was placed in two lifts of 3 inches each above the filter pack and then a thick slurry of powdered bentonite and water was added to seal the remainder of the borehole annulus to ground surface. The top of each SGP was fitted with a valve to maintain an air-tight seal between installation and sampling. No outer protective casing was installed for the A-level and B-level SGPs.

In three SGP clusters, a deep SGP (C-level) was installed approximately two feet above the water table at the time of drilling **(Figure 8)** in order to monitor the soil gas just above the water table in case the SVE vent in the overlying backfill was not able to control and collect it. Two additional deep SGPs were installed as single installations in the waste/sand layer (**Figure 7**) approximately ten and twenty five feet, respectively, from SVE-2 (**Figure 5**) in order to monitor vacuum and soil gas quality within the sand/waste layer. Each C-level SGP was installed with the screened interval approximately two feet above the water table elevation at the time of drilling. Each C-level SGP was constructed with a 1-inch diameter 5-ft long 0.010-inch machined opened Schedule 40 PVC screen with one-inch diameter flush thread Schedule 40 PVC riser to the surface. The PVC riser on each C-level SGP was capped at the surface with a vapor plug and ball value for sampling. C-level SGPs were completed as stickups with a 4-inch outer steel protective casing, consistent with other monitoring wells at the Site.

The horizontal location and top of casing elevation for all new and existing wells were surveyed by Thew Associates Land Surveyors on 9-10 December 2010. Survey data for the wells are provided in **Appendix C**.

3.3 Pilot Test System Equipment

3.3.1 Air Injection System

The air injection system consisted of a compressor and associated piping. Air flow from the compressor was controlled by a ball valve at the compressor air discharge. The discharge of the air compressor was connected to a manifold by means of an air hose. A pressure regulator controlled the pressure discharged to the manifold. Before entering the well, air passed through a coalescing filter and an activated carbon filter in order to remove particles, droplets, or vapors from the compressor discharge. Flow and pressure to AIW-1 were controlled by a flow control valve integral to the rotameter mounted on the manifold.

For the helium tracer test (Section 4.7), a helium gas cylinder was connected to the well head with tubing and compression fittings. A pressure regulator mounted on the cylinder controlled the helium injection pressure and a metering valve controlled the helium flow rate. A ball valve isolated the helium line from the main air injection line and a check valve prevented backflow.

3.3.2 SVE System

The SVE system consisted of a vacuum blower, a moisture separator and associated piping. The vacuum blower was used to generate vacuum in the SVE vents and draw soil vapors into the screen. The moisture separator was used to knock out entrained water droplets. The level of vacuum generated by the vacuum blower was controlled by the admission of dilution air from the atmosphere. VOC emissions in the off-gas were controlled by two vapor-phase granular activated carbon (VGAC) units connected to the discharge of the vacuum blower.

3.3.3 Instrumentation

The air injection system was equipped with gauges to measure pressure and flow. Pressure was measured at the pressure regulator and at the AS wellhead using direct-read gauges. Flow was measured on the air and helium lines using rotameters.

The SVE system was equipped with gauges to measure vacuum, flow, and temperature. Vacuum was measured at the SVE wellhead and at the moisture separator. Flow and temperature were measured between the SVE vent and the moisture separator using an air velocity and temperature meter. Sampling ports were installed at the SVE wellhead (SP1), discharge of the vacuum blower before entering the first VGAC unit (SP2), and after the second VGAC unit before discharging to the atmosphere (SP3). Samples were collected from the ports to screen for total VOCs using a PID and for carbon dioxide (CO_2), oxygen (O_2) and methane (CH_4) using a GEM 2000 landfill gas (LFG) monitor, as described in Section 4.6.

4. PILOT TEST PROGRAM

The pilot test program was conducted by Geosyntec over a two week period starting 7 March 2011 and ending 16 March 2011 and was implemented in accordance with the approved *Air Sparging/Soil Vapor Extraction Pilot Test Work Plan* (Geosyntec, 2010b), except with a few minor variations as noted in the discussion below. **Table 2** lists the measurements that were conducted as part of the pilot test program and their purpose for meeting the pilot test objectives. The components of the proposed pilot test were consistent with published guidance for AS and SVE pilot testing (Leeson et al., 2002, USACOE, 2002, and USACOE, 2008). The operation, measurement, and monitoring that was conducted during each stage of the pilot test program are described in greater detail in the following sections.

4.1 Baseline Conditions

Prior to any injection of air into the subsurface, the baseline condition of the groundwater and the vadose zone was determined. Groundwater levels were measured in the all pilot test wells (AIW-1, MW-12, MW-14, MW-15, MW-16, and MW-17) prior sampling to determine the elevation of the water. These data are summarized in **Table 3A**. Temporal trends in site background groundwater elevations during the pilot test were monitored using a pressure transducer in groundwater monitoring well MW-14 that was located outside the expected zone of influence of the pilot test. Baseline groundwater conditions in each of the pilot test groundwater monitoring wells to be used to monitor groundwater quality (MW-12, MW-15, MW-16 and MW-17) were documented using low-flow purging (submersible pump) and monitoring. Field parameters were measured during stabilization using an In-Situ Troll 9500 water quality meter that was coupled with a flow through cell. Monitored geochemical field parameters included temperature, pH, specific conductance, turbidity, dissolved oxygen (DO) concentration, and oxidation-reduction potential (ORP). Reasonable attempts were made to achieve the following field parameter stabilization control limits for three consecutive readings prior to recording final groundwater measurements: +/- 0.1 for pH; +/-3% for specific conductance and temperature; +/- 10 millivolts (mV) for ORP; and +/-10% for DO and turbidity. The final field parameter measurements are considered the baseline geochemistry. These data are tabulated in **Table 3B**.

To document the baseline vadose zone conditions, each SGP was purged and sampled for screening. The SGPs were screened for total VOCs using a PID and for CO_2, O_2 and CH_4 using a LFG monitor as described in Section 4.6. These data are tabulated in **Table 3C**.

4.2 Vacuum Step Rate Test

Each of the two SVE vents were tested individually one after the other on 8 and 9 March 2011. SVE testing at each vent began with a vacuum step rate test to evaluate the vapor recovery rates obtainable at various applied vacuums (vent capacities). The stepped-rate test data were used to develop the air yield from the vent versus the applied wellhead vacuum. To begin, the vacuum blower was started with the dilution valve fully open. The applied vacuum at the SVE wellhead and at the moisture separator, as well as the flow rate at the SVE wellhead was measured. The SVE vapor sampling ports (i.e. SP1, SP2, and SP3) were sampled and screened using the PID and LFG monitor to establish baseline levels of VOCs and landfill gases. The time, vacuum levels, flow rate, and PID and LFG measurements were recorded.

Vacuum was applied to the SVE vent in equal increasing steps by opening the valve to the SVE vent and partially closing the dilution air valve. For each step, the applied vacuum at the SVE wellhead and at the moisture separator, and the flow rate at the SVE wellhead were measured. After the vacuum and extraction rate were allowed to stabilize for at least 10 minutes, the SVE vapor sampling ports at the SVE wellhead and at the vacuum blower discharge were sampled and screened using the PID and LFG monitor. At the end of each step, the time, vacuum levels, flow rate, PID and LFG measurements, and ambient barometric pressure and temperature were recorded. Step increases in vacuum continued until increasing the vacuum did not increase the flow rate at the SVE wellhead or the dilution valve was fully closed. The measurements were repeated with similar step decreases in vacuum until the dilution valve was fully open. The vacuum step rate test data for SVE-1 and SVE-2 are summarized in **Tables 4A** and **4B**, respectively.

4.3 Vacuum Constant Rate Test

After the vacuum step rate test was completed at each SVE vent, the vacuum constant rate test was conducted in order to determine the distribution of vacuum around the SVE vents and to collect data to estimate the air permeability and air-filled porosity of the IDDA 1b excavation backfill and the surrounding solid waste, respectively. In addition, data were collected on the groundwater pressure response during SVE startup and shutdown. The vacuum constant rate test was conducted at the highest extraction rate measured during the step test for each SVE vent.

In order to document the initial conditions at each SVE vent prior to restarting the vacuum blower, the vacuum levels were measured at the SVE vent and at the SGPs, as well as the barometric pressure. Monitoring of barometric pressure before and during the test was important because noise associated with barometric pressure fluctuations can otherwise obscure the desired vacuum signal. Samples were collected from the SVE sampling ports and screened with the PID for VOCs and LFG monitor for landfill gases. The groundwater monitoring wells were gauged

and pressure transducers were placed inside all groundwater monitoring wells in order to monitor the groundwater pressure response during SVE startup. The pressure transducers were set up to log the groundwater pressure every 20 seconds.

The vacuum blower was restarted with the dilution valve open and the dilution valve was gradually closed until the maximum extraction flow rate, as determined during the vacuum step test, was reached. The applied vacuum at the SVE wellhead and at the moisture separator and the vapor extraction rate at the SVE wellhead were measured and recorded after startup and then periodically to confirm the constant extraction rate. Vacuum was measured at the SGPs and recorded every three minutes in the first ten minutes of operation and then every ten minutes until the vacuum levels stabilized. Samples were collected from the SVE sampling ports and screened with the PID for VOCs and LFG monitor for landfill gases every 30 minutes. These data are summarized for SVE-1 and SVE-2 in **Tables 5A** and **5B**, respectively.

Once the vacuum levels at the SGPs had stabilized (±10%), the time, the vacuum levels at the SGPs, SVE vent and moisture separator, the extraction rate and the ambient barometric pressure and temperature were measured and recorded. For the test at SVE-1, Summa canisters were used to collect samples of the off-gas from the SVE sampling ports (SP1, SP2, and SP3), and submitted to a fixed laboratory for analysis of VOCs by USEPA test method TO-15. Copies of the analytical reports are provided in **Appendix D**.

The blower was then shut down and the vacuum level in the SGPs was measured and recorded at regular intervals to monitor the recovery to ambient conditions. Once the vacuum levels in the SGPs returned to ambient conditions, pressure transducer logging was stopped.

4.4 Air Injection Step Test

Air injection testing began with step increases in the injection pressure in order to determine the entry pressure required to initiate air flow into the aquifer. To frame the pressure constraints of the pilot test, the minimum and maximum pressures were calculated. The minimum pressure was the pressure required to overcome the hydrostatic pressure in the sparging well. The maximum pressure was intended to prevent fracturing of the sediments and is equal to the overburden pressure exerted by the weight of the soil and water columns multiplied by a factor of safety (USACOE, 2008). Based on historic water levels and the screened interval for the AIW well, the hydrostatic pressure is approximately 10 feet of water or 4.3 psig. The depth to the top of the AIW well screen was 35.5 feet. With the assumption of a soil density of 2.7 g/cm^3 and a porosity of 30%, the overburden pressure is equal to approximately 30 psig. Using a safety factor of 75%, the maximum allowable injection pressure was approximately 22.5 psig.

In addition to concerns that the injected air might fracture the overburden soils, there was also a concern of the effect that injected air might have on the geosynthetic membrane. The maximum allowable pressure directly beneath the geomembrane was assumed to be equal to the weight of soil and water columns on top of the geomembrane. Based on the as-built construction of the landfill cover (Golder, 1998), the thickness of soil above the liner was assumed to be at least 18 inches and the average wet density of soil was assumed to be approximately 115 pounds per cubic foot. Therefore, the pressure due to the soil and water above the geomembrane was approximately 1.2 psig. The SVE system was also operated during air injection to prevent potential pressure buildup and disturbance of the geomembrane. In addition, the pressure in the shallow SGPs was monitored to ensure that pressure beneath the cap never approached 1.2 psig.

Prior to injection, the AIW well was gauged to measure the depth to water in order to confirm the minimum and maximum pressure. The helium line was isolated by closing the ball valve. The SVE system was started to collect vapors and protect the cap integrity as described above. The regulating valve on the pressure regulator remained closed and the AIW well was vented so that there was no pressure in the line. The time, the pressure at the pressure regulator and at the AIW wellhead, the applied vacuum at the SVE wellhead, and the extraction rate were measured and recorded as the zero gauge pressure condition. The air injection flow control valve was slowly opened until measureable flow (1 scfm) was observed. The air injection rate and pressure were documented and allowed to stabilize for 10-15 minutes. After the air injection and extraction were allowed to stabilize for at least 10 minutes, the AIW injection rate and pressure were documented, and the SVE vapor sampling ports were sampled and screened using the PID and LFG monitor and the values recorded. After the aforementioned measurements, the injection rate was increased 1-2 scfm and allowed to stabilize and the measurements repeated. The 1-2 scfm step rate increases and measurements continued until the injection capacity of the air compressor was reached. Step increases in flow did not elevate the pressure to the maximum injection pressure threshold to avoid overburden fracturing (22.5 psig) and the pressure in the shallow SGPs did not exceed 1 psig (~28 inches of water). The measurements were then repeated with similar step decreases in pressure until no flow was measured on the air injection line. The air injection step test data are summarized in **Table 6**.

4.5 Groundwater Pressure Response

After the achievable injection pressures and flow rates were determined in the air injection step test (Section 4.4), the pressures were allowed to return to ambient conditions, and the groundwater pressure response was measured during start-up and shutdown. The groundwater pressure response provides general information about the air distribution, the transient start-up period, and the time required to achieve steady state. This information, in turn, will support the evaluation and potential design of a pulsed sparging system configuration, if appropriate.

Prior to air injection, pressure transducers that had been deployed in the groundwater monitoring wells were set up to record groundwater pressure every 20 seconds. Once sufficient ambient data were collected, the SVE system at SVE-1 was restarted at the maximum extraction rate used in the constant rate vacuum test (Section 4.3). Once the groundwater SVE pressure response had stabilized, air injection was restarted at the maximum pressure achieved during the air injection step rate test (Section 4.4) without exceeding the pressure limits in the shallow SGPs. In addition, the pressure in the shallow SGPs was measured and recorded to ensure that the pressure did not exceed 1.2 psig (Section 4.4). Approximately every hour during AS/SVE operation, the SVE vapor sampling ports were sampled and screened using the PID and LFG monitor and the values recorded. The SVE and shallow SGP monitoring data are summarized in **Table 7**.

The air injection regime was considered to have reached steady-state when the groundwater pressure returned to its pre-injection value (± 2%). Once steady-state was achieved, air injection was terminated by closing the ball valve to the air line. Groundwater pressure monitoring continued in order to measure the response during shutdown. The SVE system continued operating as not to affect the groundwater pressure response during shutdown. Sampling and screening using a PID and LFG monitor of the SVE vapor sampling ports was repeated at approximately 1 hour and 2 hours after air sparging was terminated. The SVE system was shut down and sample port screening was stopped after approximately two hours as the groundwater pressure returned to near initial conditions.

4.6 Soil Gas Monitoring

Each SGP was purged to remove any atmospheric air entrained during installation. Soil gas quality was screened in the field by filling a Tedlar™ bag and analyzing the collected vapor with calibrated PID and LFG monitors. Field instruments were calibrated according to manufacturer's instructions, and calibration checks were performed on a regular basis throughout the monitoring program. A minimum of 3 liters (L) was purged prior to the baseline sampling. At least 1 SGP volume of air was purged between other sampling events.

4.7 Helium Tracer Test, Steady-State and Post-Injection Monitoring

Helium is a convenient inert tracer gas that can be used to determine the recovery of AS air by the SVE system and to determine lateral extent of air distribution. The degree of recovery by the SVE system is an assessment of the capacity of the co-located SVE vent to capture the injected air and volatilized VOCs. High recovery (>80%) is an indication of good capture. Low recovery (<30%) may indicate that injected air is trapped beneath less permeable strata and is moving laterally beyond the reach of the SVE system (Leeson et al., 2002). This is a potential concern within the former IDDA 1b source area where the waste and/or IDDA 1b backfill may form a less permeable layer than the sand/gravel layer below it. Therefore, the design of the

helium tracer test also evaluated potential lateral migration and air transport to the water table in addition to the recovery in the SVE well through monitoring for helium in the deep SGPs during, and in the absence of, SVE operation.

Steady-state and post-injection monitoring was planned to follow the helium tracer tests in order to monitor groundwater geochemistry and soil gas quality during and following air injection. Prior to the initiation of the helium tracer tests, the groundwater geochemistry was monitored. To monitor the geochemical conditions at MW-12 and MW-17 an In-Situ Troll 9500 water quality meter was submerged below the water table and deployed in the screened interval for the duration of the steady-state test and post-injection monitoring. The water quality meters were set to automatically measure and log the groundwater chemical parameters every 10 minutes for the duration of the test. The wells were fitted with well caps that allowed for passage of the water quality meter, but sealed the well casing to prevent vapors from escaping.

Field parameters at MW-15 and MW-16 were measured using low-flow sampling and monitoring techniques. Field parameters were measured during stabilization using an In-Situ Troll 9500 water quality meter placed in a flow-through cell that was connected to a submersible pump. Monitored geochemical field parameters included temperature, pH, specific conductance, turbidity, DO concentration, and ORP. Reasonable attempts were made to achieve the following field parameter stabilization control limits for three consecutive readings prior to recording final ground water measurements: +/- 0.1 for pH; +/-3% for specific conductance and temperature; +/-10 mV for ORP; and +/-10% for DO and turbidity. The final field parameter measurements were considered the geochemistry before the start of the steady-state test. MW-15 and MW-16 were also sampled throughout the steady-state and post-injection monitoring period to document potential changes in groundwater geochemistry. However, due to the desired sampling frequency it was impractical to complete low-flow sampling and monitoring techniques each time. Thus an abbreviated method was implemented for each sampling interval by measuring the geochemistry with the water quality meter after 10 minutes of purging (~500 mL/min).

Soil gas composition was also documented in the deep SGPs before and during the steady-state and post-injection monitoring period with a PID and LFG. SGPs were sampled following the procedures outlined in Section 4.6.

The helium tracer test began after the transient start-up period (determined during the groundwater pressure response testing in Section 4.5). As a baseline, a sample was taken from SVE-1 and screened using a helium detector model MGD 2002 to document that helium was not present before injection. An unexpected elevated reading was registered on the helium detector, which was determined to be due to interference from methane in the soil gas. It was therefore determined that the helium detector could not be used for field screening for helium under Site

conditions. Instead, Summa canisters collected for VOC analysis as part of the steady-state test described below were also submitted for helium analysis in order to assess recovery of the injected air by the SVE system. However, monitoring of the deep SGPs for helium was not possible.

For steady-state monitoring, groundwater geochemistry and soil gas field measurements were collected at least every 30 minutes until DO concentration in each groundwater monitoring well had stabilized, or for a maximum of eight hours. The steady-state groundwater geochemistry for monitoring wells MW-15 and MW-16 and the soil gas monitoring data are tabulated in **Tables 8** and **9**, respectively. The groundwater quality logs for MW-12 and MW-17 are provided in **Appendix F**. Steady-state monitoring continued for approximately six hours when it was concluded that DO concentrations had stabilized.

At the end of the steady-state monitoring period, helium was blended into the injected air by opening the helium cylinder to pressurize the helium line and then slowly opening the metering valve to achieve a helium concentration of approximately 5% by volume by adjusting the helium flow rate (Q_{He}). The target ratio Q_{He} to the air flow rate (Q_{Air}) is derived in the equations below.

$$\frac{Q_{He}}{Q_{Air} + Q_{He}} = \sim 5\%$$

$$Q_{He} \sim \frac{Q_{Air}}{19}$$

After helium was injected for approximately fifteen minutes, Summa canisters were used to collect samples of the off-gas from the SVE sampling ports and submitted to a fixed laboratory for analysis of VOCs by EPA Method TO-15 and helium by ASTM Method D1946. The helium tank was spent unexpectedly approximately 20 minutes into the 30 minute sample collection period. The air and helium injection was then stopped while the SVE system continued operation. Post-injection monitoring commenced immediately with groundwater geochemistry field measurements at MW-15 and MW-16 and soil gas field measurements in the deep SGPs repeated at approximately 1 hour, 2 hours, 4 hours, and 16 hours after sparging stopped. The post-injection groundwater geochemistry data for MW-15 and MW-16 and the soil gas monitoring data are tabulated in **Tables 8** and **9**, respectively. Groundwater geochemistry at MW-12 and MW-17 was monitored every 10 minutes with In-Situ Troll 9500 meters that were placed in the well screen for the duration of the test. The groundwater quality logs for MW-12 and MW-17 are provided in **Appendix E**. The SVE sampling ports were also sampled and screened with a PID and LFG monitor in order to monitor for changes in the quality of the off-gas. Four hours after the air sparging was terminated, the SVE system was also stopped. The

final round of water quality and soil gas composition measurements were taken 16 hours after air sparging was terminated.

At the conclusion of AS and SVE pilot test operations, an attempt was made to collect samples of condensate collected from the drain of the moisture separator and submit to a fixed laboratory for analysis for TCL VOCs and SVOCs in accordance with Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Update III (USEPA, 1996). However, the volume of water accumulated in the moisture separator during the test was insufficient to allow sample collection.

5. RESULTS AND DISCUSSION

5.1 Baseline Conditions

Baseline groundwater elevations are summarized in **Table 3A**. Groundwater elevations ranged from 675.79 feet above mean sea level (ft msl) at MW-12 to 676.13 ft msl at MW-15 (approximately 22 to 24 ft bgs). The measured groundwater elevations are consistent with historical groundwater elevations shown on **Figures 4** and **5**.

The groundwater geochemistry readings collected during the initial baseline sampling event are provided are in **Table 3B**. These readings generally show that groundwater has similar geochemical properties throughout the PTA. The groundwater was slightly acidic with pH values ranging from 6.27 to 6.28. Specific conductance ranged from 293.5 to 311.4 mS/cm. The groundwater was anaerobic with oxidation reduction potential (ORP) ranging from -58 to -126 mV and no detectable DO. This corresponds to an iron-reducing to sulfate-reducing geochemical environment.

Baseline soil gas concentrations in the PTA are presented in **Table 3C**. These data show that CH_4 concentrations were 24 to 64 per cent by volume. Although CH_4 detection was expected, it is expected that the concentrations detected will not be sustained during full-scale/long-term operations due to age of the waste and reaction of CH_4 and injected oxygen via methanotrophic bacteria. CO_2 concentrations were also elevated with values ranging from 12.1 to 22.3%. Oxygen content was low with values ranging from 0.3 to 3.7 % and the remaining volume was assumed to be N_2 gas. These values generally indicate that anaerobic decomposition of the waste mass is ongoing. VOCs were detected in soil gas extracted from all the probes with PID values ranging from 22.1 to 193.2 ppmv. Higher PID readings were typically seen in the C-level (deep) probes than in the B-level (intermediate) probes. This is likely a result of the C-level probes being closer to the water table.

5.2 Vacuum Step Rate Tests

SVE-1 was screened in the compacted backfill material and was utilized during the vacuum step rate test to determine the air yielding capacity of the backfill material at various vacuums levels. Data collected during implementation of the SVE-1 vacuum step rate test are presented in **Table 4A**. A graphical representation of the flow obtained at SVE-1 for each change in pressure is shown in **Figure 8**. The step rate test showed that the maximum yielding capacity (using the particular equipment) was approximately 70 cubic feet per min (cfm) with a vacuum of -6.5 inches of mercury (in Hg) at the well head. The off-gas composition at the SVE-1 well head was similar to that observed in the intermediate soil gas probes during the baseline soil gas

monitoring (Section 5.1) except that oxygen concentrations increased and CH_4 concentrations decreased such that potentially explosive conditions were temporarily generated during the pilot test.

SVE-2 was installed near the boundary of the former IDDA 1b area and screened in the sand/waste material that occurs adjacent to and/or below the backfill. A step rate test was completed at SVE-2 to determine the air yielding capacity of the sand/waste material. Data collected during completion of the SVE-2 test are summarized in **Table 4B** and plotted in **Figure 8**. The test showed that the maximum well yield was approximately 140 cfm with a vacuum of -3.5 in Hg at the well head. Off-gas composition throughout the test was similar to that observed in the deep soil gas probes during baseline soil gas monitoring. CH_4 concentrations remained higher and oxygen concentrations remained lower compared to the SVE-1 vacuum step rate test.

Adequate soil vapor was recovered from both the SVE-1and SVE-2 step rate tests to support full-scale SVE operations. However, as shown in **Figure 8** more soil vapor was extracted at SVE-2 at each vacuum level. This was anticipated due to the expected higher permeability material (sand/waste) surrounding the SVE-2 vent compared to the compacted backfill material surrounding the SVE-1 vent.

5.3 Vacuum Constant Rate Tests

5.3.1 SVE-1 Vacuum Constant Rate Test

The vacuum constant rate test at SVE-1 was completed to determine air permeability, air porosity, and SVE radius of influence in the backfill material. Data collected during implementation of the SVE-1 constant rate test are summarized in **Table 5A**. As shown in **Figure 9A**, the transient vacuum response in the intermediate SGPs (installed in the backfill material) was similar throughout the PTA. The similar slopes suggest that air permeability and air porosity were similar throughout the backfill material. The slope break after approximately 30 minutes of soil vapor extraction suggests achievement of near steady-state conditions. **Figure 9B** shows the vacuum response in both the intermediate and deep SGPs after steady-state conditions were reached as a function of horizontal distance from SVE-1. These data generally show as expected that the vacuum response in the intermediate SGPs decreased as distance from the well increased. However, the vacuum response in the deep SGPs was much less pronounced. This was somewhat anticipated since SVE-1 was screened in the backfill material and not in the sand material that encompasses the deep SGPs. It is thought that the maximum achievable extraction rate (~70 cfm) at SVE-1 produced less vacuum in the sand material underneath the backfill due to higher air permeability in that zone that allowed for rapid vapor recovery.

A detailed analysis (**Appendix F**) was completed in accordance with the SVE guidance (USACOE, 2002) on the transient vacuum response in the intermediate SGPs to evaluate air permeability and air-filled porosity in the backfill. The analysis was completed by plotting the transient data on a log-log plot of time vs. pressure response. The resulting data curve was then visually matched to an appropriate leaky well function curve (Hantush and Jacob, 1955) which is often used to help determine hydraulic conductivity in aquifers. The match point values were inserted into equations D-13 and D-14 presented in the SVE guidance (USACOE, 2002) to calculate air permeability and air-filled porosity. The resulting air permeability values and air-filled porosity values for the backfill are provided in **Table 10**. The average air permeability and air-filled porosity of the backfill are 5.0 x 10^{-8} cm^2 and 17 % respectively. The air-filled porosity values are consistent with average values for silty materials (0.16-0.18) published in the SVE guidance (USACOE, 2002). It is also noteworthy that the calculated air permeability in the backfill is greater than the minimum threshold (10^{-10} cm^2) for SVE feasibility presented in the SVE guidance (USACOE, 2002).

5.3.2 SVE-2 Vacuum Constant Rate Test

Similar to the SVE-1 constant rate test, the SVE-2 constant rate test was completed to determine air permeability, air porosity, and SVE ROI in the sand/waste material that is adjacent to and/or beneath the backfill material. Data collected during implementation of the SVE-2 constant rate test are summarized in **Table 5B**. **Figure 10A** presents the transient vacuum response in the deep SGPs (installed in the sand/waste material) and shows that the vacuum response was similar in the sand material throughout the PTA. Similar to SVE-1, a slope break after approximately 30 minutes of soil vapor extraction suggests achievement of near steady-state conditions. **Figure 10B** shows the vacuum response in both the intermediate and deep SGPs after steady-state conditions were reached as a function of horizontal distance from SVE-2. These data generally show as expected that the vacuum response in the intermediate and deep SGPs decreased as distance from the well increased. However, unlike the SVE-1 constant rate test, the backfill material showed a similar vacuum response as the sand/waste material even though the SVE vent was installed into a different formation. It is thought that the maximum achievable extraction rate (~140 cfm) at SVE-2 was sufficient to extract air and similarly stress the backfill due to its lower permeability.

The same air permeability and air-filled porosity analysis completed for SVE-1 above (Section 5.3.1) was also completed on the data collected during the SVE-2 constant rate test and is presented in detail in **Appendix F**. The resulting air permeability values and air-filled porosity values for the sand/waste are provided in **Table 10**. The average air permeability and air-filled porosity of the backfill are 4.0 x 10^{-7} cm^2 and 21 %, respectively. These values indicate that the sand/waste material is approximately 10 times more permeable than the compacted backfill

material. The air porosity values of the sand/waste material are consistent with the average values for sandy materials (0.20-0.24) published in the SVE guidance (ACOE, 2002). The calculated air permeability in the sand/waste is also greater than the minimum threshold (10^{-10} cm^2) for SVE feasibility presented in the SVE guidance (USACOE, 2002).

5.4 Air Injection Step Test

An air injection step test was completed at AIW-1 to determine the amount of air that could be injected during air sparging. Data collected during the air injection step test are presented in **Table 6** with a plot of the injection pressure vs. injection rate shown in **Figure 11**. The depth to water was measured at approximately 23.76 ft BTOC or 14 ft above the well screen before injection started. The height of the water above the well screen was important as it had to be pushed out of the well before air could enter the screened interval. The hydrostatic pressure (P_h) needed to displace 14 ft of water is approximately 6 psi (0.43 psi/ft). As shown on **Figure 11**, the pressure at which initial air flow was observed (P_{inj}) was approximately 7 psi. The difference between P_{inj} and P_h is defined as the entry pressure (P_e) and represents the resistance to air entering the saturated zone in addition to P_h (USACOE, 2008). As shown on **Figure 11**, P_e is approximately 1 psi, indicating that there is little resistance to air entering the porous media at AIW-1.

As shown in **Figure 11**, injection pressure generally increased linearly as flow increased. For each increase in flow of 1 scfm the injection pressure generally increased 0.25 psi. The maximum sustainable injection rate with the air compressor equipment used during the pilot test was 13 scfm which resulted in a maximum injection pressure of 12.5 psi. The maximum injection pressure of 12.5 psi was below the 22.5 psi threshold to avoid formation fracturing as outlined in Section 4.4. It is also noteworthy that pressure in the shallow SGPs remained negative during the step test, which was below the 1.2 psig threshold (Section 4.4) to protect the cap. VOC and oxygen concentrations in the SVE off-gas (**Table 6**) did not show significant increases during air injection in comparison to the constant rate vacuum test at SVE-1 (**Table 5A**), most likely due to the short duration of the air injection step test.

5.5 Groundwater Pressure Response

The groundwater pressure response to soil vapor extraction at SVE-1 and air injection at AIW-1 was determined to evaluate the distribution of the groundwater response and the time it takes groundwater to reach near steady-state conditions throughout the PTA. Off-gas data collected during the groundwater pressure response test are summarized in **Table 7**. Data from pressure transducers that were deployed in the pilot test wells are shown on **Figure 12**. All monitoring wells exhibited a decrease in groundwater pressure after the start of SVE and then an increase in groundwater pressure shortly after the start of air injection. This represents the pressure increase

as air flows into the saturated zone. The subsequent decrease in groundwater pressure can be understood as injected air reaching the groundwater table and air injection reaching steady-state (Leeson et al, 2002). When air injection was stopped, the groundwater pressure decreased as water re-entered the air-filled porous media. Qualitatively, the overall groundwater pressure response indicates good air permeability in the saturated zone.

As shown on **Figure 12,** it took approximately two hours to reach steady-state upon initiating injection and similarly approximately two hours to return to static upon shut-down. This suggests a minimum two-hour injection period and two-hour recovery period for pulsed AS operation.

5.6 Helium Tracer Test

As discussed in Section 4.7, due to CH_4 interference with the helium detector the helium tracer test could not be completed as proposed in the Pilot Test Work Plan. Instead, Summa canisters collected from the SVE sampling ports were submitted to the fixed laboratory for helium analysis. Helium analysis was not be completed on the samples collected from sampling ports SP1 and SP2 due to laboratory dilutions that elevated the detection limit. The sample results from SP3 (see **Appendix D**) show that 13% helium was detected. This result is greater than the 5% helium target concentration added during injection. It is possible that the true injected helium concentration was greater than 5%, which would account for the depletion of the helium cylinder faster than calculated during helium injection. However, the injected concentration was not verified in the field. Although the helium concentration at SP3 was higher than anticipated, it does qualitatively show that air injected during sparging was collected by the SVE system.

5.7 Steady-State and Post-Injection Monitoring

Steady-state and post-injection monitoring were implemented to observe potential changes in groundwater geochemistry and soil gas quality during and following steady-state air injection. **Figure 13** shows DO concentrations and ORP at MW-12 and MW-17 over time from before the beginning of air injection until approximately 12 hours after shutdown of the SVE system. Data logs from the downhole groundwater geochemistry monitoring at MW-12 and MW-17 are presented in **Appendix E**. As shown in **Figure 13**, the DO response in MW-12 was almost immediate following the start of air injection with a slower increase in ORP. The near saturation response at MW-12 (10 ft from AIW-1) indicates that it is within the ROI of the AS well. Following the shutdown of air injection, the DO concentration at MW-12 decreased from 8 mg/L to 4 mg/L over four hours with the SVE system in operation. The decrease in DO concentration was slower following shutdown of the SVE system. This suggests that air was trapped in the pore spaces and dissipated with the cessation of air injection. The rate of dissipation was higher during SVE operation.

Data logging at MW-17 was interrupted during the test but the ORP was observed to be approximately 400 mV during air injection and data in **Figure 13** show that ORP rose above 400 mV during the post-injection period. There was not a documented increase in DO at MW-17. ORP increases at MW-17 seem to indicate oxygen consumption in the absence of aeration. This suggests that MW-17 (15 ft from AIW-1) is near the edge of the AS ROI. The location of the SVE well between AIW-1 and MW-17 may also be a factor. Groundwater geochemical data collected at MW-15 and MW-16 during the test are summarized in **Table 8**. Increases in DO at MW-15 and MW-16 were not observed, but ORP increased slightly suggesting that the geochemistry at these wells was only slightly affected by air injection.

A summary of the SGP and SVE off-gas data collected during the steady-state test and post-injection monitoring period is summarized in **Table 9**. PID readings at the SVE system sampling ports were above those during the SVE-1 constant rate test (**Table 5A)** and the groundwater pressure response (**Table 7**). PID readings collected in the deep SGPs during the steady-state and post-injection monitoring periods are plotted in **Figure 14**. These data show that VOC concentrations in soil gas were increasing during the test suggesting VOC transfer from groundwater to overlying soil gas during sparging. PID readings declined once air-sparging was terminated.

5.8 Off-Gas Laboratory Analytical Data

Soil gas samples were collected in Summa canisters from each SVE sampling port and during the operation of the SVE and air injection systems (Section 4.7). The purpose of this sampling was to evaluate the composition of the SVE off-gas and the potential need for off-gas treatment. Summa canisters were also collected during operation of the SVE system alone (Section 4.3) in order to evaluate the changes in soil gas composition due to air sparging. Soil gas samples were submitted to the fixed laboratory for analysis of VOCs via USEPA method TO-15. The results of the laboratory analyses are summarized in **Table 11** with detailed laboratory reports provided in **Appendix E**. As shown in **Table 11**, a number of VOCs were detected in the SVE off-gas prior to treatment using GAC with and without operation of the air injection system. No significant increases in VOC concentrations occurred with the addition of air injection. This is consistent with the observed small increases in PID readings. This may be due to a larger capture zone for the SVE well relative to that of the AS well, which would diminish any observed effect of air injection.

Detected VOC concentrations in **Table 11** are compared to the Annual Guideline Concentrations (AGCs) and Short-term Guideline Concentrations (SGCs) for non-criteria air pollutants (NYSDEC, 1997). The VOCs detected in soil gas prior to treatment exceeded the AGCs and in most cases, the SGCs. Therefore, aboveground treatment of the SVE off-gas will be necessary

prior to discharge to the atmosphere until VOCs in the off-gas no longer exceed the AGCs and SGCs.

6. BASIS OF DESIGN

The AS/SVE Pilot Test conducted at the Site successfully collected site-specific data to support the design of full-scale AS/SVE systems to be constructed within the former source areas. The recommended basis of design is summarized in **Table 12** and described in more detail in the following sections. The data collected in former IDDA 1b sand/waste layer are assumed to be applicable to the former IDDA 2 and former septage lagoon source areas since this material occurs in the unsaturated zone in both areas.

6.1 Air Sparging

Based on the observed changes in groundwater geochemistry at MW-12 and MW-17 during and following steady-state air injection, the AS ROI recommended for the full-scale design is 15 feet. A recommended design flow rate of 15 scfm, slightly above the maximum flow rate achieved during the pilot test, should help to ensure that this ROI is achieved. The corresponding injection pressure is 13.5 psig based on the air injection step rate test.

Pulsed air injection is recommended to allow air (i.e. oxygen) trapped in the pore spaces to dissipate into the saturated zone and to reduce the size requirements for the air compressor (Leeson et al, 2002). Based on the groundwater pressure response, the minimum period for air injection is two hours in order to allow the air injection to come to steady-state. The recommended recovery period between cycles is also two hours given the persistence of DO and the time required for the groundwater pressure to return to pre-injection conditions.

6.2 Soil Vapor Extraction

In the design of typical SVE systems, the SVE ROI is based on the time (t_{ex}) required to exchange a target number of pore volumes in order to achieve the removal of residuals from the vadose zone. Since the goal of SVE for the remedial action is to collect the vapors that are generated from AS, at a minimum t_{ex} needs to be equal to the time (t_{fill}) required to fill the pore space during AS to prevent vapor migration. The air-filled porosity values calculated from the SVE constant rate tests were used to derive the SVE ROI in both the backfill and sand/waste layers and are discussed in detail in **Appendix F**. As discussed above, the recommended AS ROI is 15 feet at an air injection rate of 15 scfm. Thus $t_{fill} = t_{ex}$ and was calculated for each geologic material with the given air-filled porosity, volume of soil above the water table, and injection flow rate. The values for t_{ex} were then inserted with other known variables (**Appendix F**) into equation 5-1 provided in the SVE guidance (USACOE, 2002) to determine the ROI for a given SVE extraction rate. The calculated ROI for each SVE extraction rate are summarized in **Table 13**.

As shown in **Table 13**, the ROI for the backfill and sand/waste geologic materials are the same for each given flow rate. This is due to the fact that t_{fill} and t_{ex} are both a function of the air-filled porosity values. Thus, the specific values of air permeability and air-filled porosity have no direct effect on the calculated SVE ROI. The difference in air permeability and air-filled porosity between the backfill and sand/waste layer is reflected in the SVE vacuum that will be required to achieve a certain SVE flow rate for the desired ROI.

6.3 Off-Gas Treatment

The comparison of detected VOC concentrations in the SVE off-gas to the AGCs and SGCs indicate that aboveground treatment of the off-gas will be required during the initial phase of operation until VOC concentrations no longer exceed the AGCs and SGCs. Options for off-gas treatment will be evaluated as part of the full-scale design.

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TABLES

TABLE 1
WELL, SOIL VAPOR EXTRACTION VENT, AND SGP CONSTRUCTION DETAILS

Cortese Landfill
Narrowsburg, New York

Location Identifier (Units)	Location Type	Northing (Survey ft)	Easting (Survey ft)	Ground Surface Elevation (ft amsl)	Top of Inner Casing Elevation (ft amsl)	Inner Casing Height (ft ags)	Completion Type	Inner Casing Type	Screen Type	Screened Interval (ft bgs)	Screened in Geologic Material
AIW-1	Air Injection Well	1008657.8	337566.3	698.9	700.99	2.09	Stickup	2" Schedule 80 PVC	2", 0.010, Wire-Wrapped Stainless Steel	35.5-37	Sand and Gravel
MW-17	Monitoring Well	1008644.4	337560.7	698.4	700.44	2.04	Stickup	2" Schedule 80 PVC	2", 0.010, Machine Slotted SCH40 PVC	26-31	Sand and Gravel
SGP-1A	Soil Gas Probe	1008661.7	337558.6	698.6	NA	NA	Ground Surface	1/4" Nylaflow Tubing	Stainless Steel Vapor Implant	3.5-4.5	Compacted Backfill
SGP-1B	Soil Gas Probe	1008661.7	337558.6	698.6	NA	NA	Ground Surface	1/4" Nylaflow Tubing	Stainless Steel Vapor Implant	12-13	Compacted Backfill
SGP-2A	Soil Gas Probe	1008655.2	337566.9	698.9	NA	NA	Ground Surface	1/4" Nylaflow Tubing	Stainless Steel Vapor Implant	3.5-4.5	Compacted Backfill
SGP-2B	Soil Gas Probe	1008655.2	337566.9	698.9	NA	NA	Ground Surface	1/4" Nylaflow Tubing	Stainless Steel Vapor Implant	13.5-14.5	Compacted Backfill
SGP-2C	Soil Gas Probe	1008655.2	337566.9	698.9	700.69	1.79	Stickup	1" Schedule 40 PVC	1", 0.010 Machine Slotted SCH40 PVC	18-23	Sand
SGP-3A	Soil Gas Probe	1008649.3	337562.3	698.5	NA	NA	Ground Surface	1/4" Nylaflow Tubing	Stainless Steel Vapor Implant	3.5-4.5	Compacted Backfill
SGP-3B	Soil Gas Probe	1008649.3	337562.3	698.5	NA	NA	Ground Surface	1/4" Nylaflow Tubing	Stainless Steel Vapor Implant	13-14	Compacted Backfill
SGP-3C	Soil Gas Probe	1008649.3	337562.3	698.5	700.21	1.71	Stickup	1" Schedule 40 PVC	1", 0.010 Machine Slotted SCH40 PVC	18-23	Sand
SGP-4A	Soil Gas Probe	1008639.9	337558.8	698.1	NA	NA	Ground Surface	1/4" Nylaflow Tubing	Stainless Steel Vapor Implant	3.5-4.5	Compacted Backfill
SGP-4B	Soil Gas Probe	1008639.9	337558.8	698.1	NA	NA	Ground Surface	1/4" Nylaflow Tubing	Stainless Steel Vapor Implant	13.5-15	Sand
SGP-4C	Soil Gas Probe	1008639.9	337558.8	698.1	699.81	1.71	Stickup	1" Schedule 40 PVC	1", 0.010 Machine Slotted SCH40 PVC	18-23	Sand
SGP-5A	Soil Gas Probe	1008665.5	337555.3	698.6	NA	NA	Ground Surface	1/4" Nylaflow Tubing	Stainless Steel Vapor Implant	3.5-4.5	Compacted Backfill
SGP-5B	Soil Gas Probe	1008665.5	337555.3	698.6	NA	NA	Ground Surface	1/4" Nylaflow Tubing	Stainless Steel Vapor Implant	12.5-13.5	Compacted Backfill
SGP-6A	Soil Gas Probe	1008670.0	337552.7	698.6	NA	NA	Ground Surface	1/4" Nylaflow Tubing	Stainless Steel Vapor Implant	3.5-4.5	Compacted Backfill
SGP-6B	Soil Gas Probe	1008670.0	337552.7	698.6	N/A	NA	Ground Surface	1/4" Nylaflow Tubing	Stainless Steel Vapor Implant	13-14	Compacted Backfill
SGP-7	Soil Gas Probe	1008683.5	337538.0	698.3	701.09	2.79	Stickup	1" Schedule 40 PVC	1", 0.010 Machine Slotted SCH40 PVC	15-20	Sand/Waste
SGP-8	Soil Gas Probe	1008695.2	337531.6	698.2	700.11	1.91	Stickup	1" Schedule 40 PVC	1", 0.010 Machine Slotted SCH40 PVC	10-15	Sand/Waste
SVE-1	Soil Vapor Extraction Vent	1008653.6	337564.9	698.9	700.86	1.96	Stickup	4" Schedule 40 PVC	4", 0.010, Wire-Wrapped SCH 80 PVC	10.5-15	Compacted Backfill
SVE-2	Soil Vapor Extraction Vent	1008676.2	337546.8	698.5	700.38	1.88	Stickup	4" Schedule 40 PVC	4", 0.010, Wire-Wrapped SCH 80 PVC	13.5-18	Sand/Waste

Notes:
All points were suveryed by Thew Associates Land Surveyors on 9-10 Decmeber 2010
ft amsl - feet above mean sea level
ft ags - feet above ground surface
ft bgs - feet below ground surface
NA - Not Applicable

Horizontal Datum is NAD83 on New York State Plane East Coordinate System

Vertical Datum is NAVD88

TABLE 2
PILOT TEST PROGRAM COMPONENTS

Cortese Landfill
Narrowsburg, New York

Pilot Test Component	Measurement	Purpose
Baseline Conditions	Depth to water	Baseline water elevation
	Groundwater geochemistry	Baseline geochemistry
	Soil gas quality	Baseline soil gas concentrations
Vacuum Step Rate	Vacuum applied Flow attained	Determine vapor recovery rates in IDDA 1b backfill
Vacuum Constant Rate Test	Vacuum applied Flow attained Vacuum response	Determine radius of influence and vent efficiencies in IDDA1b backfill
Air Injection Step Test	Injection pressure Injection flow rate	Entry pressure Achievable flow rate
Groundwater Pressure	Groundwater pressure	Lateral air distribution Time required to reach steady state
Helium Tracer Test	Helium concentration	Connectivity between AS well and SVE vent and AS radius of influence
Steady State Monitoring	Groundwater geochemistry	Lateral air distribution
	Soil gas quality	Determine soil gas conditions during system operation
Post-Injection Monitoring	Groundwater geochemistry	Change in Redox conditions
Off –gas quality	Off-gas constituent analysis	Determine appropriate off-gas treatment technology
Moisture Separator Sampling	Condensate quality	Determine disposal criteria for condensate

TABLE 3A
BASELINE GROUNDWATER ELEVATIONS

Cortese Landfill
Narrowsburg, New York

Monitoring Well	Ground Elevation[1] (ft msl)	Top of PVC[1] (ft)	Depth to Water[2] (ft)	Groundwater Elevation (ft msl)
MW-12	699.0	701.25	25.46	675.79
MW-14	698.4	700.70	24.74	675.96
MW-15	698.0	700.03	23.90	676.13
MW-16	699.5	701.16	25.21	675.95
MW-17	698.4	700.44	24.47	675.97
AIW-1	698.9	701.31	24.90	676.41

Notes:

1. Ground and top of PVC elevations were surveyed by Thew Associates Land Surveyors on 9-10 December 2010.
2. Depth to water was gauged from the top of PVC on 7 March 2011.

TABLE 3B
BASELINE GROUNDWATER GEOCHEMISTRY

Cortese Landfill
Narrowsburg, New York

Well	MW-12						
Time	DTW (ft BTOC)	Pumping Rate (mL/min)	pH	Conductivity (mS/cm)	ORP (mV)	DO (mg/L)	Temp (°C)
Initial	25.40	-	-	-	-	-	-
1538	25.51	960	6.30	336.2	-82	0.02	11.23
1543	25.60	960	6.27	327.6	-117	-0.02	11.58
1548	25.60	960	6.26	320.9	-127	-0.05	11.41
1553	25.65	840	6.26	316.9	-104	-0.05	11.48
1558	25.65	600	6.26	312.4	-94	-0.05	11.49
1603	25.65	900	6.27	311.7	-122	-0.07	11.45
1608	25.67	840	6.27	310.6	-125	-0.07	11.49
1613	**25.67**	**720**	**6.27**	**311.4**	**-126**	**-0.07**	**11.50**

Well	MW-15						
Time	DTW (ft BTOC)	Pumping Rate (mL/min)	pH	Conductivity (mS/cm)	ORP (mV)	DO (mg/L)	Temp (°C)
Initial	24.72	-	-	-	-	-	-
1610	24.72	500	6.27	305.4	-57	0.08	10.78
1615	24.70	700	6.27	305.0	-65	-0.03	10.83
1620	24.70	600	6.27	305.2	-70	-0.05	10.70
1625	24.70	600	6.27	305.5	-73	-0.06	10.69
1630	24.70	500	6.27	306.1	-76	-0.07	10.81
1635	24.70	500	6.27	307.5	-78	-0.08	10.88
1640	**24.70**	**500**	**6.27**	**307.8**	**-80**	**-0.08**	**10.97**

Well	MW-16						
Time	DTW (ft BTOC)	Pumping Rate (mL/min)	pH	Conductivity (mS/cm)	ORP (mV)	DO (mg/L)	Temp (°C)
Initial	25.14	-	-	-	-	-	-
1503	25.15	500	6.27	292.6	-42	0.07	9.65
1508	25.15	500	6.30	292.3	-51	0.09	10.30
1513	25.15	500	6.26	277.4	-29	0.28	9.20
1518	25.15	500	6.28	289.2	-43	-0.01	10.34
1523	25.15	500	6.28	293.0	-53	-0.08	10.38
1528	25.15	600	6.28	292.2	-55	-0.08	10.13
1533	**25.15**	**600**	**6.28**	**293.5**	**-58**	**-0.09**	**10.36**

Well	MW-17						
Time	DTW (ft BTOC)	Pumping Rate (mL/min)	pH	Conductivity (mS/cm)	ORP (mV)	DO (mg/L)	Temp (°C)
Initial	24.47	-	-	-	-	-	-
1333	24.67	1000	6.24	310.7	-69	1.19	10.91
1340	24.64	350	6.26	284.4	-140	-0.08	11.03
1345	24.42	0	6.82	1.4	-51	7.23	12.16
1350	24.50	500	6.27	311.1	-70	0.28	10.71
1355	24.50	500	6.27	309.7	-85	0.02	10.79
1400	24.50	500	6.27	309.0	-93	-0.06	10.87
1405	24.50	500	6.28	309.3	-97	-0.07	10.86
1410	**24.50**	**500**	**6.28**	**310.1**	**-96**	**-0.08**	**10.85**

Notes:
1) All wells were sampled on 07 March 2011 using low-flow groundwater sampling procedures.

DO - dissolved oxygen
DTW- depth to water
ft BTOC - feet below top of inner casing
mL/min - milliliter per minute
mS/cm - millisiemens per centimeter
mg/L - milligrams per liter
mV - millivolts
ORP - oxidation reduction potential
°C - degrees Celcius

TABLE 3C
BASELINE SOIL GAS DATA

Cortese Landfill
Narrowsburg, New York

			Bag 1					Bag 2					Bag 3					Bag 4				
Soil Gas Probe	**Initial Vacuum (in Hg)**	**Time**	**Cumulative Volume (L)**	**CH_4**	**CO_2**	**O_2**	**PID (ppmv)**	**Cumulative Volume (L)**	**CH_4**	**CO_2**	**O_2**	**PID (ppmv)**	**Cumulative Volume (L)**	**CH_4**	**CO_2**	**O_2**	**PID (ppmv)**	**Cumulative Volume (L)**	**CH_4**	**CO_2**	**O_2**	**PID (ppmv)**
1B	--	14:05	1	29.7	14.2	0.5	32.3	2	27.1	13.7	1.1	21.6	3	22.5	11.3	4.2	23.5	**4**	**23.8**	**12.1**	**3.7**	**23.1**
2B	0.02	14:55	1	29.6	13.9	1.2	66.4	2	31.2	14.8	0.0	58.1	3	**28.4**	**14.1**	**1.5**	**49.1**	--	--	--	--	--
2C	0.01	--	1	41.9	17.2	4.3	144.5	2	58.8	21.0	1.6	158.8	5	66.2	21.4	0.8	152.3	**8**	**64.0**	**20.8**	**0.9**	**163.3**
3B [1]	-0.02	15:30	--	21.4	7.9	8.7	75.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3C	--	15:10	1	35.6	19.1	3.2	121.1	3	43.4	21.2	1.5	291	5	48.5	21.4	1.1	223	**8**	**50.7**	**22.3**	**0.8**	**193.2**
4B [2]	0.01	16:15	1	38.9	21.2	2.2	53.1	2	41.6	22.6	0.8	81.3	3	40.8	21.9	0.9	176.0	**4**	**39.0**	**21.0**	**1.5**	**99.1**
4C	0.01	15:55	1	33.7	21.8	1.7	80.5	3	37.9	22.2	0.8	50.1	5	42.0	22.6	0.1	121.0	**8**	**42.2**	**22.3**	**0.3**	**114.2**
5B	-0.04	13:40	1	32.4	14.5	1.1	40.6	2	28.0	12.6	3.8	25.6	3	--	--	--	--	**4**	**31.0**	**14.3**	**0.6**	**22.1**
6B	0.01	13:15	1	29.3	13.1	5.0	63.6	2	33.3	15.2	1.3	40.9	3	**32.5**	**14.8**	**0.4**	**31.5**	--	--	--	--	--
7	0.01	16:35	1	26.3	18.0	1.9	91.8	3	30.5	19.0	1.6	98.3	5	32.5	19.6	0.9	124.7	**8**	**31.7**	**19.1**	**1.3**	**107.6**
8	0.00	17:00	1	29.5	15.2	3.9	37.1	3	36.4	15.7	2.9	31.6	5	41.2	16.4	1.9	28.7	**8**	**39.6**	**16.3**	**2.0**	**31.9**

Notes:

All soil gas probes were sampled on 07 March 2011

Bold and shaded values represent accepted baseline soil gas data

[1] Water was entrained in SGP-3B during sampling. Soil gas could not be collected from the probe during the AS/SVE pilot test.

[2] Data indicate that SGP-4B was installed in the naturally-occuring sand material and not in the backfill as intended.

in Hg - inches of Mercury column

L - Liter

PID - photoionization detector model miniRAE 3000

ppmv - parts per million by volume

CH_4 - Methane

CO_2 - Carbon Dioxide

O_2 - Oxygen

TABLE 4A
SUMMARY OF VACUUM, FLOW RATE, AND OFF-GAS MONITORING DURING SVE-1 STEP RATE TEST

Cortese Landfill
Narrowsburg, New York

Time	Vacuum		Air Velocity (ft/min)	Flow Rate (acfm)	PID (ppmv)			LFG (%)											
								SP1			SP2			SP3			Air Temp (° F)	Barometric Pressure (in Hg)
	SVE Well (in Hg)	Moisture Separator (in H_2O)	SVE Well		SP1	SP2	SP3	CH_4	CO_2	O_2	CH_4	CO_2	O_2	CH_4	CO_2	O_2		
1110	-0.5	-9	670	14.6	133.0	100.4	4.0	0.5	0.8	20.0	0.6	0.5	20.2	0.8	5.5	19.5	40.6	29.8
1119	-0.5	-9	690	15.0	26.0	84.0	3.9	11.4	7.5	11.4	0.5	0.5	20.3	0.6	1.4	20.1	--	29.8
1120	-2.5	-28	1276	27.8	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1129	-2.5	-28	1313	28.6	18.0	30.9	0.6	25.8	13.9	3.8	2.9	1.9	18.4	1.7	1.2	19.2	--	--
1130	-2.5	-42	1970	42.9	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1139	-3	-44	1830	39.9	18.1	26.9	0.2	27.5	14.1	3.8	5.9	3.2	16.8	5.2	3.2	16.6	--	--
1140	-4.5	-56	2330	50.8	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1149	-5	-57	2720	59.3	19.2	25.0	0.2	10.7	5.4	13.9	8.5	4.4	15.3	6.5	4.0	15.5	--	--
1150	-5.5	-70	3000	65.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1159	-5.5	-71	2920	63.7	22.3	26.1	0.2	28.8	13.8	3.4	12.3	6.0	13.4	10.4	6.0	13.7	--	--
1200	-6.5	-84	3100	67.6	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1209	-6.5	-84	3150	68.7	28.6	29.3	0.2	1.0	0.7	18.7	15.4	7.7	11.3	13.3	7.9	10.4	--	29.8
1210	-6	-71	2840	61.9	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1219	-6	-70	2960	64.5	28.0	33.7	0.5	30.0	13.9	3.8	12.4	5.8	14.4	7.0	4.6	16.0	--	29.8
1220	-5	-56	2190	47.7	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1229	-4.75	-55	2140	46.7	34.5	35.9	0.8	24.3	11.1	6.9	9.1	4.3	15.8	7.5	4.1	15.4	--	--
1230	-4	-42	1480	32.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1239	-3	-40	1450	31.6	31.0	39.0	1.1	31.7	14.1	3.4	5.0	2.6	17.9	5.4	3.0	17.4	--	--
1240	-2.5	-28	1020	22.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1249	-2.5	-26	1020	22.2	30.2	38.0	1.2	29.9	13.2	5.7	3.1	1.7	18.5	3.0	1.8	18.2	--	--
1250	-1	-9	360	7.8	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1259	0	-9	410	8.9	29.0	42.0	2.0	30.7	13.4	7.0	0.8	0.6	20.1	0.7	0.6	20.2	--	--
1300	END TEST																	

Notes:

The SVE-1 step rate test was completed on 09 March 2011.

SP1 - sampling port at SVE well-head

SP2 - sampling port at discharge of vacuum blower before entering VGAC units

SP3 - sampling port after second VGAC unit before exiting to the atmosphere

VGAC - vapor-phase granulated activated carbon

in Hg - inches of Mercury column

in H_2O - inches of water column

ft/min - feet per minute

acfm - actual cubic feet per minute

PID - photoionization detector model miniRAE 3000

ppmv - parts per million by volume

LFG % - percent landfill gas measured using GEM2000

CH_4 - Methane

CO_2 - Carbon Dioxide

O_2 - Oxygen

°F - Degrees Farenheit

TABLE 4B
SUMMARY OF VACUUM, FLOW RATE, AND OFF-GAS MONITORING DURING SVE-2 STEP RATE TEST

Cortese Landfill
Narrowsburg, New York

Time	Vacuum		Air Velocity (ft/min)	Flow Rate (acfm)	PID (ppmv)			LFG (%)										
								SP1			SP2			SP3			Air Temp (° F)	Barometric Pressure (in Hg)
	SVE Well (in Hg)	Moisture Separator (in H_2O)	SVE Well		SP1	SP2	SP3	CH_4	CO_2	O_2	CH_4	CO_2	O_2	CH_4	CO_2	O_2		
1518	0.0	0.0	1281	27.9	94.1	151.4	0.0	39.2	18.6	2.3	3.2	2.2	18.5	2.5	1.6	18.7	46	29.76
1540	0.0	0.0	1045	22.8	117.5	155.0	0.2	41.4	19.5	1.5	3.9	2.2	18.2	2.5	2.1	18.7	--	--
1542	-1.8	0.0	5410	117.9	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1559	-2.0	0.0	4734	103.2	168.0	153.0	0.2	40.3	19.1	2.0	22.0	11.3	9.8	13.3	11.4	0.9	--	--
1600	-3.0	0.0	6790	148.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1619	-3.0	-0.2	6907	150.6	96.0	101.0	0.5	40.2	19.2	1.5	40.0	19.2	1.4	23.8	19.9	2.7	48.3	29.76
1620	-3.5	-0.3	6330	138.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1634	-3.5	-0.3	6131	133.7	95.0	98.0	0.6	38.8	18.5	2.1	39.8	19.6	1.2	18.3	13.8	7.4	--	--
1635	-3.0	0.0	4460	97.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1644	-3.0	0.0	4310	94.0	138.0	106.0	0.7	40.4	19.7	1.2	25.1	12.8	8.1	18.2	13.8	7.4	--	--
1645	-2.0	0.0	2076	45.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1704	-2.0	0.0	2290	49.9	92.0	145.0	1.1	37.8	18.4	2.4	12.1	6.7	14.3	7.6	5.5	15.3	43.8	--
1705	0.0	0.0	700	15.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1709	0.0	0.0	721	15.7	93.0	170.0	2.1	35.1	18.2	3.5	3.2	2.1	18.9	2.6	2.2	19.1	--	--
1710	END TEST																	

Notes:

The SVE-2 step rate test was completed on 09 March 2011.

SP1 - sampling port at SVE well-head

SP2 - sampling port at discharge of vacuum blower before entering VGAC units

SP3 - sampling port after second VGAC unit before exiting to the atmosphere

VGAC - vapor-phase granulated activated carbon

in Hg - inches of Mercury column

in H_2O - inches of water column

ft/min - feet per minute

acfm - actual cubic feet per minute

PID - photoionization detector model miniRAE 3000

ppmv - parts per million by volume

LFG % - percent landfill gas measured using GEM2000

CH_4 - Methane

CO_2 - Carbon Dioxide

O_2 - Oxygen

°F - Degrees Farenheit

TABLE 5A
SUMMARY OF SGP VACUUM RESPONSE AND SVE OFF-GAS MONITORING DURING SVE-1 CONSTANT RATE TEST

Cortese Landfill
Narrowsburg, New York

Time	Vacuum		Pressure at Soil Gas Probes (in H_2O)											PID (ppmv)			LFG (%)											
																	SP1			SP2			SP3			Barometric Pressure (in Hg)	Extracted Air Temp (°F)
	SVE Well (in Hg)	Moisture Separator (in H_2O)	1B	2B	2C	3B [1]	3C	4B [2]	4C	5B	6B	7	8	SP1	SP2	SP3	CH_4	CO_2	O_2	CH_4	CO_2	O_2	CH_4	CO_2	O_2		
Distance from SVE-1 (ft)			10	3	3	5	5	15	15	15	21	40	53														
initial	0	0	0.0	-1.5	0.1	--	0.3	-4.6	0.3	0.0	0.0	-1.5	0.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1444	-5.5	-72	-16.0	-28.0	-0.1	--	0.0	0.0	0.0	-11.0	-9.0	-1.0	0.0	32.5	38.4	0.3	31.3	14.4	4.3	15.1	7.2	15.9	8.6	0.9	12.8	29.71	41.5
1447	-5.5	-72	-18.0	-30.0	-0.1	--	-0.1	-0.1	-0.1	-14.0	-12.0	-1.5	0.0	--	--	--	--	--	--	--	--	--	--	--	--	29.71	41.3
1450	-5.5	-72	-19.0	-31.0	-0.3	--	-0.3	-0.3	-0.3	-15.0	-12.5	-1.5	-1.0	--	--	--	--	--	--	--	--	--	--	--	--	29.71	41.4
1453	-5.5	-72	-20.0	-32.0	-0.3	--	-0.3	-0.4	-0.3	-16.0	-14.0	-1.5	-1.0	--	--	--	--	--	--	--	--	--	--	--	--	29.71	41.3
1503	-5.5	-72	-22.0	-33.0	-0.5	-32.1	-0.7	-0.5	-0.5	-18.0	-16.0	-1.5	-1.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1513	-6	-72	-22.0	-34.0	-0.8	-33.0	-1.0	-0.8	-0.8	-18.0	-16.0	-1.5	-1.0	33.5	44.0	0.4	33.9	14.9	9.0	13.4	6.1	13.6	1.9	1.1	17.6	29.69	41.6
1523	-6	-72	-22.5	-34.0	-1.0	-33.9	-0.8	-0.8	-0.7	-18.5	-16.5	-1.5	-1.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1533	-6	-72	-22.5	-34.0	-1.1	-34.0	-1.0	-1.1	-1.0	-19.0	-16.5	-1.5	-1.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1543	-6	-72	-22.5	-34.0	-1.1	-34.3	-1.0	-1.0	-0.8	-19.0	-16.5	-1.5	-1.0	39.0	39.5	0.5	15.1	6.7	12.7	15.3	6.7	13.0	12.3	6.5	13.4	29.68	41.3
1553	-6	-72	-23.0	-34.0	-1.2	-34.3	-1.0	-1.1	-1.0	-19.0	-17.0	-1.5	-1.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Collected Summa Cannisters					--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1645	-6	-72	-23.0	-34.0	-1.2	-34.5	-1.2	-1.1	-1.1	-14.0	--	--	-1.0	38.0	40.0	0.5	35.7	15.3	5.6	15.0	6.6	13.5	12.5	6.7	13.4	29.68	40.8
SHUT DOWN BLOWER				--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1652	0	0	-6.0	-7.0	-1.2	-10.9	-1.0	-0.8	-0.7	-4.0	-7.5	-1.0	-1.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1707	0	0	0.0	-2.0	-0.5	-8.3	-0.3	-0.5	-0.3	-1.0	-2.0	-1.0	-1.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1727	0	0	0.0	-1.8	-0.1	-4.6	0.0	0.0	0.0	-1.5	-1.5	-1.0	0.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

[1] During initial baseline sampling, water was entrained in SGP-3B and thus data may not be representative.

[2] Data indicate that SGP-4B was installed in the naturally-occuring sand material and not in the backfill as intended.

The SVE-1 constant rate test was completed on 09 March 2011.

SP1 - sampling port at SVE well-head

SP2 - sampling port at discharge of vacuum blower before entering VGAC units

SP3 - sampling port after second VGAC unit before exiting to the atmosphere

VGAC - vapor-phase granulated activated carbon

in Hg - inches of Mercury column

in H_2O - inches of water column

PID - photoionization detector model miniRAE 3000

ppmv - parts per million by volume

LFG % - percent landfill gas measured using GEM2000

CH_4 - Methane

CO_2 - Carbon Dioxide

O_2 - Oxygen

°F - Degrees Farenheit

TABLE 5B
SUMMARY OF SGP VACUUM RESPONSE AND SVE OFF-GAS MONITORING DURING SVE-2 CONSTANT RATE TEST

Cortese Landfill
Narrowsburg, New York

Time	SVE Well Vacuum (in Hg)	Pressure at Soil Gas Probes (in H_2O)											PID (ppmv)			LFG (%)									Barometric Pressure (in Hg)
																SP1			SP2			SP3			
		1B	2B	2C	3B [1]	3C	4B [2]	4C	5B	6B	7	8	SP1	SP2	SP3	CH_4	CO_2	O_2	CH_4	CO_2	O_2	CH_4	CO_2	O_2	
Distance from SVE-2 (ft		18.5	29	29	31	31	38	38	13.5	8.5	11.5	24.5													
845	-4	0.0	-0.5	1.4	--	1.4	1.4	1.4	0.0	0.0	0.0	0.0	73	74	0.8	42.6	20.8	3.5	44.1	21.4	3.1	1.7	1.1	14.2	29.83
848	-4	1.0	-1.0	-3.1	--	-2.9	-2.2	-2.3	0.0	0.0	-7.0	-3.0	--	--	--	--	--	--	--	--	--	--	--	--	29.83
851	-4	0.5	-1.0	-3.9	--	-3.5	-2.7	-2.7	-1.0	-1.0	-7.5	-4.0	--	--	--	--	--	--	--	--	--	--	--	--	29.83
854	-4	0.2	-1.5	-4.4	--	-3.9	-2.9	-3.0	-1.0	-1.5	-8.0	-4.0	--	--	--	--	--	--	--	--	--	--	--	--	29.83
957	-4	0.0	-1.8	-4.6	--	-4.1	-3.1	-3.1	-1.0	-2.0	-8.0	-4.0	--	--	--	--	--	--	--	--	--	--	--	--	29.83
907	-4	0.0	-2.0	-5.2	--	-4.5	-3.5	-3.5	-2.0	-2.0	-8.5	-4.5	--	--	--	--	--	--	--	--	--	--	--	--	29.83
917	-4.25	-0.5	-2.2	-5.4	--	-4.8	-3.8	-3.7	-2.0	-2.5	-8.5	-4.5	71	73.2	0.5	39.5	19.9	2.1	41.1	20.6	1.7	2.6	1.7	17.2	29.83
927	-4.25	-0.5	-2.5	-5.6	-1.9	-5.0	-3.9	-3.9	-2.0	-3.0	-8.5	-5.0	--	--	--	--	--	--	--	--	--	--	--	--	29.83
937	-4.25	-1.0	-2.2	-5.6	--	-5.0	-3.8	-3.9	-2.3	-3.5	-9.0	-5.0	--	--	--	--	--	--	--	--	--	--	--	--	29.83
947	-4.25	-1.0	-3.0	-5.7	--	-5.0	-3.9	-4.1	-2.3	-3.5	-9.0	-5.0	91	89	0.5	38.5	20.1	3.2	38.6	20.3	2.3	21.1	16.6	5.7	29.83
957	-4.25	-1.0	-3.0	-6.0	--	-5.0	-3.9	-3.9	-2.3	-3.5	-9.0	-5.0	--	--	--	--	--	--	--	--	--	--	--	--	29.83
1007	--	--	--	--	--	--	--	--	--	--	--	--	68	67	0.2	38.9	20.3	1.7	38.4	20.6	1.8	26.5	21.3	1.4	29.83
1010	SHUT DOWN												--	--	--	--	--	--	--	--	--	--	--	--	29.83
1020	0	-0.5	-2.3	-1.0	--	-0.7	-0.5	-0.4	-2.0	-2.5	-2.0	-2.0	--	--	--	--	--	--	--	--	--	--	--	--	29.83
1030	0	0.0	-2.0	-0.4	--	-0.3	-0.3	-0.3	-1.0	-2.0	-2.0	-1.0	--	--	--	--	--	--	--	--	--	--	--	--	29.83
1050	0	0.0	-1.5	0.0	--	0.1	0.0	0.1	0.0	-1.5	-1.5	-1.0	--	--	--	--	--	--	--	--	--	--	--	--	29.83

Notes:

[1] During initial baseline sampling, water was entrained in SGP-3B and thus data may not be representative.

[2] Data indicate that SGP-4B was installed in the naturally-occuring sand material and not in the backfill as intended.

The SVE-2 constant rate test was completed on 09 March 2011.

SP1 - sampling port at SVE well-head

SP2 - sampling port at discharge of vacuum blower before entering VGAC units

SP3 - sampling port after second VGAC unit before exiting to the atmosphere

VGAC - vapor-phase granulated activated carbon

in Hg - inches of Mercury column

in H_2O - inches of water column

ft - feet

PID - photoionization detector model miniRAE 3000

ppmv - parts per million by volume

LFG % - percent landfill gas measured using GEM2000

CH_4 - Methane

CO_2 - Carbon Dioxide

O_2 - Oxygen

TABLE 6
SUMMARY OF DATA COLLECTED DURING AIR INJECTION STEP TEST

Cortese Landfill
Narrowsburg, New York

Time	AIW Well [1]				SVE Well		PID (ppmv)			LFG (%)										Pressure in Shallow SGPs (in H_2O)					
										SP1			SP2			SP3									
	Pressure Regulator (psig)	Well Head Injection Pressure (psig)	Injection Flow Rate (scfm)	Vacuum (in Hg)	Air Velocity (ft/min)	Extraction Flow Rate (acfm)	SP1	SP2	SP3	CH_4	CO_2	O_2	CH_4	CO_2	O_2	CH_4	CO_2	O_2	1A	2A	3A	4A	5A	6A
830	0	0	--	--	--	--	39.0	42.2	0.9	37.5	15.2	4.0	21.2	8.7	10.9	17.7	9.2	10.3	-25.0	-25.0	1.0	4.0	-22.0	-14.0
845	70	3	0	-7	3150	68.7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
850	65	5	0	-7	2000	43.6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
855	60	7	0	-7	1900	41.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
917	15	8	1	-7	2250	49.1	40.0	45.0	1.0	35.8	14.4	4.6	21.2	8.9	10.9	17.5	9.2	11.9	-25.0	-26.0	1.0	0.0	-22.0	-15.0
931	20	9	3	-7	1950	42.5	37.5	44.0	1.1	38.3	15.3	6.4	23.0	9.6	10.4	18.2	9.7	10.7	-25.0	-26.0	2.0	0.0	-22.0	-15.0
941	15	10.5	5	-7	2000	43.6	39.1	41.9	1.0	36.8	14.1	4.7	14.8	5.9	14.7	18.0	9.7	10.6	--	--	--	--	--	--
955	20	11	7	-7	2240	48.8	46.7	42.0	0.8	36.9	15.1	5.6	22.1	9.1	11.2	14.5	8.1	12.4	-25.0	-26	2.0	0.0	-22.0	-15.0
1010	20	11.5	9	-7	2320	50.6	37.9	40.1	1.1	36.0	15.0	4.8	22.4	9.3	11.2	17.7	9.7	10.4	--	--	--	--	--	--
1025	22	12	11	-7	2200	48.0	38.0	39.8	1.0	34.7	14.0	6.2	22.4	9.2	10.9	18.1	9.8	10.3	--	--	--	--	--	--
1040	23	12.5	13	-7	2330	50.8	39.3	37.9	1.1	36.5	14.8	5.6	22.3	9.2	11.2	18.0	9.8	10.4	--	--	--	--	--	--
1055	18	12	12	-7	2440	53.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1115	18	9	7	-7	2440	53.2	--	--	--	--	--	--	--	--	--	--	--	--	-24.0	-26.0	3.0	0.0	-22.0	-15.0
1120	18	9	5	-7	2300	50.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1125	18	8	3	-7	2100	45.8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1130	26	7	1	-7	2150	46.9	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1135	26	5	0	-7	2100	45.8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

[1] The intial depth to water at AIW-1 on March 14, 2011 was 23.76 ft BTOC which corresponds to approximately 14 ft of water above the well screen.
The air injection step test was completed on 10 March 2011
SP1 - sampling port at SVE well-head
SP2 - sampling port at discharge of vacuum blower before entering VGAC units
SP3 - sampling port after second VGAC unit before exiting to the atmosphere
VGAC - vapor-phase granulated activated carbon
in Hg - inches of Mercury column
in H_2O - inches of water column
ft/min - feet per minute
psig - pounds per square inch, gauge
PID - photoionization detector model miniRAE 3000
ppmv - parts per million by volume
LFG % - percent landfill gas measured using GEM2000
CH_4 - Methane
CO_2 - Carbon Dioxide
O_2 - Oxygen
scfm - standard cubic feet per minute
acfm - actual cubic feet per minute

TABLE 7
SVE OFF-GAS AND SHALLOW SGP MONITORING DURING GROUNDWATER PRESSURE RESPONSE

Cortese Landfill
Narrowsburg, New York

Time	AS Well		SVE Well			PID (ppmv)			SP1			SP2			SP3			Pressure (in H_2O)					
	Flow (scfm)	Pressure (psig)	Air Velocity (ft/min)	Flow Rate (acfm)	Vacuum (in Hg)	SP1	SP2	SP3	CH_4 (%)	CO_2 (%)	O_2 (%)	CH_4 (%)	CO_2 (%)	O_2 (%)	CH_4 (%)	CO_2 (%)	O_2 (%)	1A	2A	3A	4A	5A	6A
12:25	Begin SVE																						
12:26	0	0	2660	58.0	-5.5	--	--	--	--	--	--	--	--	--	--	--	--	-13	-15	--	--	-7	-10
13:42	0	0	2660	58.0	-5.5	75	83	1.2	41.2	16.6	2.7	17.7	7.5	12.6	14.0	7.7	12.4	-22	-20	--	--	-12	-17
13:50	Begin Air Sparge																						
14:12	13	12.5	2440	53.2	-5.8	72	85	1.3	41.9	16.3	3.1	16.8	7.4	12.6	14.1	7.8	12.3	-22	-20	-24	-16	-12	-17
14:42	13	12	2460	53.6	-6.0	72	88	1.1	39.5	15.7	3.8	18.2	7.6	12.5	14.1	7.7	12.6	-22	-20	-24	-16	-12	-17
15:34	13	12	2585	56.4	-6.0	70	81	1.3	40.6	16.3	3.6	18.0	7.5	12.6	13.8	7.7	12.8	-22	-20	-24	-16	-12	-17
16:30	13	11	2270	49.5	-6.0	72	82	1.2	41.9	16.4	3.3	17.9	7.6	12.5	13.9	7.8	12.6	-22	-20	-24	-16	-12	-17
16:35	Shut down Air Sparge																						
17:35	0	7	2350	51.2	-6.0	71	83	1.3	40.5	16.3	4.0	16.9	7.3	12.8	13.6	7.7	13.0	-22	-20	-25	-16	-12	-17
18:15	0	7	2120	46.2	-6.0	74	85	1.3	38.2	15.5	4.9	17.4	7.5	12.9	13.3	7.6	12.8	-18	-20	-24	-16	-12	-17
18:20	Shut down SVE Well																						

Notes:
The groundwater pressure response test was implemented on 14 March 2011.
SP1 - sampling port at SVE well-head
SP2 - sampling port at discharge of vacuum blower before entering VGAC units
SP3 - sampling port after second VGAC unit before exiting to the atmosphere
in H_2O - inches of water column
ft/min - feet per minute
PID - photoionization detector model miniRAE 3000
ppmv - parts per million by volume
% - percent
CH_4 - Methane
CO_2 - Carbon Dioxide
O_2 - Oxygen
scfm - standard cubic feet per minute
acfm - actual cubic feet per minute
psig - pounds per square inch gauge
in Hg - inches of Mercury

TABLE 8
GROUNDWATER GEOCHEMISTRY DURING STEADY-STATE AND POST-INJECTION MONITORING

Cortese Landfill
Narrowsburg, New York

Well	Distance (ft) from SVE-1	Date	Time	pH	Conductivity (mS/cm)	ORP (mV)	DO (mg/L) (1)	Temperature (°C)
MW-15	27	3/15/2011	10:45	6.11	297.1	-160	-0.03	11.50
			14:52	6.01	306.1	-80	-0.01	11.52
			16:24	6.11	274.7	-19	0.30	11.04
			18:00	6.14	309.6	-45	-0.01	11.33
			20:00	6.14	302.6	-36	-0.01	11.29
		3/16/2011	8:00	6.29	426.1	-56	0.06	9.27
MW-16	26	3/15/2011	10:20	6.12	272.8	-166	-0.05	10.93
			15:04	6.07	281.6	-74	0.08	11.42
			16:34	6.11	332.2	-60	0.01	11.42
			18:10	6.17	277.9	-40	0	10.93
			20:00	6.16	276.9	-28	0	11.13
		3/16/2011	8:00	6.14	493.7	-19	-0.03	10.77
MW-12	10	3/15/2011	10:20	6.41	271.0	-21	0.18	10.54
			15:00	6.61	170.1	55	8.47	10.49
			16:30	6.66	171.5	61	7.67	10.47
			18:10	6.28	176.2	58	6.07	10.62
			20:00	6.27	183.6	53	4.2	10.61
		3/16/2011	8:00	6.46	135.3	61	2.01	10.42
MW-17 (2)	15	3/15/2011	10:45	6.22	302.1	55	-0.12	11.82
			15:00	--	--	--	--	--
			16:30	--	--	--	--	--
			18:00	--	--	--	--	--
			10:04	6.28	279.5	433	-0.13	11.82
		3/16/2011	8:04	6.31	280.1	557.0	-0.14	11.79

Notes:

Select data from MW-12 and MW-17 are presented

AS/SVE system was started at 11:00

AS shutdown occurred at 16:15

SVE shutdown occurred at 20:10

(1) Negative DO values are likely due to a slight calibration drift and DO concentrations near zero.

(2) Data logging was interupted at MW-17 and thus data during certain time-frames are not available.

mS/cm - millisiemens per centimeter

mV - millivolts

mg/L - milligrams per liter

°C - degrees Celcius

ft - feet

DO - dissolved oxygen

ORP - oxidation reduction potential

TABLE 9
SUMMARY OF SOIL GAS DATA COLLECTED DURING STEADY-STATE AND POST-INJECTION MONITORING

Cortese Landfill
Narrowsburg, New York

Time	Pressure					Pressure (H_2O)																PID (ppmv)								
	Injection Flow (scfm)	AS Well (in Hg)	SVE Well (in H_2O)	Moisture Separator (in H_2O)	SVE Well Air Velocity (ft/min)	1A	1B	2A	2B	2C	3A	3B [1]	3C	4A	4B [2]	4C [3]	5A	5B	6A	6B	7	8	2C	3C	4B [2]	7	8	SP1	SP2	SP3
1040	--	--	--	--	--	--	0.1	--	0.1	0.1	--	--	0	--	0.0	0.0	--	0.0	--	0.0	0.1	0.1	3050	1340	160	72	41	--	--	--
1100	System Startup																													
1130	13	12	-5.5	-73	3490	-21	-25	-18	-36	0.7	-24	-34	0.3	-17	-0.3	1.0	-12	-20	-16	-14	0.1	-0.3	--	--	--	--	--	--	--	--
1200	13	11.5	-6.25	-73	3800	-22	-26	-20	-36	0.7	-24	-35	0.4	-16	-0.1	0.5	-12	-20	-17	-17	0.3	-0.1	5830	4030	770	81.9	42.6	63.3	71	0
1230	13	12	-6.25	-73	4060	-22	-26	-20	-36	-0.3	-24	-35	-0.1	-15	0.0	-72	-12	-21	-18	-18	0.1	-0.1	--	--	--	--	--	--	--	--
1300	15	11.5	-6.0	-73	4370	-22	-26	-20	-36	0.5	-24	-35	0.4	-16	-0.3	-69	-12	-20	-18	-16	-0.1	0.0	6900	4500	1400	99.5	46.1	60	68	1.0
1530	15	12.5	-6.0	-72	4250	-22	-26	-19	-36	1.0	-25	-35	0.5	-16	-0.3	0.3	-12	-20	-18	-16	-0.5	0.0	11000	6000	3660	400	59	73	88	1.0
1615	AIW Shut down																													
1815	0	7	-6.0	-70	3150	-23	-27	-20.0	-38	-2.4	-25	-37	-1.5	-17	-1.2	-1.8	-15	-21	-18	-18	-1.2	-1.5	3985	3250	319	149	35	50	60	1.0
2000	0	0	-6.0	0	3000	-23	-27	-20.0	-38	-2.7	-26	-37	-2.3	-17	-2.0	-2.0	-13	-21	-19	-18	-1.5	-1.4	1985	665	180	76	33	51	52	0.5
800	0	0	0.0	0	0	1	0	-1	0	0.0	0	-2	0.0	0	-0.4	0.0	-2	0	5	0	-0.1	0.0	1200	271	160	77	30	--	--	--

Time	LFG (%)																													
	2C			3C			4B [2]			7			8			SP1			SP2			SP3								
	CH_4	CO_2	O_2	CH_4	CO_2	O_2	CH_4	CO_2	O_2	CH_4	CO_2	O_2	CH_4	CO_2	O_2	CH_4	CO_2	O_2	CH_4	CO_2	O_2	CH_4	CO_2	O_2	CH_4	CO_2	O_2	CH_4	CO_2	O_2
1040	22.7	6.7	17.3	17.5	9.8	14.6	24.7	20	3.5	39.5	20.2	1.9	32	17.5	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1100	System Startup																													
1130	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1200	17.8	3.0	18.4	12.1	5.8	17.9	17.2	14.6	12.2	38.9	18.5	4.7	34.1	19.2	1.5	39.2	15.5	4.9	16.1	6.9	13.1	13.0	7.5	12.6						
1230	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
1300	16.0	2.3	19.6	8.1	4.1	18.8	6.4	6.7	17.6	43.2	19.7	4.3	35.5	18.9	1.2	32.6	13.4	6.6	16.1	6.9	13.3	12.3	7.1	13.1						
1530	9.7	1.1	18.5	8.8	2.2	18.7	11.0	5.0	18.8	19.8	15.4	12.8	38.7	18.9	2.2	35.6	14.0	6.5	14.8	6.3	14.5	11.4	6.7	14.0						
1615	AIW Shut down																													
1815	9.5	2.1	18.6	8.3	4.0	17.8	12.9	8.4	10.2	22.9	15.7	7.4	35.1	19.4	1.1	33.7	14.6	6.4	15.4	6.9	13.9	11.6	7.1	13.8						
2000	16.1	5.2	11.1	7.2	3.8	13.5	20.8	16.9	2.9	16.5	11.6	8.9	29.8	18.8	0.8	37.8	16.4	5.1	15.6	7.3	13.6	12.3	7.5	13.5						
800	19.0	6.1	10.9	23.1	11.4	4.9	20.1	16.4	3.7	25.3	17.2	4.1	31.0	18.5	1.5	--	--	--	--	--	--	--	--	--						

Notes

[1] During initial baseline sampling, water was entrained in SGP-3B and thus data may not be representative.

[2] Data indicate that SGP-4B was installed in the naturally-occuring sand material and not in the backfill as intended.

[3] Due to heavy rains, SGP-4C was submerged below the water table and thus soil gas samples could be collected. SGP-4B was sampled instead.

The steady state test and post injection monitoring was completed on 14 March 2011 in conjunction with the helium tracer test.

SP1 - sampling port at SVE well-head

SP2 - sampling port at discharge of vacuum blower before entering VGAC units

SP3 - sampling port after second VGAC unit before exiting to the atmosphere

VGAC - vapor-phase granulated activated carbon

in Hg - inches of Mercury column

in H_2O - inches of water column

ft/min - feet per minute

PID - photoionization detector model miniRAE 3000

ppmv - parts per million by volume

LFG % - percent landfill gas measured using GEM2000

CH_4 - Methane

CO_2 - Carbon Dioxide

O_2 - Oxygen

scfm - standard cubic feet per minute

acfm - actual cubic feet per minute

TABLE 10
SUMMARY OF CALCULATED AIR PERMEABILITY AND AIR-FILLED POROSITY

Cortese Landfill
Narrowsburg, New York

Constant Rate Test	Geologic Material	Parameter	Units	SGP-1B	SGP-5B	SGP-6B	Average	Typical Range (1)
SVE-1	Compacted Backfill	Air-Filled Porosity	m^3/m^3	0.211	0.173	0.123	0.169	0.16-0.18
		Air Permeability	cm^2	$4.76 * 10^{-8}$	$5.58 * 10^{-8}$	$6.34 * 10^{-8}$	$4.98 * 10^{-8}$	NA
SVE-2	Sand/Waste	Air-Filled Porosity	m^3/m^3	0.16	0.138	0.337	0.212	0.20-0.24
		Air Permeability	cm^2	$4.13 * 10^{-7}$	$6.15 * 10^{-7}$	$1.78 * 10^{-7}$	$4.02 * 10^{-7}$	NA

Notes:

Detailed calculations for air permeability and air-filled porosity are provided in Appendix D.

(1) Typical ranges for air-filled porosity were taken from Table 4-8 in SVE guidance (ACOE, 2002)

NA - Not Available

m^3/m^3 - cubic meter per cubic meter

cm^2 - square centimeter

TABLE 11
SUMMARY OF OFF-GAS ANALYTICAL DATA

Cortese Landfill
Narrowsburg, New York

Sample ID	SVE-SP1	SVE-SP2	SVE-SP3	AS-SP1	AS-SP2	AS-SP3	*Guideline Concentrations*	
Lab Sample Number	200-4315-1	200-4315-2	200-4315-3	200-4315-4	200-4315-5	200-4315-6		
Sampling Date	3/9/2011	3/9/2011	3/9/2011	3/15/2011	3/15/2011	3/15/2011		
Sampling Time	16:38	16:37	16:39	15:55	15:55	15:55		
Matrix	AIR	AIR	AIR	AIR	AIR	AIR		
Dilution Factor	15300	6860	1	14000	6900	3.97		
Units	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3		
Parameter							*SGC*	*AGC*
1,1,1-Trichloroethane	**330000**	**120000**	1.1 U	**440000**	**220000**	4.3 U	*9000*	*5000*
1,1,2,2-Tetrachloroethane	21000 U	9400 U	1.4 U	19000 U	9500 U	5.5 U		*16*
1,1,2-Trichloroethane	17000 U	7500 U	1.1 U	15000 U	7500 U	4.3 U		*1.4*
1,1-Dichloroethane	**79000**	**29000**	0.81 U	**77000**	**38000**	3.2 U		*0.63*
1,1-Dichloroethene	12000 U	5400 U	0.79 U	11000 U	5500 U	3.1 U		*70*
1,2,4-Trichlorobenzene	57000 U	25000 U	3.7 U	52000 U	26000 U	15 U	*3700*	
1,2-Dichloroethane	12000 U	5600 U	0.81 U	11000 U	5600 U	3.2 U		*0.04*
1,2-Dichloropropane	14000 U	6300 U	0.92 U	13000 U	6400 U	3.7 U		*4*
1,4-Dichlorobenzene	18000 U	8200 U	1.2 U	17000 U	8300 U	4.8 U		*0.09*
1,4-Dioxane	280000 U	120000 U	18 U	250000 U	120000 U	72 U	*3000*	*0.13*
Benzene	**12000**	4400 U	0.64 U	**15000**	**7500**	2.5 U	*1300*	*0.13*
Bromoform	32000 U	14000 U	2.1 U	29000 U	14000 U	8.2 U		*0.91*
Bromomethane	12000 U	5300 U	0.78 U	11000 U	5400 U	3.1 U	*3900*	*5*
Carbon disulfide	24000 U	11000 U	1.6 U	22000 U	11000 U	6.2 U	*6200*	*700*
Carbon tetrachloride	19000 U	8600 U	1.3 U	18000 U	8700 U	5 U	*1900*	*0.17*
Chlorobenzene	14000 U	6300 U	0.92 U	13000 U	6300 U	3.6 U		*110*
Chloroethane	**20000**	9100 U	1.3 U	**26000**	**13000**	5.2 U		*10000*
Chloroform	**19000**	6700 U	0.98 U	14000 U	6700 U	3.9 U	*150*	*0.04*
Chloromethane	16000 U	7100 U	**9**	14000 U	7100 U	**7.8**	*22000*	*90*
Ethylbenzene	13000 U	6000 U	0.87 U	**21000**	**9600**	3.4 U	*54000*	*1000*
Hexachlorobutadiene	33000 U	15000 U	2.1 U	30000 U	15000 U	8.5 U		*0.05*
Methylene Chloride	**85000**	29000	1.7 U	**46000**	**22000**	6.9 U	*14000*	*2.10*
Naphthalene	40000 U	18000 U	2.6 U	37000 U	18000 U	10 U	*7900*	*3*
Styrene	13000 U	5800 U	0.85 U	12000 U	5900 U	3.4 U	*17000*	*1000*
Tetrachloroethene	**55000**	**19000**	1.4 U	**67000**	**33000**	5.4 U	*1000*	*1*
Toluene	**680000**	**240000**	**2.4**	**750000**	**370000**	**3.3**	*37000*	*5000*
Trichloroethene	**2300000**	**810000**	5.8	**1400000**	**690000**	11	*14000*	*0.5*
Vinyl chloride	**150000**	**50000**	0.51 U	**100000**	**52000**	300	*180000*	*0.11*
Xylene (total)	**41000**	**17000**	0.87 U	**75000**	**33000**	3.4 U	*4300*	*100*

Notes:

All values are in µg/m^3

Air Samples were analyzed by GC/MS VOA - TO15 method.

U - Indicates the analyte was analyzed for but not detected, reporting limit is provided.

SGC - Short-Term Guideline Concentrations

AGC- Annual Guideline Concentrations

Bolding indicates detection of parameter

Light gray shading indicates exceedence of AGC only.

Dark gray shading indicates exeedance of both AGC and SGC.

µ/m^3 - micrograms per cubic meter

TABLE 12
BASIS OF DESIGN

Cortese Landfill
Narrowsburg, New York

Design Parameter	Value
Air Sparging	
Injection Flow Rate (scfm)	15
Injection Pressure (psig)	13.5
ROI (ft)	15
SVE IDDA 1b Backfill	
Extraction flow rate (cfm)	50
Extraction Vacuum (in H20)	55
ROI (ft)	37.5
SVE IDDA 1b Sand/Waste, IDDA 2 and Septage Lagoons	
Extraction Flow Rate (cfm)	50
Extraction Vacuum (in H20)	9
ROI (ft)	37.5
SVE Off-gas Quality	
Off-gas Treatment	Required

Notes:

The data collected in former IDDA 1b sand/waste layer are assumed to be applicable to the former IDDA 2 and former septage lagoon source areas.
ROI - radius of influence
scfm - standard cubic feet per minute
psig - pounds per square inch, gauge
ft - feet
cfm - cubic feet per minute
in H_2O inches of water column

TABLE 13
SOIL VAPOR EXTRACTION RADIUS OF INFLUENCE

Cortese Landfill
Narrowsburg, New York

SVE Flow (scfm)	Backfill		Sand/Waste	
	ROI (ft)	SVE-1 Step Rate Test Well Head Vacuum (in H_2O)	ROI (ft)	SVE-2 Step Rate Test Well Head Vacuum (in H_2O)
30	23.7	-30	23.7	-4
40	29	-42	29	-7
50	37.5	-55	37.5	-9
60	41.1	-70	41.1	-11
70	44.3	-88	44.3	-14
80	Maximum achievable extraction rate of 70 scfm during SVE-1 Step Rate Test		47.4	-17
90			50.3	-20
100			53	-23
110			55.6	-27
120			58.1	-31
130			60.5	-37
140			62.8	-45

Notes:

Detailed calculations for SVE ROI are provided in Appendix D.

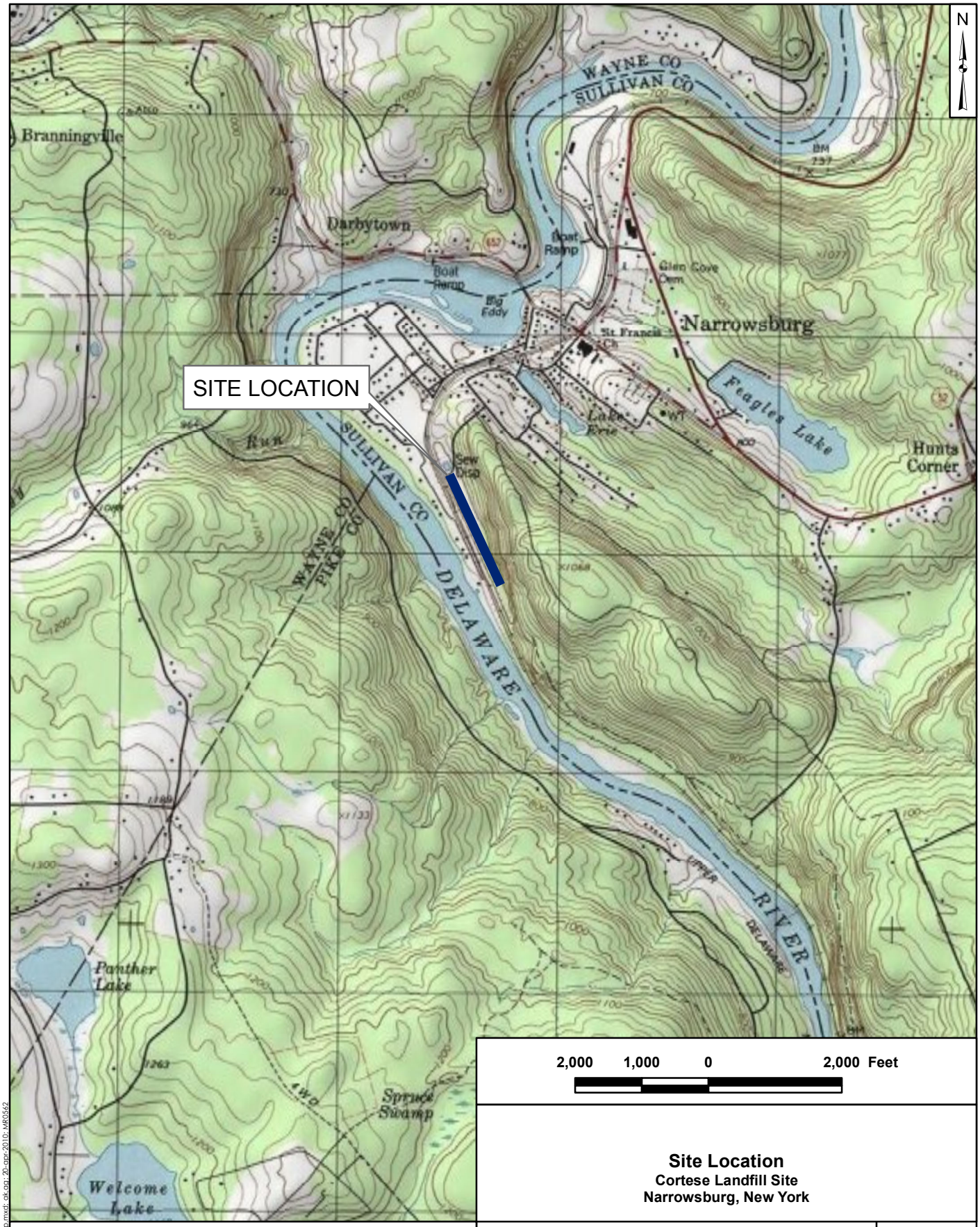
scfm - standard cubic feet per minute

ft - feet

ROI - radius of influence

in H_2O - inches of water column

FIGURES



Site Location
Cortese Landfill Site
Narrowsburg, New York

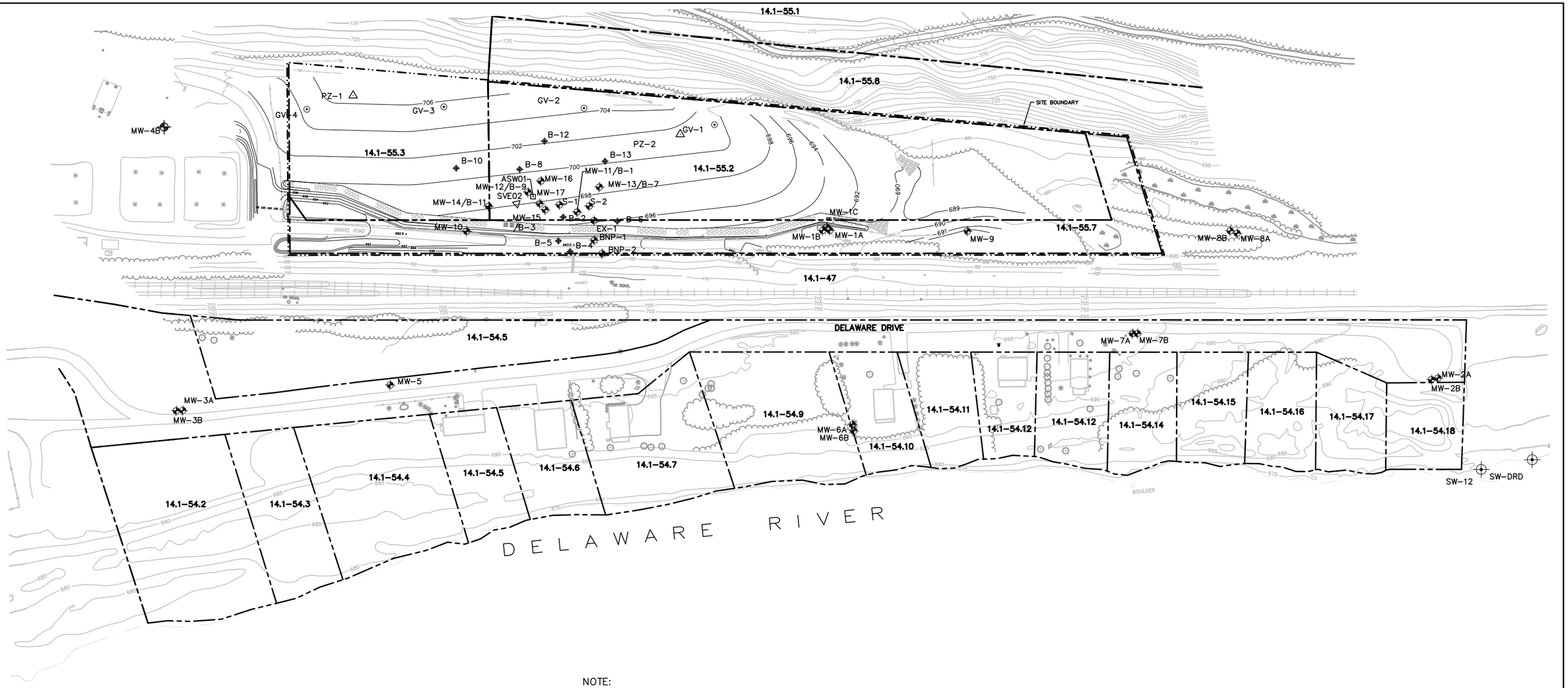
Notes
USGS 7.5' Topographic Quadrangle Narrowsburg, New York

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Columbia, Maryland | August 2011

Figure 1

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LEGEND

- PROPERTY BOUNDARY
- SITE BOUNDARY
- FENCE
- 704 — ELEVATION CONTOUR
- GV–1 — PASSIVE GAS VENT
- MW–10 — MONITORING WELL
- SW–DRU — SURFACE WATER SAMPLE POINT
- PZ–1 — PIEZOMETER
- B–10 — SOIL BORING AT IDDA 1b
- 14.1–54.3 — TAX LOT AND BLOCK NUMBER/ OWNER OF THE PARCEL

NOTE:

1.) ALL COORDINATES SHOWN ON THIS MAP REFLECT THE NORTH AMERICAN DATUM 1983 (NAD 83) AS DERIVED USING THE NATIONAL GEODETIC SURVEY SHIFT OF N 05°05'25" AND E A DISTANCE OF 426,246.03' AS APPLIED TO THE NATIONAL GEODETIC SURVEY DATUM OF 1927 (NAD 27). ALL ELEVATIONS SHOWN ON THIS MAP REFLECT THE NORTH AMERICAN VERTICAL DATUM OF 1988, AS DERIVED USING THE NATIONAL GEODETIC SURVEY SHIFT OF –0.5479' AS APPLIED TO THE NATIONAL GEODETIC VERTICAL DATUM OF 1929.

2.) TOPOGRAPHY AND SURFACE FEATURES EAST OF DELAWARE DRIVE WERE ORIGINALLY PREPARED BY FIELD METHODS BY OM P. POPLI P.E., L.S. P.C. CONSULTING ENGINEERS & SURVEYORS, ROCHESTER, NEW YORK, MARCH 1995. TOPOGRAPHY CHANGES SINCE MARCH 1995 PREPARED BY ENVIRONMENTAL RESEARCH, INC. ON DECEMBER 12, 1996. TOPOGRAPHY AND SURFACE FEATURES WEST OF DELAWARE DRIVE WERE DIGITIZED FROM AN ELECTRONICALLY SCANNED FILE OF THE TOPOGRAPHIC BASE MAP PREPARED BY ROBINSON AERIAL SURVEYS, INC., BY PHOTOGRAMMETRIC METHODS FROM PHOTOGRAPH TAKEN APRIL 18, 1985.

3.) PROPERTY LINES EAST OF DELAWARE DRIVE WERE DETERMINED FROM A SURVEY MAP ENTITLED "CORTESE LAND FILL SITE" DATED MAY 7, 1985, PREPARED BY GARY PACKER, P.L.S. AND "TAX MAP, TOWN OF TUSTEN, SULLIVAN COUNTY, NY," DATED 11/20/92 AND REVISED 12/18/08. PROPERTY OWNERSHIP DATA WERE DERIVED FROM THE SULLIVER COUNTY MAP VIEWER (HTTP://WEBAPPS.SCGNET.US/SCIMAP/MAIN.ASP). LANDFILL PROPERTY BOUNDARY TAKEN FROM BASELINE–PROPERTY BOUNDARY–CONTROL, CORTESE LANDFILL SITE, TOWN OF TUSTEN, SULLIVAN COUNTY, NY, MAY 7, 1985, BY GARY PARKER, P.L.S.

4.) REFERENCE: DRAWING DEVELOPED FROM FIGURE 2, "SITE PLAN" OF THE SOURCE CHARACTERIZATION REPORT BY GOLDER ASSOCIATES, INC., DATED 24 JANUARY 2008.

150 75 0 150

SCALE: 1" = 150'

SITE PLAN
CORTESE LANDFILL SITE
NARROWSBURG, NEW YORK

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DATE:	FEBRUARY 2012
PROJECT NO.	MR0562B
DOCUMENT NO.	MD11251
FILE NO.	0562f521
FIGURE NO.	2

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NORTH

PZ-1

FORMER LOCATION OF INTACT DRUM DISPOSAL AREA 1b

FORMER LOCATION OF INTACT DRUM DISPOSAL AREA 1a

MW-4A
MW-4B

PZ-2

FORMER LOCATION OF INTACT DRUM DISPOSAL AREA 2

FORMER SEPTAGE LAGOONS

MW-1C
MW-1B
MW-1A
MW-9
MW-10

GRAVEL ROAD

Steps

RR SIGNAL

CONRAIL RAILROAD

TANK

MW-5

MW-3B
MW-3A

DELAWARE DRIVE

MW-7A
MW-7B

MW-6A
MW-6B

BOULDER

DELAWARE RIVER

E 338,000
N 1,009,000
E 337,000
N 1,006,500
N 1,008,000
E 337,500

LEGEND

- LANDFILL PROPERTY BOUNDARY
- 750 — TOPOGRAPHIC CONTOUR
- MW-10 — MONITORING WELL
- PZ-1 — PIEZOMETER

100 0 100
SCALE FEET

NOTES

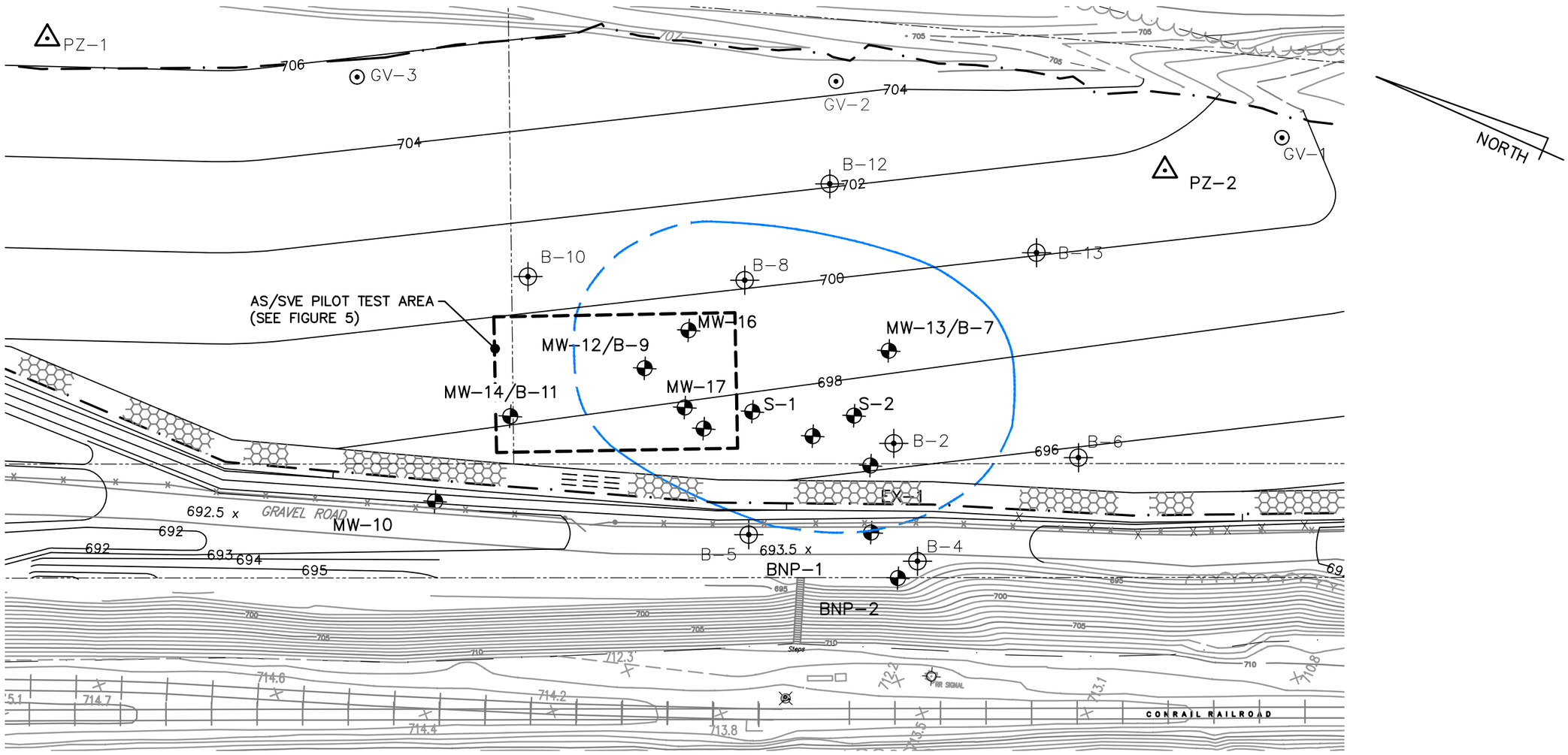
REFERENCE: FIGURE DEVELOPED FROM FIGURE 4A OF THE SHALLOW GROUNDWATER HOT SPOT INVESTIGATION, REMEDIAL WORK ELEMENT II, CORTESE LANDFILL SITE, NARROWSBURG, NEW YORK (GOLDER ASSOCIATES, INC.; 2001).

FORMER SOURCE AREAS
CORTESE LANDFILL SITE
NARROWSBURG, NEW YORK

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COLUMBIA, MARYLAND

DATE:	AUGUST 2011
PROJECT NO.	MR0562B
DOCUMENT NO.	MD11251
FILE NO.	0562f522
FIGURE NO.	3

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LEGEND

- LANDFILL PROPERTY BOUNDARY (SEE REFERENCE 2)
- APPROXIMATE LOCATION OF PROPERTY BOUNDARY (SEE REFERENCE 2)
- FENCE
- 695 — LANDFILL COVER ELEVATION CONTOUR
- 700 — PRE-EXISTING TOPOGRAPHY ELEVATION CONTOUR
- ESTIMATED SOURCE AREA (DASHED WHERE INFERRED)
- W / 6 — DETAIL OR CROSS SECTION DESIGNATION; FIGURE No. WHERE DETAIL OR CROSS SECTION IS PRESENTED
- GV-1 — PASSIVE GAS VENT
- MW-10 — MONITORING WELL
- PZ-1 — PIEZOMETER

NOTES

1.) ALL COORDINATES SHOWN ON THIS MAP REFLECT THE NORTH AMERICAN DATUM 1983 (NAD 83) AS DERIVED USING THE NATIONAL GEODETIC SURVEY SHIFT OF N 05°05'25" AND E A DISTANCE OF 426,246.03' AS APPLIED TO THE NATIONAL GEODETIC SURVEY DATUM OF 1927 (NAD 27). ALL ELEVATIONS SHOWN ON THIS MAP REFLECT THE NORTH AMERICAN VERTICAL DATUM OF 1988, AS DERIVED USING THE NATIONAL GEODETIC SURVEY SHIFT OF -0.5479' AS APPLIED TO THE NATIONAL GEODETIC VERTICAL DATUM OF 1929.

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3.) ALL EXISTING MONITORING WELLS AND ALL SOIL BORINGS COMPLETED IN SEPTEMBER AND OCTOBER 2007, WERE (RE)SURVEYED BY TECTONIC ENGINEERING OF MOUNTAINVILLE, NY. THESE LOCATIONS AND ELEVATIONS WERE TIED TO THE NORTH AMERICAN DATUM OF 1983 (NAD 83) AND NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88) UTILIZING GLOBAL POSITIONING SYSTEM (GPS) DATA. MINOR DISCREPANCIES NOTED BETWEEN PREVIOUS SURVEYS NAD 83 DATA AND THE NEW SURVEY NAD 83 DATA WERE RESOLVED BY ADJUSTING KNOWN FIXED POINTS FROM BOTH SETS OF DATA UNTIL THEY WERE ALIGNED. DISCREPANCIES WERE ALSO NOTED BETWEEN PREVIOUS SURVEYS NAVD 88 DATA AND THE NEW SURVEY NAVD 88 DATA. THE NEW SURVEY NAVD 88 DATA WAS USED TO DEVELOP THE GEOLOGIC CROSS SECTIONS IN THIS REPORT.

4.) SOURCE AREA INCLUDES BORINGS WITH GREATER THAN TEN TIMES (10X) THE NY TAGM SOIL SCREENING VALUES FOR GROUNDWATER PROTECTION (UG/KG). THE SOURCE AREA ONLY INCLUDES AREAS NEAR OR BELOW THE WATER GROUNDWATER TABLE AND AREAS WHICH WOULD BE TARGETED FOR SOURCE AREA REMEDIATION. BORING B-10 HAS CONCENTRATIONS GREATER THAN 10X TAGM BUT WAS NOT INCLUDED IN THE SOURCE AREA BECAUSE THE DETECTIONS EXCEEDING 10X TAGM WERE ABOVE THE WATER TABLE. BORING B-4 HAS CONCENTRATIONS GREATER THAN 10X TAGM BUT WAS NOT INCLUDED IN THE SOURCE AREA BECAUSE THESE DETECTIONS ONLY INCLUDED KETONES WHICH ARE NOT DETECTED IN DOWNGRADIENT WELLS AND WOULD NOT BE TARGETED FOR SOURCE AREA REMEDIATION.

5.) REFERENCE: FIGURE DEVELOPED FROM FIGURE 6G OF THE SOURCE CHARACTERIZATION REPORT, CORTESE LANDFILL SITE, NARROWSBURG, NEW YORK (GOLDER ASSOCIATES, JANUARY 2008).

50 25 0 50

SCALE: 1" = 50'

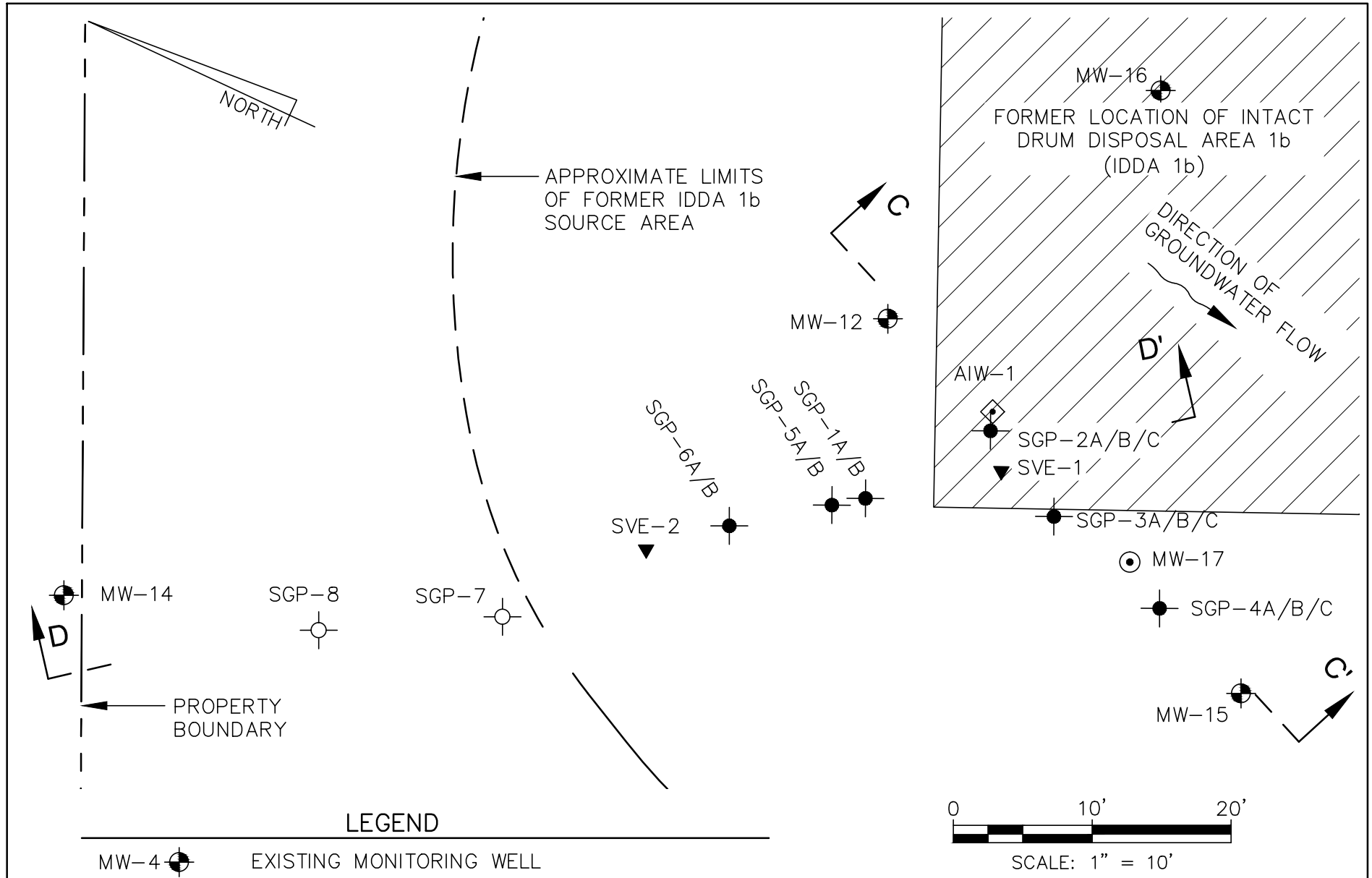
ESTIMATED EXTENT OF FORMER IDDA 1b SOURCE AREA

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DATE:	AUGUST 2011
PROJECT NO.	MR0562B
DOCUMENT NO.	MD11251
FILE NO.	0562f523
FIGURE NO.	4

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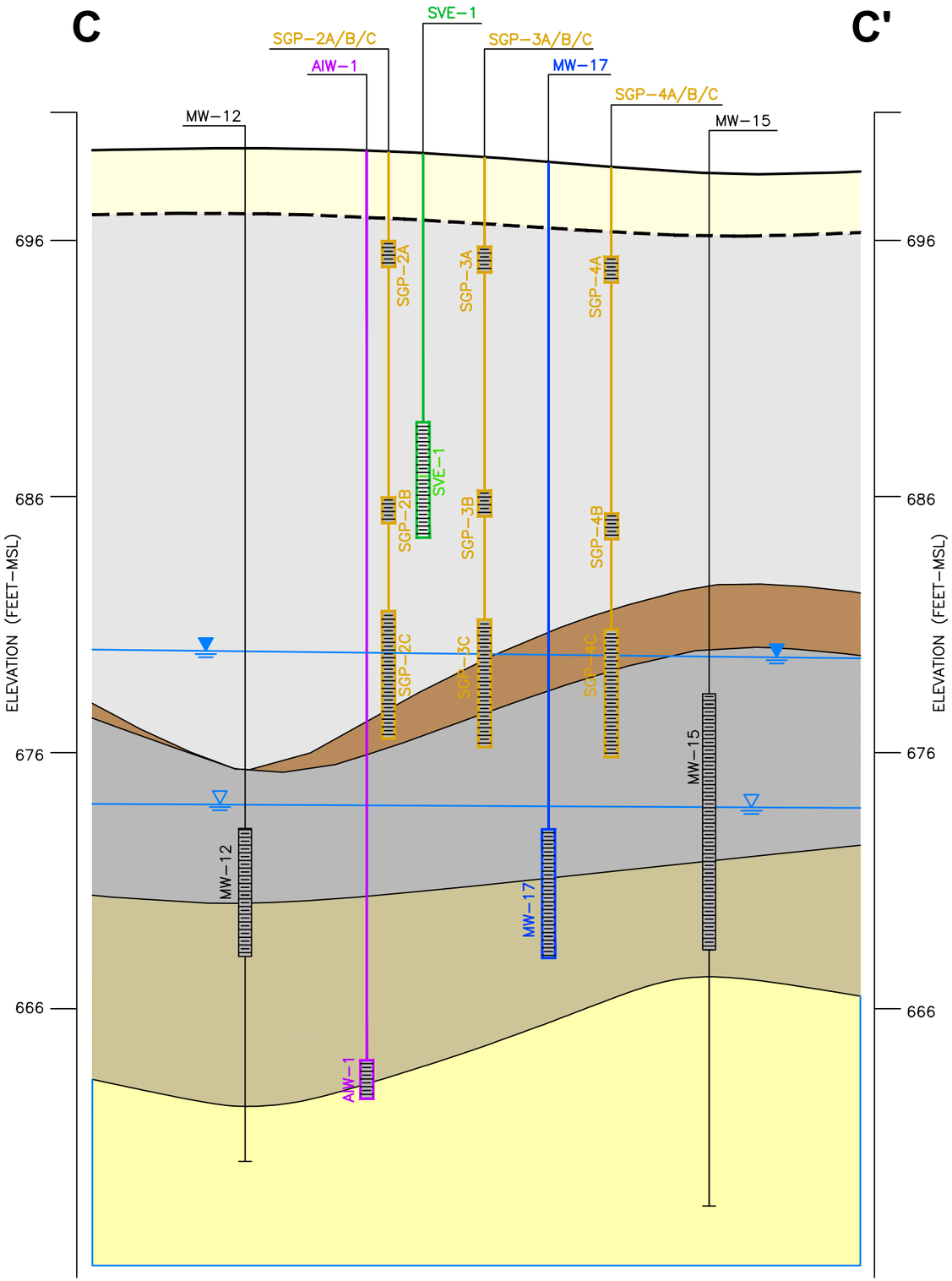


AS/SVE PILOT SYSTEM LAYOUT

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DATE:	AUGUST 2011
PROJECT NO.	MR0562B
DOCUMENT NO.	MD11251
FILE NO.	0562f507
FIGURE NO.	5

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LEGEND

MW-12 ← EXISTING MONITORING WELL IDENTIFICATION
SCREEN INTERVAL

MW-17 ← NEW MONITORING WELL IDENTIFICATION
SCREEN INTERVAL

SVE-1 ← NEW SVE VENT IDENTIFICATION
SCREEN INTERVAL

AIW-1 ← NEW AIR SPARGING WELL IDENTIFICATION
SCREEN INTERVAL

SGP-1A ← PROPOSED SOIL GAS PROBE IDENTIFICATION
SCREEN INTERVAL

LANDFILL CAP

SAND / SILT FILL
REDDISH-BROWN SILTY FINE SAND AND SILT FILL

WASTE

UPPER SAND AND GRAVEL UNIT

SAND
BROWN TO GRAY SILTY, GRAVELLY, FINE TO COARSE SAND

SAND AND GRAVEL
BROWN TO GREENISH GRAY SILTY, FINE TO COARSE SAND AND FINE TO COARSE GRAVEL

SILTY SAND
BROWN TO LIGHT BROWN SANDY SILT AND GRAVEL

GEOSYNTHETIC COMPONENTS OF LANDFILL CAP

GROUNDWATER TABLE

SEASONAL HIGH GROUNDWATER ELEVATION (1987-2009) (SEE NOTE 7)

SEASONAL LOW GROUNDWATER ELEVATION (1987-2009) (SEE NOTE 7)

MW MONITORING WELL
AIW AIR SPARGING WELL
SVE SOIL VAPOR EXTRACTION
SGP SOIL GAS PROBE

NOTES

1. ALL EXISTING MONITORING WELLS AND ALL SOIL BORINGS COMPLETED IN SEPTEMBER AND OCTOBER 2007, WERE (RE)SURVEYED BY TECTONIC ENGINEERING OF MOUNTAINVILLE, NY. THESE LOCATIONS AND ELEVATIONS WERE TIED TO THE NORTH AMERICAN DATUM OF 1983 (NAD 83) AND NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88) UTILIZING GLOBAL POSITIONING SYSTEM (GPS) DATA. MINOR DISCREPANCIES NOTED BETWEEN PREVIOUS SURVEYS NAD 83 DATA AND THE NEW SURVEY NAD 83 DATA WERE RESOLVED BY ADJUSTING KNOWN FIXED POINTS FROM BOTH SETS OF DATA UNTIL THEY WERE ALIGNED. DISCREPANCIES WERE ALSO NOTED BETWEEN PREVIOUS SURVEYS NAVD 88 DATA AND THE NEW SURVEY NAVD 88 DATA. THE NEW SURVEY NAVD 88 DATA WAS USED TO DEVELOP THE GEOLOGIC CROSS SECTIONS IN THIS REPORT.
2. REFERENCE: FIGURE DEVELOPED FROM FIGURE 4B, "HYDROGEOLOGIC CROSS SECTION A-A'," OF THE 2008 SOURCE CHARACTERIZATION REPORT BY GOLDER ASSOCIATES, INC.
3. VERTICAL AXES WERE ADJUSTED BY 6 FEET DUE TO DISCREPANCIES BETWEEN THE SURVEYED ELEVATIONS AND PREVIOUS SURVEYS DURING THE PHASE III RI INVESTIGATION.
4. SEE FIGURE 8 FOR CROSS-SECTION LOCATION.
5. PROPOSED BORINGS WERE INSTALLED WITH HOLLOW-STEM AUGER METHODS AFTER FIRST HAND DIGGING TO EXPOSE THE GEOSYNTHETIC COMPONENTS AND CUTTING A HOLE IN THE LINER LARGE ENOUGH TO ALLOW THE DRILL TOOLING TO PASS THROUGH.
6. SOIL GAS PROBE PAIRS WERE INSTALLED IN ADJACENT DIRECT PUSH BORINGS.
7. SEASONAL HIGH AND LOW GROUNDWATER ELEVATIONS TAKEN FROM TABLE 5 OF "WATER LEVEL DATA" OF THE 2009 "ANNUAL ENVIRONMENTAL MONITORING REPORT, REMEDIAL WORK ELEMENT I" BY GEOSYNTEC CONSULTANTS.

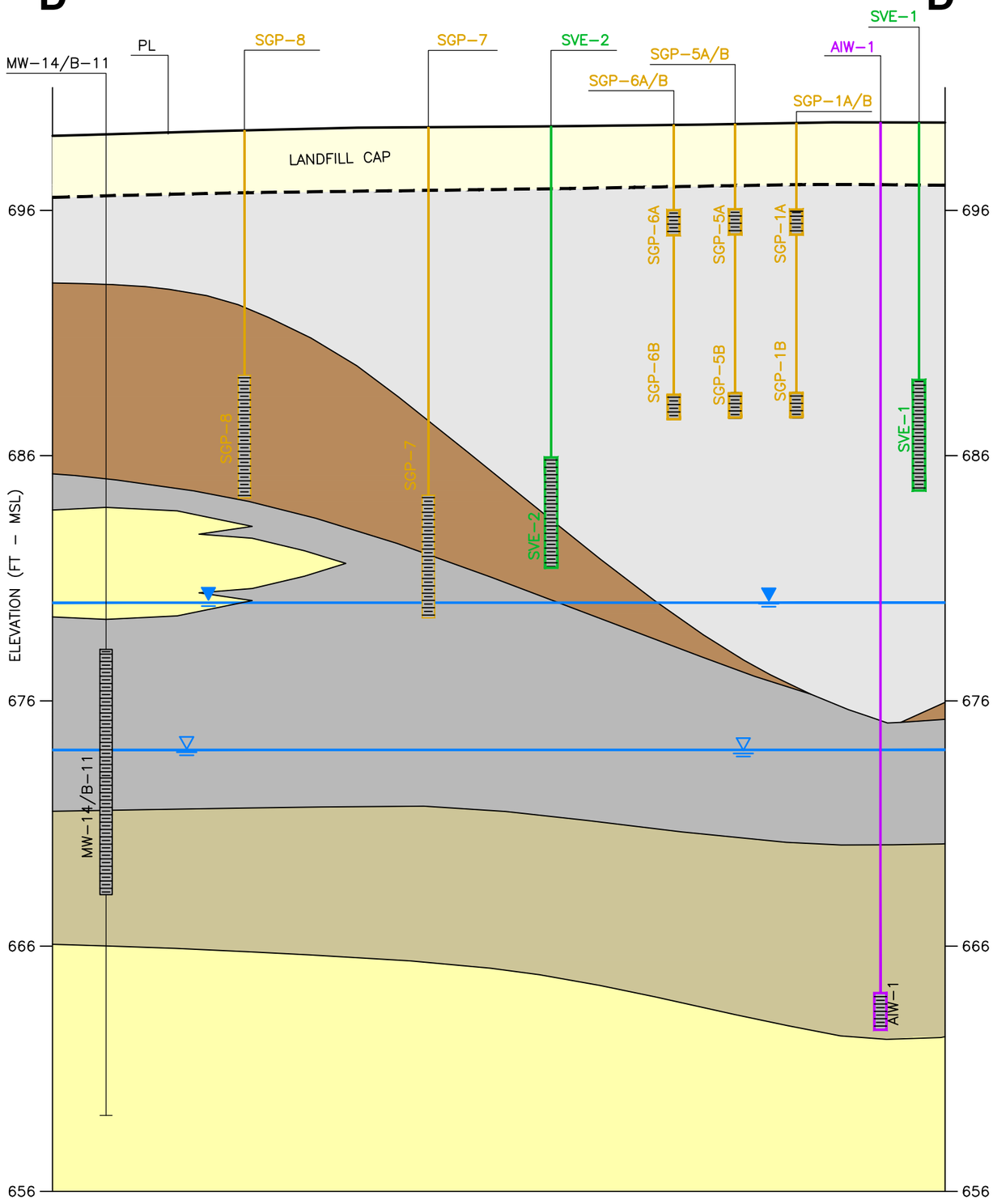
10 0 10
HORIZONTAL SCALE FEET
5 0 5
VERTICAL SCALE FEET
2X = VERTICAL EXAGGERATION

CROSS SECTION C-C' OF PILOT TEST AREA

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COLUMBIA, MARYLAND

DATE:	AUGUST 2011
PROJECT NO.	MR0562B
DOCUMENT NO.	MD11251
FILE NO.	0562f518
FIGURE NO.	6

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LEGEND

MW-12 — EXISTING MONITORING WELL IDENTIFICATION; SCREEN INTERVAL

MW-17 — NEW MONITORING WELL IDENTIFICATION; SCREEN INTERVAL

SVE-1 — NEW SVE VENT IDENTIFICATION; SCREEN INTERVAL

AIW-1 — NEW AIR SPARGING WELL IDENTIFICATION; SCREEN INTERVAL

SGP-1A — NEW SOIL GAS PROBE IDENTIFICATION; SCREEN INTERVAL

LANDFILL CAP

SAND / SILT FILL
REDDISH-BROWN SILTY FINE SAND AND SILT FILL

WASTE

UPPER SAND AND GRAVEL UNIT

SAND
BROWN TO GRAY SILTY, GRAVELLY, FINE TO COARSE SAND

SAND AND GRAVEL
BROWN TO GREENISH GRAY SILTY, FINE TO COARSE SAND AND FINE TO COARSE GRAVEL

SILTY SAND
BROWN TO LIGHT BROWN SANDY SILT AND GRAVEL

GEOSYNTHETIC COMPONENTS OF LANDFILL CAP

GROUNDWATER TABLE

SEASONAL HIGH GROUNDWATER ELEVATION (1987-2009) (SEE NOTE 7)

SEASONAL LOW GROUNDWATER ELEVATION (1987-2009) (SEE NOTE 7)

MW MONITORING WELL

AIW AIR SPARGING WELL

SVE SOIL VAPOR EXTRACTION

SGP SOIL GAS PROBE

NOTES

1. ALL EXISTING MONITORING WELLS AND ALL SOIL BORINGS COMPLETED IN SEPTEMBER AND OCTOBER 2007, WERE (RE)SURVEYED BY TECTONIC ENGINEERING OF MOUNTAINVILLE, NY. THESE LOCATIONS AND ELEVATIONS WERE TIED TO THE NORTH AMERICAN DATUM OF 1983 (NAD 83) AND NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88) UTILIZING GLOBAL POSITIONING SYSTEM (GPS) DATA. MINOR DISCREPANCIES NOTED BETWEEN PREVIOUS SURVEYS NAD 83 DATA AND THE NEW SURVEY NAD 83 DATA WERE RESOLVED BY ADJUSTING KNOWN FIXED POINTS FROM BOTH SETS OF DATA UNTIL THEY WERE ALIGNED. DISCREPANCIES WERE ALSO NOTED BETWEEN PREVIOUS SURVEYS NAVD 88 DATA AND THE NEW SURVEY NAVD 88 DATA. THE NEW SURVEY NAVD 88 DATA WAS USED TO DEVELOP THE GEOLOGIC CROSS SECTIONS IN THIS REPORT.
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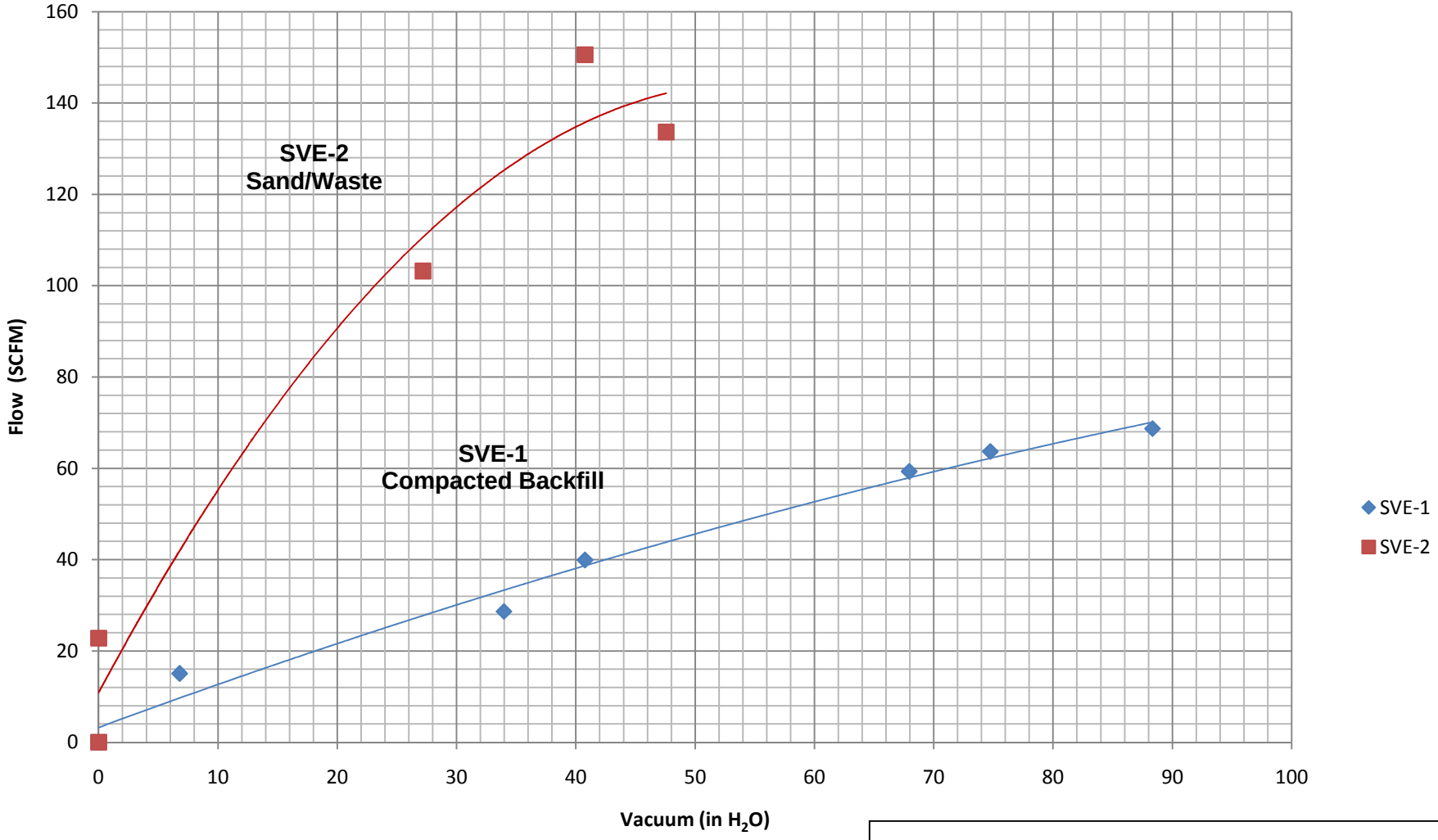
10 0 10
HORIZONTAL SCALE FEET
5 0 5
VERTICAL SCALE FEET
2X = VERTICAL EXAGGERATION

CROSS SECTION D-D' OF PILOT TEST AREA

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DATE:	AUGUST 2011
PROJECT NO.	MR0562B
DOCUMENT NO.	MD11251
FILE NO.	0562f509
FIGURE NO.	7

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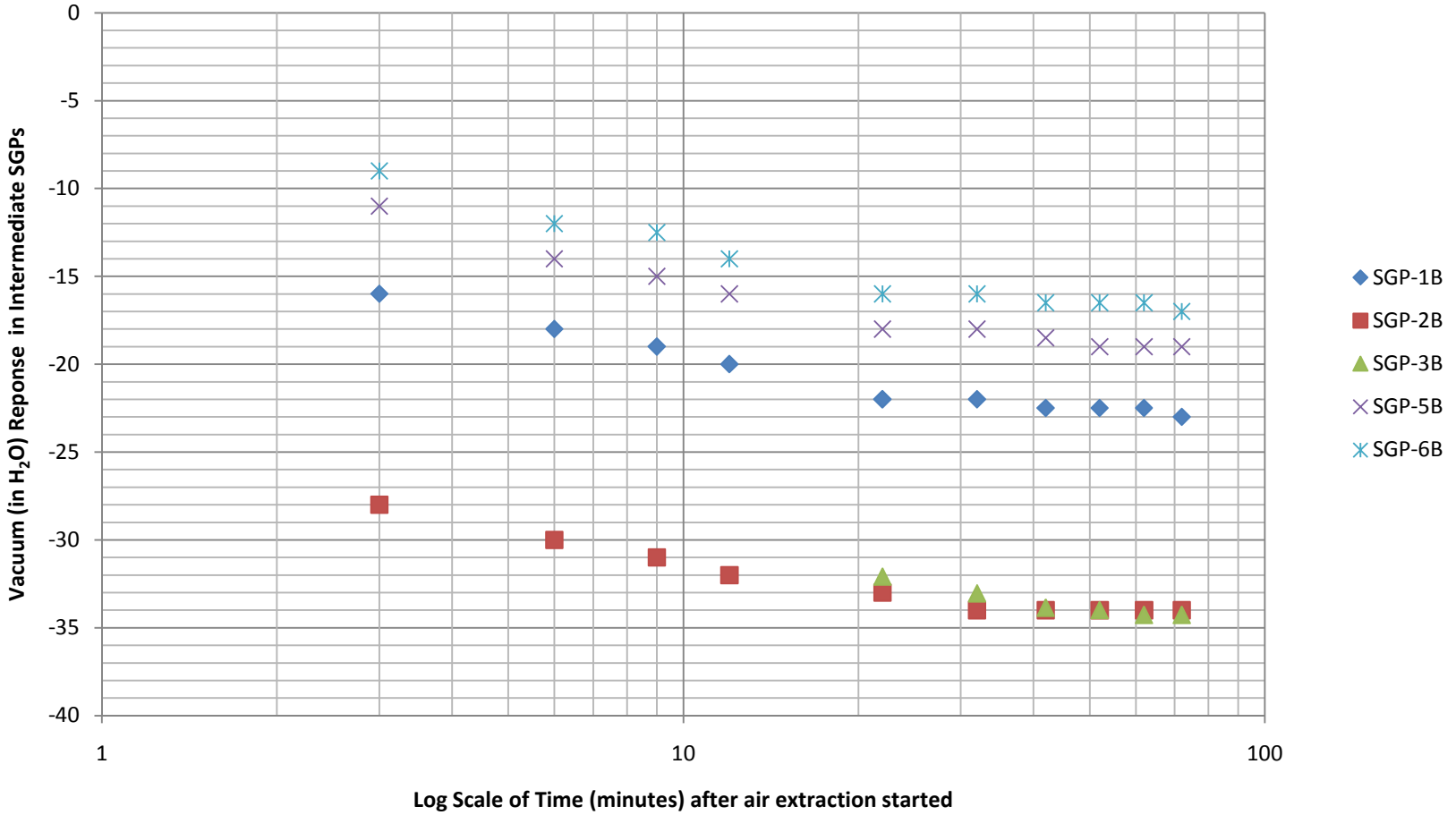
SVE Step Rate Tests
Cortese Landfill
Narrowsburg, New York

Notes
in H_20 - inches of water column
SCFM - standard cubic feet per minute

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Figure **8**



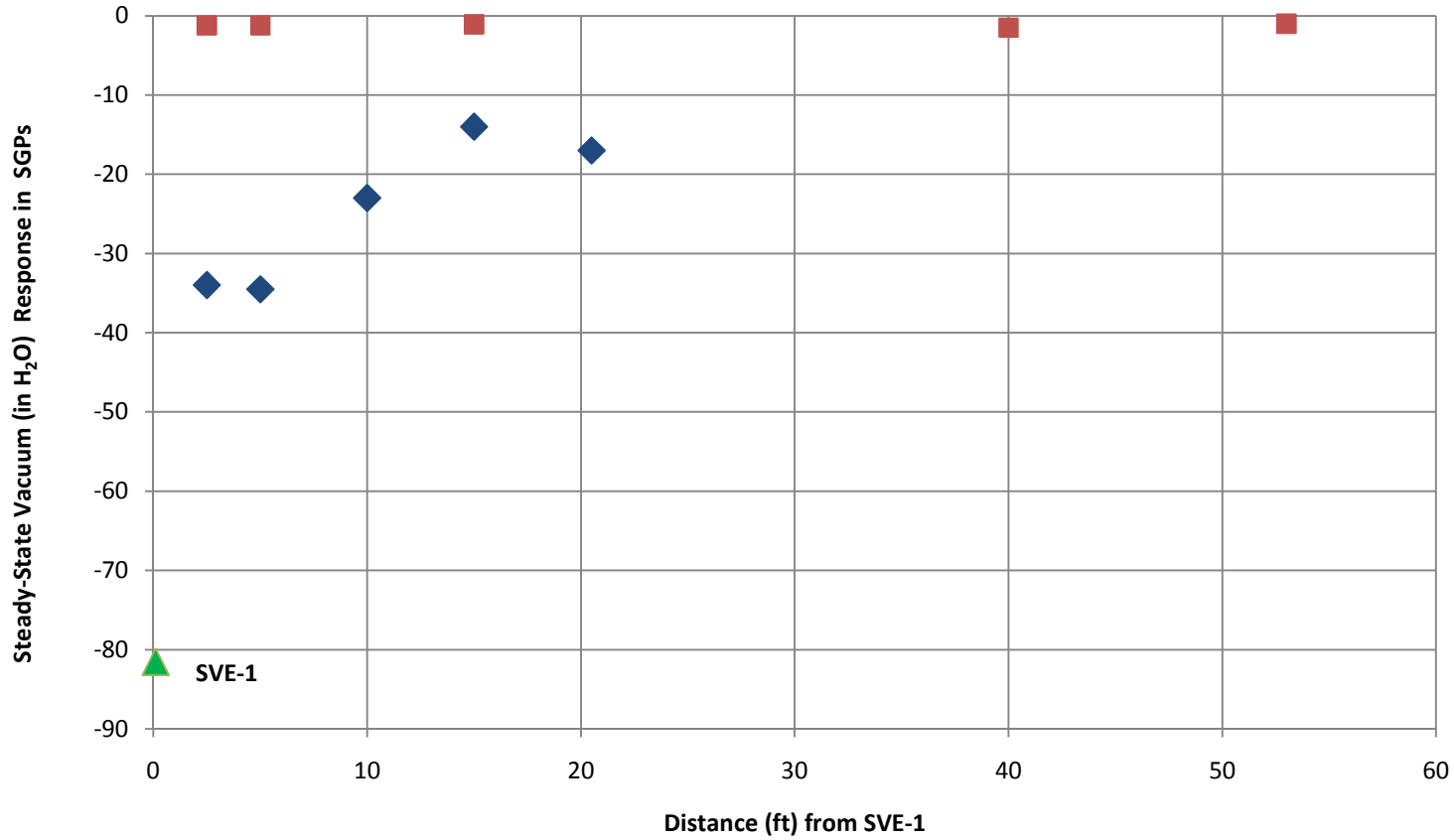
SVE-1 Constant Rate Test -
Transient Vacuum Response in Intermediate SGPs
Cortese Landfill
Narrowsburg, New York

Notes
SGP - soil sas probe
SGP-4B was completed in the sand/waste layer and is not included.

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Figure **9A**



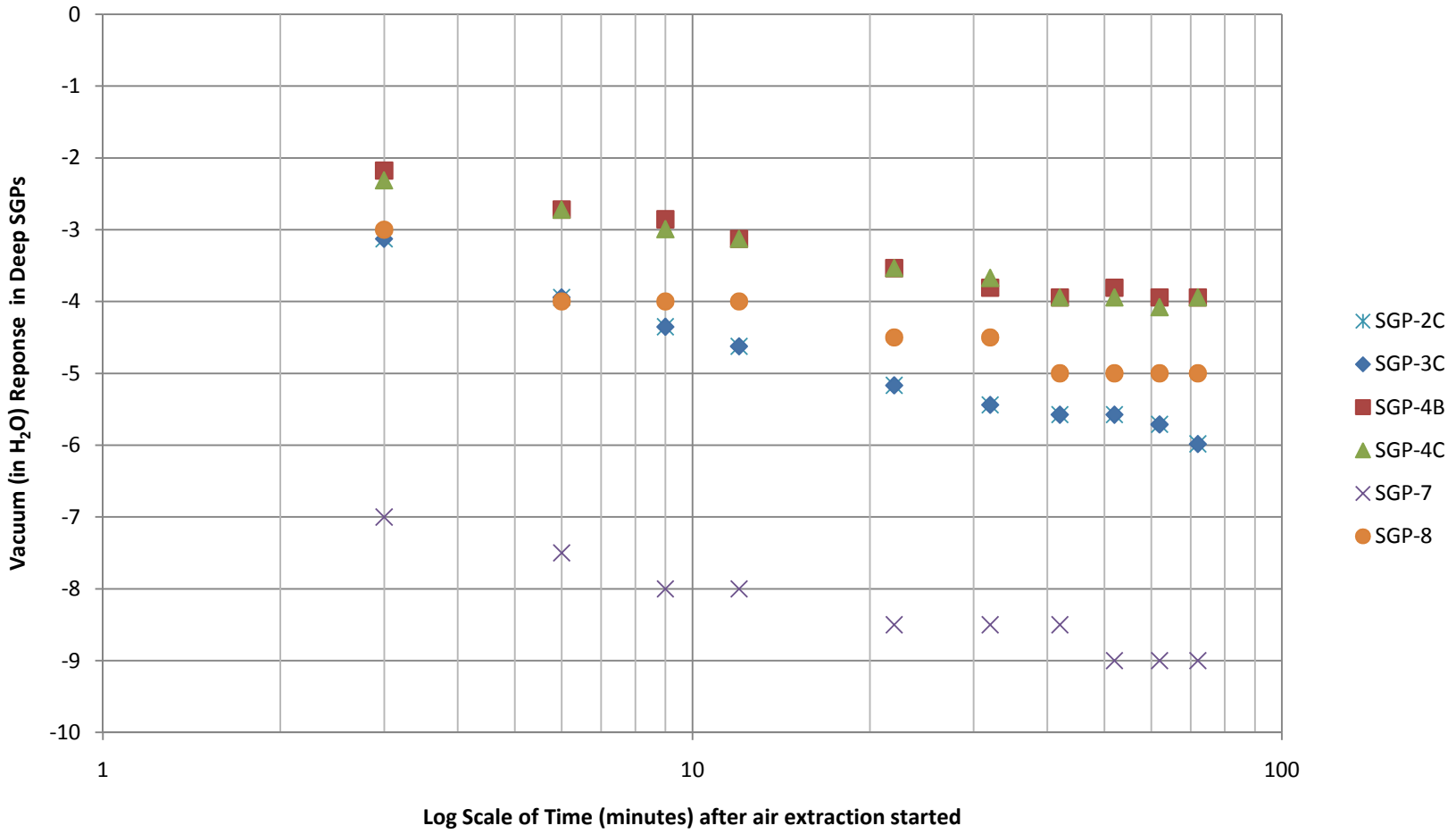
SVE-1 Constant Rate Test -
Distance and Vacuum Response
Cortese Landfill
Narrowsburg, New York

Notes
Steady-state vacuum response was considered as the response when vacuum had stabilized (± 10%). See Table 5A.

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Figure **9B**



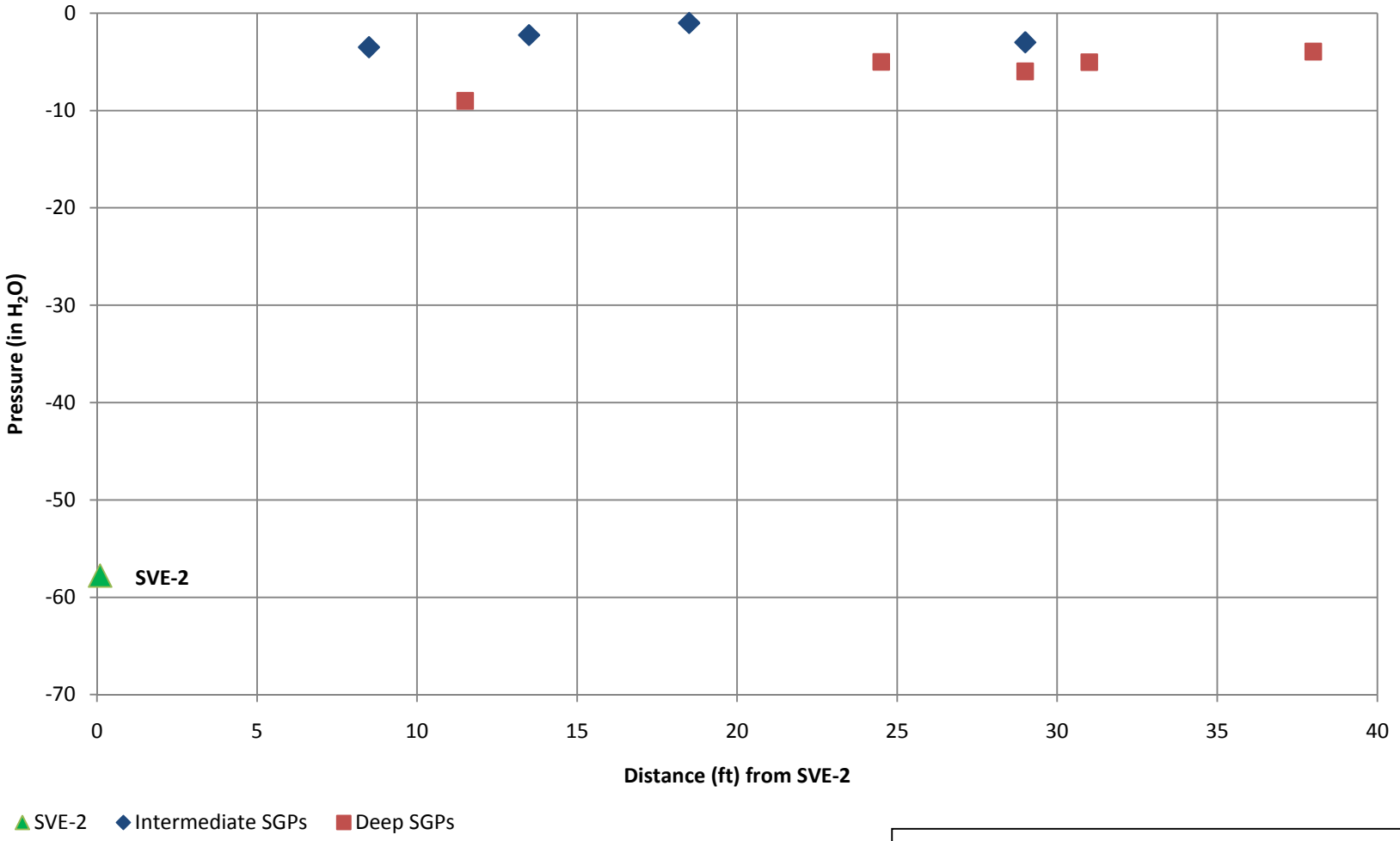
SVE-2 Constant Rate Test -
Transient Vacuum Response in Deep SGPs
Cortese Landfill
Narrowsburg, New York

Notes
SGP - soil gas probe
SGP-4B was completed in the sand/waste layer and is included.

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Figure **10A**



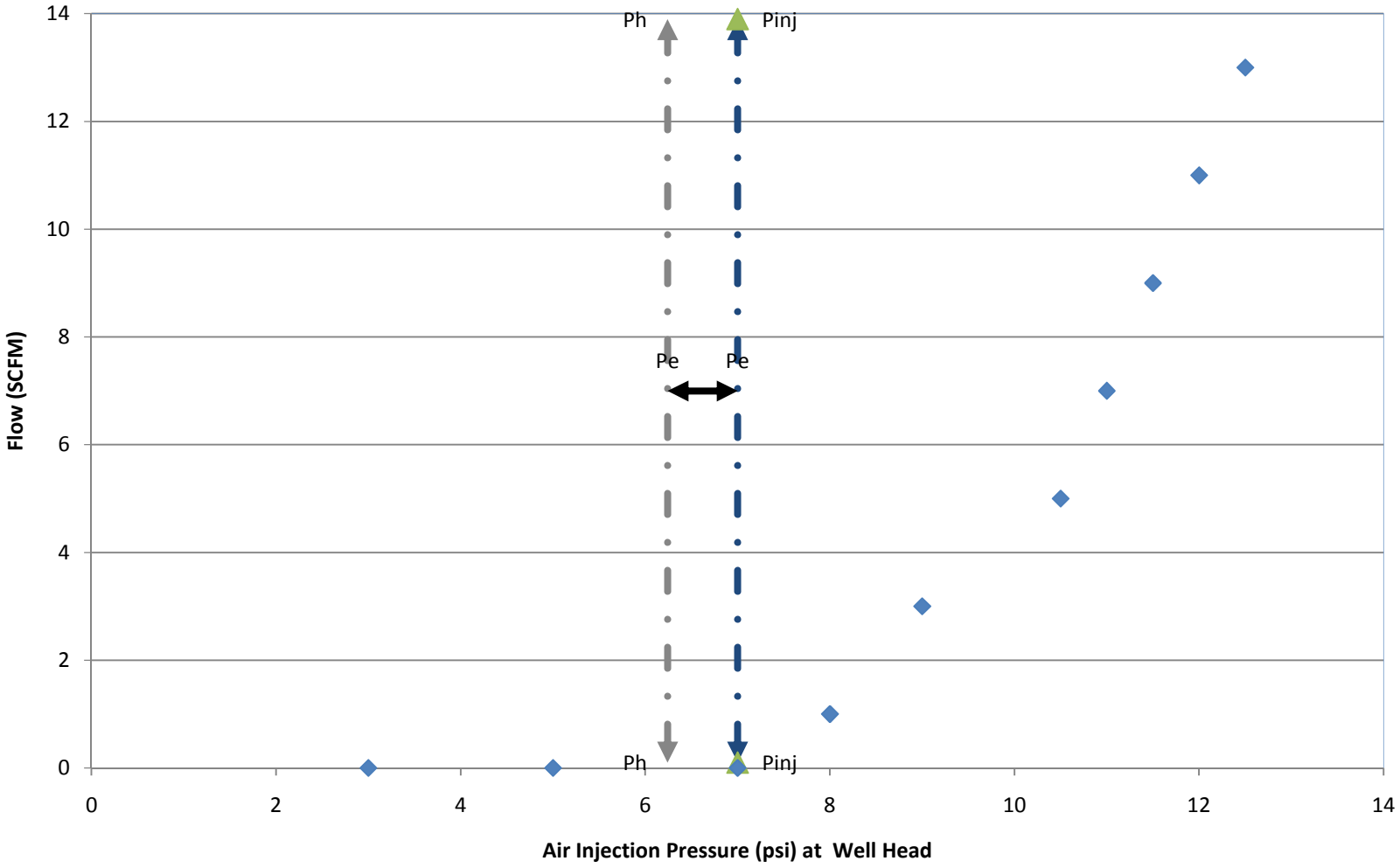
SVE-2 Constant Rate Test -
Distance and Vacuum Response
Cortese Landfill
Narrowsburg, New York

Notes
Steady-state vacuum response was considered as theresponse when vacuum had stabilized (± 10%). See Table 5B.

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Figure **10B**



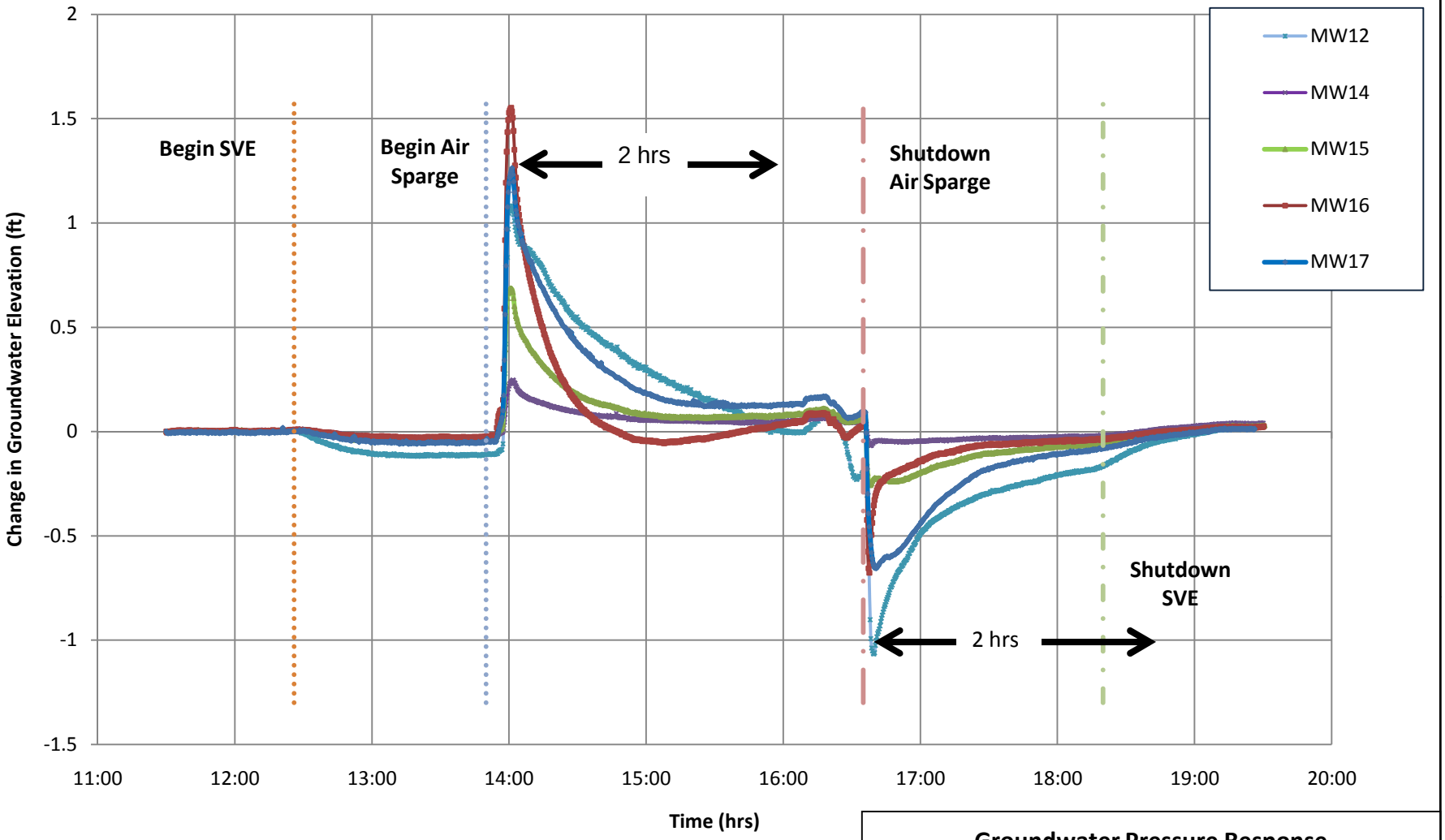
Air Injection Step Rate Test
Cortese Landfill
Narrowsburg, New York

Notes
Ph -theoretical injection pressure needed to overcome hydrostatic head
Pinj - injection pressure at which flow was observed
Pe - pressure difference between Ph and Pinj
SCFM - standard cubic feet per minute
psi - pounds per square inch

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Figure **11**



Groundwater Pressure Response

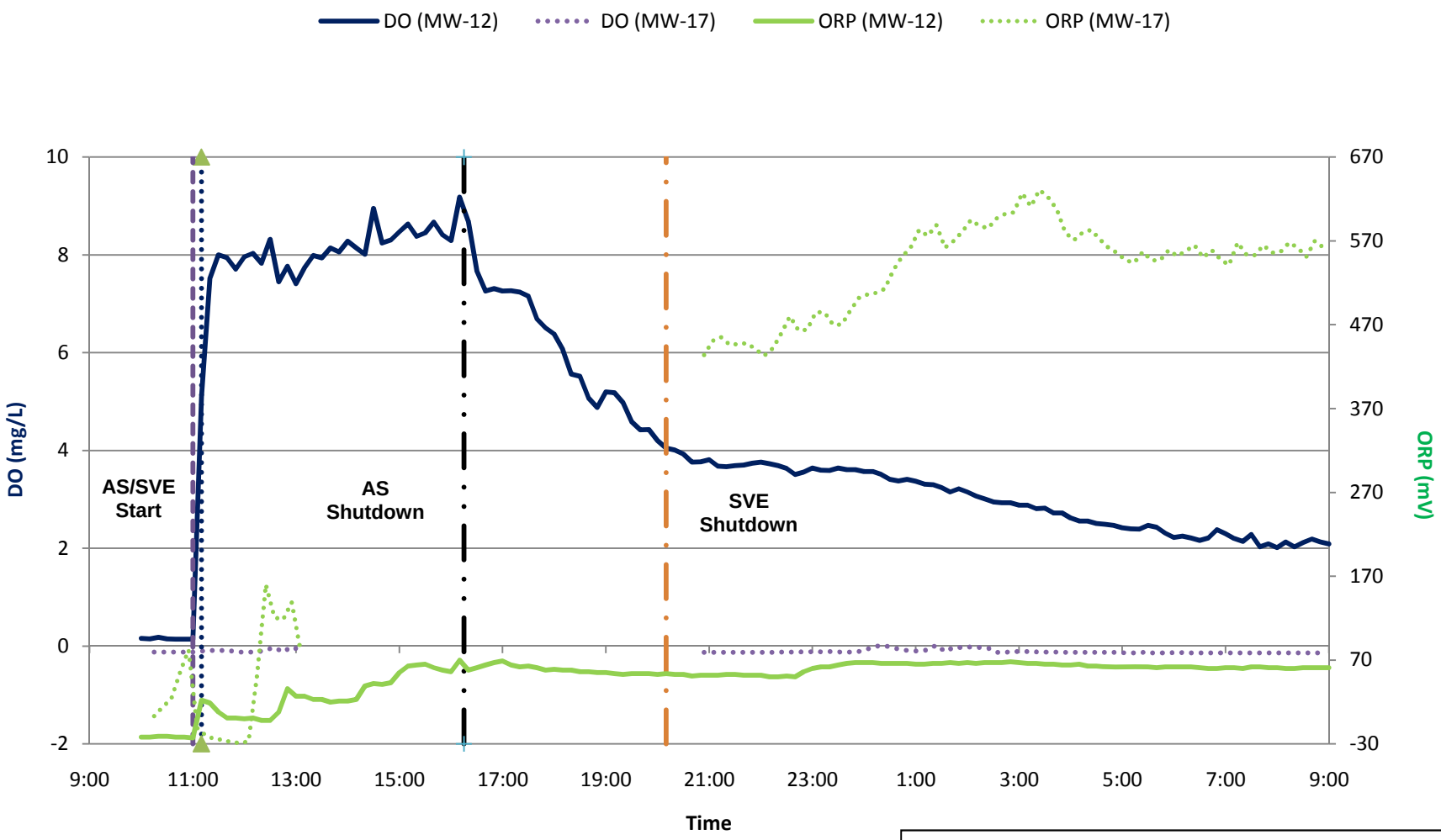
Cortese Landfill

Narrowsburg, New York

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Figure **12**



Steady-State and Post-Injection Monitoring - MW-12 and MW-17 DO and ORP

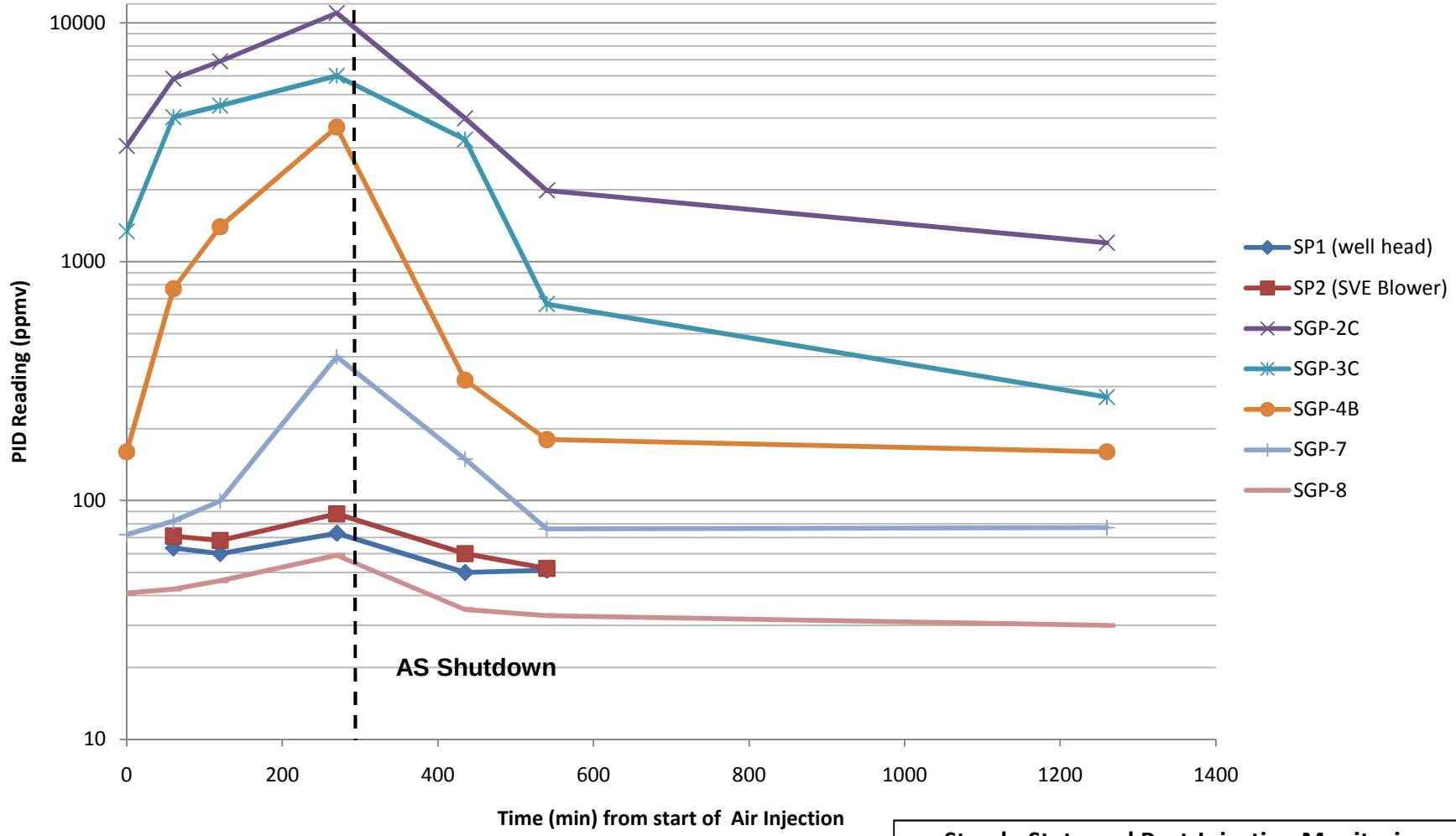
Cortese Landfill
Narrowsburg, New York

Notes
Data logging at MW-17 stopped unexpectedly at 13:05. Logging was resumed following SVE shutdown.
DO - dissolved oxygen
ORP - oxidation reduction potential

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Figure **13**



Steady-State and Post-Injection Monitoring - PID in Deep SGPs

Cortese Landfill
Narrowsburg, New York

Notes
ppmv - parts per million vapor
PID - photo ionization detector
SGP - soil gas probe
AS - air sparging

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Figure **14**

Appendix A
Borehole and Well Construction Logs for Newly Installed Wells, SVE Vents, and SGPs

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AIW-1

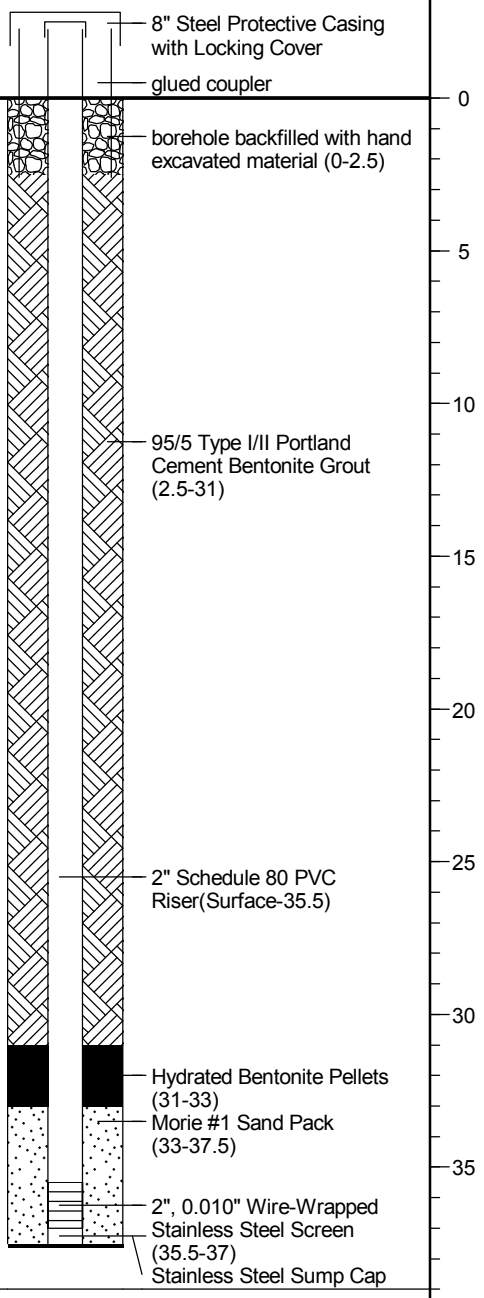
CLIENT Cortese Landfill PRP Group
PROJECT NAME Cortese Landfill
PROJECT NUMBER MR0562B
PROJECT LOCATION Narrowsburg, NY
DATE STARTED 12/6/10 **COMPLETED** 12/7/10
Northing 1008657.8 ft **Easting** 337566.3 ft
DRILLER Parratt-Wolf
GROUND ELEVATION 698.9 ft **TOC ELEVATION** 700.99 ft
DRILLING METHOD Hollow Stem Auger
RIG TYPE D-90 **BORING DIAMETER** 8 in
SAMPLING METHOD Drill Cuttings/SS
LOGGED BY Adam Gray **CHECKED BY** Robert Glazier

Notes No lithologic sample taken from 0 to 30 ft bgs, interpretation made from drill cuttings on augers at surface. PID readings taken on drill cuttings at surface.

DEPTH (ft)	ELEVATION (ft msl)	RUN RECOVERY	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	ENVIRONMENTAL DATA
0	698		Excavated to landfill liner by hand	SM		Silty Fine SAND, dark reddish brown (landfill cap/backfill)	
						LINER	
5	695			SM		Silty Fine SAND, some fine gravel throughout, dark reddish brown (landfill cap/backfill)	
10	690						
15	685					trace waste (piece of rubber tire)	PID = 60
						SAND , some fine gravel, very dark gray and brown	
20	680			SW			PID = 775
25	675		DTW 23.2 ft bgs on 12/9/2010				PID = 1250
30	670		(30-32)	GW-GM		SAND and GRAVEL, very dark brown and gray	PID = 10
35	665		(33-35)				
			(35-37)				
40	660		(37-39)	SM		Sandy SILT, light brown	

Bottom of borehole at 39.0 feet.

SGP AND WELL CONSTRUCTION DETAILS



Well development completed on 9-10 December 2010. Water quality parameters at the end of well development were Temperature 9.9°C, Specific Conductance 715 µS/cm, Turbidity 350 NTU, pH 6.3. Approximately 40 gallons were removed from the well in 4.0 hrs.

CORTESE WELL/SGP - 7/11/11 15:18 - P:\GINT\PROJECTS\MR0562B - CORTESE.GPJ

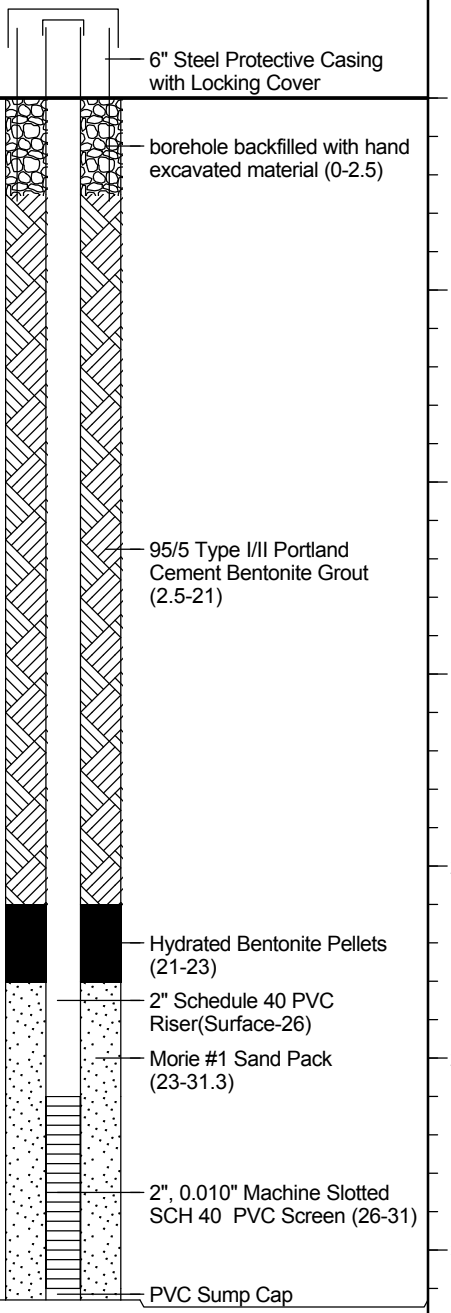
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MW-17

CLIENT Cortese Landfill PRP Group
PROJECT NAME Cortese Landfill
PROJECT NUMBER MR0562B
PROJECT LOCATION Narrowsburg, NY
DATE STARTED 12/8/10 **COMPLETED** 12/8/10
Northing 1008644.4 ft **Easting** 337560.7 ft
DRILLER Parratt-Wolf
GROUND ELEVATION 698.4 ft **TOC ELEVATION** 700.44 ft
DRILLING METHOD Hollow Stem Auger
RIG TYPE D-90 **BORING DIAMETER** 8 in
SAMPLING METHOD Drill Cuttings
LOGGED BY Adam Gray **CHECKED BY** Robert Glazier
Notes No lithologic samples taken, interpretation made from drill cuttings on augers at surface. PID readings taken on drill cuttings at surface.

DEPTH (ft)	ELEVATION (ft msl)	REMARKS	U.S.C.S.	MATERIAL DESCRIPTION	ENVIRONMENTAL DATA
0	698	Excavated to landfill liner by hand	SM	Silty Fine SAND, dark reddish brown (landfill cap/backfill)	
				LINER	
5	695			Silty Fine SAND, dark reddish brown (landfill cap/backfill)	
10	690		SM		
15	685		SW	SAND, some silt, some fine gravel, some waste, dark brown	
20	680			Sand , some fine gravel, very dark gray and brown	PID = 50
25	675	DTW 22.7 ft bgs on 12/9/2010	SW		
30	670		GW-GM	SAND and GRAVEL, very dark brown and gray	
	665			Bottom of borehole at 31.3 feet.	

SGP AND WELL CONSTRUCTION DETAILS



Well development completed on 9 December 2010. Water quality parameters at the end of well development were Temperature 10.5°C, Specific Conductance 690 µS/cm, Turbidity 60 NTUs, pH 6.3. Approximately 55 gallons were removed from the well in 1.25 hours.

CORTESE WELL/SGP - 2/28/11 16:44 - P:\GINT\PROJECTS\MR0562B - CORTESE.GPJ

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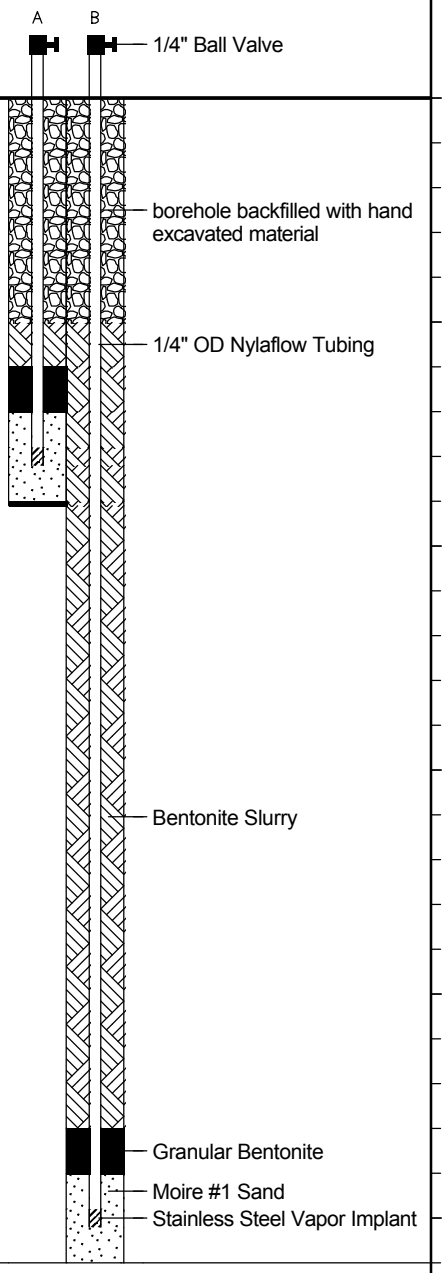
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SGP-1A/B

CLIENT Cortese Landfill PRP Group
PROJECT NAME Cortese Landfill
PROJECT NUMBER MR0562B
PROJECT LOCATION Narrowsburg, NY
DATE STARTED 11/30/10 **COMPLETED** 11/30/10
Northing 1008661.7 ft **Easting** 337558.6 ft
DRILLER Parratt-Wolf
GROUND ELEVATION 698.6 ft **TOC ELEVATION** ---
DRILLING METHOD Direct Push Technology
RIG TYPE 6620 DT Geoprobe **BORING DIAMETER** 2.5 in
SAMPLING METHOD N/A
LOGGED BY Adam Gray **CHECKED BY** Robert Glazier
Notes

DEPTH (ft)	ELEVATION (ft msl)	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0	698.6	Excavated to landfill liner by hand	SM		Silty Fine SAND, dark reddish brown (landfill cap/backfill)
2.5	695.0				LINER Lithology Not Documented
5.0	692.5				
7.5	690.0				
10.0	687.5				
12.5	685.0				Bottom of borehole at 13.0 feet.

SGP AND WELL CONSTRUCTION DETAILS



CORTESE WELL/SGP - 2/28/11 16:44 - P:\GINT\PROJECTS\MR0562B - CORTESE.GPJ

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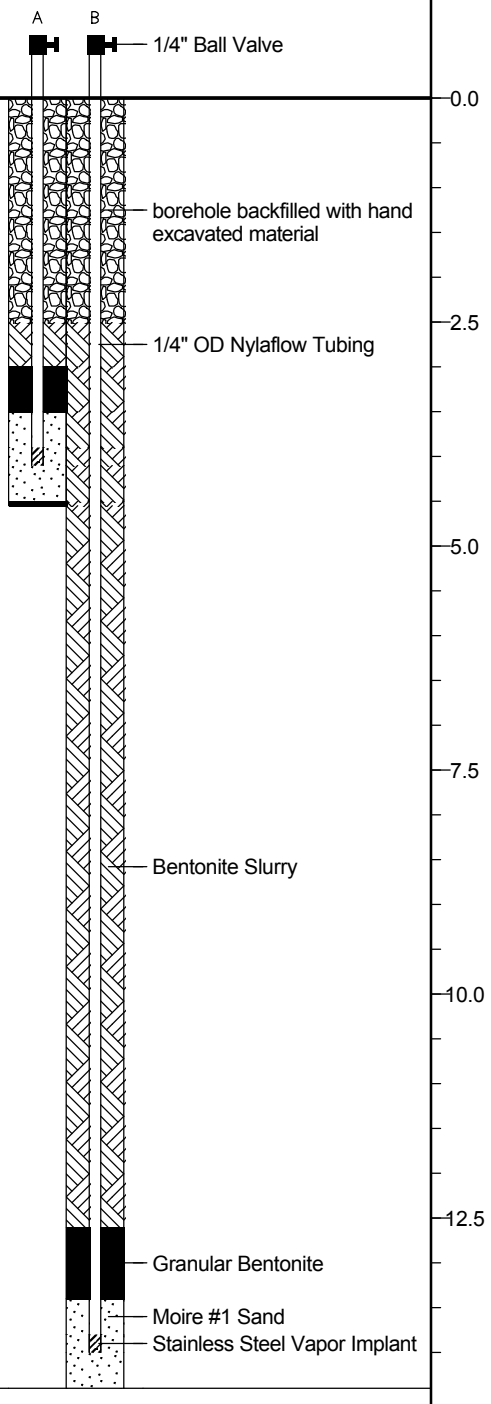
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SGP-2A/B

CLIENT Cortese Landfill PRP Group
PROJECT NAME Cortese Landfill
PROJECT NUMBER MR0562B
PROJECT LOCATION Narrowsburg, NY
DATE STARTED 11/30/10 **COMPLETED** 11/30/10
Northing 1008655.2 ft **Easting** 337566.9 ft
DRILLER Parratt-Wolf
GROUND ELEVATION 698.9 ft **TOC ELEVATION** ---
DRILLING METHOD Direct Push Technology
RIG TYPE 6620 DT Geoprobe **BORING DIAMETER** 2.5 in
SAMPLING METHOD N/A
LOGGED BY Adam Gray **CHECKED BY** Robert Glazier
Notes

DEPTH (ft)	ELEVATION (ft msl)	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0	698.9	Excavated to landfill liner by hand	SM		Silty Fine SAND, dark reddish brown (landfill cap/backfill)
2.5	695.0				LINER Lithology Not Documented
5.0	692.5				
7.5	690.0				
10.0	687.5				
12.5	685.0				

SGP AND WELL CONSTRUCTION DETAILS



Bottom of borehole at 14.4 feet.

CORTESE WELL/SGP - 2/28/11 16:44 - P:\GINT\PROJECTS\MR0562B - CORTESE.GPJ

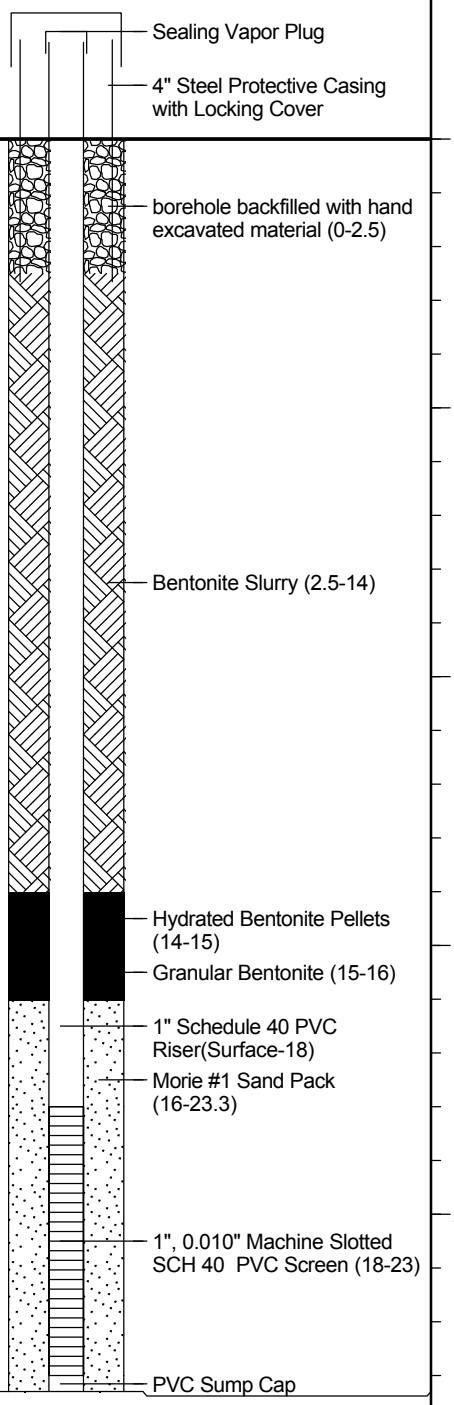
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SGP-2C

CLIENT Cortese Landfill PRP Group
PROJECT NAME Cortese Landfill
PROJECT NUMBER MR0562B
PROJECT LOCATION Narrowsburg, NY
DATE STARTED 11/30/10 **COMPLETED** 11/30/10
Northing 1008655.2 ft **Easting** 337566.9 ft
DRILLER Parratt-Wolf
GROUND ELEVATION 698.9 ft **TOC ELEVATION** 700.69 ft
DRILLING METHOD Direct Push Technology
RIG TYPE 6620 DT Geoprobe **BORING DIAMETER** 3.5 in
SAMPLING METHOD Core-Barrel
LOGGED BY Adam Gray **CHECKED BY** Robert Glazier
Notes

DEPTH (ft)	ELEVATION (ft msl)	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0	698	Excavated to landfill liner by hand	SM		Silty Fine SAND, dark reddish brown (landfill cap/backfill)
					LINER Lithology Not Documented
5	695				
10	690				
15	685				
20	680				
	675				Bottom of borehole at 23.3 feet.

SGP AND WELL CONSTRUCTION DETAILS



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SGP-3A/B

CLIENT Cortese Landfill PRP Group
PROJECT NAME Cortese Landfill
PROJECT NUMBER MR0562B
PROJECT LOCATION Narrowsburg, NY
DATE STARTED 11/30/10 **COMPLETED** 11/30/10
Northing 1008649.3 ft **Easting** 337562.3 ft
DRILLER Parratt-Wolf
GROUND ELEVATION 698.5 ft **TOC ELEVATION** ---
DRILLING METHOD Direct Push Technology
RIG TYPE 6620 DT Geoprobe **BORING DIAMETER** 2.5 in
SAMPLING METHOD N/A
LOGGED BY Adam Gray **CHECKED BY** Robert Glazier
Notes

DEPTH (ft)	ELEVATION (ft msl)	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	SGP AND WELL CONSTRUCTION DETAILS
0.0	698.5	Excavated to landfill liner by hand	SM		Silty Fine SAND, dark reddish brown (landfill cap/backfill)	A, B: 1/4" Ball Valve; borehole backfilled with hand excavated material
2.5	695.0				LINER Lithology Not Documented	1/4" OD Nylaflow Tubing
5.0	692.5					
7.5	690.0					Bentonite Slurry
10.0	687.5					
12.5	685.0					Granular Bentonite; Moire #1 Sand; Stainless Steel Vapor Implant
14.0					Bottom of borehole at 14.0 feet.	

CORTESE WELL/SGP - 2/28/11 16:44 - P:\GINT\PROJECTS\MR0562B - CORTESE.GPJ

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SGP-3C

CLIENT Cortese Landfill PRP Group
PROJECT NAME Cortese Landfill
PROJECT NUMBER MR0562B
PROJECT LOCATION Narrowsburg, NY
DATE STARTED 11/30/10 **COMPLETED** 11/30/10
Northing 1008649.3 ft **Easting** 337562.3 ft
DRILLER Parratt-Wolf
GROUND ELEVATION 698.5 ft **TOC ELEVATION** 700.21 ft
DRILLING METHOD Direct Push Technology
RIG TYPE 6620 DT Geoprobe **BORING DIAMETER** 3.5 in
SAMPLING METHOD Core-Barrel
LOGGED BY Adam Gray **CHECKED BY** Robert Glazier
Notes PID readings taken on core-barrel sample.

DEPTH (ft)	ELEVATION (ft msl)	RUN RECOVERY	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	ENVIRONMENTAL DATA
0	698.5		Excavated to landfill liner by hand	SM		Silty Fine SAND, dark reddish brown (landfill cap/backfill)	
						LINER	
						Lithology Not Documented	
5	695						
	690						
10							
	685		softer drilling from 13-15				
15							
	680						
20			(19-23)	SW		SAND, fine grained, some Silt, grayish dark brown	PID = 150
							PID = 500
	675					Bottom of borehole at 23.3 feet.	

SGP AND WELL CONSTRUCTION DETAILS

- Sealing Vapor Plug
- 4" Steel Protective Casing with Locking Cover
- borehole backfilled with hand excavated material (0-2.5)
- Bentonite Slurry (2.5-14)
- Hydrated Bentonite Pellets (14-15)
- Granular Bentonite (15-16)
- 1" Schedule 40 PVC Riser(Surface-18)
- Morie #1 Sand Pack (16-23.3)
- 1", 0.010" Machine Slotted SCH 40 PVC Screen (18-23)
- PVC Sump Cap

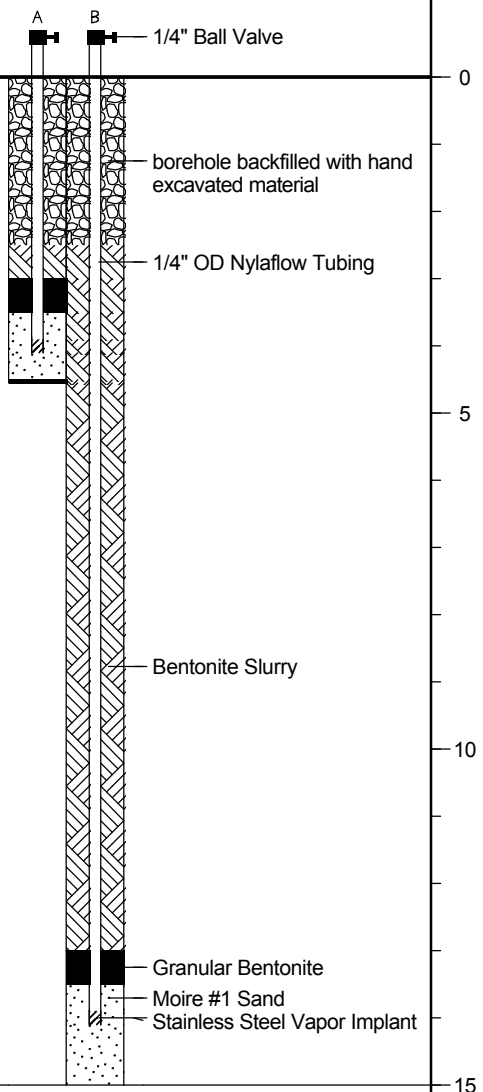
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SGP-4A/B

CLIENT Cortese Landfill PRP Group
PROJECT NAME Cortese Landfill
PROJECT NUMBER MR0562B
PROJECT LOCATION Narrowsburg, NY
DATE STARTED 11/30/10 **COMPLETED** 11/30/10
Northing 1008639.9 ft **Easting** 337558.8 ft
DRILLER Parratt-Wolf
GROUND ELEVATION 698.1 ft **TOC ELEVATION** ---
DRILLING METHOD Direct Push Technology
RIG TYPE 6620 DT Geoprobe **BORING DIAMETER** 2.5 in
SAMPLING METHOD N/A
LOGGED BY Adam Gray **CHECKED BY** Robert Glazier
Notes

DEPTH (ft)	ELEVATION (ft msl)	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0		Excavated to landfill liner by hand	SM		Silty Fine SAND, dark reddish brown (landfill cap/backfill)
					LINER
					Lithology Not Documented
5	695				
10	690				
	685				
15	680				Bottom of borehole at 15.0 feet.

SGP AND WELL CONSTRUCTION DETAILS



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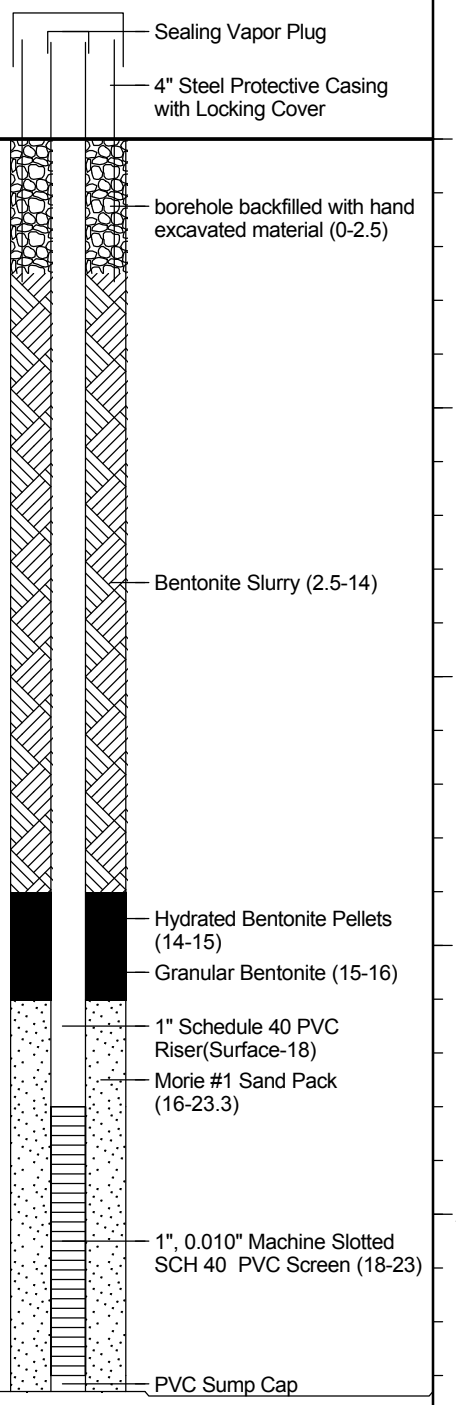
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SGP-4C

CLIENT Cortese Landfill PRP Group
PROJECT NAME Cortese Landfill
PROJECT NUMBER MR0562B
PROJECT LOCATION Narrowsburg, NY
DATE STARTED 11/29/10 **COMPLETED** 11/29/10
Northing 1008639.9 ft **Easting** 337558.8 ft
DRILLER Parratt-Wolf
GROUND ELEVATION 698.1 ft **TOC ELEVATION** 699.81 ft
DRILLING METHOD Direct Push Technology
RIG TYPE 6620 DT Geoprobe **BORING DIAMETER** 3.5 in
SAMPLING METHOD Core-Barrel
LOGGED BY Adam Gray **CHECKED BY** Robert Glazier
Notes PID reading taken on core-barrel sample.

DEPTH (ft)	ELEVATION (ft msl)	RUN RECOVERY	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	ENVIRONMENTAL DATA
0	698		Excavated to landfill liner by hand	SM		Silty Fine SAND, dark reddish brown (landfill cap/backfill)	
						LINER Lithology Not Documented	
5	695						
	690						
10							
	685		softer drilling from 13-15				
15			harder drilling from 15-19				
	680						
20			(19-23)	SW		SAND, fine grained, some Silt, dark brown and brown	PID = 45
	675					Bottom of borehole at 23.3 feet.	

SGP AND WELL CONSTRUCTION DETAILS



CORTESE WELL/SGP - 2/28/11 16:45 - P:\GINT\PROJECTS\MR0562B - CORTESE.GPJ

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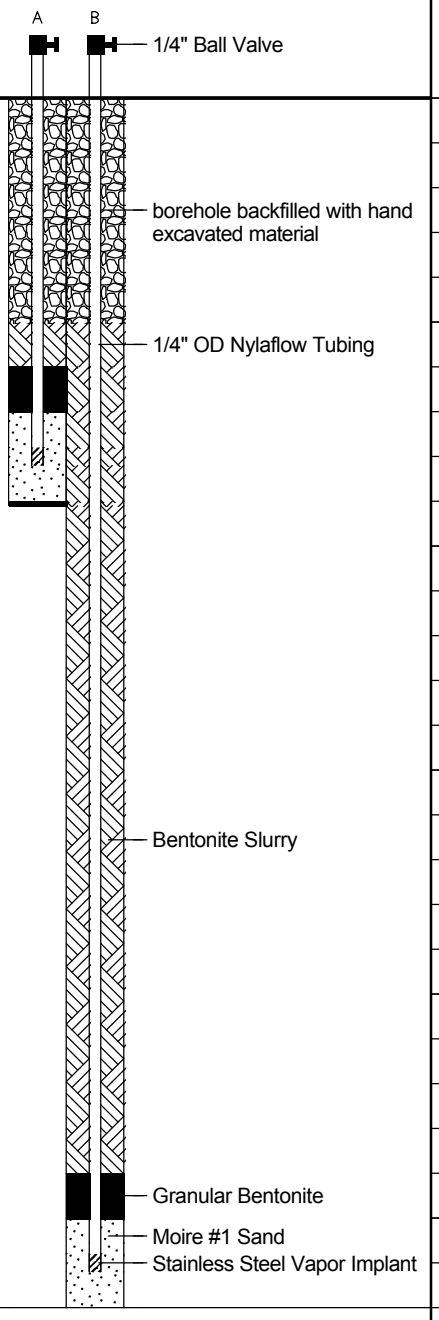
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SGP-5A/B

CLIENT Cortese Landfill PRP Group
PROJECT NAME Cortese Landfill
PROJECT NUMBER MR0562B
PROJECT LOCATION Narrowsburg, NY
DATE STARTED 12/6/10 **COMPLETED** 12/6/10
Northing 1008655.5 ft **Easting** 337555.3 ft
DRILLER Parratt-Wolf
GROUND ELEVATION 698.6 ft **TOC ELEVATION** ---
DRILLING METHOD Direct Push Technology
RIG TYPE 6620 DT Geoprobe **BORING DIAMETER** 2.5 in
SAMPLING METHOD N/A
LOGGED BY Adam Gray **CHECKED BY** Robert Glazier
Notes

DEPTH (ft)	ELEVATION (ft msl)	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0	698.6	Excavated to landfill liner by hand	SM		Silty Fine SAND, dark reddish brown (landfill cap/backfill)
2.5	695.0				LINER Lithology Not Documented
5.0	692.5				
7.5	690.0				
10.0	687.5				
12.5	685.0				Bottom of borehole at 13.5 feet.

SGP AND WELL CONSTRUCTION DETAILS



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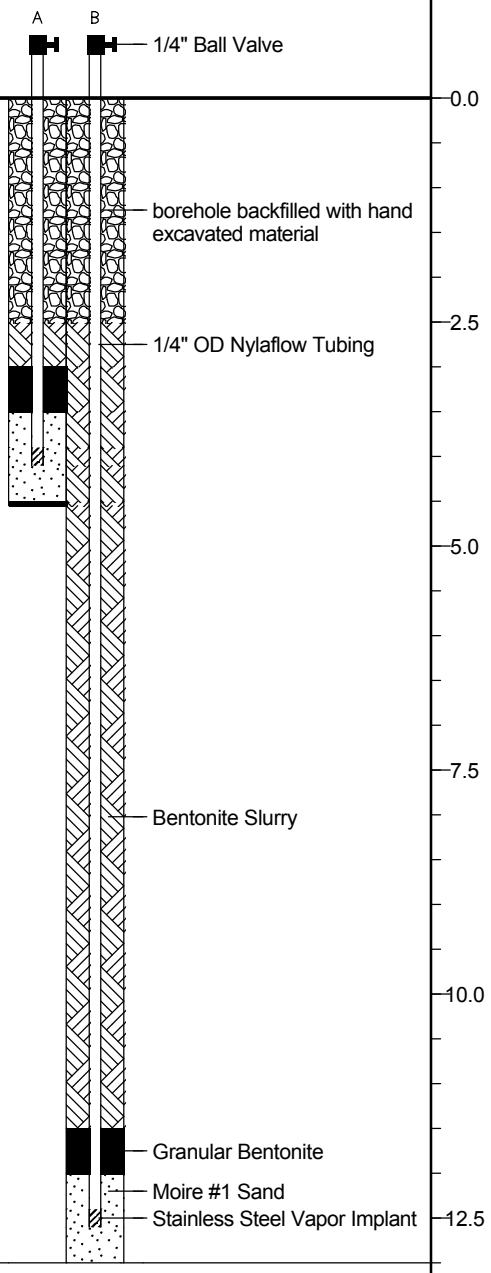
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SGP-6A/B

CLIENT Cortese Landfill PRP Group
PROJECT NAME Cortese Landfill
PROJECT NUMBER MR0562B
PROJECT LOCATION Narrowsburg, NY
DATE STARTED 12/6/10 **COMPLETED** 12/6/10
Northing 1008670.0 ft **Easting** 337552.7 ft
DRILLER Parratt-Wolf
GROUND ELEVATION 698.6 ft **TOC ELEVATION** ---
DRILLING METHOD Direct Push Technology
RIG TYPE 6620 DT Geoprobe **BORING DIAMETER** 2.5 in
SAMPLING METHOD N/A
LOGGED BY Adam Gray **CHECKED BY** Robert Glazier
Notes

DEPTH (ft)	ELEVATION (ft msl)	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0	698.6	Excavated to landfill liner by hand	SM		Silty Fine SAND, dark reddish brown (landfill cap/backfill)
2.5	696.1				LINER Lithology Not Documented
5.0	693.6				
7.5	691.1				
10.0	688.6				
12.5	686.1				Bottom of borehole at 13.0 feet.

SGP AND WELL CONSTRUCTION DETAILS



CORTESE WELL/SGP - 2/28/11 16:45 - P:\GINT\PROJECTS\MR0562B - CORTESE.GPJ

Geosyntec consultants

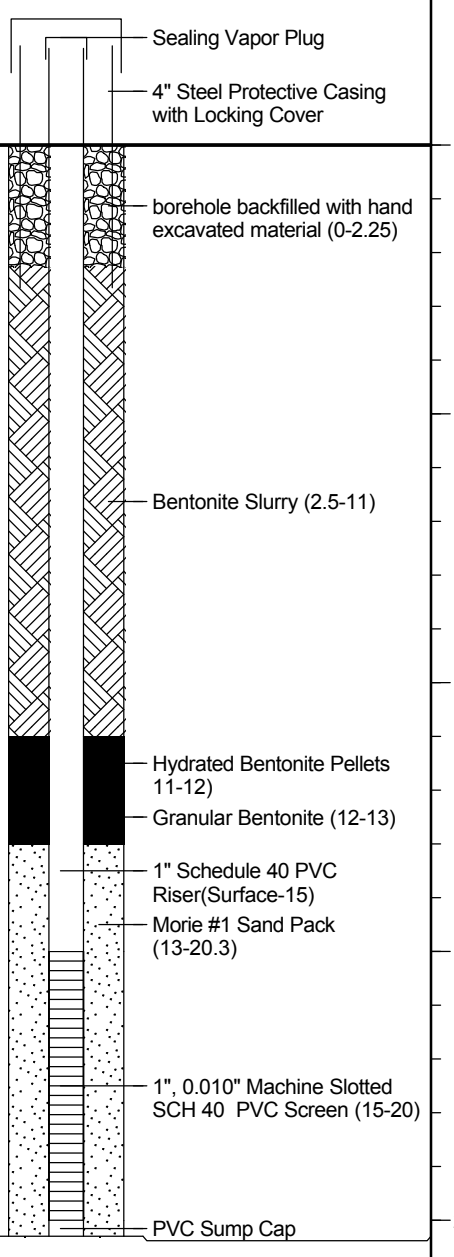
engineers | scientists | innovators

SGP-7

CLIENT Cortese Landfill PRP Group
PROJECT NAME Cortese Landfill
PROJECT NUMBER MR0562B
PROJECT LOCATION Narrowsburg, NY
DATE STARTED 12/1/10 **COMPLETED** 12/1/10
Northing 1008683.5 ft **Easting** 337538.0 ft
DRILLER Parratt-Wolf
GROUND ELEVATION 698.3 ft **TOC ELEVATION** 701.09 ft
DRILLING METHOD Direct Push Technology
RIG TYPE 6620 DT Geoprobe **BORING DIAMETER** 3.5 in
SAMPLING METHOD Core-Barrel
LOGGED BY Adam Gray **CHECKED BY** Robert Glazier
Notes No PID readings taken on core-barrel samples.

DEPTH (ft)	ELEVATION (ft msl)	RUN RECOVERY	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0	698		Excavated to landfill liner by hand	SM		Silty Fine SAND, dark reddish brown (landfill cap/backfill)
						LINER
						Lithology Not Documented
5	695					
	690					Sandy SILT, reddish brown, (backfill)
10			(9-13)	SM		
	685					SAND, with fine gravel, some silt, grayish brown and brown
15			(13-17)	SW		
	680		(17-20)			
20						
	675					Bottom of borehole at 20.3 feet.

SGP AND WELL CONSTRUCTION DETAILS



Geosyntec consultants

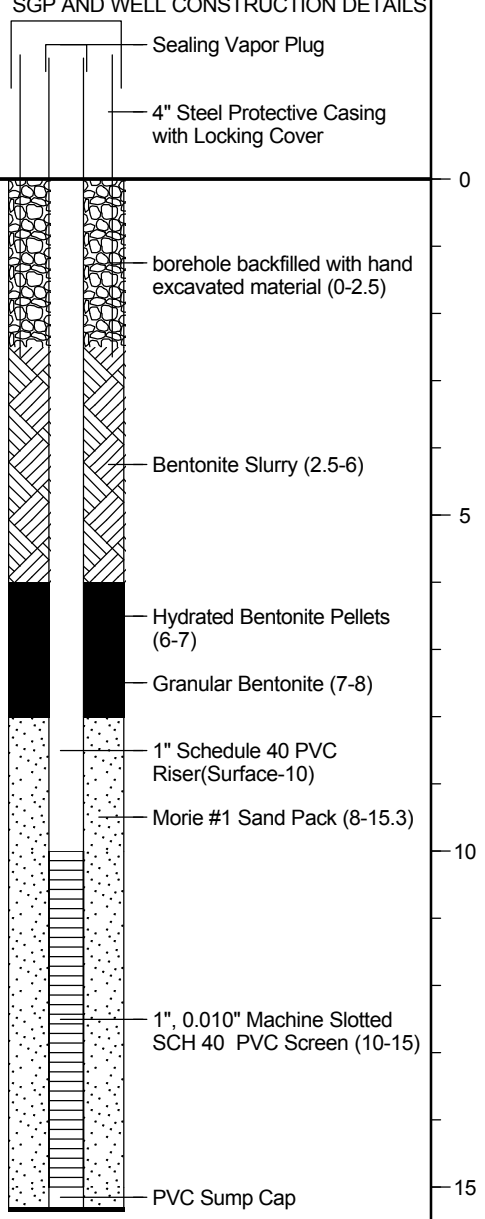
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SGP-8

CLIENT Cortese Landfill PRP Group
PROJECT NAME Cortese Landfill
PROJECT NUMBER MR0562B
PROJECT LOCATION Narrowsburg, NY
DATE STARTED 12/2/10 **COMPLETED** 12/6/10
Northing 1008695.2 ft **Easting** 337531.6 ft
DRILLER Parratt-Wolf
GROUND ELEVATION 698.2 ft **TOC ELEVATION** 700.11 ft
DRILLING METHOD Direct Push Technology
RIG TYPE 6620 DT Geoprobe **BORING DIAMETER** 3.5 in
SAMPLING METHOD Core-Barrel
LOGGED BY Adam Gray **CHECKED BY** Robert Glazier
Notes PID readings taken on core-barrel samples.

DEPTH (ft)	ELEVATION (ft msl)	RUN RECOVERY	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	ENVIRONMENTAL DATA
0	698		Excavated to landfill liner by hand	SM		Silty Fine SAND, dark reddish brown (landfill cap/backfill)	
						LINER	
	695			SM		Silty Fine SAND, dark reddish brown (landfill cap/backfill)	
5			(4-8) hard drilling from 6.5-7.5	SM		Silty SAND, some waste (plastic, glass, wood), very dark gray and brown	PID = 10 PID = 25 PID = 30 PID = 180 PID = 45
	690						
10			(8-12)				
	685		(12-16)	SM		Sandy SILT, brown, no waste	PID = 10
15			refusal at 15.3 with large 3.5" diameter tooling	SW		SAND, with fine gravel, trace silt, grayish brown	
	680					Bottom of borehole at 16.0 feet.	

SGP AND WELL CONSTRUCTION DETAILS



Geosyntec consultants

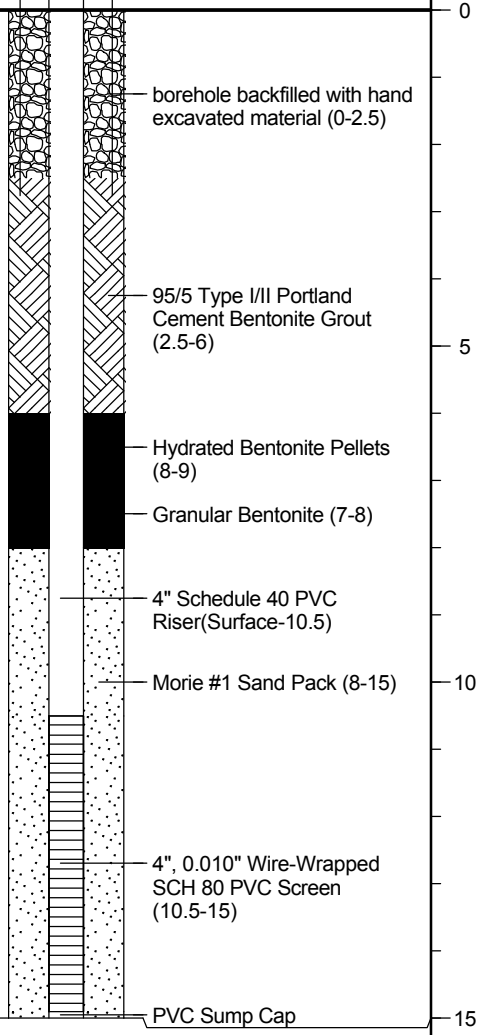
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SVE-1

CLIENT Cortese Landfill PRP Group
PROJECT NAME Cortese Landfill
PROJECT NUMBER MR0562B
PROJECT LOCATION Narrowsburg, NY
DATE STARTED 12/7/10 **COMPLETED** 12/9/10
Northing 1008653.6 ft **Easting** 337564.9 ft
DRILLER Parratt-Wolf
GROUND ELEVATION 698.9 ft **TOC ELEVATION** 700.86 ft
DRILLING METHOD Hollow Stem Auger
RIG TYPE D-90 **BORING DIAMETER** 10 in
SAMPLING METHOD Drill Cuttings
LOGGED BY Adam Gray **CHECKED BY** Robert Glazier
Notes No lithologic samples taken, interpretation made from drill cuttings on augers at surface.

DEPTH (ft)	ELEVATION (ft msl)	REMARKS	U.S.C.S.	MATERIAL DESCRIPTION	ENVIRONMENTAL DATA
0	695	Excavated to landfill liner by hand	SM	Silty Fine SAND, dark reddish brown (landfill cap/backfill)	
				LINER	
5			SM	Silty Fine SAND, dark reddish brown (landfill cap/backfill)	
10	690			some fine to coarse rounded gravels surfacing	PID = 30
15	685		SW	SAND, dark gray, evidence of some waste (plastic)	
	680			Bottom of borehole at 15.0 feet.	

SGP AND WELL CONSTRUCTION DETAILS



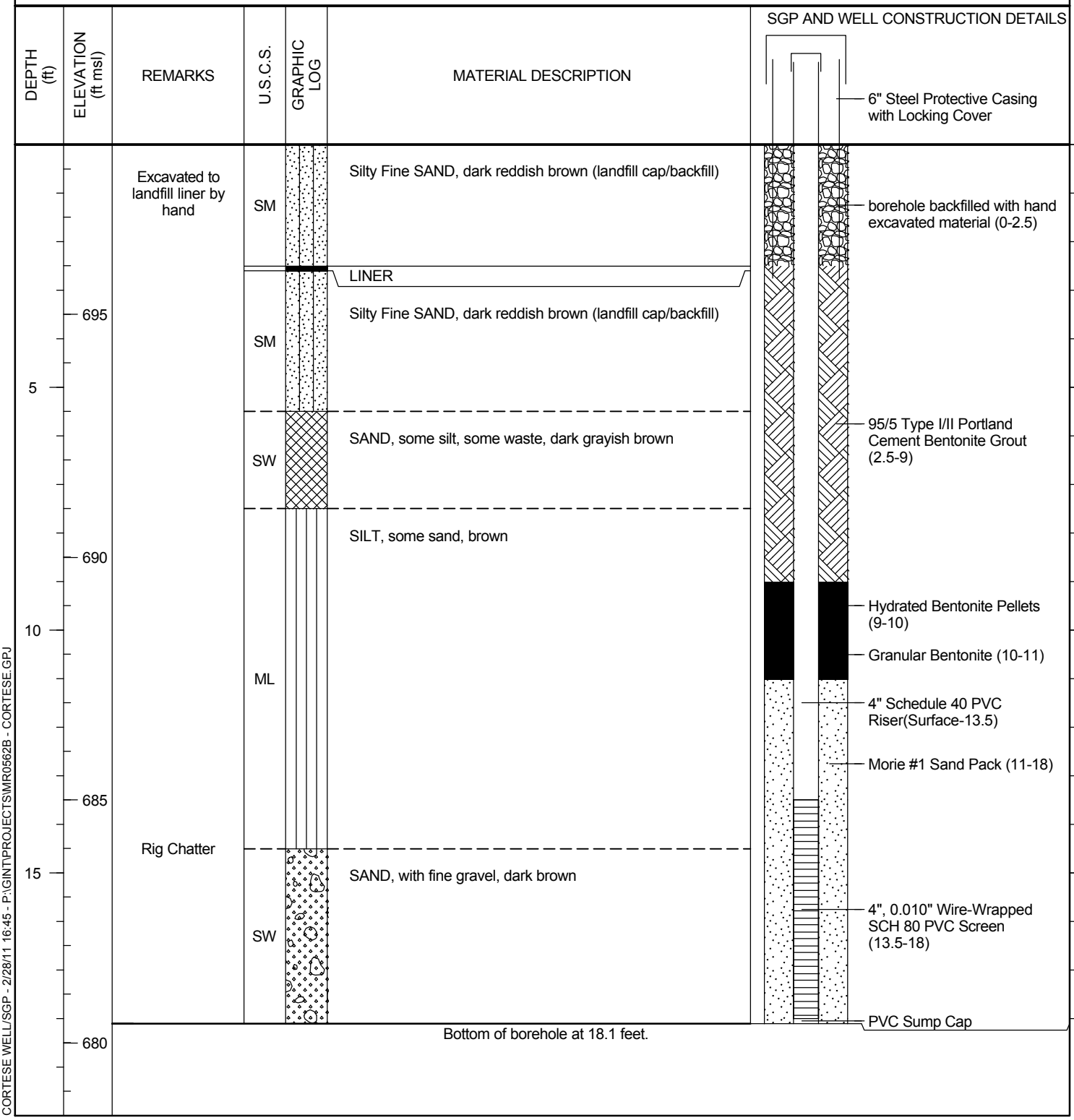
CORTESE WELL/SGP - 2/28/11 16:45 - P:\GINT\PROJECTS\MR0562B - CORTESE.GPJ

Geosyntec consultants

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SVE-2

CLIENT Cortese Landfill PRP Group
PROJECT NAME Cortese Landfill
PROJECT NUMBER MR0562B
PROJECT LOCATION Narrowsburg, NY
DATE STARTED 12/8/10 **COMPLETED** 12/9/10
Northing 1008676.2 ft **Easting** 337546.8 ft
DRILLER Parratt-Wolf
GROUND ELEVATION 698.5 ft **TOC ELEVATION** 700.38 ft
DRILLING METHOD Hollow Stem Auger
RIG TYPE D-90 **BORING DIAMETER** 10 in
SAMPLING METHOD Drill Cuttings
LOGGED BY Adam Gray **CHECKED BY** Robert Glazier
Notes No lithologic samples taken, interpretation made from drill cuttings on augers at surface.



CORTESE WELL/SGP - 2/28/11 16:45 - P:\GINT\PROJECTS\MR0562B - CORTESE.GPJ

Appendix B
Well Development Logs

Monitoring Well Development Log

Geosyntec consultants

Geosyntec Consultants
10220 Old Columbia Road
Columbia, MD 21046
PHONE (410)381-4333 FAX (410) 381-4499

Project Name: Cortese Landfill AS/SVE Install Date: 12/9/10 Page 1 of 1
Project Number: MA0562B
Field Personnel: A. Gray
Driller: Mark Eaves / Peter Wilson -> Parratt Wolf
Weather: 20s, clear
Monitoring Well ID: MW-17

Was the sand pack surged during installation? ☒ Yes ☐ No Casing Diameter: 2 ☒ inches ☐ centimeters

Measuring Point: ☒ Top of Inside Casing ☐ Ground Surface ☐ Top of Outer Casing ☐ Other:
Equipment Type: ☐ Bailer ☒ Pump Pump Type: Whale pump Pump Capacity: 3 ☒ gpm ☐ Lpm

Initial Depth to Bottom: 33.65 ft below measuring point – prior to well development ☒ soft ☐ hard
Final Depth to Bottom: 33.66 ft below measuring point – after well development ☐ soft ☒ hard

Initial Depth to Water: 24.78 ft below measuring point – prior to well development
Final Depth to Water: ~~23.45~~ 24.9 ft below measuring point – after well development

Purge water: ☐ to ground ☒ containerized in drums ☐ containerized in a poly tank ☐ other:

Time	Volume of Water Removed (gallons)	Depth to Water (ft)	Temperature (F)	Specific Conductance (µS/cm)	Turbidity (NTU)	pH (S.U.)	Comments
1059	~		Surge screen every 2 ft		->		start surge with Block
1113			8.44°C	814	7800	6.24	Start pumping 1gpm
		4			Cloudy		
1121	~10 g	25.25	10.39	702	7800	6.24	Surge with pump 2 gpm
1127							Surge with pump Cloudy
1134							Surge with pump Cloudy
1139	~73	25.15	10.66	682	405	6.27	Cloudy 5 gpm/pump
1144							Stop pump surge with Block
1153							Start pump
1200							Surge with pump Cloudy
1202							Surge with pump Cloudy
1206	~45		8.11°C	697	-	6.21	
1208					284		
1210					134		
1212		25.2	10.52	685	88	6.30	
1216	~55				56.7		Stop pumping Development
12/10/10 757							Start complete

Comments:

Monitoring Well Development Log

Geosyntec consultants

Geosyntec Consultants
10220 Old Columbia Road
Columbia, MD 21046
PHONE (410)381-4333 FAX (410) 381-4499

Project Name: Cortese Landfill
Project Number: MR0562B
Field Personnel: A. Gray
Driller: Mark Favez / Mike Wilson
Weather: 20s / clear

Date: 12/9/10 - 12/10 Page 1 of 2

Monitoring Well ID: AIW-1

Was the sand pack surged during installation? ☒ Yes ☐ No Casing Diameter: 2 ☒ inches ☐ centimeters (Schedule 80)

Measuring Point: ☒ Top of Inside Casing ☐ Ground Surface ☒ Top of Outer Casing ☐ Other:
Equipment Type: ☐ Bailer ☐ Pump Pump Type: _____ Pump Capacity: 3 ☒ gpm ☐ Lpm

Initial Depth to Bottom: ? ft below measuring point – prior to well development ☐ soft ☐ hard
Final Depth to Bottom: 40.0 ft below measuring point – after well development ☐ soft ☐ hard

Initial Depth to Water: 25.44 ft below measuring point – prior to well development 53.2 bgs
Final Depth to Water: 38.8 ft below measuring point – after well development

Purge water: ☐ to ground ☒ containerized in drums ☐ containerized in a poly tank ☐ other:_____

Time	Volume of Water Removed (gallons)	Depth to Water (ft)	Temperature (F)	Specific Conductance (µS/cm)	Turbidity (NTU)	pH (S.U.)	Comments
1334		25.44					Start Pump
1345		39.2	7.60	2550	7500	6.64	Brown
1347		water Below pump					Stop pump allow Recovery
1355		35.1					Start
1359		38.55					Stop
1409		34.05					Start pump
1413		39.65	8.71	2450	7800	6.61	Stop pump
1423		34.15					Start clearing
1427		7	9.40	1940	7500	6.52	Stop
1437		34.1					
1442		38.8					
1452		340	10.00	1440	7500	6.48	Start
1457		38.7					
1511		32.15					Start
1517	80 g	38.7					
1525		Surge Block	Stuck in well				
1600		PVC well casing cutoff to grab surge riser					
1615		Surge Block pulled from well.					
12/10/10			IDTW = 23.78	558	38.05	riser	was cut yesterday
757	Start	pumping					
803		37.1	9.88	1290	>800	6.08	Stop pumping

Comments: 0816 31.4

Monitoring Well Development Log

Geosyntec consultants

Geosyntec Consultants
10220 Old Columbia Road
Columbia, MD 21046
PHONE (410)381-4333 FAX (410) 381-4499

Project Name: _____
Project Number: _____
Field Personnel: _____
Driller: _____
Weather: _____

Date: 12/9 - 10/2010 Page 2 of 2

Monitoring Well ID: AIW-1

Was the sand pack surged during installation? ☐ Yes ☐ No Casing Diameter:_____ ☐ inches ☐ centimeters

Measuring Point: ☐ Top of Inside Casing ☐ Ground Surface ☐ Top of Outer Casing ☐ Other: _____
Equipment Type: ☐ Bailer ☐ Pump Pump Type: _____ Pump Capacity: _____ ☐ gpm ☐ Lpm

Initial Depth to Bottom: _____ ft below measuring point – prior to well development ☐ soft ☐ hard
Final Depth to Bottom: 40.0 ft below measuring point – after well development ☐ soft ☐ hard

Initial Depth to Water: _____ ft below measuring point – prior to well development
Final Depth to Water: _____ ft below measuring point – after well development

Purge water: ☐ to ground ☐ containerized in drums ☐ containerized in a poly tank ☐ other:_____

Time	Volume of Water Removed (gallons)	Depth to Water (ft)	Temperature (F)	Specific Conductance (µS/cm)	Turbidity (NTU)	pH (S.U.)	Comments
0820		~~31.1~~	57.1				Stop
0830		31.6					Start
0834		37.1					Stop
0845		30.3					Start
0850		37.1					Stop
0701		30.3					
0907		28.1					Start
0911		37.1	9.61	788	>800	6.23	Stop 800-1000
		Break from development while pw attaches					
		riser to pvc with glued coupler sch 40 pvc. No 80/ell					
		schedule 40 appx 1.5ft long					
1031		25.65					Start Surge w/pump
1040		38.6	7				Stop pump
1051		32.4	9.78	802	732	6.36	Start
1103		38.8	8.86	717	338	6.29	Stop pump
1114		32.15					Start pump
1118	≈40	38.8	9.92	713	373	6.33	Stop pump

Comments:

Appendix C
Well and Soil Gas Probe Survey Data

Cortese Landfill
Narrowsburg, New York
Monitor Well Locations and Elevations

Well Identifier	Northing	Easting	Ground Elevation	Top of Casing Elevation	Top of P.V.C. Elevation	Top of Pump Elevation	Top of P.V.C. Plug Elevation
AIW-1	1,008,657.8	337,566.3	698.9	701.31	700.99	N/A	N/A
BNP-1	1,008,547.4	337,543.8	693.4	697.04	697.45	N/A	N/A
BNP-2	1,008,528.5	337,530.3	693.4	697.02	696.77	N/A	N/A
EX-1	1,008,559.6	337,570.6	696.0	N/A	N/A	697.19	N/A
MW-1A	1,008,230.54	337,701.18	690.6	693.07	N/A	692.58	N/A
MW-1B	1,008,240.26	337,696.45	690.9	692.79	N/A	692.25	N/A
MW-1C	1,008,237.05	337,703.59	690.6	692.34	N/A	691.80	N/A
MW-2A	1,007,307.11	337,869.60	682.6	684.95	N/A	684.49	N/A
MW-2B	1,007,315.01	337,863.51	683.1	685.01	N/A	684.55	N/A
MW-3A	1,009,007.24	337,059.52	695.8	698.85	N/A	698.36	N/A
MW-3B	1,009,016.04	337,055.08	695.9	698.90	N/A	698.42	N/A
MW-4B	1,009,155.44	337,462.89	699.5	700.32	700.04	N/A	N/A
MW-5	1,008,738.66	337,220.92	695.6	697.54	697.04	N/A	N/A
MW-6A	1,008,081.29	337,449.05	692.1	693.77	693.50	N/A	N/A
MW-6B	1,008,075.48	337,441.06	692.0	695.30	N/A	695.00	N/A
MW-7A	1,007,752.79	337,744.34	692.6	694.73	N/A	694.12	N/A
MW-7B	1,007,746.31	337,747.30	692.0	693.82	N/A	693.52	N/A
MW-8A	1,007,670.73	337,945.62	687.9	692.01	N/A	691.15	N/A
MW-8B	1,007,681.64	337,944.67	688.0	691.31	N/A	690.59	N/A
MW-9	1,008,041.67	337,783.94	692.7	695.76	N/A	695.14	N/A
MW-10	1,008,727.82	337,478.50	694.3	694.76	N/A	693.91	N/A
MW-11	1,008,588.00	337,572.07	696.9	699.71	N/A	699.35	N/A
MW-12	1,008,667.5	337,569.3	699.0	701.45	701.25	N/A	N/A
MW-13	1,008,572.7	337,619.9	698.9	701.44	700.84	N/A	N/A
MW-14	1,008,712.9	337,526.1	698.4	701.07	700.70	N/A	N/A
MW-15	1,008,633.1	337,555.6	698.0	700.88	700.03	N/A	N/A
MW-16	1,008,656.6	337,592.4	699.5	701.66	701.16	N/A	N/A
MW-17	1,008,644.4	337,560.7	698.4	700.71	700.44	N/A	N/A
PZ-1	1,008,964.9	337,594.1	705.7	N/A	709.15	N/A	N/A
PZ-2	1,008,493.7	337,740.4	701.4	N/A	703.04	N/A	N/A
S-1	1,008,616.6	337,571.2	698.3	700.70	N/A	700.44	N/A
S-2	1,008,575.0	337,587.6	698.5	700.63	N/A	700.39	N/A
SGP-1	1,008,661.7	337,558.6	698.6	N/A	N/A	N/A	N/A
SGP-2C	1,008,655.2	337,566.9	698.9	701.34	N/A	N/A	700.69
SGP-3C	1,008,649.3	337,562.3	698.5	700.82	N/A	N/A	700.21
SGP-4C	1,008,639.9	337,558.8	698.1	700.31	N/A	N/A	699.81
SGP-5	1,008,665.5	337,555.3	698.6	N/A	N/A	N/A	N/A
SGP-6	1,008,670.0	337,552.7	698.6	N/A	N/A	N/A	N/A
SGP-7	1,008,683.5	337,538.0	698.3	701.54	N/A	N/A	701.09
SGP-8	1,008,695.2	337,531.6	698.2	700.55	N/A	N/A	700.11
SVE-1	1,008,653.6	337,564.9	698.9	701.23	700.86	N/A	N/A
SVE-2	1,008,676.2	337,546.8	698.5	700.76	700.38	N/A	N/A

Survey Control

BM DISK-2	1,008,057.3	337,778.0	692.83
BM DISK-3	1,008,979.93	337,383.97	694.93

Coordinates and elevations shown are referenced to BM DISK-2 as shown on a drawing titled "Final Conditions Plan Cortese Landfill Remediation Site" dated November 12, 1997, prepared by Environmental Research, Inc.

In monitor wells that contained pumps, elevations were recorded to the top of each pump.

THEW was instructed not to remove any P.V.C. plugs to obtain top of P.V.C. elevations and were instructed to obtain elevations to the top of each plug.

Appendix D
Off-Gas Laboratory Results

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

Job Number: 200-4315-1

SDG Number: Narrowburg, NY

Job Description: Cortese NPL site

For:
Geosyntec Consultants, Inc.
10220 Old Columbia Road
Suite A
Columbia, MD 21046

Attention: Mr. Aron Krasnopoler



Approved for release.
Joseph Carabillo
Project Manager I
4/7/2011 1:14 PM

Joseph Carabillo
Project Manager I
joseph.carabillo@testamericainc.com
04/07/2011
Revision: 1

The test results in this report relate only to sample(s) as received by the laboratory. These test results were derived under a quality system that adheres to the requirements of NELAC. Pursuant to NELAC, this report may not be produced in full without written approval from the laboratory

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CASE NARRATIVE

Client: Geosyntec Consultants, Inc.

Project: Cortese NPL site

Report Number: 200-4315-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

Trichloroethene was added to data set and provided in revision one of this report on 4/7/11.

RECEIPT

The samples were received on 03/18/2011; the samples arrived in good condition. The temperature of the coolers at receipt was ambient.

HELIUM

Sample AS-SP3 was analyzed for Helium in accordance with ASTM D1946 (MOD). The sample was analyzed on 03/28/2011.

No difficulties were encountered during the Helium analysis.

All quality control parameters were within the acceptance limits.

VOLATILE ORGANIC COMPOUNDS

Samples SVE-SP1, SVE-SP2, SVE-SP3, AS-SP1, AS-SP2 and AS-SP3 were analyzed for Volatile Organic Compounds in accordance with EPA Method TO-15. The samples were analyzed on 03/26/2011 and 03/29/2011.

Samples SVE-SP1[15300X], SVE-SP2[6860X], AS-SP1[14000X], AS-SP2[6900X] and AS-SP3[4X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No difficulties were encountered during the VOC analyses.

All quality control parameters were within the acceptance limits.

GC VOA MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Instrument ID: 2866.i Analysis Batch Number: 4164

Lab Sample ID: IC 200-4164/2 Client Sample ID:

Date Analyzed: 06/08/10 08:48 Lab File ID: 08jun100839-r021.d GC Column: CTR-1 ID: 3.175(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Helium	0.90	Peak not found by the data system	pd	06/08/10 09:49

Lab Sample ID: IC 200-4164/3 Client Sample ID:

Date Analyzed: 06/08/10 08:53 Lab File ID: 08jun100839-r031.d GC Column: CTR-1 ID: 3.175(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Helium	0.87	Baseline event	pd	06/08/10 09:50

Lab Sample ID: ICRT 200-4164/4 Client Sample ID:

Date Analyzed: 06/08/10 08:57 Lab File ID: 08jun100839-r041.d GC Column: CTR-1 ID: 3.175(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Helium	0.88	Baseline event	pd	06/08/10 09:47

Lab Sample ID: IC 200-4164/5 Client Sample ID:

Date Analyzed: 06/08/10 09:01 Lab File ID: 08jun100839-r051.d GC Column: CTR-1 ID: 3.175(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Helium	0.93	Baseline event	pd	06/08/10 09:51

Lab Sample ID: IC 200-4164/7 Client Sample ID:

Date Analyzed: 06/08/10 09:40 Lab File ID: 08jun100938-r011.d GC Column: CTR-1 ID: 3.175(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Helium	0.96	Peak not found by the data system	pd	06/08/10 09:52

D1946

GC VOA MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Instrument ID: 2866.i Analysis Batch Number: 4164

Lab Sample ID: ICV 200-4164/8 Client Sample ID:

Date Analyzed: 06/08/10 09:57 Lab File ID: 08jun100957-r011.d GC Column: CTR-1 ID: 3.175(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Helium	0.92	Baseline event	pd	06/08/10 10:08

GC VOA MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Instrument ID: 2866.i Analysis Batch Number: 15706

Lab Sample ID: CCVC 200-15706/6 Client Sample ID:

Date Analyzed: 03/28/11 14:26 Lab File ID: 28ma111426-r011.d GC Column: CTR-1 ID: 3.175(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Helium	0.86	Baseline event	mrv	03/28/11 14:46

AIR - GC/MS VOA MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Instrument ID: C.i Analysis Batch Number: 15760

Lab Sample ID: 200-4315-5 Client Sample ID: AS-SP2

Date Analyzed: 03/26/11 04:24 Lab File ID: cjrc014.d GC Column: RTX-624 ID: 0.32(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Chloroform	10.20	Peak not found by the data system	klp	03/30/11 10:16

AIR - GC/MS VOA MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Instrument ID: G.i Analysis Batch Number: 14625

Lab Sample ID: IC 200-14625/3 Client Sample ID:

Date Analyzed: 03/02/11 15:57 Lab File ID: gff003.d GC Column: RTX-624 ID: 0.32(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
1,1-Dichloroethane	8.27	Baseline event	sv	03/02/11 22:52

SAMPLE SUMMARY

Client: Geosyntec Consultants, Inc.

Job Number: 200-4315-1
Sdg Number: Narrowburg, NY

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
200-4315-1	SVE-SP1	Air	03/09/2011 1638	03/18/2011 1045
200-4315-2	SVE-SP2	Air	03/09/2011 1637	03/18/2011 1045
200-4315-3	SVE-SP3	Air	03/09/2011 1639	03/18/2011 1045
200-4315-4	AS-SP1	Air	03/15/2011 1555	03/18/2011 1045
200-4315-5	AS-SP2	Air	03/15/2011 1555	03/18/2011 1045
200-4315-6	AS-SP3	Air	03/15/2011 1555	03/18/2011 1045

METHOD SUMMARY

Client: Geosyntec Consultants, Inc.

Job Number: 200-4315-1
Sdg Number: Narrowburg, NY

Description	Lab Location	Method	Preparation Method
Matrix Air			
Fixed Gases (Helium)	TAL BUR	ASTM D1946	
Collection via Summa Canister	TAL BUR		Summa Canister
Volatile Organic Compounds in Ambient Air	TAL BUR	EPA TO-15	
Collection via Summa Canister	TAL BUR		Summa Canister

Lab References:

TAL BUR = TestAmerica Burlington

Method References:

ASTM = ASTM International

EPA = US Environmental Protection Agency

METHOD / ANALYST SUMMARY

Client: Geosyntec Consultants, Inc.

Job Number: 200-4315-1
Sdg Number: Narrowburg, NY

Method	Analyst	Analyst ID
ASTM D1946	Veilleux, Michael R	MRV
EPA TO-15	Desjardins, William R	WRD
EPA TO-15	Valjevac, Sanel	SV

Client: Geosyntec Consultants, Inc.

Job Number: 200-4315-1
Sdg Number: Narrowburg, NY

Client Sample ID: **AS-SP3**

Lab Sample ID: 200-4315-6
Client Matrix: Air

Date Sampled: 03/15/2011 1555
Date Received: 03/18/2011 1045

D1946 Fixed Gases (Helium)

Analysis Method:	D1946	Analysis Batch:	200-15706	Instrument ID:	2866.i
Prep Method:	Summa Canister	Prep Batch:	N/A	Lab File ID:	28ma111402-r011.d
Dilution:	1.4			Initial Weight/Volume:	300 uL
Analysis Date:	03/28/2011 1403			Final Weight/Volume:	300 uL
Prep Date:	03/28/2011 1403			Injection Volume:	300 uL

Analyte	Result (% v/v)	Qualifier	RL
Helium	13		0.24

Client: Geosyntec Consultants, Inc.

Job Number: 200-4315-1
Sdg Number: Narrowburg, NY

Client Sample ID: **SVE-SP1**

Lab Sample ID: 200-4315-1
Client Matrix: Air

Date Sampled: 03/09/2011 1638
Date Received: 03/18/2011 1045

TO-15 Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-15	Analysis Batch:	200-15760	Instrument ID:	C.i
Prep Method:	Summa Canister	Prep Batch:	N/A	Lab File ID:	cjrc010.d
Dilution:	15300			Initial Weight/Volume:	13 mL
Analysis Date:	03/26/2011 0111			Final Weight/Volume:	200 mL
Prep Date:	03/26/2011 0111			Injection Volume:	200 mL

Analyte	Result (ppb v/v)	Qualifier	RL
Benzene	3600		3100
Bromoform	3100	U	3100
Bromomethane	3100	U	3100
Carbon disulfide	7600	U	7600
Carbon tetrachloride	3100	U	3100
Chlorobenzene	3100	U	3100
Chloroethane	7600		7600
Chloroform	3900		3100
Chloromethane	7600	U	7600
1,4-Dichlorobenzene	3100	U	3100
1,1-Dichloroethane	20000		3100
1,2-Dichloroethane	3100	U	3100
1,1-Dichloroethene	3100	U	3100
1,2-Dichloropropane	3100	U	3100
1,4-Dioxane	76000	U	76000
Ethylbenzene	3100	U	3100
Hexachlorobutadiene	3100	U	3100
Methylene Chloride	24000		7600
Naphthalene	7600	U	7600
Styrene	3100	U	3100
1,1,2,2-Tetrachloroethane	3100	U	3100
Tetrachloroethene	8100		3100
Toluene	180000		3100
1,2,4-Trichlorobenzene	7600	U	7600
1,1,1-Trichloroethane	60000		3100
1,1,2-Trichloroethane	3100	U	3100
Vinyl chloride	57000		3100
Xylene (total)	9500		3100
Trichloroethene	420000		3100

Analyte	Result (ug/m3)	Qualifier	RL
Benzene	12000		9800
Bromoform	32000	U	32000
Bromomethane	12000	U	12000
Carbon disulfide	24000	U	24000
Carbon tetrachloride	19000	U	19000
Chlorobenzene	14000	U	14000
Chloroethane	20000		20000
Chloroform	19000		15000
Chloromethane	16000	U	16000
1,4-Dichlorobenzene	18000	U	18000
1,1-Dichloroethane	79000		12000
1,2-Dichloroethane	12000	U	12000
1,1-Dichloroethene	12000	U	12000
1,2-Dichloropropane	14000	U	14000
1,4-Dioxane	280000	U	280000

Client: Geosyntec Consultants, Inc.

Job Number: 200-4315-1
Sdg Number: Narrowburg, NY

Client Sample ID: **SVE-SP1**

Lab Sample ID: 200-4315-1
Client Matrix: Air

Date Sampled: 03/09/2011 1638
Date Received: 03/18/2011 1045

TO-15 Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-15	Analysis Batch:	200-15760	Instrument ID:	C.i
Prep Method:	Summa Canister	Prep Batch:	N/A	Lab File ID:	cjrc010.d
Dilution:	15300			Initial Weight/Volume:	13 mL
Analysis Date:	03/26/2011 0111			Final Weight/Volume:	200 mL
Prep Date:	03/26/2011 0111			Injection Volume:	200 mL

Analyte	Result (ug/m3)	Qualifier	RL
Ethylbenzene	13000	U	13000
Hexachlorobutadiene	33000	U	33000
Methylene Chloride	85000		27000
Naphthalene	40000	U	40000
Styrene	13000	U	13000
1,1,2,2-Tetrachloroethane	21000	U	21000
Tetrachloroethene	55000		21000
Toluene	680000		12000
1,2,4-Trichlorobenzene	57000	U	57000
1,1,1-Trichloroethane	330000		17000
1,1,2-Trichloroethane	17000	U	17000
Vinyl chloride	150000		7800
Xylene (total)	41000		13000
Trichloroethene	2300000		16000

Client: Geosyntec Consultants, Inc.

Job Number: 200-4315-1
Sdg Number: Narrowburg, NY

Client Sample ID: **SVE-SP2**

Lab Sample ID: 200-4315-2
Client Matrix: Air

Date Sampled: 03/09/2011 1637
Date Received: 03/18/2011 1045

TO-15 Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-15	Analysis Batch:	200-15760	Instrument ID:	C.i
Prep Method:	Summa Canister	Prep Batch:	N/A	Lab File ID:	cjrc011.d
Dilution:	6860			Initial Weight/Volume:	22 mL
Analysis Date:	03/26/2011 0159			Final Weight/Volume:	200 mL
Prep Date:	03/26/2011 0159			Injection Volume:	200 mL

Analyte	Result (ppb v/v)	Qualifier	RL
Benzene	1400	U	1400
Bromoform	1400	U	1400
Bromomethane	1400	U	1400
Carbon disulfide	3400	U	3400
Carbon tetrachloride	1400	U	1400
Chlorobenzene	1400	U	1400
Chloroethane	3400	U	3400
Chloroform	1400	U	1400
Chloromethane	3400	U	3400
1,4-Dichlorobenzene	1400	U	1400
1,1-Dichloroethane	7100		1400
1,2-Dichloroethane	1400	U	1400
1,1-Dichloroethene	1400	U	1400
1,2-Dichloropropane	1400	U	1400
1,4-Dioxane	34000	U	34000
Ethylbenzene	1400	U	1400
Hexachlorobutadiene	1400	U	1400
Methylene Chloride	8400		3400
Naphthalene	3400	U	3400
Styrene	1400	U	1400
1,1,2,2-Tetrachloroethane	1400	U	1400
Tetrachloroethene	2900		1400
Toluene	64000		1400
1,2,4-Trichlorobenzene	3400	U	3400
1,1,1-Trichloroethane	21000		1400
1,1,2-Trichloroethane	1400	U	1400
Vinyl chloride	20000		1400
Xylene (total)	4000		1400
Trichloroethene	150000		1400

Analyte	Result (ug/m3)	Qualifier	RL
Benzene	4400	U	4400
Bromoform	14000	U	14000
Bromomethane	5300	U	5300
Carbon disulfide	11000	U	11000
Carbon tetrachloride	8600	U	8600
Chlorobenzene	6300	U	6300
Chloroethane	9100	U	9100
Chloroform	6700	U	6700
Chloromethane	7100	U	7100
1,4-Dichlorobenzene	8200	U	8200
1,1-Dichloroethane	29000		5600
1,2-Dichloroethane	5600	U	5600
1,1-Dichloroethene	5400	U	5400
1,2-Dichloropropane	6300	U	6300
1,4-Dioxane	120000	U	120000

Client: Geosyntec Consultants, Inc.

Job Number: 200-4315-1
Sdg Number: Narrowburg, NY

Client Sample ID: **SVE-SP2**

Lab Sample ID: 200-4315-2
Client Matrix: Air

Date Sampled: 03/09/2011 1637
Date Received: 03/18/2011 1045

TO-15 Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-15	Analysis Batch:	200-15760	Instrument ID:	C.i
Prep Method:	Summa Canister	Prep Batch:	N/A	Lab File ID:	cjrc011.d
Dilution:	6860			Initial Weight/Volume:	22 mL
Analysis Date:	03/26/2011 0159			Final Weight/Volume:	200 mL
Prep Date:	03/26/2011 0159			Injection Volume:	200 mL

Analyte	Result (ug/m3)	Qualifier	RL
Ethylbenzene	6000	U	6000
Hexachlorobutadiene	15000	U	15000
Methylene Chloride	29000		12000
Naphthalene	18000	U	18000
Styrene	5800	U	5800
1,1,2,2-Tetrachloroethane	9400	U	9400
Tetrachloroethene	19000		9300
Toluene	240000		5200
1,2,4-Trichlorobenzene	25000	U	25000
1,1,1-Trichloroethane	120000		7500
1,1,2-Trichloroethane	7500	U	7500
Vinyl chloride	50000		3500
Xylene (total)	17000		6000
Trichloroethene	810000		7400

Client: Geosyntec Consultants, Inc.

Job Number: 200-4315-1
Sdg Number: Narrowburg, NY

Client Sample ID: **SVE-SP3**

Lab Sample ID: 200-4315-3
Client Matrix: Air

Date Sampled: 03/09/2011 1639
Date Received: 03/18/2011 1045

TO-15 Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-15	Analysis Batch:	200-15760	Instrument ID:	C.i
Prep Method:	Summa Canister	Prep Batch:	N/A	Lab File ID:	cjrc012.d
Dilution:	1.0			Initial Weight/Volume:	200 mL
Analysis Date:	03/26/2011 0247			Final Weight/Volume:	200 mL
Prep Date:	03/26/2011 0247			Injection Volume:	200 mL

Analyte	Result (ppb v/v)	Qualifier	RL
Benzene	0.20	U	0.20
Bromoform	0.20	U	0.20
Bromomethane	0.20	U	0.20
Carbon disulfide	0.50	U	0.50
Carbon tetrachloride	0.20	U	0.20
Chlorobenzene	0.20	U	0.20
Chloroethane	0.50	U	0.50
Chloroform	0.20	U	0.20
Chloromethane	4.4		0.50
1,4-Dichlorobenzene	0.20	U	0.20
1,1-Dichloroethane	0.20	U	0.20
1,2-Dichloroethane	0.20	U	0.20
1,1-Dichloroethene	0.20	U	0.20
1,2-Dichloropropane	0.20	U	0.20
1,4-Dioxane	5.0	U	5.0
Ethylbenzene	0.20	U	0.20
Hexachlorobutadiene	0.20	U	0.20
Methylene Chloride	0.50	U	0.50
Naphthalene	0.50	U	0.50
Styrene	0.20	U	0.20
1,1,2,2-Tetrachloroethane	0.20	U	0.20
Tetrachloroethene	0.20	U	0.20
Toluene	0.63		0.20
1,2,4-Trichlorobenzene	0.50	U	0.50
1,1,1-Trichloroethane	0.20	U	0.20
1,1,2-Trichloroethane	0.20	U	0.20
Vinyl chloride	0.20	U	0.20
Xylene (total)	0.20	U	0.20
Trichloroethene	1.1		0.20

Analyte	Result (ug/m3)	Qualifier	RL
Benzene	0.64	U	0.64
Bromoform	2.1	U	2.1
Bromomethane	0.78	U	0.78
Carbon disulfide	1.6	U	1.6
Carbon tetrachloride	1.3	U	1.3
Chlorobenzene	0.92	U	0.92
Chloroethane	1.3	U	1.3
Chloroform	0.98	U	0.98
Chloromethane	9.0		1.0
1,4-Dichlorobenzene	1.2	U	1.2
1,1-Dichloroethane	0.81	U	0.81
1,2-Dichloroethane	0.81	U	0.81
1,1-Dichloroethene	0.79	U	0.79
1,2-Dichloropropane	0.92	U	0.92
1,4-Dioxane	18	U	18

Client: Geosyntec Consultants, Inc.

Job Number: 200-4315-1
Sdg Number: Narrowburg, NY

Client Sample ID: **SVE-SP3**

Lab Sample ID: 200-4315-3
Client Matrix: Air

Date Sampled: 03/09/2011 1639
Date Received: 03/18/2011 1045

TO-15 Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-15	Analysis Batch:	200-15760	Instrument ID:	C.i
Prep Method:	Summa Canister	Prep Batch:	N/A	Lab File ID:	cjrc012.d
Dilution:	1.0			Initial Weight/Volume:	200 mL
Analysis Date:	03/26/2011 0247			Final Weight/Volume:	200 mL
Prep Date:	03/26/2011 0247			Injection Volume:	200 mL

Analyte	Result (ug/m3)	Qualifier	RL
Ethylbenzene	0.87	U	0.87
Hexachlorobutadiene	2.1	U	2.1
Methylene Chloride	1.7	U	1.7
Naphthalene	2.6	U	2.6
Styrene	0.85	U	0.85
1,1,2,2-Tetrachloroethane	1.4	U	1.4
Tetrachloroethene	1.4	U	1.4
Toluene	2.4		0.75
1,2,4-Trichlorobenzene	3.7	U	3.7
1,1,1-Trichloroethane	1.1	U	1.1
1,1,2-Trichloroethane	1.1	U	1.1
Vinyl chloride	0.51	U	0.51
Xylene (total)	0.87	U	0.87
Trichloroethene	5.8		1.1

Client: Geosyntec Consultants, Inc.

Job Number: 200-4315-1
Sdg Number: Narrowburg, NY

Client Sample ID: **AS-SP1**

Lab Sample ID: 200-4315-4
Client Matrix: Air

Date Sampled: 03/15/2011 1555
Date Received: 03/18/2011 1045

TO-15 Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-15	Analysis Batch:	200-15760	Instrument ID:	C.i
Prep Method:	Summa Canister	Prep Batch:	N/A	Lab File ID:	cjrc013.d
Dilution:	14000			Initial Weight/Volume:	40 mL
Analysis Date:	03/26/2011 0336			Final Weight/Volume:	200 mL
Prep Date:	03/26/2011 0336			Injection Volume:	200 mL

Analyte	Result (ppb v/v)	Qualifier	RL
Benzene	4600		2800
Bromoform	2800	U	2800
Bromomethane	2800	U	2800
Carbon disulfide	7000	U	7000
Carbon tetrachloride	2800	U	2800
Chlorobenzene	2800	U	2800
Chloroethane	9900		7000
Chloroform	2800	U	2800
Chloromethane	7000	U	7000
1,4-Dichlorobenzene	2800	U	2800
1,1-Dichloroethane	19000		2800
1,2-Dichloroethane	2800	U	2800
1,1-Dichloroethene	2800	U	2800
1,2-Dichloropropane	2800	U	2800
1,4-Dioxane	70000	U	70000
Ethylbenzene	4800		2800
Hexachlorobutadiene	2800	U	2800
Methylene Chloride	13000		7000
Naphthalene	7000	U	7000
Styrene	2800	U	2800
1,1,2,2-Tetrachloroethane	2800	U	2800
Tetrachloroethene	9800		2800
Toluene	200000		2800
1,2,4-Trichlorobenzene	7000	U	7000
1,1,1-Trichloroethane	81000		2800
1,1,2-Trichloroethane	2800	U	2800
Vinyl chloride	39000		2800
Xylene (total)	17000		2800
Trichloroethene	260000		2800

Analyte	Result (ug/m3)	Qualifier	RL
Benzene	15000		8900
Bromoform	29000	U	29000
Bromomethane	11000	U	11000
Carbon disulfide	22000	U	22000
Carbon tetrachloride	18000	U	18000
Chlorobenzene	13000	U	13000
Chloroethane	26000		18000
Chloroform	14000	U	14000
Chloromethane	14000	U	14000
1,4-Dichlorobenzene	17000	U	17000
1,1-Dichloroethane	77000		11000
1,2-Dichloroethane	11000	U	11000
1,1-Dichloroethene	11000	U	11000
1,2-Dichloropropane	13000	U	13000
1,4-Dioxane	250000	U	250000

Client: Geosyntec Consultants, Inc.

Job Number: 200-4315-1
Sdg Number: Narrowburg, NY

Client Sample ID: **AS-SP1**

Lab Sample ID: 200-4315-4
Client Matrix: Air

Date Sampled: 03/15/2011 1555
Date Received: 03/18/2011 1045

TO-15 Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-15	Analysis Batch:	200-15760	Instrument ID:	C.i
Prep Method:	Summa Canister	Prep Batch:	N/A	Lab File ID:	cjrc013.d
Dilution:	14000			Initial Weight/Volume:	40 mL
Analysis Date:	03/26/2011 0336			Final Weight/Volume:	200 mL
Prep Date:	03/26/2011 0336			Injection Volume:	200 mL

Analyte	Result (ug/m3)	Qualifier	RL
Ethylbenzene	21000		12000
Hexachlorobutadiene	30000	U	30000
Methylene Chloride	46000		24000
Naphthalene	37000	U	37000
Styrene	12000	U	12000
1,1,2,2-Tetrachloroethane	19000	U	19000
Tetrachloroethene	67000		19000
Toluene	750000		11000
1,2,4-Trichlorobenzene	52000	U	52000
1,1,1-Trichloroethane	440000		15000
1,1,2-Trichloroethane	15000	U	15000
Vinyl chloride	100000		7200
Xylene (total)	75000		12000
Trichloroethene	1400000		15000

Client: Geosyntec Consultants, Inc.

Job Number: 200-4315-1
Sdg Number: Narrowburg, NY

Client Sample ID: **AS-SP2**

Lab Sample ID: 200-4315-5
Client Matrix: Air

Date Sampled: 03/15/2011 1555
Date Received: 03/18/2011 1045

TO-15 Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-15	Analysis Batch:	200-15760	Instrument ID:	C.i
Prep Method:	Summa Canister	Prep Batch:	N/A	Lab File ID:	cjrc014.d
Dilution:	6900			Initial Weight/Volume:	26 mL
Analysis Date:	03/26/2011 0424			Final Weight/Volume:	200 mL
Prep Date:	03/26/2011 0424			Injection Volume:	200 mL

Analyte	Result (ppb v/v)	Qualifier	RL
Benzene	2300		1400
Bromoform	1400	U	1400
Bromomethane	1400	U	1400
Carbon disulfide	3400	U	3400
Carbon tetrachloride	1400	U	1400
Chlorobenzene	1400	U	1400
Chloroethane	4800		3400
Chloroform	1400	U	1400
Chloromethane	3400	U	3400
1,4-Dichlorobenzene	1400	U	1400
1,1-Dichloroethane	9500		1400
1,2-Dichloroethane	1400	U	1400
1,1-Dichloroethene	1400	U	1400
1,2-Dichloropropane	1400	U	1400
1,4-Dioxane	34000	U	34000
Ethylbenzene	2200		1400
Hexachlorobutadiene	1400	U	1400
Methylene Chloride	6400		3400
Naphthalene	3400	U	3400
Styrene	1400	U	1400
1,1,2,2-Tetrachloroethane	1400	U	1400
Tetrachloroethene	4800		1400
Toluene	97000		1400
1,2,4-Trichlorobenzene	3400	U	3400
1,1,1-Trichloroethane	40000		1400
1,1,2-Trichloroethane	1400	U	1400
Vinyl chloride	20000		1400
Xylene (total)	7600		1400
Trichloroethene	130000		1400

Analyte	Result (ug/m3)	Qualifier	RL
Benzene	7500		4400
Bromoform	14000	U	14000
Bromomethane	5400	U	5400
Carbon disulfide	11000	U	11000
Carbon tetrachloride	8700	U	8700
Chlorobenzene	6300	U	6300
Chloroethane	13000		9100
Chloroform	6700	U	6700
Chloromethane	7100	U	7100
1,4-Dichlorobenzene	8300	U	8300
1,1-Dichloroethane	38000		5600
1,2-Dichloroethane	5600	U	5600
1,1-Dichloroethene	5500	U	5500
1,2-Dichloropropane	6400	U	6400
1,4-Dioxane	120000	U	120000

Client: Geosyntec Consultants, Inc.

Job Number: 200-4315-1
Sdg Number: Narrowburg, NY

Client Sample ID: **AS-SP2**

Lab Sample ID: 200-4315-5
Client Matrix: Air

Date Sampled: 03/15/2011 1555
Date Received: 03/18/2011 1045

TO-15 Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-15	Analysis Batch:	200-15760	Instrument ID:	C.i
Prep Method:	Summa Canister	Prep Batch:	N/A	Lab File ID:	cjrc014.d
Dilution:	6900			Initial Weight/Volume:	26 mL
Analysis Date:	03/26/2011 0424			Final Weight/Volume:	200 mL
Prep Date:	03/26/2011 0424			Injection Volume:	200 mL

Analyte	Result (ug/m3)	Qualifier	RL
Ethylbenzene	9600		6000
Hexachlorobutadiene	15000	U	15000
Methylene Chloride	22000		12000
Naphthalene	18000	U	18000
Styrene	5900	U	5900
1,1,2,2-Tetrachloroethane	9500	U	9500
Tetrachloroethene	33000		9400
Toluene	370000		5200
1,2,4-Trichlorobenzene	26000	U	26000
1,1,1-Trichloroethane	220000		7500
1,1,2-Trichloroethane	7500	U	7500
Vinyl chloride	52000		3500
Xylene (total)	33000		6000
Trichloroethene	690000		7400

Client: Geosyntec Consultants, Inc.

Job Number: 200-4315-1
Sdg Number: Narrowburg, NY

Client Sample ID: **AS-SP3**

Lab Sample ID: 200-4315-6
Client Matrix: Air

Date Sampled: 03/15/2011 1555
Date Received: 03/18/2011 1045

TO-15 Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-15	Analysis Batch:	200-15787	Instrument ID:	G.i
Prep Method:	Summa Canister	Prep Batch:	N/A	Lab File ID:	gffv005.d
Dilution:	3.97			Initial Weight/Volume:	69 mL
Analysis Date:	03/29/2011 1429			Final Weight/Volume:	200 mL
Prep Date:	03/29/2011 1429			Injection Volume:	200 mL

Analyte	Result (ppb v/v)	Qualifier	RL
Benzene	0.79	U	0.79
Bromoform	0.79	U	0.79
Bromomethane	0.79	U	0.79
Carbon disulfide	2.0	U	2.0
Carbon tetrachloride	0.79	U	0.79
Chlorobenzene	0.79	U	0.79
Chloroethane	2.0	U	2.0
Chloroform	0.79	U	0.79
Chloromethane	3.8		2.0
1,4-Dichlorobenzene	0.79	U	0.79
1,1-Dichloroethane	0.79	U	0.79
1,2-Dichloroethane	0.79	U	0.79
1,1-Dichloroethene	0.79	U	0.79
1,2-Dichloropropane	0.79	U	0.79
1,4-Dioxane	20	U	20
Ethylbenzene	0.79	U	0.79
Hexachlorobutadiene	0.79	U	0.79
Methylene Chloride	2.0	U	2.0
Naphthalene	2.0	U	2.0
Styrene	0.79	U	0.79
1,1,2,2-Tetrachloroethane	0.79	U	0.79
Tetrachloroethene	0.79	U	0.79
Toluene	0.87		0.79
1,2,4-Trichlorobenzene	2.0	U	2.0
1,1,1-Trichloroethane	0.79	U	0.79
1,1,2-Trichloroethane	0.79	U	0.79
Vinyl chloride	120		0.79
Xylene (total)	0.79	U	0.79
Trichloroethene	2.0		0.79

Analyte	Result (ug/m3)	Qualifier	RL
Benzene	2.5	U	2.5
Bromoform	8.2	U	8.2
Bromomethane	3.1	U	3.1
Carbon disulfide	6.2	U	6.2
Carbon tetrachloride	5.0	U	5.0
Chlorobenzene	3.6	U	3.6
Chloroethane	5.2	U	5.2
Chloroform	3.9	U	3.9
Chloromethane	7.8		4.1
1,4-Dichlorobenzene	4.8	U	4.8
1,1-Dichloroethane	3.2	U	3.2
1,2-Dichloroethane	3.2	U	3.2
1,1-Dichloroethene	3.1	U	3.1
1,2-Dichloropropane	3.7	U	3.7
1,4-Dioxane	72	U	72

Client: Geosyntec Consultants, Inc.

Job Number: 200-4315-1
Sdg Number: Narrowburg, NY

Client Sample ID: **AS-SP3**

Lab Sample ID: 200-4315-6
Client Matrix: Air

Date Sampled: 03/15/2011 1555
Date Received: 03/18/2011 1045

TO-15 Volatile Organic Compounds in Ambient Air

Analysis Method:	TO-15	Analysis Batch:	200-15787	Instrument ID:	G.i
Prep Method:	Summa Canister	Prep Batch:	N/A	Lab File ID:	gffv005.d
Dilution:	3.97			Initial Weight/Volume:	69 mL
Analysis Date:	03/29/2011 1429			Final Weight/Volume:	200 mL
Prep Date:	03/29/2011 1429			Injection Volume:	200 mL

Analyte	Result (ug/m3)	Qualifier	RL
Ethylbenzene	3.4	U	3.4
Hexachlorobutadiene	8.5	U	8.5
Methylene Chloride	6.9	U	6.9
Naphthalene	10	U	10
Styrene	3.4	U	3.4
1,1,2,2-Tetrachloroethane	5.5	U	5.5
Tetrachloroethene	5.4	U	5.4
Toluene	3.3		3.0
1,2,4-Trichlorobenzene	15	U	15
1,1,1-Trichloroethane	4.3	U	4.3
1,1,2-Trichloroethane	4.3	U	4.3
Vinyl chloride	300		2.0
Xylene (total)	3.4	U	3.4
Trichloroethene	11		4.3

Client: Geosyntec Consultants, Inc.

Job Number: 200-4315-1
Sdg Number: Narrowburg, NY

Method Blank - Batch: 200-15706

Method: D1946
Preparation: Summa Canister

Lab Sample ID:	MB 200-15706/3	Analysis Batch:	200-15706	Instrument ID:	2866.i
Client Matrix:	Air	Prep Batch:	N/A	Lab File ID:	28ma111343-r021.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	300 uL
Analysis Date:	03/28/2011 1353	Units:	% v/v	Final Weight/Volume:	300 uL
Prep Date:	03/28/2011 1353			Injection Volume:	300 uL
Leach Date:	N/A				

Analyte	Result	Qual	RL
Helium	0.17	U	0.17

Lab Control Sample - Batch: 200-15706

Method: D1946
Preparation: Summa Canister

Lab Sample ID:	LCS 200-15706/2	Analysis Batch:	200-15706	Instrument ID:	2866.i
Client Matrix:	Air	Prep Batch:	N/A	Lab File ID:	28ma111343-r011.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	300 uL
Analysis Date:	03/28/2011 1344	Units:	% v/v	Final Weight/Volume:	300 uL
Prep Date:	03/28/2011 1344			Injection Volume:	300 uL
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Helium	5.00	5.13	103	70 - 130	

Client: Geosyntec Consultants, Inc.

Job Number: 200-4315-1
Sdg Number: Narrowburg, NY

Method Blank - Batch: 200-15760

Method: TO-15
Preparation: Summa Canister

Lab Sample ID:	MB 200-15760/6	Analysis Batch:	200-15760	Instrument ID:	C.i
Client Matrix:	Air	Prep Batch:	N/A	Lab File ID:	cjrc006.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	200 mL
Analysis Date:	03/25/2011 2158	Units:	ppb v/v	Final Weight/Volume:	200 mL
Prep Date:	03/25/2011 2158			Injection Volume:	200 mL
Leach Date:	N/A				

Analyte	Result	Qual	RL
Benzene	0.20	U	0.20
Bromoform	0.20	U	0.20
Bromomethane	0.20	U	0.20
Carbon disulfide	0.50	U	0.50
Carbon tetrachloride	0.20	U	0.20
Chlorobenzene	0.20	U	0.20
Chloroethane	0.50	U	0.50
Chloroform	0.20	U	0.20
Chloromethane	0.50	U	0.50
1,4-Dichlorobenzene	0.20	U	0.20
1,1-Dichloroethane	0.20	U	0.20
1,2-Dichloroethane	0.20	U	0.20
1,1-Dichloroethene	0.20	U	0.20
1,2-Dichloropropane	0.20	U	0.20
1,4-Dioxane	5.0	U	5.0
Ethylbenzene	0.20	U	0.20
Hexachlorobutadiene	0.20	U	0.20
Methylene Chloride	0.50	U	0.50
Naphthalene	0.50	U	0.50
Styrene	0.20	U	0.20
1,1,2,2-Tetrachloroethane	0.20	U	0.20
Tetrachloroethene	0.20	U	0.20
Toluene	0.20	U	0.20
1,2,4-Trichlorobenzene	0.50	U	0.50
1,1,1-Trichloroethane	0.20	U	0.20
1,1,2-Trichloroethane	0.20	U	0.20
Vinyl chloride	0.20	U	0.20
Xylene (total)	0.20	U	0.20
Trichloroethene	0.20	U	0.20

Client: Geosyntec Consultants, Inc.

Job Number: 200-4315-1
Sdg Number: Narrowburg, NY

Method Blank - Batch: 200-15760

Method: TO-15
Preparation: Summa Canister

Lab Sample ID:	MB 200-15760/6	Analysis Batch:	200-15760	Instrument ID:	C.i
Client Matrix:	Air	Prep Batch:	N/A	Lab File ID:	cjrc006.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	200 mL
Analysis Date:	03/25/2011 2158	Units:	ug/m3	Final Weight/Volume:	200 mL
Prep Date:	03/25/2011 2158			Injection Volume:	200 mL
Leach Date:	N/A				

Analyte	Result	Qual	RL
Benzene	0.64	U	0.64
Bromoform	2.1	U	2.1
Bromomethane	0.78	U	0.78
Carbon disulfide	1.6	U	1.6
Carbon tetrachloride	1.3	U	1.3
Chlorobenzene	0.92	U	0.92
Chloroethane	1.3	U	1.3
Chloroform	0.98	U	0.98
Chloromethane	1.0	U	1.0
1,4-Dichlorobenzene	1.2	U	1.2
1,1-Dichloroethane	0.81	U	0.81
1,2-Dichloroethane	0.81	U	0.81
1,1-Dichloroethene	0.79	U	0.79
1,2-Dichloropropane	0.92	U	0.92
1,4-Dioxane	18	U	18
Ethylbenzene	0.87	U	0.87
Hexachlorobutadiene	2.1	U	2.1
Methylene Chloride	1.7	U	1.7
Naphthalene	2.6	U	2.6
Styrene	0.85	U	0.85
1,1,2,2-Tetrachloroethane	1.4	U	1.4
Tetrachloroethene	1.4	U	1.4
Toluene	0.75	U	0.75
1,2,4-Trichlorobenzene	3.7	U	3.7
1,1,1-Trichloroethane	1.1	U	1.1
1,1,2-Trichloroethane	1.1	U	1.1
Vinyl chloride	0.51	U	0.51
Xylene (total)	0.87	U	0.87
Trichloroethene	1.1	U	1.1

Client: Geosyntec Consultants, Inc.

Job Number: 200-4315-1
Sdg Number: Narrowburg, NY

Lab Control Sample - Batch: 200-15760

Method: TO-15
Preparation: Summa Canister

Lab Sample ID:	LCS 200-15760/5	Analysis Batch:	200-15760	Instrument ID:	C.i
Client Matrix:	Air	Prep Batch:	N/A	Lab File ID:	cjrc005.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	200 mL
Analysis Date:	03/25/2011 2110	Units:	ppb v/v	Final Weight/Volume:	200 mL
Prep Date:	03/25/2011 2110			Injection Volume:	200 mL
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Benzene	10.0	9.75	98	70 - 130	
Bromoform	10.0	11.1	111	70 - 130	
Bromomethane	10.0	9.51	95	70 - 130	
Carbon disulfide	10.0	9.83	98	70 - 130	
Carbon tetrachloride	10.0	10.9	109	70 - 130	
Chlorobenzene	10.0	9.59	96	70 - 130	
Chloroethane	10.0	9.78	98	70 - 130	
Chloroform	10.0	10.4	104	70 - 130	
Chloromethane	10.0	9.83	98	70 - 130	
1,4-Dichlorobenzene	10.0	9.61	96	70 - 130	
1,1-Dichloroethane	10.0	10.2	102	70 - 130	
1,2-Dichloroethane	10.0	10.9	109	70 - 130	
1,1-Dichloroethene	10.0	11.0	110	70 - 130	
1,2-Dichloropropane	10.0	9.94	99	70 - 130	
1,4-Dioxane	10.0	7.60	76	70 - 130	
Ethylbenzene	10.0	10.2	102	70 - 130	
Hexachlorobutadiene	10.0	10.5	105	70 - 130	
Methylene Chloride	10.0	10.6	106	70 - 130	
m,p-Xylene	20.0	19.7	99	70 - 130	
Naphthalene	10.0	7.62	76	70 - 130	
Styrene	10.0	10.4	104	70 - 130	
1,1,2,2-Tetrachloroethane	10.0	9.49	95	70 - 130	
Tetrachloroethene	10.0	9.40	94	70 - 130	
Toluene	10.0	9.36	94	70 - 130	
1,2,4-Trichlorobenzene	10.0	7.65	77	70 - 130	
1,1,1-Trichloroethane	10.0	10.7	107	70 - 130	
1,1,2-Trichloroethane	10.0	9.18	92	70 - 130	
Vinyl chloride	10.0	10.1	101	70 - 130	
Xylene, o-	10.0	9.51	95	70 - 130	
Trichloroethene	10.0	10.0	100	70 - 130	

Client: Geosyntec Consultants, Inc.

Job Number: 200-4315-1
Sdg Number: Narrowburg, NY

Method Blank - Batch: 200-15787

Method: TO-15
Preparation: Summa Canister

Lab Sample ID:	MB 200-15787/4	Analysis Batch:	200-15787	Instrument ID:	G.i
Client Matrix:	Air	Prep Batch:	N/A	Lab File ID:	gffv004.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	200 mL
Analysis Date:	03/29/2011 1338	Units:	ppb v/v	Final Weight/Volume:	200 mL
Prep Date:	03/29/2011 1338			Injection Volume:	200 mL
Leach Date:	N/A				

Analyte	Result	Qual	RL
Benzene	0.20	U	0.20
Bromoform	0.20	U	0.20
Bromomethane	0.20	U	0.20
Carbon disulfide	0.50	U	0.50
Carbon tetrachloride	0.20	U	0.20
Chlorobenzene	0.20	U	0.20
Chloroethane	0.50	U	0.50
Chloroform	0.20	U	0.20
Chloromethane	0.50	U	0.50
1,4-Dichlorobenzene	0.20	U	0.20
1,1-Dichloroethane	0.20	U	0.20
1,2-Dichloroethane	0.20	U	0.20
1,1-Dichloroethene	0.20	U	0.20
1,2-Dichloropropane	0.20	U	0.20
1,4-Dioxane	5.0	U	5.0
Ethylbenzene	0.20	U	0.20
Hexachlorobutadiene	0.20	U	0.20
Methylene Chloride	0.50	U	0.50
Naphthalene	0.50	U	0.50
Styrene	0.20	U	0.20
1,1,2,2-Tetrachloroethane	0.20	U	0.20
Tetrachloroethene	0.20	U	0.20
Toluene	0.20	U	0.20
1,2,4-Trichlorobenzene	0.50	U	0.50
1,1,1-Trichloroethane	0.20	U	0.20
1,1,2-Trichloroethane	0.20	U	0.20
Vinyl chloride	0.20	U	0.20
Xylene (total)	0.20	U	0.20
Trichloroethene	0.20	U	0.20

Client: Geosyntec Consultants, Inc.

Job Number: 200-4315-1
Sdg Number: Narrowburg, NY

Method Blank - Batch: 200-15787

Method: TO-15
Preparation: Summa Canister

Lab Sample ID:	MB 200-15787/4	Analysis Batch:	200-15787	Instrument ID:	G.i
Client Matrix:	Air	Prep Batch:	N/A	Lab File ID:	gffv004.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	200 mL
Analysis Date:	03/29/2011 1338	Units:	ug/m3	Final Weight/Volume:	200 mL
Prep Date:	03/29/2011 1338			Injection Volume:	200 mL
Leach Date:	N/A				

Analyte	Result	Qual	RL
Benzene	0.64	U	0.64
Bromoform	2.1	U	2.1
Bromomethane	0.78	U	0.78
Carbon disulfide	1.6	U	1.6
Carbon tetrachloride	1.3	U	1.3
Chlorobenzene	0.92	U	0.92
Chloroethane	1.3	U	1.3
Chloroform	0.98	U	0.98
Chloromethane	1.0	U	1.0
1,4-Dichlorobenzene	1.2	U	1.2
1,1-Dichloroethane	0.81	U	0.81
1,2-Dichloroethane	0.81	U	0.81
1,1-Dichloroethene	0.79	U	0.79
1,2-Dichloropropane	0.92	U	0.92
1,4-Dioxane	18	U	18
Ethylbenzene	0.87	U	0.87
Hexachlorobutadiene	2.1	U	2.1
Methylene Chloride	1.7	U	1.7
Naphthalene	2.6	U	2.6
Styrene	0.85	U	0.85
1,1,2,2-Tetrachloroethane	1.4	U	1.4
Tetrachloroethene	1.4	U	1.4
Toluene	0.75	U	0.75
1,2,4-Trichlorobenzene	3.7	U	3.7
1,1,1-Trichloroethane	1.1	U	1.1
1,1,2-Trichloroethane	1.1	U	1.1
Vinyl chloride	0.51	U	0.51
Xylene (total)	0.87	U	0.87
Trichloroethene	1.1	U	1.1

Client: Geosyntec Consultants, Inc.

Job Number: 200-4315-1
Sdg Number: Narrowburg, NY

Lab Control Sample - Batch: 200-15787

Method: TO-15
Preparation: Summa Canister

Lab Sample ID:	LCS 200-15787/3	Analysis Batch:	200-15787	Instrument ID:	G.i
Client Matrix:	Air	Prep Batch:	N/A	Lab File ID:	gffv003.d
Dilution:	1.0	Leach Batch:	N/A	Initial Weight/Volume:	200 mL
Analysis Date:	03/29/2011 1247	Units:	ppb v/v	Final Weight/Volume:	200 mL
Prep Date:	03/29/2011 1247			Injection Volume:	200 mL
Leach Date:	N/A				

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Benzene	10.0	9.29	93	70 - 130	
Bromoform	10.0	10.8	108	70 - 130	
Bromomethane	10.0	8.50	85	70 - 130	
Carbon disulfide	10.0	9.29	93	70 - 130	
Carbon tetrachloride	10.0	11.3	113	70 - 130	
Chlorobenzene	10.0	8.90	89	70 - 130	
Chloroethane	10.0	8.39	84	70 - 130	
Chloroform	10.0	9.38	94	70 - 130	
Chloromethane	10.0	8.50	85	70 - 130	
1,4-Dichlorobenzene	10.0	9.37	94	70 - 130	
1,1-Dichloroethane	10.0	9.50	95	70 - 130	
1,2-Dichloroethane	10.0	9.72	97	70 - 130	
1,1-Dichloroethene	10.0	11.1	111	70 - 130	
1,2-Dichloropropane	10.0	8.89	89	70 - 130	
1,4-Dioxane	10.0	8.86	89	70 - 130	
Ethylbenzene	10.0	8.66	87	70 - 130	
Hexachlorobutadiene	10.0	10.6	106	70 - 130	
Methylene Chloride	10.0	10.1	101	70 - 130	
m,p-Xylene	20.0	17.1	85	70 - 130	
Naphthalene	10.0	9.81	98	70 - 130	
Styrene	10.0	9.51	95	70 - 130	
1,1,2,2-Tetrachloroethane	10.0	8.31	83	70 - 130	
Tetrachloroethene	10.0	9.62	96	70 - 130	
Toluene	10.0	8.48	85	70 - 130	
1,2,4-Trichlorobenzene	10.0	9.44	94	70 - 130	
1,1,1-Trichloroethane	10.0	10.8	108	70 - 130	
1,1,2-Trichloroethane	10.0	8.38	84	70 - 130	
Vinyl chloride	10.0	8.25	83	70 - 130	
Xylene, o-	10.0	8.67	87	70 - 130	
Trichloroethene	10.0	10.0	100	70 - 130	

DATA REPORTING QUALIFIERS

Client: Geosyntec Consultants, Inc.

Job Number: 200-4315-1
Sdg Number: Narrowburg, NY

Lab Section	Qualifier	Description
GC VOA		
	U	Indicates the analyte was analyzed for but not detected.
Air - GC/MS VOA		
	U	Indicates the analyte was analyzed for but not detected.

Client: Geosyntec Consultants, Inc.

Job Number: 200-4315-1
Sdg Number: Narrowburg, NY

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
GC VOA					
Analysis Batch:200-15706					
LCS 200-15706/2	Lab Control Sample	T	Air	D1946	
MB 200-15706/3	Method Blank	T	Air	D1946	
200-4315-6	AS-SP3	T	Air	D1946	
Air - GC/MS VOA					
Analysis Batch:200-15760					
LCS 200-15760/5	Lab Control Sample	T	Air	TO-15	
MB 200-15760/6	Method Blank	T	Air	TO-15	
200-4315-1	SVE-SP1	T	Air	TO-15	
200-4315-2	SVE-SP2	T	Air	TO-15	
200-4315-3	SVE-SP3	T	Air	TO-15	
200-4315-4	AS-SP1	T	Air	TO-15	
200-4315-5	AS-SP2	T	Air	TO-15	
Analysis Batch:200-15787					
LCS 200-15787/3	Lab Control Sample	T	Air	TO-15	
MB 200-15787/4	Method Blank	T	Air	TO-15	
200-4315-6	AS-SP3	T	Air	TO-15	

Report Basis
T = Total

Report Basis
T = Total

Client: Geosyntec Consultants, Inc.

Job Number: 200-4315-1
SDG: Narrowburg, NY

Laboratory Chronicle

Lab ID: 200-4315-1 **Client ID:** SVE-SP1

Sample Date/Time: 03/09/2011 16:38 Received Date/Time: 03/18/2011 10:45

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:Summa Canister	200-4315-A-1		200-15760		03/26/2011 01:11	15300	TAL BUR	SV
A:TO-15	200-4315-A-1		200-15760		03/26/2011 01:11	15300	TAL BUR	SV

Lab ID: 200-4315-2 **Client ID:** SVE-SP2

Sample Date/Time: 03/09/2011 16:37 Received Date/Time: 03/18/2011 10:45

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:Summa Canister	200-4315-A-2		200-15760		03/26/2011 01:59	6860	TAL BUR	SV
A:TO-15	200-4315-A-2		200-15760		03/26/2011 01:59	6860	TAL BUR	SV

Lab ID: 200-4315-3 **Client ID:** SVE-SP3

Sample Date/Time: 03/09/2011 16:39 Received Date/Time: 03/18/2011 10:45

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:Summa Canister	200-4315-A-3		200-15760		03/26/2011 02:47	1	TAL BUR	SV
A:TO-15	200-4315-A-3		200-15760		03/26/2011 02:47	1	TAL BUR	SV

Lab ID: 200-4315-4 **Client ID:** AS-SP1

Sample Date/Time: 03/15/2011 15:55 Received Date/Time: 03/18/2011 10:45

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:Summa Canister	200-4315-A-4		200-15760		03/26/2011 03:36	14000	TAL BUR	SV
A:TO-15	200-4315-A-4		200-15760		03/26/2011 03:36	14000	TAL BUR	SV

Lab ID: 200-4315-5 **Client ID:** AS-SP2

Sample Date/Time: 03/15/2011 15:55 Received Date/Time: 03/18/2011 10:45

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:Summa Canister	200-4315-A-5		200-15760		03/26/2011 04:24	6900	TAL BUR	SV
A:TO-15	200-4315-A-5		200-15760		03/26/2011 04:24	6900	TAL BUR	SV

Client: Geosyntec Consultants, Inc.

Job Number: 200-4315-1
SDG: Narrowburg, NY

Laboratory Chronicle

Lab ID: 200-4315-6 **Client ID:** AS-SP3

Sample Date/Time: 03/15/2011 15:55 Received Date/Time: 03/18/2011 10:45

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:Summa Canister	200-4315-A-6		200-15706		03/28/2011 14:03	1.4	TAL BUR	MRV
A:D1946	200-4315-A-6		200-15706		03/28/2011 14:03	1.4	TAL BUR	MRV
P:Summa Canister	200-4315-A-6		200-15787		03/29/2011 14:29	3.97	TAL BUR	WRD
A:TO-15	200-4315-A-6		200-15787		03/29/2011 14:29	3.97	TAL BUR	WRD

Lab ID: MB **Client ID:** N/A

Sample Date/Time: N/A Received Date/Time: N/A

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:Summa Canister	MB 200-15706/3		200-15706		03/28/2011 13:53	1	TAL BUR	MRV
A:D1946	MB 200-15706/3		200-15706		03/28/2011 13:53	1	TAL BUR	MRV
P:Summa Canister	MB 200-15760/6		200-15760		03/25/2011 21:58	1	TAL BUR	SV
A:TO-15	MB 200-15760/6		200-15760		03/25/2011 21:58	1	TAL BUR	SV
P:Summa Canister	MB 200-15787/4		200-15787		03/29/2011 13:38	1	TAL BUR	WRD
A:TO-15	MB 200-15787/4		200-15787		03/29/2011 13:38	1	TAL BUR	WRD

Lab ID: LCS **Client ID:** N/A

Sample Date/Time: N/A Received Date/Time: N/A

Method	Bottle ID	Run	Analysis Batch	Prep Batch	Date Prepared / Analyzed	Dil	Lab	Analyst
P:Summa Canister	LCS 200-15706/2		200-15706		03/28/2011 13:44	1	TAL BUR	MRV
A:D1946	LCS 200-15706/2		200-15706		03/28/2011 13:44	1	TAL BUR	MRV
P:Summa Canister	LCS 200-15760/5		200-15760		03/25/2011 21:10	1	TAL BUR	SV
A:TO-15	LCS 200-15760/5		200-15760		03/25/2011 21:10	1	TAL BUR	SV
P:Summa Canister	LCS 200-15787/3		200-15787		03/29/2011 12:47	1	TAL BUR	WRD
A:TO-15	LCS 200-15787/3		200-15787		03/29/2011 12:47	1	TAL BUR	WRD

Lab References:
TAL BUR = TestAmerica Burlington

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
ATASTMHECCVw_00004	07/01/10	05/13/10	nitrogen, Lot n/a	10 L	ATASTMHECCVs_00001	500 mL	Helium	5 % v/v
.ATASTMHECCVs_00001	07/01/10	Grace/Alltech, Lot 109-90-00699-A1			(Purchased Reagent)		Helium	100 % v/v
ATASTMHECCVw_00008	04/28/11	01/31/11	nitrogen, Lot n/a	10 L	ATASTMHECCVs_00005	500 mL	Helium	5 % v/v
.ATASTMHECCVs_00005	10/08/11	Grace/Alltech, Lot 109-00-03487-A1			(Purchased Reagent)		Helium	100 % v/v
ATASTMHEICVw_00005	07/01/10	04/22/10	ACETONE, Lot n/a	10 L	ATASTMHECCVs_00003	500 mL	Helium	5 % v/v
.ATASTMHECCVs_00003	07/01/10	Grace/Alltech, Lot 109-90-00763-A1			(Purchased Reagent)		Helium	100 % v/v
ATASTMHEICVw_00011	04/18/11	01/31/11	ACETONE, Lot n/a	10 L	ATASTMHECCVs_00002	500 mL	Helium	5 % v/v
.ATASTMHECCVs_00002	04/18/11	Grace/Alltech, Lot 109-90-00699-A1			(Purchased Reagent)		Helium	100 % v/v
ATTO15CAL1w_00039	05/01/11	02/08/11		15.463 L	ATTO15CAL6w_00031	155 mL	1,1,1-Trichloroethane	0.20044 ppb v/v
							1,1,2,2-Tetrachloroethane	0.20044 ppb v/v
							1,1,2-Trichloro-1,2,2-trifluoroethane	0.20044 ppb v/v
							1,1,2-Trichloroethane	0.20044 ppb v/v
							1,1-Dichloroethane	0.20044 ppb v/v
							1,1-Dichloroethene	0.20044 ppb v/v
							1,2,3-Trichlorobenzene	0.20044 ppb v/v
							1,2,3-Trichloropropane	0.20044 ppb v/v
							1,2,4-Trichlorobenzene	0.20044 ppb v/v
							1,2,4-Trimethylbenzene	0.20044 ppb v/v
							1,2-Dichloro-1,1,2,2-tetrafluoroethane	0.20044 ppb v/v
							1,2-Dichlorobenzene	0.20044 ppb v/v
							1,2-Dichloroethane	0.20044 ppb v/v
							1,2-Dichloropropane	0.20044 ppb v/v
							1,3,5-Trimethylbenzene	0.20044 ppb v/v
							1,3-Dichlorobenzene	0.20044 ppb v/v
							1,4-Dichlorobenzene	0.20044 ppb v/v
							1,4-Dioxane	0.20044 ppb v/v
							2-Butanone (MEK)	0.20044 ppb v/v
							2-Chlorotoluene	0.20044 ppb v/v
							2-Hexanone	0.20044 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							2-Methyl-2-propanol	0.20044 ppb v/v
							2-Methylbutane	0.20044 ppb v/v
							3-Chloro-1-propene	0.20044 ppb v/v
							4-Ethyltoluene	0.20044 ppb v/v
							4-Isopropyltoluene	0.20044 ppb v/v
							4-Methyl-2-pentanone (MIBK)	0.20044 ppb v/v
							Acetone	0.20044 ppb v/v
							Acetonitrile	0.20044 ppb v/v
							Acrolein	0.20044 ppb v/v
							Acrylonitrile	0.20044 ppb v/v
							Alpha Methyl Styrene	0.20044 ppb v/v
							Benzene	0.20044 ppb v/v
							Benzyl chloride	0.20044 ppb v/v
							Bromoform	0.20044 ppb v/v
							Bromomethane	0.20044 ppb v/v
							Butadiene	0.20044 ppb v/v
							Butane	0.20044 ppb v/v
							Carbon disulfide	0.20044 ppb v/v
							Carbon tetrachloride	0.20044 ppb v/v
							Chlorobenzene	0.20044 ppb v/v
							Chlorodibromomethane	0.20044 ppb v/v
							Chlorodifluoromethane	0.20044 ppb v/v
							Chloroethane	0.20044 ppb v/v
							Chloroform	0.20044 ppb v/v
							Chloromethane	0.20044 ppb v/v
							cis-1,2-Dichloroethene	0.20044 ppb v/v

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							cis-1,3-Dichloropropene	0.20044 ppb v/v
							Cyclohexane	0.20044 ppb v/v
							Dibromomethane	0.20044 ppb v/v
							Dichlorobromomethane	0.20044 ppb v/v
							Dichlorodifluoromethane	0.20044 ppb v/v
							Dodecane	0.20044 ppb v/v
							Ethyl acetate	0.20044 ppb v/v
							Ethyl ether	0.20044 ppb v/v
							Ethylbenzene	0.20044 ppb v/v
							Ethylene Dibromide	0.20044 ppb v/v
							Hexachlorobutadiene	0.20044 ppb v/v
							Hexane	0.20044 ppb v/v
							Isooctane	0.20044 ppb v/v
							Isopropyl alcohol	0.20044 ppb v/v
							Isopropylbenzene	0.20044 ppb v/v
							m,p-Xylene	0.400879 ppb v/v
							Methyl methacrylate	0.20044 ppb v/v
							Methyl tert-butyl ether	0.20044 ppb v/v
							Methylene Chloride	0.20044 ppb v/v
							n-Butanol	0.20044 ppb v/v
							n-Butylbenzene	0.20044 ppb v/v
							n-Decane	0.20044 ppb v/v
							n-Heptane	0.20044 ppb v/v
							n-Nonane	0.20044 ppb v/v
							n-Octane	0.20044 ppb v/v
							N-Propylbenzene	0.20044 ppb v/v

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Naphthalene	0.20044 ppb v/v
							Pentane	0.20044 ppb v/v
							Propene	0.20044 ppb v/v
							sec-Butylbenzene	0.20044 ppb v/v
							Styrene	0.20044 ppb v/v
							tert-Butylbenzene	0.20044 ppb v/v
							Tetrachloroethene	0.20044 ppb v/v
							Tetrahydrofuran	0.20044 ppb v/v
							Toluene	0.20044 ppb v/v
							trans-1,2-Dichloroethene	0.20044 ppb v/v
							trans-1,3-Dichloropropene	0.20044 ppb v/v
							Trichloroethene	0.20044 ppb v/v
							Trichlorofluoromethane	0.20044 ppb v/v
							Undecane	0.20044 ppb v/v
							Vinyl acetate	0.20044 ppb v/v
							Vinyl bromide	0.20044 ppb v/v
							Vinyl chloride	0.20044 ppb v/v
							Xylene, o-	0.20044 ppb v/v
							Ethanol	0.400944 ppb v/v
.ATTO15CAL6w_00031	05/01/11	02/08/11		15.463 L	ATTO15CALSTKi_00020	1546 mL	1,1,1-Trichloroethane	19.9961 ppb v/v
							1,1,2,2-Tetrachloroethane	19.9961 ppb v/v
							1,1,2-Trichloro-1,2,2-trifluoroethane	19.9961 ppb v/v
							1,1,2-Trichloroethane	19.9961 ppb v/v
							1,1-Dichloroethane	19.9961 ppb v/v
							1,1-Dichloroethene	19.9961 ppb v/v
							1,2,3-Trichlorobenzene	19.9961 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							1,2,3-Trichloropropane	19.9961 ppb v/v
							1,2,4-Trichlorobenzene	19.9961 ppb v/v
							1,2,4-Trimethylbenzene	19.9961 ppb v/v
							1,2-Dichloro-1,1,2,2-tetrafluoroethane	19.9961 ppb v/v
							1,2-Dichlorobenzene	19.9961 ppb v/v
							1,2-Dichloroethane	19.9961 ppb v/v
							1,2-Dichloropropane	19.9961 ppb v/v
							1,3,5-Trimethylbenzene	19.9961 ppb v/v
							1,3-Dichlorobenzene	19.9961 ppb v/v
							1,4-Dichlorobenzene	19.9961 ppb v/v
							1,4-Dioxane	19.9961 ppb v/v
							2-Butanone (MEK)	19.9961 ppb v/v
							2-Chlorotoluene	19.9961 ppb v/v
							2-Hexanone	19.9961 ppb v/v
							2-Methyl-2-propanol	19.9961 ppb v/v
							2-Methylbutane	19.9961 ppb v/v
							3-Chloro-1-propene	19.9961 ppb v/v
							4-Ethyltoluene	19.9961 ppb v/v
							4-Isopropyltoluene	19.9961 ppb v/v
							4-Methyl-2-pentanone (MIBK)	19.9961 ppb v/v
							Acetone	19.9961 ppb v/v
							Acetonitrile	19.9961 ppb v/v
							Acrolein	19.9961 ppb v/v
							Acrylonitrile	19.9961 ppb v/v
							Alpha Methyl Styrene	19.9961 ppb v/v
							Benzene	19.9961 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Benzyl chloride	19.9961 ppb v/v
							Bromoform	19.9961 ppb v/v
							Bromomethane	19.9961 ppb v/v
							Butadiene	19.9961 ppb v/v
							Butane	19.9961 ppb v/v
							Carbon disulfide	19.9961 ppb v/v
							Carbon tetrachloride	19.9961 ppb v/v
							Chlorobenzene	19.9961 ppb v/v
							Chlorodibromomethane	19.9961 ppb v/v
							Chlorodifluoromethane	19.9961 ppb v/v
							Chloroethane	19.9961 ppb v/v
							Chloroform	19.9961 ppb v/v
							Chloromethane	19.9961 ppb v/v
							cis-1,2-Dichloroethene	19.9961 ppb v/v
							cis-1,3-Dichloropropene	19.9961 ppb v/v
							Cyclohexane	19.9961 ppb v/v
							Dibromomethane	19.9961 ppb v/v
							Dichlorobromomethane	19.9961 ppb v/v
							Dichlorodifluoromethane	19.9961 ppb v/v
							Dodecane	19.9961 ppb v/v
							Ethyl acetate	19.9961 ppb v/v
							Ethyl ether	19.9961 ppb v/v
							Ethylbenzene	19.9961 ppb v/v
							Ethylene Dibromide	19.9961 ppb v/v
							Hexachlorobutadiene	19.9961 ppb v/v
							Hexane	19.9961 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Isooctane	19.9961 ppb v/v
							Isopropyl alcohol	19.9961 ppb v/v
							Isopropylbenzene	19.9961 ppb v/v
							m,p-Xylene	39.9922 ppb v/v
							Methyl methacrylate	19.9961 ppb v/v
							Methyl tert-butyl ether	19.9961 ppb v/v
							Methylene Chloride	19.9961 ppb v/v
							n-Butanol	19.9961 ppb v/v
							n-Butylbenzene	19.9961 ppb v/v
							n-Decane	19.9961 ppb v/v
							n-Heptane	19.9961 ppb v/v
							n-Nonane	19.9961 ppb v/v
							n-Octane	19.9961 ppb v/v
							N-Propylbenzene	19.9961 ppb v/v
							Naphthalene	19.9961 ppb v/v
							Pentane	19.9961 ppb v/v
							Propene	19.9961 ppb v/v
							sec-Butylbenzene	19.9961 ppb v/v
							Styrene	19.9961 ppb v/v
							tert-Butylbenzene	19.9961 ppb v/v
							Tetrachloroethene	19.9961 ppb v/v
							Tetrahydrofuran	19.9961 ppb v/v
							Toluene	19.9961 ppb v/v
							trans-1,2-Dichloroethene	19.9961 ppb v/v
							trans-1,3-Dichloropropene	19.9961 ppb v/v
							Trichloroethene	19.9961 ppb v/v

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Trichlorofluoromethane	19.9961 ppb v/v
							Undecane	19.9961 ppb v/v
							Vinyl acetate	19.9961 ppb v/v
							Vinyl bromide	19.9961 ppb v/v
							Vinyl chloride	19.9961 ppb v/v
							Xylene, o-	19.9961 ppb v/v
					ATTO15EthCALw_00016	1237 mL	Ethanol	39.9987 ppb v/v
..ATTO15CALSTKi_00020	05/01/11	02/01/11	DI WATER, Lot 1003	37.5 L	ATTO15CALs_00006	7500 mL	1,1,1-Trichloroethane	200 ppb v/v
							1,1,2,2-Tetrachloroethane	200 ppb v/v
							1,1,2-Trichloro-1,2,2-trifluoroethane	200 ppb v/v
							1,1,2-Trichloroethane	200 ppb v/v
							1,1-Dichloroethane	200 ppb v/v
							1,1-Dichloroethene	200 ppb v/v
							1,2,3-Trichlorobenzene	200 ppb v/v
							1,2,3-Trichloropropane	200 ppb v/v
							1,2,4-Trichlorobenzene	200 ppb v/v
							1,2,4-Trimethylbenzene	200 ppb v/v
							1,2-Dichloro-1,1,2,2-tetrafluoroethane	200 ppb v/v
							1,2-Dichlorobenzene	200 ppb v/v
							1,2-Dichloroethane	200 ppb v/v
							1,2-Dichloropropane	200 ppb v/v
							1,3,5-Trimethylbenzene	200 ppb v/v
							1,3-Dichlorobenzene	200 ppb v/v
							1,4-Dichlorobenzene	200 ppb v/v
							1,4-Dioxane	200 ppb v/v
							2-Butanone (MEK)	200 ppb v/v
							2-Chlorotoluene	200 ppb v/v
							2-Hexanone	200 ppb v/v
							2-Methyl-2-propanol	200 ppb v/v
							2-Methylbutane	200 ppb v/v
							3-Chloro-1-propene	200 ppb v/v
							4-Ethyltoluene	200 ppb v/v
							4-Isopropyltoluene	200 ppb v/v
							4-Methyl-2-pentanone (MIBK)	200 ppb v/v
							Acetone	200 ppb v/v
							Acetonitrile	200 ppb v/v
							Acrolein	200 ppb v/v
							Acrylonitrile	200 ppb v/v
							Alpha Methyl Styrene	200 ppb v/v
							Benzene	200 ppb v/v
							Benzyl chloride	200 ppb v/v
							Bromoform	200 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Bromomethane	200 ppb v/v
							Butadiene	200 ppb v/v
							Butane	200 ppb v/v
							Carbon disulfide	200 ppb v/v
							Carbon tetrachloride	200 ppb v/v
							Chlorobenzene	200 ppb v/v
							Chlorodibromomethane	200 ppb v/v
							Chlorodifluoromethane	200 ppb v/v
							Chloroethane	200 ppb v/v
							Chloroform	200 ppb v/v
							Chloromethane	200 ppb v/v
							cis-1,2-Dichloroethene	200 ppb v/v
							cis-1,3-Dichloropropene	200 ppb v/v
							Cyclohexane	200 ppb v/v
							Dibromomethane	200 ppb v/v
							Dichlorobromomethane	200 ppb v/v
							Dichlorodifluoromethane	200 ppb v/v
							Dodecane	200 ppb v/v
							Ethyl acetate	200 ppb v/v
							Ethyl ether	200 ppb v/v
							Ethylbenzene	200 ppb v/v
							Ethylene Dibromide	200 ppb v/v
							Hexachlorobutadiene	200 ppb v/v
							Hexane	200 ppb v/v
							Isooctane	200 ppb v/v
							Isopropyl alcohol	200 ppb v/v
							Isopropylbenzene	200 ppb v/v
							m,p-Xylene	400 ppb v/v
							Methyl methacrylate	200 ppb v/v
							Methyl tert-butyl ether	200 ppb v/v
							Methylene Chloride	200 ppb v/v
							n-Butanol	200 ppb v/v
							n-Butylbenzene	200 ppb v/v
							n-Decane	200 ppb v/v
							n-Heptane	200 ppb v/v
							n-Nonane	200 ppb v/v
							n-Octane	200 ppb v/v
							N-Propylbenzene	200 ppb v/v
							Naphthalene	200 ppb v/v
							Pentane	200 ppb v/v
							Propene	200 ppb v/v
							sec-Butylbenzene	200 ppb v/v
							Styrene	200 ppb v/v
							tert-Butylbenzene	200 ppb v/v
							Tetrachloroethene	200 ppb v/v
							Tetrahydrofuran	200 ppb v/v
							Toluene	200 ppb v/v
							trans-1,2-Dichloroethene	200 ppb v/v
							trans-1,3-Dichloropropene	200 ppb v/v
							Trichloroethene	200 ppb v/v

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Trichlorofluoromethane	200 ppb v/v
							Undecane	200 ppb v/v
							Vinyl acetate	200 ppb v/v
							Vinyl bromide	200 ppb v/v
							Vinyl chloride	200 ppb v/v
							Xylene, o-	200 ppb v/v
...ATTO15CALs_00006	11/30/11		Spectra Gases, Lot cc-250179		(Purchased Reagent)		1,1,1-Trichloroethane	1 ppm v/v
							1,1,2,2-Tetrachloroethane	1 ppm v/v
							1,1,2-Trichloro-1,2,2-trifluoroethane	1 ppm v/v
							1,1,2-Trichloroethane	1 ppm v/v
							1,1-Dichloroethane	1 ppm v/v
							1,1-Dichloroethene	1 ppm v/v
							1,2,3-Trichlorobenzene	1 ppm v/v
							1,2,3-Trichloropropane	1 ppm v/v
							1,2,4-Trichlorobenzene	1 ppm v/v
							1,2,4-Trimethylbenzene	1 ppm v/v
							1,2-Dichloro-1,1,2,2-tetrafluoroethane	1 ppm v/v
							1,2-Dichlorobenzene	1 ppm v/v
							1,2-Dichloroethane	1 ppm v/v
							1,2-Dichloropropane	1 ppm v/v
							1,3,5-Trimethylbenzene	1 ppm v/v
							1,3-Dichlorobenzene	1 ppm v/v
							1,4-Dichlorobenzene	1 ppm v/v
							1,4-Dioxane	1 ppm v/v
							2-Butanone (MEK)	1 ppm v/v
							2-Chlorotoluene	1 ppm v/v
							2-Hexanone	1 ppm v/v
							2-Methyl-2-propanol	1 ppm v/v
							2-Methylbutane	1 ppm v/v
							3-Chloro-1-propene	1 ppm v/v
							4-Ethyltoluene	1 ppm v/v
							4-Isopropyltoluene	1 ppm v/v
							4-Methyl-2-pentanone (MIBK)	1 ppm v/v
							Acetone	1 ppm v/v
							Acetonitrile	1 ppm v/v
							Acrolein	1 ppm v/v
							Acrylonitrile	1 ppm v/v
							Alpha Methyl Styrene	1 ppm v/v
							Benzene	1 ppm v/v
							Benzyl chloride	1 ppm v/v
							Bromoform	1 ppm v/v
							Bromomethane	1 ppm v/v
							Butadiene	1 ppm v/v
							Butane	1 ppm v/v
							Carbon disulfide	1 ppm v/v
							Carbon tetrachloride	1 ppm v/v
							Chlorobenzene	1 ppm v/v
							Chlorodibromomethane	1 ppm v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Chlorodifluoromethane	1 ppm v/v
							Chloroethane	1 ppm v/v
							Chloroform	1 ppm v/v
							Chloromethane	1 ppm v/v
							cis-1,2-Dichloroethene	1 ppm v/v
							cis-1,3-Dichloropropene	1 ppm v/v
							Cyclohexane	1 ppm v/v
							Dibromomethane	1 ppm v/v
							Dichlorobromomethane	1 ppm v/v
							Dichlorodifluoromethane	1 ppm v/v
							Dodecane	1 ppm v/v
							Ethyl acetate	1 ppm v/v
							Ethyl ether	1 ppm v/v
							Ethylbenzene	1 ppm v/v
							Ethylene Dibromide	1 ppm v/v
							Hexachlorobutadiene	1 ppm v/v
							Hexane	1 ppm v/v
							Isooctane	1 ppm v/v
							Isopropyl alcohol	1 ppm v/v
							Isopropylbenzene	1 ppm v/v
							m,p-Xylene	2 ppm v/v
							Methyl methacrylate	1 ppm v/v
							Methyl tert-butyl ether	1 ppm v/v
							Methylene Chloride	1 ppm v/v
							n-Butanol	1 ppm v/v
							n-Butylbenzene	1 ppm v/v
							n-Decane	1 ppm v/v
							n-Heptane	1 ppm v/v
							n-Nonane	1 ppm v/v
							n-Octane	1 ppm v/v
							N-Propylbenzene	1 ppm v/v
							Naphthalene	1 ppm v/v
							Pentane	1 ppm v/v
							Propene	1 ppm v/v
							sec-Butylbenzene	1 ppm v/v
							Styrene	1 ppm v/v
							tert-Butylbenzene	1 ppm v/v
							Tetrachloroethene	1 ppm v/v
							Tetrahydrofuran	1 ppm v/v
							Toluene	1 ppm v/v
							trans-1,2-Dichloroethene	1 ppm v/v
							trans-1,3-Dichloropropene	1 ppm v/v
							Trichloroethene	1 ppm v/v
							Trichlorofluoromethane	1 ppm v/v
							Undecane	1 ppm v/v
							Vinyl acetate	1 ppm v/v
							Vinyl bromide	1 ppm v/v
							Vinyl chloride	1 ppm v/v
							Xylene, o-	1 ppm v/v

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..ATTO15EthCALw_00016	05/07/11	02/07/11	VOA Free Water, Lot 7952	37.5 ppb	ATTO15EthCALs_00004	18.75 uL	Ethanol	500 ppb v/v
...ATTO15EthCALs_00004	12/10/11	SIGMA, Lot 05796KM			(Purchased Reagent)		Ethanol	1 mL/mL
ATTO15CAL2w_00036	05/01/11	02/08/11		15.463 L	ATTO15CAL6w_00031	386 mL	1,1,1-Trichloroethane	0.499159 ppb v/v
							1,1,2,2-Tetrachloroethane	0.499159 ppb v/v
							1,1,2-Trichloro-1,2,2-trifluoroethane	0.499159 ppb v/v
							1,1,2-Trichloroethane	0.499159 ppb v/v
							1,1-Dichloroethane	0.499159 ppb v/v
							1,1-Dichloroethene	0.499159 ppb v/v
							1,2,3-Trichlorobenzene	0.499159 ppb v/v
							1,2,3-Trichloropropane	0.499159 ppb v/v
							1,2,4-Trichlorobenzene	0.499159 ppb v/v
							1,2,4-Trimethylbenzene	0.499159 ppb v/v
							1,2-Dichloro-1,1,2,2-tetrafluoroethane	0.499159 ppb v/v
							1,2-Dichlorobenzene	0.499159 ppb v/v
							1,2-Dichloroethane	0.499159 ppb v/v
							1,2-Dichloropropane	0.499159 ppb v/v
							1,3,5-Trimethylbenzene	0.499159 ppb v/v
							1,3-Dichlorobenzene	0.499159 ppb v/v
							1,4-Dichlorobenzene	0.499159 ppb v/v
							1,4-Dioxane	0.499159 ppb v/v
							2-Butanone (MEK)	0.499159 ppb v/v
							2-Chlorotoluene	0.499159 ppb v/v
							2-Hexanone	0.499159 ppb v/v
							2-Methyl-2-propanol	0.499159 ppb v/v
							2-Methylbutane	0.499159 ppb v/v
							3-Chloro-1-propene	0.499159 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							4-Ethyltoluene	0.499159 ppb v/v
							4-Isopropyltoluene	0.499159 ppb v/v
							4-Methyl-2-pentanone (MIBK)	0.499159 ppb v/v
							Acetone	0.499159 ppb v/v
							Acetonitrile	0.499159 ppb v/v
							Acrolein	0.499159 ppb v/v
							Acrylonitrile	0.499159 ppb v/v
							Alpha Methyl Styrene	0.499159 ppb v/v
							Benzene	0.499159 ppb v/v
							Benzyl chloride	0.499159 ppb v/v
							Bromoform	0.499159 ppb v/v
							Bromomethane	0.499159 ppb v/v
							Butadiene	0.499159 ppb v/v
							Butane	0.499159 ppb v/v
							Carbon disulfide	0.499159 ppb v/v
							Carbon tetrachloride	0.499159 ppb v/v
							Chlorobenzene	0.499159 ppb v/v
							Chlorodibromomethane	0.499159 ppb v/v
							Chlorodifluoromethane	0.499159 ppb v/v
							Chloroethane	0.499159 ppb v/v
							Chloroform	0.499159 ppb v/v
							Chloromethane	0.499159 ppb v/v
							cis-1,2-Dichloroethene	0.499159 ppb v/v
							cis-1,3-Dichloropropene	0.499159 ppb v/v
							Cyclohexane	0.499159 ppb v/v
							Dibromomethane	0.499159 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Dichlorobromomethane	0.499159 ppb v/v
							Dichlorodifluoromethane	0.499159 ppb v/v
							Dodecane	0.499159 ppb v/v
							Ethyl acetate	0.499159 ppb v/v
							Ethyl ether	0.499159 ppb v/v
							Ethylbenzene	0.499159 ppb v/v
							Ethylene Dibromide	0.499159 ppb v/v
							Hexachlorobutadiene	0.499159 ppb v/v
							Hexane	0.499159 ppb v/v
							Isooctane	0.499159 ppb v/v
							Isopropyl alcohol	0.499159 ppb v/v
							Isopropylbenzene	0.499159 ppb v/v
							m,p-Xylene	0.998319 ppb v/v
							Methyl methacrylate	0.499159 ppb v/v
							Methyl tert-butyl ether	0.499159 ppb v/v
							Methylene Chloride	0.499159 ppb v/v
							n-Butanol	0.499159 ppb v/v
							n-Butylbenzene	0.499159 ppb v/v
							n-Decane	0.499159 ppb v/v
							n-Heptane	0.499159 ppb v/v
							n-Nonane	0.499159 ppb v/v
							n-Octane	0.499159 ppb v/v
							N-Propylbenzene	0.499159 ppb v/v
							Naphthalene	0.499159 ppb v/v
							Pentane	0.499159 ppb v/v
							Propene	0.499159 ppb v/v

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							sec-Butylbenzene	0.499159 ppb v/v
							Styrene	0.499159 ppb v/v
							tert-Butylbenzene	0.499159 ppb v/v
							Tetrachloroethene	0.499159 ppb v/v
							Tetrahydrofuran	0.499159 ppb v/v
							Toluene	0.499159 ppb v/v
							trans-1,2-Dichloroethene	0.499159 ppb v/v
							trans-1,3-Dichloropropene	0.499159 ppb v/v
							Trichloroethene	0.499159 ppb v/v
							Trichlorofluoromethane	0.499159 ppb v/v
							Undecane	0.499159 ppb v/v
							Vinyl acetate	0.499159 ppb v/v
							Vinyl bromide	0.499159 ppb v/v
							Vinyl chloride	0.499159 ppb v/v
							Xylene, o-	0.499159 ppb v/v
							Ethanol	5.00805 ppb v/v
					ATTO15EthCALw_00016	124 mL	Ethanol	5.00805 ppb v/v
.ATTO15CAL6w_00031	05/01/11	02/08/11		15.463 L	ATTO15CALSTKi_00020	1546 mL	1,1,1-Trichloroethane	19.9961 ppb v/v
							1,1,2,2-Tetrachloroethane	19.9961 ppb v/v
							1,1,2-Trichloro-1,2,2-trifluoroethane	19.9961 ppb v/v
							1,1,2-Trichloroethane	19.9961 ppb v/v
							1,1-Dichloroethane	19.9961 ppb v/v
							1,1-Dichloroethene	19.9961 ppb v/v
							1,2,3-Trichlorobenzene	19.9961 ppb v/v
							1,2,3-Trichloropropane	19.9961 ppb v/v
							1,2,4-Trichlorobenzene	19.9961 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							1,2,4-Trimethylbenzene	19.9961 ppb v/v
							1,2-Dichloro-1,1,2,2-tetrafluoroethane	19.9961 ppb v/v
							1,2-Dichlorobenzene	19.9961 ppb v/v
							1,2-Dichloroethane	19.9961 ppb v/v
							1,2-Dichloropropane	19.9961 ppb v/v
							1,3,5-Trimethylbenzene	19.9961 ppb v/v
							1,3-Dichlorobenzene	19.9961 ppb v/v
							1,4-Dichlorobenzene	19.9961 ppb v/v
							1,4-Dioxane	19.9961 ppb v/v
							2-Butanone (MEK)	19.9961 ppb v/v
							2-Chlorotoluene	19.9961 ppb v/v
							2-Hexanone	19.9961 ppb v/v
							2-Methyl-2-propanol	19.9961 ppb v/v
							2-Methylbutane	19.9961 ppb v/v
							3-Chloro-1-propene	19.9961 ppb v/v
							4-Ethyltoluene	19.9961 ppb v/v
							4-Isopropyltoluene	19.9961 ppb v/v
							4-Methyl-2-pentanone (MIBK)	19.9961 ppb v/v
							Acetone	19.9961 ppb v/v
							Acetonitrile	19.9961 ppb v/v
							Acrolein	19.9961 ppb v/v
							Acrylonitrile	19.9961 ppb v/v
							Alpha Methyl Styrene	19.9961 ppb v/v
							Benzene	19.9961 ppb v/v
							Benzyl chloride	19.9961 ppb v/v
							Bromoform	19.9961 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Bromomethane	19.9961 ppb v/v
							Butadiene	19.9961 ppb v/v
							Butane	19.9961 ppb v/v
							Carbon disulfide	19.9961 ppb v/v
							Carbon tetrachloride	19.9961 ppb v/v
							Chlorobenzene	19.9961 ppb v/v
							Chlorodibromomethane	19.9961 ppb v/v
							Chlorodifluoromethane	19.9961 ppb v/v
							Chloroethane	19.9961 ppb v/v
							Chloroform	19.9961 ppb v/v
							Chloromethane	19.9961 ppb v/v
							cis-1,2-Dichloroethene	19.9961 ppb v/v
							cis-1,3-Dichloropropene	19.9961 ppb v/v
							Cyclohexane	19.9961 ppb v/v
							Dibromomethane	19.9961 ppb v/v
							Dichlorobromomethane	19.9961 ppb v/v
							Dichlorodifluoromethane	19.9961 ppb v/v
							Dodecane	19.9961 ppb v/v
							Ethyl acetate	19.9961 ppb v/v
							Ethyl ether	19.9961 ppb v/v
							Ethylbenzene	19.9961 ppb v/v
							Ethylene Dibromide	19.9961 ppb v/v
							Hexachlorobutadiene	19.9961 ppb v/v
							Hexane	19.9961 ppb v/v
							Isooctane	19.9961 ppb v/v
							Isopropyl alcohol	19.9961 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Isopropylbenzene	19.9961 ppb v/v
							m,p-Xylene	39.9922 ppb v/v
							Methyl methacrylate	19.9961 ppb v/v
							Methyl tert-butyl ether	19.9961 ppb v/v
							Methylene Chloride	19.9961 ppb v/v
							n-Butanol	19.9961 ppb v/v
							n-Butylbenzene	19.9961 ppb v/v
							n-Decane	19.9961 ppb v/v
							n-Heptane	19.9961 ppb v/v
							n-Nonane	19.9961 ppb v/v
							n-Octane	19.9961 ppb v/v
							N-Propylbenzene	19.9961 ppb v/v
							Naphthalene	19.9961 ppb v/v
							Pentane	19.9961 ppb v/v
							Propene	19.9961 ppb v/v
							sec-Butylbenzene	19.9961 ppb v/v
							Styrene	19.9961 ppb v/v
							tert-Butylbenzene	19.9961 ppb v/v
							Tetrachloroethene	19.9961 ppb v/v
							Tetrahydrofuran	19.9961 ppb v/v
							Toluene	19.9961 ppb v/v
							trans-1,2-Dichloroethene	19.9961 ppb v/v
							trans-1,3-Dichloropropene	19.9961 ppb v/v
							Trichloroethene	19.9961 ppb v/v
							Trichlorofluoromethane	19.9961 ppb v/v
							Undecane	19.9961 ppb v/v

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Vinyl acetate	19.9961 ppb v/v
							Vinyl bromide	19.9961 ppb v/v
							Vinyl chloride	19.9961 ppb v/v
							Xylene, o-	19.9961 ppb v/v
					ATTO15EthCALw_00016	1237 mL	Ethanol	39.9987 ppb v/v
..ATTO15CALSTKi_00020	05/01/11	02/01/11	DI WATER, Lot 1003	37.5 L	ATTO15CALs_00006	7500 mL	1,1,1-Trichloroethane	200 ppb v/v
							1,1,2,2-Tetrachloroethane	200 ppb v/v
							1,1,2-Trichloro-1,2,2-trifluoroethane	200 ppb v/v
							1,1,2-Trichloroethane	200 ppb v/v
							1,1-Dichloroethane	200 ppb v/v
							1,1-Dichloroethene	200 ppb v/v
							1,2,3-Trichlorobenzene	200 ppb v/v
							1,2,3-Trichloropropane	200 ppb v/v
							1,2,4-Trichlorobenzene	200 ppb v/v
							1,2,4-Trimethylbenzene	200 ppb v/v
							1,2-Dichloro-1,1,2,2-tetrafluoroethane	200 ppb v/v
							1,2-Dichlorobenzene	200 ppb v/v
							1,2-Dichloroethane	200 ppb v/v
							1,2-Dichloropropane	200 ppb v/v
							1,3,5-Trimethylbenzene	200 ppb v/v
							1,3-Dichlorobenzene	200 ppb v/v
							1,4-Dichlorobenzene	200 ppb v/v
							1,4-Dioxane	200 ppb v/v
							2-Butanone (MEK)	200 ppb v/v
							2-Chlorotoluene	200 ppb v/v
							2-Hexanone	200 ppb v/v
							2-Methyl-2-propanol	200 ppb v/v
							2-Methylbutane	200 ppb v/v
							3-Chloro-1-propene	200 ppb v/v
							4-Ethyltoluene	200 ppb v/v
							4-Isopropyltoluene	200 ppb v/v
							4-Methyl-2-pentanone (MIBK)	200 ppb v/v
							Acetone	200 ppb v/v
							Acetonitrile	200 ppb v/v
							Acrolein	200 ppb v/v
							Acrylonitrile	200 ppb v/v
							Alpha Methyl Styrene	200 ppb v/v
							Benzene	200 ppb v/v
							Benzyl chloride	200 ppb v/v
							Bromoform	200 ppb v/v
							Bromomethane	200 ppb v/v
							Butadiene	200 ppb v/v
							Butane	200 ppb v/v
							Carbon disulfide	200 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Carbon tetrachloride	200 ppb v/v
							Chlorobenzene	200 ppb v/v
							Chlorodibromomethane	200 ppb v/v
							Chlorodifluoromethane	200 ppb v/v
							Chloroethane	200 ppb v/v
							Chloroform	200 ppb v/v
							Chloromethane	200 ppb v/v
							cis-1,2-Dichloroethene	200 ppb v/v
							cis-1,3-Dichloropropene	200 ppb v/v
							Cyclohexane	200 ppb v/v
							Dibromomethane	200 ppb v/v
							Dichlorobromomethane	200 ppb v/v
							Dichlorodifluoromethane	200 ppb v/v
							Dodecane	200 ppb v/v
							Ethyl acetate	200 ppb v/v
							Ethyl ether	200 ppb v/v
							Ethylbenzene	200 ppb v/v
							Ethylene Dibromide	200 ppb v/v
							Hexachlorobutadiene	200 ppb v/v
							Hexane	200 ppb v/v
							Isooctane	200 ppb v/v
							Isopropyl alcohol	200 ppb v/v
							Isopropylbenzene	200 ppb v/v
							m,p-Xylene	400 ppb v/v
							Methyl methacrylate	200 ppb v/v
							Methyl tert-butyl ether	200 ppb v/v
							Methylene Chloride	200 ppb v/v
							n-Butanol	200 ppb v/v
							n-Butylbenzene	200 ppb v/v
							n-Decane	200 ppb v/v
							n-Heptane	200 ppb v/v
							n-Nonane	200 ppb v/v
							n-Octane	200 ppb v/v
							N-Propylbenzene	200 ppb v/v
							Naphthalene	200 ppb v/v
							Pentane	200 ppb v/v
							Propene	200 ppb v/v
							sec-Butylbenzene	200 ppb v/v
							Styrene	200 ppb v/v
							tert-Butylbenzene	200 ppb v/v
							Tetrachloroethene	200 ppb v/v
							Tetrahydrofuran	200 ppb v/v
							Toluene	200 ppb v/v
							trans-1,2-Dichloroethene	200 ppb v/v
							trans-1,3-Dichloropropene	200 ppb v/v
							Trichloroethene	200 ppb v/v
							Trichlorofluoromethane	200 ppb v/v
							Undecane	200 ppb v/v
							Vinyl acetate	200 ppb v/v
							Vinyl bromide	200 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Vinyl chloride	200 ppb v/v
							Xylene, o-	200 ppb v/v
...ATTO15CALs_00006	11/30/11	Spectra Gases, Lot cc-250179			(Purchased Reagent)		1,1,1-Trichloroethane	1 ppm v/v
							1,1,2,2-Tetrachloroethane	1 ppm v/v
							1,1,2-Trichloro-1,2,2-trifluoroethane	1 ppm v/v
							1,1,2-Trichloroethane	1 ppm v/v
							1,1-Dichloroethane	1 ppm v/v
							1,1-Dichloroethene	1 ppm v/v
							1,2,3-Trichlorobenzene	1 ppm v/v
							1,2,3-Trichloropropane	1 ppm v/v
							1,2,4-Trichlorobenzene	1 ppm v/v
							1,2,4-Trimethylbenzene	1 ppm v/v
							1,2-Dichloro-1,1,2,2-tetrafluoroethane	1 ppm v/v
							1,2-Dichlorobenzene	1 ppm v/v
							1,2-Dichloroethane	1 ppm v/v
							1,2-Dichloropropane	1 ppm v/v
							1,3,5-Trimethylbenzene	1 ppm v/v
							1,3-Dichlorobenzene	1 ppm v/v
							1,4-Dichlorobenzene	1 ppm v/v
							1,4-Dioxane	1 ppm v/v
							2-Butanone (MEK)	1 ppm v/v
							2-Chlorotoluene	1 ppm v/v
							2-Hexanone	1 ppm v/v
							2-Methyl-2-propanol	1 ppm v/v
							2-Methylbutane	1 ppm v/v
							3-Chloro-1-propene	1 ppm v/v
							4-Ethyltoluene	1 ppm v/v
							4-Isopropyltoluene	1 ppm v/v
							4-Methyl-2-pentanone (MIBK)	1 ppm v/v
							Acetone	1 ppm v/v
							Acetonitrile	1 ppm v/v
							Acrolein	1 ppm v/v
							Acrylonitrile	1 ppm v/v
							Alpha Methyl Styrene	1 ppm v/v
							Benzene	1 ppm v/v
							Benzyl chloride	1 ppm v/v
							Bromoform	1 ppm v/v
							Bromomethane	1 ppm v/v
							Butadiene	1 ppm v/v
							Butane	1 ppm v/v
							Carbon disulfide	1 ppm v/v
							Carbon tetrachloride	1 ppm v/v
							Chlorobenzene	1 ppm v/v
							Chlorodibromomethane	1 ppm v/v
							Chlorodifluoromethane	1 ppm v/v
							Chloroethane	1 ppm v/v
							Chloroform	1 ppm v/v
							Chloromethane	1 ppm v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							cis-1,2-Dichloroethene	1 ppm v/v
							cis-1,3-Dichloropropene	1 ppm v/v
							Cyclohexane	1 ppm v/v
							Dibromomethane	1 ppm v/v
							Dichlorobromomethane	1 ppm v/v
							Dichlorodifluoromethane	1 ppm v/v
							Dodecane	1 ppm v/v
							Ethyl acetate	1 ppm v/v
							Ethyl ether	1 ppm v/v
							Ethylbenzene	1 ppm v/v
							Ethylene Dibromide	1 ppm v/v
							Hexachlorobutadiene	1 ppm v/v
							Hexane	1 ppm v/v
							Isooctane	1 ppm v/v
							Isopropyl alcohol	1 ppm v/v
							Isopropylbenzene	1 ppm v/v
							m,p-Xylene	2 ppm v/v
							Methyl methacrylate	1 ppm v/v
							Methyl tert-butyl ether	1 ppm v/v
							Methylene Chloride	1 ppm v/v
							n-Butanol	1 ppm v/v
							n-Butylbenzene	1 ppm v/v
							n-Decane	1 ppm v/v
							n-Heptane	1 ppm v/v
							n-Nonane	1 ppm v/v
							n-Octane	1 ppm v/v
							N-Propylbenzene	1 ppm v/v
							Naphthalene	1 ppm v/v
							Pentane	1 ppm v/v
							Propene	1 ppm v/v
							sec-Butylbenzene	1 ppm v/v
							Styrene	1 ppm v/v
							tert-Butylbenzene	1 ppm v/v
							Tetrachloroethene	1 ppm v/v
							Tetrahydrofuran	1 ppm v/v
							Toluene	1 ppm v/v
							trans-1,2-Dichloroethene	1 ppm v/v
							trans-1,3-Dichloropropene	1 ppm v/v
							Trichloroethene	1 ppm v/v
							Trichlorofluoromethane	1 ppm v/v
							Undecane	1 ppm v/v
							Vinyl acetate	1 ppm v/v
							Vinyl bromide	1 ppm v/v
							Vinyl chloride	1 ppm v/v
							Xylene, o-	1 ppm v/v
..ATTO15EthCALw_00016	05/07/11	02/07/11	VOA Free Water, Lot 7952	37.5 ppb	ATTO15EthCALs_00004	18.75 uL	Ethanol	500 ppb v/v
...ATTO15EthCALs_00004	12/10/11		SIGMA, Lot 05796KM		(Purchased Reagent)		Ethanol	1 mL/mL
.ATTO15EthCALw_00016	05/07/11	02/07/11	VOA Free Water, Lot 7952	37.5 ppb	ATTO15EthCALs_00004	18.75 uL	Ethanol	500 ppb v/v

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..ATTO15EthCALs_00004	12/10/11	SIGMA, Lot 05796KM			(Purchased Reagent)		Ethanol	1 mL/mL
ATTO15CAL2w_00037	05/01/11	02/08/11		15.463 L	ATTO15CAL6w_00031	386 mL	1,1,1-Trichloroethane	0.499159 ppb v/v
							1,1,2,2-Tetrachloroethane	0.499159 ppb v/v
							1,1,2-Trichloro-1,2,2-trifluoroethane	0.499159 ppb v/v
							1,1,2-Trichloroethane	0.499159 ppb v/v
							1,1-Dichloroethane	0.499159 ppb v/v
							1,1-Dichloroethene	0.499159 ppb v/v
							1,2,3-Trichlorobenzene	0.499159 ppb v/v
							1,2,3-Trichloropropane	0.499159 ppb v/v
							1,2,4-Trichlorobenzene	0.499159 ppb v/v
							1,2,4-Trimethylbenzene	0.499159 ppb v/v
							1,2-Dichloro-1,1,2,2-tetrafluoroethane	0.499159 ppb v/v
							1,2-Dichlorobenzene	0.499159 ppb v/v
							1,2-Dichloroethane	0.499159 ppb v/v
							1,2-Dichloropropane	0.499159 ppb v/v
							1,3,5-Trimethylbenzene	0.499159 ppb v/v
							1,3-Dichlorobenzene	0.499159 ppb v/v
							1,4-Dichlorobenzene	0.499159 ppb v/v
							1,4-Dioxane	0.499159 ppb v/v
							2-Butanone (MEK)	0.499159 ppb v/v
							2-Chlorotoluene	0.499159 ppb v/v
							2-Hexanone	0.499159 ppb v/v
							2-Methyl-2-propanol	0.499159 ppb v/v
							2-Methylbutane	0.499159 ppb v/v
							3-Chloro-1-propene	0.499159 ppb v/v
							4-Ethyltoluene	0.499159 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							4-Isopropyltoluene	0.499159 ppb v/v
							4-Methyl-2-pentanone (MIBK)	0.499159 ppb v/v
							Acetone	0.499159 ppb v/v
							Acetonitrile	0.499159 ppb v/v
							Acrolein	0.499159 ppb v/v
							Acrylonitrile	0.499159 ppb v/v
							Alpha Methyl Styrene	0.499159 ppb v/v
							Benzene	0.499159 ppb v/v
							Benzyl chloride	0.499159 ppb v/v
							Bromoform	0.499159 ppb v/v
							Bromomethane	0.499159 ppb v/v
							Butadiene	0.499159 ppb v/v
							Butane	0.499159 ppb v/v
							Carbon disulfide	0.499159 ppb v/v
							Carbon tetrachloride	0.499159 ppb v/v
							Chlorobenzene	0.499159 ppb v/v
							Chlorodibromomethane	0.499159 ppb v/v
							Chlorodifluoromethane	0.499159 ppb v/v
							Chloroethane	0.499159 ppb v/v
							Chloroform	0.499159 ppb v/v
							Chloromethane	0.499159 ppb v/v
							cis-1,2-Dichloroethene	0.499159 ppb v/v
							cis-1,3-Dichloropropene	0.499159 ppb v/v
							Cyclohexane	0.499159 ppb v/v
							Dibromomethane	0.499159 ppb v/v
							Dichlorobromomethane	0.499159 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Dichlorodifluoromethane	0.499159 ppb v/v
							Dodecane	0.499159 ppb v/v
							Ethyl acetate	0.499159 ppb v/v
							Ethyl ether	0.499159 ppb v/v
							Ethylbenzene	0.499159 ppb v/v
							Ethylene Dibromide	0.499159 ppb v/v
							Hexachlorobutadiene	0.499159 ppb v/v
							Hexane	0.499159 ppb v/v
							Isooctane	0.499159 ppb v/v
							Isopropyl alcohol	0.499159 ppb v/v
							Isopropylbenzene	0.499159 ppb v/v
							m,p-Xylene	0.998319 ppb v/v
							Methyl methacrylate	0.499159 ppb v/v
							Methyl tert-butyl ether	0.499159 ppb v/v
							Methylene Chloride	0.499159 ppb v/v
							n-Butanol	0.499159 ppb v/v
							n-Butylbenzene	0.499159 ppb v/v
							n-Decane	0.499159 ppb v/v
							n-Heptane	0.499159 ppb v/v
							n-Nonane	0.499159 ppb v/v
							n-Octane	0.499159 ppb v/v
							N-Propylbenzene	0.499159 ppb v/v
							Naphthalene	0.499159 ppb v/v
							Pentane	0.499159 ppb v/v
							Propene	0.499159 ppb v/v
							sec-Butylbenzene	0.499159 ppb v/v

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Styrene	0.499159 ppb v/v
							tert-Butylbenzene	0.499159 ppb v/v
							Tetrachloroethene	0.499159 ppb v/v
							Tetrahydrofuran	0.499159 ppb v/v
							Toluene	0.499159 ppb v/v
							trans-1,2-Dichloroethene	0.499159 ppb v/v
							trans-1,3-Dichloropropene	0.499159 ppb v/v
							Trichloroethene	0.499159 ppb v/v
							Trichlorofluoromethane	0.499159 ppb v/v
							Undecane	0.499159 ppb v/v
							Vinyl acetate	0.499159 ppb v/v
							Vinyl bromide	0.499159 ppb v/v
							Vinyl chloride	0.499159 ppb v/v
							Xylene, o-	0.499159 ppb v/v
							Ethanol	5.00805 ppb v/v
					ATTO15EthCALw_00016	124 mL	Ethanol	5.00805 ppb v/v
.ATTO15CAL6w_00031	05/01/11	02/08/11		15.463 L	ATTO15CALSTKi_00020	1546 mL	1,1,1-Trichloroethane	19.9961 ppb v/v
							1,1,2,2-Tetrachloroethane	19.9961 ppb v/v
							1,1,2-Trichloro-1,2,2-trifluoroethane	19.9961 ppb v/v
							1,1,2-Trichloroethane	19.9961 ppb v/v
							1,1-Dichloroethane	19.9961 ppb v/v
							1,1-Dichloroethene	19.9961 ppb v/v
							1,2,3-Trichlorobenzene	19.9961 ppb v/v
							1,2,3-Trichloropropane	19.9961 ppb v/v
							1,2,4-Trichlorobenzene	19.9961 ppb v/v
							1,2,4-Trimethylbenzene	19.9961 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							1,2-Dichloro-1,1,2,2-tetrafluoroethane	19.9961 ppb v/v
							1,2-Dichlorobenzene	19.9961 ppb v/v
							1,2-Dichloroethane	19.9961 ppb v/v
							1,2-Dichloropropane	19.9961 ppb v/v
							1,3,5-Trimethylbenzene	19.9961 ppb v/v
							1,3-Dichlorobenzene	19.9961 ppb v/v
							1,4-Dichlorobenzene	19.9961 ppb v/v
							1,4-Dioxane	19.9961 ppb v/v
							2-Butanone (MEK)	19.9961 ppb v/v
							2-Chlorotoluene	19.9961 ppb v/v
							2-Hexanone	19.9961 ppb v/v
							2-Methyl-2-propanol	19.9961 ppb v/v
							2-Methylbutane	19.9961 ppb v/v
							3-Chloro-1-propene	19.9961 ppb v/v
							4-Ethyltoluene	19.9961 ppb v/v
							4-Isopropyltoluene	19.9961 ppb v/v
							4-Methyl-2-pentanone (MIBK)	19.9961 ppb v/v
							Acetone	19.9961 ppb v/v
							Acetonitrile	19.9961 ppb v/v
							Acrolein	19.9961 ppb v/v
							Acrylonitrile	19.9961 ppb v/v
							Alpha Methyl Styrene	19.9961 ppb v/v
							Benzene	19.9961 ppb v/v
							Benzyl chloride	19.9961 ppb v/v
							Bromoform	19.9961 ppb v/v
							Bromomethane	19.9961 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Butadiene	19.9961 ppb v/v
							Butane	19.9961 ppb v/v
							Carbon disulfide	19.9961 ppb v/v
							Carbon tetrachloride	19.9961 ppb v/v
							Chlorobenzene	19.9961 ppb v/v
							Chlorodibromomethane	19.9961 ppb v/v
							Chlorodifluoromethane	19.9961 ppb v/v
							Chloroethane	19.9961 ppb v/v
							Chloroform	19.9961 ppb v/v
							Chloromethane	19.9961 ppb v/v
							cis-1,2-Dichloroethene	19.9961 ppb v/v
							cis-1,3-Dichloropropene	19.9961 ppb v/v
							Cyclohexane	19.9961 ppb v/v
							Dibromomethane	19.9961 ppb v/v
							Dichlorobromomethane	19.9961 ppb v/v
							Dichlorodifluoromethane	19.9961 ppb v/v
							Dodecane	19.9961 ppb v/v
							Ethyl acetate	19.9961 ppb v/v
							Ethyl ether	19.9961 ppb v/v
							Ethylbenzene	19.9961 ppb v/v
							Ethylene Dibromide	19.9961 ppb v/v
							Hexachlorobutadiene	19.9961 ppb v/v
							Hexane	19.9961 ppb v/v
							Isooctane	19.9961 ppb v/v
							Isopropyl alcohol	19.9961 ppb v/v
							Isopropylbenzene	19.9961 ppb v/v

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							m,p-Xylene	39.9922 ppb v/v
							Methyl methacrylate	19.9961 ppb v/v
							Methyl tert-butyl ether	19.9961 ppb v/v
							Methylene Chloride	19.9961 ppb v/v
							n-Butanol	19.9961 ppb v/v
							n-Butylbenzene	19.9961 ppb v/v
							n-Decane	19.9961 ppb v/v
							n-Heptane	19.9961 ppb v/v
							n-Nonane	19.9961 ppb v/v
							n-Octane	19.9961 ppb v/v
							N-Propylbenzene	19.9961 ppb v/v
							Naphthalene	19.9961 ppb v/v
							Pentane	19.9961 ppb v/v
							Propene	19.9961 ppb v/v
							sec-Butylbenzene	19.9961 ppb v/v
							Styrene	19.9961 ppb v/v
							tert-Butylbenzene	19.9961 ppb v/v
							Tetrachloroethene	19.9961 ppb v/v
							Tetrahydrofuran	19.9961 ppb v/v
							Toluene	19.9961 ppb v/v
							trans-1,2-Dichloroethene	19.9961 ppb v/v
							trans-1,3-Dichloropropene	19.9961 ppb v/v
							Trichloroethene	19.9961 ppb v/v
							Trichlorofluoromethane	19.9961 ppb v/v
							Undecane	19.9961 ppb v/v
							Vinyl acetate	19.9961 ppb v/v

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SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Vinyl bromide	19.9961 ppb v/v
							Vinyl chloride	19.9961 ppb v/v
							Xylene, o-	19.9961 ppb v/v
					ATTO15EthCALw_00016	1237 mL	Ethanol	39.9987 ppb v/v
..ATTO15CALSTKi_00020	05/01/11	02/01/11	DI WATER, Lot 1003	37.5 L	ATTO15CALs_00006	7500 mL	1,1,1-Trichloroethane	200 ppb v/v
							1,1,2,2-Tetrachloroethane	200 ppb v/v
							1,1,2-Trichloro-1,2,2-trifluoroethane	200 ppb v/v
							1,1,2-Trichloroethane	200 ppb v/v
							1,1-Dichloroethane	200 ppb v/v
							1,1-Dichloroethene	200 ppb v/v
							1,2,3-Trichlorobenzene	200 ppb v/v
							1,2,3-Trichloropropane	200 ppb v/v
							1,2,4-Trichlorobenzene	200 ppb v/v
							1,2,4-Trimethylbenzene	200 ppb v/v
							1,2-Dichloro-1,1,2,2-tetrafluoroethane	200 ppb v/v
							1,2-Dichlorobenzene	200 ppb v/v
							1,2-Dichloroethane	200 ppb v/v
							1,2-Dichloropropane	200 ppb v/v
							1,3,5-Trimethylbenzene	200 ppb v/v
							1,3-Dichlorobenzene	200 ppb v/v
							1,4-Dichlorobenzene	200 ppb v/v
							1,4-Dioxane	200 ppb v/v
							2-Butanone (MEK)	200 ppb v/v
							2-Chlorotoluene	200 ppb v/v
							2-Hexanone	200 ppb v/v
							2-Methyl-2-propanol	200 ppb v/v
							2-Methylbutane	200 ppb v/v
							3-Chloro-1-propene	200 ppb v/v
							4-Ethyltoluene	200 ppb v/v
							4-Isopropyltoluene	200 ppb v/v
							4-Methyl-2-pentanone (MIBK)	200 ppb v/v
							Acetone	200 ppb v/v
							Acetonitrile	200 ppb v/v
							Acrolein	200 ppb v/v
							Acrylonitrile	200 ppb v/v
							Alpha Methyl Styrene	200 ppb v/v
							Benzene	200 ppb v/v
							Benzyl chloride	200 ppb v/v
							Bromoform	200 ppb v/v
							Bromomethane	200 ppb v/v
							Butadiene	200 ppb v/v
							Butane	200 ppb v/v
							Carbon disulfide	200 ppb v/v
							Carbon tetrachloride	200 ppb v/v
							Chlorobenzene	200 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Chlorodibromomethane	200 ppb v/v
							Chlorodifluoromethane	200 ppb v/v
							Chloroethane	200 ppb v/v
							Chloroform	200 ppb v/v
							Chloromethane	200 ppb v/v
							cis-1,2-Dichloroethene	200 ppb v/v
							cis-1,3-Dichloropropene	200 ppb v/v
							Cyclohexane	200 ppb v/v
							Dibromomethane	200 ppb v/v
							Dichlorobromomethane	200 ppb v/v
							Dichlorodifluoromethane	200 ppb v/v
							Dodecane	200 ppb v/v
							Ethyl acetate	200 ppb v/v
							Ethyl ether	200 ppb v/v
							Ethylbenzene	200 ppb v/v
							Ethylene Dibromide	200 ppb v/v
							Hexachlorobutadiene	200 ppb v/v
							Hexane	200 ppb v/v
							Isooctane	200 ppb v/v
							Isopropyl alcohol	200 ppb v/v
							Isopropylbenzene	200 ppb v/v
							m,p-Xylene	400 ppb v/v
							Methyl methacrylate	200 ppb v/v
							Methyl tert-butyl ether	200 ppb v/v
							Methylene Chloride	200 ppb v/v
							n-Butanol	200 ppb v/v
							n-Butylbenzene	200 ppb v/v
							n-Decane	200 ppb v/v
							n-Heptane	200 ppb v/v
							n-Nonane	200 ppb v/v
							n-Octane	200 ppb v/v
							N-Propylbenzene	200 ppb v/v
							Naphthalene	200 ppb v/v
							Pentane	200 ppb v/v
							Propene	200 ppb v/v
							sec-Butylbenzene	200 ppb v/v
							Styrene	200 ppb v/v
							tert-Butylbenzene	200 ppb v/v
							Tetrachloroethene	200 ppb v/v
							Tetrahydrofuran	200 ppb v/v
							Toluene	200 ppb v/v
							trans-1,2-Dichloroethene	200 ppb v/v
							trans-1,3-Dichloropropene	200 ppb v/v
							Trichloroethene	200 ppb v/v
							Trichlorofluoromethane	200 ppb v/v
							Undecane	200 ppb v/v
							Vinyl acetate	200 ppb v/v
							Vinyl bromide	200 ppb v/v
							Vinyl chloride	200 ppb v/v
							Xylene, o-	200 ppb v/v

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SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...ATTO15CALs_00006	11/30/11		Spectra Gases, Lot cc-250179		(Purchased Reagent)		1,1,1-Trichloroethane	1 ppm v/v
							1,1,2,2-Tetrachloroethane	1 ppm v/v
							1,1,2-Trichloro-1,2,2-trifluoroethane	1 ppm v/v
							1,1,2-Trichloroethane	1 ppm v/v
							1,1-Dichloroethane	1 ppm v/v
							1,1-Dichloroethene	1 ppm v/v
							1,2,3-Trichlorobenzene	1 ppm v/v
							1,2,3-Trichloropropane	1 ppm v/v
							1,2,4-Trichlorobenzene	1 ppm v/v
							1,2,4-Trimethylbenzene	1 ppm v/v
							1,2-Dichloro-1,1,2,2-tetrafluoroethane	1 ppm v/v
							1,2-Dichlorobenzene	1 ppm v/v
							1,2-Dichloroethane	1 ppm v/v
							1,2-Dichloropropane	1 ppm v/v
							1,3,5-Trimethylbenzene	1 ppm v/v
							1,3-Dichlorobenzene	1 ppm v/v
							1,4-Dichlorobenzene	1 ppm v/v
							1,4-Dioxane	1 ppm v/v
							2-Butanone (MEK)	1 ppm v/v
							2-Chlorotoluene	1 ppm v/v
							2-Hexanone	1 ppm v/v
							2-Methyl-2-propanol	1 ppm v/v
							2-Methylbutane	1 ppm v/v
							3-Chloro-1-propene	1 ppm v/v
							4-Ethyltoluene	1 ppm v/v
							4-Isopropyltoluene	1 ppm v/v
							4-Methyl-2-pentanone (MIBK)	1 ppm v/v
							Acetone	1 ppm v/v
							Acetonitrile	1 ppm v/v
							Acrolein	1 ppm v/v
							Acrylonitrile	1 ppm v/v
							Alpha Methyl Styrene	1 ppm v/v
							Benzene	1 ppm v/v
							Benzyl chloride	1 ppm v/v
							Bromoform	1 ppm v/v
							Bromomethane	1 ppm v/v
							Butadiene	1 ppm v/v
							Butane	1 ppm v/v
							Carbon disulfide	1 ppm v/v
							Carbon tetrachloride	1 ppm v/v
							Chlorobenzene	1 ppm v/v
							Chlorodibromomethane	1 ppm v/v
							Chlorodifluoromethane	1 ppm v/v
							Chloroethane	1 ppm v/v
							Chloroform	1 ppm v/v
							Chloromethane	1 ppm v/v
							cis-1,2-Dichloroethene	1 ppm v/v
							cis-1,3-Dichloropropene	1 ppm v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Cyclohexane	1 ppm v/v
							Dibromomethane	1 ppm v/v
							Dichlorobromomethane	1 ppm v/v
							Dichlorodifluoromethane	1 ppm v/v
							Dodecane	1 ppm v/v
							Ethyl acetate	1 ppm v/v
							Ethyl ether	1 ppm v/v
							Ethylbenzene	1 ppm v/v
							Ethylene Dibromide	1 ppm v/v
							Hexachlorobutadiene	1 ppm v/v
							Hexane	1 ppm v/v
							Isooctane	1 ppm v/v
							Isopropyl alcohol	1 ppm v/v
							Isopropylbenzene	1 ppm v/v
							m,p-Xylene	2 ppm v/v
							Methyl methacrylate	1 ppm v/v
							Methyl tert-butyl ether	1 ppm v/v
							Methylene Chloride	1 ppm v/v
							n-Butanol	1 ppm v/v
							n-Butylbenzene	1 ppm v/v
							n-Decane	1 ppm v/v
							n-Heptane	1 ppm v/v
							n-Nonane	1 ppm v/v
							n-Octane	1 ppm v/v
							N-Propylbenzene	1 ppm v/v
							Naphthalene	1 ppm v/v
							Pentane	1 ppm v/v
							Propene	1 ppm v/v
							sec-Butylbenzene	1 ppm v/v
							Styrene	1 ppm v/v
							tert-Butylbenzene	1 ppm v/v
							Tetrachloroethene	1 ppm v/v
							Tetrahydrofuran	1 ppm v/v
							Toluene	1 ppm v/v
							trans-1,2-Dichloroethene	1 ppm v/v
							trans-1,3-Dichloropropene	1 ppm v/v
							Trichloroethene	1 ppm v/v
							Trichlorofluoromethane	1 ppm v/v
							Undecane	1 ppm v/v
							Vinyl acetate	1 ppm v/v
							Vinyl bromide	1 ppm v/v
							Vinyl chloride	1 ppm v/v
							Xylene, o-	1 ppm v/v
..ATTO15EthCALw_00016	05/07/11	02/07/11	VOA Free Water, Lot 7952	37.5 ppb	ATTO15EthCALs_00004	18.75 uL	Ethanol	500 ppb v/v
...ATTO15EthCALs_00004	12/10/11		SIGMA, Lot 05796KM		(Purchased Reagent)		Ethanol	1 mL/mL
.ATTO15EthCALw_00016	05/07/11	02/07/11	VOA Free Water, Lot 7952	37.5 ppb	ATTO15EthCALs_00004	18.75 uL	Ethanol	500 ppb v/v
..ATTO15EthCALs_00004	12/10/11		SIGMA, Lot 05796KM		(Purchased Reagent)		Ethanol	1 mL/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
ATTO15CAL3w_00044	05/01/11	02/08/11		15.463 L	ATTO15CALSTKi_00020	386 mL	1,1,1-Trichloroethane	4.99256 ppb v/v
							1,1,2,2-Tetrachloroethane	4.99256 ppb v/v
							1,1,2-Trichloro-1,2,2-trifluoroethane	4.99256 ppb v/v
							1,1,2-Trichloroethane	4.99256 ppb v/v
							1,1-Dichloroethane	4.99256 ppb v/v
							1,1-Dichloroethene	4.99256 ppb v/v
							1,2,3-Trichlorobenzene	4.99256 ppb v/v
							1,2,3-Trichloropropane	4.99256 ppb v/v
							1,2,4-Trichlorobenzene	4.99256 ppb v/v
							1,2,4-Trimethylbenzene	4.99256 ppb v/v
							1,2-Dichloro-1,1,2,2-tetrafluoroethane	4.99256 ppb v/v
							1,2-Dichlorobenzene	4.99256 ppb v/v
							1,2-Dichloroethane	4.99256 ppb v/v
							1,2-Dichloropropane	4.99256 ppb v/v
							1,3,5-Trimethylbenzene	4.99256 ppb v/v
							1,3-Dichlorobenzene	4.99256 ppb v/v
							1,4-Dichlorobenzene	4.99256 ppb v/v
							1,4-Dioxane	4.99256 ppb v/v
							2-Butanone (MEK)	4.99256 ppb v/v
							2-Chlorotoluene	4.99256 ppb v/v
							2-Hexanone	4.99256 ppb v/v
							2-Methyl-2-propanol	4.99256 ppb v/v
							2-Methylbutane	4.99256 ppb v/v
							3-Chloro-1-propene	4.99256 ppb v/v
							4-Ethyltoluene	4.99256 ppb v/v
							4-Isopropyltoluene	4.99256 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							4-Methyl-2-pentanone (MIBK)	4.99256 ppb v/v
							Acetone	4.99256 ppb v/v
							Acetonitrile	4.99256 ppb v/v
							Acrolein	4.99256 ppb v/v
							Acrylonitrile	4.99256 ppb v/v
							Alpha Methyl Styrene	4.99256 ppb v/v
							Benzene	4.99256 ppb v/v
							Benzyl chloride	4.99256 ppb v/v
							Bromoform	4.99256 ppb v/v
							Bromomethane	4.99256 ppb v/v
							Butadiene	4.99256 ppb v/v
							Butane	4.99256 ppb v/v
							Carbon disulfide	4.99256 ppb v/v
							Carbon tetrachloride	4.99256 ppb v/v
							Chlorobenzene	4.99256 ppb v/v
							Chlorodibromomethane	4.99256 ppb v/v
							Chlorodifluoromethane	4.99256 ppb v/v
							Chloroethane	4.99256 ppb v/v
							Chloroform	4.99256 ppb v/v
							Chloromethane	4.99256 ppb v/v
							cis-1,2-Dichloroethene	4.99256 ppb v/v
							cis-1,3-Dichloropropene	4.99256 ppb v/v
							Cyclohexane	4.99256 ppb v/v
							Dibromomethane	4.99256 ppb v/v
							Dichlorobromomethane	4.99256 ppb v/v
							Dichlorodifluoromethane	4.99256 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Dodecane	4.99256 ppb v/v
							Ethyl acetate	4.99256 ppb v/v
							Ethyl ether	4.99256 ppb v/v
							Ethylbenzene	4.99256 ppb v/v
							Ethylene Dibromide	4.99256 ppb v/v
							Hexachlorobutadiene	4.99256 ppb v/v
							Hexane	4.99256 ppb v/v
							Isooctane	4.99256 ppb v/v
							Isopropyl alcohol	4.99256 ppb v/v
							Isopropylbenzene	4.99256 ppb v/v
							m,p-Xylene	9.98513 ppb v/v
							Methyl methacrylate	4.99256 ppb v/v
							Methyl tert-butyl ether	4.99256 ppb v/v
							Methylene Chloride	4.99256 ppb v/v
							n-Butanol	4.99256 ppb v/v
							n-Butylbenzene	4.99256 ppb v/v
							n-Decane	4.99256 ppb v/v
							n-Heptane	4.99256 ppb v/v
							n-Nonane	4.99256 ppb v/v
							n-Octane	4.99256 ppb v/v
							N-Propylbenzene	4.99256 ppb v/v
							Naphthalene	4.99256 ppb v/v
							Pentane	4.99256 ppb v/v
							Propene	4.99256 ppb v/v
							sec-Butylbenzene	4.99256 ppb v/v
							Styrene	4.99256 ppb v/v

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							tert-Butylbenzene	4.99256 ppb v/v
							Tetrachloroethene	4.99256 ppb v/v
							Tetrahydrofuran	4.99256 ppb v/v
							Toluene	4.99256 ppb v/v
							trans-1,2-Dichloroethene	4.99256 ppb v/v
							trans-1,3-Dichloropropene	4.99256 ppb v/v
							Trichloroethene	4.99256 ppb v/v
							Trichlorofluoromethane	4.99256 ppb v/v
							Undecane	4.99256 ppb v/v
							Vinyl acetate	4.99256 ppb v/v
							Vinyl bromide	4.99256 ppb v/v
							Vinyl chloride	4.99256 ppb v/v
							Xylene, o-	4.99256 ppb v/v
					ATTO15EthCALw_00016	309 mL	Ethanol	9.99159 ppb v/v
.ATTO15CALSTKi_00020	05/01/11	02/01/11	DI WATER, Lot 1003	37.5 L	ATTO15CALs_00006	7500 mL	1,1,1-Trichloroethane	200 ppb v/v
							1,1,2,2-Tetrachloroethane	200 ppb v/v
							1,1,2-Trichloro-1,2,2-trifluoroethane	200 ppb v/v
							1,1,2-Trichloroethane	200 ppb v/v
							1,1-Dichloroethane	200 ppb v/v
							1,1-Dichloroethene	200 ppb v/v
							1,2,3-Trichlorobenzene	200 ppb v/v
							1,2,3-Trichloropropane	200 ppb v/v
							1,2,4-Trichlorobenzene	200 ppb v/v
							1,2,4-Trimethylbenzene	200 ppb v/v
							1,2-Dichloro-1,1,2,2-tetrafluoroethane	200 ppb v/v
							1,2-Dichlorobenzene	200 ppb v/v
							1,2-Dichloroethane	200 ppb v/v
							1,2-Dichloropropane	200 ppb v/v
							1,3,5-Trimethylbenzene	200 ppb v/v
							1,3-Dichlorobenzene	200 ppb v/v
							1,4-Dichlorobenzene	200 ppb v/v
							1,4-Dioxane	200 ppb v/v
							2-Butanone (MEK)	200 ppb v/v
							2-Chlorotoluene	200 ppb v/v
							2-Hexanone	200 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							2-Methyl-2-propanol	200 ppb v/v
							2-Methylbutane	200 ppb v/v
							3-Chloro-1-propene	200 ppb v/v
							4-Ethyltoluene	200 ppb v/v
							4-Isopropyltoluene	200 ppb v/v
							4-Methyl-2-pentanone (MIBK)	200 ppb v/v
							Acetone	200 ppb v/v
							Acetonitrile	200 ppb v/v
							Acrolein	200 ppb v/v
							Acrylonitrile	200 ppb v/v
							Alpha Methyl Styrene	200 ppb v/v
							Benzene	200 ppb v/v
							Benzyl chloride	200 ppb v/v
							Bromoform	200 ppb v/v
							Bromomethane	200 ppb v/v
							Butadiene	200 ppb v/v
							Butane	200 ppb v/v
							Carbon disulfide	200 ppb v/v
							Carbon tetrachloride	200 ppb v/v
							Chlorobenzene	200 ppb v/v
							Chlorodibromomethane	200 ppb v/v
							Chlorodifluoromethane	200 ppb v/v
							Chloroethane	200 ppb v/v
							Chloroform	200 ppb v/v
							Chloromethane	200 ppb v/v
							cis-1,2-Dichloroethene	200 ppb v/v
							cis-1,3-Dichloropropene	200 ppb v/v
							Cyclohexane	200 ppb v/v
							Dibromomethane	200 ppb v/v
							Dichlorobromomethane	200 ppb v/v
							Dichlorodifluoromethane	200 ppb v/v
							Dodecane	200 ppb v/v
							Ethyl acetate	200 ppb v/v
							Ethyl ether	200 ppb v/v
							Ethylbenzene	200 ppb v/v
							Ethylene Dibromide	200 ppb v/v
							Hexachlorobutadiene	200 ppb v/v
							Hexane	200 ppb v/v
							Isooctane	200 ppb v/v
							Isopropyl alcohol	200 ppb v/v
							Isopropylbenzene	200 ppb v/v
							m,p-Xylene	400 ppb v/v
							Methyl methacrylate	200 ppb v/v
							Methyl tert-butyl ether	200 ppb v/v
							Methylene Chloride	200 ppb v/v
							n-Butanol	200 ppb v/v
							n-Butylbenzene	200 ppb v/v
							n-Decane	200 ppb v/v
							n-Heptane	200 ppb v/v
							n-Nonane	200 ppb v/v

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							n-Octane	200 ppb v/v
							N-Propylbenzene	200 ppb v/v
							Naphthalene	200 ppb v/v
							Pentane	200 ppb v/v
							Propene	200 ppb v/v
							sec-Butylbenzene	200 ppb v/v
							Styrene	200 ppb v/v
							tert-Butylbenzene	200 ppb v/v
							Tetrachloroethene	200 ppb v/v
							Tetrahydrofuran	200 ppb v/v
							Toluene	200 ppb v/v
							trans-1,2-Dichloroethene	200 ppb v/v
							trans-1,3-Dichloropropene	200 ppb v/v
							Trichloroethene	200 ppb v/v
							Trichlorofluoromethane	200 ppb v/v
							Undecane	200 ppb v/v
							Vinyl acetate	200 ppb v/v
							Vinyl bromide	200 ppb v/v
							Vinyl chloride	200 ppb v/v
							Xylene, o-	200 ppb v/v
..ATTO15CALs_00006	11/30/11		Spectra Gases, Lot cc-250179		(Purchased Reagent)		1,1,1-Trichloroethane	1 ppm v/v
							1,1,2,2-Tetrachloroethane	1 ppm v/v
							1,1,2-Trichloro-1,2,2-trifluoroethane	1 ppm v/v
							1,1,2-Trichloroethane	1 ppm v/v
							1,1-Dichloroethane	1 ppm v/v
							1,1-Dichloroethene	1 ppm v/v
							1,2,3-Trichlorobenzene	1 ppm v/v
							1,2,3-Trichloropropane	1 ppm v/v
							1,2,4-Trichlorobenzene	1 ppm v/v
							1,2,4-Trimethylbenzene	1 ppm v/v
							1,2-Dichloro-1,1,2,2-tetrafluoroethane	1 ppm v/v
							1,2-Dichlorobenzene	1 ppm v/v
							1,2-Dichloroethane	1 ppm v/v
							1,2-Dichloropropane	1 ppm v/v
							1,3,5-Trimethylbenzene	1 ppm v/v
							1,3-Dichlorobenzene	1 ppm v/v
							1,4-Dichlorobenzene	1 ppm v/v
							1,4-Dioxane	1 ppm v/v
							2-Butanone (MEK)	1 ppm v/v
							2-Chlorotoluene	1 ppm v/v
							2-Hexanone	1 ppm v/v
							2-Methyl-2-propanol	1 ppm v/v
							2-Methylbutane	1 ppm v/v
							3-Chloro-1-propene	1 ppm v/v
							4-Ethyltoluene	1 ppm v/v
							4-Isopropyltoluene	1 ppm v/v
							4-Methyl-2-pentanone (MIBK)	1 ppm v/v
							Acetone	1 ppm v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Acetonitrile	1 ppm v/v
							Acrolein	1 ppm v/v
							Acrylonitrile	1 ppm v/v
							Alpha Methyl Styrene	1 ppm v/v
							Benzene	1 ppm v/v
							Benzyl chloride	1 ppm v/v
							Bromoform	1 ppm v/v
							Bromomethane	1 ppm v/v
							Butadiene	1 ppm v/v
							Butane	1 ppm v/v
							Carbon disulfide	1 ppm v/v
							Carbon tetrachloride	1 ppm v/v
							Chlorobenzene	1 ppm v/v
							Chlorodibromomethane	1 ppm v/v
							Chlorodifluoromethane	1 ppm v/v
							Chloroethane	1 ppm v/v
							Chloroform	1 ppm v/v
							Chloromethane	1 ppm v/v
							cis-1,2-Dichloroethene	1 ppm v/v
							cis-1,3-Dichloropropene	1 ppm v/v
							Cyclohexane	1 ppm v/v
							Dibromomethane	1 ppm v/v
							Dichlorobromomethane	1 ppm v/v
							Dichlorodifluoromethane	1 ppm v/v
							Dodecane	1 ppm v/v
							Ethyl acetate	1 ppm v/v
							Ethyl ether	1 ppm v/v
							Ethylbenzene	1 ppm v/v
							Ethylene Dibromide	1 ppm v/v
							Hexachlorobutadiene	1 ppm v/v
							Hexane	1 ppm v/v
							Isooctane	1 ppm v/v
							Isopropyl alcohol	1 ppm v/v
							Isopropylbenzene	1 ppm v/v
							m,p-Xylene	2 ppm v/v
							Methyl methacrylate	1 ppm v/v
							Methyl tert-butyl ether	1 ppm v/v
							Methylene Chloride	1 ppm v/v
							n-Butanol	1 ppm v/v
							n-Butylbenzene	1 ppm v/v
							n-Decane	1 ppm v/v
							n-Heptane	1 ppm v/v
							n-Nonane	1 ppm v/v
							n-Octane	1 ppm v/v
							N-Propylbenzene	1 ppm v/v
							Naphthalene	1 ppm v/v
							Pentane	1 ppm v/v
							Propene	1 ppm v/v
							sec-Butylbenzene	1 ppm v/v
							Styrene	1 ppm v/v

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							tert-Butylbenzene	1 ppm v/v
							Tetrachloroethene	1 ppm v/v
							Tetrahydrofuran	1 ppm v/v
							Toluene	1 ppm v/v
							trans-1,2-Dichloroethene	1 ppm v/v
							trans-1,3-Dichloropropene	1 ppm v/v
							Trichloroethene	1 ppm v/v
							Trichlorofluoromethane	1 ppm v/v
							Undecane	1 ppm v/v
							Vinyl acetate	1 ppm v/v
							Vinyl bromide	1 ppm v/v
							Vinyl chloride	1 ppm v/v
							Xylene, o-	1 ppm v/v
.ATTO15EthCALw_00016	05/07/11	02/07/11	VOA Free Water, Lot 7952	37.5 ppb	ATTO15EthCALs_00004	18.75 uL	Ethanol	500 ppb v/v
..ATTO15EthCALs_00004	12/10/11	SIGMA, Lot 05796KM			(Purchased Reagent)		Ethanol	1 mL/mL
ATTO15CAL3w_00045	05/01/11	02/08/11		15.463 L	ATTO15CALSTKi_00020	386 mL	1,1,1-Trichloroethane	4.99256 ppb v/v
							1,1,2,2-Tetrachloroethane	4.99256 ppb v/v
							1,1,2-Trichloro-1,2,2-trifluoroethane	4.99256 ppb v/v
							1,1,2-Trichloroethane	4.99256 ppb v/v
							1,1-Dichloroethane	4.99256 ppb v/v
							1,1-Dichloroethene	4.99256 ppb v/v
							1,2,3-Trichlorobenzene	4.99256 ppb v/v
							1,2,3-Trichloropropane	4.99256 ppb v/v
							1,2,4-Trichlorobenzene	4.99256 ppb v/v
							1,2,4-Trimethylbenzene	4.99256 ppb v/v
							1,2-Dichloro-1,1,2,2-tetrafluoroethane	4.99256 ppb v/v
							1,2-Dichlorobenzene	4.99256 ppb v/v
							1,2-Dichloroethane	4.99256 ppb v/v
							1,2-Dichloropropane	4.99256 ppb v/v
							1,3,5-Trimethylbenzene	4.99256 ppb v/v
							1,3-Dichlorobenzene	4.99256 ppb v/v
							1,4-Dichlorobenzene	4.99256 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							1,4-Dioxane	4.99256 ppb v/v
							2-Butanone (MEK)	4.99256 ppb v/v
							2-Chlorotoluene	4.99256 ppb v/v
							2-Hexanone	4.99256 ppb v/v
							2-Methyl-2-propanol	4.99256 ppb v/v
							2-Methylbutane	4.99256 ppb v/v
							3-Chloro-1-propene	4.99256 ppb v/v
							4-Ethyltoluene	4.99256 ppb v/v
							4-Isopropyltoluene	4.99256 ppb v/v
							4-Methyl-2-pentanone (MIBK)	4.99256 ppb v/v
							Acetone	4.99256 ppb v/v
							Acetonitrile	4.99256 ppb v/v
							Acrolein	4.99256 ppb v/v
							Acrylonitrile	4.99256 ppb v/v
							Alpha Methyl Styrene	4.99256 ppb v/v
							Benzene	4.99256 ppb v/v
							Benzyl chloride	4.99256 ppb v/v
							Bromoform	4.99256 ppb v/v
							Bromomethane	4.99256 ppb v/v
							Butadiene	4.99256 ppb v/v
							Butane	4.99256 ppb v/v
							Carbon disulfide	4.99256 ppb v/v
							Carbon tetrachloride	4.99256 ppb v/v
							Chlorobenzene	4.99256 ppb v/v
							Chlorodibromomethane	4.99256 ppb v/v
							Chlorodifluoromethane	4.99256 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Chloroethane	4.99256 ppb v/v
							Chloroform	4.99256 ppb v/v
							Chloromethane	4.99256 ppb v/v
							cis-1,2-Dichloroethene	4.99256 ppb v/v
							cis-1,3-Dichloropropene	4.99256 ppb v/v
							Cyclohexane	4.99256 ppb v/v
							Dibromomethane	4.99256 ppb v/v
							Dichlorobromomethane	4.99256 ppb v/v
							Dichlorodifluoromethane	4.99256 ppb v/v
							Dodecane	4.99256 ppb v/v
							Ethyl acetate	4.99256 ppb v/v
							Ethyl ether	4.99256 ppb v/v
							Ethylbenzene	4.99256 ppb v/v
							Ethylene Dibromide	4.99256 ppb v/v
							Hexachlorobutadiene	4.99256 ppb v/v
							Hexane	4.99256 ppb v/v
							Isooctane	4.99256 ppb v/v
							Isopropyl alcohol	4.99256 ppb v/v
							Isopropylbenzene	4.99256 ppb v/v
							m,p-Xylene	9.98513 ppb v/v
							Methyl methacrylate	4.99256 ppb v/v
							Methyl tert-butyl ether	4.99256 ppb v/v
							Methylene Chloride	4.99256 ppb v/v
							n-Butanol	4.99256 ppb v/v
							n-Butylbenzene	4.99256 ppb v/v
							n-Decane	4.99256 ppb v/v

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							n-Heptane	4.99256 ppb v/v
							n-Nonane	4.99256 ppb v/v
							n-Octane	4.99256 ppb v/v
							N-Propylbenzene	4.99256 ppb v/v
							Naphthalene	4.99256 ppb v/v
							Pentane	4.99256 ppb v/v
							Propene	4.99256 ppb v/v
							sec-Butylbenzene	4.99256 ppb v/v
							Styrene	4.99256 ppb v/v
							tert-Butylbenzene	4.99256 ppb v/v
							Tetrachloroethene	4.99256 ppb v/v
							Tetrahydrofuran	4.99256 ppb v/v
							Toluene	4.99256 ppb v/v
							trans-1,2-Dichloroethene	4.99256 ppb v/v
							trans-1,3-Dichloropropene	4.99256 ppb v/v
							Trichloroethene	4.99256 ppb v/v
							Trichlorofluoromethane	4.99256 ppb v/v
							Undecane	4.99256 ppb v/v
							Vinyl acetate	4.99256 ppb v/v
							Vinyl bromide	4.99256 ppb v/v
							Vinyl chloride	4.99256 ppb v/v
							Xylene, o-	4.99256 ppb v/v
					ATTO15EthCALw_00016	309 mL	Ethanol	9.99159 ppb v/v
.ATTO15CALSTKi_00020	05/01/11	02/01/11	DI WATER, Lot 1003	37.5 L	ATTO15CALs_00006	7500 mL	1,1,1-Trichloroethane	200 ppb v/v
							1,1,2,2-Tetrachloroethane	200 ppb v/v
							1,1,2-Trichloro-1,2,2-trifluoroethane	200 ppb v/v
							1,1,2-Trichloroethane	200 ppb v/v
							1,1-Dichloroethane	200 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							1,1-Dichloroethene	200 ppb v/v
							1,2,3-Trichlorobenzene	200 ppb v/v
							1,2,3-Trichloropropane	200 ppb v/v
							1,2,4-Trichlorobenzene	200 ppb v/v
							1,2,4-Trimethylbenzene	200 ppb v/v
							1,2-Dichloro-1,1,2,2-tetrafluoroethane	200 ppb v/v
							1,2-Dichlorobenzene	200 ppb v/v
							1,2-Dichloroethane	200 ppb v/v
							1,2-Dichloropropane	200 ppb v/v
							1,3,5-Trimethylbenzene	200 ppb v/v
							1,3-Dichlorobenzene	200 ppb v/v
							1,4-Dichlorobenzene	200 ppb v/v
							1,4-Dioxane	200 ppb v/v
							2-Butanone (MEK)	200 ppb v/v
							2-Chlorotoluene	200 ppb v/v
							2-Hexanone	200 ppb v/v
							2-Methyl-2-propanol	200 ppb v/v
							2-Methylbutane	200 ppb v/v
							3-Chloro-1-propene	200 ppb v/v
							4-Ethyltoluene	200 ppb v/v
							4-Isopropyltoluene	200 ppb v/v
							4-Methyl-2-pentanone (MIBK)	200 ppb v/v
							Acetone	200 ppb v/v
							Acetonitrile	200 ppb v/v
							Acrolein	200 ppb v/v
							Acrylonitrile	200 ppb v/v
							Alpha Methyl Styrene	200 ppb v/v
							Benzene	200 ppb v/v
							Benzyl chloride	200 ppb v/v
							Bromoform	200 ppb v/v
							Bromomethane	200 ppb v/v
							Butadiene	200 ppb v/v
							Butane	200 ppb v/v
							Carbon disulfide	200 ppb v/v
							Carbon tetrachloride	200 ppb v/v
							Chlorobenzene	200 ppb v/v
							Chlorodibromomethane	200 ppb v/v
							Chlorodifluoromethane	200 ppb v/v
							Chloroethane	200 ppb v/v
							Chloroform	200 ppb v/v
							Chloromethane	200 ppb v/v
							cis-1,2-Dichloroethene	200 ppb v/v
							cis-1,3-Dichloropropene	200 ppb v/v
							Cyclohexane	200 ppb v/v
							Dibromomethane	200 ppb v/v
							Dichlorobromomethane	200 ppb v/v
							Dichlorodifluoromethane	200 ppb v/v
							Dodecane	200 ppb v/v
							Ethyl acetate	200 ppb v/v

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Ethyl ether	200 ppb v/v
							Ethylbenzene	200 ppb v/v
							Ethylene Dibromide	200 ppb v/v
							Hexachlorobutadiene	200 ppb v/v
							Hexane	200 ppb v/v
							Isooctane	200 ppb v/v
							Isopropyl alcohol	200 ppb v/v
							Isopropylbenzene	200 ppb v/v
							m,p-Xylene	400 ppb v/v
							Methyl methacrylate	200 ppb v/v
							Methyl tert-butyl ether	200 ppb v/v
							Methylene Chloride	200 ppb v/v
							n-Butanol	200 ppb v/v
							n-Butylbenzene	200 ppb v/v
							n-Decane	200 ppb v/v
							n-Heptane	200 ppb v/v
							n-Nonane	200 ppb v/v
							n-Octane	200 ppb v/v
							N-Propylbenzene	200 ppb v/v
							Naphthalene	200 ppb v/v
							Pentane	200 ppb v/v
							Propene	200 ppb v/v
							sec-Butylbenzene	200 ppb v/v
							Styrene	200 ppb v/v
							tert-Butylbenzene	200 ppb v/v
							Tetrachloroethene	200 ppb v/v
							Tetrahydrofuran	200 ppb v/v
							Toluene	200 ppb v/v
							trans-1,2-Dichloroethene	200 ppb v/v
							trans-1,3-Dichloropropene	200 ppb v/v
							Trichloroethene	200 ppb v/v
							Trichlorofluoromethane	200 ppb v/v
							Undecane	200 ppb v/v
							Vinyl acetate	200 ppb v/v
							Vinyl bromide	200 ppb v/v
							Vinyl chloride	200 ppb v/v
							Xylene, o-	200 ppb v/v
..ATTO15CALs_00006	11/30/11		Spectra Gases, Lot cc-250179		(Purchased Reagent)		1,1,1-Trichloroethane	1 ppm v/v
							1,1,2,2-Tetrachloroethane	1 ppm v/v
							1,1,2-Trichloro-1,2,2-trifluoroethane	1 ppm v/v
							1,1,2-Trichloroethane	1 ppm v/v
							1,1-Dichloroethane	1 ppm v/v
							1,1-Dichloroethene	1 ppm v/v
							1,2,3-Trichlorobenzene	1 ppm v/v
							1,2,3-Trichloropropane	1 ppm v/v
							1,2,4-Trichlorobenzene	1 ppm v/v
							1,2,4-Trimethylbenzene	1 ppm v/v
							1,2-Dichloro-1,1,2,2-tetrafluoroethane	1 ppm v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							1,2-Dichlorobenzene	1 ppm v/v
							1,2-Dichloroethane	1 ppm v/v
							1,2-Dichloropropane	1 ppm v/v
							1,3,5-Trimethylbenzene	1 ppm v/v
							1,3-Dichlorobenzene	1 ppm v/v
							1,4-Dichlorobenzene	1 ppm v/v
							1,4-Dioxane	1 ppm v/v
							2-Butanone (MEK)	1 ppm v/v
							2-Chlorotoluene	1 ppm v/v
							2-Hexanone	1 ppm v/v
							2-Methyl-2-propanol	1 ppm v/v
							2-Methylbutane	1 ppm v/v
							3-Chloro-1-propene	1 ppm v/v
							4-Ethyltoluene	1 ppm v/v
							4-Isopropyltoluene	1 ppm v/v
							4-Methyl-2-pentanone (MIBK)	1 ppm v/v
							Acetone	1 ppm v/v
							Acetonitrile	1 ppm v/v
							Acrolein	1 ppm v/v
							Acrylonitrile	1 ppm v/v
							Alpha Methyl Styrene	1 ppm v/v
							Benzene	1 ppm v/v
							Benzyl chloride	1 ppm v/v
							Bromoform	1 ppm v/v
							Bromomethane	1 ppm v/v
							Butadiene	1 ppm v/v
							Butane	1 ppm v/v
							Carbon disulfide	1 ppm v/v
							Carbon tetrachloride	1 ppm v/v
							Chlorobenzene	1 ppm v/v
							Chlorodibromomethane	1 ppm v/v
							Chlorodifluoromethane	1 ppm v/v
							Chloroethane	1 ppm v/v
							Chloroform	1 ppm v/v
							Chloromethane	1 ppm v/v
							cis-1,2-Dichloroethene	1 ppm v/v
							cis-1,3-Dichloropropene	1 ppm v/v
							Cyclohexane	1 ppm v/v
							Dibromomethane	1 ppm v/v
							Dichlorobromomethane	1 ppm v/v
							Dichlorodifluoromethane	1 ppm v/v
							Dodecane	1 ppm v/v
							Ethyl acetate	1 ppm v/v
							Ethyl ether	1 ppm v/v
							Ethylbenzene	1 ppm v/v
							Ethylene Dibromide	1 ppm v/v
							Hexachlorobutadiene	1 ppm v/v
							Hexane	1 ppm v/v
							Isooctane	1 ppm v/v
							Isopropyl alcohol	1 ppm v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Isopropylbenzene	1 ppm v/v
							m,p-Xylene	2 ppm v/v
							Methyl methacrylate	1 ppm v/v
							Methyl tert-butyl ether	1 ppm v/v
							Methylene Chloride	1 ppm v/v
							n-Butanol	1 ppm v/v
							n-Butylbenzene	1 ppm v/v
							n-Decane	1 ppm v/v
							n-Heptane	1 ppm v/v
							n-Nonane	1 ppm v/v
							n-Octane	1 ppm v/v
							N-Propylbenzene	1 ppm v/v
							Naphthalene	1 ppm v/v
							Pentane	1 ppm v/v
							Propene	1 ppm v/v
							sec-Butylbenzene	1 ppm v/v
							Styrene	1 ppm v/v
							tert-Butylbenzene	1 ppm v/v
							Tetrachloroethene	1 ppm v/v
							Tetrahydrofuran	1 ppm v/v
							Toluene	1 ppm v/v
							trans-1,2-Dichloroethene	1 ppm v/v
							trans-1,3-Dichloropropene	1 ppm v/v
							Trichloroethene	1 ppm v/v
							Trichlorofluoromethane	1 ppm v/v
							Undecane	1 ppm v/v
							Vinyl acetate	1 ppm v/v
							Vinyl bromide	1 ppm v/v
							Vinyl chloride	1 ppm v/v
							Xylene, o-	1 ppm v/v
.ATTO15EthCALw_00016	05/07/11	02/07/11	VOA Free Water, Lot 7952	37.5 ppb	ATTO15EthCALs_00004	18.75 uL	Ethanol	500 ppb v/v
..ATTO15EthCALs_00004	12/10/11		SIGMA, Lot 05796KM		(Purchased Reagent)		Ethanol	1 mL/mL
ATTO15CAL4w_00111	05/01/11	02/08/11		15.463 L	ATTO15CALSTKi_00020	773 mL	1,1,1-Trichloroethane	9.99806 ppb v/v
							1,1,2,2-Tetrachloroethane	9.99806 ppb v/v
							1,1,2-Trichloro-1,2,2-trifluoroethane	9.99806 ppb v/v
							1,1,2-Trichloroethane	9.99806 ppb v/v
							1,1-Dichloroethane	9.99806 ppb v/v
							1,1-Dichloroethene	9.99806 ppb v/v
							1,2,3-Trichlorobenzene	9.99806 ppb v/v
							1,2,3-Trichloropropane	9.99806 ppb v/v
							1,2,4-Trichlorobenzene	9.99806 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							1,2,4-Trimethylbenzene	9.99806 ppb v/v
							1,2-Dichloro-1,1,2,2-tetrafluoroethane	9.99806 ppb v/v
							1,2-Dichlorobenzene	9.99806 ppb v/v
							1,2-Dichloroethane	9.99806 ppb v/v
							1,2-Dichloropropane	9.99806 ppb v/v
							1,3,5-Trimethylbenzene	9.99806 ppb v/v
							1,3-Dichlorobenzene	9.99806 ppb v/v
							1,4-Dichlorobenzene	9.99806 ppb v/v
							1,4-Dioxane	9.99806 ppb v/v
							2-Butanone (MEK)	9.99806 ppb v/v
							2-Chlorotoluene	9.99806 ppb v/v
							2-Hexanone	9.99806 ppb v/v
							2-Methyl-2-propanol	9.99806 ppb v/v
							2-Methylbutane	9.99806 ppb v/v
							3-Chloro-1-propene	9.99806 ppb v/v
							4-Ethyltoluene	9.99806 ppb v/v
							4-Isopropyltoluene	9.99806 ppb v/v
							4-Methyl-2-pentanone (MIBK)	9.99806 ppb v/v
							Acetone	9.99806 ppb v/v
							Acetonitrile	9.99806 ppb v/v
							Acrolein	9.99806 ppb v/v
							Acrylonitrile	9.99806 ppb v/v
							Alpha Methyl Styrene	9.99806 ppb v/v
							Benzene	9.99806 ppb v/v
							Benzyl chloride	9.99806 ppb v/v
							Bromoform	9.99806 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Bromomethane	9.99806 ppb v/v
							Butadiene	9.99806 ppb v/v
							Butane	9.99806 ppb v/v
							Carbon disulfide	9.99806 ppb v/v
							Carbon tetrachloride	9.99806 ppb v/v
							Chlorobenzene	9.99806 ppb v/v
							Chlorodibromomethane	9.99806 ppb v/v
							Chlorodifluoromethane	9.99806 ppb v/v
							Chloroethane	9.99806 ppb v/v
							Chloroform	9.99806 ppb v/v
							Chloromethane	9.99806 ppb v/v
							cis-1,2-Dichloroethene	9.99806 ppb v/v
							cis-1,3-Dichloropropene	9.99806 ppb v/v
							Cyclohexane	9.99806 ppb v/v
							Dibromomethane	9.99806 ppb v/v
							Dichlorobromomethane	9.99806 ppb v/v
							Dichlorodifluoromethane	9.99806 ppb v/v
							Dodecane	9.99806 ppb v/v
							Ethyl acetate	9.99806 ppb v/v
							Ethyl ether	9.99806 ppb v/v
							Ethylbenzene	9.99806 ppb v/v
							Ethylene Dibromide	9.99806 ppb v/v
							Hexachlorobutadiene	9.99806 ppb v/v
							Hexane	9.99806 ppb v/v
							Isooctane	9.99806 ppb v/v
							Isopropyl alcohol	9.99806 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Isopropylbenzene	9.99806 ppb v/v
							m,p-Xylene	19.9961 ppb v/v
							Methyl methacrylate	9.99806 ppb v/v
							Methyl tert-butyl ether	9.99806 ppb v/v
							Methylene Chloride	9.99806 ppb v/v
							n-Butanol	9.99806 ppb v/v
							n-Butylbenzene	9.99806 ppb v/v
							n-Decane	9.99806 ppb v/v
							n-Heptane	9.99806 ppb v/v
							n-Nonane	9.99806 ppb v/v
							n-Octane	9.99806 ppb v/v
							N-Propylbenzene	9.99806 ppb v/v
							Naphthalene	9.99806 ppb v/v
							Pentane	9.99806 ppb v/v
							Propene	9.99806 ppb v/v
							sec-Butylbenzene	9.99806 ppb v/v
							Styrene	9.99806 ppb v/v
							tert-Butylbenzene	9.99806 ppb v/v
							Tetrachloroethene	9.99806 ppb v/v
							Tetrahydrofuran	9.99806 ppb v/v
							Toluene	9.99806 ppb v/v
							trans-1,2-Dichloroethene	9.99806 ppb v/v
							trans-1,3-Dichloropropene	9.99806 ppb v/v
							Trichloroethene	9.99806 ppb v/v
							Trichlorofluoromethane	9.99806 ppb v/v
							Undecane	9.99806 ppb v/v

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Vinyl acetate	9.99806 ppb v/v
							Vinyl bromide	9.99806 ppb v/v
							Vinyl chloride	9.99806 ppb v/v
							Xylene, o-	9.99806 ppb v/v
					ATTO15EthCALw_00016	464 mL	Ethanol	15.0036 ppb v/v
.ATTO15CALSTKi_00020	05/01/11	02/01/11	DI WATER, Lot 1003	37.5 L	ATTO15CALs_00006	7500 mL	1,1,1-Trichloroethane	200 ppb v/v
							1,1,2,2-Tetrachloroethane	200 ppb v/v
							1,1,2-Trichloro-1,2,2-trifluoroethane	200 ppb v/v
							1,1,2-Trichloroethane	200 ppb v/v
							1,1-Dichloroethane	200 ppb v/v
							1,1-Dichloroethene	200 ppb v/v
							1,2,3-Trichlorobenzene	200 ppb v/v
							1,2,3-Trichloropropane	200 ppb v/v
							1,2,4-Trichlorobenzene	200 ppb v/v
							1,2,4-Trimethylbenzene	200 ppb v/v
							1,2-Dichloro-1,1,2,2-tetrafluoroethane	200 ppb v/v
							1,2-Dichlorobenzene	200 ppb v/v
							1,2-Dichloroethane	200 ppb v/v
							1,2-Dichloropropane	200 ppb v/v
							1,3,5-Trimethylbenzene	200 ppb v/v
							1,3-Dichlorobenzene	200 ppb v/v
							1,4-Dichlorobenzene	200 ppb v/v
							1,4-Dioxane	200 ppb v/v
							2-Butanone (MEK)	200 ppb v/v
							2-Chlorotoluene	200 ppb v/v
							2-Hexanone	200 ppb v/v
							2-Methyl-2-propanol	200 ppb v/v
							2-Methylbutane	200 ppb v/v
							3-Chloro-1-propene	200 ppb v/v
							4-Ethyltoluene	200 ppb v/v
							4-Isopropyltoluene	200 ppb v/v
							4-Methyl-2-pentanone (MIBK)	200 ppb v/v
							Acetone	200 ppb v/v
							Acetonitrile	200 ppb v/v
							Acrolein	200 ppb v/v
							Acrylonitrile	200 ppb v/v
							Alpha Methyl Styrene	200 ppb v/v
							Benzene	200 ppb v/v
							Benzyl chloride	200 ppb v/v
							Bromoform	200 ppb v/v
							Bromomethane	200 ppb v/v
							Butadiene	200 ppb v/v
							Butane	200 ppb v/v
							Carbon disulfide	200 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Carbon tetrachloride	200 ppb v/v
							Chlorobenzene	200 ppb v/v
							Chlorodibromomethane	200 ppb v/v
							Chlorodifluoromethane	200 ppb v/v
							Chloroethane	200 ppb v/v
							Chloroform	200 ppb v/v
							Chloromethane	200 ppb v/v
							cis-1,2-Dichloroethene	200 ppb v/v
							cis-1,3-Dichloropropene	200 ppb v/v
							Cyclohexane	200 ppb v/v
							Dibromomethane	200 ppb v/v
							Dichlorobromomethane	200 ppb v/v
							Dichlorodifluoromethane	200 ppb v/v
							Dodecane	200 ppb v/v
							Ethyl acetate	200 ppb v/v
							Ethyl ether	200 ppb v/v
							Ethylbenzene	200 ppb v/v
							Ethylene Dibromide	200 ppb v/v
							Hexachlorobutadiene	200 ppb v/v
							Hexane	200 ppb v/v
							Isooctane	200 ppb v/v
							Isopropyl alcohol	200 ppb v/v
							Isopropylbenzene	200 ppb v/v
							m,p-Xylene	400 ppb v/v
							Methyl methacrylate	200 ppb v/v
							Methyl tert-butyl ether	200 ppb v/v
							Methylene Chloride	200 ppb v/v
							n-Butanol	200 ppb v/v
							n-Butylbenzene	200 ppb v/v
							n-Decane	200 ppb v/v
							n-Heptane	200 ppb v/v
							n-Nonane	200 ppb v/v
							n-Octane	200 ppb v/v
							N-Propylbenzene	200 ppb v/v
							Naphthalene	200 ppb v/v
							Pentane	200 ppb v/v
							Propene	200 ppb v/v
							sec-Butylbenzene	200 ppb v/v
							Styrene	200 ppb v/v
							tert-Butylbenzene	200 ppb v/v
							Tetrachloroethene	200 ppb v/v
							Tetrahydrofuran	200 ppb v/v
							Toluene	200 ppb v/v
							trans-1,2-Dichloroethene	200 ppb v/v
							trans-1,3-Dichloropropene	200 ppb v/v
							Trichloroethene	200 ppb v/v
							Trichlorofluoromethane	200 ppb v/v
							Undecane	200 ppb v/v
							Vinyl acetate	200 ppb v/v
							Vinyl bromide	200 ppb v/v

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Vinyl chloride	200 ppb v/v
							Xylene, o-	200 ppb v/v
..ATTO15CALs_00006	11/30/11	Spectra Gases, Lot cc-250179			(Purchased Reagent)		1,1,1-Trichloroethane	1 ppm v/v
							1,1,2,2-Tetrachloroethane	1 ppm v/v
							1,1,2-Trichloro-1,2,2-trifluoroethane	1 ppm v/v
							1,1,2-Trichloroethane	1 ppm v/v
							1,1-Dichloroethane	1 ppm v/v
							1,1-Dichloroethene	1 ppm v/v
							1,2,3-Trichlorobenzene	1 ppm v/v
							1,2,3-Trichloropropane	1 ppm v/v
							1,2,4-Trichlorobenzene	1 ppm v/v
							1,2,4-Trimethylbenzene	1 ppm v/v
							1,2-Dichloro-1,1,2,2-tetrafluoroethane	1 ppm v/v
							1,2-Dichlorobenzene	1 ppm v/v
							1,2-Dichloroethane	1 ppm v/v
							1,2-Dichloropropane	1 ppm v/v
							1,3,5-Trimethylbenzene	1 ppm v/v
							1,3-Dichlorobenzene	1 ppm v/v
							1,4-Dichlorobenzene	1 ppm v/v
							1,4-Dioxane	1 ppm v/v
							2-Butanone (MEK)	1 ppm v/v
							2-Chlorotoluene	1 ppm v/v
							2-Hexanone	1 ppm v/v
							2-Methyl-2-propanol	1 ppm v/v
							2-Methylbutane	1 ppm v/v
							3-Chloro-1-propene	1 ppm v/v
							4-Ethyltoluene	1 ppm v/v
							4-Isopropyltoluene	1 ppm v/v
							4-Methyl-2-pentanone (MIBK)	1 ppm v/v
							Acetone	1 ppm v/v
							Acetonitrile	1 ppm v/v
							Acrolein	1 ppm v/v
							Acrylonitrile	1 ppm v/v
							Alpha Methyl Styrene	1 ppm v/v
							Benzene	1 ppm v/v
							Benzyl chloride	1 ppm v/v
							Bromoform	1 ppm v/v
							Bromomethane	1 ppm v/v
							Butadiene	1 ppm v/v
							Butane	1 ppm v/v
							Carbon disulfide	1 ppm v/v
							Carbon tetrachloride	1 ppm v/v
							Chlorobenzene	1 ppm v/v
							Chlorodibromomethane	1 ppm v/v
							Chlorodifluoromethane	1 ppm v/v
							Chloroethane	1 ppm v/v
							Chloroform	1 ppm v/v
							Chloromethane	1 ppm v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							cis-1,2-Dichloroethene	1 ppm v/v
							cis-1,3-Dichloropropene	1 ppm v/v
							Cyclohexane	1 ppm v/v
							Dibromomethane	1 ppm v/v
							Dichlorobromomethane	1 ppm v/v
							Dichlorodifluoromethane	1 ppm v/v
							Dodecane	1 ppm v/v
							Ethyl acetate	1 ppm v/v
							Ethyl ether	1 ppm v/v
							Ethylbenzene	1 ppm v/v
							Ethylene Dibromide	1 ppm v/v
							Hexachlorobutadiene	1 ppm v/v
							Hexane	1 ppm v/v
							Isooctane	1 ppm v/v
							Isopropyl alcohol	1 ppm v/v
							Isopropylbenzene	1 ppm v/v
							m,p-Xylene	2 ppm v/v
							Methyl methacrylate	1 ppm v/v
							Methyl tert-butyl ether	1 ppm v/v
							Methylene Chloride	1 ppm v/v
							n-Butanol	1 ppm v/v
							n-Butylbenzene	1 ppm v/v
							n-Decane	1 ppm v/v
							n-Heptane	1 ppm v/v
							n-Nonane	1 ppm v/v
							n-Octane	1 ppm v/v
							N-Propylbenzene	1 ppm v/v
							Naphthalene	1 ppm v/v
							Pentane	1 ppm v/v
							Propene	1 ppm v/v
							sec-Butylbenzene	1 ppm v/v
							Styrene	1 ppm v/v
							tert-Butylbenzene	1 ppm v/v
							Tetrachloroethene	1 ppm v/v
							Tetrahydrofuran	1 ppm v/v
							Toluene	1 ppm v/v
							trans-1,2-Dichloroethene	1 ppm v/v
							trans-1,3-Dichloropropene	1 ppm v/v
							Trichloroethene	1 ppm v/v
							Trichlorofluoromethane	1 ppm v/v
							Undecane	1 ppm v/v
							Vinyl acetate	1 ppm v/v
							Vinyl bromide	1 ppm v/v
							Vinyl chloride	1 ppm v/v
							Xylene, o-	1 ppm v/v
.ATTO15EthCALw_00016	05/07/11	02/07/11	VOA Free Water, Lot 7952	37.5 ppb	ATTO15EthCALs_00004	18.75 uL	Ethanol	500 ppb v/v
..ATTO15EthCALs_00004	12/10/11		SIGMA, Lot 05796KM		(Purchased Reagent)		Ethanol	1 mL/mL
ATTO15CAL4w_00116	05/01/11	02/08/11		15.463 L	ATTO15CALSTKi_00020	773 mL	1,1,1-Trichloroethane	9.99806 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							1,1,2,2-Tetrachloroethane	9.99806 ppb v/v
							1,1,2-Trichloro-1,2,2-trifluoroethane	9.99806 ppb v/v
							1,1,2-Trichloroethane	9.99806 ppb v/v
							1,1-Dichloroethane	9.99806 ppb v/v
							1,1-Dichloroethene	9.99806 ppb v/v
							1,2,3-Trichlorobenzene	9.99806 ppb v/v
							1,2,3-Trichloropropane	9.99806 ppb v/v
							1,2,4-Trichlorobenzene	9.99806 ppb v/v
							1,2,4-Trimethylbenzene	9.99806 ppb v/v
							1,2-Dichloro-1,1,2,2-tetrafluoroethane	9.99806 ppb v/v
							1,2-Dichlorobenzene	9.99806 ppb v/v
							1,2-Dichloroethane	9.99806 ppb v/v
							1,2-Dichloroethene, Total	19.9961 ppb v/v
							1,2-Dichloropropane	9.99806 ppb v/v
							1,3,5-Trimethylbenzene	9.99806 ppb v/v
							1,3-Dichlorobenzene	9.99806 ppb v/v
							1,4-Dichlorobenzene	9.99806 ppb v/v
							1,4-Dioxane	9.99806 ppb v/v
							2-Butanone (MEK)	9.99806 ppb v/v
							2-Chlorotoluene	9.99806 ppb v/v
							2-Hexanone	9.99806 ppb v/v
							2-Methyl-2-propanol	9.99806 ppb v/v
							2-Methylbutane	9.99806 ppb v/v
							3-Chloro-1-propene	9.99806 ppb v/v
							4-Ethyltoluene	9.99806 ppb v/v
							4-Isopropyltoluene	9.99806 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							4-Methyl-2-pentanone (MIBK)	9.99806 ppb v/v
							Acetone	9.99806 ppb v/v
							Acetonitrile	9.99806 ppb v/v
							Acrolein	9.99806 ppb v/v
							Acrylonitrile	9.99806 ppb v/v
							Alpha Methyl Styrene	9.99806 ppb v/v
							Benzene	9.99806 ppb v/v
							Benzyl chloride	9.99806 ppb v/v
							Bromoform	9.99806 ppb v/v
							Bromomethane	9.99806 ppb v/v
							Butadiene	9.99806 ppb v/v
							Butane	9.99806 ppb v/v
							Carbon disulfide	9.99806 ppb v/v
							Carbon tetrachloride	9.99806 ppb v/v
							Chlorobenzene	9.99806 ppb v/v
							Chlorodibromomethane	9.99806 ppb v/v
							Chlorodifluoromethane	9.99806 ppb v/v
							Chloroethane	9.99806 ppb v/v
							Chloroform	9.99806 ppb v/v
							Chloromethane	9.99806 ppb v/v
							cis-1,2-Dichloroethene	9.99806 ppb v/v
							cis-1,3-Dichloropropene	9.99806 ppb v/v
							Cyclohexane	9.99806 ppb v/v
							Dibromomethane	9.99806 ppb v/v
							Dichlorobromomethane	9.99806 ppb v/v
							Dichlorodifluoromethane	9.99806 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Dodecane	9.99806 ppb v/v
							Ethyl acetate	9.99806 ppb v/v
							Ethyl ether	9.99806 ppb v/v
							Ethylbenzene	9.99806 ppb v/v
							Ethylene Dibromide	9.99806 ppb v/v
							Hexachlorobutadiene	9.99806 ppb v/v
							Hexane	9.99806 ppb v/v
							Isooctane	9.99806 ppb v/v
							Isopropyl alcohol	9.99806 ppb v/v
							Isopropylbenzene	9.99806 ppb v/v
							m,p-Xylene	19.9961 ppb v/v
							Methyl methacrylate	9.99806 ppb v/v
							Methyl tert-butyl ether	9.99806 ppb v/v
							Methylene Chloride	9.99806 ppb v/v
							n-Butanol	9.99806 ppb v/v
							n-Butylbenzene	9.99806 ppb v/v
							n-Decane	9.99806 ppb v/v
							n-Heptane	9.99806 ppb v/v
							n-Nonane	9.99806 ppb v/v
							n-Octane	9.99806 ppb v/v
							N-Propylbenzene	9.99806 ppb v/v
							Naphthalene	9.99806 ppb v/v
							Pentane	9.99806 ppb v/v
							Propene	9.99806 ppb v/v
							sec-Butylbenzene	9.99806 ppb v/v
							Styrene	9.99806 ppb v/v

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							tert-Butylbenzene	9.99806 ppb v/v
							Tetrachloroethene	9.99806 ppb v/v
							Tetrahydrofuran	9.99806 ppb v/v
							Toluene	9.99806 ppb v/v
							trans-1,2-Dichloroethene	9.99806 ppb v/v
							trans-1,3-Dichloropropene	9.99806 ppb v/v
							Trichloroethene	9.99806 ppb v/v
							Trichlorofluoromethane	9.99806 ppb v/v
							Undecane	9.99806 ppb v/v
							Vinyl acetate	9.99806 ppb v/v
							Vinyl bromide	9.99806 ppb v/v
							Vinyl chloride	9.99806 ppb v/v
							Xylene (total)	29.9942 ppb v/v
							Xylene, o-	9.99806 ppb v/v
					ATTO15EthCALw_00016	464 mL	Ethanol	15.0036 ppb v/v
.ATTO15CALSTKi_00020	05/01/11	02/01/11	DI WATER, Lot 1003	37.5 L	ATTO15CALs_00006	7500 mL	1,1,1-Trichloroethane	200 ppb v/v
							1,1,2,2-Tetrachloroethane	200 ppb v/v
							1,1,2-Trichloro-1,2,2-trifluoroethane	200 ppb v/v
							1,1,2-Trichloroethane	200 ppb v/v
							1,1-Dichloroethane	200 ppb v/v
							1,1-Dichloroethene	200 ppb v/v
							1,2,3-Trichlorobenzene	200 ppb v/v
							1,2,3-Trichloropropane	200 ppb v/v
							1,2,4-Trichlorobenzene	200 ppb v/v
							1,2,4-Trimethylbenzene	200 ppb v/v
							1,2-Dichloro-1,1,2,2-tetrafluoroethane	200 ppb v/v
							1,2-Dichlorobenzene	200 ppb v/v
							1,2-Dichloroethane	200 ppb v/v
							1,2-Dichloroethene, Total	400 ppb v/v
							1,2-Dichloropropane	200 ppb v/v
							1,3,5-Trimethylbenzene	200 ppb v/v
							1,3-Dichlorobenzene	200 ppb v/v
							1,4-Dichlorobenzene	200 ppb v/v
							1,4-Dioxane	200 ppb v/v
							2-Butanone (MEK)	200 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							2-Chlorotoluene	200 ppb v/v
							2-Hexanone	200 ppb v/v
							2-Methyl-2-propanol	200 ppb v/v
							2-Methylbutane	200 ppb v/v
							3-Chloro-1-propene	200 ppb v/v
							4-Ethyltoluene	200 ppb v/v
							4-Isopropyltoluene	200 ppb v/v
							4-Methyl-2-pentanone (MIBK)	200 ppb v/v
							Acetone	200 ppb v/v
							Acetonitrile	200 ppb v/v
							Acrolein	200 ppb v/v
							Acrylonitrile	200 ppb v/v
							Alpha Methyl Styrene	200 ppb v/v
							Benzene	200 ppb v/v
							Benzyl chloride	200 ppb v/v
							Bromoform	200 ppb v/v
							Bromomethane	200 ppb v/v
							Butadiene	200 ppb v/v
							Butane	200 ppb v/v
							Carbon disulfide	200 ppb v/v
							Carbon tetrachloride	200 ppb v/v
							Chlorobenzene	200 ppb v/v
							Chlorodibromomethane	200 ppb v/v
							Chlorodifluoromethane	200 ppb v/v
							Chloroethane	200 ppb v/v
							Chloroform	200 ppb v/v
							Chloromethane	200 ppb v/v
							cis-1,2-Dichloroethene	200 ppb v/v
							cis-1,3-Dichloropropene	200 ppb v/v
							Cyclohexane	200 ppb v/v
							Dibromomethane	200 ppb v/v
							Dichlorobromomethane	200 ppb v/v
							Dichlorodifluoromethane	200 ppb v/v
							Dodecane	200 ppb v/v
							Ethyl acetate	200 ppb v/v
							Ethyl ether	200 ppb v/v
							Ethylbenzene	200 ppb v/v
							Ethylene Dibromide	200 ppb v/v
							Hexachlorobutadiene	200 ppb v/v
							Hexane	200 ppb v/v
							Isooctane	200 ppb v/v
							Isopropyl alcohol	200 ppb v/v
							Isopropylbenzene	200 ppb v/v
							m,p-Xylene	400 ppb v/v
							Methyl methacrylate	200 ppb v/v
							Methyl tert-butyl ether	200 ppb v/v
							Methylene Chloride	200 ppb v/v
							n-Butanol	200 ppb v/v
							n-Butylbenzene	200 ppb v/v
							n-Decane	200 ppb v/v

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							n-Heptane	200 ppb v/v
							n-Nonane	200 ppb v/v
							n-Octane	200 ppb v/v
							N-Propylbenzene	200 ppb v/v
							Naphthalene	200 ppb v/v
							Pentane	200 ppb v/v
							Propene	200 ppb v/v
							sec-Butylbenzene	200 ppb v/v
							Styrene	200 ppb v/v
							tert-Butylbenzene	200 ppb v/v
							Tetrachloroethene	200 ppb v/v
							Tetrahydrofuran	200 ppb v/v
							Toluene	200 ppb v/v
							trans-1,2-Dichloroethene	200 ppb v/v
							trans-1,3-Dichloropropene	200 ppb v/v
							Trichloroethene	200 ppb v/v
							Trichlorofluoromethane	200 ppb v/v
							Undecane	200 ppb v/v
							Vinyl acetate	200 ppb v/v
							Vinyl bromide	200 ppb v/v
							Vinyl chloride	200 ppb v/v
							Xylene (total)	600 ppb v/v
							Xylene, o-	200 ppb v/v
..ATTO15CALs_00006	11/30/11		Spectra Gases, Lot cc-250179		(Purchased Reagent)		1,1,1-Trichloroethane	1 ppm v/v
							1,1,2,2-Tetrachloroethane	1 ppm v/v
							1,1,2-Trichloro-1,2,2-trifluoroethane	1 ppm v/v
							1,1,2-Trichloroethane	1 ppm v/v
							1,1-Dichloroethane	1 ppm v/v
							1,1-Dichloroethene	1 ppm v/v
							1,2,3-Trichlorobenzene	1 ppm v/v
							1,2,3-Trichloropropane	1 ppm v/v
							1,2,4-Trichlorobenzene	1 ppm v/v
							1,2,4-Trimethylbenzene	1 ppm v/v
							1,2-Dichloro-1,1,2,2-tetrafluoroethane	1 ppm v/v
							1,2-Dichlorobenzene	1 ppm v/v
							1,2-Dichloroethane	1 ppm v/v
							1,2-Dichloroethene, Total	2 ppm v/v
							1,2-Dichloropropane	1 ppm v/v
							1,3,5-Trimethylbenzene	1 ppm v/v
							1,3-Dichlorobenzene	1 ppm v/v
							1,4-Dichlorobenzene	1 ppm v/v
							1,4-Dioxane	1 ppm v/v
							2-Butanone (MEK)	1 ppm v/v
							2-Chlorotoluene	1 ppm v/v
							2-Hexanone	1 ppm v/v
							2-Methyl-2-propanol	1 ppm v/v
							2-Methylbutane	1 ppm v/v
							3-Chloro-1-propene	1 ppm v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							4-Ethyltoluene	1 ppm v/v
							4-Isopropyltoluene	1 ppm v/v
							4-Methyl-2-pentanone (MIBK)	1 ppm v/v
							Acetone	1 ppm v/v
							Acetonitrile	1 ppm v/v
							Acrolein	1 ppm v/v
							Acrylonitrile	1 ppm v/v
							Alpha Methyl Styrene	1 ppm v/v
							Benzene	1 ppm v/v
							Benzyl chloride	1 ppm v/v
							Bromoform	1 ppm v/v
							Bromomethane	1 ppm v/v
							Butadiene	1 ppm v/v
							Butane	1 ppm v/v
							Carbon disulfide	1 ppm v/v
							Carbon tetrachloride	1 ppm v/v
							Chlorobenzene	1 ppm v/v
							Chlorodibromomethane	1 ppm v/v
							Chlorodifluoromethane	1 ppm v/v
							Chloroethane	1 ppm v/v
							Chloroform	1 ppm v/v
							Chloromethane	1 ppm v/v
							cis-1,2-Dichloroethene	1 ppm v/v
							cis-1,3-Dichloropropene	1 ppm v/v
							Cyclohexane	1 ppm v/v
							Dibromomethane	1 ppm v/v
							Dichlorobromomethane	1 ppm v/v
							Dichlorodifluoromethane	1 ppm v/v
							Dodecane	1 ppm v/v
							Ethyl acetate	1 ppm v/v
							Ethyl ether	1 ppm v/v
							Ethylbenzene	1 ppm v/v
							Ethylene Dibromide	1 ppm v/v
							Hexachlorobutadiene	1 ppm v/v
							Hexane	1 ppm v/v
							Isooctane	1 ppm v/v
							Isopropyl alcohol	1 ppm v/v
							Isopropylbenzene	1 ppm v/v
							m,p-Xylene	2 ppm v/v
							Methyl methacrylate	1 ppm v/v
							Methyl tert-butyl ether	1 ppm v/v
							Methylene Chloride	1 ppm v/v
							n-Butanol	1 ppm v/v
							n-Butylbenzene	1 ppm v/v
							n-Decane	1 ppm v/v
							n-Heptane	1 ppm v/v
							n-Nonane	1 ppm v/v
							n-Octane	1 ppm v/v
							N-Propylbenzene	1 ppm v/v
							Naphthalene	1 ppm v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Pentane	1 ppm v/v
							Propene	1 ppm v/v
							sec-Butylbenzene	1 ppm v/v
							Styrene	1 ppm v/v
							tert-Butylbenzene	1 ppm v/v
							Tetrachloroethene	1 ppm v/v
							Tetrahydrofuran	1 ppm v/v
							Toluene	1 ppm v/v
							trans-1,2-Dichloroethene	1 ppm v/v
							trans-1,3-Dichloropropene	1 ppm v/v
							Trichloroethene	1 ppm v/v
							Trichlorofluoromethane	1 ppm v/v
							Undecane	1 ppm v/v
							Vinyl acetate	1 ppm v/v
							Vinyl bromide	1 ppm v/v
							Vinyl chloride	1 ppm v/v
							Xylene (total)	3 ppm v/v
							Xylene, o-	1 ppm v/v
.ATTO15EthCALw_00016	05/07/11	02/07/11	VOA Free Water, Lot 7952	37.5 ppb	ATTO15EthCALs_00004	18.75 uL	Ethanol	500 ppb v/v
..ATTO15EthCALs_00004	12/10/11	SIGMA, Lot 05796KM			(Purchased Reagent)		Ethanol	1 mL/mL
ATTO15CAL4w_00121	05/01/11	03/25/11		15.463 L	ATTO15CALSTKi_00020	773 mL	1,1,1-Trichloroethane	9.99806 ppb v/v
							1,1,2,2-Tetrachloroethane	9.99806 ppb v/v
							1,1,2-Trichloroethane	9.99806 ppb v/v
							1,1-Dichloroethane	9.99806 ppb v/v
							1,1-Dichloroethene	9.99806 ppb v/v
							1,2,4-Trichlorobenzene	9.99806 ppb v/v
							1,2-Dichloroethane	9.99806 ppb v/v
							1,2-Dichloroethene, Total	19.9961 ppb v/v
							1,2-Dichloropropane	9.99806 ppb v/v
							1,4-Dichlorobenzene	9.99806 ppb v/v
							1,4-Dioxane	9.99806 ppb v/v
							Benzene	9.99806 ppb v/v
							Bromoform	9.99806 ppb v/v
							Bromomethane	9.99806 ppb v/v
							Carbon disulfide	9.99806 ppb v/v

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Carbon tetrachloride	9.99806 ppb v/v
							Chlorobenzene	9.99806 ppb v/v
							Chloroethane	9.99806 ppb v/v
							Chloroform	9.99806 ppb v/v
							Chloromethane	9.99806 ppb v/v
							Dichlorodifluoromethane	9.99806 ppb v/v
							Ethylbenzene	9.99806 ppb v/v
							Hexachlorobutadiene	9.99806 ppb v/v
							m,p-Xylene	19.9961 ppb v/v
							Methylene Chloride	9.99806 ppb v/v
							Naphthalene	9.99806 ppb v/v
							Styrene	9.99806 ppb v/v
							Tetrachloroethene	9.99806 ppb v/v
							Toluene	9.99806 ppb v/v
							Trichloroethene	9.99806 ppb v/v
							Vinyl chloride	9.99806 ppb v/v
							Xylene (total)	29.9942 ppb v/v
							Xylene, o-	9.99806 ppb v/v
.ATTO15CALSTKi_00020	05/01/11	02/01/11	DI WATER, Lot 1003	37.5 L	ATTO15CALs_00006	7500 mL	1,1,1-Trichloroethane	200 ppb v/v
							1,1,2,2-Tetrachloroethane	200 ppb v/v
							1,1,2-Trichloroethane	200 ppb v/v
							1,1-Dichloroethane	200 ppb v/v
							1,1-Dichloroethene	200 ppb v/v
							1,2,4-Trichlorobenzene	200 ppb v/v
							1,2-Dichloroethane	200 ppb v/v
							1,2-Dichloroethene, Total	400 ppb v/v
							1,2-Dichloropropane	200 ppb v/v
							1,4-Dichlorobenzene	200 ppb v/v
							1,4-Dioxane	200 ppb v/v
							Benzene	200 ppb v/v
							Bromoform	200 ppb v/v
							Bromomethane	200 ppb v/v
							Carbon disulfide	200 ppb v/v
							Carbon tetrachloride	200 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Chlorobenzene	200 ppb v/v
							Chloroethane	200 ppb v/v
							Chloroform	200 ppb v/v
							Chloromethane	200 ppb v/v
							Dichlorodifluoromethane	200 ppb v/v
							Ethylbenzene	200 ppb v/v
							Hexachlorobutadiene	200 ppb v/v
							m,p-Xylene	400 ppb v/v
							Methylene Chloride	200 ppb v/v
							Naphthalene	200 ppb v/v
							Styrene	200 ppb v/v
							Tetrachloroethene	200 ppb v/v
							Toluene	200 ppb v/v
							Trichloroethene	200 ppb v/v
							Vinyl chloride	200 ppb v/v
							Xylene (total)	600 ppb v/v
							Xylene, o-	200 ppb v/v
..ATTO15CALs_00006	11/30/11		Spectra Gases, Lot cc-250179		(Purchased Reagent)		1,1,1-Trichloroethane	1 ppm v/v
							1,1,2,2-Tetrachloroethane	1 ppm v/v
							1,1,2-Trichloroethane	1 ppm v/v
							1,1-Dichloroethane	1 ppm v/v
							1,1-Dichloroethene	1 ppm v/v
							1,2,4-Trichlorobenzene	1 ppm v/v
							1,2-Dichloroethane	1 ppm v/v
							1,2-Dichloroethene, Total	2 ppm v/v
							1,2-Dichloropropane	1 ppm v/v
							1,4-Dichlorobenzene	1 ppm v/v
							1,4-Dioxane	1 ppm v/v
							Benzene	1 ppm v/v
							Bromoform	1 ppm v/v
							Bromomethane	1 ppm v/v
							Carbon disulfide	1 ppm v/v
							Carbon tetrachloride	1 ppm v/v
							Chlorobenzene	1 ppm v/v
							Chloroethane	1 ppm v/v
							Chloroform	1 ppm v/v
							Chloromethane	1 ppm v/v
							Dichlorodifluoromethane	1 ppm v/v
							Ethylbenzene	1 ppm v/v
							Hexachlorobutadiene	1 ppm v/v
							m,p-Xylene	2 ppm v/v
							Methylene Chloride	1 ppm v/v
							Naphthalene	1 ppm v/v
							Styrene	1 ppm v/v
							Tetrachloroethene	1 ppm v/v
							Toluene	1 ppm v/v
							Trichloroethene	1 ppm v/v
							Vinyl chloride	1 ppm v/v
							Xylene (total)	3 ppm v/v
							Xylene, o-	1 ppm v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
ATTO15CAL5w_00016	05/01/11	02/08/11		15.463 L	ATTO15CALSTKi_00020	1160 mL	1,1,1-Trichloroethane	15.0036 ppb v/v
							1,1,2,2-Tetrachloroethane	15.0036 ppb v/v
							1,1,2-Trichloro-1,2,2-trifluoroethane	15.0036 ppb v/v
							1,1,2-Trichloroethane	15.0036 ppb v/v
							1,1-Dichloroethane	15.0036 ppb v/v
							1,1-Dichloroethene	15.0036 ppb v/v
							1,2,3-Trichlorobenzene	15.0036 ppb v/v
							1,2,3-Trichloropropane	15.0036 ppb v/v
							1,2,4-Trichlorobenzene	15.0036 ppb v/v
							1,2,4-Trimethylbenzene	15.0036 ppb v/v
							1,2-Dichloro-1,1,2,2-tetrafluoroethane	15.0036 ppb v/v
							1,2-Dichlorobenzene	15.0036 ppb v/v
							1,2-Dichloroethane	15.0036 ppb v/v
							1,2-Dichloropropane	15.0036 ppb v/v
							1,3,5-Trimethylbenzene	15.0036 ppb v/v
							1,3-Dichlorobenzene	15.0036 ppb v/v
							1,4-Dichlorobenzene	15.0036 ppb v/v
							1,4-Dioxane	15.0036 ppb v/v
							2-Butanone (MEK)	15.0036 ppb v/v
							2-Chlorotoluene	15.0036 ppb v/v
							2-Hexanone	15.0036 ppb v/v
							2-Methyl-2-propanol	15.0036 ppb v/v
							2-Methylbutane	15.0036 ppb v/v
							3-Chloro-1-propene	15.0036 ppb v/v
							4-Ethyltoluene	15.0036 ppb v/v
							4-Isopropyltoluene	15.0036 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							4-Methyl-2-pentanone (MIBK)	15.0036 ppb v/v
							Acetone	15.0036 ppb v/v
							Acetonitrile	15.0036 ppb v/v
							Acrolein	15.0036 ppb v/v
							Acrylonitrile	15.0036 ppb v/v
							Alpha Methyl Styrene	15.0036 ppb v/v
							Benzene	15.0036 ppb v/v
							Benzyl chloride	15.0036 ppb v/v
							Bromoform	15.0036 ppb v/v
							Bromomethane	15.0036 ppb v/v
							Butadiene	15.0036 ppb v/v
							Butane	15.0036 ppb v/v
							Carbon disulfide	15.0036 ppb v/v
							Carbon tetrachloride	15.0036 ppb v/v
							Chlorobenzene	15.0036 ppb v/v
							Chlorodibromomethane	15.0036 ppb v/v
							Chlorodifluoromethane	15.0036 ppb v/v
							Chloroethane	15.0036 ppb v/v
							Chloroform	15.0036 ppb v/v
							Chloromethane	15.0036 ppb v/v
							cis-1,2-Dichloroethene	15.0036 ppb v/v
							cis-1,3-Dichloropropene	15.0036 ppb v/v
							Cyclohexane	15.0036 ppb v/v
							Dibromomethane	15.0036 ppb v/v
							Dichlorobromomethane	15.0036 ppb v/v
							Dichlorodifluoromethane	15.0036 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Dodecane	15.0036 ppb v/v
							Ethyl acetate	15.0036 ppb v/v
							Ethyl ether	15.0036 ppb v/v
							Ethylbenzene	15.0036 ppb v/v
							Ethylene Dibromide	15.0036 ppb v/v
							Hexachlorobutadiene	15.0036 ppb v/v
							Hexane	15.0036 ppb v/v
							Isooctane	15.0036 ppb v/v
							Isopropyl alcohol	15.0036 ppb v/v
							Isopropylbenzene	15.0036 ppb v/v
							m,p-Xylene	30.0071 ppb v/v
							Methyl methacrylate	15.0036 ppb v/v
							Methyl tert-butyl ether	15.0036 ppb v/v
							Methylene Chloride	15.0036 ppb v/v
							n-Butanol	15.0036 ppb v/v
							n-Butylbenzene	15.0036 ppb v/v
							n-Decane	15.0036 ppb v/v
							n-Heptane	15.0036 ppb v/v
							n-Nonane	15.0036 ppb v/v
							n-Octane	15.0036 ppb v/v
							N-Propylbenzene	15.0036 ppb v/v
							Naphthalene	15.0036 ppb v/v
							Pentane	15.0036 ppb v/v
							Propene	15.0036 ppb v/v
							sec-Butylbenzene	15.0036 ppb v/v
							Styrene	15.0036 ppb v/v

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							tert-Butylbenzene	15.0036 ppb v/v
							Tetrachloroethene	15.0036 ppb v/v
							Tetrahydrofuran	15.0036 ppb v/v
							Toluene	15.0036 ppb v/v
							trans-1,2-Dichloroethene	15.0036 ppb v/v
							trans-1,3-Dichloropropene	15.0036 ppb v/v
							Trichloroethene	15.0036 ppb v/v
							Trichlorofluoromethane	15.0036 ppb v/v
							Undecane	15.0036 ppb v/v
							Vinyl acetate	15.0036 ppb v/v
							Vinyl bromide	15.0036 ppb v/v
							Vinyl chloride	15.0036 ppb v/v
							Xylene, o-	15.0036 ppb v/v
					ATTO15EthCALw_00016	620 mL	Ethanol	20.0479 ppb v/v
.ATTO15CALSTKi_00020	05/01/11	02/01/11	DI WATER, Lot 1003	37.5 L	ATTO15CALs_00006	7500 mL	1,1,1-Trichloroethane	200 ppb v/v
							1,1,2,2-Tetrachloroethane	200 ppb v/v
							1,1,2-Trichloro-1,2,2-trifluoroethane	200 ppb v/v
							1,1,2-Trichloroethane	200 ppb v/v
							1,1-Dichloroethane	200 ppb v/v
							1,1-Dichloroethene	200 ppb v/v
							1,2,3-Trichlorobenzene	200 ppb v/v
							1,2,3-Trichloropropane	200 ppb v/v
							1,2,4-Trichlorobenzene	200 ppb v/v
							1,2,4-Trimethylbenzene	200 ppb v/v
							1,2-Dichloro-1,1,2,2-tetrafluoroethane	200 ppb v/v
							1,2-Dichlorobenzene	200 ppb v/v
							1,2-Dichloroethane	200 ppb v/v
							1,2-Dichloropropane	200 ppb v/v
							1,3,5-Trimethylbenzene	200 ppb v/v
							1,3-Dichlorobenzene	200 ppb v/v
							1,4-Dichlorobenzene	200 ppb v/v
							1,4-Dioxane	200 ppb v/v
							2-Butanone (MEK)	200 ppb v/v
							2-Chlorotoluene	200 ppb v/v
							2-Hexanone	200 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							2-Methyl-2-propanol	200 ppb v/v
							2-Methylbutane	200 ppb v/v
							3-Chloro-1-propene	200 ppb v/v
							4-Ethyltoluene	200 ppb v/v
							4-Isopropyltoluene	200 ppb v/v
							4-Methyl-2-pentanone (MIBK)	200 ppb v/v
							Acetone	200 ppb v/v
							Acetonitrile	200 ppb v/v
							Acrolein	200 ppb v/v
							Acrylonitrile	200 ppb v/v
							Alpha Methyl Styrene	200 ppb v/v
							Benzene	200 ppb v/v
							Benzyl chloride	200 ppb v/v
							Bromoform	200 ppb v/v
							Bromomethane	200 ppb v/v
							Butadiene	200 ppb v/v
							Butane	200 ppb v/v
							Carbon disulfide	200 ppb v/v
							Carbon tetrachloride	200 ppb v/v
							Chlorobenzene	200 ppb v/v
							Chlorodibromomethane	200 ppb v/v
							Chlorodifluoromethane	200 ppb v/v
							Chloroethane	200 ppb v/v
							Chloroform	200 ppb v/v
							Chloromethane	200 ppb v/v
							cis-1,2-Dichloroethene	200 ppb v/v
							cis-1,3-Dichloropropene	200 ppb v/v
							Cyclohexane	200 ppb v/v
							Dibromomethane	200 ppb v/v
							Dichlorobromomethane	200 ppb v/v
							Dichlorodifluoromethane	200 ppb v/v
							Dodecane	200 ppb v/v
							Ethyl acetate	200 ppb v/v
							Ethyl ether	200 ppb v/v
							Ethylbenzene	200 ppb v/v
							Ethylene Dibromide	200 ppb v/v
							Hexachlorobutadiene	200 ppb v/v
							Hexane	200 ppb v/v
							Isooctane	200 ppb v/v
							Isopropyl alcohol	200 ppb v/v
							Isopropylbenzene	200 ppb v/v
							m,p-Xylene	400 ppb v/v
							Methyl methacrylate	200 ppb v/v
							Methyl tert-butyl ether	200 ppb v/v
							Methylene Chloride	200 ppb v/v
							n-Butanol	200 ppb v/v
							n-Butylbenzene	200 ppb v/v
							n-Decane	200 ppb v/v
							n-Heptane	200 ppb v/v
							n-Nonane	200 ppb v/v

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							n-Octane	200 ppb v/v
							N-Propylbenzene	200 ppb v/v
							Naphthalene	200 ppb v/v
							Pentane	200 ppb v/v
							Propene	200 ppb v/v
							sec-Butylbenzene	200 ppb v/v
							Styrene	200 ppb v/v
							tert-Butylbenzene	200 ppb v/v
							Tetrachloroethene	200 ppb v/v
							Tetrahydrofuran	200 ppb v/v
							Toluene	200 ppb v/v
							trans-1,2-Dichloroethene	200 ppb v/v
							trans-1,3-Dichloropropene	200 ppb v/v
							Trichloroethene	200 ppb v/v
							Trichlorofluoromethane	200 ppb v/v
							Undecane	200 ppb v/v
							Vinyl acetate	200 ppb v/v
							Vinyl bromide	200 ppb v/v
							Vinyl chloride	200 ppb v/v
							Xylene, o-	200 ppb v/v
..ATTO15CALs_00006	11/30/11		Spectra Gases, Lot cc-250179		(Purchased Reagent)		1,1,1-Trichloroethane	1 ppm v/v
							1,1,2,2-Tetrachloroethane	1 ppm v/v
							1,1,2-Trichloro-1,2,2-trifluoroethane	1 ppm v/v
							1,1,2-Trichloroethane	1 ppm v/v
							1,1-Dichloroethane	1 ppm v/v
							1,1-Dichloroethene	1 ppm v/v
							1,2,3-Trichlorobenzene	1 ppm v/v
							1,2,3-Trichloropropane	1 ppm v/v
							1,2,4-Trichlorobenzene	1 ppm v/v
							1,2,4-Trimethylbenzene	1 ppm v/v
							1,2-Dichloro-1,1,2,2-tetrafluoroethane	1 ppm v/v
							1,2-Dichlorobenzene	1 ppm v/v
							1,2-Dichloroethane	1 ppm v/v
							1,2-Dichloropropane	1 ppm v/v
							1,3,5-Trimethylbenzene	1 ppm v/v
							1,3-Dichlorobenzene	1 ppm v/v
							1,4-Dichlorobenzene	1 ppm v/v
							1,4-Dioxane	1 ppm v/v
							2-Butanone (MEK)	1 ppm v/v
							2-Chlorotoluene	1 ppm v/v
							2-Hexanone	1 ppm v/v
							2-Methyl-2-propanol	1 ppm v/v
							2-Methylbutane	1 ppm v/v
							3-Chloro-1-propene	1 ppm v/v
							4-Ethyltoluene	1 ppm v/v
							4-Isopropyltoluene	1 ppm v/v
							4-Methyl-2-pentanone (MIBK)	1 ppm v/v
							Acetone	1 ppm v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Acetonitrile	1 ppm v/v
							Acrolein	1 ppm v/v
							Acrylonitrile	1 ppm v/v
							Alpha Methyl Styrene	1 ppm v/v
							Benzene	1 ppm v/v
							Benzyl chloride	1 ppm v/v
							Bromoform	1 ppm v/v
							Bromomethane	1 ppm v/v
							Butadiene	1 ppm v/v
							Butane	1 ppm v/v
							Carbon disulfide	1 ppm v/v
							Carbon tetrachloride	1 ppm v/v
							Chlorobenzene	1 ppm v/v
							Chlorodibromomethane	1 ppm v/v
							Chlorodifluoromethane	1 ppm v/v
							Chloroethane	1 ppm v/v
							Chloroform	1 ppm v/v
							Chloromethane	1 ppm v/v
							cis-1,2-Dichloroethene	1 ppm v/v
							cis-1,3-Dichloropropene	1 ppm v/v
							Cyclohexane	1 ppm v/v
							Dibromomethane	1 ppm v/v
							Dichlorobromomethane	1 ppm v/v
							Dichlorodifluoromethane	1 ppm v/v
							Dodecane	1 ppm v/v
							Ethyl acetate	1 ppm v/v
							Ethyl ether	1 ppm v/v
							Ethylbenzene	1 ppm v/v
							Ethylene Dibromide	1 ppm v/v
							Hexachlorobutadiene	1 ppm v/v
							Hexane	1 ppm v/v
							Isooctane	1 ppm v/v
							Isopropyl alcohol	1 ppm v/v
							Isopropylbenzene	1 ppm v/v
							m,p-Xylene	2 ppm v/v
							Methyl methacrylate	1 ppm v/v
							Methyl tert-butyl ether	1 ppm v/v
							Methylene Chloride	1 ppm v/v
							n-Butanol	1 ppm v/v
							n-Butylbenzene	1 ppm v/v
							n-Decane	1 ppm v/v
							n-Heptane	1 ppm v/v
							n-Nonane	1 ppm v/v
							n-Octane	1 ppm v/v
							N-Propylbenzene	1 ppm v/v
							Naphthalene	1 ppm v/v
							Pentane	1 ppm v/v
							Propene	1 ppm v/v
							sec-Butylbenzene	1 ppm v/v
							Styrene	1 ppm v/v

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							tert-Butylbenzene	1 ppm v/v
							Tetrachloroethene	1 ppm v/v
							Tetrahydrofuran	1 ppm v/v
							Toluene	1 ppm v/v
							trans-1,2-Dichloroethene	1 ppm v/v
							trans-1,3-Dichloropropene	1 ppm v/v
							Trichloroethene	1 ppm v/v
							Trichlorofluoromethane	1 ppm v/v
							Undecane	1 ppm v/v
							Vinyl acetate	1 ppm v/v
							Vinyl bromide	1 ppm v/v
							Vinyl chloride	1 ppm v/v
							Xylene, o-	1 ppm v/v
.ATTO15EthCALw_00016	05/07/11	02/07/11	VOA Free Water, Lot 7952	37.5 ppb	ATTO15EthCALs_00004	18.75 uL	Ethanol	500 ppb v/v
..ATTO15EthCALs_00004	12/10/11	SIGMA, Lot 05796KM			(Purchased Reagent)		Ethanol	1 mL/mL
ATTO15CAL6w_00031	05/01/11	02/08/11		15.463 L	ATTO15CALSTKi_00020	1546 mL	1,1,1-Trichloroethane	19.9961 ppb v/v
							1,1,2,2-Tetrachloroethane	19.9961 ppb v/v
							1,1,2-Trichloro-1,2,2-trifluoroethane	19.9961 ppb v/v
							1,1,2-Trichloroethane	19.9961 ppb v/v
							1,1-Dichloroethane	19.9961 ppb v/v
							1,1-Dichloroethene	19.9961 ppb v/v
							1,2,3-Trichlorobenzene	19.9961 ppb v/v
							1,2,3-Trichloropropane	19.9961 ppb v/v
							1,2,4-Trichlorobenzene	19.9961 ppb v/v
							1,2,4-Trimethylbenzene	19.9961 ppb v/v
							1,2-Dichloro-1,1,2,2-tetrafluoroethane	19.9961 ppb v/v
							1,2-Dichlorobenzene	19.9961 ppb v/v
							1,2-Dichloroethane	19.9961 ppb v/v
							1,2-Dichloropropane	19.9961 ppb v/v
							1,3,5-Trimethylbenzene	19.9961 ppb v/v
							1,3-Dichlorobenzene	19.9961 ppb v/v
							1,4-Dichlorobenzene	19.9961 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							1,4-Dioxane	19.9961 ppb v/v
							2-Butanone (MEK)	19.9961 ppb v/v
							2-Chlorotoluene	19.9961 ppb v/v
							2-Hexanone	19.9961 ppb v/v
							2-Methyl-2-propanol	19.9961 ppb v/v
							2-Methylbutane	19.9961 ppb v/v
							3-Chloro-1-propene	19.9961 ppb v/v
							4-Ethyltoluene	19.9961 ppb v/v
							4-Isopropyltoluene	19.9961 ppb v/v
							4-Methyl-2-pentanone (MIBK)	19.9961 ppb v/v
							Acetone	19.9961 ppb v/v
							Acetonitrile	19.9961 ppb v/v
							Acrolein	19.9961 ppb v/v
							Acrylonitrile	19.9961 ppb v/v
							Alpha Methyl Styrene	19.9961 ppb v/v
							Benzene	19.9961 ppb v/v
							Benzyl chloride	19.9961 ppb v/v
							Bromoform	19.9961 ppb v/v
							Bromomethane	19.9961 ppb v/v
							Butadiene	19.9961 ppb v/v
							Butane	19.9961 ppb v/v
							Carbon disulfide	19.9961 ppb v/v
							Carbon tetrachloride	19.9961 ppb v/v
							Chlorobenzene	19.9961 ppb v/v
							Chlorodibromomethane	19.9961 ppb v/v
							Chlorodifluoromethane	19.9961 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Chloroethane	19.9961 ppb v/v
							Chloroform	19.9961 ppb v/v
							Chloromethane	19.9961 ppb v/v
							cis-1,2-Dichloroethene	19.9961 ppb v/v
							cis-1,3-Dichloropropene	19.9961 ppb v/v
							Cyclohexane	19.9961 ppb v/v
							Dibromomethane	19.9961 ppb v/v
							Dichlorobromomethane	19.9961 ppb v/v
							Dichlorodifluoromethane	19.9961 ppb v/v
							Dodecane	19.9961 ppb v/v
							Ethyl acetate	19.9961 ppb v/v
							Ethyl ether	19.9961 ppb v/v
							Ethylbenzene	19.9961 ppb v/v
							Ethylene Dibromide	19.9961 ppb v/v
							Hexachlorobutadiene	19.9961 ppb v/v
							Hexane	19.9961 ppb v/v
							Isooctane	19.9961 ppb v/v
							Isopropyl alcohol	19.9961 ppb v/v
							Isopropylbenzene	19.9961 ppb v/v
							m,p-Xylene	39.9922 ppb v/v
							Methyl methacrylate	19.9961 ppb v/v
							Methyl tert-butyl ether	19.9961 ppb v/v
							Methylene Chloride	19.9961 ppb v/v
							n-Butanol	19.9961 ppb v/v
							n-Butylbenzene	19.9961 ppb v/v
							n-Decane	19.9961 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							n-Heptane	19.9961 ppb v/v
							n-Nonane	19.9961 ppb v/v
							n-Octane	19.9961 ppb v/v
							N-Propylbenzene	19.9961 ppb v/v
							Naphthalene	19.9961 ppb v/v
							Pentane	19.9961 ppb v/v
							Propene	19.9961 ppb v/v
							sec-Butylbenzene	19.9961 ppb v/v
							Styrene	19.9961 ppb v/v
							tert-Butylbenzene	19.9961 ppb v/v
							Tetrachloroethene	19.9961 ppb v/v
							Tetrahydrofuran	19.9961 ppb v/v
							Toluene	19.9961 ppb v/v
							trans-1,2-Dichloroethene	19.9961 ppb v/v
							trans-1,3-Dichloropropene	19.9961 ppb v/v
							Trichloroethene	19.9961 ppb v/v
							Trichlorofluoromethane	19.9961 ppb v/v
							Undecane	19.9961 ppb v/v
							Vinyl acetate	19.9961 ppb v/v
							Vinyl bromide	19.9961 ppb v/v
							Vinyl chloride	19.9961 ppb v/v
							Xylene, o-	19.9961 ppb v/v
					ATTO15EthCALw_00016	1237 mL	Ethanol	39.9987 ppb v/v
.ATTO15CALSTKi_00020	05/01/11	02/01/11	DI WATER, Lot 1003	37.5 L	ATTO15CALs_00006	7500 mL	1,1,1-Trichloroethane	200 ppb v/v
							1,1,2,2-Tetrachloroethane	200 ppb v/v
							1,1,2-Trichloro-1,2,2-trifluoroethane	200 ppb v/v
							1,1,2-Trichloroethane	200 ppb v/v
							1,1-Dichloroethane	200 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							1,1-Dichloroethene	200 ppb v/v
							1,2,3-Trichlorobenzene	200 ppb v/v
							1,2,3-Trichloropropane	200 ppb v/v
							1,2,4-Trichlorobenzene	200 ppb v/v
							1,2,4-Trimethylbenzene	200 ppb v/v
							1,2-Dichloro-1,1,2,2-tetrafluoroethane	200 ppb v/v
							1,2-Dichlorobenzene	200 ppb v/v
							1,2-Dichloroethane	200 ppb v/v
							1,2-Dichloropropane	200 ppb v/v
							1,3,5-Trimethylbenzene	200 ppb v/v
							1,3-Dichlorobenzene	200 ppb v/v
							1,4-Dichlorobenzene	200 ppb v/v
							1,4-Dioxane	200 ppb v/v
							2-Butanone (MEK)	200 ppb v/v
							2-Chlorotoluene	200 ppb v/v
							2-Hexanone	200 ppb v/v
							2-Methyl-2-propanol	200 ppb v/v
							2-Methylbutane	200 ppb v/v
							3-Chloro-1-propene	200 ppb v/v
							4-Ethyltoluene	200 ppb v/v
							4-Isopropyltoluene	200 ppb v/v
							4-Methyl-2-pentanone (MIBK)	200 ppb v/v
							Acetone	200 ppb v/v
							Acetonitrile	200 ppb v/v
							Acrolein	200 ppb v/v
							Acrylonitrile	200 ppb v/v
							Alpha Methyl Styrene	200 ppb v/v
							Benzene	200 ppb v/v
							Benzyl chloride	200 ppb v/v
							Bromoform	200 ppb v/v
							Bromomethane	200 ppb v/v
							Butadiene	200 ppb v/v
							Butane	200 ppb v/v
							Carbon disulfide	200 ppb v/v
							Carbon tetrachloride	200 ppb v/v
							Chlorobenzene	200 ppb v/v
							Chlorodibromomethane	200 ppb v/v
							Chlorodifluoromethane	200 ppb v/v
							Chloroethane	200 ppb v/v
							Chloroform	200 ppb v/v
							Chloromethane	200 ppb v/v
							cis-1,2-Dichloroethene	200 ppb v/v
							cis-1,3-Dichloropropene	200 ppb v/v
							Cyclohexane	200 ppb v/v
							Dibromomethane	200 ppb v/v
							Dichlorobromomethane	200 ppb v/v
							Dichlorodifluoromethane	200 ppb v/v
							Dodecane	200 ppb v/v
							Ethyl acetate	200 ppb v/v

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Ethyl ether	200 ppb v/v
							Ethylbenzene	200 ppb v/v
							Ethylene Dibromide	200 ppb v/v
							Hexachlorobutadiene	200 ppb v/v
							Hexane	200 ppb v/v
							Isooctane	200 ppb v/v
							Isopropyl alcohol	200 ppb v/v
							Isopropylbenzene	200 ppb v/v
							m,p-Xylene	400 ppb v/v
							Methyl methacrylate	200 ppb v/v
							Methyl tert-butyl ether	200 ppb v/v
							Methylene Chloride	200 ppb v/v
							n-Butanol	200 ppb v/v
							n-Butylbenzene	200 ppb v/v
							n-Decane	200 ppb v/v
							n-Heptane	200 ppb v/v
							n-Nonane	200 ppb v/v
							n-Octane	200 ppb v/v
							N-Propylbenzene	200 ppb v/v
							Naphthalene	200 ppb v/v
							Pentane	200 ppb v/v
							Propene	200 ppb v/v
							sec-Butylbenzene	200 ppb v/v
							Styrene	200 ppb v/v
							tert-Butylbenzene	200 ppb v/v
							Tetrachloroethene	200 ppb v/v
							Tetrahydrofuran	200 ppb v/v
							Toluene	200 ppb v/v
							trans-1,2-Dichloroethene	200 ppb v/v
							trans-1,3-Dichloropropene	200 ppb v/v
							Trichloroethene	200 ppb v/v
							Trichlorofluoromethane	200 ppb v/v
							Undecane	200 ppb v/v
							Vinyl acetate	200 ppb v/v
							Vinyl bromide	200 ppb v/v
							Vinyl chloride	200 ppb v/v
							Xylene, o-	200 ppb v/v
..ATTO15CALs_00006	11/30/11		Spectra Gases, Lot cc-250179		(Purchased Reagent)		1,1,1-Trichloroethane	1 ppm v/v
							1,1,2,2-Tetrachloroethane	1 ppm v/v
							1,1,2-Trichloro-1,2,2-trifluoroethane	1 ppm v/v
							1,1,2-Trichloroethane	1 ppm v/v
							1,1-Dichloroethane	1 ppm v/v
							1,1-Dichloroethene	1 ppm v/v
							1,2,3-Trichlorobenzene	1 ppm v/v
							1,2,3-Trichloropropane	1 ppm v/v
							1,2,4-Trichlorobenzene	1 ppm v/v
							1,2,4-Trimethylbenzene	1 ppm v/v
							1,2-Dichloro-1,1,2,2-tetrafluoroethane	1 ppm v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							1,2-Dichlorobenzene	1 ppm v/v
							1,2-Dichloroethane	1 ppm v/v
							1,2-Dichloropropane	1 ppm v/v
							1,3,5-Trimethylbenzene	1 ppm v/v
							1,3-Dichlorobenzene	1 ppm v/v
							1,4-Dichlorobenzene	1 ppm v/v
							1,4-Dioxane	1 ppm v/v
							2-Butanone (MEK)	1 ppm v/v
							2-Chlorotoluene	1 ppm v/v
							2-Hexanone	1 ppm v/v
							2-Methyl-2-propanol	1 ppm v/v
							2-Methylbutane	1 ppm v/v
							3-Chloro-1-propene	1 ppm v/v
							4-Ethyltoluene	1 ppm v/v
							4-Isopropyltoluene	1 ppm v/v
							4-Methyl-2-pentanone (MIBK)	1 ppm v/v
							Acetone	1 ppm v/v
							Acetonitrile	1 ppm v/v
							Acrolein	1 ppm v/v
							Acrylonitrile	1 ppm v/v
							Alpha Methyl Styrene	1 ppm v/v
							Benzene	1 ppm v/v
							Benzyl chloride	1 ppm v/v
							Bromoform	1 ppm v/v
							Bromomethane	1 ppm v/v
							Butadiene	1 ppm v/v
							Butane	1 ppm v/v
							Carbon disulfide	1 ppm v/v
							Carbon tetrachloride	1 ppm v/v
							Chlorobenzene	1 ppm v/v
							Chlorodibromomethane	1 ppm v/v
							Chlorodifluoromethane	1 ppm v/v
							Chloroethane	1 ppm v/v
							Chloroform	1 ppm v/v
							Chloromethane	1 ppm v/v
							cis-1,2-Dichloroethene	1 ppm v/v
							cis-1,3-Dichloropropene	1 ppm v/v
							Cyclohexane	1 ppm v/v
							Dibromomethane	1 ppm v/v
							Dichlorobromomethane	1 ppm v/v
							Dichlorodifluoromethane	1 ppm v/v
							Dodecane	1 ppm v/v
							Ethyl acetate	1 ppm v/v
							Ethyl ether	1 ppm v/v
							Ethylbenzene	1 ppm v/v
							Ethylene Dibromide	1 ppm v/v
							Hexachlorobutadiene	1 ppm v/v
							Hexane	1 ppm v/v
							Isooctane	1 ppm v/v
							Isopropyl alcohol	1 ppm v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Isopropylbenzene	1 ppm v/v
							m,p-Xylene	2 ppm v/v
							Methyl methacrylate	1 ppm v/v
							Methyl tert-butyl ether	1 ppm v/v
							Methylene Chloride	1 ppm v/v
							n-Butanol	1 ppm v/v
							n-Butylbenzene	1 ppm v/v
							n-Decane	1 ppm v/v
							n-Heptane	1 ppm v/v
							n-Nonane	1 ppm v/v
							n-Octane	1 ppm v/v
							N-Propylbenzene	1 ppm v/v
							Naphthalene	1 ppm v/v
							Pentane	1 ppm v/v
							Propene	1 ppm v/v
							sec-Butylbenzene	1 ppm v/v
							Styrene	1 ppm v/v
							tert-Butylbenzene	1 ppm v/v
							Tetrachloroethene	1 ppm v/v
							Tetrahydrofuran	1 ppm v/v
							Toluene	1 ppm v/v
							trans-1,2-Dichloroethene	1 ppm v/v
							trans-1,3-Dichloropropene	1 ppm v/v
							Trichloroethene	1 ppm v/v
							Trichlorofluoromethane	1 ppm v/v
							Undecane	1 ppm v/v
							Vinyl acetate	1 ppm v/v
							Vinyl bromide	1 ppm v/v
							Vinyl chloride	1 ppm v/v
							Xylene, o-	1 ppm v/v
.ATTO15EthCALw_00016	05/07/11	02/07/11	VOA Free Water, Lot 7952	37.5 ppb	ATTO15EthCALs_00004	18.75 uL	Ethanol	500 ppb v/v
..ATTO15EthCALs_00004	12/10/11		SIGMA, Lot 05796KM		(Purchased Reagent)		Ethanol	1 mL/mL
ATTO15CAL7w_00016	05/01/11	02/08/11		15.463 L	ATTO15CALSTKi_00020	3092 mL	1,1,1-Trichloroethane	39.9922 ppb v/v
							1,1,2,2-Tetrachloroethane	39.9922 ppb v/v
							1,1,2-Trichloro-1,2,2-trifluoroethane	39.9922 ppb v/v
							1,1,2-Trichloroethane	39.9922 ppb v/v
							1,1-Dichloroethane	39.9922 ppb v/v
							1,1-Dichloroethene	39.9922 ppb v/v
							1,2,3-Trichlorobenzene	39.9922 ppb v/v
							1,2,3-Trichloropropane	39.9922 ppb v/v
							1,2,4-Trichlorobenzene	39.9922 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							1,2,4-Trimethylbenzene	39.9922 ppb v/v
							1,2-Dichloro-1,1,2,2-tetrafluoroethane	39.9922 ppb v/v
							1,2-Dichlorobenzene	39.9922 ppb v/v
							1,2-Dichloroethane	39.9922 ppb v/v
							1,2-Dichloropropane	39.9922 ppb v/v
							1,3,5-Trimethylbenzene	39.9922 ppb v/v
							1,3-Dichlorobenzene	39.9922 ppb v/v
							1,4-Dichlorobenzene	39.9922 ppb v/v
							1,4-Dioxane	39.9922 ppb v/v
							2-Butanone (MEK)	39.9922 ppb v/v
							2-Chlorotoluene	39.9922 ppb v/v
							2-Hexanone	39.9922 ppb v/v
							2-Methyl-2-propanol	39.9922 ppb v/v
							2-Methylbutane	39.9922 ppb v/v
							3-Chloro-1-propene	39.9922 ppb v/v
							4-Ethyltoluene	39.9922 ppb v/v
							4-Isopropyltoluene	39.9922 ppb v/v
							4-Methyl-2-pentanone (MIBK)	39.9922 ppb v/v
							Acetone	39.9922 ppb v/v
							Acetonitrile	39.9922 ppb v/v
							Acrolein	39.9922 ppb v/v
							Acrylonitrile	39.9922 ppb v/v
							Alpha Methyl Styrene	39.9922 ppb v/v
							Benzene	39.9922 ppb v/v
							Benzyl chloride	39.9922 ppb v/v
							Bromoform	39.9922 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Bromomethane	39.9922 ppb v/v
							Butadiene	39.9922 ppb v/v
							Butane	39.9922 ppb v/v
							Carbon disulfide	39.9922 ppb v/v
							Carbon tetrachloride	39.9922 ppb v/v
							Chlorobenzene	39.9922 ppb v/v
							Chlorodibromomethane	39.9922 ppb v/v
							Chlorodifluoromethane	39.9922 ppb v/v
							Chloroethane	39.9922 ppb v/v
							Chloroform	39.9922 ppb v/v
							Chloromethane	39.9922 ppb v/v
							cis-1,2-Dichloroethene	39.9922 ppb v/v
							cis-1,3-Dichloropropene	39.9922 ppb v/v
							Cyclohexane	39.9922 ppb v/v
							Dibromomethane	39.9922 ppb v/v
							Dichlorobromomethane	39.9922 ppb v/v
							Dichlorodifluoromethane	39.9922 ppb v/v
							Dodecane	39.9922 ppb v/v
							Ethyl acetate	39.9922 ppb v/v
							Ethyl ether	39.9922 ppb v/v
							Ethylbenzene	39.9922 ppb v/v
							Ethylene Dibromide	39.9922 ppb v/v
							Hexachlorobutadiene	39.9922 ppb v/v
							Hexane	39.9922 ppb v/v
							Isooctane	39.9922 ppb v/v
							Isopropyl alcohol	39.9922 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Isopropylbenzene	39.9922 ppb v/v
							m,p-Xylene	79.9845 ppb v/v
							Methyl methacrylate	39.9922 ppb v/v
							Methyl tert-butyl ether	39.9922 ppb v/v
							Methylene Chloride	39.9922 ppb v/v
							n-Butanol	39.9922 ppb v/v
							n-Butylbenzene	39.9922 ppb v/v
							n-Decane	39.9922 ppb v/v
							n-Heptane	39.9922 ppb v/v
							n-Nonane	39.9922 ppb v/v
							n-Octane	39.9922 ppb v/v
							N-Propylbenzene	39.9922 ppb v/v
							Naphthalene	39.9922 ppb v/v
							Pentane	39.9922 ppb v/v
							Propene	39.9922 ppb v/v
							sec-Butylbenzene	39.9922 ppb v/v
							Styrene	39.9922 ppb v/v
							tert-Butylbenzene	39.9922 ppb v/v
							Tetrachloroethene	39.9922 ppb v/v
							Tetrahydrofuran	39.9922 ppb v/v
							Toluene	39.9922 ppb v/v
							trans-1,2-Dichloroethene	39.9922 ppb v/v
							trans-1,3-Dichloropropene	39.9922 ppb v/v
							Trichloroethene	39.9922 ppb v/v
							Trichlorofluoromethane	39.9922 ppb v/v
							Undecane	39.9922 ppb v/v

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Vinyl acetate	39.9922 ppb v/v
							Vinyl bromide	39.9922 ppb v/v
							Vinyl chloride	39.9922 ppb v/v
							Xylene, o-	39.9922 ppb v/v
					ATTO15EthCALw_00016	3092 mL	Ethanol	99.9806 ppb v/v
.ATTO15CALSTKi_00020	05/01/11	02/01/11	DI WATER, Lot 1003	37.5 L	ATTO15CALs_00006	7500 mL	1,1,1-Trichloroethane	200 ppb v/v
							1,1,2,2-Tetrachloroethane	200 ppb v/v
							1,1,2-Trichloro-1,2,2-trifluoroethane	200 ppb v/v
							1,1,2-Trichloroethane	200 ppb v/v
							1,1-Dichloroethane	200 ppb v/v
							1,1-Dichloroethene	200 ppb v/v
							1,2,3-Trichlorobenzene	200 ppb v/v
							1,2,3-Trichloropropane	200 ppb v/v
							1,2,4-Trichlorobenzene	200 ppb v/v
							1,2,4-Trimethylbenzene	200 ppb v/v
							1,2-Dichloro-1,1,2,2-tetrafluoroethane	200 ppb v/v
							1,2-Dichlorobenzene	200 ppb v/v
							1,2-Dichloroethane	200 ppb v/v
							1,2-Dichloropropane	200 ppb v/v
							1,3,5-Trimethylbenzene	200 ppb v/v
							1,3-Dichlorobenzene	200 ppb v/v
							1,4-Dichlorobenzene	200 ppb v/v
							1,4-Dioxane	200 ppb v/v
							2-Butanone (MEK)	200 ppb v/v
							2-Chlorotoluene	200 ppb v/v
							2-Hexanone	200 ppb v/v
							2-Methyl-2-propanol	200 ppb v/v
							2-Methylbutane	200 ppb v/v
							3-Chloro-1-propene	200 ppb v/v
							4-Ethyltoluene	200 ppb v/v
							4-Isopropyltoluene	200 ppb v/v
							4-Methyl-2-pentanone (MIBK)	200 ppb v/v
							Acetone	200 ppb v/v
							Acetonitrile	200 ppb v/v
							Acrolein	200 ppb v/v
							Acrylonitrile	200 ppb v/v
							Alpha Methyl Styrene	200 ppb v/v
							Benzene	200 ppb v/v
							Benzyl chloride	200 ppb v/v
							Bromoform	200 ppb v/v
							Bromomethane	200 ppb v/v
							Butadiene	200 ppb v/v
							Butane	200 ppb v/v
							Carbon disulfide	200 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Carbon tetrachloride	200 ppb v/v
							Chlorobenzene	200 ppb v/v
							Chlorodibromomethane	200 ppb v/v
							Chlorodifluoromethane	200 ppb v/v
							Chloroethane	200 ppb v/v
							Chloroform	200 ppb v/v
							Chloromethane	200 ppb v/v
							cis-1,2-Dichloroethene	200 ppb v/v
							cis-1,3-Dichloropropene	200 ppb v/v
							Cyclohexane	200 ppb v/v
							Dibromomethane	200 ppb v/v
							Dichlorobromomethane	200 ppb v/v
							Dichlorodifluoromethane	200 ppb v/v
							Dodecane	200 ppb v/v
							Ethyl acetate	200 ppb v/v
							Ethyl ether	200 ppb v/v
							Ethylbenzene	200 ppb v/v
							Ethylene Dibromide	200 ppb v/v
							Hexachlorobutadiene	200 ppb v/v
							Hexane	200 ppb v/v
							Isooctane	200 ppb v/v
							Isopropyl alcohol	200 ppb v/v
							Isopropylbenzene	200 ppb v/v
							m,p-Xylene	400 ppb v/v
							Methyl methacrylate	200 ppb v/v
							Methyl tert-butyl ether	200 ppb v/v
							Methylene Chloride	200 ppb v/v
							n-Butanol	200 ppb v/v
							n-Butylbenzene	200 ppb v/v
							n-Decane	200 ppb v/v
							n-Heptane	200 ppb v/v
							n-Nonane	200 ppb v/v
							n-Octane	200 ppb v/v
							N-Propylbenzene	200 ppb v/v
							Naphthalene	200 ppb v/v
							Pentane	200 ppb v/v
							Propene	200 ppb v/v
							sec-Butylbenzene	200 ppb v/v
							Styrene	200 ppb v/v
							tert-Butylbenzene	200 ppb v/v
							Tetrachloroethene	200 ppb v/v
							Tetrahydrofuran	200 ppb v/v
							Toluene	200 ppb v/v
							trans-1,2-Dichloroethene	200 ppb v/v
							trans-1,3-Dichloropropene	200 ppb v/v
							Trichloroethene	200 ppb v/v
							Trichlorofluoromethane	200 ppb v/v
							Undecane	200 ppb v/v
							Vinyl acetate	200 ppb v/v
							Vinyl bromide	200 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Vinyl chloride	200 ppb v/v
							Xylene, o-	200 ppb v/v
..ATTO15CALs_00006	11/30/11	Spectra Gases, Lot cc-250179			(Purchased Reagent)		1,1,1-Trichloroethane	1 ppm v/v
							1,1,2,2-Tetrachloroethane	1 ppm v/v
							1,1,2-Trichloro-1,2,2-trifluoroethane	1 ppm v/v
							1,1,2-Trichloroethane	1 ppm v/v
							1,1-Dichloroethane	1 ppm v/v
							1,1-Dichloroethene	1 ppm v/v
							1,2,3-Trichlorobenzene	1 ppm v/v
							1,2,3-Trichloropropane	1 ppm v/v
							1,2,4-Trichlorobenzene	1 ppm v/v
							1,2,4-Trimethylbenzene	1 ppm v/v
							1,2-Dichloro-1,1,2,2-tetrafluoroethane	1 ppm v/v
							1,2-Dichlorobenzene	1 ppm v/v
							1,2-Dichloroethane	1 ppm v/v
							1,2-Dichloropropane	1 ppm v/v
							1,3,5-Trimethylbenzene	1 ppm v/v
							1,3-Dichlorobenzene	1 ppm v/v
							1,4-Dichlorobenzene	1 ppm v/v
							1,4-Dioxane	1 ppm v/v
							2-Butanone (MEK)	1 ppm v/v
							2-Chlorotoluene	1 ppm v/v
							2-Hexanone	1 ppm v/v
							2-Methyl-2-propanol	1 ppm v/v
							2-Methylbutane	1 ppm v/v
							3-Chloro-1-propene	1 ppm v/v
							4-Ethyltoluene	1 ppm v/v
							4-Isopropyltoluene	1 ppm v/v
							4-Methyl-2-pentanone (MIBK)	1 ppm v/v
							Acetone	1 ppm v/v
							Acetonitrile	1 ppm v/v
							Acrolein	1 ppm v/v
							Acrylonitrile	1 ppm v/v
							Alpha Methyl Styrene	1 ppm v/v
							Benzene	1 ppm v/v
							Benzyl chloride	1 ppm v/v
							Bromoform	1 ppm v/v
							Bromomethane	1 ppm v/v
							Butadiene	1 ppm v/v
							Butane	1 ppm v/v
							Carbon disulfide	1 ppm v/v
							Carbon tetrachloride	1 ppm v/v
							Chlorobenzene	1 ppm v/v
							Chlorodibromomethane	1 ppm v/v
							Chlorodifluoromethane	1 ppm v/v
							Chloroethane	1 ppm v/v
							Chloroform	1 ppm v/v
							Chloromethane	1 ppm v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							cis-1,2-Dichloroethene	1 ppm v/v
							cis-1,3-Dichloropropene	1 ppm v/v
							Cyclohexane	1 ppm v/v
							Dibromomethane	1 ppm v/v
							Dichlorobromomethane	1 ppm v/v
							Dichlorodifluoromethane	1 ppm v/v
							Dodecane	1 ppm v/v
							Ethyl acetate	1 ppm v/v
							Ethyl ether	1 ppm v/v
							Ethylbenzene	1 ppm v/v
							Ethylene Dibromide	1 ppm v/v
							Hexachlorobutadiene	1 ppm v/v
							Hexane	1 ppm v/v
							Isooctane	1 ppm v/v
							Isopropyl alcohol	1 ppm v/v
							Isopropylbenzene	1 ppm v/v
							m,p-Xylene	2 ppm v/v
							Methyl methacrylate	1 ppm v/v
							Methyl tert-butyl ether	1 ppm v/v
							Methylene Chloride	1 ppm v/v
							n-Butanol	1 ppm v/v
							n-Butylbenzene	1 ppm v/v
							n-Decane	1 ppm v/v
							n-Heptane	1 ppm v/v
							n-Nonane	1 ppm v/v
							n-Octane	1 ppm v/v
							N-Propylbenzene	1 ppm v/v
							Naphthalene	1 ppm v/v
							Pentane	1 ppm v/v
							Propene	1 ppm v/v
							sec-Butylbenzene	1 ppm v/v
							Styrene	1 ppm v/v
							tert-Butylbenzene	1 ppm v/v
							Tetrachloroethene	1 ppm v/v
							Tetrahydrofuran	1 ppm v/v
							Toluene	1 ppm v/v
							trans-1,2-Dichloroethene	1 ppm v/v
							trans-1,3-Dichloropropene	1 ppm v/v
							Trichloroethene	1 ppm v/v
							Trichlorofluoromethane	1 ppm v/v
							Undecane	1 ppm v/v
							Vinyl acetate	1 ppm v/v
							Vinyl bromide	1 ppm v/v
							Vinyl chloride	1 ppm v/v
							Xylene, o-	1 ppm v/v
.ATTO15EthCALw_00016	05/07/11	02/07/11	VOA Free Water, Lot 7952	37.5 ppb	ATTO15EthCALs_00004	18.75 uL	Ethanol	500 ppb v/v
..ATTO15EthCALs_00004	12/10/11		SIGMA, Lot 05796KM		(Purchased Reagent)		Ethanol	1 mL/mL
ATTO15CISs_00004	11/15/11		Spectra, Lot CC-250115		(Purchased Reagent)		1,4-Difluorobenzene	100 ppb v/v
							Chlorobenzene-d5	100 ppb v/v

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Chlorobromomethane	100 ppb v/v
ATTO15GIS_00004	11/15/12	Spectra Gases, Lot CC-344439			(Purchased Reagent)		1,4-Difluorobenzene	100 ppb v/v
							Chlorobenzene-d5	100 ppb v/v
							Chlorobromomethane	100 ppb v/v
ATTO15LCSW_00103	05/01/11	03/01/11		15.463 L	ATTO15LCSSTKi_00020	773 mL	1,1,1-Trichloroethane	9.99806 ppb v/v
							1,1,2,2-Tetrachloroethane	9.99806 ppb v/v
							1,1,2-Trichloroethane	9.99806 ppb v/v
							1,1-Dichloroethane	9.99806 ppb v/v
							1,1-Dichloroethene	9.99806 ppb v/v
							1,2,4-Trichlorobenzene	9.99806 ppb v/v
							1,2-Dichloroethane	9.99806 ppb v/v
							1,2-Dichloroethene, Total	19.9961 ppb v/v
							1,2-Dichloropropane	9.99806 ppb v/v
							1,4-Dichlorobenzene	9.99806 ppb v/v
							1,4-Dioxane	9.99806 ppb v/v
							Benzene	9.99806 ppb v/v
							Bromoform	9.99806 ppb v/v
							Bromomethane	9.99806 ppb v/v
							Carbon disulfide	9.99806 ppb v/v
							Carbon tetrachloride	9.99806 ppb v/v
							Chlorobenzene	9.99806 ppb v/v
							Chloroethane	9.99806 ppb v/v
							Chloroform	9.99806 ppb v/v
							Chloromethane	9.99806 ppb v/v
							Dichlorodifluoromethane	9.99806 ppb v/v
							Ethylbenzene	9.99806 ppb v/v
							Hexachlorobutadiene	9.99806 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							m,p-Xylene	19.9961 ppb v/v
							Methylene Chloride	9.99806 ppb v/v
							Naphthalene	9.99806 ppb v/v
							Styrene	9.99806 ppb v/v
							Tetrachloroethene	9.99806 ppb v/v
							Toluene	9.99806 ppb v/v
							Vinyl chloride	9.99806 ppb v/v
							Xylene (total)	29.9942 ppb v/v
							Xylene, o-	9.99806 ppb v/v
.ATTO15LCSSTKi_00020	05/01/11	02/01/11	DI WATER, Lot 7951	37.5 L	ATTO15LCSs_00009	7500 mL	1,1,1-Trichloroethane	200 ppb v/v
							1,1,2,2-Tetrachloroethane	200 ppb v/v
							1,1,2-Trichloroethane	200 ppb v/v
							1,1-Dichloroethane	200 ppb v/v
							1,1-Dichloroethene	200 ppb v/v
							1,2,4-Trichlorobenzene	200 ppb v/v
							1,2-Dichloroethane	200 ppb v/v
							1,2-Dichloroethene, Total	400 ppb v/v
							1,2-Dichloropropane	200 ppb v/v
							1,4-Dichlorobenzene	200 ppb v/v
							1,4-Dioxane	200 ppb v/v
							Benzene	200 ppb v/v
							Bromoform	200 ppb v/v
							Bromomethane	200 ppb v/v
							Carbon disulfide	200 ppb v/v
							Carbon tetrachloride	200 ppb v/v
							Chlorobenzene	200 ppb v/v
							Chloroethane	200 ppb v/v
							Chloroform	200 ppb v/v
							Chloromethane	200 ppb v/v
							Dichlorodifluoromethane	200 ppb v/v
							Ethylbenzene	200 ppb v/v
							Hexachlorobutadiene	200 ppb v/v
							m,p-Xylene	400 ppb v/v
							Methylene Chloride	200 ppb v/v
							Naphthalene	200 ppb v/v
							Styrene	200 ppb v/v
							Tetrachloroethene	200 ppb v/v
							Toluene	200 ppb v/v
							Vinyl chloride	200 ppb v/v
							Xylene (total)	600 ppb v/v
							Xylene, o-	200 ppb v/v
..ATTO15LCSs_00009	11/30/11		Spectra Gases, Lot CC-230114		(Purchased Reagent)		1,1,1-Trichloroethane	1 ppm v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							1,1,2,2-Tetrachloroethane	1 ppm v/v
							1,1,2-Trichloroethane	1 ppm v/v
							1,1-Dichloroethane	1 ppm v/v
							1,1-Dichloroethene	1 ppm v/v
							1,2,4-Trichlorobenzene	1 ppm v/v
							1,2-Dichloroethane	1 ppm v/v
							1,2-Dichloroethene, Total	2 ppm v/v
							1,2-Dichloropropane	1 ppm v/v
							1,4-Dichlorobenzene	1 ppm v/v
							1,4-Dioxane	1 ppm v/v
							Benzene	1 ppm v/v
							Bromoform	1 ppm v/v
							Bromomethane	1 ppm v/v
							Carbon disulfide	1 ppm v/v
							Carbon tetrachloride	1 ppm v/v
							Chlorobenzene	1 ppm v/v
							Chloroethane	1 ppm v/v
							Chloroform	1 ppm v/v
							Chloromethane	1 ppm v/v
							Dichlorodifluoromethane	1 ppm v/v
							Ethylbenzene	1 ppm v/v
							Hexachlorobutadiene	1 ppm v/v
							m,p-Xylene	2 ppm v/v
							Methylene Chloride	1 ppm v/v
							Naphthalene	1 ppm v/v
							Styrene	1 ppm v/v
							Tetrachloroethene	1 ppm v/v
							Toluene	1 ppm v/v
							Vinyl chloride	1 ppm v/v
							Xylene (total)	3 ppm v/v
							Xylene, o-	1 ppm v/v
ATTO15LCSW_00108	05/01/11	03/09/11		15.463 L	ATTO15LCSSTKi_00020	773 mL	1,1,1-Trichloroethane	9.99806 ppb v/v
							1,1,2,2-Tetrachloroethane	9.99806 ppb v/v
							1,1,2-Trichloroethane	9.99806 ppb v/v
							1,1-Dichloroethane	9.99806 ppb v/v
							1,1-Dichloroethene	9.99806 ppb v/v
							1,2,4-Trichlorobenzene	9.99806 ppb v/v
							1,2-Dichloroethane	9.99806 ppb v/v
							1,2-Dichloroethene, Total	19.9961 ppb v/v
							1,2-Dichloropropane	9.99806 ppb v/v
							1,4-Dichlorobenzene	9.99806 ppb v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							1,4-Dioxane	9.99806 ppb v/v
							Benzene	9.99806 ppb v/v
							Bromoform	9.99806 ppb v/v
							Bromomethane	9.99806 ppb v/v
							Carbon disulfide	9.99806 ppb v/v
							Carbon tetrachloride	9.99806 ppb v/v
							Chlorobenzene	9.99806 ppb v/v
							Chloroethane	9.99806 ppb v/v
							Chloroform	9.99806 ppb v/v
							Chloromethane	9.99806 ppb v/v
							Dichlorodifluoromethane	9.99806 ppb v/v
							Ethylbenzene	9.99806 ppb v/v
							Hexachlorobutadiene	9.99806 ppb v/v
							m,p-Xylene	19.9961 ppb v/v
							Methylene Chloride	9.99806 ppb v/v
							Naphthalene	9.99806 ppb v/v
							Styrene	9.99806 ppb v/v
							Tetrachloroethene	9.99806 ppb v/v
							Toluene	9.99806 ppb v/v
							Trichloroethene	9.99806 ppb v/v
							Vinyl chloride	9.99806 ppb v/v
							Xylene (total)	29.9942 ppb v/v
							Xylene, o-	9.99806 ppb v/v
.ATTO15LCSSTKi_00020	05/01/11	02/01/11	DI WATER, Lot 7951	37.5 L	ATTO15LCSs_00009	7500 mL	1,1,1-Trichloroethane	200 ppb v/v
							1,1,2,2-Tetrachloroethane	200 ppb v/v
							1,1,2-Trichloroethane	200 ppb v/v
							1,1-Dichloroethane	200 ppb v/v
							1,1-Dichloroethene	200 ppb v/v
							1,2,4-Trichlorobenzene	200 ppb v/v

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							1,2-Dichloroethane	200 ppb v/v
							1,2-Dichloroethene, Total	400 ppb v/v
							1,2-Dichloropropane	200 ppb v/v
							1,4-Dichlorobenzene	200 ppb v/v
							1,4-Dioxane	200 ppb v/v
							Benzene	200 ppb v/v
							Bromoform	200 ppb v/v
							Bromomethane	200 ppb v/v
							Carbon disulfide	200 ppb v/v
							Carbon tetrachloride	200 ppb v/v
							Chlorobenzene	200 ppb v/v
							Chloroethane	200 ppb v/v
							Chloroform	200 ppb v/v
							Chloromethane	200 ppb v/v
							Dichlorodifluoromethane	200 ppb v/v
							Ethylbenzene	200 ppb v/v
							Hexachlorobutadiene	200 ppb v/v
							m,p-Xylene	400 ppb v/v
							Methylene Chloride	200 ppb v/v
							Naphthalene	200 ppb v/v
							Styrene	200 ppb v/v
							Tetrachloroethene	200 ppb v/v
							Toluene	200 ppb v/v
							Trichloroethene	200 ppb v/v
							Vinyl chloride	200 ppb v/v
							Xylene (total)	600 ppb v/v
							Xylene, o-	200 ppb v/v
..ATTO15LCSs_00009	11/30/11		Spectra Gases, Lot CC-230119		(Purchased Reagent)		1,1,1-Trichloroethane	1 ppm v/v
							1,1,2,2-Tetrachloroethane	1 ppm v/v
							1,1,2-Trichloroethane	1 ppm v/v
							1,1-Dichloroethane	1 ppm v/v
							1,1-Dichloroethene	1 ppm v/v
							1,2,4-Trichlorobenzene	1 ppm v/v
							1,2-Dichloroethane	1 ppm v/v
							1,2-Dichloroethene, Total	2 ppm v/v
							1,2-Dichloropropane	1 ppm v/v
							1,4-Dichlorobenzene	1 ppm v/v
							1,4-Dioxane	1 ppm v/v
							Benzene	1 ppm v/v
							Bromoform	1 ppm v/v
							Bromomethane	1 ppm v/v
							Carbon disulfide	1 ppm v/v
							Carbon tetrachloride	1 ppm v/v
							Chlorobenzene	1 ppm v/v
							Chloroethane	1 ppm v/v
							Chloroform	1 ppm v/v
							Chloromethane	1 ppm v/v
							Dichlorodifluoromethane	1 ppm v/v
							Ethylbenzene	1 ppm v/v
							Hexachlorobutadiene	1 ppm v/v

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							m,p-Xylene	2 ppm v/v
							Methylene Chloride	1 ppm v/v
							Naphthalene	1 ppm v/v
							Styrene	1 ppm v/v
							Tetrachloroethene	1 ppm v/v
							Toluene	1 ppm v/v
							Trichloroethene	1 ppm v/v
							Vinyl chloride	1 ppm v/v
							Xylene (total)	3 ppm v/v
							Xylene, o-	1 ppm v/v

Certification Summary

Client: Geosyntec Consultants, Inc.
Project/Site: Cortese NPL site

TestAmerica Job ID: 200-4315-1
SDG: Narrowburg, NY

Laboratory	Authority	Program	EPA Region	Certification ID
TestAmerica Burlington		USDA		P330-11-00093
TestAmerica Burlington	ACLASS	DoD ELAP	0	ADE-1492
TestAmerica Burlington	Connecticut	State Program	1	PH-0751
TestAmerica Burlington	Delaware	Delaware DNREC	3	NA
TestAmerica Burlington	Maine	State Program	1	VT00008
TestAmerica Burlington	Minnesota	State Program	5	050-999-436
TestAmerica Burlington	New Hampshire	NELAC	1	200610
TestAmerica Burlington	New Jersey	NELAC	2	VT972
TestAmerica Burlington	New York	NELAC	2	10391
TestAmerica Burlington	Pennsylvania	NELAC	3	68-00489
TestAmerica Burlington	Rhode Island	State Program	1	LAO00298
TestAmerica Burlington	Vermont	State Program	1	VT-4000

Accreditation may not be offered or required for all methods and analytes reported in this package. Please contact your project manager for the laboratory's current list of certified methods and analytes.

D1946_He

Fixed Gases (Helium)

FORM III
GC VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Matrix: Air Level: Low Lab File ID: 28ma111343-r011.d

Lab ID: LCS 200-15706/2 Client ID:

COMPOUND	SPIKE ADDED (% v/v)	LCS CONCENTRATION (% v/v)	LCS % REC	QC LIMITS REC	#
Helium	5.00	5.13	103	70-130	

Column to be used to flag recovery and RPD values

FORM III D1946

FORM IV
GC VOA METHOD BLANK SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Lab File ID: 28ma111343-r021.d Lab Sample ID: MB 200-15706/3

Matrix: Air Heated Purge:(Y/N) N

Instrument ID: 2866.i Date Analyzed: 03/28/2011 13:53

GC Column: CTR-1 ID: 3.175(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 200-15706/2	28ma111343-r011.d	03/28/2011 13:44
AS-SP3	200-4315-6	28ma111402-r011.d	03/28/2011 14:03

FORM I
GC VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Client Sample ID: AS-SP3 Lab Sample ID: 200-4315-6

Matrix: Air Lab File ID: 28ma111402-r011.d

Analysis Method: D1946 Date Collected: 03/15/2011 15:55

Sample wt/vol: 300(uL) Date Analyzed: 03/28/2011 14:03

Soil Aliquot Vol: Dilution Factor: 1.4

Soil Extract Vol.: GC Column: ID:

% Moisture: Level: (low/med) Low

Analysis Batch No.: 15706 Units: % v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
7440-59-7	Helium	13		0.24	0.24

TestAmerica Burlington

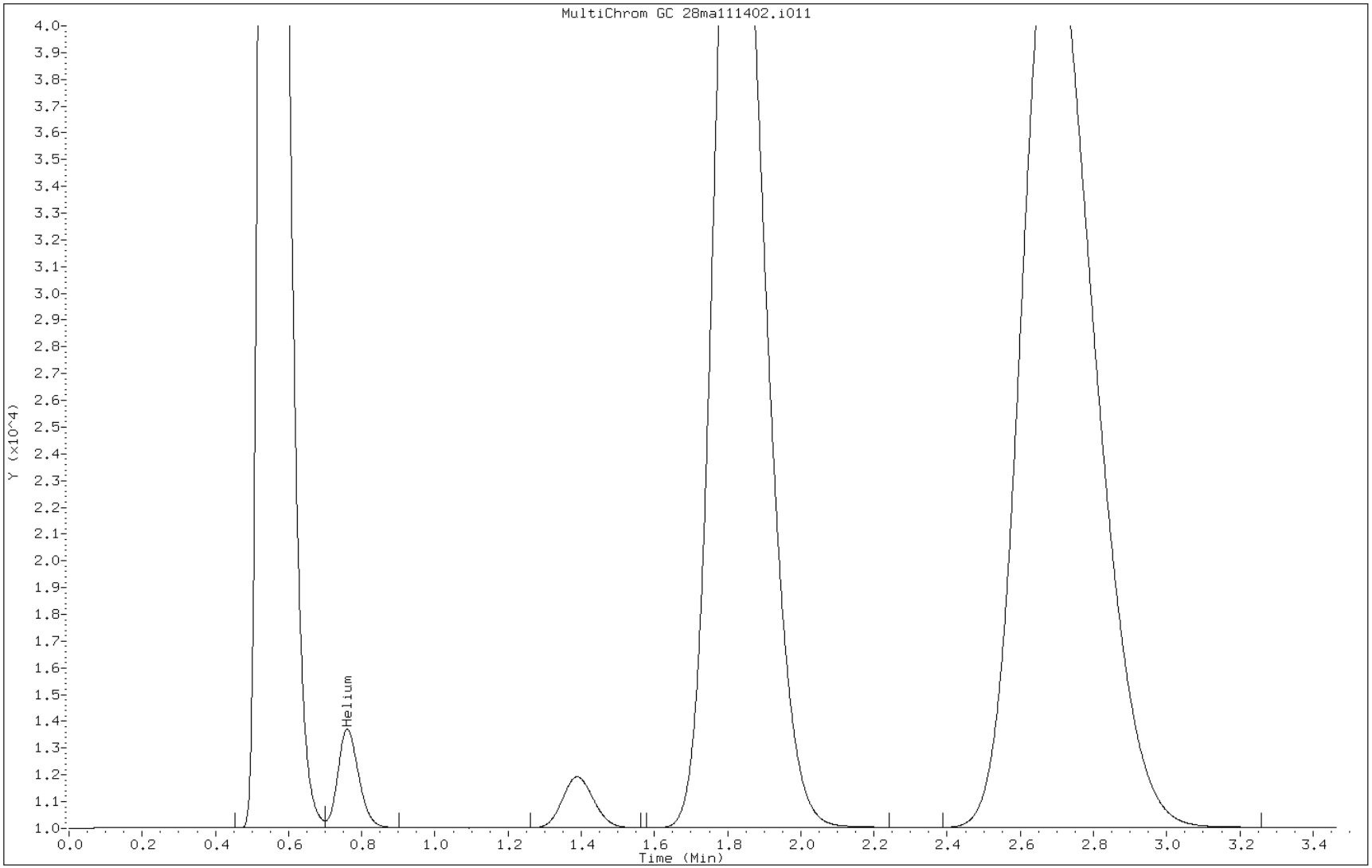
Lab Sample Id: 200-4315-6
Client Smp ID: AS-SP3
Inj Date : 28-MAR-2011 14:03
Operator : MRV Inst ID: 2866_2.i
Smp Info : 200-4315-A-6,1.37
Misc Info : 200-4315-A-6
Comment :
Method : /var/chem/2866_2.i/060810_1/28MAR111325.b/ASTM_He2t.m
Meth Date : 29-Mar-2011 08:20 mrv Quant Type: ESTD
Cal Date : 08-JUN-2010 09:40 Cal File: 08jun100938-r011.d
Als bottle: 1
Dil Factor: 1.37000
Integrator: HP Genie Compound Sublist: all.sub
Target Version: 3.50
Processing Host: chemsvr5

Concentration Formula: Amt * DF * 1 * CpndVariable

Cpnd Variable Local Compound Variable

					CONCENTRATIONS	
					ON-COLUMN	FINAL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(% v/v)	(% v/v)
9 Helium	0.761	0.884	-0.123	222152	9.50433	13

Data File:	28ma111402-r011.d	Date:	28-MAR-2011 14:03
Client ID:	AS-SP3	Instrument:	2866_2.i
Operator:	MRV	Inj Vol:	300.0
Column Type:	CTR-1	Diameter:	3.18
Stationary Phase:	CTR-1		
Sample Info:	200-4315-A-6,1.37		
Lab Sample ID:	200-4315-6		



FORM VI
GC VOA INITIAL CALIBRATION DATA
EXTERNAL STANDARD RETENTION TIME SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1 Analy Batch No.: 4164

SDG No.: Narrowburg, NY

Instrument ID: 2866.i GC Column: CTR-1 ID: 3.175(mm) Heated Purge: (Y/N) N

Calibration Start Date: 06/08/2010 08:48 Calibration End Date: 06/08/2010 09:40 Calibration ID: 1483

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 200-4164/7	08jun100938-r011.d
Level 2	IC 200-4164/2	08jun100839-r021.d
Level 3	IC 200-4164/3	08jun100839-r031.d
Level 4	ICRT 200-4164/4	08jun100839-r041.d
Level 5	IC 200-4164/5	08jun100839-r051.d
Level 6	IC 200-4164/6	08jun100839-r061.d

ANALYTE	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6					RT WINDOW	AVG RT
Helium	0.957	0.900	0.867	0.884	0.925	0.978					0.684 - 1.084	0.919

FORM VI
GC VOA INITIAL CALIBRATION DATA
EXTERNAL STANDARD CURVE EVALUTION

Lab Name: TestAmerica Burlington Job No.: 200-4315-1 Analy Batch No.: 4164

SDG No.: Narrowburg, NY

Instrument ID: 2866.i GC Column: CTR-1 ID: 3.175(mm) Heated Purge: (Y/N) N

Calibration Start Date: 06/08/2010 08:48 Calibration End Date: 06/08/2010 09:40 Calibration ID: 1483

Calibration Files:

LEVEL:	LAB SAMPLE ID:	EPA SAMPLE NO:	LAB FILE ID:
Level 1	IC 200-4164/7	ic	08jun100938-r011.d
Level 2	IC 200-4164/2	ic	08jun100839-r021.d
Level 3	IC 200-4164/3	ic	08jun100839-r031.d
Level 4	ICRT 200-4164/4	icrt	08jun100839-r041.d
Level 5	IC 200-4164/5	ic	08jun100839-r051.d
Level 6	IC 200-4164/6	ic	08jun100839-r061.d

ANALYTE	CF				CURVE TYPE	COEFFICIENT			#	MIN CF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 5	LVL 2 LVL 6	LVL 3	LVL 4		B	M1	M2								
Helium	18106 25961	23059 26915	21455	24747	Ave		23373.7762				13.9		30.0			

Note: The m1 coefficient is the same as Ave CF for an Ave curve type.

FORM VI
GC VOA INITIAL CALIBRATION DATA
EXTERNAL STANDARD RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Burlington Job No.: 200-4315-1 Analy Batch No.: 4164

SDG No.: Narrowburg, NY

Instrument ID: 2866.i GC Column: CTR-1 ID: 3.175(mm) Heated Purge: (Y/N) N

Calibration Start Date: 06/08/2010 08:48 Calibration End Date: 06/08/2010 09:40 Calibration ID: 1483

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 200-4164/7	08jun100938-r011.d
Level 2	IC 200-4164/2	08jun100839-r021.d
Level 3	IC 200-4164/3	08jun100839-r031.d
Level 4	ICRT 200-4164/4	08jun100839-r041.d
Level 5	IC 200-4164/5	08jun100839-r051.d
Level 6	IC 200-4164/6	08jun100839-r061.d

ANALYTE	CURVE TYPE	RESPONSE					CONCENTRATION (% V/V)				
		LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5
Helium	Ave	3078 449487	19139	36473	123734	215475	0.170 16.7	0.830	1.70	5.00	8.30

Curve Type Legend:
Ave = Average

TestAmerica Burlington

Data file : /var/chem/2866_2.i/060810_1/08JUN100839TAL.b/08jun100839-r021.d
Lab Smp Id: ic Client Smp ID: ic
Inj Date : 08-JUN-2010 08:48
Operator : PAD Inst ID: 2866_2.i
Smp Info : ic,1
Misc Info :
Comment :
Method : /var/chem/2866_2.i/060810_1/08JUN100839TAL.b/ASTM_He2t.m
Meth Date : 09-Jul-2010 11:59 pd Quant Type: ESTD
Cal Date : 08-JUN-2010 08:48 Cal File: 08jun100839-r021.d
Als bottle: 1 Calibration Sample, Level: 2
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: all.sub
Target Version: 3.50
Processing Host: chemsvr5

Concentration Formula: Amt * DF * 1 * CpndVariable

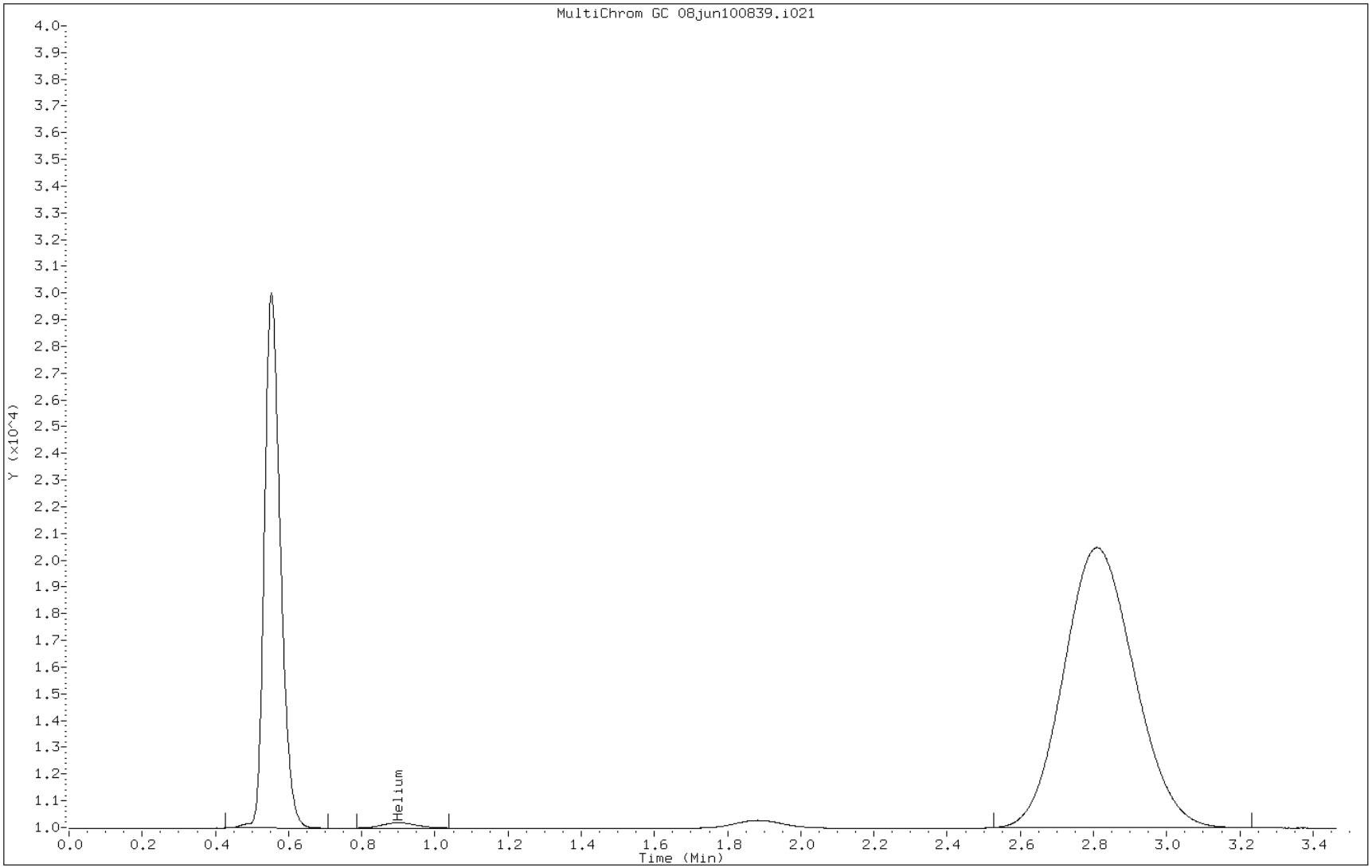
Cpnd Variable Local Compound Variable

					AMOUNTS	
					CAL-AMT	ON-COL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(% v/v)	(% v/v)
9 Helium	0.900	0.884	0.016	19139	0.83000	0.82(M)

QC Flag Legend

M - Compound response manually integrated.

Data File:	08jun100839-r021.d	Date:	08-JUN-2010 08:48
Client ID:	ic	Instrument:	2866_2.i
Operator:	PAD	Inj Vol:	300.0
Column Type:	CTR-1	Diameter:	3.18
Stationary Phase:	CTR-1		
Sample Info:	ic,1		
Lab Sample ID:	ic		



Manual Integration Report

Data File: 08jun100839-r021.d
Lab Sample ID: ic
Inj. Date and Time: 08-JUN-2010 08:48
Instrument ID: 2866_2.i
Client ID: ic
Compound: 9 Helium
CAS #: 7440-59-7
Report Date: 07/09/2010

Processing Integration Results

Not Detected

Expected RT: 0.88

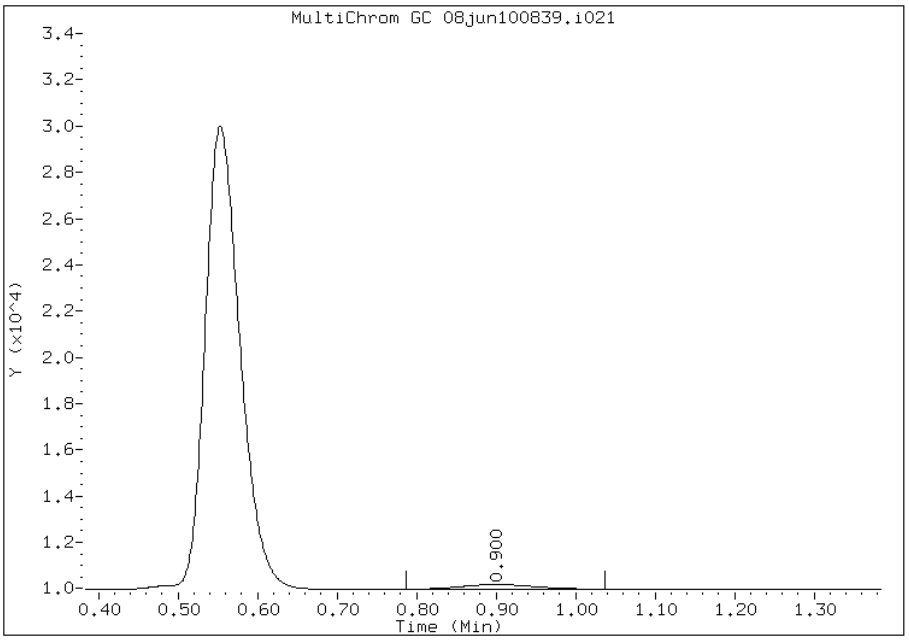
Manual Integration Results

RT: 0.90

Response: 19139

Amount: 0.8188

Conc: 0.8188



Manually Integrated By: pd
Manual Integration Reason: Peak not found by the data system

TestAmerica Burlington

Data file : /var/chem/2866_2.i/060810_1/08JUN100839TAL.b/08jun100839-r031.d
Lab Smp Id: ic Client Smp ID: ic
Inj Date : 08-JUN-2010 08:53
Operator : PAD Inst ID: 2866_2.i
Smp Info : ic,1
Misc Info :
Comment :
Method : /var/chem/2866_2.i/060810_1/08JUN100839TAL.b/ASTM_He2t.m
Meth Date : 09-Jul-2010 11:59 pd Quant Type: ESTD
Cal Date : 08-JUN-2010 08:53 Cal File: 08jun100839-r031.d
Als bottle: 1 Calibration Sample, Level: 3
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: all.sub
Target Version: 3.50
Processing Host: chemsvr5

Concentration Formula: Amt * DF * 1 * CpndVariable

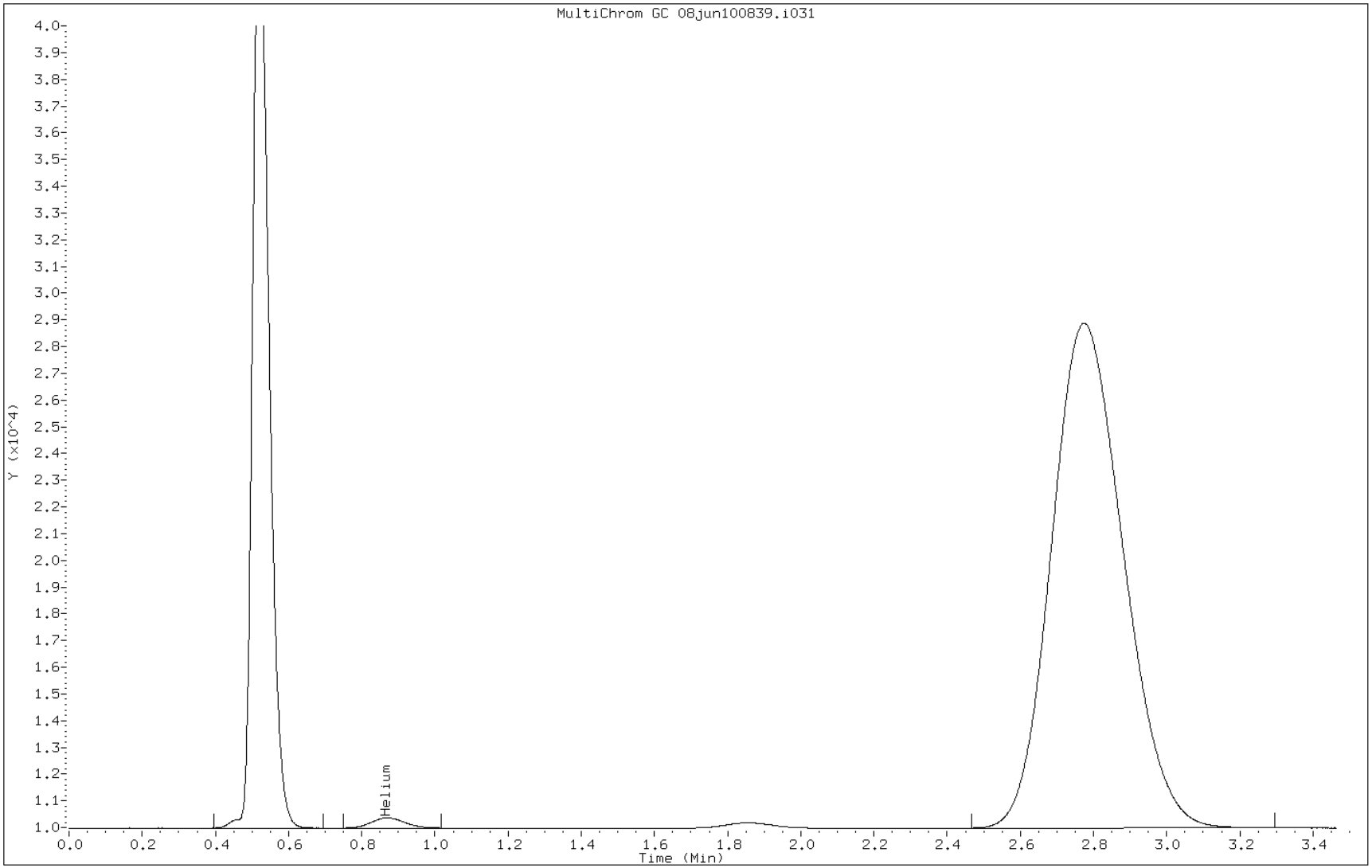
Cpnd Variable Local Compound Variable

					AMOUNTS	
					CAL-AMT	ON-COL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(% v/v)	(% v/v)
==========	==	======	======	========	=======	=======
9 Helium	0.867	0.884	-0.017	36473	1.70000	1.6(M)

QC Flag Legend

M - Compound response manually integrated.

Data File:	08jun100839-r031.d	Date:	08-JUN-2010 08:53
Client ID:	ic	Instrument:	2866_2.i
Operator:	PAD	Inj Vol:	300.0
Column Type:	CTR-1	Diameter:	3.18
Stationary Phase:	CTR-1		
Sample Info:	ic,1		
Lab Sample ID:	ic		



Manual Integration Report

Data File: 08jun100839-r031.d
Lab Sample ID: ic
Inj. Date and Time: 08-JUN-2010 08:53
Instrument ID: 2866_2.i
Client ID: ic
Compound: 9 Helium
CAS #: 7440-59-7
Report Date: 07/09/2010

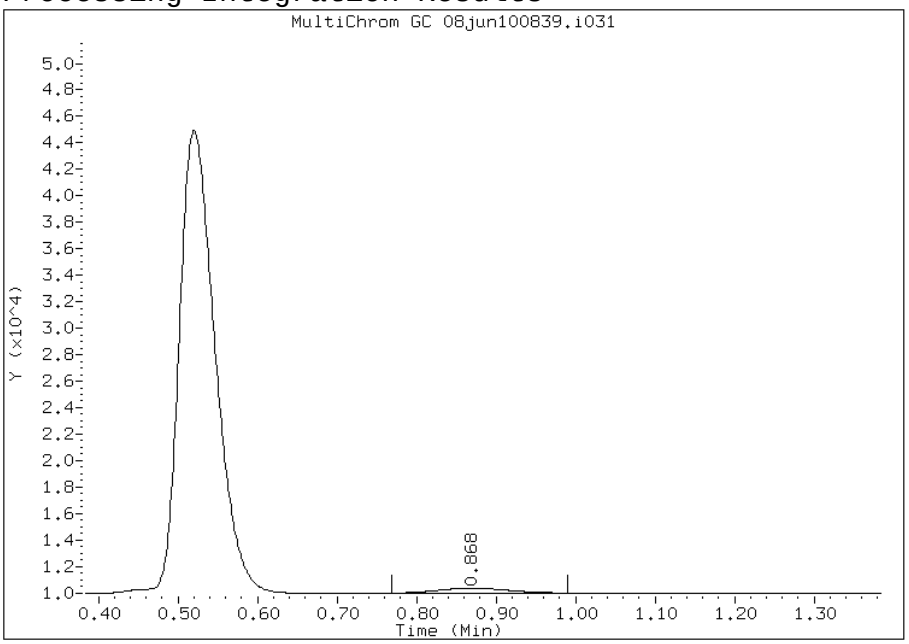
Processing Integration Results

RT: 0.87

Response: 33803

Amount: 1.51

Conc: 1.51



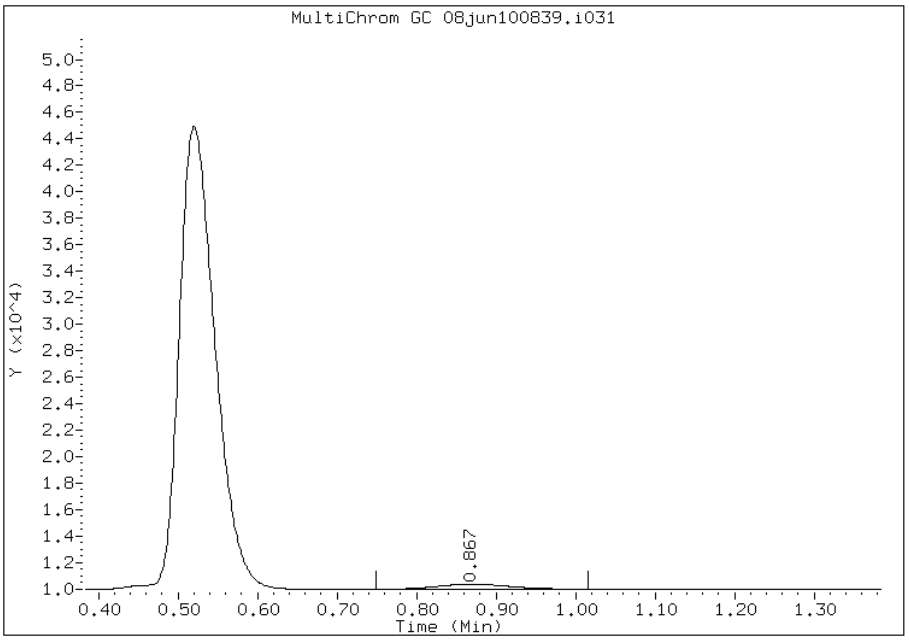
Manual Integration Results

RT: 0.87

Response: 36473

Amount: 1.56

Conc: 1.56



Manually Integrated By: pd
Manual Integration Reason: Baseline event

TestAmerica Burlington

Data file : /var/chem/2866_2.i/060810_1/08JUN100839TAL.b/08jun100839-r041.d
Lab Smp Id: icrt Client Smp ID: icrt
Inj Date : 08-JUN-2010 08:57
Operator : PAD Inst ID: 2866_2.i
Smp Info : icrt,1
Misc Info :
Comment :
Method : /var/chem/2866_2.i/060810_1/08JUN100839TAL.b/ASTM_He2t.m
Meth Date : 09-Jul-2010 11:59 pd Quant Type: ESTD
Cal Date : 08-JUN-2010 08:57 Cal File: 08jun100839-r041.d
Als bottle: 1 Calibration Sample, Level: 4
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: all.sub
Target Version: 3.50
Processing Host: chemsvr5

Concentration Formula: Amt * DF * 1 * CpndVariable

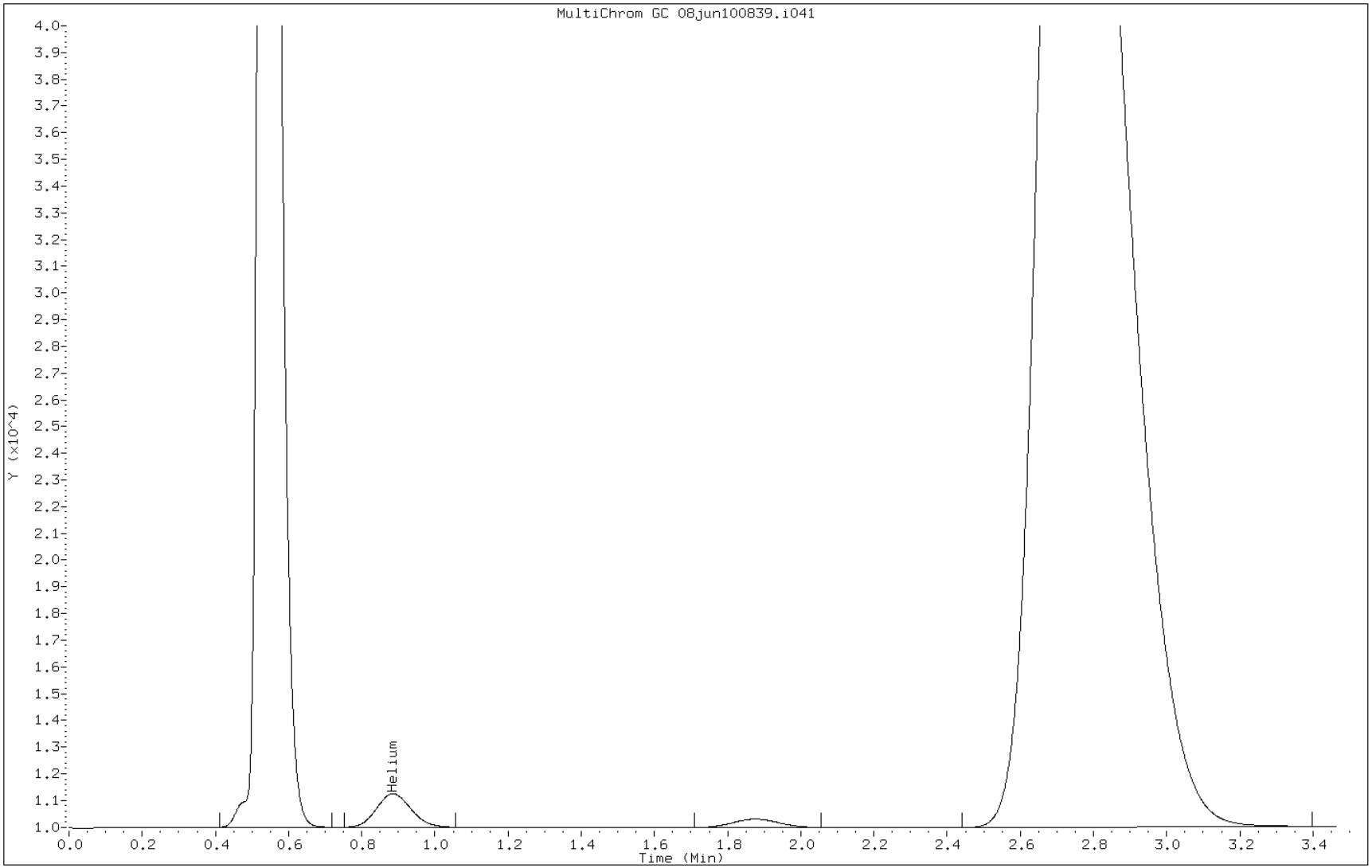
Cpnd Variable Local Compound Variable

					AMOUNTS	
					CAL-AMT	ON-COL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(% v/v)	(% v/v)
==========	==	======	======	========	=======	=======
9 Helium	0.884	0.884	0.000	123734	5.00000	5.3(M)

QC Flag Legend

M - Compound response manually integrated.

Data File:	08jun100839-r041.d	Date:	08-JUN-2010 08:57
Client ID:	icrt	Instrument:	2866_2.i
Operator:	PAD	Inj Vol:	300.0
Column Type:	CTR-1	Diameter:	3.18
Stationary Phase:	CTR-1		
Sample Info:	icrt,1		
Lab Sample ID:	icrt		



Manual Integration Report

Data File: 08jun100839-r041.d
Lab Sample ID: icrt
Inj. Date and Time: 08-JUN-2010 08:57
Instrument ID: 2866_2.i
Client ID: icrt
Compound: 9 Helium
CAS #: 7440-59-7
Report Date: 07/09/2010

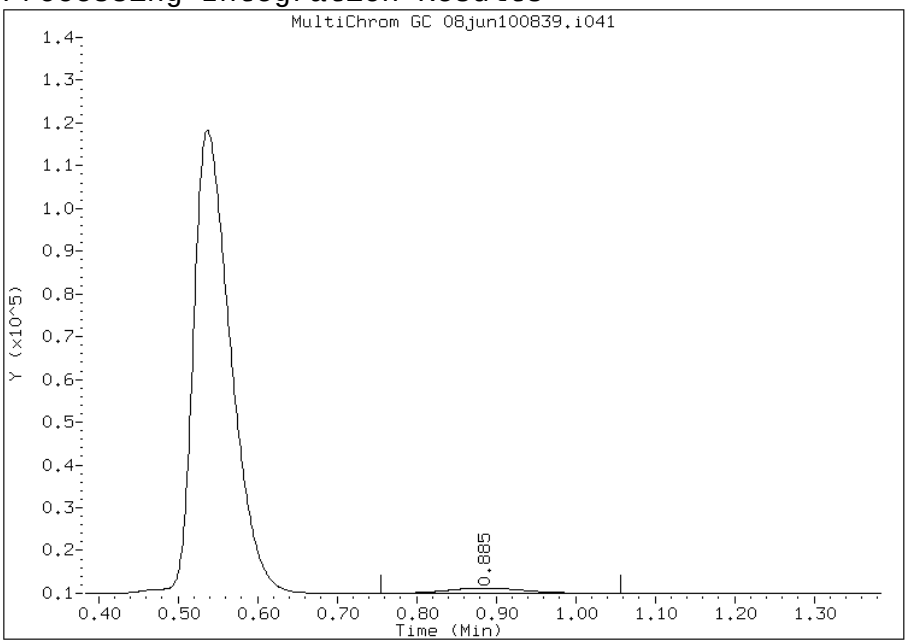
Processing Integration Results

RT: 0.89

Response: 123519

Amount: 5.00

Conc: 5.00



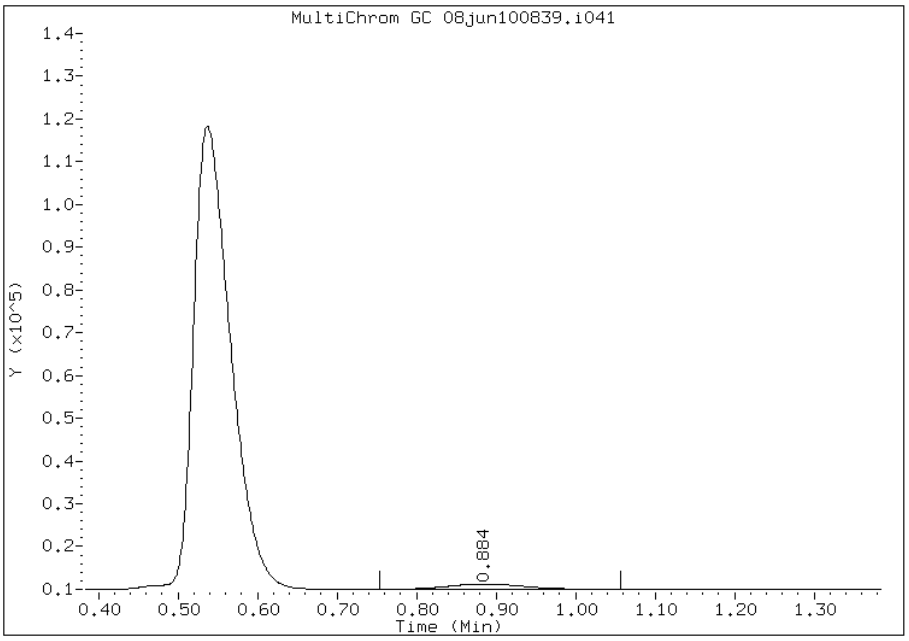
Manual Integration Results

RT: 0.88

Response: 123734

Amount: 5.29

Conc: 5.29



Manually Integrated By: pd
Manual Integration Reason: Baseline event

TestAmerica Burlington

Data file : /var/chem/2866_2.i/060810_1/08JUN100839TAL.b/08jun100839-r051.d
Lab Smp Id: ic Client Smp ID: ic
Inj Date : 08-JUN-2010 09:01
Operator : PAD Inst ID: 2866_2.i
Smp Info : ic,1
Misc Info :
Comment :
Method : /var/chem/2866_2.i/060810_1/08JUN100839TAL.b/ASTM_He2t.m
Meth Date : 09-Jul-2010 11:59 pd Quant Type: ESTD
Cal Date : 08-JUN-2010 09:01 Cal File: 08jun100839-r051.d
Als bottle: 1 Calibration Sample, Level: 5
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: all.sub
Target Version: 3.50
Processing Host: chemsvr5

Concentration Formula: Amt * DF * 1 * CpndVariable

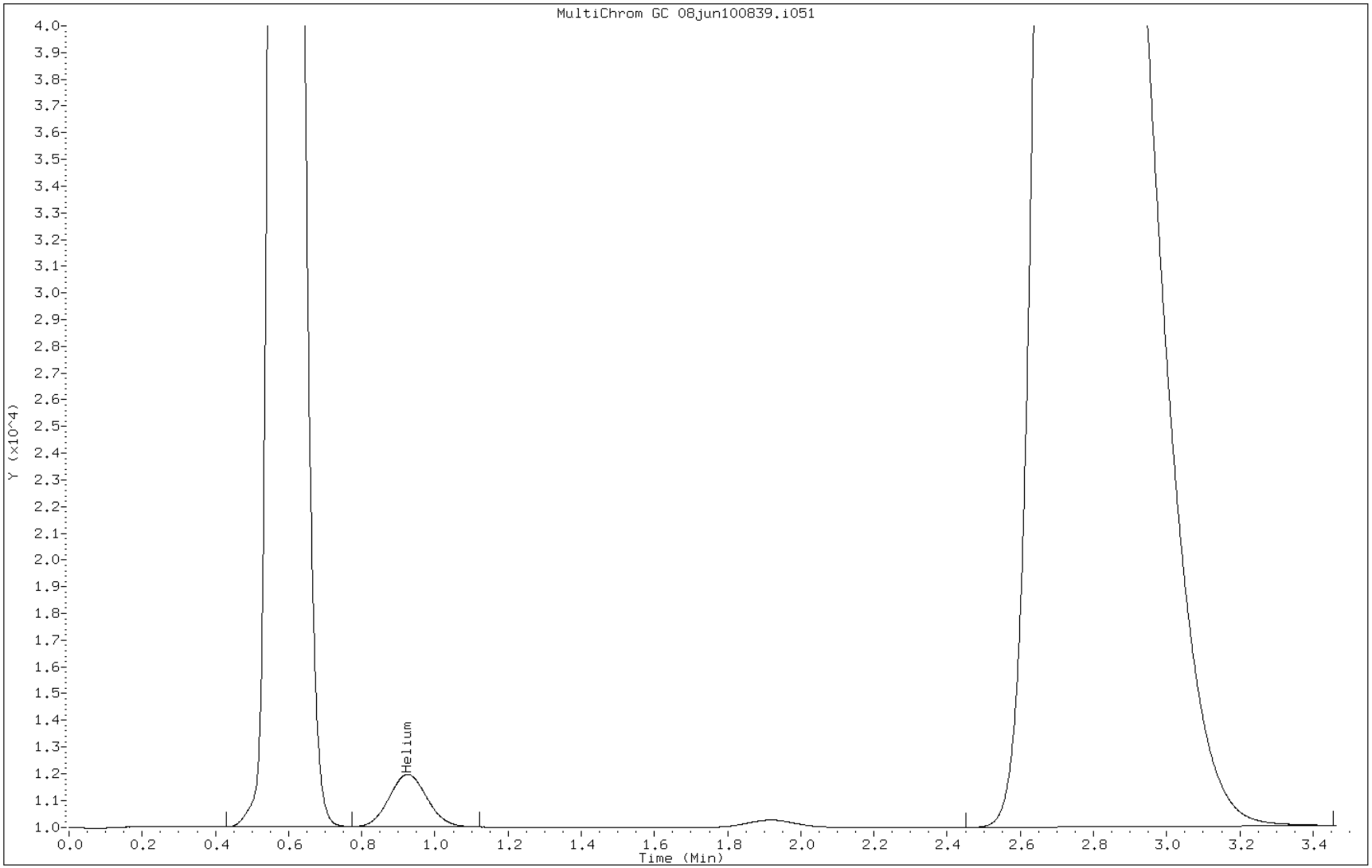
Cpnd Variable Local Compound Variable

					AMOUNTS	
					CAL-AMT	ON-COL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(% v/v)	(% v/v)
9 Helium	0.925	0.884	0.041	215475	8.30000	9.2(M)

QC Flag Legend

M - Compound response manually integrated.

Data File:	08jun100839-r051.d	Date:	08-JUN-2010 09:01
Client ID:	ic	Instrument:	2866_2.i
Operator:	PAD	Inj Vol:	300.0
Column Type:	CTR-1	Diameter:	3.18
Stationary Phase:	CTR-1		
Sample Info:	ic,1		
Lab Sample ID:	ic		



Manual Integration Report

Data File: 08jun100839-r051.d
Lab Sample ID: ic
Inj. Date and Time: 08-JUN-2010 09:01
Instrument ID: 2866_2.i
Client ID: ic
Compound: 9 Helium
CAS #: 7440-59-7
Report Date: 07/09/2010

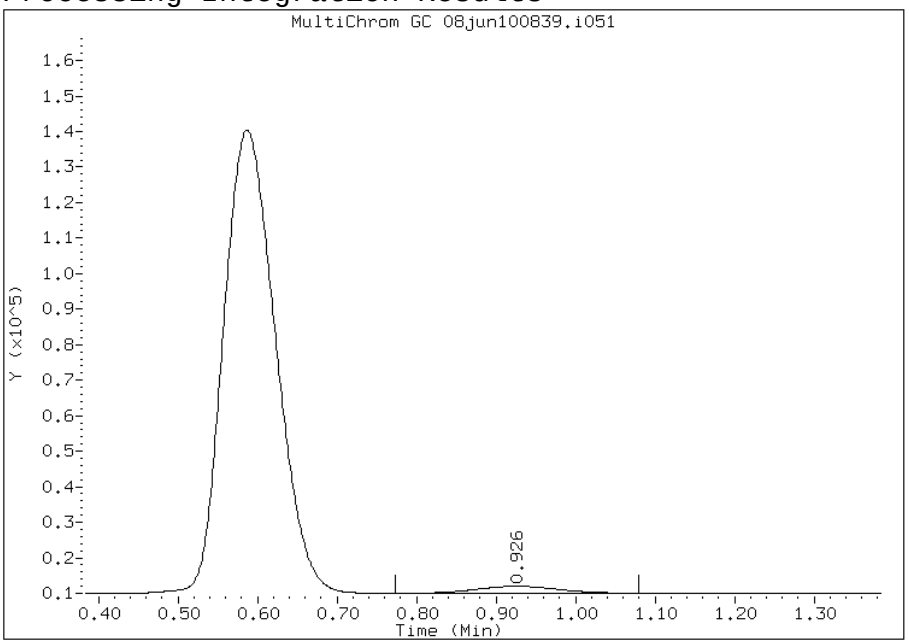
Processing Integration Results

RT: 0.93

Response: 209035

Amount: 8.98

Conc: 8.98



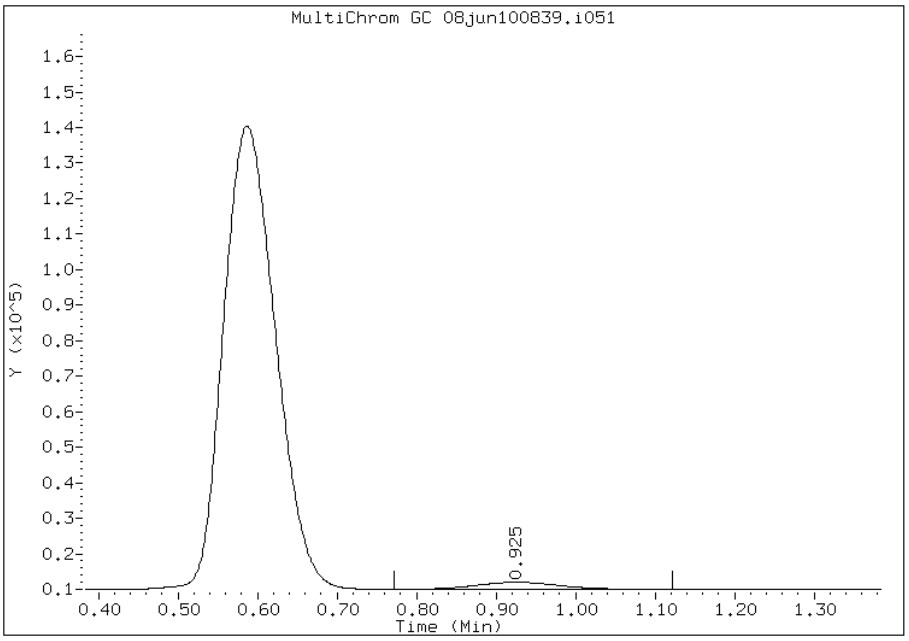
Manual Integration Results

RT: 0.93

Response: 215475

Amount: 9.22

Conc: 9.22



Manually Integrated By: pd
Manual Integration Reason: Baseline event

TestAmerica Burlington

Data file : /var/chem/2866_2.i/060810_1/08JUN100839TAL.b/08jun100839-r061.d
Lab Smp Id: ic Client Smp ID: ic
Inj Date : 08-JUN-2010 09:05
Operator : PAD Inst ID: 2866_2.i
Smp Info : ic,1
Misc Info :
Comment :
Method : /var/chem/2866_2.i/060810_1/08JUN100839TAL.b/ASTM_He2t.m
Meth Date : 09-Jul-2010 11:59 pd Quant Type: ESTD
Cal Date : 08-JUN-2010 09:05 Cal File: 08jun100839-r061.d
Als bottle: 1 Calibration Sample, Level: 6
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: all.sub
Target Version: 3.50
Processing Host: chemsvr5

Concentration Formula: Amt * DF * 1 * CpndVariable

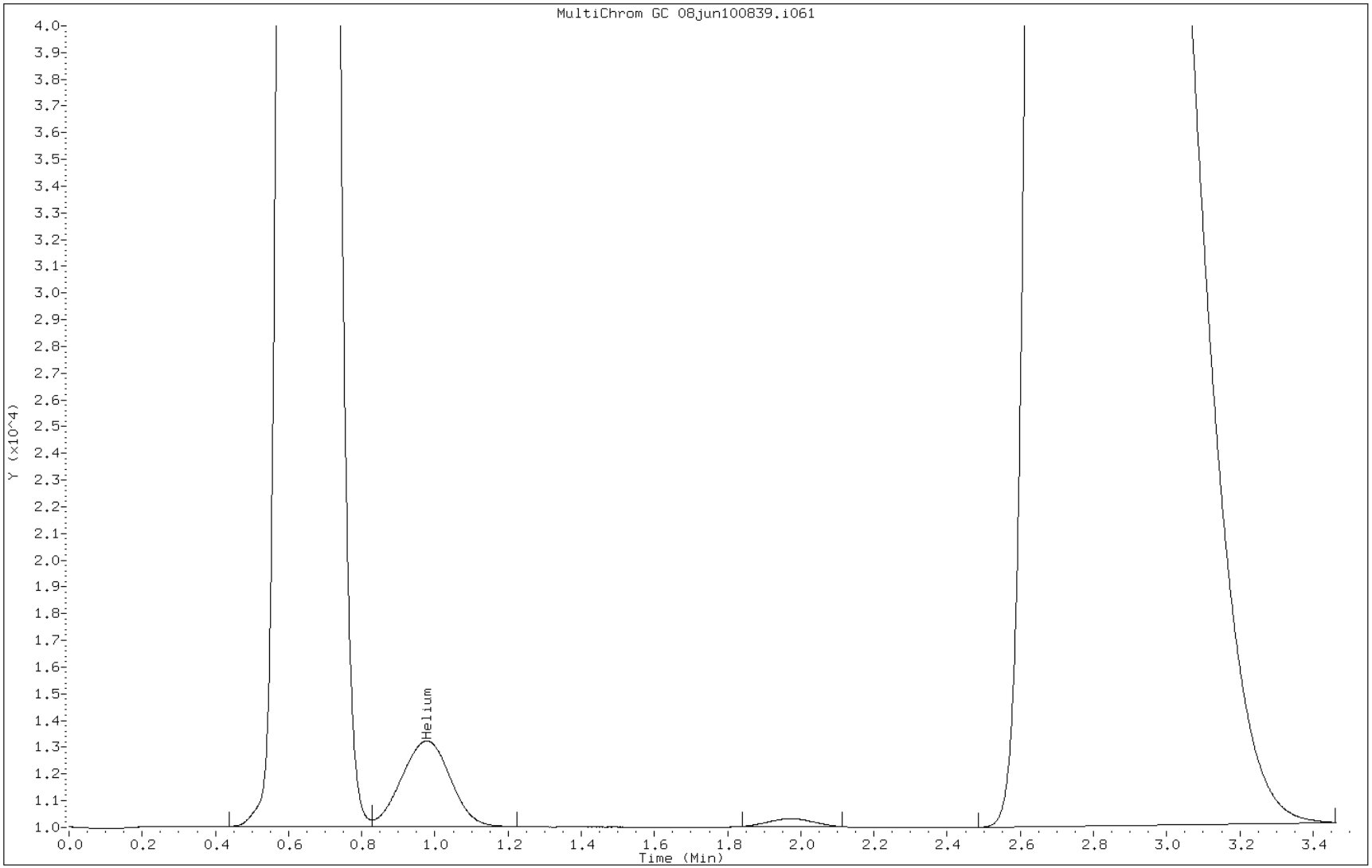
Cpnd Variable Local Compound Variable

					AMOUNTS	
					CAL-AMT	ON-COL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(% v/v)	(% v/v)
9 Helium	0.978	0.884	0.094	449487	16.7000	19(A)

QC Flag Legend

A - Target compound detected but, quantitated amount
exceeded maximum amount.

Data File:	08jun100839-r061.d	Date:	08-JUN-2010 09:05
Client ID:	ic	Instrument:	2866_2.i
Operator:	PAD	Inj Vol:	300.0
Column Type:	CTR-1	Diameter:	3.18
Stationary Phase:	CTR-1		
Sample Info:	ic,1		
Lab Sample ID:	ic		



TestAmerica Burlington

Data file : /var/chem/2866_2.i/060810_1/08JUN100839TAL.b/08jun100938-r011.d
Lab Smp Id: ic Client Smp ID: ic
Inj Date : 08-JUN-2010 09:40
Operator : PAD Inst ID: 2866_2.i
Smp Info : ic,1
Misc Info :
Comment :
Method : /var/chem/2866_2.i/060810_1/08JUN100839TAL.b/ASTM_He2t.m
Meth Date : 09-Jul-2010 11:59 pd Quant Type: ESTD
Cal Date : 08-JUN-2010 09:40 Cal File: 08jun100938-r011.d
Als bottle: 1 Calibration Sample, Level: 1
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: all.sub
Target Version: 3.50
Processing Host: chemsvr5

Concentration Formula: Amt * DF * 1 * CpndVariable

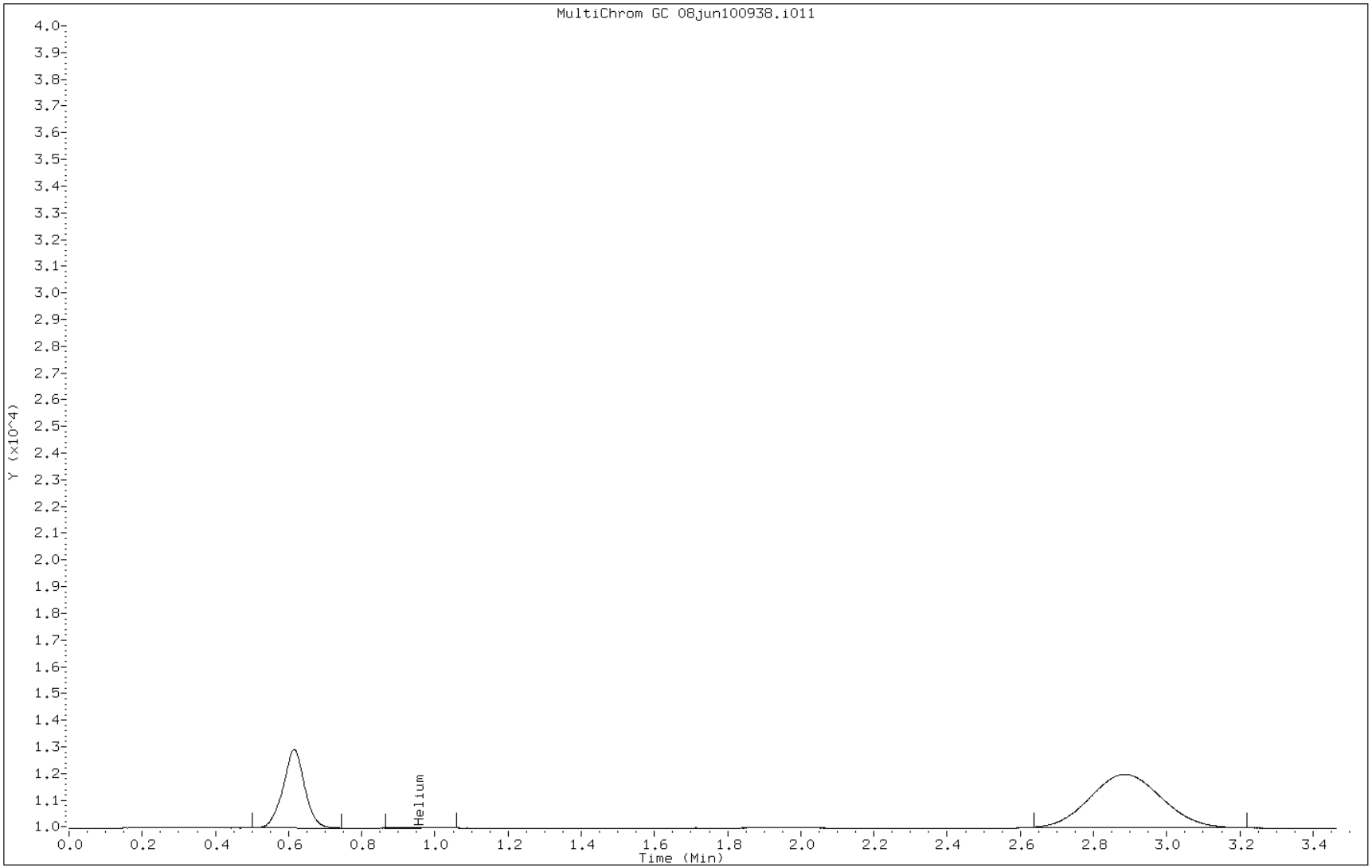
Cpnd Variable Local Compound Variable

					AMOUNTS	
					CAL-AMT	ON-COL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(% v/v)	(% v/v)
9 Helium	0.957	0.884	0.073	3078	0.17000	0.13(aM)

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.

Data File:	08jun100938-r011.d	Date:	08-JUN-2010 09:40
Client ID:	ic	Instrument:	2866_2.i
Operator:	PAD	Inj Vol:	300.0
Column Type:	CTR-1	Diameter:	3.18
Stationary Phase:	CTR-1		
Sample Info:	ic,1		
Lab Sample ID:	ic		



Manual Integration Report

Data File: 08jun100938-r011.d
Lab Sample ID: ic
Inj. Date and Time: 08-JUN-2010 09:40
Instrument ID: 2866_2.i
Client ID: ic
Compound: 9 Helium
CAS #: 7440-59-7
Report Date: 07/09/2010

Processing Integration Results

Not Detected

Expected RT: 0.88

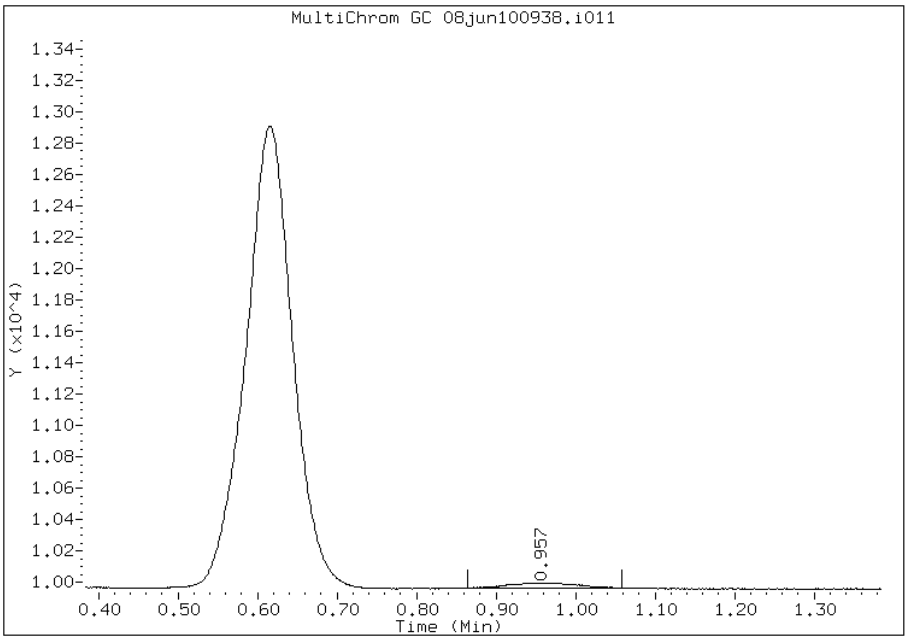
Manual Integration Results

RT: 0.96

Response: 3078

Amount: 0.1317

Conc: 0.1317



Manually Integrated By: pd
Manual Integration Reason: Peak not found by the data system

FORM VII
GC VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Lab Sample ID: ICV 200-4164/8 Calibration Date: 06/08/2010 09:57

Instrument ID: 2866.i Calib Start Date: 06/08/2010 08:48

GC Column: CTR-1 ID: 3.18(mm) Calib End Date: 06/08/2010 09:40

Lab File ID: 08jun100957-r011.d Conc. Units: % v/v Heated Purge: (Y/N) N

EPA Sample No.: ICV

ANALYTE	CURVE TYPE	AVE CF	CF	MIN CF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Helium	Ave	23374	22559		4.83	5.00	-3.5	

FORM VII
GC VOA CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Lab Sample ID: ICV 200-4164/8 Calibration Date: 06/08/2010 09:57

Instrument ID: 2866.i Calib Start Date: 06/08/2010 08:48

GC Column: CTR-1 ID: 3.18(mm) Calib End Date: 06/08/2010 09:40

Lab File ID: 08jun100957-r011.d Heated Purge: (Y/N) N

Analyte	RT	RT WINDOW	
		TO	FROM
Helium	0.92	0.68	1.08

TestAmerica Burlington

Data file : /var/chem/2866_2.i/060810_1/08JUN100839TAL.b/08jun100957-r011.d
Lab Smp Id: ICV Client Smp ID: ICV
Inj Date : 08-JUN-2010 09:57
Operator : PAD Inst ID: 2866_2.i
Smp Info : ICV,1
Misc Info :
Comment :
Method : /var/chem/2866_2.i/060810_1/08JUN100839TAL.b/ASTM_He2t.m
Meth Date : 09-Jul-2010 11:59 pd Quant Type: ESTD
Cal Date : 08-JUN-2010 09:40 Cal File: 08jun100938-r011.d
Als bottle: 1 QC Sample: METHSPIKE
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: all.sub
Target Version: 3.50
Processing Host: chemsvr5

Concentration Formula: Amt * DF * 1 * CpndVariable

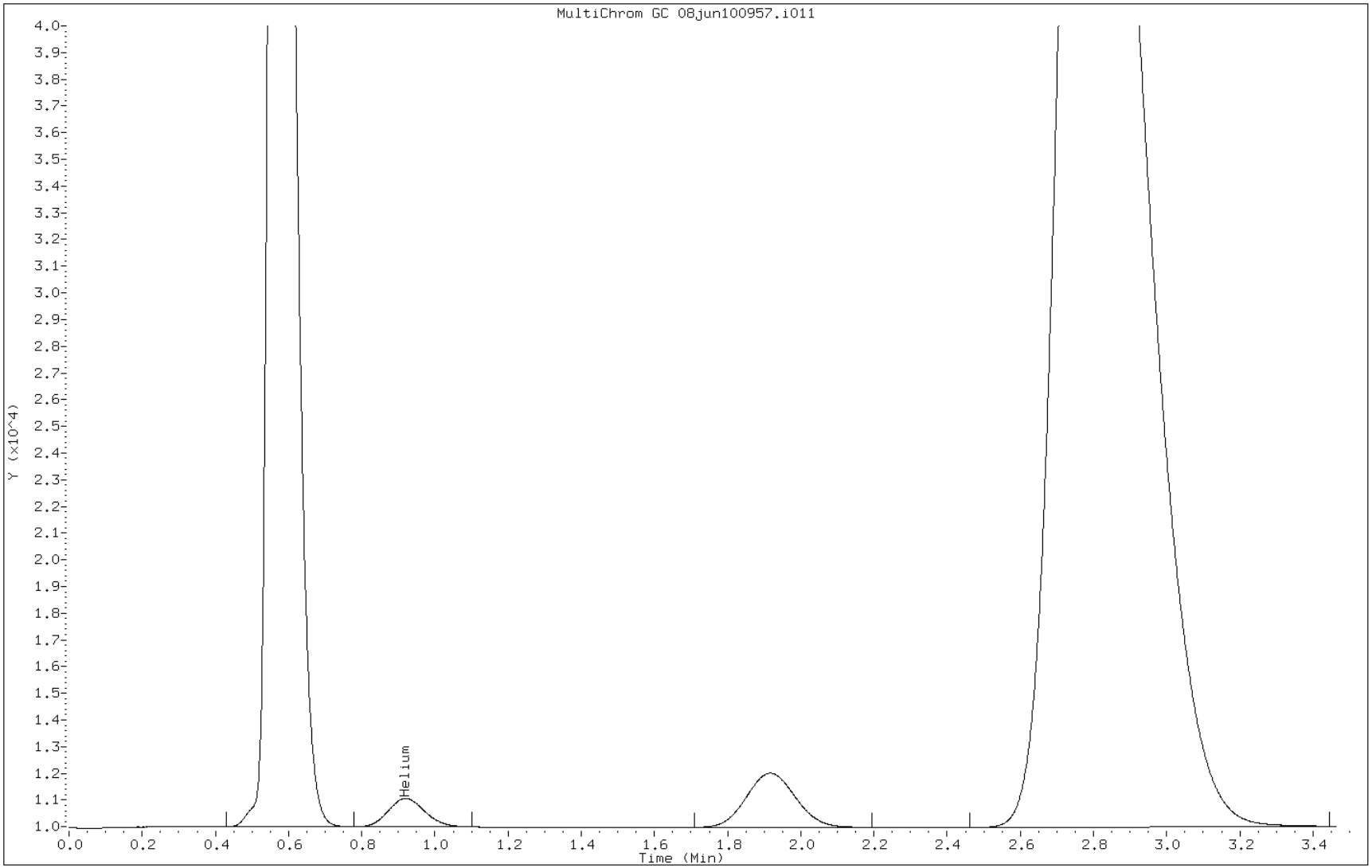
Cpnd Variable Local Compound Variable

					CONCENTRATIONS	
					ON-COLUMN	FINAL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(% v/v)	(% v/v)
9 Helium	0.918	0.884	0.034	112794	4.82566	4.8(M)

QC Flag Legend

M - Compound response manually integrated.

Data File:	08jun100957-r011.d	Date:	08-JUN-2010 09:57
Client ID:	ICV	Instrument:	2866_2.i
Operator:	PAD	Inj Vol:	300.0
Column Type:	CTR-1	Diameter:	3.18
Stationary Phase:	CTR-1		
Sample Info:	ICV,1		
Lab Sample ID:	ICV		



Manual Integration Report

Data File: 08jun100957-r011.d
Lab Sample ID: ICV
Inj. Date and Time: 08-JUN-2010 09:57
Instrument ID: 2866_2.i
Client ID: ICV
Compound: 9 Helium
CAS #: 7440-59-7
Report Date: 07/09/2010

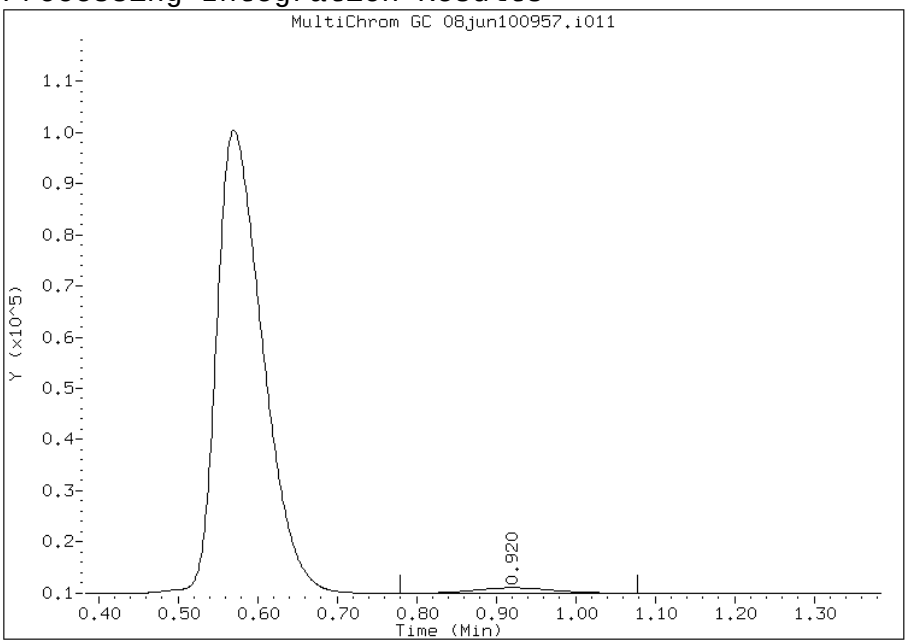
Processing Integration Results

RT: 0.92

Response: 110479

Amount: 4.73

Conc: 4.73



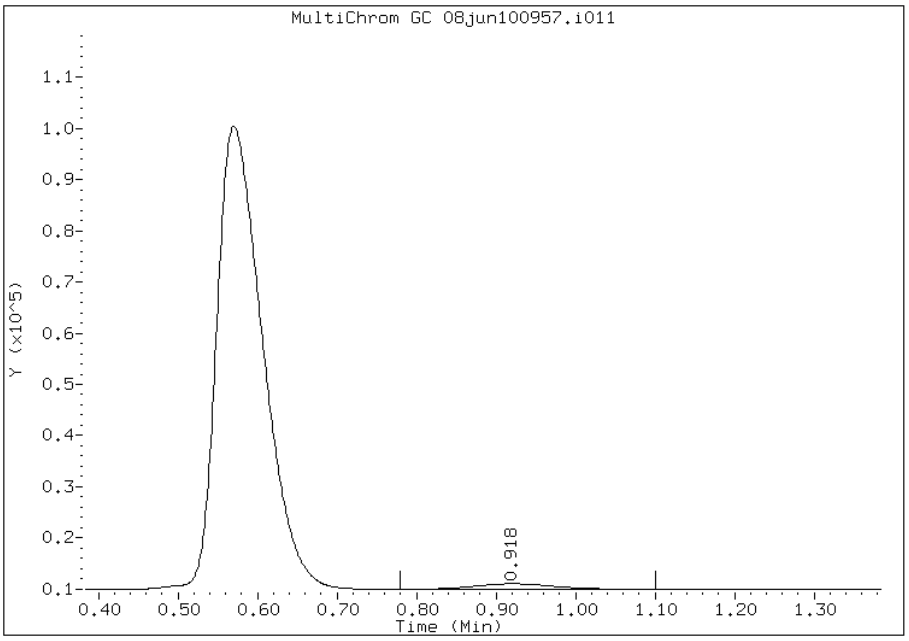
Manual Integration Results

RT: 0.92

Response: 112794

Amount: 4.83

Conc: 4.83



Manually Integrated By: pd
Manual Integration Reason: Baseline event

FORM VII
GC VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Lab Sample ID: CCV 200-15706/1 Calibration Date: 03/28/2011 13:27

Instrument ID: 2866.i Calib Start Date: 06/08/2010 08:48

GC Column: CTR-1 ID: 3.18(mm) Calib End Date: 06/08/2010 09:40

Lab File ID: 28ma111325-r011.d Conc. Units: % v/v Heated Purge: (Y/N) N

EPA Sample No.: CCV

ANALYTE	CURVE TYPE	AVE CF	CF	MIN CF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Helium	Ave	23374	22072		4.72	5.00	-5.6	30.0

FORM VII
GC VOA CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Lab Sample ID: CCV 200-15706/1 Calibration Date: 03/28/2011 13:27

Instrument ID: 2866.i Calib Start Date: 06/08/2010 08:48

GC Column: CTR-1 ID: 3.18(mm) Calib End Date: 06/08/2010 09:40

Lab File ID: 28ma111325-r011.d Heated Purge: (Y/N) N

Analyte	RT	RT WINDOW	
		TO	FROM
Helium	0.87	0.68	1.08

TestAmerica Burlington

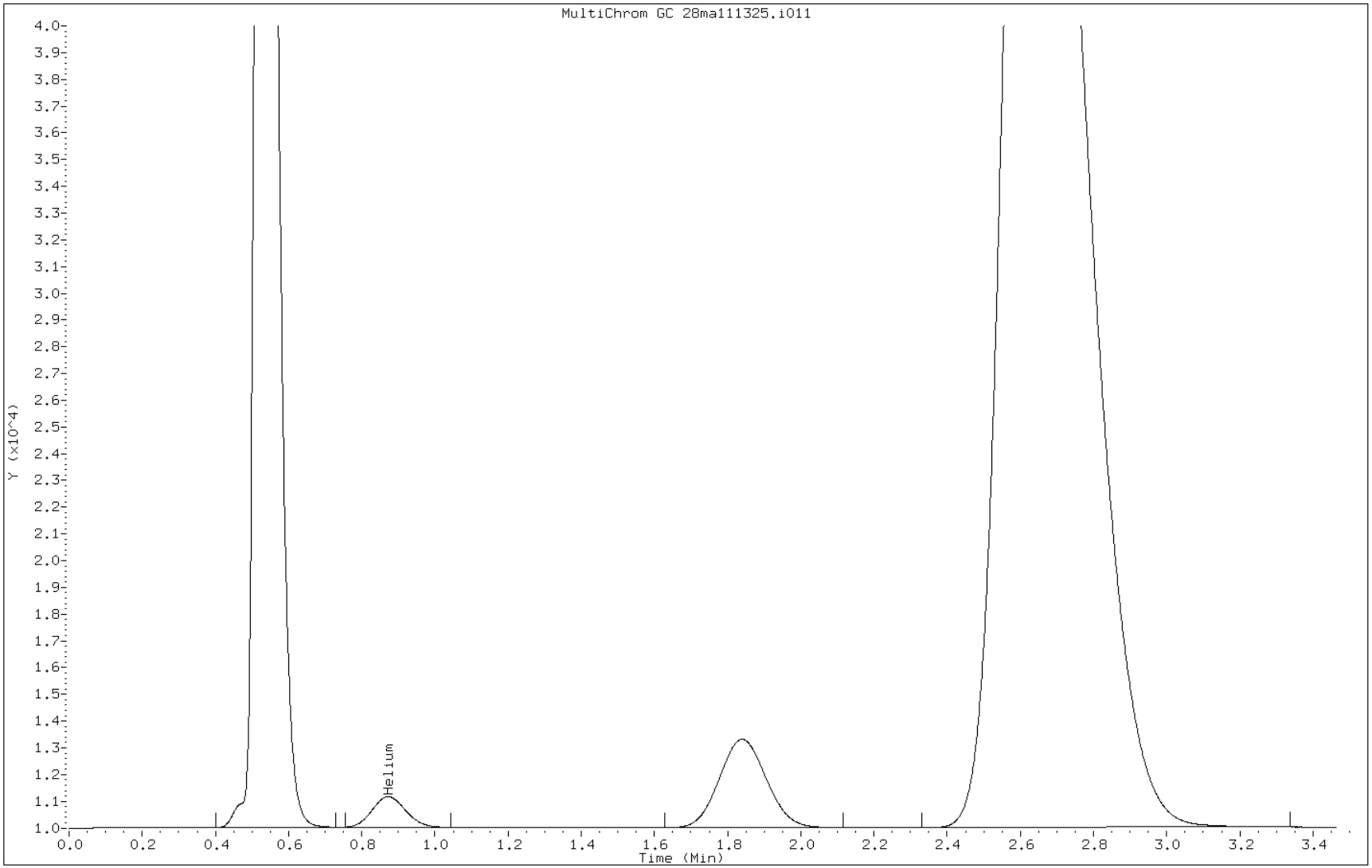
Data file : /var/chem/2866_2.i/060810_1/28MAR111325.b/28ma111325-r011.d
Lab Smp Id: CCV Client Smp ID: CCV
Inj Date : 28-MAR-2011 13:27
Operator : MRV Inst ID: 2866_2.i
Smp Info : CCV,1
Misc Info :
Comment :
Method : /var/chem/2866_2.i/060810_1/28MAR111325.b/ASTM_He2t.m
Meth Date : 29-Mar-2011 08:20 mrv Quant Type: ESTD
Cal Date : 08-JUN-2010 09:40 Cal File: 08jun100938-r011.d
Als bottle: 1 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: all.sub
Target Version: 3.50
Processing Host: chemsvr5

Concentration Formula: Amt * DF * 1 * CpndVariable

Cpnd Variable Local Compound Variable

					AMOUNTS	
					CAL-AMT	ON-COL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(% v/v)	(% v/v)
9 Helium	0.872	0.884	-0.012	110359	5.00000	4.7

Data File:	28ma111325-r011.d	Date:	28-MAR-2011 13:27
Client ID:	CCV	Instrument:	2866_2.i
Operator:	MRV	Inj Vol:	300.0
Column Type:	CTR-1	Diameter:	3.18
Stationary Phase:	CTR-1		
Sample Info:	CCV,1		
Lab Sample ID:	CCV		



FORM VII
GC VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Lab Sample ID: CCVC 200-15706/6 Calibration Date: 03/28/2011 14:26

Instrument ID: 2866.i Calib Start Date: 06/08/2010 08:48

GC Column: CTR-1 ID: 3.18(mm) Calib End Date: 06/08/2010 09:40

Lab File ID: 28ma111426-r011.d Conc. Units: % v/v Heated Purge: (Y/N) N

EPA Sample No.: CCVC

ANALYTE	CURVE TYPE	AVE CF	CF	MIN CF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Helium	Ave	23374	24785		5.30	5.00	6.0	30.0

FORM VII
GC VOA CONTINUING CALIBRATION RETENTION TIME SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Lab Sample ID: CCVC 200-15706/6 Calibration Date: 03/28/2011 14:26

Instrument ID: 2866.i Calib Start Date: 06/08/2010 08:48

GC Column: CTR-1 ID: 3.18(mm) Calib End Date: 06/08/2010 09:40

Lab File ID: 28ma111426-r011.d Heated Purge: (Y/N) N

Analyte	RT	RT WINDOW	
		TO	FROM
Helium	0.86	0.68	1.08

TestAmerica Burlington

Data file : /var/chem/2866_2.i/060810_1/28MAR111325.b/28ma111426-r011.d
Lab Smp Id: CCVC Client Smp ID: CCVC
Inj Date : 28-MAR-2011 14:26
Operator : MRV Inst ID: 2866_2.i
Smp Info : CCVC,1
Misc Info :
Comment :
Method : /var/chem/2866_2.i/060810_1/28MAR111325.b/ASTM_He2t.m
Meth Date : 29-Mar-2011 08:21 mrv Quant Type: ESTD
Cal Date : 08-JUN-2010 09:40 Cal File: 08jun100938-r011.d
Als bottle: 1 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: all.sub
Target Version: 3.50
Processing Host: chemsvr5

Concentration Formula: Amt * DF * 1 * CpndVariable

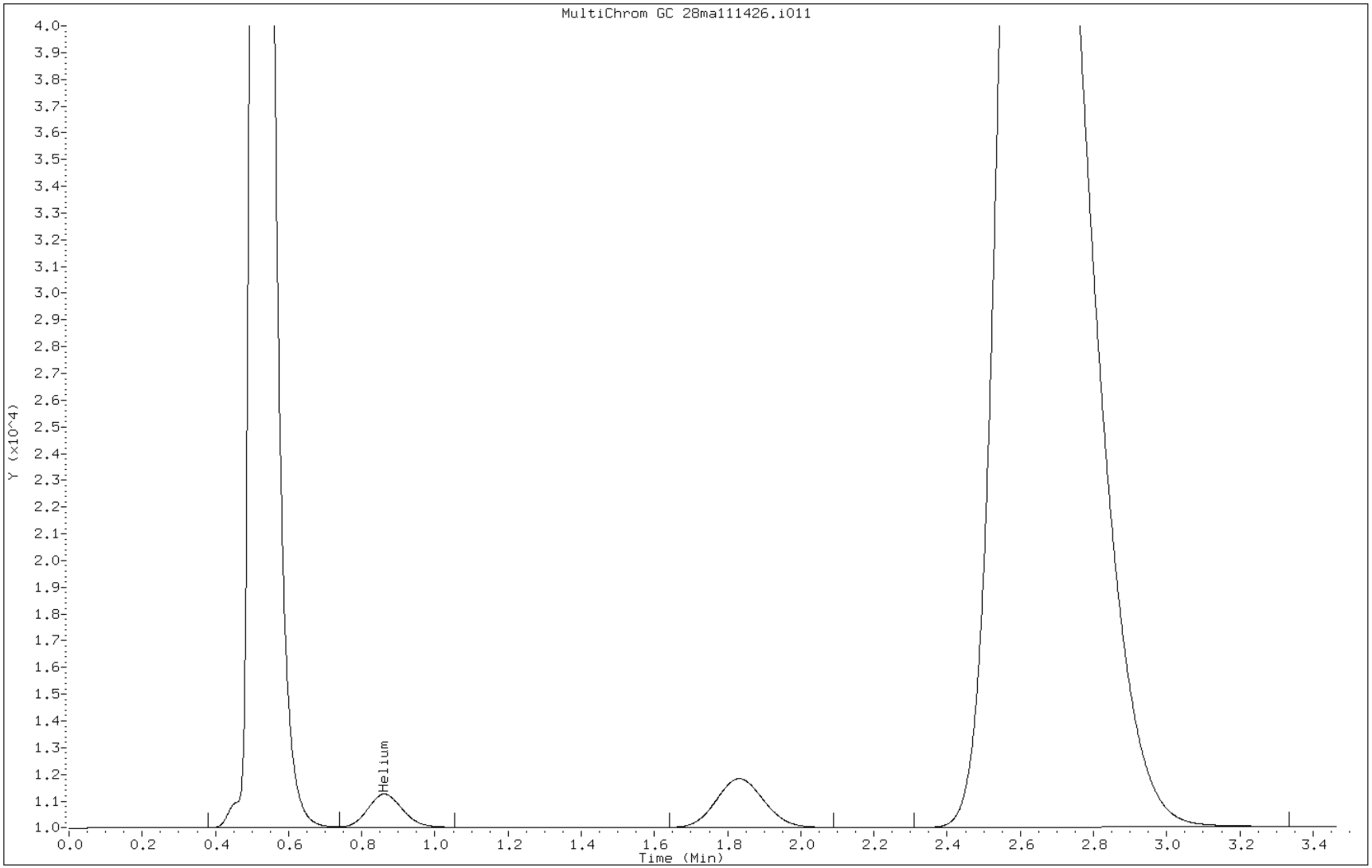
Cpnd Variable Local Compound Variable

					AMOUNTS	
					CAL-AMT	ON-COL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(% v/v)	(% v/v)
==========	==	======	======	========	=======	=======
9 Helium	0.860	0.884	-0.024	123923	5.00000	5.3(M)

QC Flag Legend

M - Compound response manually integrated.

Data File:	28ma111426-r011.d	Date:	28-MAR-2011 14:26
Client ID:	CCVC	Instrument:	2866_2.i
Operator:	MRV	Inj Vol:	300.0
Column Type:	CTR-1	Diameter:	3.18
Stationary Phase:	CTR-1		
Sample Info:	CCVC,1		
Lab Sample ID:	CCVC		



Manual Integration Report

Data File: 28ma111426-r011.d
Lab Sample ID: CCVC
Inj. Date and Time: 28-MAR-2011 14:26
Instrument ID: 2866_2.i
Client ID: CCVC
Compound: 9 Helium
CAS #: 7440-59-7
Report Date: 03/29/2011

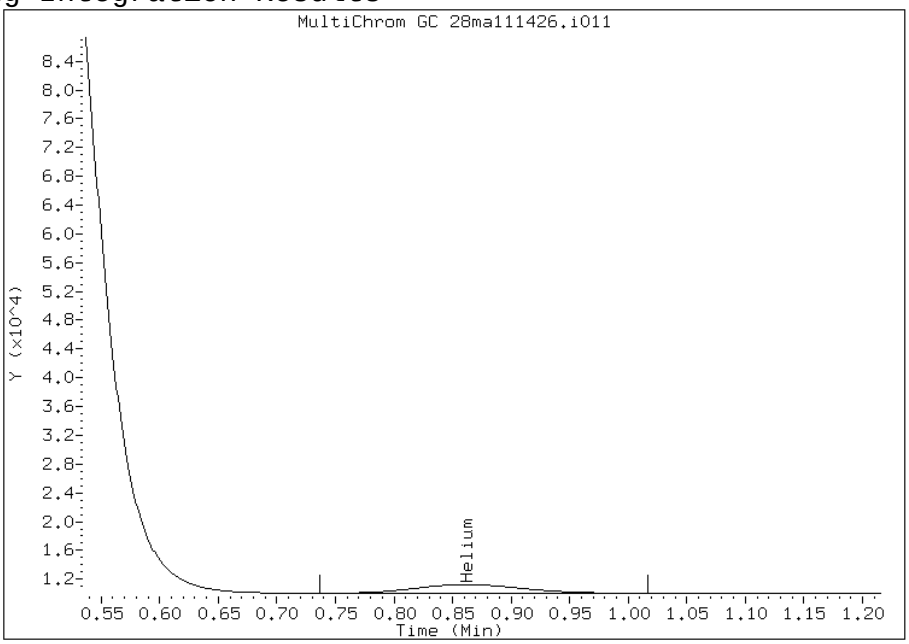
Processing Integration Results

RT: 0.86

Response: 119436

Amount: 5.11

Conc: 5.10



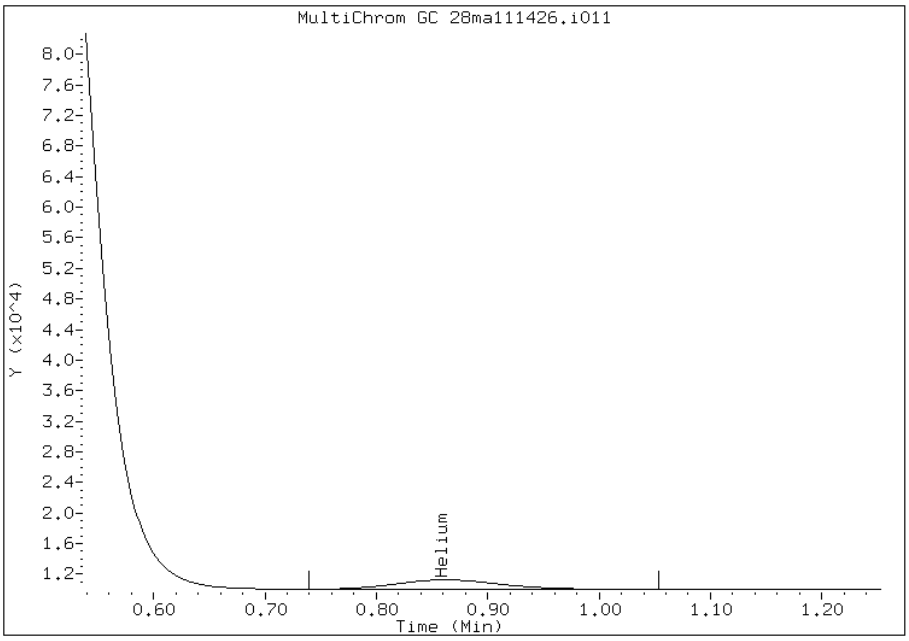
Manual Integration Results

RT: 0.86

Response: 123923

Amount: 5.30

Conc: 5.30



File Uploaded By: mrv
Manual Integration Reason: Baseline event

FORM I
GC VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Client Sample ID: Lab Sample ID: MB 200-15706/3

Matrix: Air Lab File ID: 28ma111343-r021.d

Analysis Method: D1946 Date Collected:

Sample wt/vol: 300(uL) Date Analyzed: 03/28/2011 13:53

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ID:

% Moisture: Level: (low/med) Low

Analysis Batch No.: 15706 Units: % v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
7440-59-7	Helium	0.17	U	0.17	0.17

TestAmerica Burlington

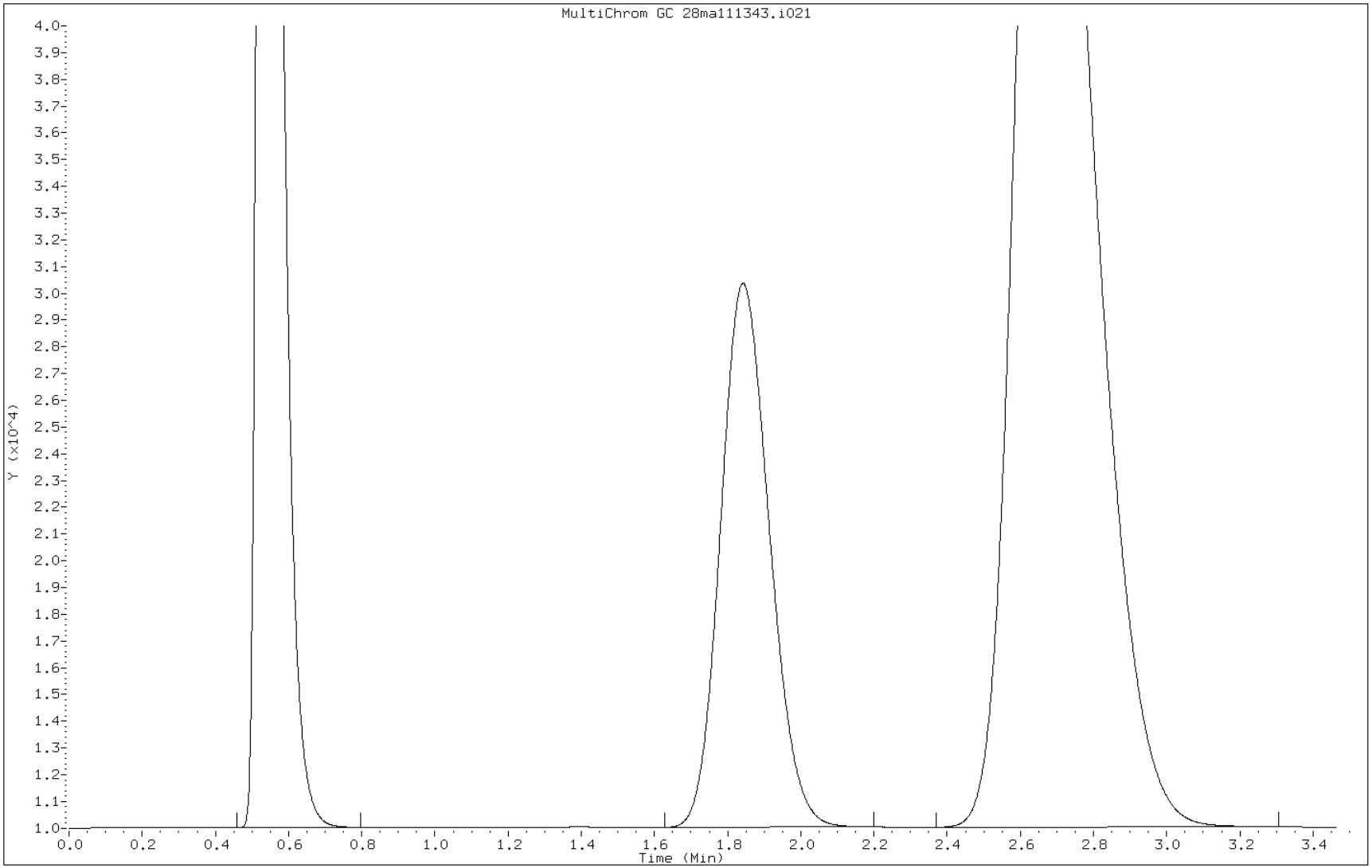
Data file : /var/chem/2866_2.i/060810_1/28MAR111325.b/28ma111343-r021.d
Lab Smp Id: MB Client Smp ID: MB
Inj Date : 28-MAR-2011 13:53
Operator : MRV Inst ID: 2866_2.i
Smp Info : MB,1
Misc Info :
Comment :
Method : /var/chem/2866_2.i/060810_1/28MAR111325.b/ASTM_He2t.m
Meth Date : 29-Mar-2011 08:20 mrv Quant Type: ESTD
Cal Date : 08-JUN-2010 09:40 Cal File: 08jun100938-r011.d
Als bottle: 1 QC Sample: BLANK
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: all.sub
Target Version: 3.50
Processing Host: chemsvr5

Concentration Formula: Amt * DF * 1 * CpndVariable

Cpnd Variable Local Compound Variable

				CONCENTRATIONS	
				ON-COLUMN	FINAL
Compounds	RT	EXP RT DLT RT	RESPONSE	(% v/v)	(% v/v)
9 Helium	Compound Not Detected.				

Data File:	28ma111343-r021.d	Date:	28-MAR-2011 13:53
Client ID:	MB	Instrument:	2866_2.i
Operator:	MRV	Inj Vol:	300.0
Column Type:	CTR-1	Diameter:	3.18
Stationary Phase:	CTR-1		
Sample Info:	MB,1		
Lab Sample ID:	MB		



FORM I
GC VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Client Sample ID: Lab Sample ID: LCS 200-15706/2

Matrix: Air Lab File ID: 28ma111343-r011.d

Analysis Method: D1946 Date Collected:

Sample wt/vol: 300(uL) Date Analyzed: 03/28/2011 13:44

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ID:

% Moisture: Level: (low/med) Low

Analysis Batch No.: 15706 Units: % v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
7440-59-7	Helium	5.13		0.17	0.17

TestAmerica Burlington

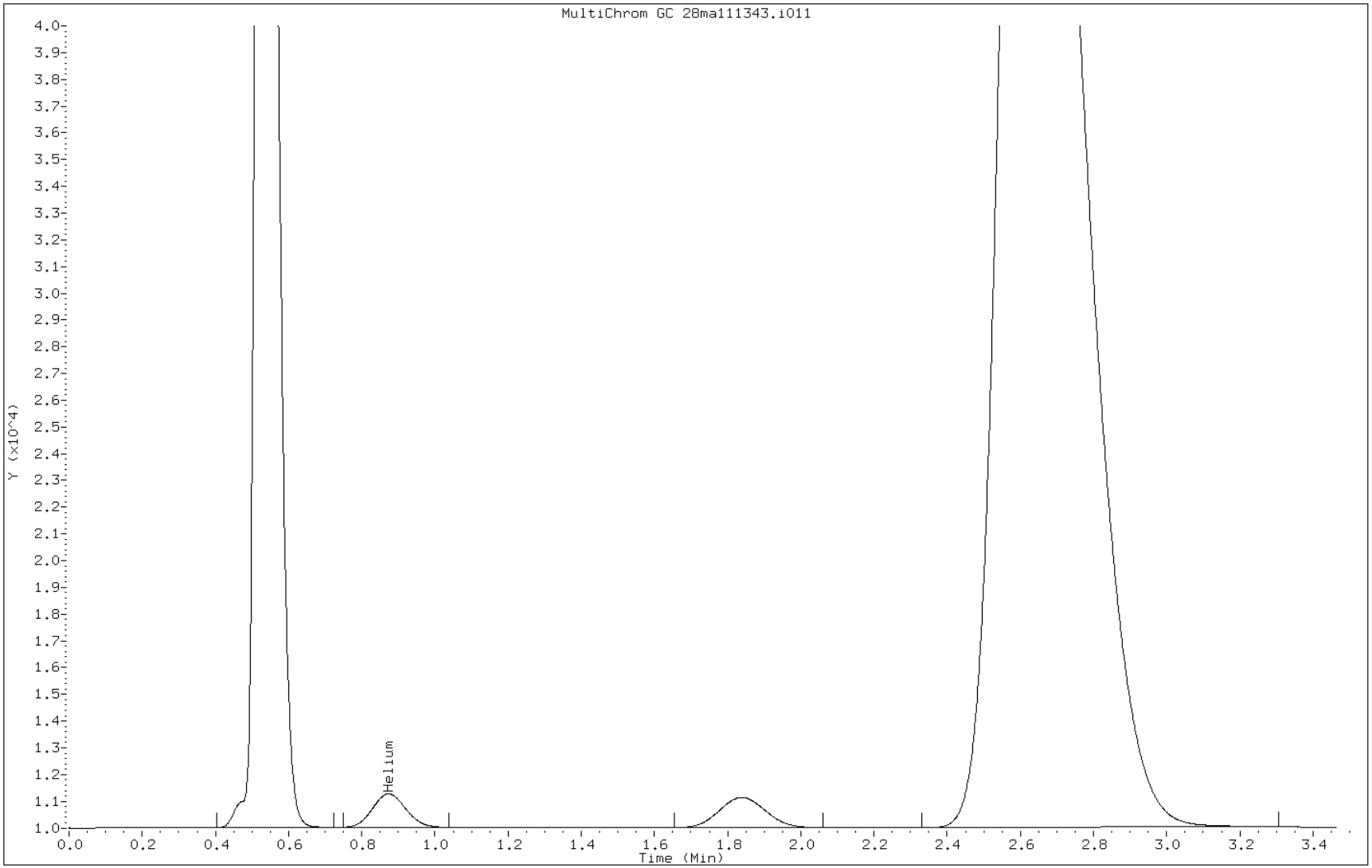
Data file : /var/chem/2866_2.i/060810_1/28MAR111325.b/28ma111343-r011.d
Lab Smp Id: LCS Client Smp ID: LCS
Inj Date : 28-MAR-2011 13:44
Operator : MRV Inst ID: 2866_2.i
Smp Info : LCS,1
Misc Info :
Comment :
Method : /var/chem/2866_2.i/060810_1/28MAR111325.b/ASTM_He2t.m
Meth Date : 29-Mar-2011 08:20 mrv Quant Type: ESTD
Cal Date : 08-JUN-2010 09:40 Cal File: 08jun100938-r011.d
Als bottle: 1 QC Sample: LCS
Dil Factor: 1.00000
Integrator: HP Genie Compound Sublist: all.sub
Target Version: 3.50
Processing Host: chemsvr5

Concentration Formula: Amt * DF * 1 * CpndVariable

Cpnd Variable Local Compound Variable

					CONCENTRATIONS	
					ON-COLUMN	FINAL
Compounds	RT	EXP RT	DLT RT	RESPONSE	(% v/v)	(% v/v)
9 Helium	0.873	0.884	-0.011	119804	5.12557	5.1

Data File:	28ma111343-r011.d	Date:	28-MAR-2011 13:44
Client ID:	LCS	Instrument:	2866_2.i
Operator:	MRV	Inj Vol:	300.0
Column Type:	CTR-1	Diameter:	3.18
Stationary Phase:	CTR-1		
Sample Info:	LCS,1		
Lab Sample ID:	LCS		



#3983

INSTRUMENT RUN LOG
INSTRUMENT ID: VR-3600

Project Reference: 060110		Test Method: ASTMD 1946 : He				Nitrogen / Acetylene Lot#[2]: N/A	
Calibration Date: 060810-1		Instrument:	Varian 3600	Type:	Headspace	ICAL / CCV Lot #: 25909	
Start Date: 06/08/10	Time: 0848	Channel 51	Column:	Rt-UPLOT	☐ FID	ICV / LCS Lot #: 23856	
End Date: 06/09/10	Time: 0848	Channel 52	Column:	CTR-1	☑ TCD	Other: N/A	

Injection #	Injection Time	Lab ID	Bottle Code	ETR	File Name	Dilution Factor	Conc.[1]	Analyst	Comments
1	0842	CAL 1	N/A		08JUN10 0839	N/A	↓	PAD	25909 R ~~IC~~
2	0848	CAL 2					✓		IC
3	0853	CAL 3					✓		IC
4	0857	CAL 4					✓		ICRT
5	0901	CAL 5					✓		IC
6	0905	CAL 6					✓		IC
7		ICV							23856 DNR ICV
1	0940	CAL 1	N/A		08JUN10 0938		✓	PAD	IC
2	0957	ICV			08JUN10 0957		✓		23856 ICV
2	1001	MBLKC060810A					✓		MB
1	1039	831630	3278	137540	08JUN10 1038	1.51	✓		C 200-481-A-2@1.51
2	1052	831634	3553		08JUN10 1049	1.54	✓		C 200-481-A-6C 1.54
3	1057	831636	4368			1.66	✓		C 200-481-A-8C 1.66
1	1101	831637	4332			1.46	✓		C 200-481-A-9C 1.46
1	1134	CCV	N/A		08JUN10 1133	N/A	✓		CCVC
									JOB # 481

PAD 6/08/10

[1] Concentration = Results are within calibration range

Legend: C=Complete • R=Reanalyze • = High • ↓= Low • ✓=Reviewed and Acceptable

[2] Used to create headspace in field samples and the MB

INSTRUMENT RUN LOG
INSTRUMENT ID: VR-3600

Project Reference: 06010		Test Method:	ASTM D 1946 Hz			Nitrogen / Acetylene Lot#[2]:	
Calibration Date: 060810_1		Instrument:	Varian 3600	Type:	Headspace	ICAL / CCV Lot #:	105961
Start Date: 03/28/11	Time: 1327	Channel 51	Column:	Rt-UPLOT	☐ FID	ICV / LCS Lot #:	105962
End Date: 3/29/11	Time: 1327	Channel 52	Column:	CTR-1	☑ TCD	Other:	

Injection #	Injection Time	TALS ID	Bottle Code	ETR	File Name	Dilution Factor	Conc.[1]	Analyst	Comments
1	1327	CCV	NA	NA	28MAR11 1325		✓	MW	
1	1344	LCS	1	1	28MAR11 1343		✓	1	
2	1353	MB	1	1	1		✓	1	
1	1403	07N-4315A-6	NA		28MAR11 1402	1.37	✓	1	C
1	1414	07N-4318-A-1	NA		28MAR11 1412	1.0	✓	1	C LOQ
1	1426	CCVC	NA		28MAR11 1426	NA	✓	1	

MW 3/29/11

[1] Concentration = Results are within calibration range

[2] Used to create headspace in field samples and the MB

Legend: C=Complete ▪ R=Reanalyze ▪ ↑ = High ▪ ↓= Low ▪ ✓=Reviewed and Acceptable

GC VOA ANALYSIS RUN LOG

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Instrument ID: 2866.i Start Date: 06/08/2010 08:42

Analysis Batch Number: 4164 End Date: 06/08/2010 11:34

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
ZZZZZ		06/08/2010 08:42	1		CTR-1 3.175(mm)
IC 200-4164/2		06/08/2010 08:48	1	08jun100839-r02 1.d	CTR-1 3.175(mm)
IC 200-4164/3		06/08/2010 08:53	1	08jun100839-r03 1.d	CTR-1 3.175(mm)
ICRT 200-4164/4		06/08/2010 08:57	1	08jun100839-r04 1.d	CTR-1 3.175(mm)
IC 200-4164/5		06/08/2010 09:01	1	08jun100839-r05 1.d	CTR-1 3.175(mm)
IC 200-4164/6		06/08/2010 09:05	1	08jun100839-r06 1.d	CTR-1 3.175(mm)
IC 200-4164/7		06/08/2010 09:40	1	08jun100938-r01 1.d	CTR-1 3.175(mm)
ICV 200-4164/8		06/08/2010 09:57	1	08jun100957-r01 1.d	CTR-1 3.175(mm)
ZZZZZ		06/08/2010 10:01	1		CTR-1 3.175(mm)
ZZZZZ		06/08/2010 10:39	1.51		CTR-1 3.175(mm)
ZZZZZ		06/08/2010 10:52	1.54		CTR-1 3.175(mm)
ZZZZZ		06/08/2010 10:57	1.66		CTR-1 3.175(mm)
ZZZZZ		06/08/2010 11:01	1.46		CTR-1 3.175(mm)
CCVC 200-4164/14		06/08/2010 11:34	1		CTR-1 3.175(mm)

GC VOA ANALYSIS RUN LOG

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Instrument ID: 2866.i Start Date: 03/28/2011 13:27

Analysis Batch Number: 15706 End Date: 03/28/2011 14:26

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 200-15706/1		03/28/2011 13:27	1	28ma111325-r011.d	CTR-1 3.175(mm)
LCS 200-15706/2		03/28/2011 13:44	1	28ma111343-r011.d	CTR-1 3.175(mm)
MB 200-15706/3		03/28/2011 13:53	1	28ma111343-r021.d	CTR-1 3.175(mm)
200-4315-6	AS-SP3	03/28/2011 14:03	1.4	28ma111402-r011.d	CTR-1 3.175(mm)
ZZZZZ		03/28/2011 14:14	1		CTR-1 3.175(mm)
CCVC 200-15706/6		03/28/2011 14:26	1	28ma111426-r011.d	CTR-1 3.175(mm)

ASTM TO-15

Post-Sampling Air Canister Pressure Check Record

Client ID	Job	Date	Time (Military)	Lab BP ("Hg)	Lab Temp (°C)	Pressure Gague ID	Analyst
Geosyntec	4315	03-18-11	1704	29.3	22	G5	J.J.

Sampling Information and Return Equipment Check	Yes	No	Comments
(1) Is a Field Test Data Sheet (FTDS) or similar sampling documentation present?	✓		
(2) Is the flow controller ID used for each canister recorded?	✓		
(3) Is visible sign of damage to canister and/or flow controller (FC) present?		✓	

If damage observed, list equipment IDs and describe condition:

Post-Sampling Return Pressure Check

Lab ID	Canister ID	Pressure[1] ("Hg)	Anomaly[2] (Y/N)	FC ID[3]	FC Return (Y/N)	Can Cert Batch ID	Comments
1	5090	-9.1	N	4698	Y	4805 BJXJ	200ml/min
2	4143	-2.5		4628		2919 BJXL	
3	3161	-6.7		4975		2919 BJXL	
4	3662	-8.5		4605		2919 BJXL	
5	4266	-10.8		4687		4805 BJXJ	
6	2632	-3.8		4697		4805 BJXJ	

JJ 03.18.2011

[1] Criteria: Return Pressure should be between -1 and -10 ("Hg)

[2] If return pressure is not within criteria, initiate anomaly report.

[3] Record the ID of the FC used for sampling if information is provided, otherwise leave blank.

Internal Use Only: Flow Controller Date and Page # _____

Summa Canister Dilution Worksheet

Client: Geosyntec Consultants, Inc.

TestAmerica Job ID: 200-4315-1
Client: Narrowburg, NY

Lab Sample ID	Canister Volume (L)	Preadjusted Pressure ("Hg)	Preadjusted Pressure (atm)	Preadjusted Volume (L)	Adjusted Pressure (psig)	Adjusted Pressure (atm)	Adjusted Volume (L)	Dilution Factor	Final Dilution Factor	Date	Analyst
200-4315-6	6	-3.4	0.89	5.32	3.1	1.21	7.27	1.37	1.37	03/28/11 13:51	Veilleux, Michael R

Formulae:

Preadjusted Volume (L) = (Preadjusted Pressure ("Hg) + 29.92 "Hg * Vol L) / 29.92 "Hg
Adjusted Volume (L) = (Adjusted Pressure (psig) + 14.7 psig * Vol L) / 14.7 psig
Dilution Factor = Adjusted Volume (L) / Preadjusted Volume (L)

Where:

29.92 "Hg = Standard atmospheric pressure in inches of Mercury (“Hg)
14.7 psig = Standard atmospheric pressure in pounds per square inch gauge (psig)

Method TO15

Volatile Organic Compounds (GC/MS)
by Method TO15

FORM III
AIR - GC/MS VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Matrix: Air Level: Low Lab File ID: cjrc005.d

Lab ID: LCS 200-15760/5 Client ID:

COMPOUND	SPIKE ADDED (ppb v/v)	LCS CONCENTRATION (ppb v/v)	LCS % REC	QC LIMITS REC	#
Benzene	10.0	9.75	98	70-130	
Bromoform	10.0	11.1	111	70-130	
Bromomethane	10.0	9.51	95	70-130	
Carbon disulfide	10.0	9.83	98	70-130	
Carbon tetrachloride	10.0	10.9	109	70-130	
Chlorobenzene	10.0	9.59	96	70-130	
Chloroethane	10.0	9.78	98	70-130	
Chloroform	10.0	10.4	104	70-130	
Chloromethane	10.0	9.83	98	70-130	
1,4-Dichlorobenzene	10.0	9.61	96	70-130	
1,1-Dichloroethane	10.0	10.2	102	70-130	
1,2-Dichloroethane	10.0	10.9	109	70-130	
1,1-Dichloroethene	10.0	11.0	110	70-130	
1,2-Dichloropropane	10.0	9.94	99	70-130	
1,4-Dioxane	10.0	7.60	76	70-130	
Ethylbenzene	10.0	10.2	102	70-130	
Hexachlorobutadiene	10.0	10.5	105	70-130	
Methylene Chloride	10.0	10.6	106	70-130	
m,p-Xylene	20.0	19.7	99	70-130	
Naphthalene	10.0	7.62	76	70-130	
Styrene	10.0	10.4	104	70-130	
1,1,2,2-Tetrachloroethane	10.0	9.49	95	70-130	
Tetrachloroethene	10.0	9.40	94	70-130	
Toluene	10.0	9.36	94	70-130	
1,2,4-Trichlorobenzene	10.0	7.65	77	70-130	
1,1,1-Trichloroethane	10.0	10.7	107	70-130	
1,1,2-Trichloroethane	10.0	9.18	92	70-130	
Vinyl chloride	10.0	10.1	101	70-130	
Xylene, o-	10.0	9.51	95	70-130	
Trichloroethene	10.0	10.0	100	70-130	

Column to be used to flag recovery and RPD values

FORM III TO-15

FORM III
AIR - GC/MS VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Matrix: Air Level: Low Lab File ID: gffv003.d

Lab ID: LCS 200-15787/3 Client ID:

COMPOUND	SPIKE ADDED (ppb v/v)	LCS CONCENTRATION (ppb v/v)	LCS % REC	QC LIMITS REC	#
Benzene	10.0	9.29	93	70-130	
Bromoform	10.0	10.8	108	70-130	
Bromomethane	10.0	8.50	85	70-130	
Carbon disulfide	10.0	9.29	93	70-130	
Carbon tetrachloride	10.0	11.3	113	70-130	
Chlorobenzene	10.0	8.90	89	70-130	
Chloroethane	10.0	8.39	84	70-130	
Chloroform	10.0	9.38	94	70-130	
Chloromethane	10.0	8.50	85	70-130	
1,4-Dichlorobenzene	10.0	9.37	94	70-130	
1,1-Dichloroethane	10.0	9.50	95	70-130	
1,2-Dichloroethane	10.0	9.72	97	70-130	
1,1-Dichloroethene	10.0	11.1	111	70-130	
1,2-Dichloropropane	10.0	8.89	89	70-130	
1,4-Dioxane	10.0	8.86	89	70-130	
Ethylbenzene	10.0	8.66	87	70-130	
Hexachlorobutadiene	10.0	10.6	106	70-130	
Methylene Chloride	10.0	10.1	101	70-130	
m,p-Xylene	20.0	17.1	85	70-130	
Naphthalene	10.0	9.81	98	70-130	
Styrene	10.0	9.51	95	70-130	
1,1,2,2-Tetrachloroethane	10.0	8.31	83	70-130	
Tetrachloroethene	10.0	9.62	96	70-130	
Toluene	10.0	8.48	85	70-130	
1,2,4-Trichlorobenzene	10.0	9.44	94	70-130	
1,1,1-Trichloroethane	10.0	10.8	108	70-130	
1,1,2-Trichloroethane	10.0	8.38	84	70-130	
Vinyl chloride	10.0	8.25	83	70-130	
Xylene, o-	10.0	8.67	87	70-130	
Trichloroethene	10.0	10.0	100	70-130	

Column to be used to flag recovery and RPD values

FORM III TO-15

FORM IV
AIR - GC/MS VOA METHOD BLANK SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Lab File ID: cjrc006.d Lab Sample ID: MB 200-15760/6

Matrix: Air Heated Purge:(Y/N) N

Instrument ID: C.i Date Analyzed: 03/25/2011 21:58

GC Column: RTX-624 ID: 0.32(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 200-15760/5	cjrc005.d	03/25/2011 21:10
SVE-SP1	200-4315-1	cjrc010.d	03/26/2011 01:11
SVE-SP2	200-4315-2	cjrc011.d	03/26/2011 01:59
SVE-SP3	200-4315-3	cjrc012.d	03/26/2011 02:47
AS-SP1	200-4315-4	cjrc013.d	03/26/2011 03:36
AS-SP2	200-4315-5	cjrc014.d	03/26/2011 04:24

FORM IV
AIR - GC/MS VOA METHOD BLANK SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Lab File ID: gffv004.d Lab Sample ID: MB 200-15787/4

Matrix: Air Heated Purge:(Y/N) N

Instrument ID: G.i Date Analyzed: 03/29/2011 13:38

GC Column: RTX-624 ID: 0.32(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 200-15787/3	gffv003.d	03/29/2011 12:47
AS-SP3	200-4315-6	gffv005.d	03/29/2011 14:29

FORM V
AIR - GC/MS VOA INSTRUMENT PERFORMANCE CHECK

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Lab File ID: cjr001.d BFB Injection Date: 03/22/2011

Instrument ID: C.i BFB Injection Time: 16:18

Analysis Batch No.: 15668

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	8.0 - 40.0% of mass 95	17.1	
75	30.0 - 66.0% of mass 95	48.6	
95	Base peak, 100% relative abundance	100.0	
96	5.0 - 9.0% of mass 95	7.5	
173	Less than 2.0% of mass 174	0.4	(0.6)1
174	50.0 - 120.0% of mass 95	64.4	
175	4.0 - 9.0 % of mass 174	4.7	(7.3)1
176	93.0 - 101.0% of mass 174	61.9	(96.2)1
177	5.0 - 9.0% of mass 176	4.1	(6.7)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	IC 200-15668/3	cjr003.d	03/22/2011	17:52
	IC 200-15668/4	cjr004.d	03/22/2011	18:40
	IC 200-15668/5	cjr005.d	03/22/2011	19:27
	ICIS 200-15668/6	cjr006.d	03/22/2011	20:15
	IC 200-15668/7	cjr007.d	03/22/2011	21:03
	IC 200-15668/8	cjr008.d	03/22/2011	21:51
	IC 200-15668/9	cjr009.d	03/22/2011	22:39
	ICV 200-15668/12	cjr012.d	03/23/2011	01:03

FORM V
AIR - GC/MS VOA INSTRUMENT PERFORMANCE CHECK

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Lab File ID: cjrc001.d BFB Injection Date: 03/25/2011

Instrument ID: C.i BFB Injection Time: 17:59

Analysis Batch No.: 15760

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	8.0 - 40.0% of mass 95	16.8	
75	30.0 - 66.0% of mass 95	48.1	
95	Base peak, 100% relative abundance	100.0	
96	5.0 - 9.0% of mass 95	7.3	
173	Less than 2.0% of mass 174	0.4	(0.6)1
174	50.0 - 120.0% of mass 95	65.5	
175	4.0 - 9.0 % of mass 174	4.6	(7.0)1
176	93.0 - 101.0% of mass 174	62.7	(95.8)1
177	5.0 - 9.0% of mass 176	4.0	(6.4)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	CCVIS 200-15760/4	cjrc004.d	03/25/2011	20:22
	LCS 200-15760/5	cjrc005.d	03/25/2011	21:10
	MB 200-15760/6	cjrc006.d	03/25/2011	21:58
SVE-SP1	200-4315-1	cjrc010.d	03/26/2011	01:11
SVE-SP2	200-4315-2	cjrc011.d	03/26/2011	01:59
SVE-SP3	200-4315-3	cjrc012.d	03/26/2011	02:47
AS-SP1	200-4315-4	cjrc013.d	03/26/2011	03:36
AS-SP2	200-4315-5	cjrc014.d	03/26/2011	04:24

FORM V
AIR - GC/MS VOA INSTRUMENT PERFORMANCE CHECK

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Lab File ID: gff001.d BFB Injection Date: 03/02/2011

Instrument ID: G.i BFB Injection Time: 14:04

Analysis Batch No.: 14625

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	8.0 - 40.0% of mass 95	13.3	
75	30.0 - 66.0% of mass 95	41.5	
95	Base peak, 100% relative abundance	100.0	
96	5.0 - 9.0% of mass 95	7.0	
173	Less than 2.0% of mass 174	0.4	(0.5)1
174	50.0 - 120.0% of mass 95	76.7	
175	4.0 - 9.0 % of mass 174	5.2	(6.8)1
176	93.0 - 101.0% of mass 174	73.8	(96.3)1
177	5.0 - 9.0% of mass 176	4.9	(6.6)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	IC 200-14625/3	gff003.d	03/02/2011	15:57
	IC 200-14625/5	gff005.d	03/02/2011	17:39
	ICIS 200-14625/6	gff006.d	03/02/2011	18:30
	IC 200-14625/7	gff007.d	03/02/2011	19:21
	IC 200-14625/8	gff008.d	03/02/2011	20:12
	IC 200-14625/9	gff009.d	03/02/2011	21:03
	IC 200-14625/15	gff015.d	03/03/2011	10:00
	ICV 200-14625/18	gff018.d	03/03/2011	12:42

FORM V
AIR - GC/MS VOA INSTRUMENT PERFORMANCE CHECK

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Lab File ID: gffv001.d BFB Injection Date: 03/29/2011

Instrument ID: G.i BFB Injection Time: 10:59

Analysis Batch No.: 15787

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	8.0 - 40.0% of mass 95	13.2	
75	30.0 - 66.0% of mass 95	41.7	
95	Base peak, 100% relative abundance	100.0	
96	5.0 - 9.0% of mass 95	7.0	
173	Less than 2.0% of mass 174	0.4	(0.5)1
174	50.0 - 120.0% of mass 95	82.0	
175	4.0 - 9.0 % of mass 174	5.7	(7.0)1
176	93.0 - 101.0% of mass 174	78.5	(95.8)1
177	5.0 - 9.0% of mass 176	5.0	(6.4)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	CCVIS 200-15787/2	gffv002.d	03/29/2011	11:54
	LCS 200-15787/3	gffv003.d	03/29/2011	12:47
	MB 200-15787/4	gffv004.d	03/29/2011	13:38
AS-SP3	200-4315-6	gffv005.d	03/29/2011	14:29

FORM VIII
AIR - GC/MS VOA INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Sample No.: ICIS 200-15668/6 Date Analyzed: 03/22/2011 20:15

Instrument ID: C.i GC Column: RTX-624 ID: 0.32(mm)

Lab File ID (Standard): cjr006.d Heated Purge: (Y/N) N

Calibration ID: 5511

		BCM		DFB		CBZ	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT		993261	10.15	5529549	11.48	4549383	15.48
UPPER LIMIT		1390565	10.48	7741369	11.81	6369136	15.81
LOWER LIMIT		595957	9.82	3317729	11.15	2729630	15.15
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICV 200-15668/12		994275	10.15	5545563	11.48	4918879	15.48

BCM = Bromochloromethane
DFB = 1,4-Difluorobenzene
CBZ = Chlorobenzene-d5

Area Limit = 60%-140% of internal standard area
RT Limit = ± 0.33 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII TO-15

FORM VIII
AIR - GC/MS VOA INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Sample No.: CCVIS 200-15760/4 Date Analyzed: 03/25/2011 20:22

Instrument ID: C.i GC Column: RTX-624 ID: 0.32(mm)

Lab File ID (Standard): cjrc004.d Heated Purge: (Y/N) N

Calibration ID: 5511

		BCM		DFB		CBZ	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		738134	10.16	4127225	11.48	3812341	15.47
UPPER LIMIT		1033388	10.49	5778115	11.81	5337277	15.80
LOWER LIMIT		442880	9.83	2476335	11.15	2287405	15.14
LAB SAMPLE ID	CLIENT SAMPLE ID						
LCS 200-15760/5		739141	10.14	4125366	11.47	3804579	15.47
MB 200-15760/6		546702	10.15	3526705	11.47	2803507	15.47
200-4315-1	SVE-SP1	570490	10.15	3683262	11.48	3131913	15.47
200-4315-2	SVE-SP2	583733	10.14	3705194	11.47	3157012	15.47
200-4315-3	SVE-SP3	621929	10.15	3510937	11.47	3220506	15.47
200-4315-4	AS-SP1	570972	10.14	3627806	11.47	3129183	15.47
200-4315-5	AS-SP2	580503	10.15	3667368	11.47	3167942	15.47

BCM = Bromochloromethane
DFB = 1,4-Difluorobenzene
CBZ = Chlorobenzene-d5

Area Limit = 60%-140% of internal standard area
RT Limit = ± 0.33 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII TO-15

FORM VIII
AIR - GC/MS VOA INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Sample No.: ICIS 200-14625/6 Date Analyzed: 03/02/2011 18:30

Instrument ID: G.i GC Column: RTX-624 ID: 0.32(mm)

Lab File ID (Standard): gff006.d Heated Purge: (Y/N) N

Calibration ID: 5167

		BCM		DFB		CBZ	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT		589645	9.53	2432014	10.93	2299244	15.05
UPPER LIMIT		825503	9.86	3404820	11.26	3218942	15.38
LOWER LIMIT		353787	9.20	1459208	10.60	1379546	14.72
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICV 200-14625/18		600136	9.53	2526919	10.93	2325182	15.05

BCM = Bromochloromethane
DFB = 1,4-Difluorobenzene
CBZ = Chlorobenzene-d5

Area Limit = 60%-140% of internal standard area
RT Limit = ± 0.33 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII TO-15

FORM VIII
AIR - GC/MS VOA INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Sample No.: CCVIS 200-15787/2 Date Analyzed: 03/29/2011 11:54

Instrument ID: G.i GC Column: RTX-624 ID: 0.32(mm)

Lab File ID (Standard): gffv002.d Heated Purge: (Y/N) N

Calibration ID: 5167

		BCM		DFB		CBZ	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		500011	9.51	2226967	10.92	2028208	15.04
UPPER LIMIT		700015	9.84	3117754	11.25	2839491	15.37
LOWER LIMIT		300007	9.18	1336180	10.59	1216925	14.71
LAB SAMPLE ID	CLIENT SAMPLE ID						
LCS 200-15787/3		492037	9.51	1974589	10.92	1961759	15.04
MB 200-15787/4		481737	9.50	2253192	10.91	1873565	15.04
200-4315-6	AS-SP3	542901	9.51	2304903	10.91	2242500	15.04

BCM = Bromochloromethane
DFB = 1,4-Difluorobenzene
CBZ = Chlorobenzene-d5

Area Limit = 60%-140% of internal standard area
RT Limit = ± 0.33 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII TO-15

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Client Sample ID: SVE-SP1 Lab Sample ID: 200-4315-1

Matrix: Air Lab File ID: cjrc010.d

Analysis Method: TO-15 Date Collected: 03/09/2011 16:38

Sample wt/vol: 13(mL) Date Analyzed: 03/26/2011 01:11

Soil Aliquot Vol: Dilution Factor: 15300

Soil Extract Vol.: GC Column: RTX-624 ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 15760 Units: ppb v/v

CAS NO.	COMPOUND NAME	MOLECULAR WEIGHT	RESULT	Q	RL	RL
71-43-2	Benzene	78.11	3600		3100	3100
75-25-2	Bromoform	252.75	3100	U	3100	3100
74-83-9	Bromomethane	94.94	3100	U	3100	3100
75-15-0	Carbon disulfide	76.14	7600	U	7600	7600
56-23-5	Carbon tetrachloride	153.81	3100	U	3100	3100
108-90-7	Chlorobenzene	112.30	3100	U	3100	3100
75-00-3	Chloroethane	64.52	7600		7600	7600
67-66-3	Chloroform	119.38	3900		3100	3100
74-87-3	Chloromethane	50.49	7600	U	7600	7600
106-46-7	1,4-Dichlorobenzene	147.00	3100	U	3100	3100
75-34-3	1,1-Dichloroethane	98.96	20000		3100	3100
107-06-2	1,2-Dichloroethane	98.96	3100	U	3100	3100
75-35-4	1,1-Dichloroethene	96.94	3100	U	3100	3100
78-87-5	1,2-Dichloropropane	112.99	3100	U	3100	3100
123-91-1	1,4-Dioxane	88.11	76000	U	76000	76000
100-41-4	Ethylbenzene	106.17	3100	U	3100	3100
87-68-3	Hexachlorobutadiene	260.76	3100	U	3100	3100
75-09-2	Methylene Chloride	84.93	24000		7600	7600
91-20-3	Naphthalene	128.17	7600	U	7600	7600
100-42-5	Styrene	104.15	3100	U	3100	3100
79-34-5	1,1,2,2-Tetrachloroethane	167.85	3100	U	3100	3100
127-18-4	Tetrachloroethene	165.83	8100		3100	3100
108-88-3	Toluene	92.14	180000		3100	3100
120-82-1	1,2,4-Trichlorobenzene	181.45	7600	U	7600	7600
71-55-6	1,1,1-Trichloroethane	133.41	60000		3100	3100
79-00-5	1,1,2-Trichloroethane	133.41	3100	U	3100	3100
75-01-4	Vinyl chloride	62.50	57000		3100	3100
1330-20-7	Xylene (total)	106.17	9500		3100	3100
79-01-6	Trichloroethene	131.39	420000		3100	3100

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Client Sample ID: SVE-SP1 Lab Sample ID: 200-4315-1

Matrix: Air Lab File ID: cjrc010.d

Analysis Method: TO-15 Date Collected: 03/09/2011 16:38

Sample wt/vol: 13(mL) Date Analyzed: 03/26/2011 01:11

Soil Aliquot Vol: Dilution Factor: 15300

Soil Extract Vol.: GC Column: RTX-624 ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 15760 Units: ug/m3

CAS NO.	COMPOUND NAME	MOLECULAR WEIGHT	RESULT	Q	RL	RL
71-43-2	Benzene	78.11	12000		9800	9800
75-25-2	Bromoform	252.75	32000	U	32000	32000
74-83-9	Bromomethane	94.94	12000	U	12000	12000
75-15-0	Carbon disulfide	76.14	24000	U	24000	24000
56-23-5	Carbon tetrachloride	153.81	19000	U	19000	19000
108-90-7	Chlorobenzene	112.30	14000	U	14000	14000
75-00-3	Chloroethane	64.52	20000		20000	20000
67-66-3	Chloroform	119.38	19000		15000	15000
74-87-3	Chloromethane	50.49	16000	U	16000	16000
106-46-7	1,4-Dichlorobenzene	147.00	18000	U	18000	18000
75-34-3	1,1-Dichloroethane	98.96	79000		12000	12000
107-06-2	1,2-Dichloroethane	98.96	12000	U	12000	12000
75-35-4	1,1-Dichloroethene	96.94	12000	U	12000	12000
78-87-5	1,2-Dichloropropane	112.99	14000	U	14000	14000
123-91-1	1,4-Dioxane	88.11	280000	U	280000	280000
100-41-4	Ethylbenzene	106.17	13000	U	13000	13000
87-68-3	Hexachlorobutadiene	260.76	33000	U	33000	33000
75-09-2	Methylene Chloride	84.93	85000		27000	27000
91-20-3	Naphthalene	128.17	40000	U	40000	40000
100-42-5	Styrene	104.15	13000	U	13000	13000
79-34-5	1,1,2,2-Tetrachloroethane	167.85	21000	U	21000	21000
127-18-4	Tetrachloroethene	165.83	55000		21000	21000
108-88-3	Toluene	92.14	680000		12000	12000
120-82-1	1,2,4-Trichlorobenzene	181.45	57000	U	57000	57000
71-55-6	1,1,1-Trichloroethane	133.41	330000		17000	17000
79-00-5	1,1,2-Trichloroethane	133.41	17000	U	17000	17000
75-01-4	Vinyl chloride	62.50	150000		7800	7800
1330-20-7	Xylene (total)	106.17	41000		13000	13000
79-01-6	Trichloroethene	131.39	2300000		16000	16000

TestAmerica Burlington

AIR TOXICS QUANTITATION REPORT

Lab Sample Id: 200-4315-1
Client Smp ID: SVE-SP1
Inj Date : 26-MAR-2011 01:11
Operator : sv Inst ID: C.i
Smp Info : 200-4315-A-1@995.00
Misc Info : 13,15300, to15all cdf 995.00
Comment :
Method : /chem/C.i/Csvr.p/cjrcto15.b/to15v5.m
Meth Date : 29-Mar-2011 20:13 sv Quant Type: ISTD
Cal Date : 22-MAR-2011 22:39 Cal File: cjr009.d
Als bottle: 7
Dil Factor: 15300.00000
Integrator: HP RTE Compound Sublist: all74.sub
Target Version: 3.50
Processing Host: chemsvr6

Concentration Formula: Amt * DF * Uf*(Vo/Vo)*(Vf/Vf) * CpndVariable

Name	Value	Description
DF	15300.00000	Dilution Factor
Uf	1.00000	ng unit correction factor
Vo	13.00000	Sample Volume purged (mL)
Vf	200.00000	Final Volume (mL)

Cpnd Variable Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	CONCENTRATIONS FINAL (ppb v/v)
2 Dichlorodifluoromethane	85	4.113	4.097	(0.405)	17271	0.11236	1700(a)
3 Chlorodifluoromethane	51	Compound Not Detected.					
4 1,2-Dichloro-1,1,2,2-tetraflu	85	Compound Not Detected.					
5 Chloromethane	50	Compound Not Detected.					
6 Butane	43	4.737	4.732	(0.467)	6085	0.10337	1600(aQ)
7 Vinyl chloride	62	4.790	4.774	(0.472)	188542	3.71846	57000
8 1,3-Butadiene	54	Compound Not Detected.					
9 Bromomethane	94	Compound Not Detected.					
10 Chloroethane	64	5.708	5.703	(0.562)	15243	0.49380	7600(a)
12 Vinyl bromide	106	Compound Not Detected.					
13 Trichlorofluoromethane	101	Compound Not Detected.					
17 1,1,2-Trichloro-1,2,2-trifluo	101	7.005	7.000	(0.690)	23781	0.20061	3100
19 1,1-Dichloroethene	96	7.085	7.075	(0.698)	8894	0.15284	2300(a)
20 Acetone	43	Compound Not Detected.					

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	FINAL (ppb v/v)
	21 Carbon disulfide	76	Compound Not Detected.					
	22 Isopropanol	45	Compound Not Detected.					
	23 Allyl chloride	41	Compound Not Detected.					
	25 Methylene chloride	49	7.929	7.929	(0.781)	87158	1.59450	24000
	26 Tert-butyl alcohol	59	Compound Not Detected.					
	27 Methyl tert-butyl ether	73	Compound Not Detected.					
	28 1,2-Dichloroethene (trans)	61	Compound Not Detected.					
	30 n-Hexane	57	8.569	8.564	(0.844)	1468354	16.7846	260000
	31 1,1-Dichloroethane	63	8.969	8.969	(0.884)	134413	1.27546	20000
M	33 1,2-Dichloroethene,Total	61				683793	9.79371	150000
	34 1,2-Dichloroethene (cis)	96	9.802	9.802	(0.966)	683793	9.79371	150000
	36 Methyl Ethyl Ketone	72	Compound Not Detected.					
*	37 Bromochloromethane	128	10.149	10.154	(1.000)	570490	10.0000	
	38 Tetrahydrofuran	42	Compound Not Detected.					
	39 Chloroform	83	10.202	10.207	(1.005)	33229	0.25192	3900
	40 Cyclohexane	84	10.464	10.464	(0.912)	258144	2.36128	36000(Q)
	41 1,1,1-Trichloroethane	97	10.458	10.458	(0.911)	628553	3.93664	60000
	42 Carbon tetrachloride	117	Compound Not Detected.					
	43 2,2,4-Trimethylpentane	57	Compound Not Detected.					
	44 Benzene	78	10.965	10.965	(0.955)	57851	0.23690	3600
	45 1,2-Dichloroethane	62	Compound Not Detected.					
	46 n-Heptane	43	11.136	11.131	(0.970)	327434	3.28460	50000
*	47 1,4-Difluorobenzene	114	11.478	11.478	(1.000)	3683262	10.0000	
	49 Trichloroethene	95	11.830	11.830	(1.031)	2975062	27.5663	420000
	50 1,2-Dichloropropane	63	Compound Not Detected.					
	51 Methyl methacrylate	69	Compound Not Detected.					
	53 1,4-Dioxane	88	Compound Not Detected.					
	54 Bromodichloromethane	83	Compound Not Detected.					
	55 1,3-Dichloropropene (cis)	75	Compound Not Detected.					
	56 Methyl isobutyl ketone	43	Compound Not Detected.					
	58 Toluene	92	13.580	13.580	(0.878)	2029778	11.7271	180000
	59 1,3-Dichloropropene (trans)	75	Compound Not Detected.					
	60 1,1,2-Trichloroethane	83	Compound Not Detected.					
	61 Tetrachloroethene	166	14.322	14.327	(0.926)	71299	0.52642	8100
	62 2-Hexanone	43	Compound Not Detected.					
	63 Dibromochloromethane	129	Compound Not Detected.					
	64 1,2-Dibromoethane	107	Compound Not Detected.					
*	65 Chlorobenzene-d5	117	15.475	15.480	(1.000)	3131913	10.0000	
	66 Chlorobenzene	112	Compound Not Detected.					
	68 Ethylbenzene	91	15.571	15.576	(1.006)	60355	0.19292	3000(a)
	69 Xylene (m,p)	106	15.715	15.720	(1.016)	62004	0.47914	7300
M	70 Xylenes, Total	106				81394	0.62405	9500
	71 Xylene (o)	106	16.222	16.222	(1.048)	19390	0.14491	2200(a)
	72 Styrene	104	Compound Not Detected.					
	73 Bromoform	173	Compound Not Detected.					
	74 Isopropylbenzene	105	Compound Not Detected.					
	75 1,1,2,2-Tetrachloroethane	83	Compound Not Detected.					

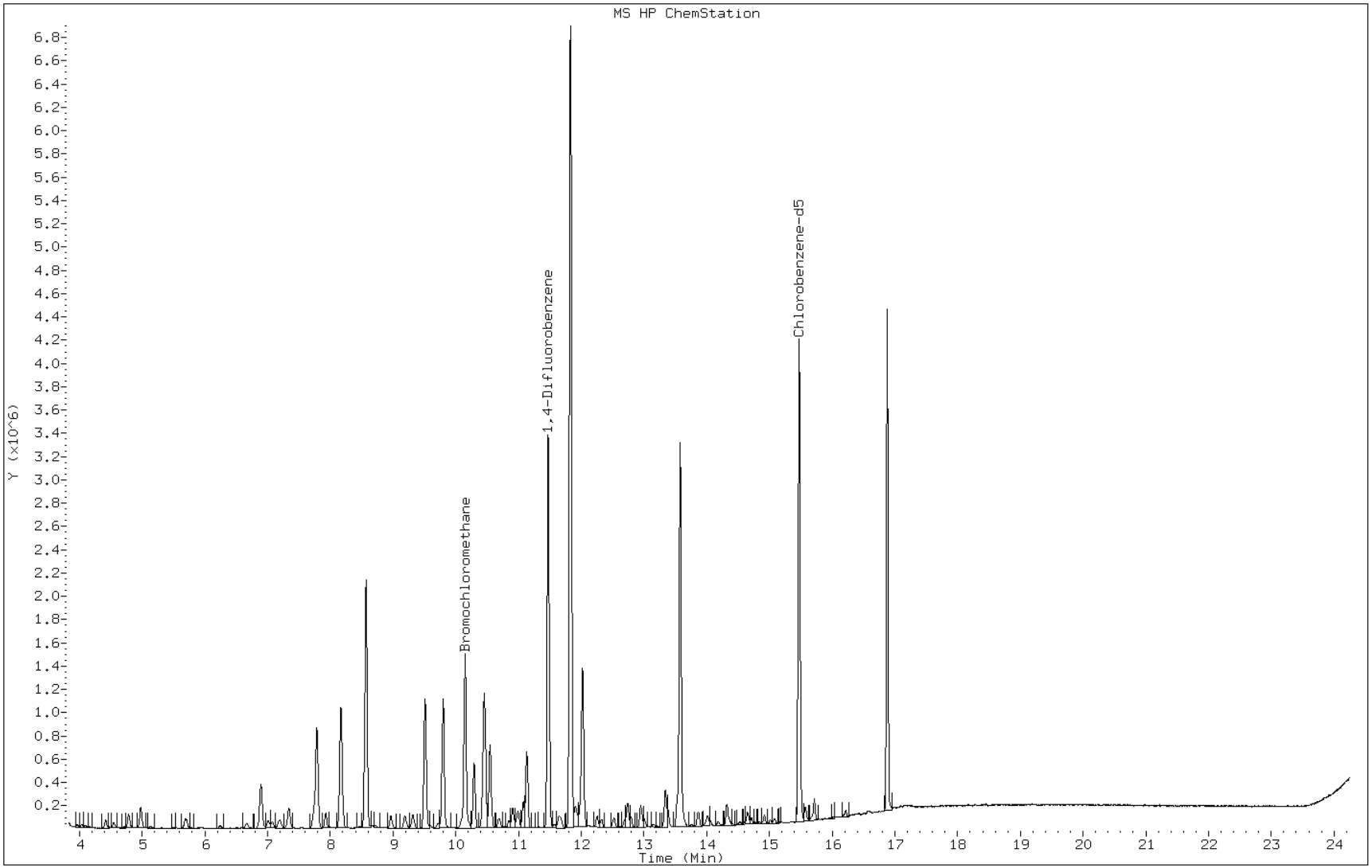
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	CONCENTRATIONS FINAL (ppb v/v)
76 n-Propylbenzene	91	Compound Not Detected.					
79 4-Ethyltoluene	105	Compound Not Detected.					
80 2-Chlorotoluene	91	Compound Not Detected.					
81 1,3,5-Trimethylbenzene	105	Compound Not Detected.					
83 tert-butylbenzene	119	Compound Not Detected.					
84 1,2,4-Trimethylbenzene	105	Compound Not Detected.					
85 sec-Butylbenzene	105	Compound Not Detected.					
86 4-Isopropyltoluene	119	Compound Not Detected.					
87 1,3-Dichlorobenzene	146	Compound Not Detected.					
88 1,4-Dichlorobenzene	146	Compound Not Detected.					
89 Benzyl chloride	91	Compound Not Detected.					
91 n-Butylbenzene	91	Compound Not Detected.					
92 1,2-Dichlorobenzene	146	Compound Not Detected.					
94 1,2,4-Trichlorobenzene	180	Compound Not Detected.					
95 1,3-Hexachlorobutadiene	225	Compound Not Detected.					
96 Naphthalene	128	Compound Not Detected.					

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
Q - Qualifier signal failed the ratio test.

Data File: cjrc010.d
Client ID: SVE-SP1
Operator: sv
Column Type: Capillary
Stationary Phase: RTX-624
Sample Info: 200-4315-A-1@995.00
Lab Sample ID: 200-4315-1

Date: 26-MAR-2011 01:11
Instrument: C.i
Inj Vol: 200.0
Diameter: 0.32



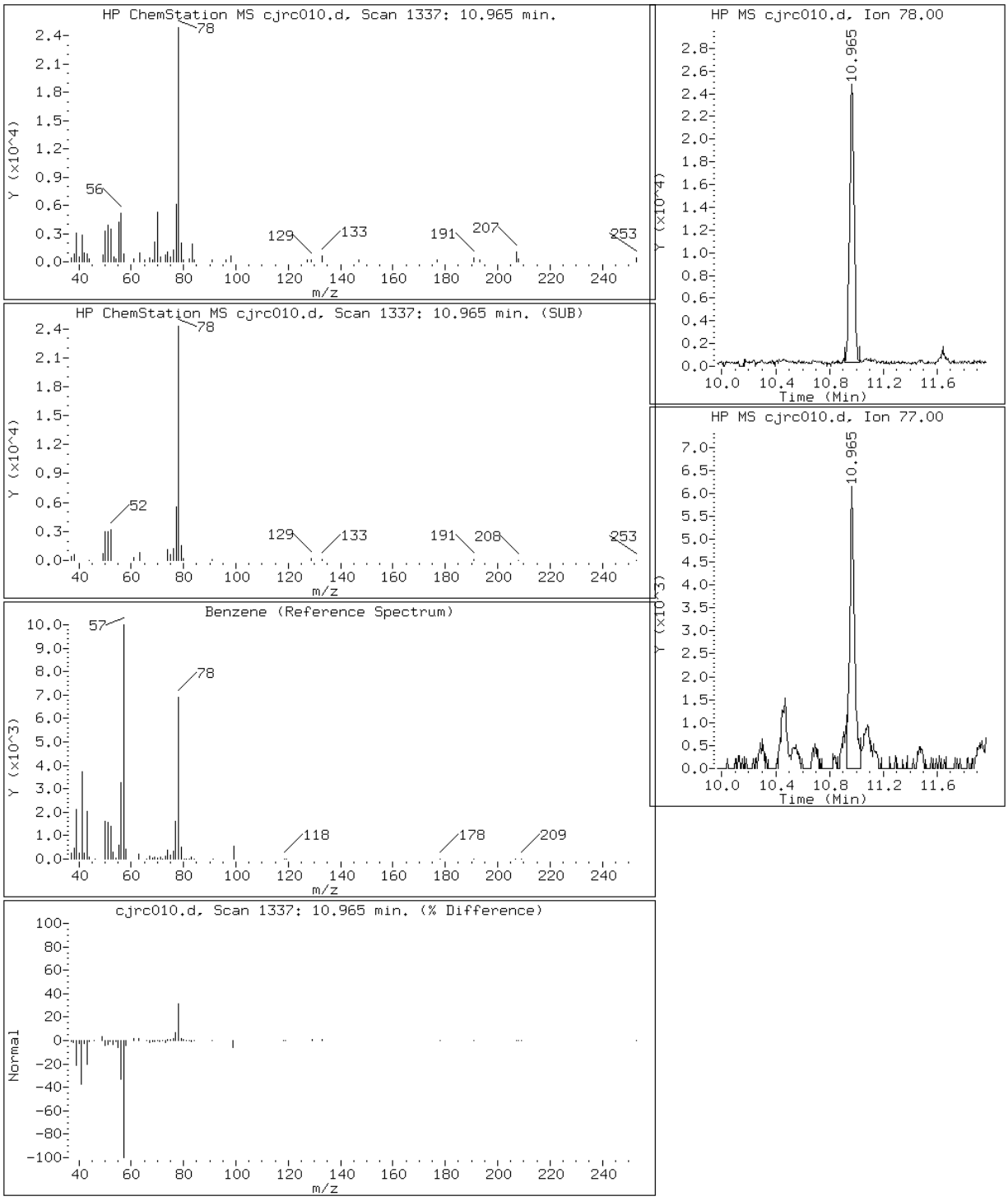
Data File: cjrc010.d

Lab Sample ID: 200-4315-1 Date: 26-MAR-2011 01:11

Client ID: SVE-SP1 Instrument: C.i

Sample Info: 200-4315-A-1@995.00 Operator: sv

44 Benzene



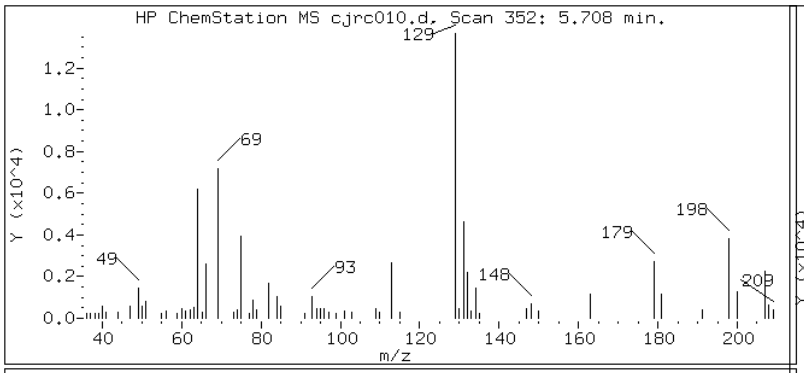
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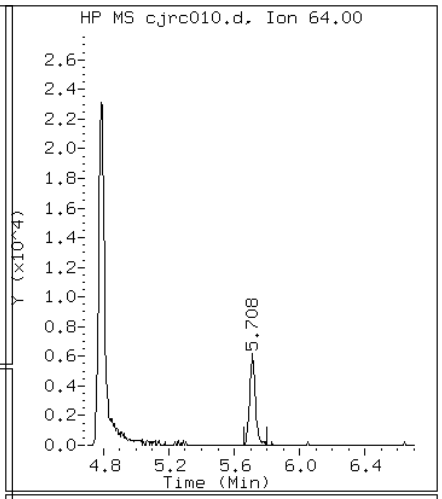
Lab Sample ID: 200-4315-1 Date: 26-MAR-2011 01:11

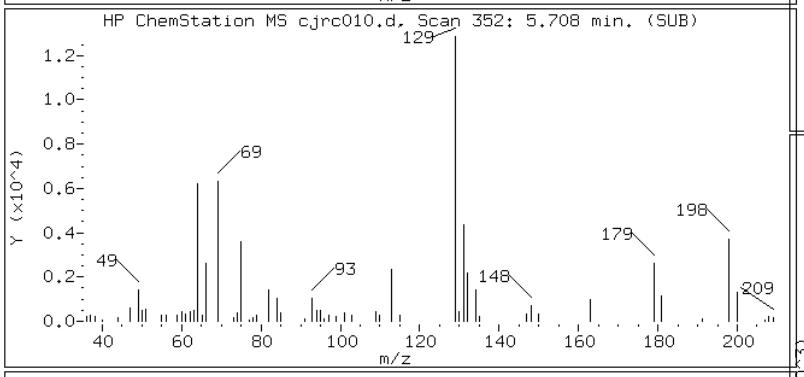
Client ID: SVE-SP1 Instrument: C.i

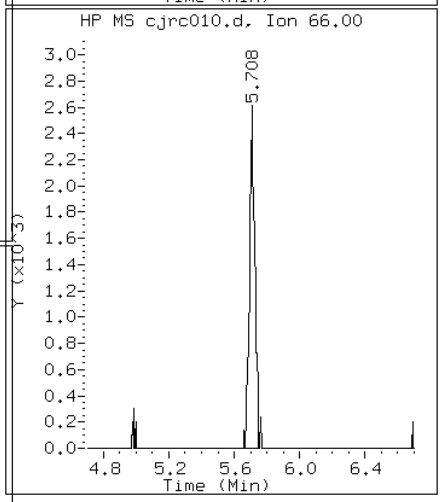
Sample Info: 200-4315-A-1@995.00 Operator: sv

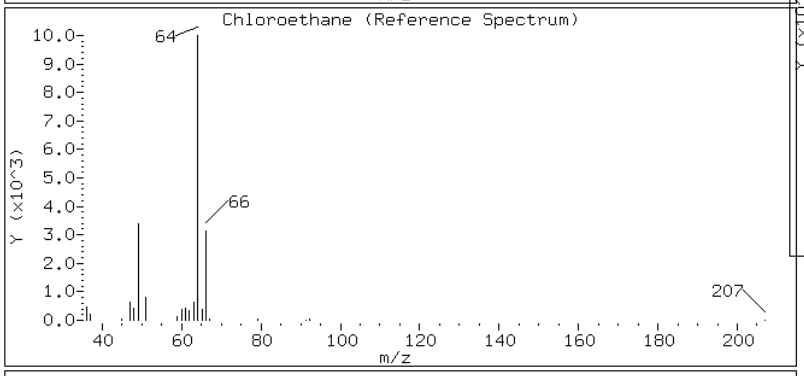
10 Chloroethane

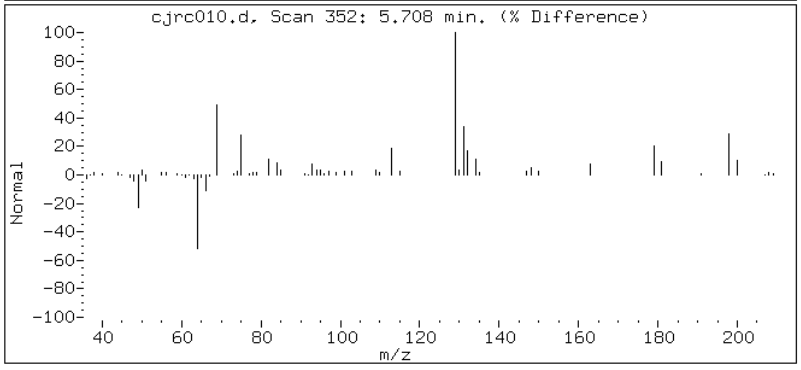












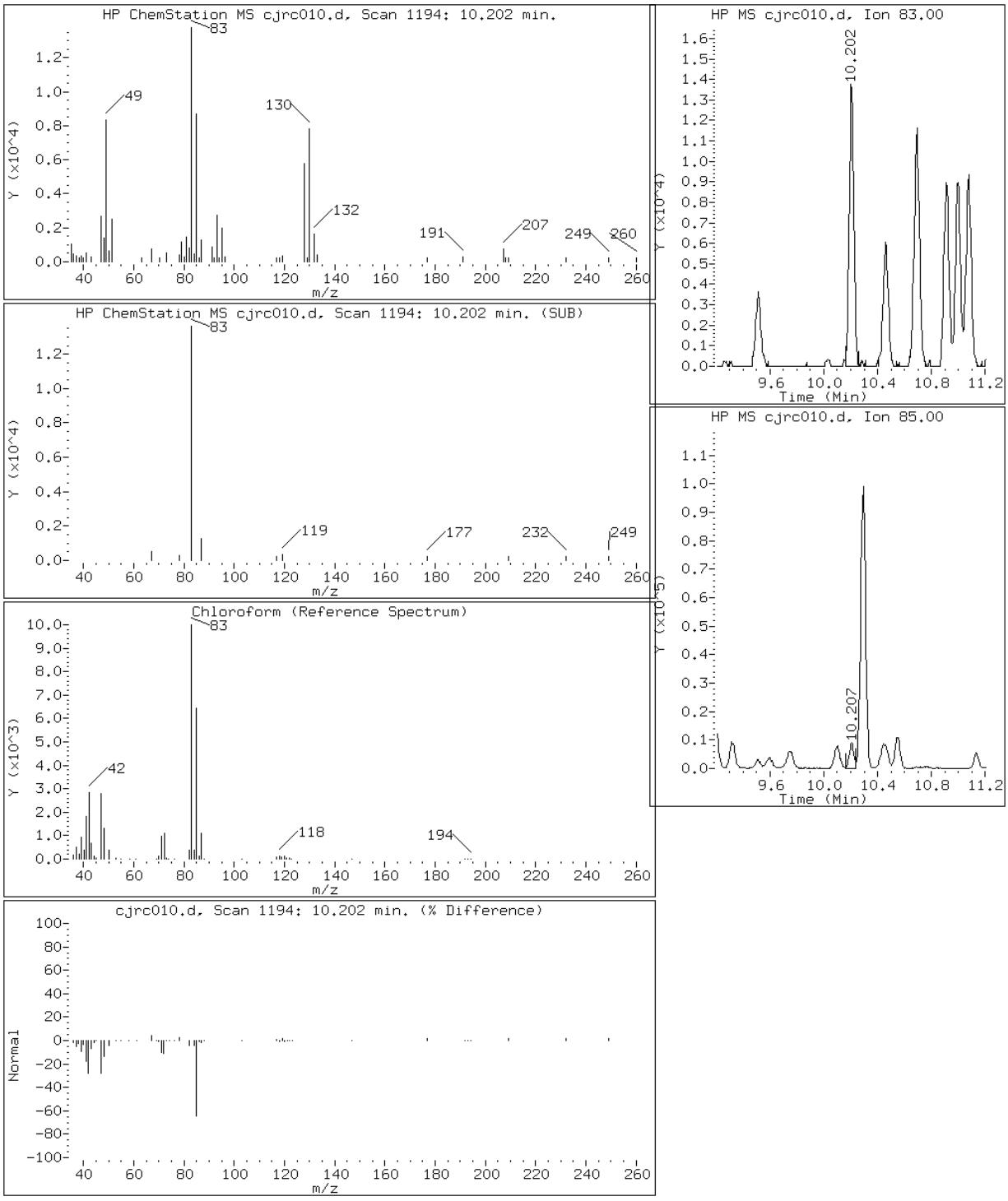
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Lab Sample ID: 200-4315-1 Date: 26-MAR-2011 01:11

Client ID: SVE-SP1 Instrument: C.i

Sample Info: 200-4315-A-1@995.00 Operator: sv

39 Chloroform



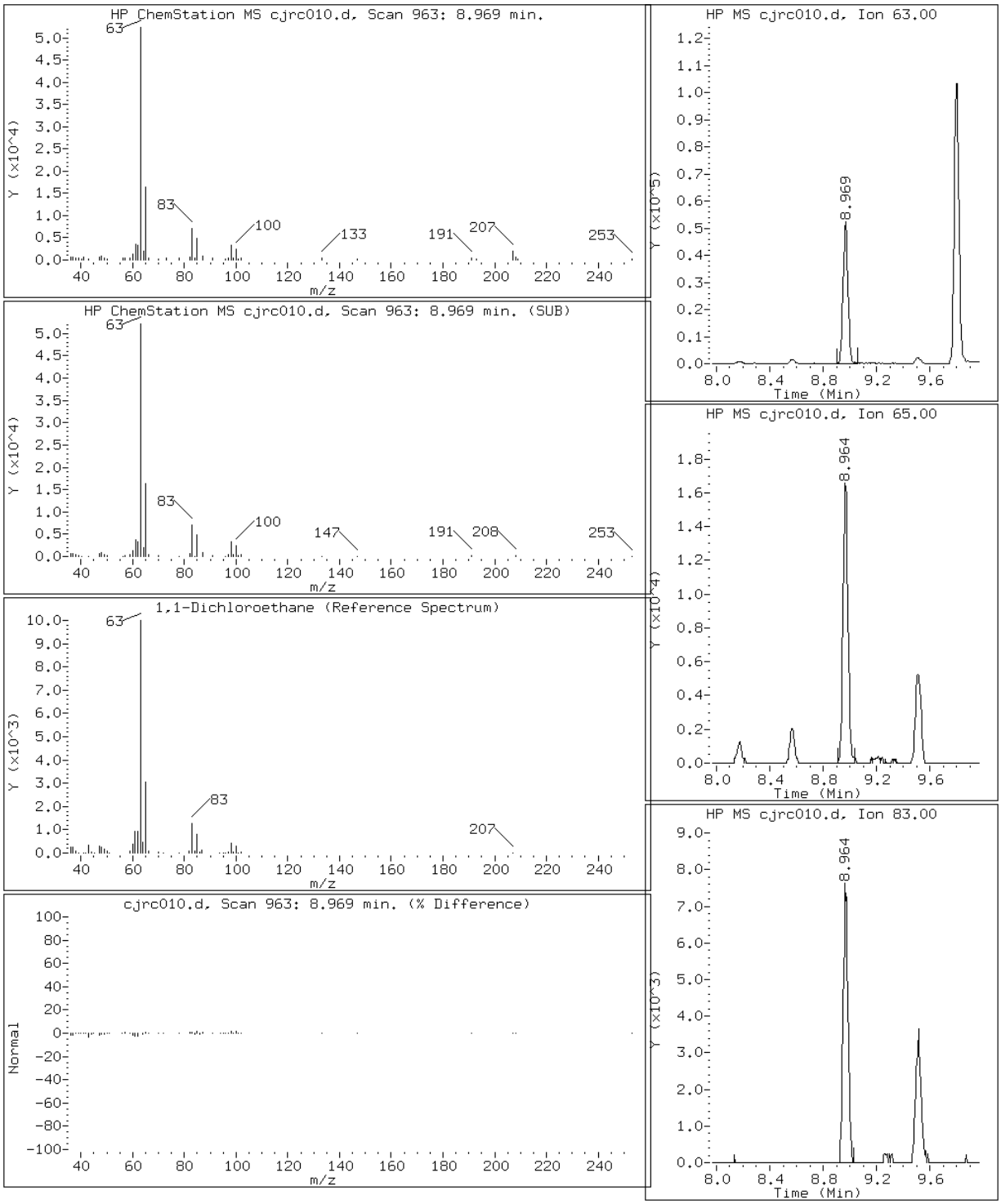
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Lab Sample ID: 200-4315-1 Date: 26-MAR-2011 01:11

Client ID: SVE-SP1 Instrument: C.i

Sample Info: 200-4315-A-1@995.00 Operator: sv

31 1,1-Dichloroethane



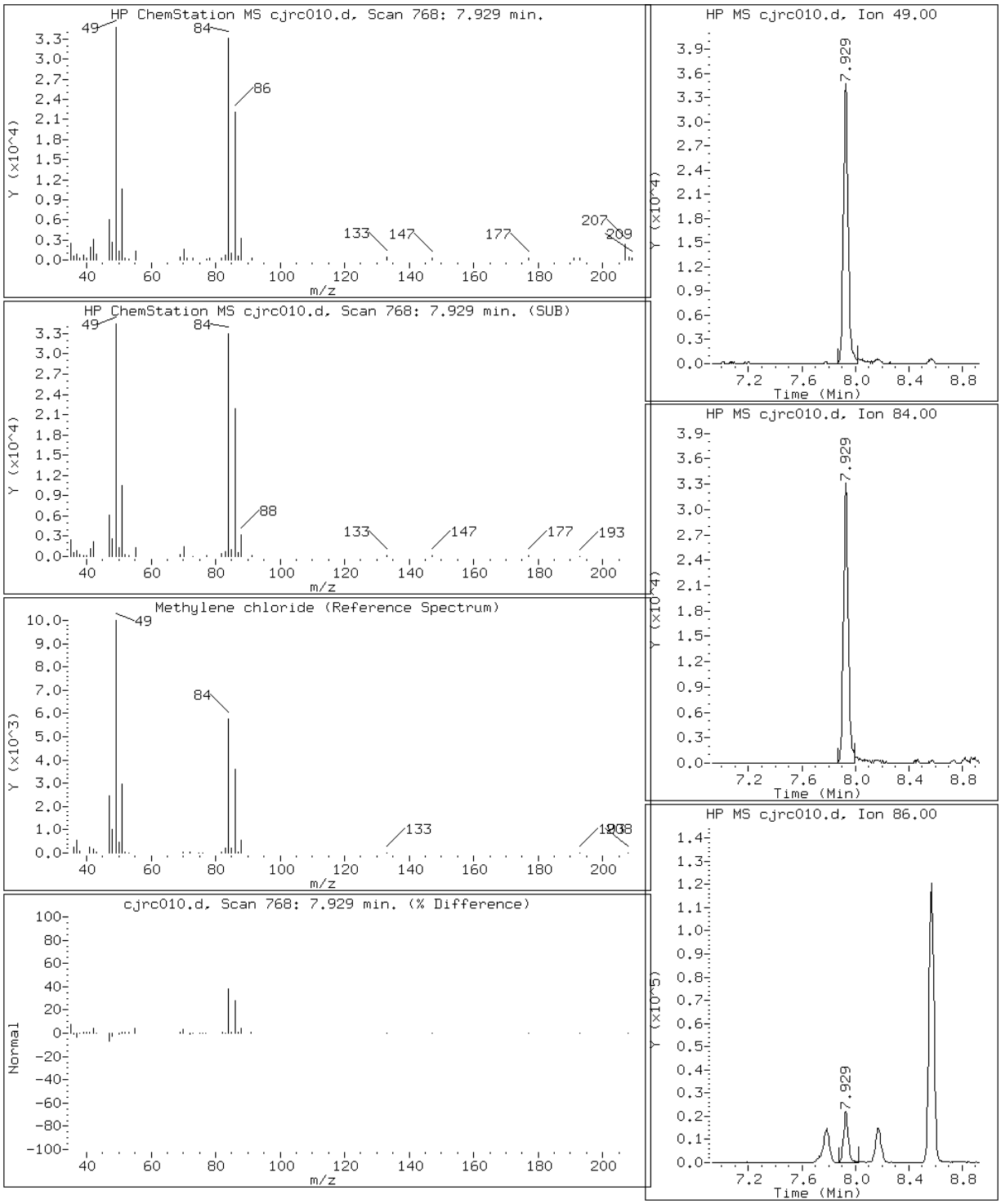
Data File: cjrc010.d

Lab Sample ID: 200-4315-1 Date: 26-MAR-2011 01:11

Client ID: SVE-SP1 Instrument: C.i

Sample Info: 200-4315-A-1@995.00 Operator: sv

25 Methylene chloride



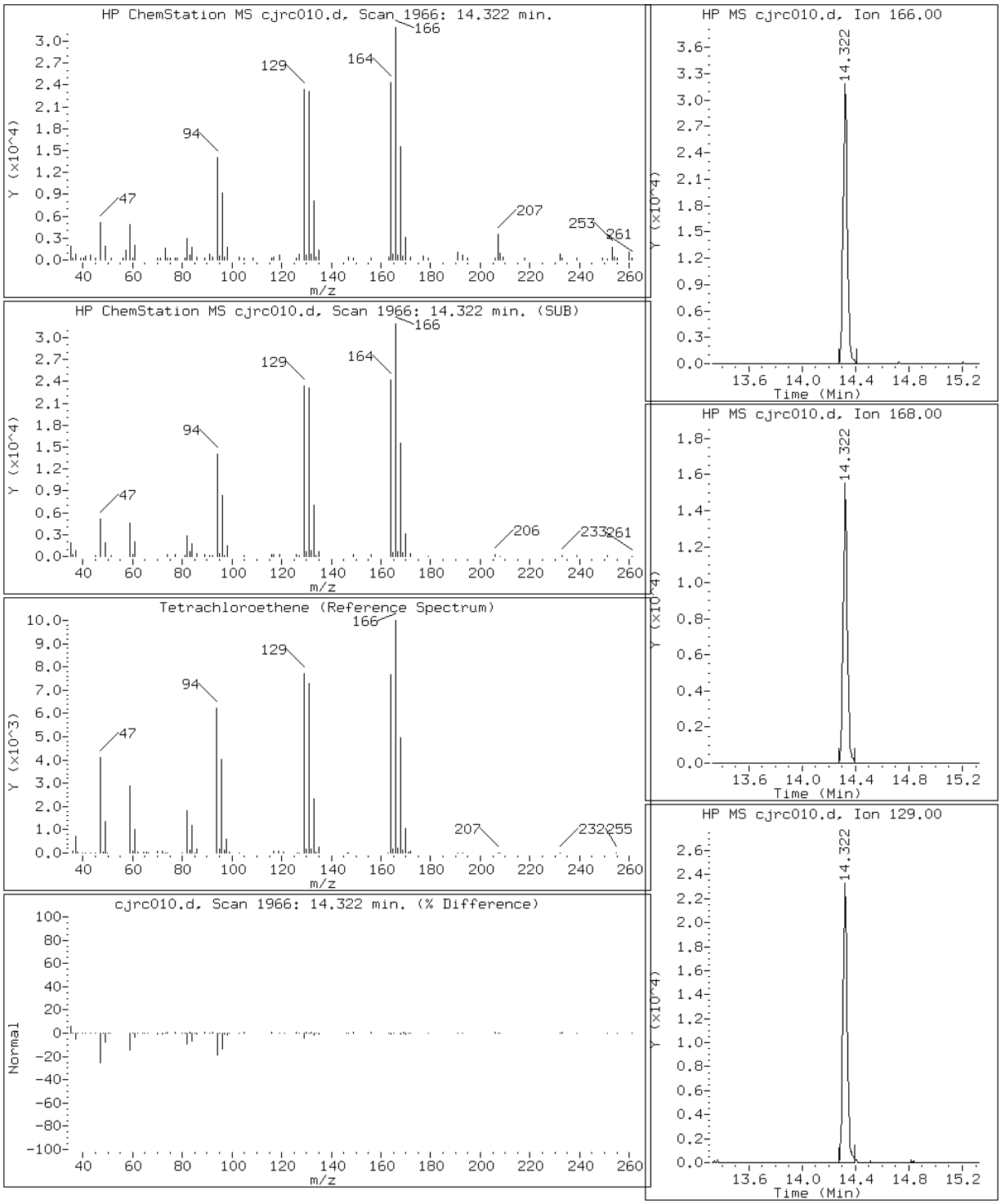
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Lab Sample ID: 200-4315-1 Date: 26-MAR-2011 01:11

Client ID: SVE-SP1 Instrument: C.i

Sample Info: 200-4315-A-1@995.00 Operator: sv

61 Tetrachloroethene



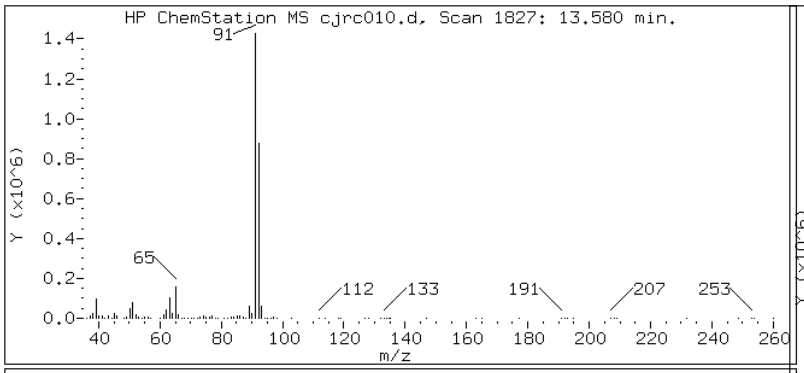
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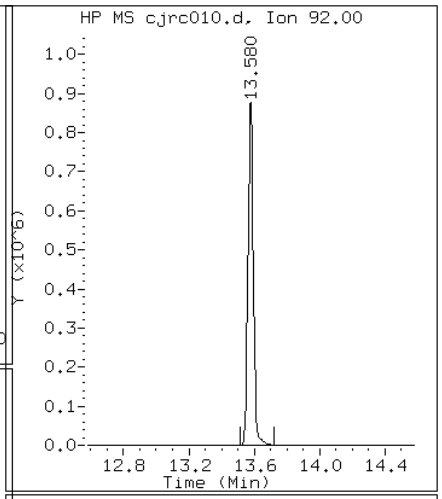
Lab Sample ID: 200-4315-1 Date: 26-MAR-2011 01:11

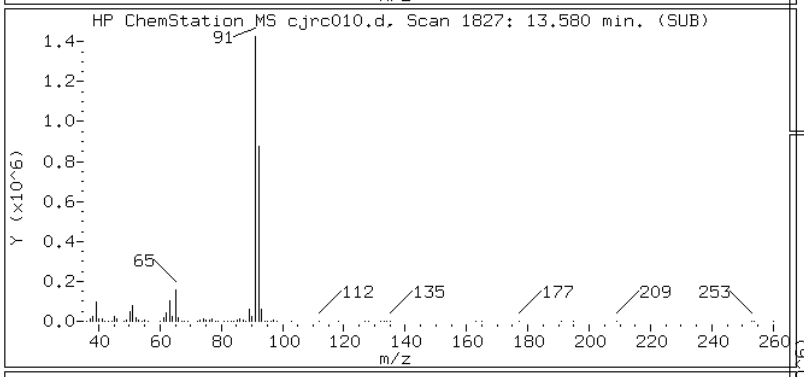
Client ID: SVE-SP1 Instrument: C.i

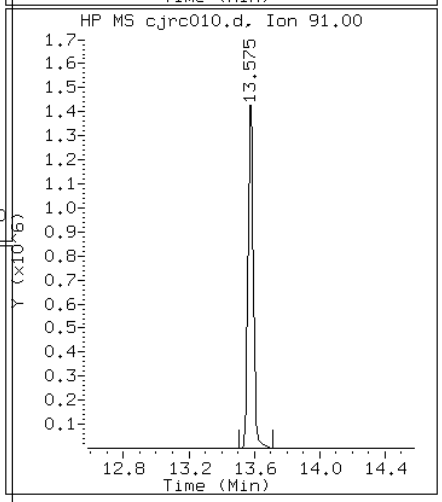
Sample Info: 200-4315-A-1@995.00 Operator: sv

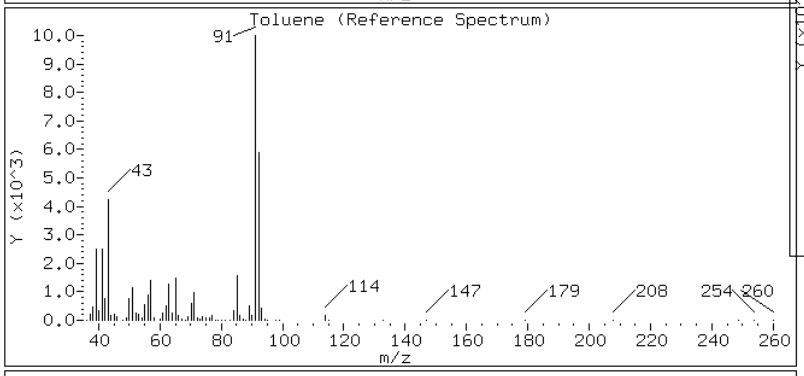
58 Toluene

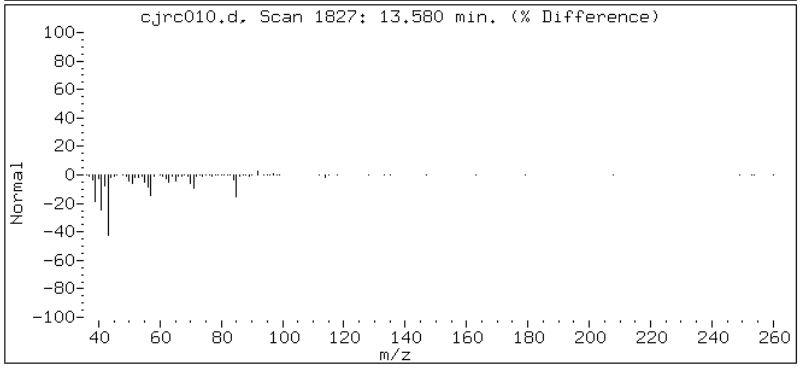












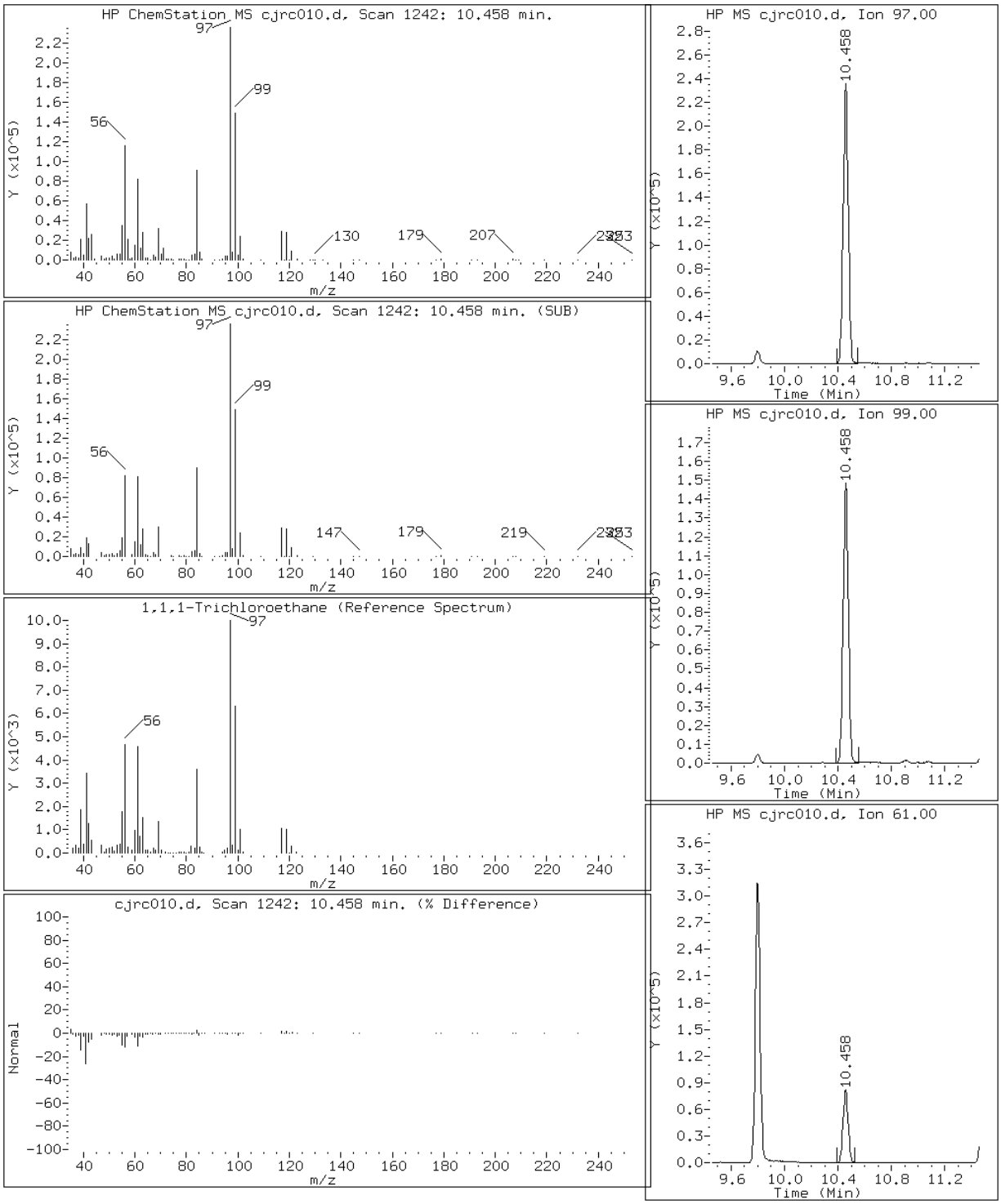
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Lab Sample ID: 200-4315-1 Date: 26-MAR-2011 01:11

Client ID: SVE-SP1 Instrument: C.i

Sample Info: 200-4315-A-1@995.00 Operator: sv

41 1,1,1-Trichloroethane



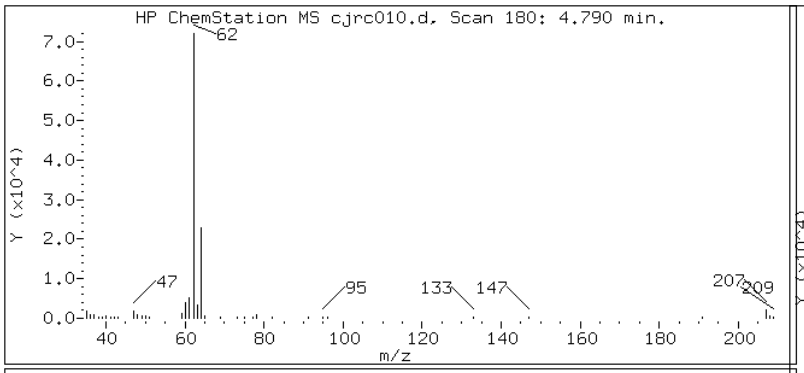
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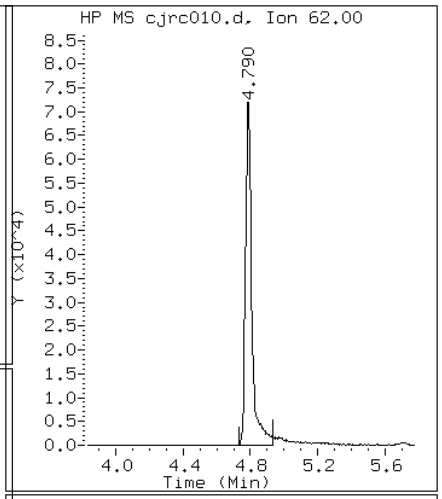
Lab Sample ID: 200-4315-1 Date: 26-MAR-2011 01:11

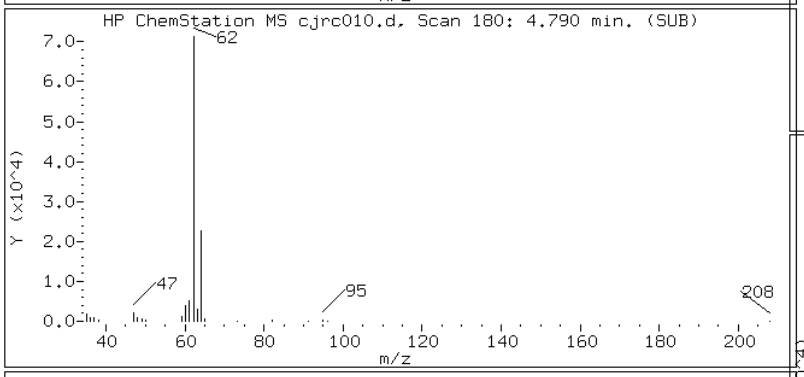
Client ID: SVE-SP1 Instrument: C.i

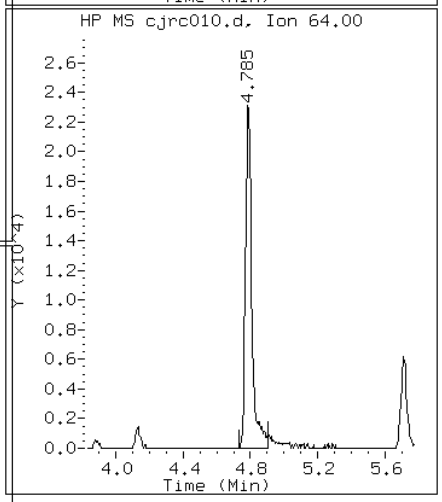
Sample Info: 200-4315-A-1@995.00 Operator: sv

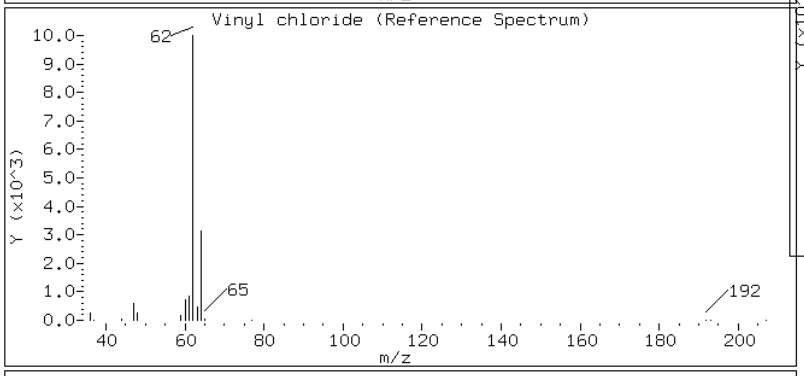
7 Vinyl chloride

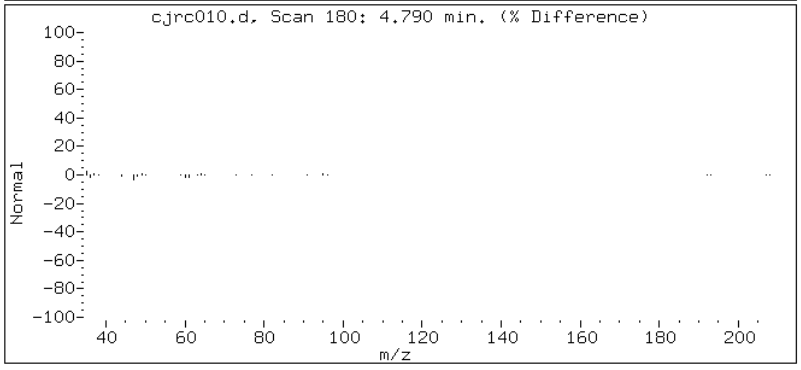












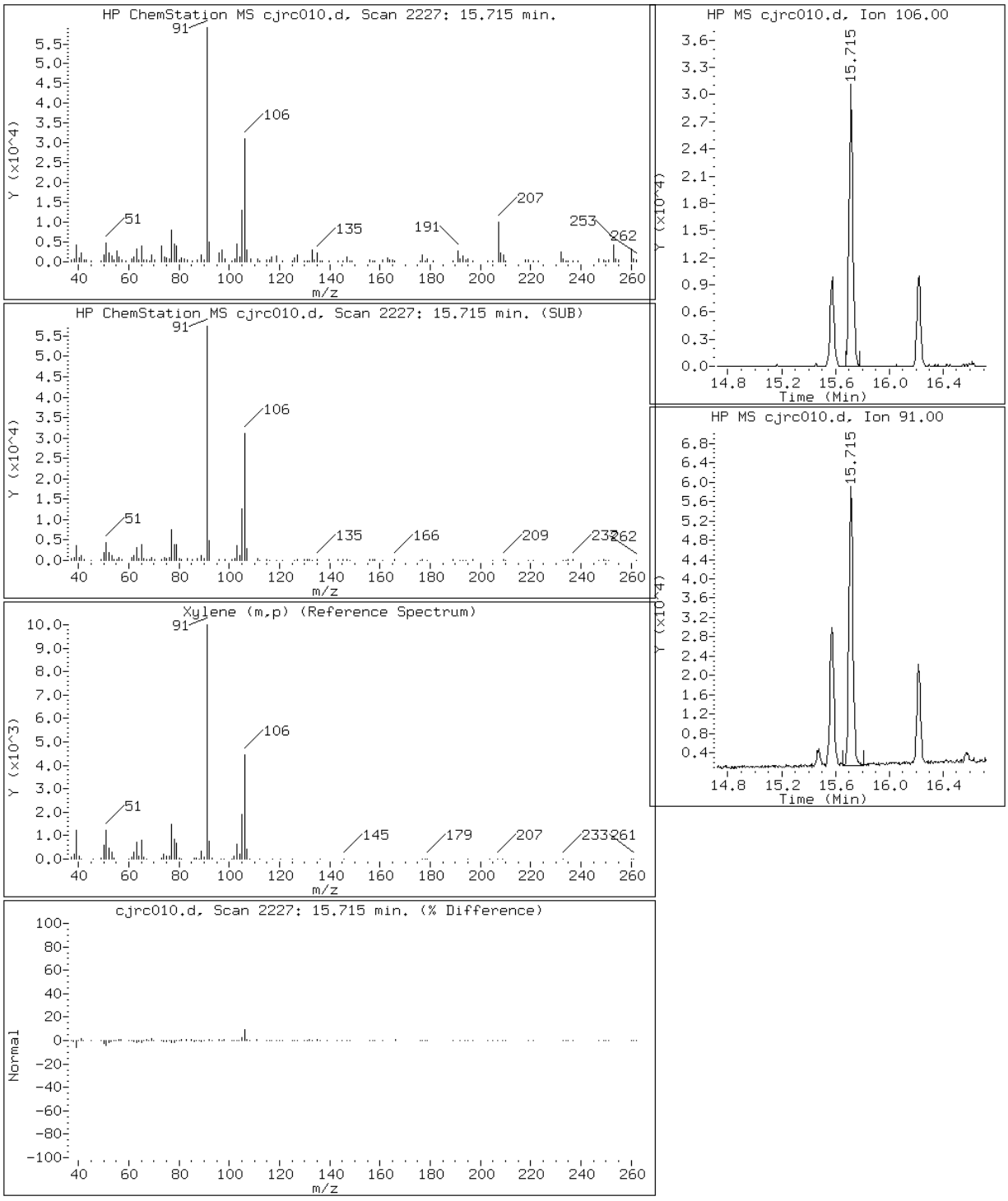
Data File: cjrc010.d

Lab Sample ID: 200-4315-1 Date: 26-MAR-2011 01:11

Client ID: SVE-SP1 Instrument: C.i

Sample Info: 200-4315-A-1@995.00 Operator: sv

69 Xylene (m,p)



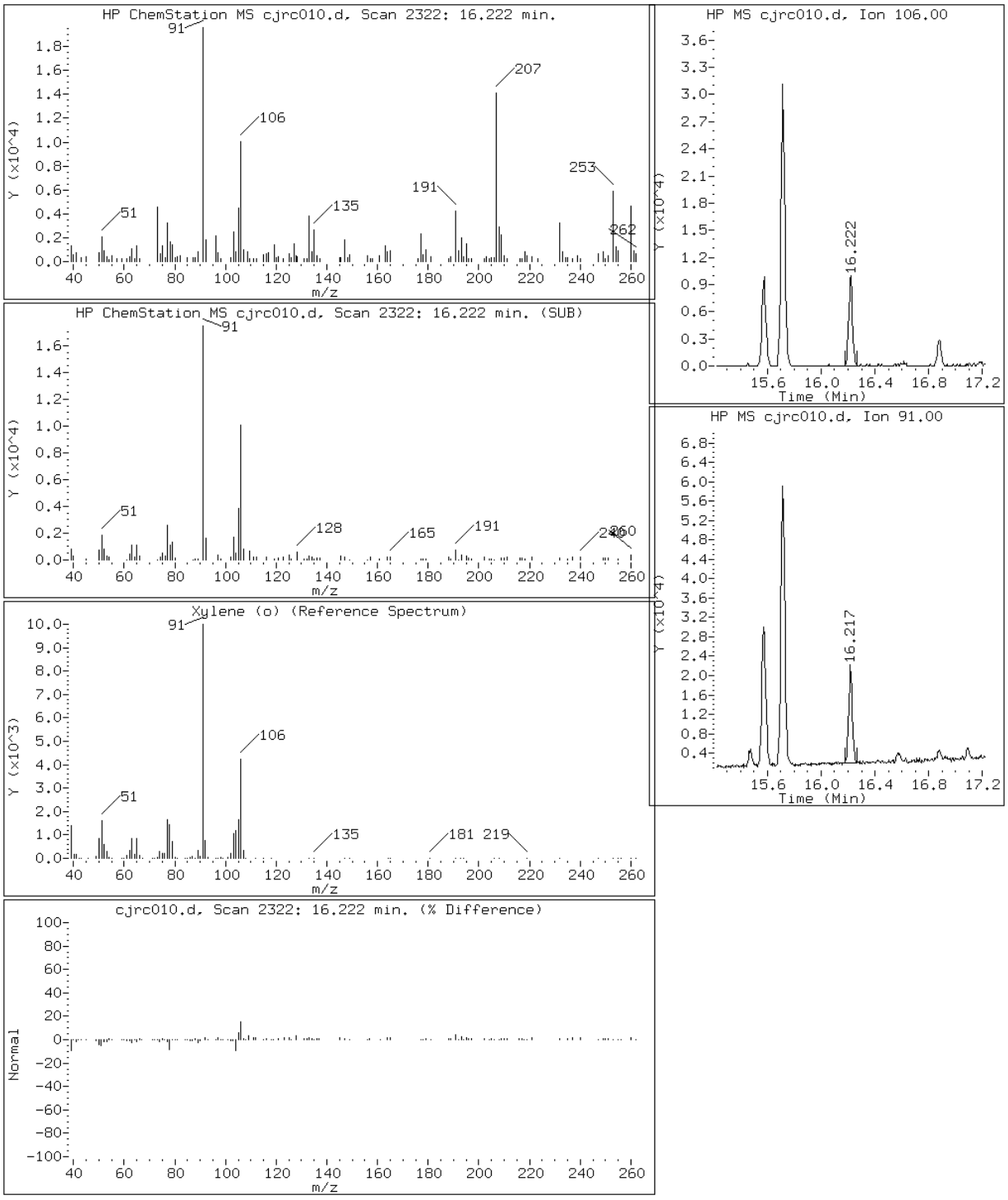
Data File: cjrc010.d

Lab Sample ID: 200-4315-1 Date: 26-MAR-2011 01:11

Client ID: SVE-SP1 Instrument: C.i

Sample Info: 200-4315-A-1@995.00 Operator: sv

71 Xylene (o)



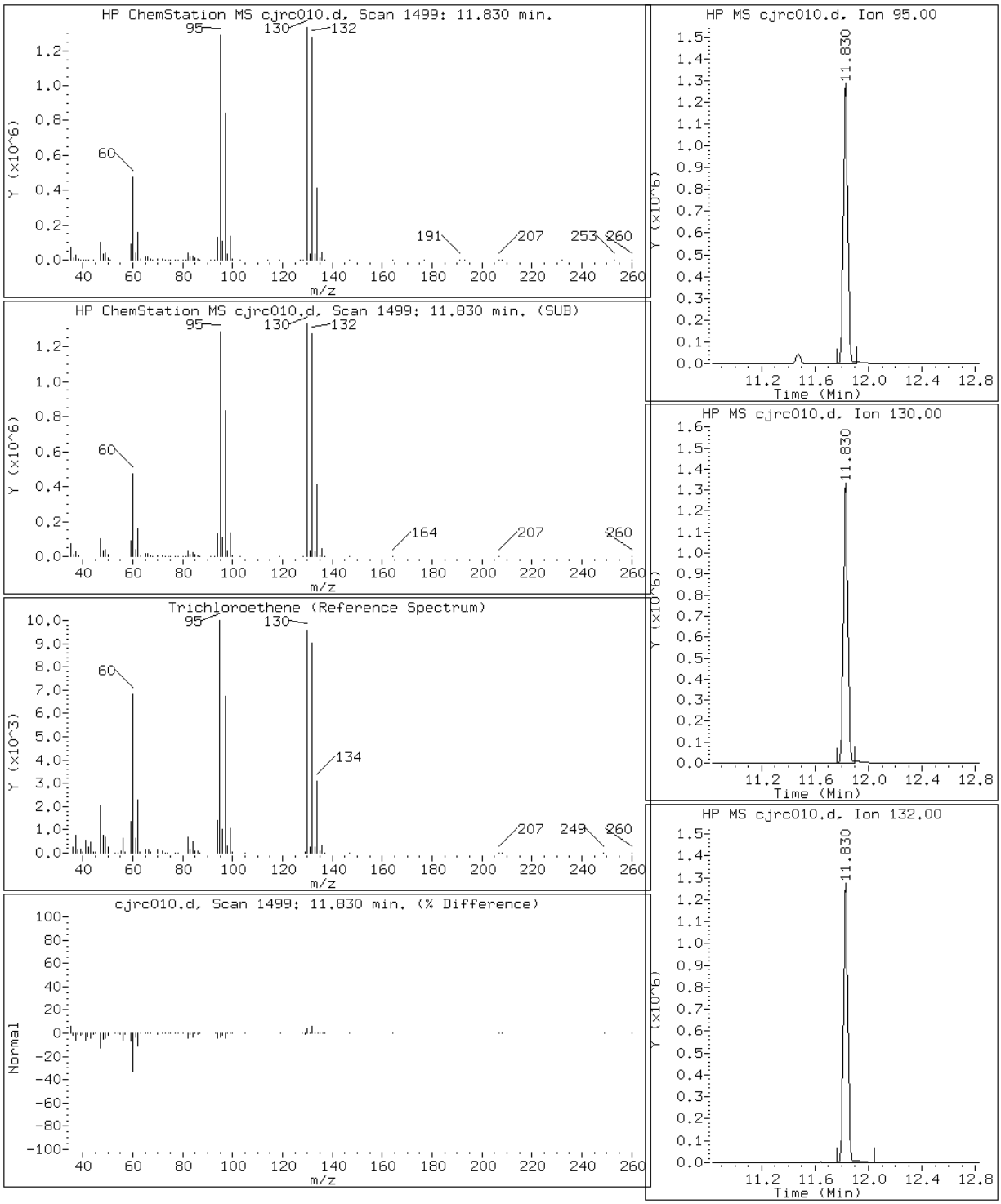
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Lab Sample ID: 200-4315-1 Date: 26-MAR-2011 01:11

Client ID: SVE-SP1 Instrument: C.i

Sample Info: 200-4315-A-1@995.00 Operator: sv

49 Trichloroethene



FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Client Sample ID: SVE-SP2 Lab Sample ID: 200-4315-2

Matrix: Air Lab File ID: cjrc011.d

Analysis Method: TO-15 Date Collected: 03/09/2011 16:37

Sample wt/vol: 22(mL) Date Analyzed: 03/26/2011 01:59

Soil Aliquot Vol: Dilution Factor: 6860

Soil Extract Vol.: GC Column: RTX-624 ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 15760 Units: ppb v/v

CAS NO.	COMPOUND NAME	MOLECULAR WEIGHT	RESULT	Q	RL	RL
71-43-2	Benzene	78.11	1400	U	1400	1400
75-25-2	Bromoform	252.75	1400	U	1400	1400
74-83-9	Bromomethane	94.94	1400	U	1400	1400
75-15-0	Carbon disulfide	76.14	3400	U	3400	3400
56-23-5	Carbon tetrachloride	153.81	1400	U	1400	1400
108-90-7	Chlorobenzene	112.30	1400	U	1400	1400
75-00-3	Chloroethane	64.52	3400	U	3400	3400
67-66-3	Chloroform	119.38	1400	U	1400	1400
74-87-3	Chloromethane	50.49	3400	U	3400	3400
106-46-7	1,4-Dichlorobenzene	147.00	1400	U	1400	1400
75-34-3	1,1-Dichloroethane	98.96	7100		1400	1400
107-06-2	1,2-Dichloroethane	98.96	1400	U	1400	1400
75-35-4	1,1-Dichloroethene	96.94	1400	U	1400	1400
78-87-5	1,2-Dichloropropane	112.99	1400	U	1400	1400
123-91-1	1,4-Dioxane	88.11	34000	U	34000	34000
100-41-4	Ethylbenzene	106.17	1400	U	1400	1400
87-68-3	Hexachlorobutadiene	260.76	1400	U	1400	1400
75-09-2	Methylene Chloride	84.93	8400		3400	3400
91-20-3	Naphthalene	128.17	3400	U	3400	3400
100-42-5	Styrene	104.15	1400	U	1400	1400
79-34-5	1,1,2,2-Tetrachloroethane	167.85	1400	U	1400	1400
127-18-4	Tetrachloroethene	165.83	2900		1400	1400
108-88-3	Toluene	92.14	64000		1400	1400
120-82-1	1,2,4-Trichlorobenzene	181.45	3400	U	3400	3400
71-55-6	1,1,1-Trichloroethane	133.41	21000		1400	1400
79-00-5	1,1,2-Trichloroethane	133.41	1400	U	1400	1400
75-01-4	Vinyl chloride	62.50	20000		1400	1400
1330-20-7	Xylene (total)	106.17	4000		1400	1400
79-01-6	Trichloroethene	131.39	150000		1400	1400

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Client Sample ID: SVE-SP2 Lab Sample ID: 200-4315-2

Matrix: Air Lab File ID: cjrc011.d

Analysis Method: TO-15 Date Collected: 03/09/2011 16:37

Sample wt/vol: 22(mL) Date Analyzed: 03/26/2011 01:59

Soil Aliquot Vol: Dilution Factor: 6860

Soil Extract Vol.: GC Column: RTX-624 ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 15760 Units: ug/m3

CAS NO.	COMPOUND NAME	MOLECULAR WEIGHT	RESULT	Q	RL	RL
71-43-2	Benzene	78.11	4400	U	4400	4400
75-25-2	Bromoform	252.75	14000	U	14000	14000
74-83-9	Bromomethane	94.94	5300	U	5300	5300
75-15-0	Carbon disulfide	76.14	11000	U	11000	11000
56-23-5	Carbon tetrachloride	153.81	8600	U	8600	8600
108-90-7	Chlorobenzene	112.30	6300	U	6300	6300
75-00-3	Chloroethane	64.52	9100	U	9100	9100
67-66-3	Chloroform	119.38	6700	U	6700	6700
74-87-3	Chloromethane	50.49	7100	U	7100	7100
106-46-7	1,4-Dichlorobenzene	147.00	8200	U	8200	8200
75-34-3	1,1-Dichloroethane	98.96	29000		5600	5600
107-06-2	1,2-Dichloroethane	98.96	5600	U	5600	5600
75-35-4	1,1-Dichloroethene	96.94	5400	U	5400	5400
78-87-5	1,2-Dichloropropane	112.99	6300	U	6300	6300
123-91-1	1,4-Dioxane	88.11	120000	U	120000	120000
100-41-4	Ethylbenzene	106.17	6000	U	6000	6000
87-68-3	Hexachlorobutadiene	260.76	15000	U	15000	15000
75-09-2	Methylene Chloride	84.93	29000		12000	12000
91-20-3	Naphthalene	128.17	18000	U	18000	18000
100-42-5	Styrene	104.15	5800	U	5800	5800
79-34-5	1,1,2,2-Tetrachloroethane	167.85	9400	U	9400	9400
127-18-4	Tetrachloroethene	165.83	19000		9300	9300
108-88-3	Toluene	92.14	240000		5200	5200
120-82-1	1,2,4-Trichlorobenzene	181.45	25000	U	25000	25000
71-55-6	1,1,1-Trichloroethane	133.41	120000		7500	7500
79-00-5	1,1,2-Trichloroethane	133.41	7500	U	7500	7500
75-01-4	Vinyl chloride	62.50	50000		3500	3500
1330-20-7	Xylene (total)	106.17	17000		6000	6000
79-01-6	Trichloroethene	131.39	810000		7400	7400

TestAmerica Burlington

AIR TOXICS QUANTITATION REPORT

Lab Sample Id: 200-4315-2
Client Smp ID: SVE-SP2
Inj Date : 26-MAR-2011 01:59
Operator : sv Inst ID: C.i
Smp Info : 200-4315-A-2@754.12
Misc Info : 22,6860, to15all cdf 754.12
Comment :
Method : /chem/C.i/Csvr.p/cjrcto15.b/to15v5.m
Meth Date : 29-Mar-2011 20:13 sv Quant Type: ISTD
Cal Date : 22-MAR-2011 22:39 Cal File: cjr009.d
Als bottle: 8
Dil Factor: 6860.00000
Integrator: HP RTE Compound Sublist: all74.sub
Target Version: 3.50
Processing Host: chemsvr6

Concentration Formula: Amt * DF * Uf*(Vo/Vo)*(Vf/Vf) * CpndVariable

Name	Value	Description
DF	6860.00000	Dilution Factor
Uf	1.00000	ng unit correction factor
Vo	22.00000	Sample Volume purged (mL)
Vf	200.00000	Final Volume (mL)

Cpnd Variable Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	FINAL (ppb v/v)
2 Dichlorodifluoromethane	85	Compound Not Detected.					
3 Chlorodifluoromethane	51	Compound Not Detected.					
4 1,2-Dichloro-1,1,2,2-tetraflu	85	Compound Not Detected.					
5 Chloromethane	50	Compound Not Detected.					
6 Butane	43	Compound Not Detected.					
7 Vinyl chloride	62	4.780	4.774	(0.471)	149024	2.87240	20000
8 1,3-Butadiene	54	Compound Not Detected.					
9 Bromomethane	94	Compound Not Detected.					
10 Chloroethane	64	5.703	5.703	(0.562)	11832	0.37460	2600(a)
12 Vinyl bromide	106	Compound Not Detected.					
13 Trichlorofluoromethane	101	Compound Not Detected.					
17 1,1,2-Trichloro-1,2,2-trifluo	101	7.000	7.000	(0.690)	19274	0.15891	1100(a)
19 1,1-Dichloroethene	96	7.069	7.075	(0.697)	7612	0.12784	880(a)
20 Acetone	43	Compound Not Detected.					

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	FINAL (ppb v/v)
	21 Carbon disulfide	76	Compound Not Detected.					
	22 Isopropanol	45	Compound Not Detected.					
	23 Allyl chloride	41	Compound Not Detected.					
	25 Methylene chloride	49	7.923	7.929	(0.781)	68496	1.22466	8400
	26 Tert-butyl alcohol	59	Compound Not Detected.					
	27 Methyl tert-butyl ether	73	Compound Not Detected.					
	28 1,2-Dichloroethene (trans)	61	Compound Not Detected.					
	30 n-Hexane	57	8.558	8.564	(0.844)	1222003	13.6517	94000
	31 1,1-Dichloroethane	63	8.959	8.969	(0.883)	112089	1.03950	7100
M	33 1,2-Dichloroethene,Total	61				568116	7.95231	55000
	34 1,2-Dichloroethene (cis)	96	9.791	9.802	(0.965)	568116	7.95231	55000
	36 Methyl Ethyl Ketone	72	Compound Not Detected.					
*	37 Bromochloromethane	128	10.143	10.154	(1.000)	583733	10.0000	
	38 Tetrahydrofuran	42	Compound Not Detected.					
	39 Chloroform	83	10.202	10.207	(1.006)	25365	0.18794	1300(a)
	40 Cyclohexane	84	10.458	10.464	(0.912)	211543	1.92356	13000(Q)
	41 1,1,1-Trichloroethane	97	10.453	10.458	(0.911)	501867	3.12460	21000
	42 Carbon tetrachloride	117	Compound Not Detected.					
	43 2,2,4-Trimethylpentane	57	Compound Not Detected.					
	44 Benzene	78	10.960	10.965	(0.955)	48196	0.19619	1300(a)
	45 1,2-Dichloroethane	62	Compound Not Detected.					
	46 n-Heptane	43	11.125	11.131	(0.970)	260761	2.60029	18000
*	47 1,4-Difluorobenzene	114	11.472	11.478	(1.000)	3705194	10.0000	
	49 Trichloroethene	95	11.824	11.830	(1.031)	2385565	21.9733	150000
	50 1,2-Dichloropropane	63	Compound Not Detected.					
	51 Methyl methacrylate	69	12.251	12.230	(1.068)	19732	0.29414	2000(aQ)
	53 1,4-Dioxane	88	Compound Not Detected.					
	54 Bromodichloromethane	83	Compound Not Detected.					
	55 1,3-Dichloropropene (cis)	75	Compound Not Detected.					
	56 Methyl isobutyl ketone	43	Compound Not Detected.					
	58 Toluene	92	13.575	13.580	(0.878)	1631068	9.34860	64000
	59 1,3-Dichloropropene (trans)	75	Compound Not Detected.					
	60 1,1,2-Trichloroethane	83	Compound Not Detected.					
	61 Tetrachloroethene	166	14.317	14.327	(0.925)	57125	0.41842	2900
	62 2-Hexanone	43	Compound Not Detected.					
	63 Dibromochloromethane	129	Compound Not Detected.					
	64 1,2-Dibromoethane	107	Compound Not Detected.					
*	65 Chlorobenzene-d5	117	15.470	15.480	(1.000)	3157012	10.0000	
	66 Chlorobenzene	112	Compound Not Detected.					
	68 Ethylbenzene	91	15.576	15.576	(1.007)	55029	0.17450	1200(a)
	69 Xylene (m,p)	106	15.715	15.720	(1.016)	57756	0.44276	3000
M	70 Xylenes, Total	106				75864	0.57702	4000
	71 Xylene (o)	106	16.217	16.222	(1.048)	18108	0.13426	920(aQ)
	72 Styrene	104	Compound Not Detected.					
	73 Bromoform	173	Compound Not Detected.					
	74 Isopropylbenzene	105	Compound Not Detected.					
	75 1,1,2,2-Tetrachloroethane	83	Compound Not Detected.					

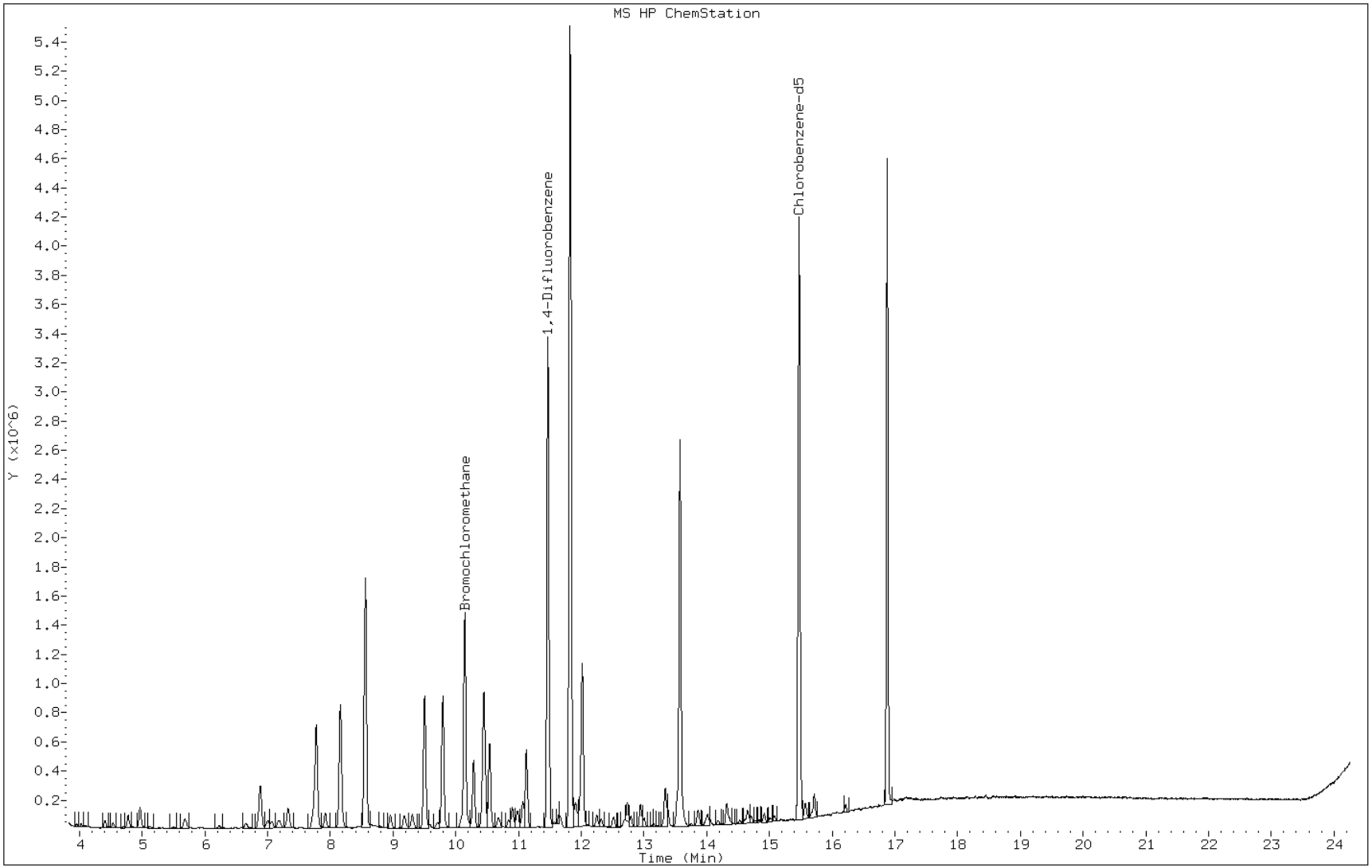
						CONCENTRATIONS	
	QUANT SIG					ON-COLUMN	FINAL
Compounds	MASS	RT	EXP RT	REL RT	RESPONSE	(ppb v/v)	(ppb v/v)
76 n-Propylbenzene	91	Compound Not Detected.					
79 4-Ethyltoluene	105	Compound Not Detected.					
80 2-Chlorotoluene	91	Compound Not Detected.					
81 1,3,5-Trimethylbenzene	105	Compound Not Detected.					
83 tert-butylbenzene	119	Compound Not Detected.					
84 1,2,4-Trimethylbenzene	105	Compound Not Detected.					
85 sec-Butylbenzene	105	Compound Not Detected.					
86 4-Isopropyltoluene	119	Compound Not Detected.					
87 1,3-Dichlorobenzene	146	Compound Not Detected.					
88 1,4-Dichlorobenzene	146	18.282	18.287	(1.182)	7981	0.04106	280(a)
89 Benzyl chloride	91	Compound Not Detected.					
91 n-Butylbenzene	91	Compound Not Detected.					
92 1,2-Dichlorobenzene	146	Compound Not Detected.					
94 1,2,4-Trichlorobenzene	180	Compound Not Detected.					
95 1,3-Hexachlorobutadiene	225	Compound Not Detected.					
96 Naphthalene	128	Compound Not Detected.					

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
Q - Qualifier signal failed the ratio test.

Data File: cjrc011.d
Client ID: SVE-SP2
Operator: sv
Column Type: Capillary
Stationary Phase: RTX-624
Sample Info: 200-4315-A-2@754.12
Lab Sample ID: 200-4315-2

Date: 26-MAR-2011 01:59
Instrument: C.i
Inj Vol: 200.0
Diameter: 0.32



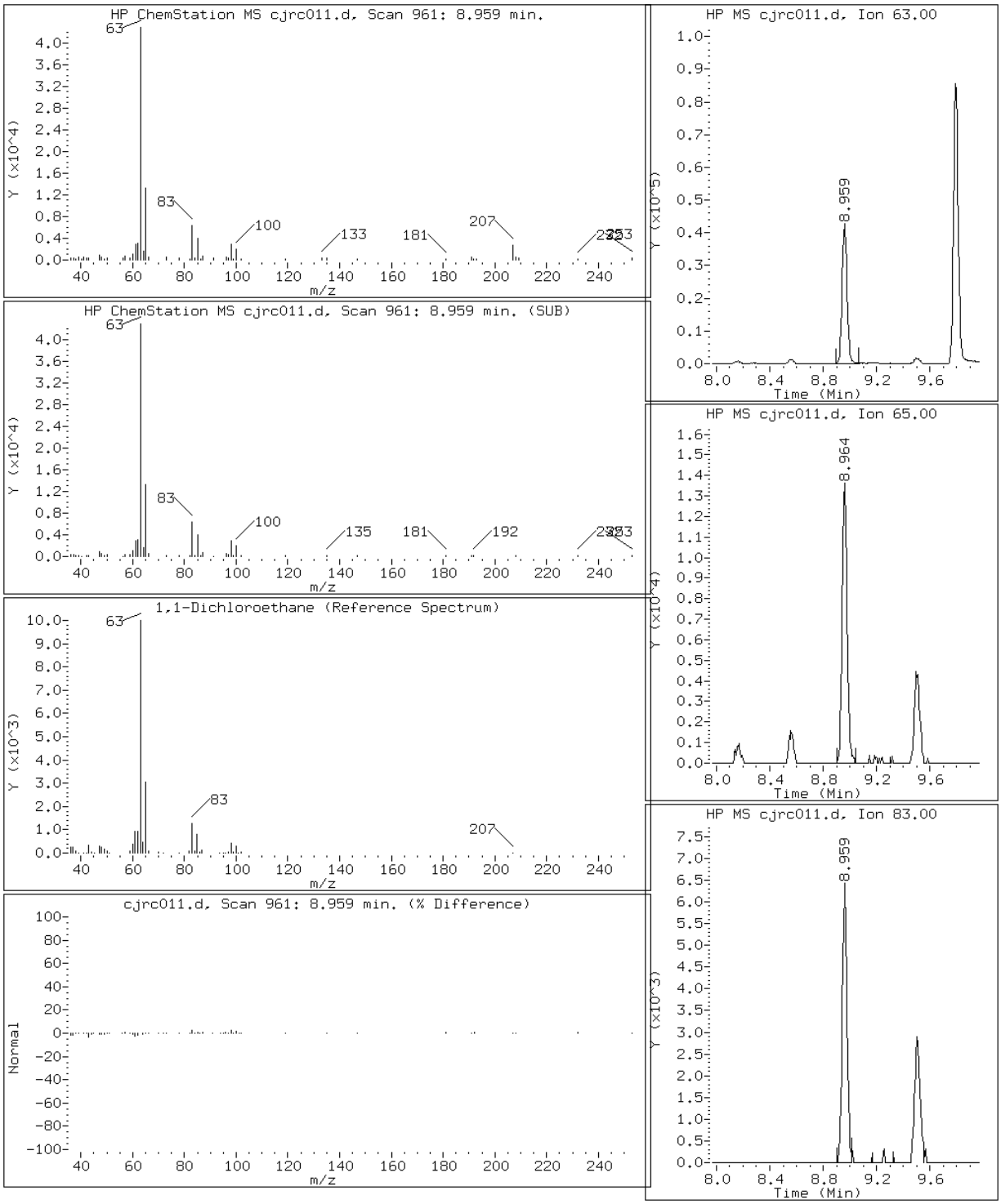
Data File: cjrc011.d

Lab Sample ID: 200-4315-2 Date: 26-MAR-2011 01:59

Client ID: SVE-SP2 Instrument: C.i

Sample Info: 200-4315-A-2@754.12 Operator: sv

31 1,1-Dichloroethane



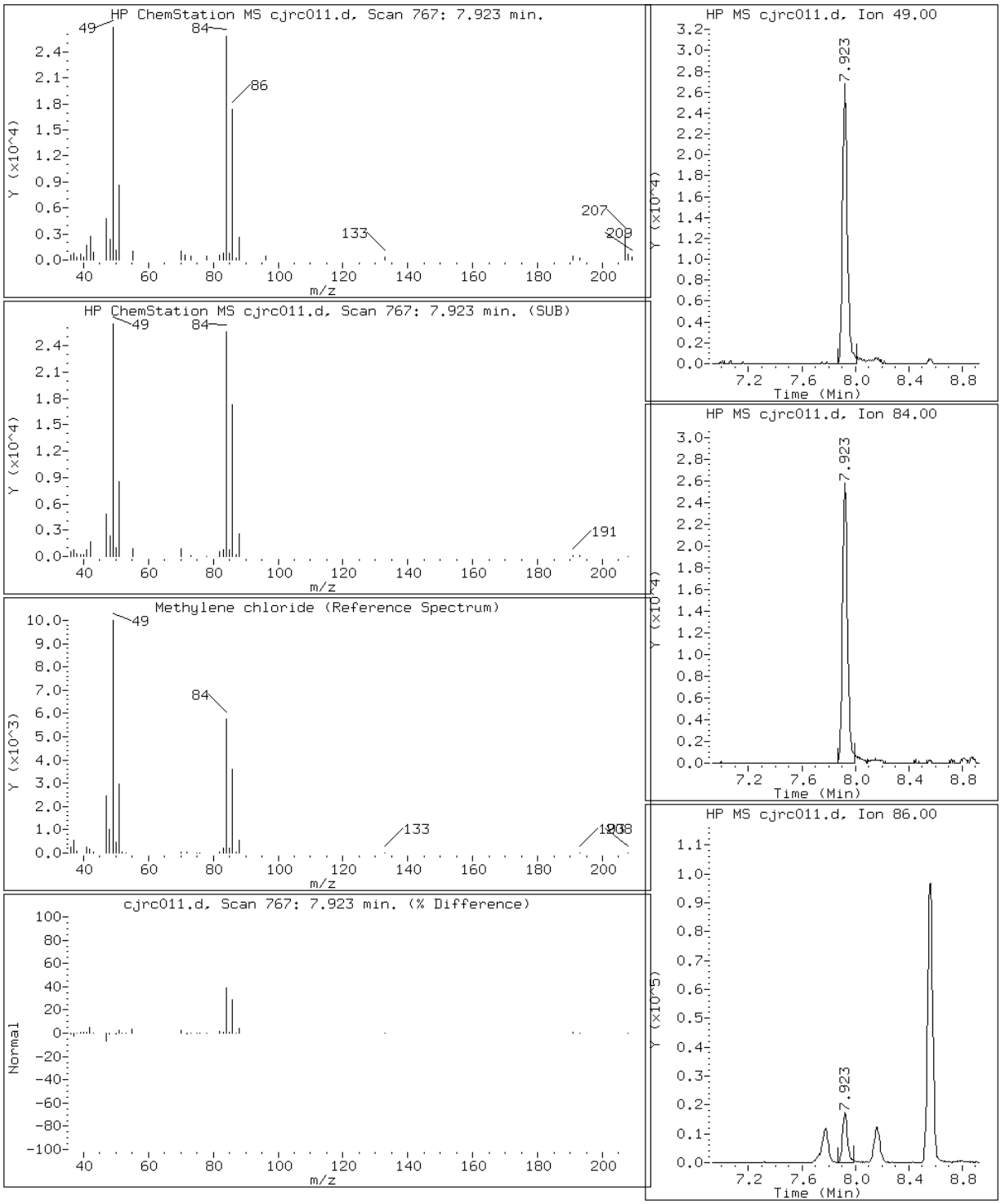
Data File: cjrc011.d

Lab Sample ID: 200-4315-2 Date: 26-MAR-2011 01:59

Client ID: SVE-SP2 Instrument: C.i

Sample Info: 200-4315-A-2@754.12 Operator: sv

25 Methylene chloride



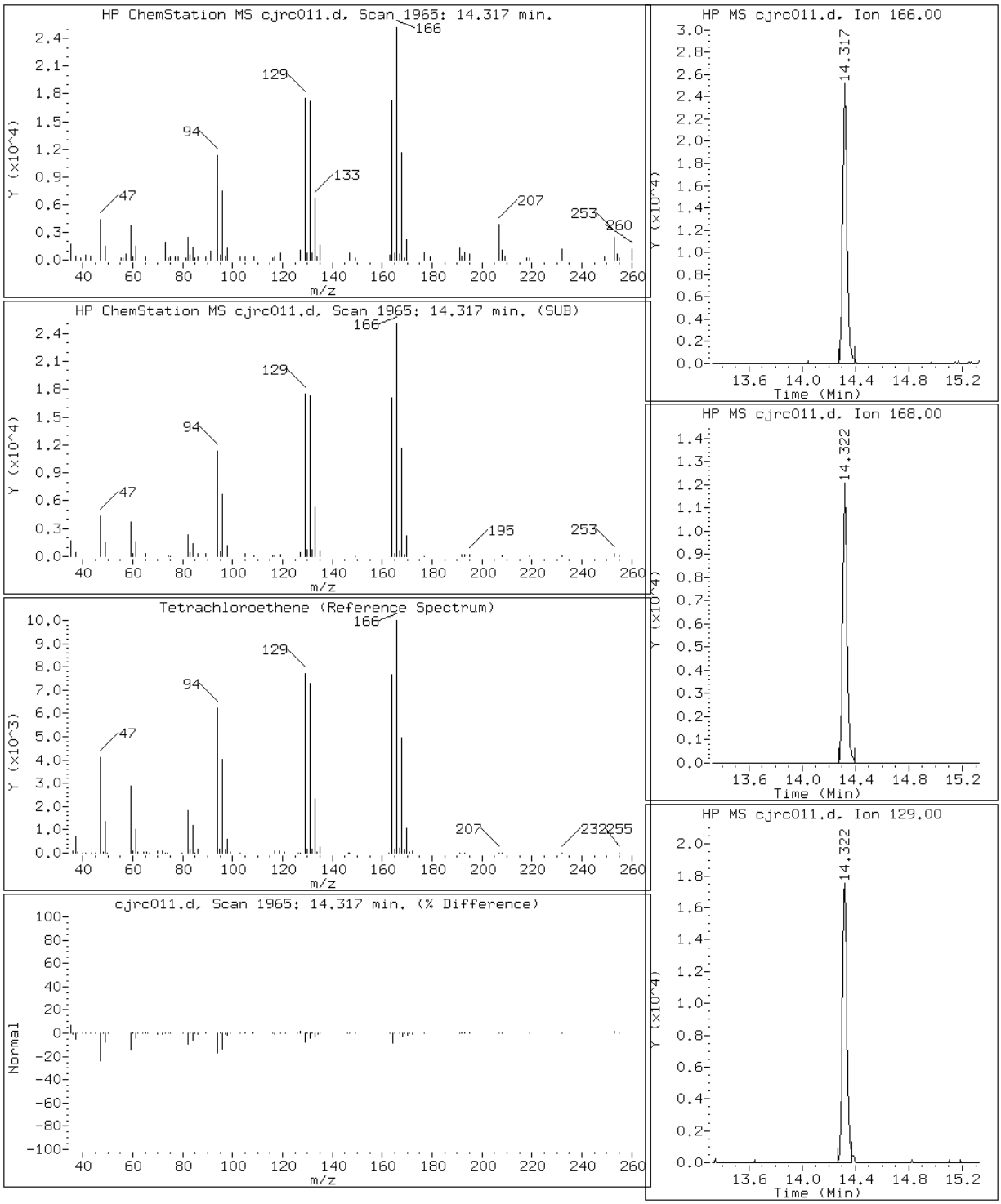
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Lab Sample ID: 200-4315-2 Date: 26-MAR-2011 01:59

Client ID: SVE-SP2 Instrument: C.i

Sample Info: 200-4315-A-2@754.12 Operator: sv

61 Tetrachloroethene



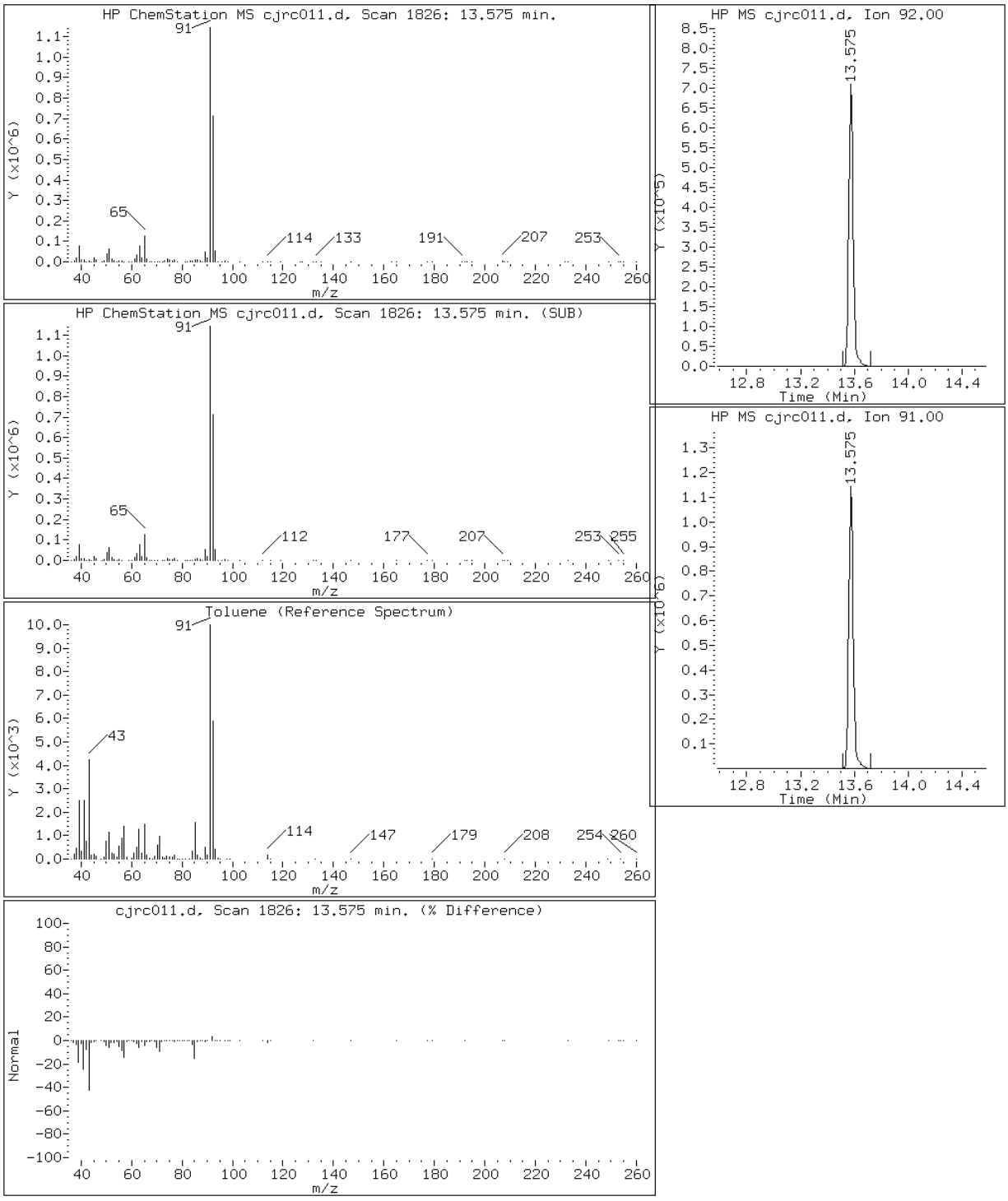
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Lab Sample ID: 200-4315-2 Date: 26-MAR-2011 01:59

Client ID: SVE-SP2 Instrument: C.i

Sample Info: 200-4315-A-2@754.12 Operator: sv

58 Toluene



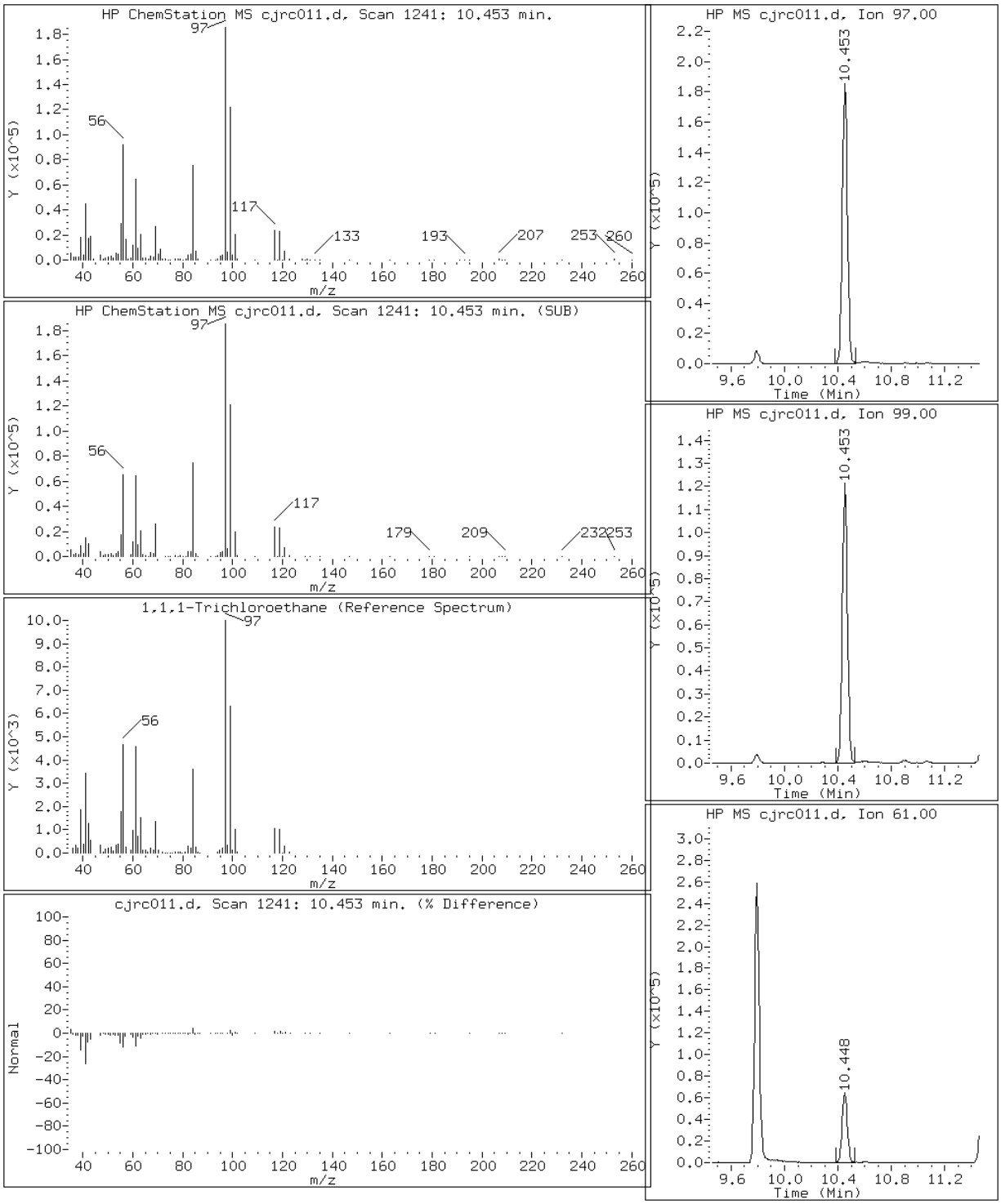
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Lab Sample ID: 200-4315-2 Date: 26-MAR-2011 01:59

Client ID: SVE-SP2 Instrument: C.i

Sample Info: 200-4315-A-2@754.12 Operator: sv

41 1,1,1-Trichloroethane



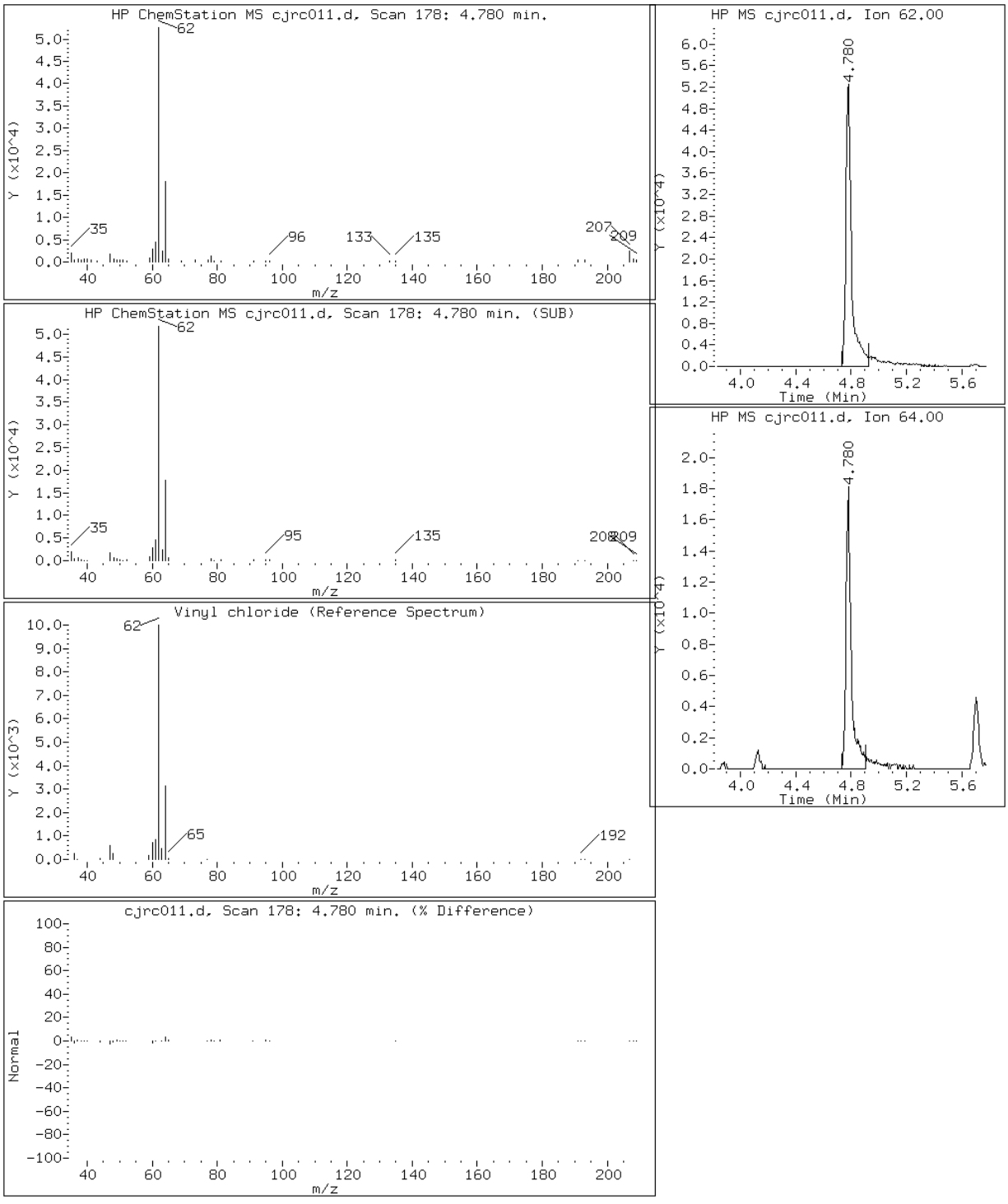
Data File: cjrc011.d

Lab Sample ID: 200-4315-2 Date: 26-MAR-2011 01:59

Client ID: SVE-SP2 Instrument: C.i

Sample Info: 200-4315-A-2@754.12 Operator: sv

7 Vinyl chloride



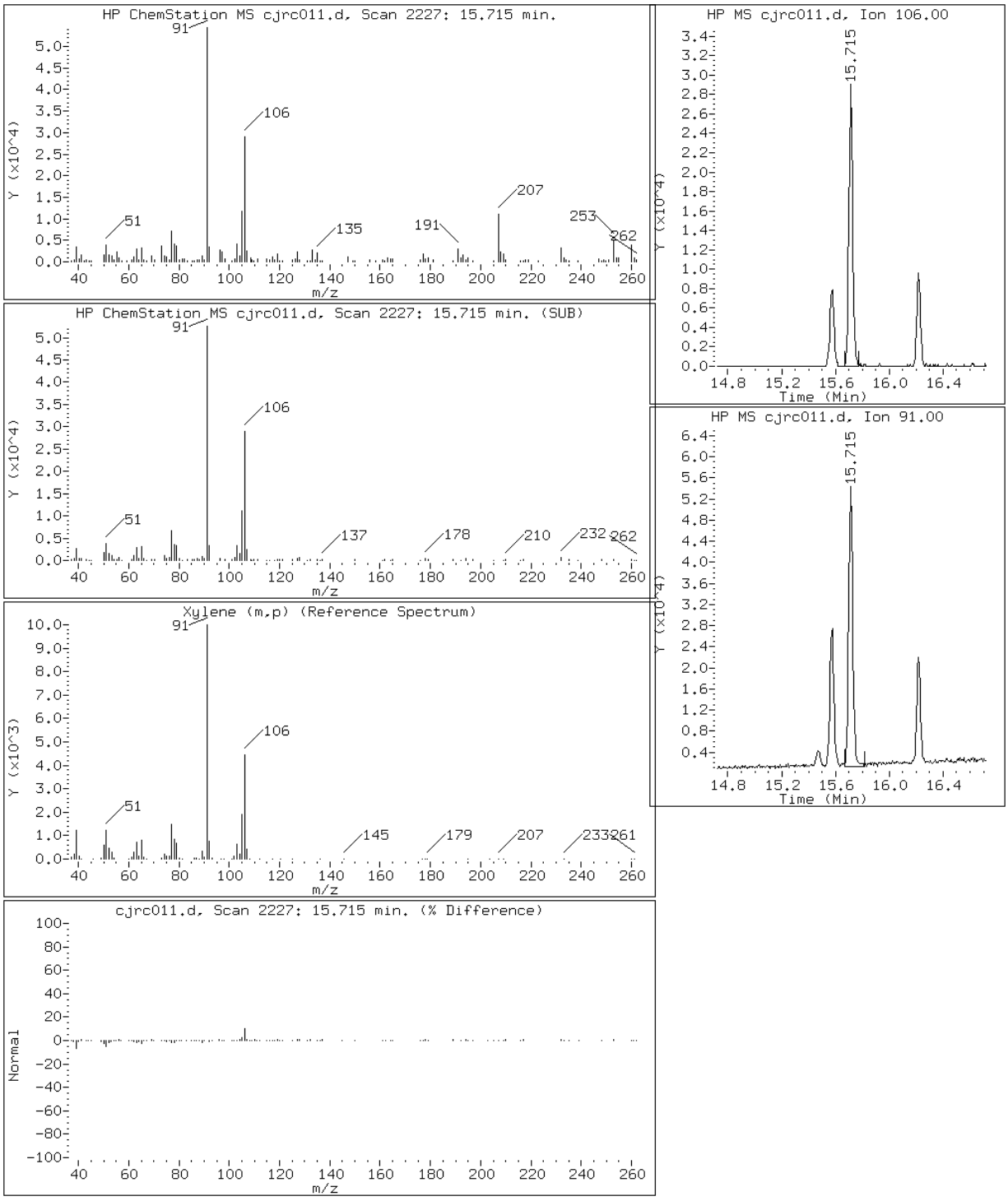
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Lab Sample ID: 200-4315-2 Date: 26-MAR-2011 01:59

Client ID: SVE-SP2 Instrument: C.i

Sample Info: 200-4315-A-2@754.12 Operator: sv

69 Xylene (m,p)



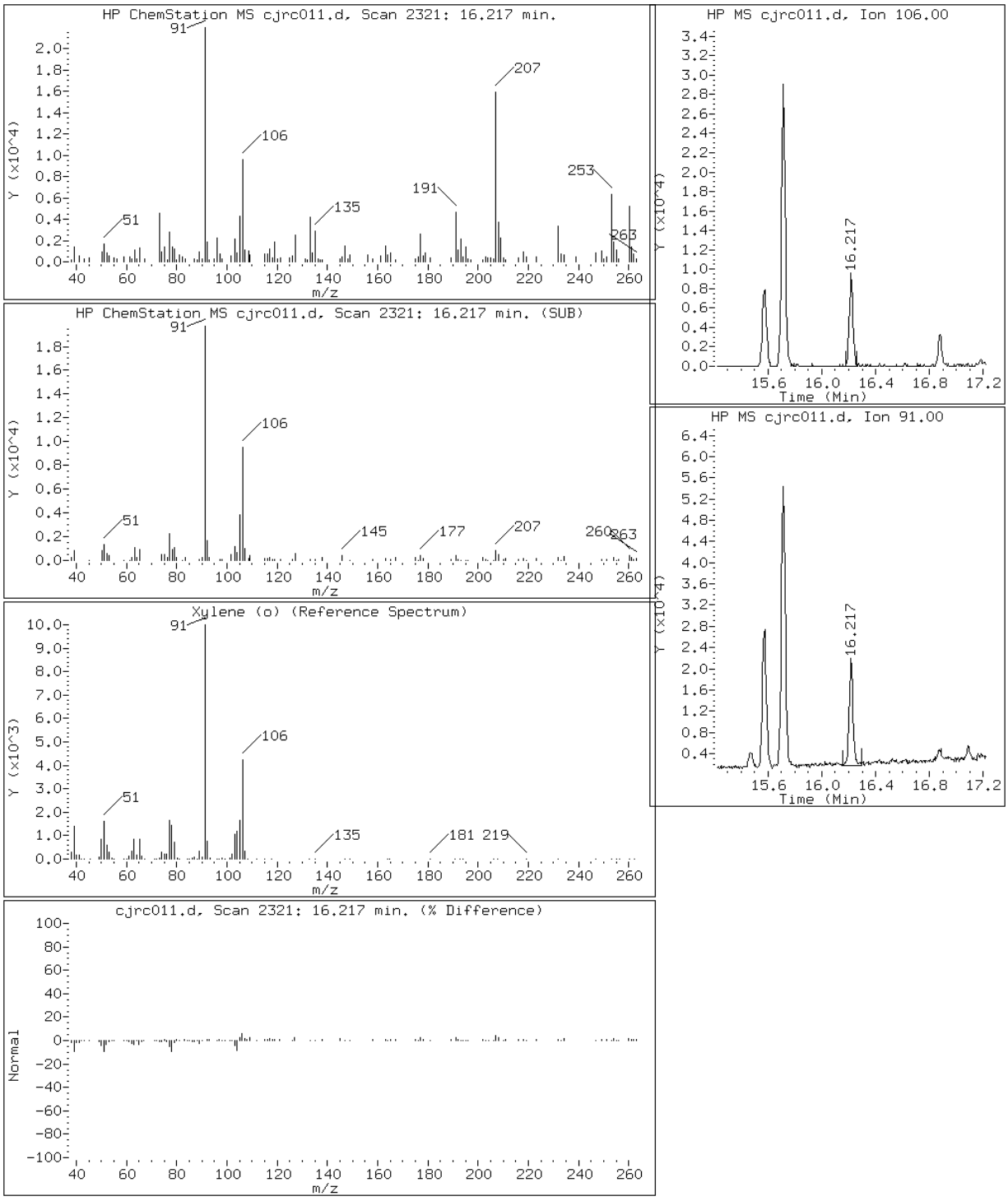
Data File: cjrc011.d

Lab Sample ID: 200-4315-2 Date: 26-MAR-2011 01:59

Client ID: SVE-SP2 Instrument: C.i

Sample Info: 200-4315-A-2@754.12 Operator: sv

71 Xylene (o)



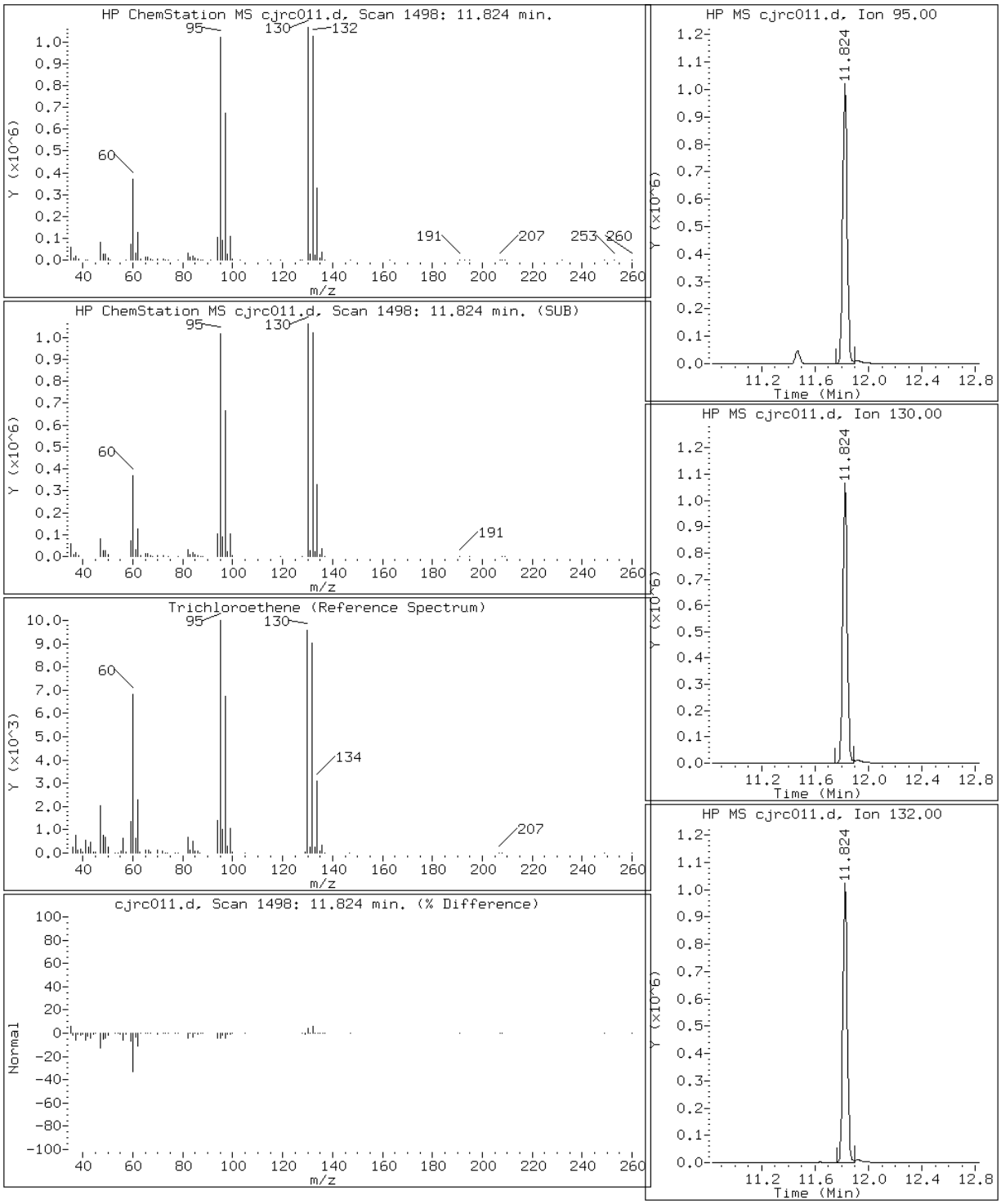
Data File: cjrc011.d

Lab Sample ID: 200-4315-2 Date: 26-MAR-2011 01:59

Client ID: SVE-SP2 Instrument: C.i

Sample Info: 200-4315-A-2@754.12 Operator: sv

49 Trichloroethene



FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Client Sample ID: SVE-SP3 Lab Sample ID: 200-4315-3

Matrix: Air Lab File ID: cjrc012.d

Analysis Method: TO-15 Date Collected: 03/09/2011 16:39

Sample wt/vol: 200(mL) Date Analyzed: 03/26/2011 02:47

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-624 ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 15760 Units: ppb v/v

CAS NO.	COMPOUND NAME	MOLECULAR WEIGHT	RESULT	Q	RL	RL
71-43-2	Benzene	78.11	0.20	U	0.20	0.20
75-25-2	Bromoform	252.75	0.20	U	0.20	0.20
74-83-9	Bromomethane	94.94	0.20	U	0.20	0.20
75-15-0	Carbon disulfide	76.14	0.50	U	0.50	0.50
56-23-5	Carbon tetrachloride	153.81	0.20	U	0.20	0.20
108-90-7	Chlorobenzene	112.30	0.20	U	0.20	0.20
75-00-3	Chloroethane	64.52	0.50	U	0.50	0.50
67-66-3	Chloroform	119.38	0.20	U	0.20	0.20
74-87-3	Chloromethane	50.49	4.4		0.50	0.50
106-46-7	1,4-Dichlorobenzene	147.00	0.20	U	0.20	0.20
75-34-3	1,1-Dichloroethane	98.96	0.20	U	0.20	0.20
107-06-2	1,2-Dichloroethane	98.96	0.20	U	0.20	0.20
75-35-4	1,1-Dichloroethene	96.94	0.20	U	0.20	0.20
78-87-5	1,2-Dichloropropane	112.99	0.20	U	0.20	0.20
123-91-1	1,4-Dioxane	88.11	5.0	U	5.0	5.0
100-41-4	Ethylbenzene	106.17	0.20	U	0.20	0.20
87-68-3	Hexachlorobutadiene	260.76	0.20	U	0.20	0.20
75-09-2	Methylene Chloride	84.93	0.50	U	0.50	0.50
91-20-3	Naphthalene	128.17	0.50	U	0.50	0.50
100-42-5	Styrene	104.15	0.20	U	0.20	0.20
79-34-5	1,1,2,2-Tetrachloroethane	167.85	0.20	U	0.20	0.20
127-18-4	Tetrachloroethene	165.83	0.20	U	0.20	0.20
108-88-3	Toluene	92.14	0.63		0.20	0.20
120-82-1	1,2,4-Trichlorobenzene	181.45	0.50	U	0.50	0.50
71-55-6	1,1,1-Trichloroethane	133.41	0.20	U	0.20	0.20
79-00-5	1,1,2-Trichloroethane	133.41	0.20	U	0.20	0.20
75-01-4	Vinyl chloride	62.50	0.20	U	0.20	0.20
1330-20-7	Xylene (total)	106.17	0.20	U	0.20	0.20
79-01-6	Trichloroethene	131.39	1.1		0.20	0.20

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Client Sample ID: SVE-SP3 Lab Sample ID: 200-4315-3

Matrix: Air Lab File ID: cjrc012.d

Analysis Method: TO-15 Date Collected: 03/09/2011 16:39

Sample wt/vol: 200(mL) Date Analyzed: 03/26/2011 02:47

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-624 ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 15760 Units: ug/m3

CAS NO.	COMPOUND NAME	MOLECULAR WEIGHT	RESULT	Q	RL	RL
71-43-2	Benzene	78.11	0.64	U	0.64	0.64
75-25-2	Bromoform	252.75	2.1	U	2.1	2.1
74-83-9	Bromomethane	94.94	0.78	U	0.78	0.78
75-15-0	Carbon disulfide	76.14	1.6	U	1.6	1.6
56-23-5	Carbon tetrachloride	153.81	1.3	U	1.3	1.3
108-90-7	Chlorobenzene	112.30	0.92	U	0.92	0.92
75-00-3	Chloroethane	64.52	1.3	U	1.3	1.3
67-66-3	Chloroform	119.38	0.98	U	0.98	0.98
74-87-3	Chloromethane	50.49	9.0		1.0	1.0
106-46-7	1,4-Dichlorobenzene	147.00	1.2	U	1.2	1.2
75-34-3	1,1-Dichloroethane	98.96	0.81	U	0.81	0.81
107-06-2	1,2-Dichloroethane	98.96	0.81	U	0.81	0.81
75-35-4	1,1-Dichloroethene	96.94	0.79	U	0.79	0.79
78-87-5	1,2-Dichloropropane	112.99	0.92	U	0.92	0.92
123-91-1	1,4-Dioxane	88.11	18	U	18	18
100-41-4	Ethylbenzene	106.17	0.87	U	0.87	0.87
87-68-3	Hexachlorobutadiene	260.76	2.1	U	2.1	2.1
75-09-2	Methylene Chloride	84.93	1.7	U	1.7	1.7
91-20-3	Naphthalene	128.17	2.6	U	2.6	2.6
100-42-5	Styrene	104.15	0.85	U	0.85	0.85
79-34-5	1,1,2,2-Tetrachloroethane	167.85	1.4	U	1.4	1.4
127-18-4	Tetrachloroethene	165.83	1.4	U	1.4	1.4
108-88-3	Toluene	92.14	2.4		0.75	0.75
120-82-1	1,2,4-Trichlorobenzene	181.45	3.7	U	3.7	3.7
71-55-6	1,1,1-Trichloroethane	133.41	1.1	U	1.1	1.1
79-00-5	1,1,2-Trichloroethane	133.41	1.1	U	1.1	1.1
75-01-4	Vinyl chloride	62.50	0.51	U	0.51	0.51
1330-20-7	Xylene (total)	106.17	0.87	U	0.87	0.87
79-01-6	Trichloroethene	131.39	5.8		1.1	1.1

TestAmerica Burlington

AIR TOXICS QUANTITATION REPORT

Lab Sample Id: 200-4315-3
Client Smp ID: SVE-SP3
Inj Date : 26-MAR-2011 02:47
Operator : sv Inst ID: C.i
Smp Info : 200-4315-A-3
Misc Info : 200,1, to15all
Comment :
Method : /chem/C.i/Csvr.p/cjrcto15.b/to15v5.m
Meth Date : 30-Mar-2011 09:16 klp Quant Type: ISTD
Cal Date : 22-MAR-2011 22:39 Cal File: cjr009.d
Als bottle: 9
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: all74.sub
Target Version: 3.50
Processing Host: chemsvr6

Concentration Formula: Amt * DF * Uf*(Vo/Vo)*(Vf/Vf) * CpndVariable

Name	Value	Description
DF	1.00000	Dilution Factor
Uf	1.00000	ng unit correction factor
Vo	200.00000	Sample Volume purged (mL)
Vf	200.00000	Final Volume (mL)

Cpnd Variable Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	FINAL (ppb v/v)
2 Dichlorodifluoromethane	85	Compound Not Detected.					
3 Chlorodifluoromethane	51	4.150	4.145	(0.409)	19039158	239.394	240(A)
4 1,2-Dichloro-1,1,2,2-tetraflu	85	Compound Not Detected.					
5 Chloromethane	50	4.540	4.534	(0.447)	193875	4.37909	4.4
6 Butane	43	Compound Not Detected.					
7 Vinyl chloride	62	Compound Not Detected.					
8 1,3-Butadiene	54	Compound Not Detected.					
9 Bromomethane	94	Compound Not Detected.					
10 Chloroethane	64	Compound Not Detected.					
12 Vinyl bromide	106	Compound Not Detected.					
13 Trichlorofluoromethane	101	Compound Not Detected.					
17 1,1,2-Trichloro-1,2,2-trifluo	101	Compound Not Detected.					
19 1,1-Dichloroethene	96	Compound Not Detected.					
20 Acetone	43	Compound Not Detected.					

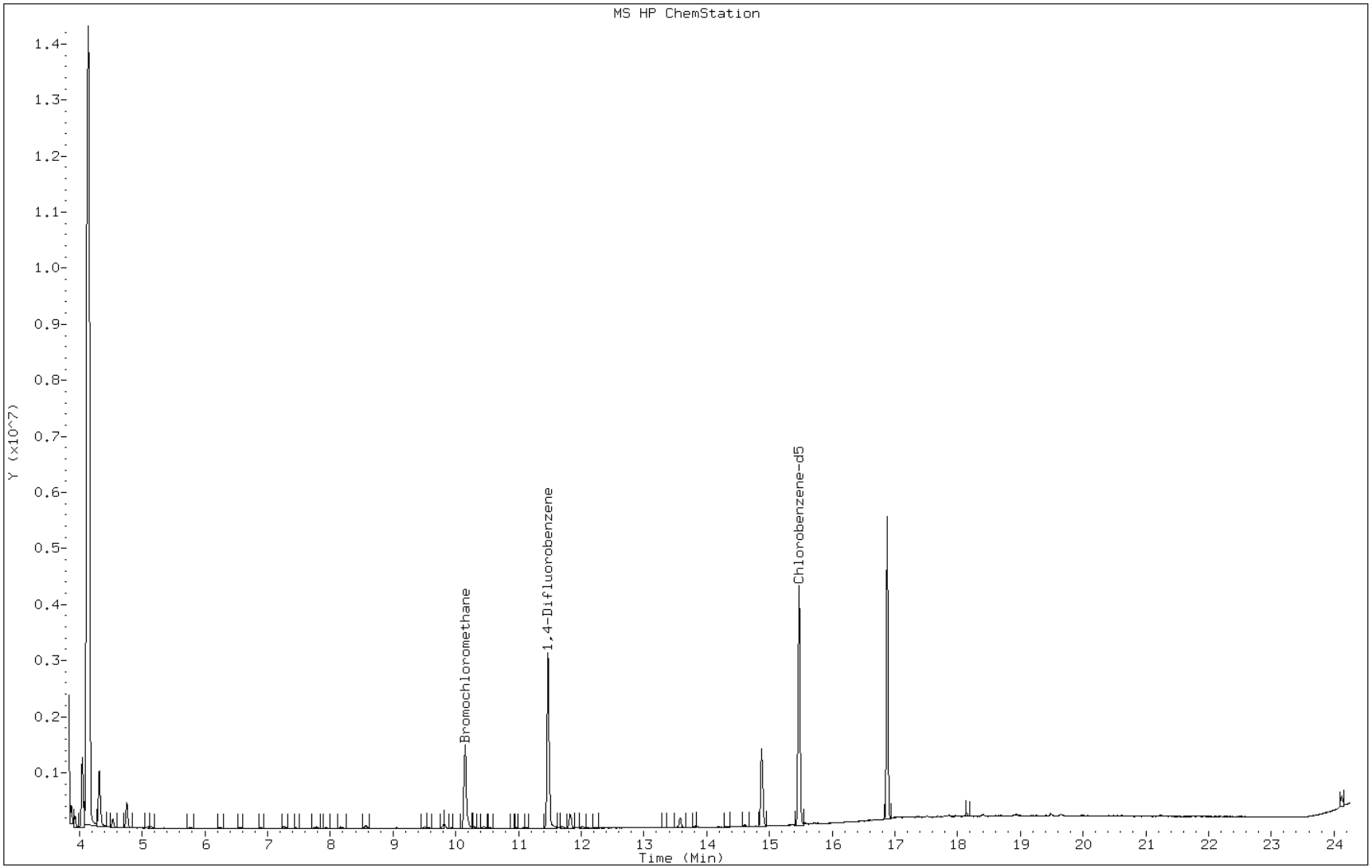
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	FINAL (ppb v/v)
	21 Carbon disulfide	76	Compound Not Detected.					
	22 Isopropanol	45	Compound Not Detected.					
	23 Allyl chloride	41	Compound Not Detected.					
	25 Methylene chloride	49	7.929	7.929	(0.781)	8100	0.13593	0.14(a)
	26 Tert-butyl alcohol	59	Compound Not Detected.					
	27 Methyl tert-butyl ether	73	Compound Not Detected.					
	28 1,2-Dichloroethene (trans)	61	Compound Not Detected.					
	30 n-Hexane	57	8.564	8.564	(0.844)	37033	0.38831	0.39
	31 1,1-Dichloroethane	63	Compound Not Detected.					
M	33 1,2-Dichloroethene,Total	61				34179	0.44904	0.45
	34 1,2-Dichloroethene (cis)	96	9.802	9.802	(0.966)	34179	0.44904	0.45
	36 Methyl Ethyl Ketone	72	9.823	9.802	(0.968)	23082	0.74561	0.75(Q)
*	37 Bromochloromethane	128	10.149	10.154	(1.000)	621929	10.0000	
	38 Tetrahydrofuran	42	Compound Not Detected.					
	39 Chloroform	83	Compound Not Detected.					
	40 Cyclohexane	84	10.453	10.464	(0.911)	8014	0.07690	0.077(a)
	41 1,1,1-Trichloroethane	97	10.453	10.458	(0.911)	15118	0.09933	0.099(a)
	42 Carbon tetrachloride	117	Compound Not Detected.					
	43 2,2,4-Trimethylpentane	57	Compound Not Detected.					
	44 Benzene	78	10.965	10.965	(0.956)	10222	0.04391	0.044(a)
	45 1,2-Dichloroethane	62	Compound Not Detected.					
	46 n-Heptane	43	11.125	11.131	(0.970)	10514	0.11065	0.11(a)
*	47 1,4-Difluorobenzene	114	11.472	11.478	(1.000)	3510937	10.0000	
	49 Trichloroethene	95	11.824	11.830	(1.031)	110742	1.07647	1.1
	50 1,2-Dichloropropane	63	Compound Not Detected.					
	51 Methyl methacrylate	69	Compound Not Detected.					
	53 1,4-Dioxane	88	Compound Not Detected.					
	54 Bromodichloromethane	83	Compound Not Detected.					
	55 1,3-Dichloropropene (cis)	75	Compound Not Detected.					
	56 Methyl isobutyl ketone	43	Compound Not Detected.					
	58 Toluene	92	13.575	13.580	(0.878)	111259	0.62512	0.63
	59 1,3-Dichloropropene (trans)	75	Compound Not Detected.					
	60 1,1,2-Trichloroethane	83	Compound Not Detected.					
	61 Tetrachloroethene	166	Compound Not Detected.					
	62 2-Hexanone	43	Compound Not Detected.					
	63 Dibromochloromethane	129	Compound Not Detected.					
	64 1,2-Dibromoethane	107	Compound Not Detected.					
*	65 Chlorobenzene-d5	117	15.470	15.480	(1.000)	3220506	10.0000	
	66 Chlorobenzene	112	Compound Not Detected.					
	68 Ethylbenzene	91	Compound Not Detected.					
	69 Xylene (m,p)	106	Compound Not Detected.					
M	70 Xylenes, Total	106	Compound Not Detected.					
	71 Xylene (o)	106	Compound Not Detected.					
	72 Styrene	104	Compound Not Detected.					
	73 Bromoform	173	Compound Not Detected.					
	74 Isopropylbenzene	105	Compound Not Detected.					
	75 1,1,2,2-Tetrachloroethane	83	Compound Not Detected.					

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	FINAL (ppb v/v)
76 n-Propylbenzene	91	Compound Not Detected.					
79 4-Ethyltoluene	105	Compound Not Detected.					
80 2-Chlorotoluene	91	Compound Not Detected.					
81 1,3,5-Trimethylbenzene	105	Compound Not Detected.					
83 tert-butylbenzene	119	Compound Not Detected.					
84 1,2,4-Trimethylbenzene	105	Compound Not Detected.					
85 sec-Butylbenzene	105	Compound Not Detected.					
86 4-Isopropyltoluene	119	Compound Not Detected.					
87 1,3-Dichlorobenzene	146	Compound Not Detected.					
88 1,4-Dichlorobenzene	146	Compound Not Detected.					
89 Benzyl chloride	91	Compound Not Detected.					
91 n-Butylbenzene	91	Compound Not Detected.					
92 1,2-Dichlorobenzene	146	Compound Not Detected.					
94 1,2,4-Trichlorobenzene	180	Compound Not Detected.					
95 1,3-Hexachlorobutadiene	225	Compound Not Detected.					
96 Naphthalene	128	Compound Not Detected.					

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
A - Target compound detected but, quantitated amount
exceeded maximum amount.
Q - Qualifier signal failed the ratio test.

Data File:	cjrc012.d	Date:	26-MAR-2011 02:47
Client ID:	SVE-SP3	Instrument:	C.i
Operator:	sv	Inj Vol:	200.0
Column Type:	Capillary	Diameter:	0.32
Stationary Phase:	RTX-624		
Sample Info:	200-4315-A-3		
Lab Sample ID:	200-4315-3		



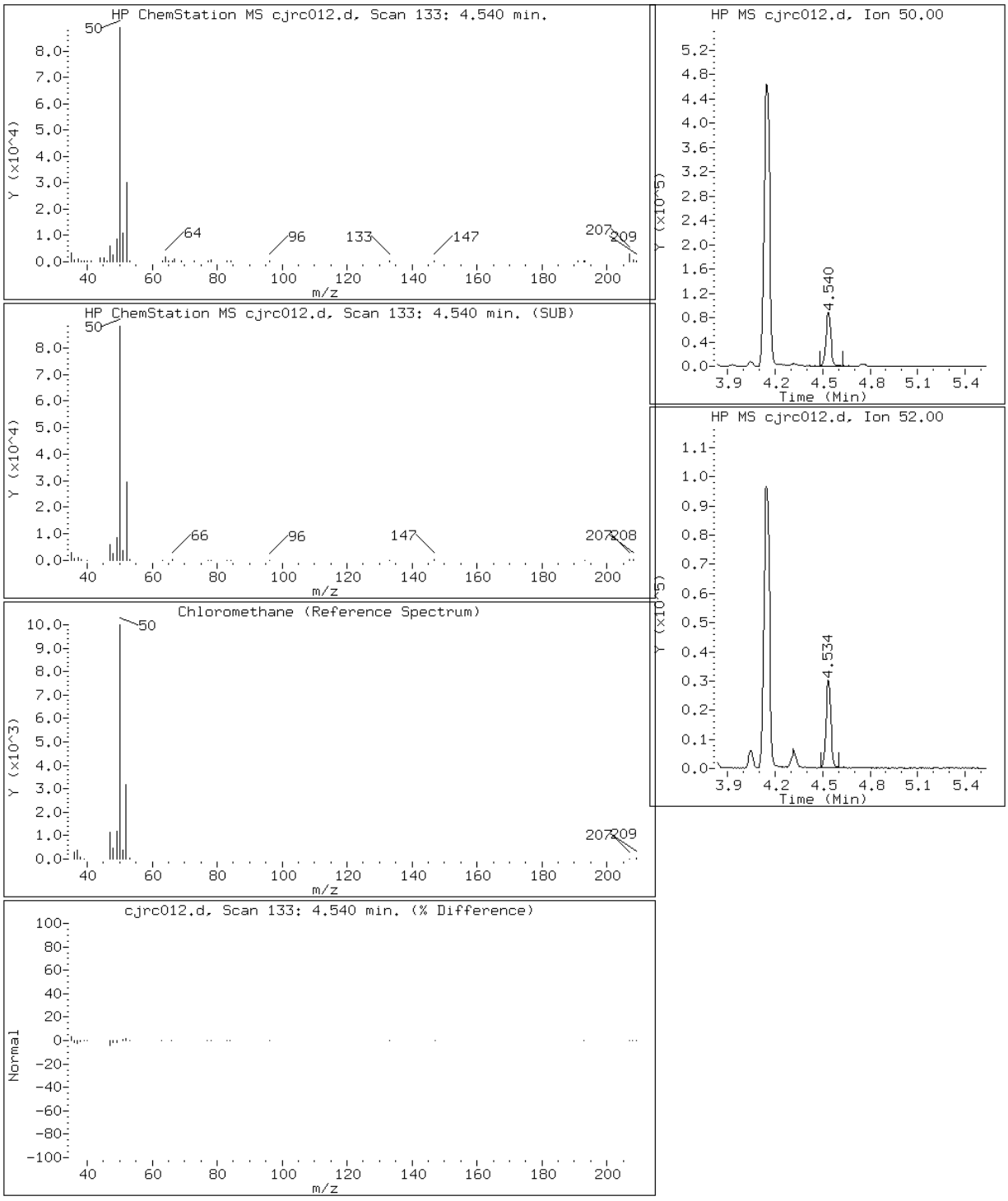
Data File: cjrc012.d

Lab Sample ID: 200-4315-3 Date: 26-MAR-2011 02:47

Client ID: SVE-SP3 Instrument: C.i

Sample Info: 200-4315-A-3 Operator: sv

5 Chloromethane



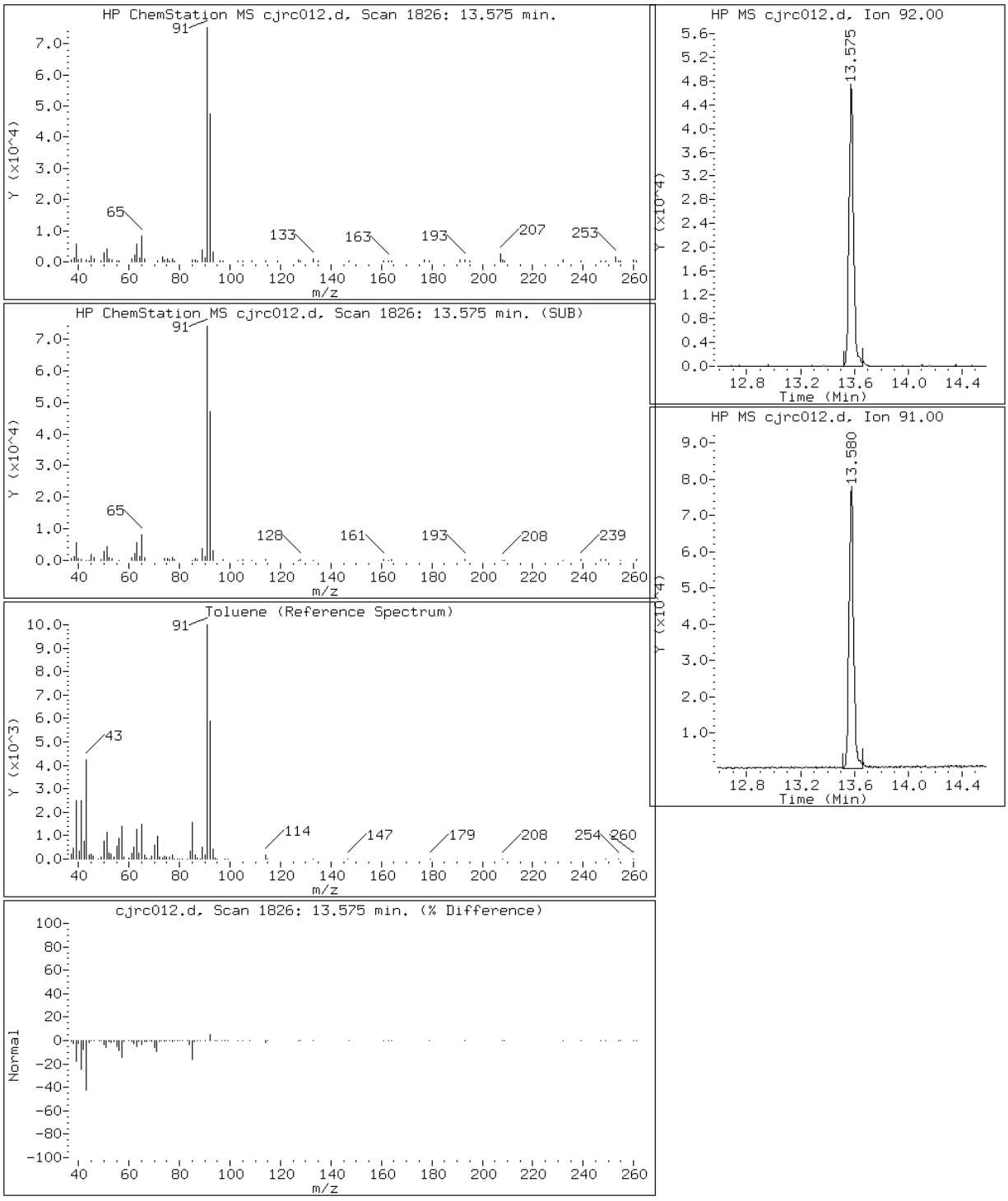
Data File: cjrc012.d

Lab Sample ID: 200-4315-3 Date: 26-MAR-2011 02:47

Client ID: SVE-SP3 Instrument: C.i

Sample Info: 200-4315-A-3 Operator: sv

58 Toluene



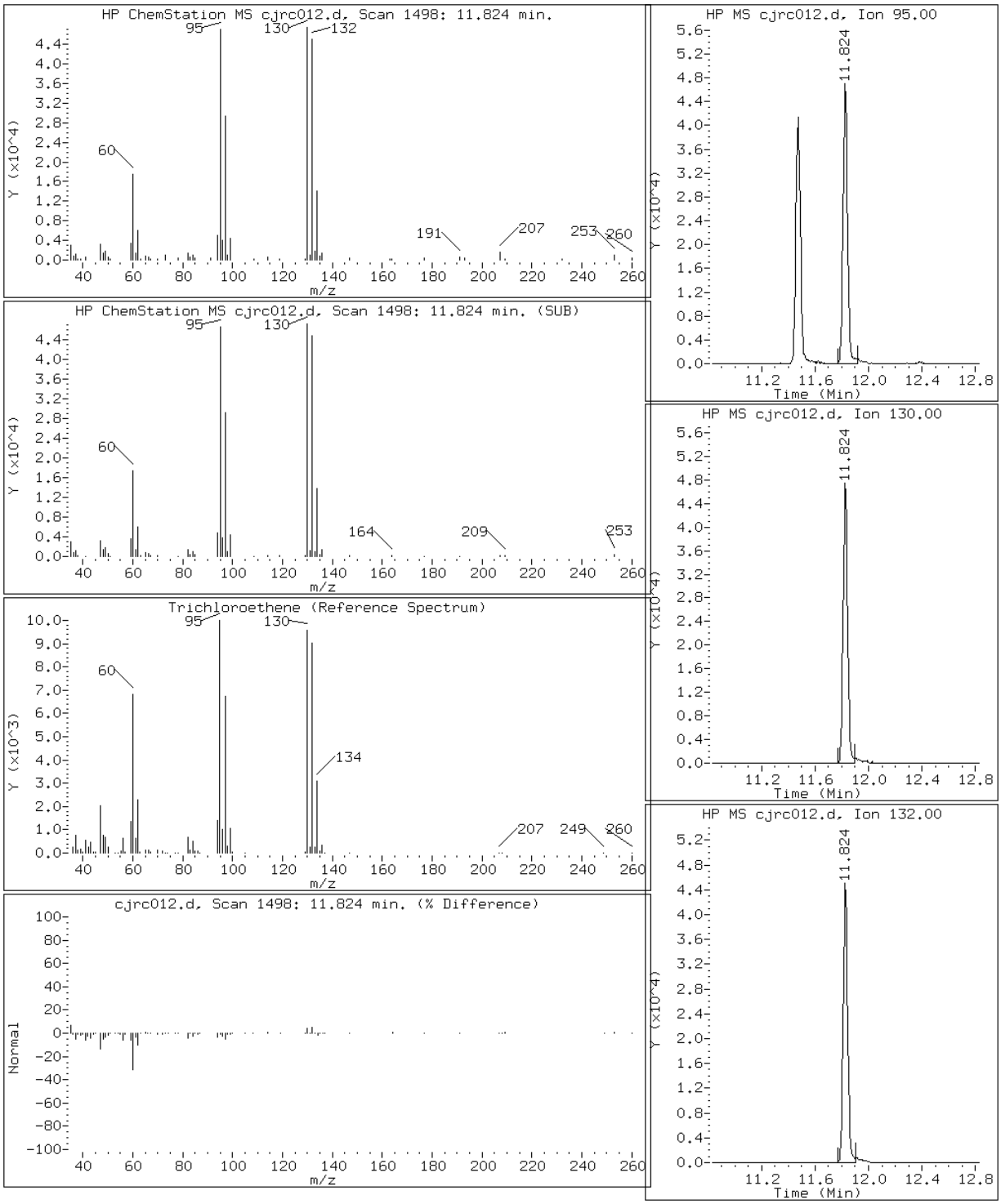
Data File: cjrc012.d

Lab Sample ID: 200-4315-3 Date: 26-MAR-2011 02:47

Client ID: SVE-SP3 Instrument: C.i

Sample Info: 200-4315-A-3 Operator: sv

49 Trichloroethene



FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Client Sample ID: AS-SP1 Lab Sample ID: 200-4315-4

Matrix: Air Lab File ID: cjrc013.d

Analysis Method: TO-15 Date Collected: 03/15/2011 15:55

Sample wt/vol: 40(mL) Date Analyzed: 03/26/2011 03:36

Soil Aliquot Vol: Dilution Factor: 14000

Soil Extract Vol.: GC Column: RTX-624 ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 15760 Units: ppb v/v

CAS NO.	COMPOUND NAME	MOLECULAR WEIGHT	RESULT	Q	RL	RL
71-43-2	Benzene	78.11	4600		2800	2800
75-25-2	Bromoform	252.75	2800	U	2800	2800
74-83-9	Bromomethane	94.94	2800	U	2800	2800
75-15-0	Carbon disulfide	76.14	7000	U	7000	7000
56-23-5	Carbon tetrachloride	153.81	2800	U	2800	2800
108-90-7	Chlorobenzene	112.30	2800	U	2800	2800
75-00-3	Chloroethane	64.52	9900		7000	7000
67-66-3	Chloroform	119.38	2800	U	2800	2800
74-87-3	Chloromethane	50.49	7000	U	7000	7000
106-46-7	1,4-Dichlorobenzene	147.00	2800	U	2800	2800
75-34-3	1,1-Dichloroethane	98.96	19000		2800	2800
107-06-2	1,2-Dichloroethane	98.96	2800	U	2800	2800
75-35-4	1,1-Dichloroethene	96.94	2800	U	2800	2800
78-87-5	1,2-Dichloropropane	112.99	2800	U	2800	2800
123-91-1	1,4-Dioxane	88.11	70000	U	70000	70000
100-41-4	Ethylbenzene	106.17	4800		2800	2800
87-68-3	Hexachlorobutadiene	260.76	2800	U	2800	2800
75-09-2	Methylene Chloride	84.93	13000		7000	7000
91-20-3	Naphthalene	128.17	7000	U	7000	7000
100-42-5	Styrene	104.15	2800	U	2800	2800
79-34-5	1,1,2,2-Tetrachloroethane	167.85	2800	U	2800	2800
127-18-4	Tetrachloroethene	165.83	9800		2800	2800
108-88-3	Toluene	92.14	200000		2800	2800
120-82-1	1,2,4-Trichlorobenzene	181.45	7000	U	7000	7000
71-55-6	1,1,1-Trichloroethane	133.41	81000		2800	2800
79-00-5	1,1,2-Trichloroethane	133.41	2800	U	2800	2800
75-01-4	Vinyl chloride	62.50	39000		2800	2800
1330-20-7	Xylene (total)	106.17	17000		2800	2800
79-01-6	Trichloroethene	131.39	260000		2800	2800

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Client Sample ID: AS-SP1 Lab Sample ID: 200-4315-4

Matrix: Air Lab File ID: cjrc013.d

Analysis Method: TO-15 Date Collected: 03/15/2011 15:55

Sample wt/vol: 40(mL) Date Analyzed: 03/26/2011 03:36

Soil Aliquot Vol: Dilution Factor: 14000

Soil Extract Vol.: GC Column: RTX-624 ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 15760 Units: ug/m3

CAS NO.	COMPOUND NAME	MOLECULAR WEIGHT	RESULT	Q	RL	RL
71-43-2	Benzene	78.11	15000		8900	8900
75-25-2	Bromoform	252.75	29000	U	29000	29000
74-83-9	Bromomethane	94.94	11000	U	11000	11000
75-15-0	Carbon disulfide	76.14	22000	U	22000	22000
56-23-5	Carbon tetrachloride	153.81	18000	U	18000	18000
108-90-7	Chlorobenzene	112.30	13000	U	13000	13000
75-00-3	Chloroethane	64.52	26000		18000	18000
67-66-3	Chloroform	119.38	14000	U	14000	14000
74-87-3	Chloromethane	50.49	14000	U	14000	14000
106-46-7	1,4-Dichlorobenzene	147.00	17000	U	17000	17000
75-34-3	1,1-Dichloroethane	98.96	77000		11000	11000
107-06-2	1,2-Dichloroethane	98.96	11000	U	11000	11000
75-35-4	1,1-Dichloroethene	96.94	11000	U	11000	11000
78-87-5	1,2-Dichloropropane	112.99	13000	U	13000	13000
123-91-1	1,4-Dioxane	88.11	250000	U	250000	250000
100-41-4	Ethylbenzene	106.17	21000		12000	12000
87-68-3	Hexachlorobutadiene	260.76	30000	U	30000	30000
75-09-2	Methylene Chloride	84.93	46000		24000	24000
91-20-3	Naphthalene	128.17	37000	U	37000	37000
100-42-5	Styrene	104.15	12000	U	12000	12000
79-34-5	1,1,2,2-Tetrachloroethane	167.85	19000	U	19000	19000
127-18-4	Tetrachloroethene	165.83	67000		19000	19000
108-88-3	Toluene	92.14	750000		11000	11000
120-82-1	1,2,4-Trichlorobenzene	181.45	52000	U	52000	52000
71-55-6	1,1,1-Trichloroethane	133.41	440000		15000	15000
79-00-5	1,1,2-Trichloroethane	133.41	15000	U	15000	15000
75-01-4	Vinyl chloride	62.50	100000		7200	7200
1330-20-7	Xylene (total)	106.17	75000		12000	12000
79-01-6	Trichloroethene	131.39	1400000		15000	15000

TestAmerica Burlington

AIR TOXICS QUANTITATION REPORT

Lab Sample Id: 200-4315-4
Client Smp ID: AS-SP1
Inj Date : 26-MAR-2011 03:36
Operator : sv Inst ID: C.i
Smp Info : 200-4315-A-4@2802.02
Misc Info : 40,14000, to15all cdf 2802.02
Comment :
Method : /chem/C.i/Csvr.p/cjrcto15.b/to15v5.m
Meth Date : 29-Mar-2011 20:13 sv Quant Type: ISTD
Cal Date : 22-MAR-2011 22:39 Cal File: cjr009.d
Als bottle: 10
Dil Factor: 14000.00000
Integrator: HP RTE Compound Sublist: all74.sub
Target Version: 3.50
Processing Host: chemsvr6

Concentration Formula: Amt * DF * Uf*(Vo/Vo)*(Vf/Vf) * CpndVariable

Name	Value	Description
DF	14000.00000	Dilution Factor
Uf	1.00000	ng unit correction factor
Vo	40.00000	Sample Volume purged (mL)
Vf	200.00000	Final Volume (mL)

Cpnd Variable Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	FINAL (ppb v/v)
2 Dichlorodifluoromethane	85	Compound Not Detected.					
3 Chlorodifluoromethane	51	Compound Not Detected.					
4 1,2-Dichloro-1,1,2,2-tetraflu	85	Compound Not Detected.					
5 Chloromethane	50	Compound Not Detected.					
6 Butane	43	Compound Not Detected.					
7 Vinyl chloride	62	4.780	4.774	(0.471)	141625	2.79080	39000
8 1,3-Butadiene	54	Compound Not Detected.					
9 Bromomethane	94	Compound Not Detected.					
10 Chloroethane	64	5.703	5.703	(0.562)	21877	0.70811	9900
12 Vinyl bromide	106	Compound Not Detected.					
13 Trichlorofluoromethane	101	Compound Not Detected.					
17 1,1,2-Trichloro-1,2,2-trifluo	101	6.995	7.000	(0.690)	20235	0.17056	2400(a)
19 1,1-Dichloroethene	96	7.075	7.075	(0.697)	10411	0.17876	2500(a)
20 Acetone	43	Compound Not Detected.					

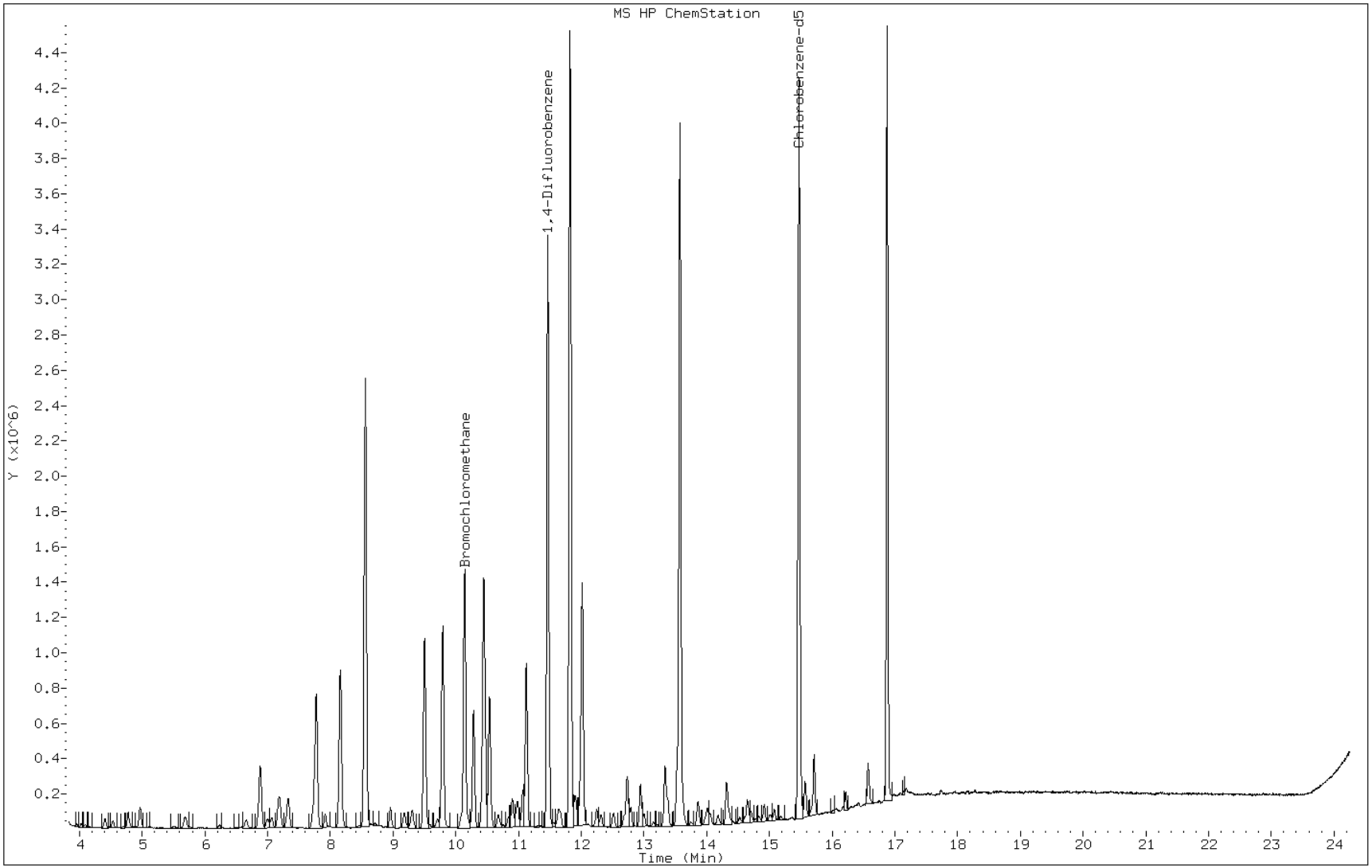
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	FINAL (ppb v/v)
	21 Carbon disulfide	76	Compound Not Detected.					
	22 Isopropanol	45	Compound Not Detected.					
	23 Allyl chloride	41	Compound Not Detected.					
	25 Methylene chloride	49	7.918	7.929	(0.781)	51448	0.94041	13000
	26 Tert-butyl alcohol	59	Compound Not Detected.					
	27 Methyl tert-butyl ether	73	Compound Not Detected.					
	28 1,2-Dichloroethene (trans)	61	Compound Not Detected.					
	30 n-Hexane	57	8.558	8.564	(0.844)	1796007	20.5126	290000
	31 1,1-Dichloroethane	63	8.959	8.969	(0.883)	143708	1.36251	19000
M	33 1,2-Dichloroethene,Total	61				700935	10.0307	140000
	34 1,2-Dichloroethene (cis)	96	9.791	9.802	(0.965)	700935	10.0307	140000
	36 Methyl Ethyl Ketone	72	Compound Not Detected.					
*	37 Bromochloromethane	128	10.143	10.154	(1.000)	570972	10.0000	
	38 Tetrahydrofuran	42	Compound Not Detected.					
	39 Chloroform	83	10.202	10.207	(1.006)	24268	0.18383	2600(a)
	40 Cyclohexane	84	10.453	10.464	(0.912)	246113	2.28564	32000(Q)
	41 1,1,1-Trichloroethane	97	10.447	10.458	(0.911)	914175	5.81302	81000
	42 Carbon tetrachloride	117	Compound Not Detected.					
	43 2,2,4-Trimethylpentane	57	Compound Not Detected.					
	44 Benzene	78	10.960	10.965	(0.956)	78612	0.32683	4600
	45 1,2-Dichloroethane	62	Compound Not Detected.					
	46 n-Heptane	43	11.125	11.131	(0.970)	455941	4.64361	65000
*	47 1,4-Difluorobenzene	114	11.467	11.478	(1.000)	3627806	10.0000	
	49 Trichloroethene	95	11.824	11.830	(1.031)	1952031	18.3636	260000
	50 1,2-Dichloropropane	63	Compound Not Detected.					
	51 Methyl methacrylate	69	12.241	12.230	(1.067)	31569	0.48064	6700(aQ)
	53 1,4-Dioxane	88	Compound Not Detected.					
	54 Bromodichloromethane	83	Compound Not Detected.					
	55 1,3-Dichloropropene (cis)	75	Compound Not Detected.					
	56 Methyl isobutyl ketone	43	Compound Not Detected.					
	58 Toluene	92	13.575	13.580	(0.878)	2464552	14.2514	200000
	59 1,3-Dichloropropene (trans)	75	Compound Not Detected.					
	60 1,1,2-Trichloroethane	83	Compound Not Detected.					
	61 Tetrachloroethene	166	14.317	14.327	(0.925)	94789	0.70047	9800
	62 2-Hexanone	43	Compound Not Detected.					
	63 Dibromochloromethane	129	Compound Not Detected.					
	64 1,2-Dibromoethane	107	Compound Not Detected.					
*	65 Chlorobenzene-d5	117	15.470	15.480	(1.000)	3129183	10.0000	
	66 Chlorobenzene	112	15.512	15.518	(1.003)	23078	0.10418	1500(a)
	68 Ethylbenzene	91	15.571	15.576	(1.007)	107348	0.34343	4800
	69 Xylene (m,p)	106	15.710	15.720	(1.016)	124805	0.96528	14000
M	70 Xylenes, Total	106				160432	1.23177	17000
	71 Xylene (o)	106	16.217	16.222	(1.048)	35627	0.26650	3700
	72 Styrene	104	Compound Not Detected.					
	73 Bromoform	173	Compound Not Detected.					
	74 Isopropylbenzene	105	Compound Not Detected.					
	75 1,1,2,2-Tetrachloroethane	83	Compound Not Detected.					

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	FINAL (ppb v/v)
76 n-Propylbenzene	91	Compound Not Detected.					
79 4-Ethyltoluene	105	Compound Not Detected.					
80 2-Chlorotoluene	91	Compound Not Detected.					
81 1,3,5-Trimethylbenzene	105	Compound Not Detected.					
83 tert-butylbenzene	119	Compound Not Detected.					
84 1,2,4-Trimethylbenzene	105	17.738	17.743	(1.147)	13910	0.05164	720(a)
85 sec-Butylbenzene	105	Compound Not Detected.					
86 4-Isopropyltoluene	119	Compound Not Detected.					
87 1,3-Dichlorobenzene	146	Compound Not Detected.					
88 1,4-Dichlorobenzene	146	18.282	18.287	(1.182)	9652	0.05010	700(a)
89 Benzyl chloride	91	Compound Not Detected.					
91 n-Butylbenzene	91	Compound Not Detected.					
92 1,2-Dichlorobenzene	146	Compound Not Detected.					
94 1,2,4-Trichlorobenzene	180	Compound Not Detected.					
95 1,3-Hexachlorobutadiene	225	Compound Not Detected.					
96 Naphthalene	128	Compound Not Detected.					

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
Q - Qualifier signal failed the ratio test.

Data File:	cjrc013.d	Date:	26-MAR-2011 03:36
Client ID:	AS-SP1	Instrument:	C.i
Operator:	sv	Inj Vol:	200.0
Column Type:	Capillary	Diameter:	0.32
Stationary Phase:	RTX-624		
Sample Info:	200-4315-A-4@2802.02		
Lab Sample ID:	200-4315-4		



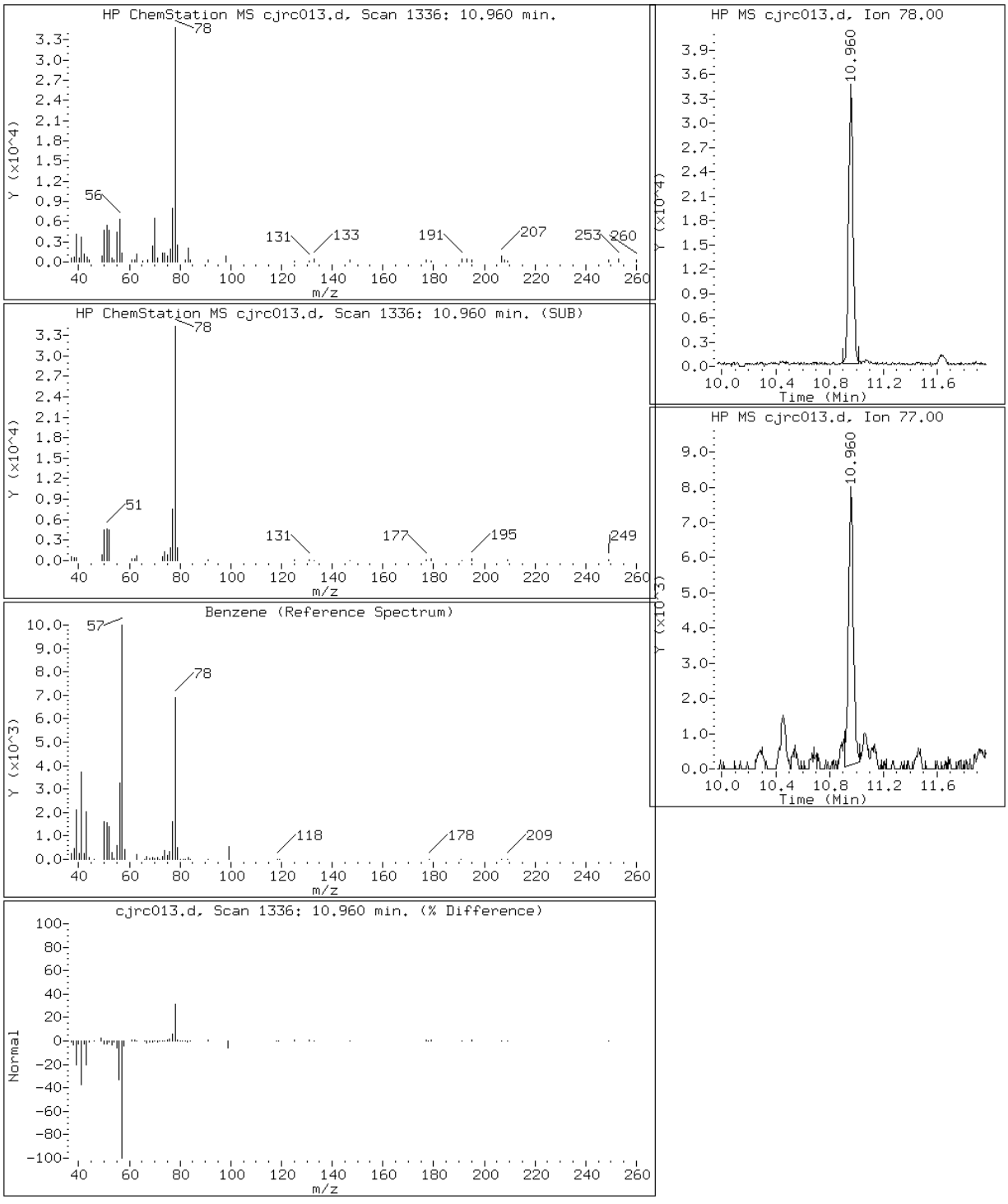
Data File: cjrc013.d

Lab Sample ID: 200-4315-4 Date: 26-MAR-2011 03:36

Client ID: AS-SP1 Instrument: C.i

Sample Info: 200-4315-A-4@2802.02 Operator: sv

44 Benzene



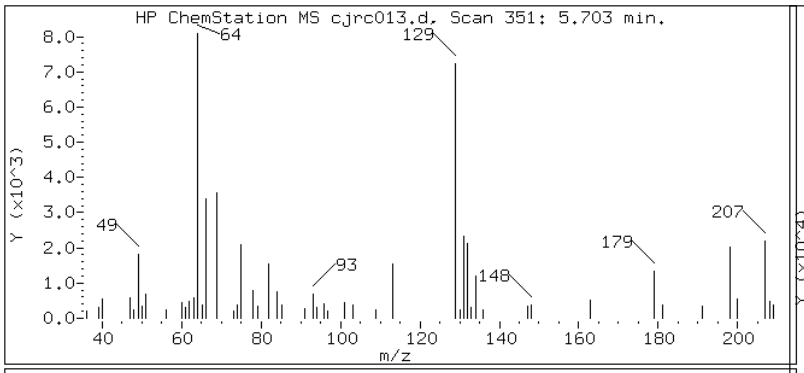
Data File: cjrc013.d

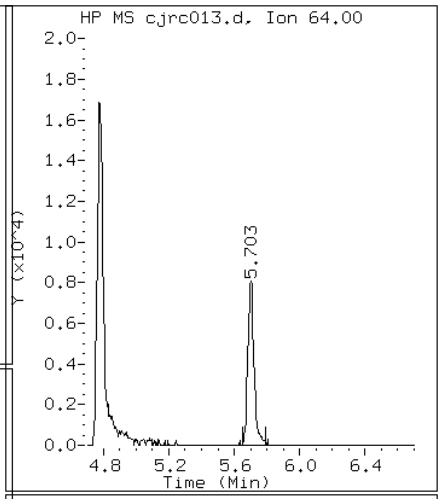
Lab Sample ID: 200-4315-4 Date: 26-MAR-2011 03:36

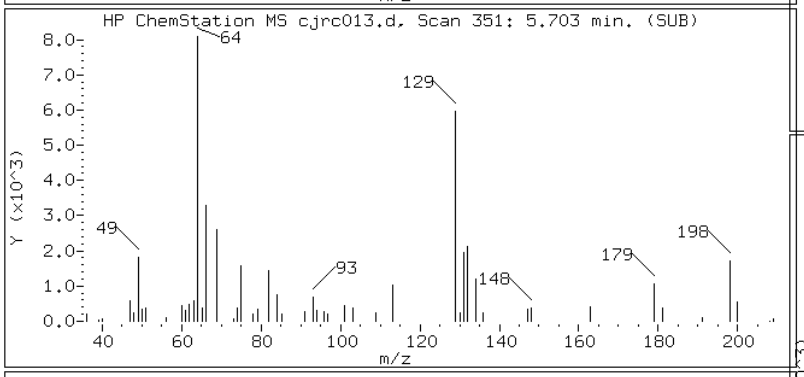
Client ID: AS-SP1 Instrument: C.i

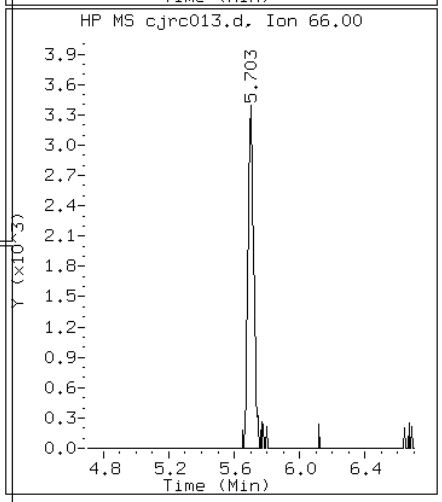
Sample Info: 200-4315-A-4@2802.02 Operator: sv

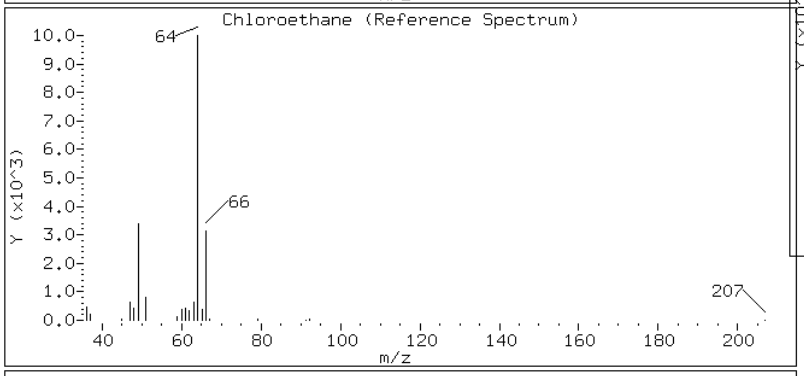
10 Chloroethane

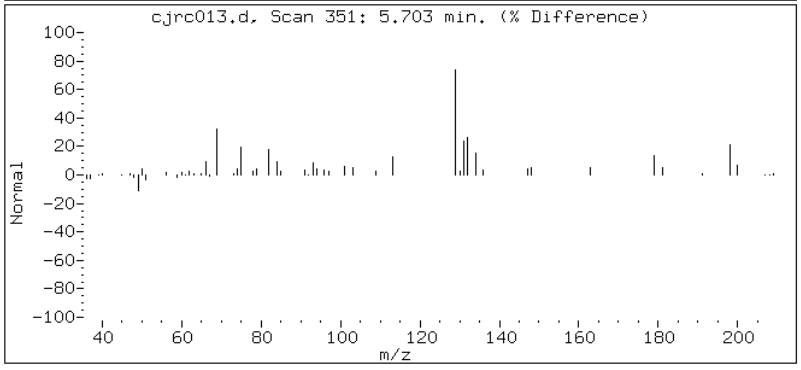












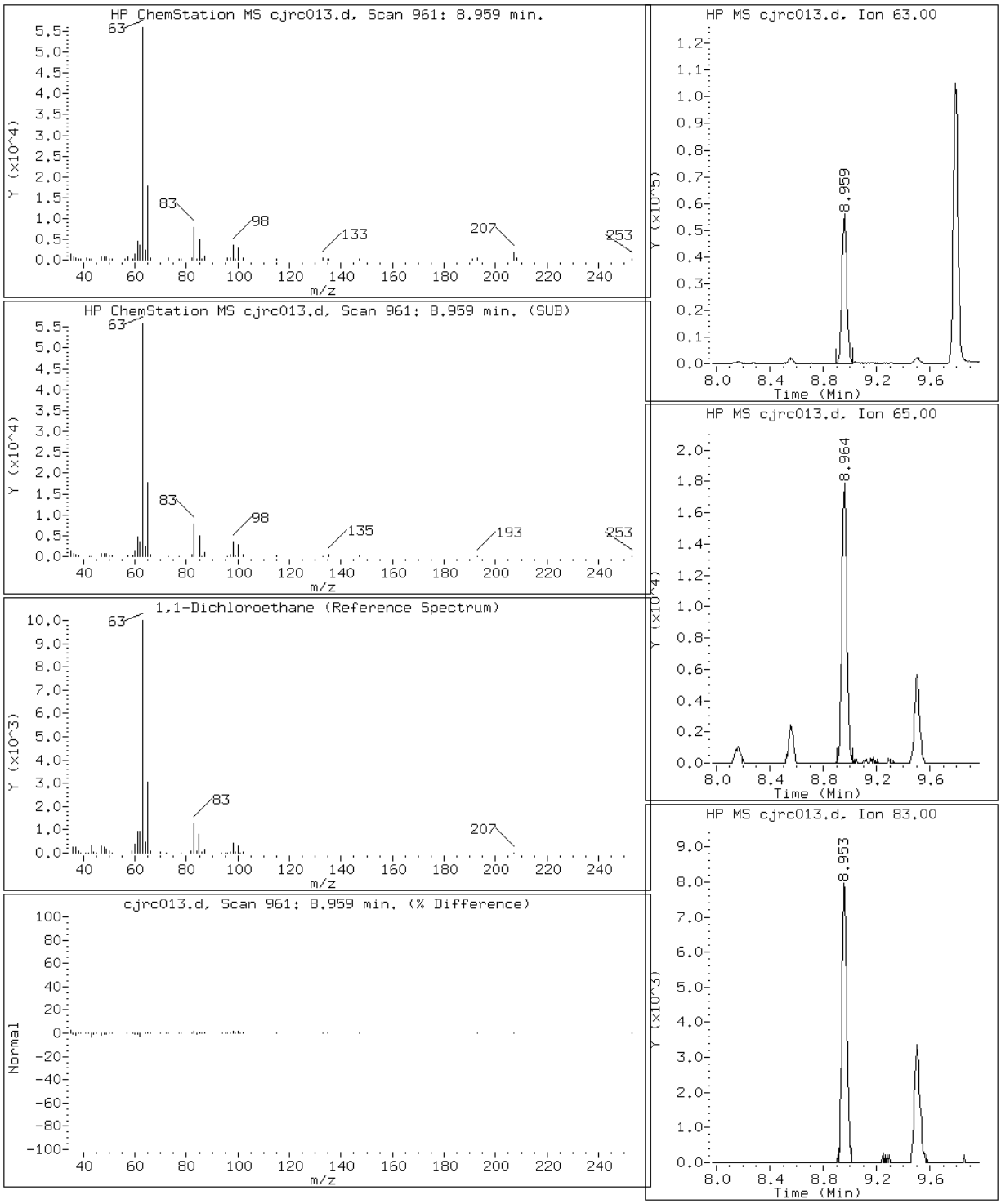
Data File: cjrc013.d

Lab Sample ID: 200-4315-4 Date: 26-MAR-2011 03:36

Client ID: AS-SP1 Instrument: C.i

Sample Info: 200-4315-A-4@2802.02 Operator: sv

31 1,1-Dichloroethane



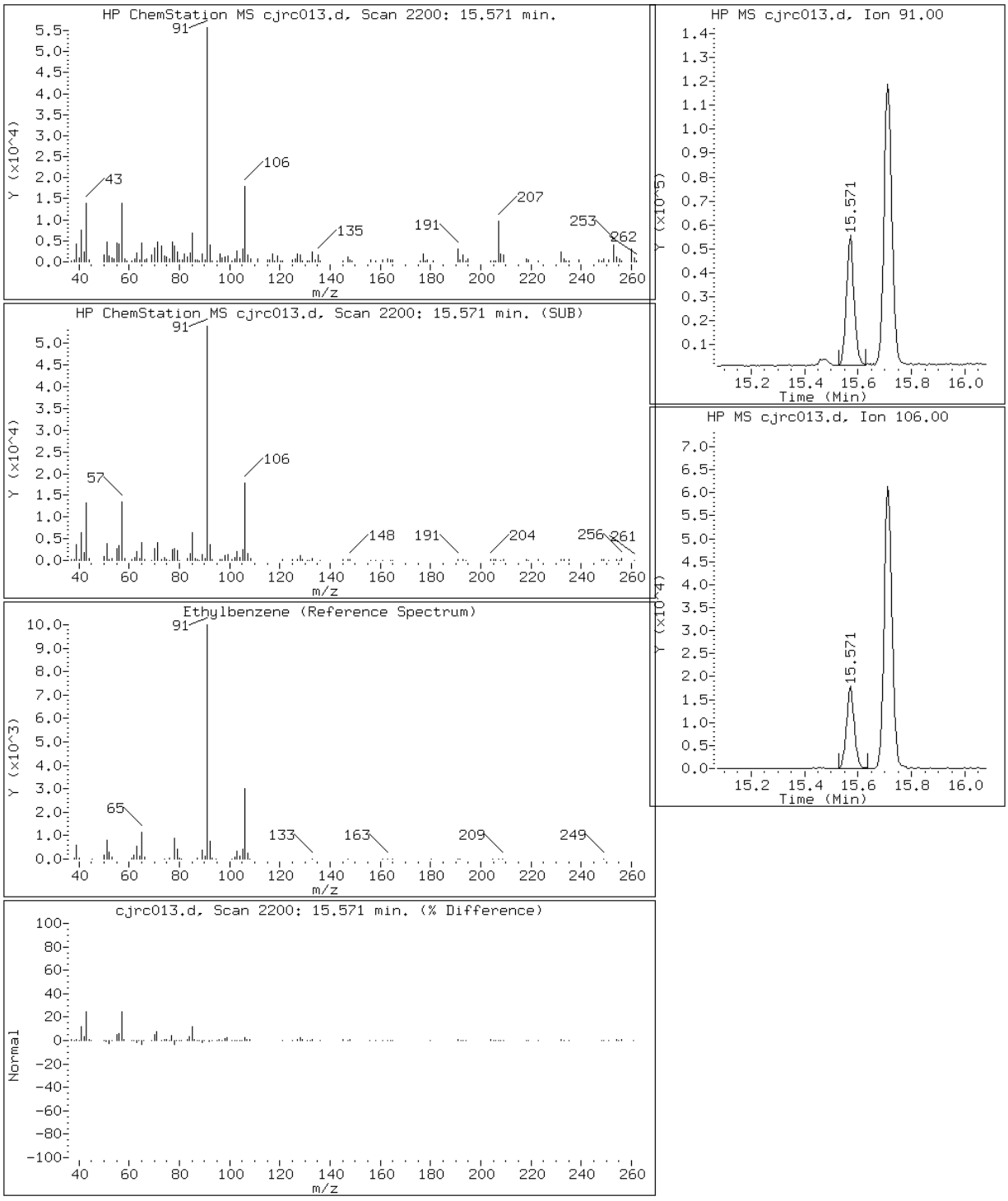
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Lab Sample ID: 200-4315-4 Date: 26-MAR-2011 03:36

Client ID: AS-SP1 Instrument: C.i

Sample Info: 200-4315-A-4@2802.02 Operator: sv

68 Ethylbenzene



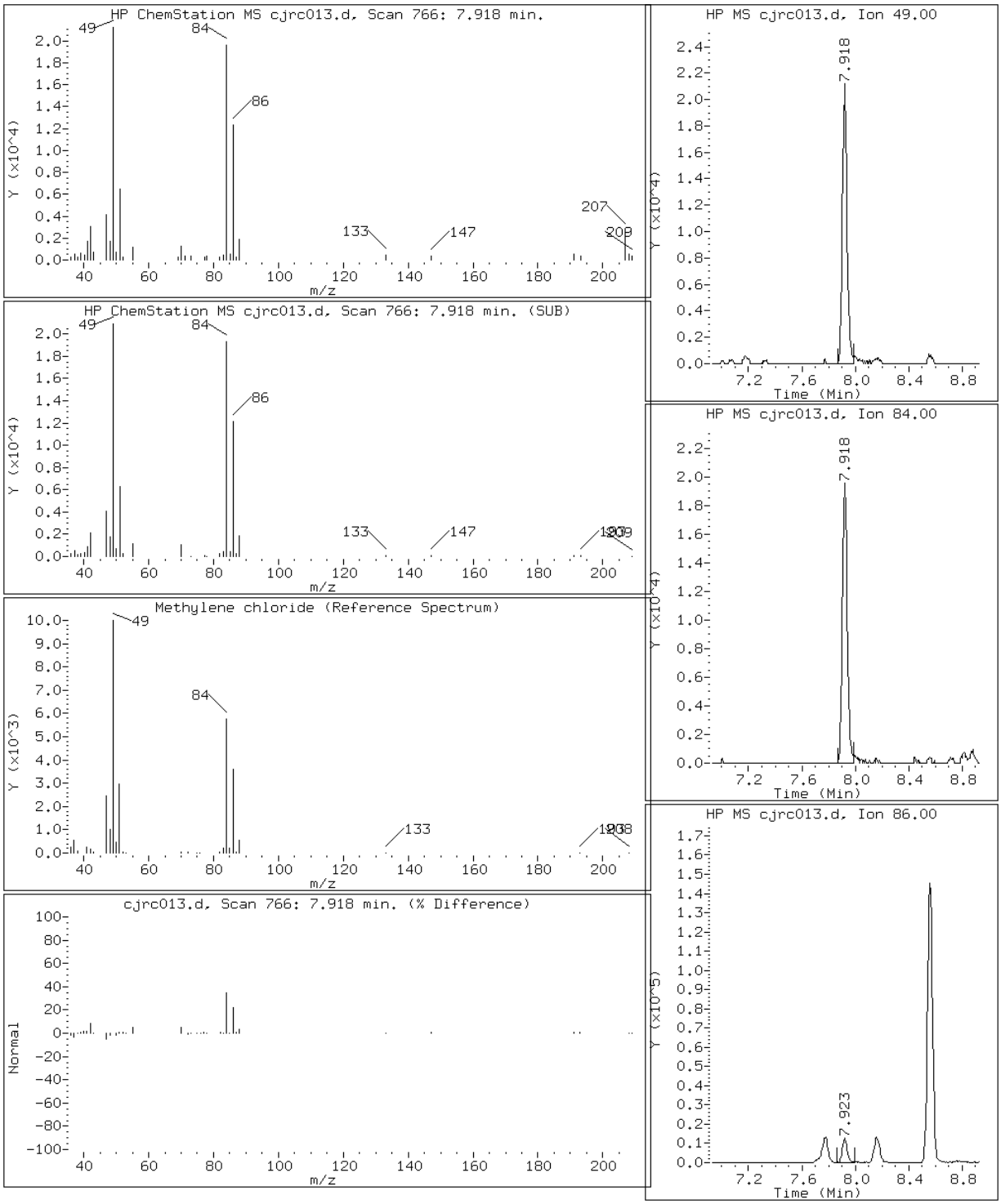
Data File: cjrc013.d

Lab Sample ID: 200-4315-4 Date: 26-MAR-2011 03:36

Client ID: AS-SP1 Instrument: C.i

Sample Info: 200-4315-A-4@2802.02 Operator: sv

25 Methylene chloride



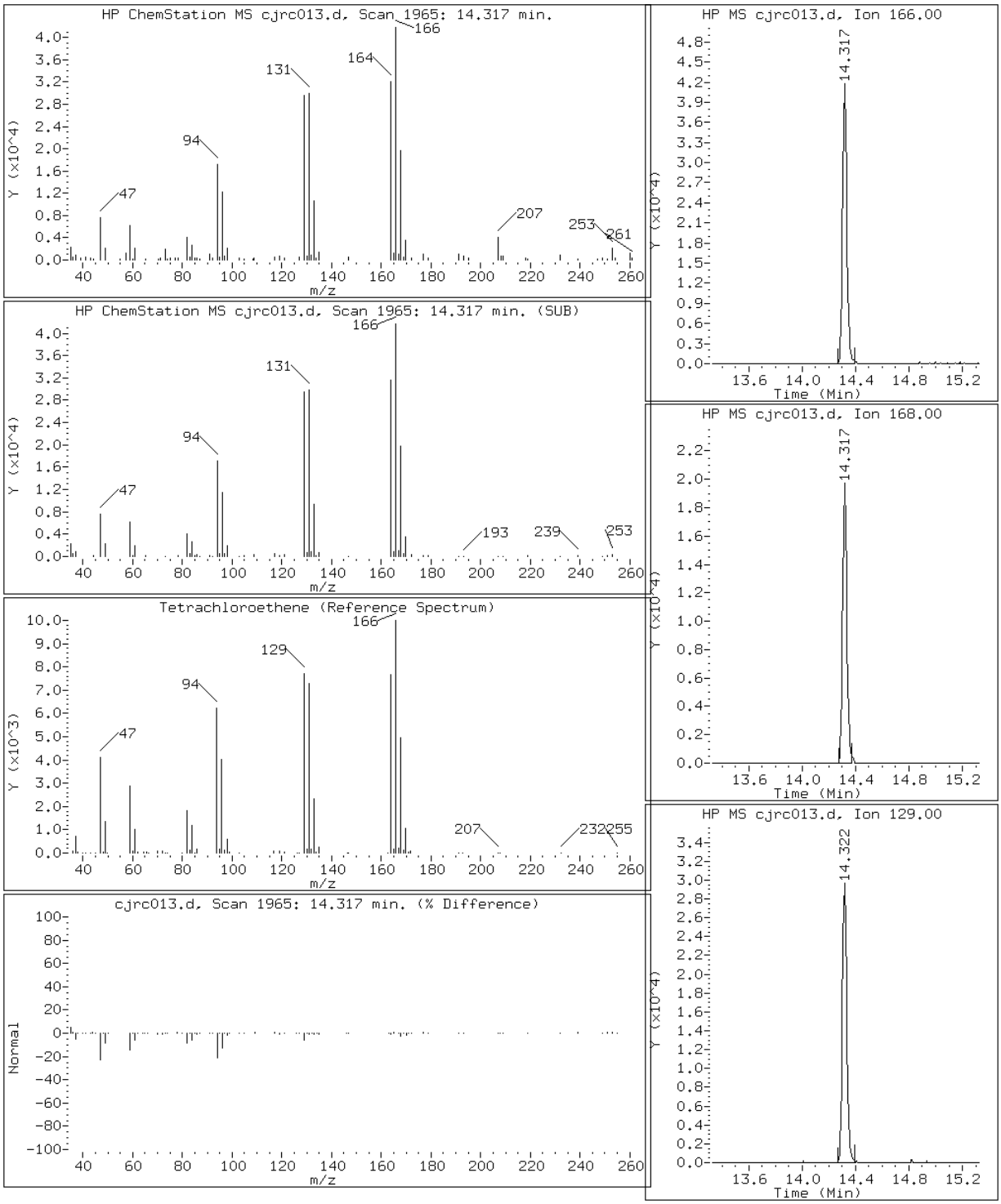
Data File: cjrc013.d

Lab Sample ID: 200-4315-4 Date: 26-MAR-2011 03:36

Client ID: AS-SP1 Instrument: C.i

Sample Info: 200-4315-A-4@2802.02 Operator: sv

61 Tetrachloroethene



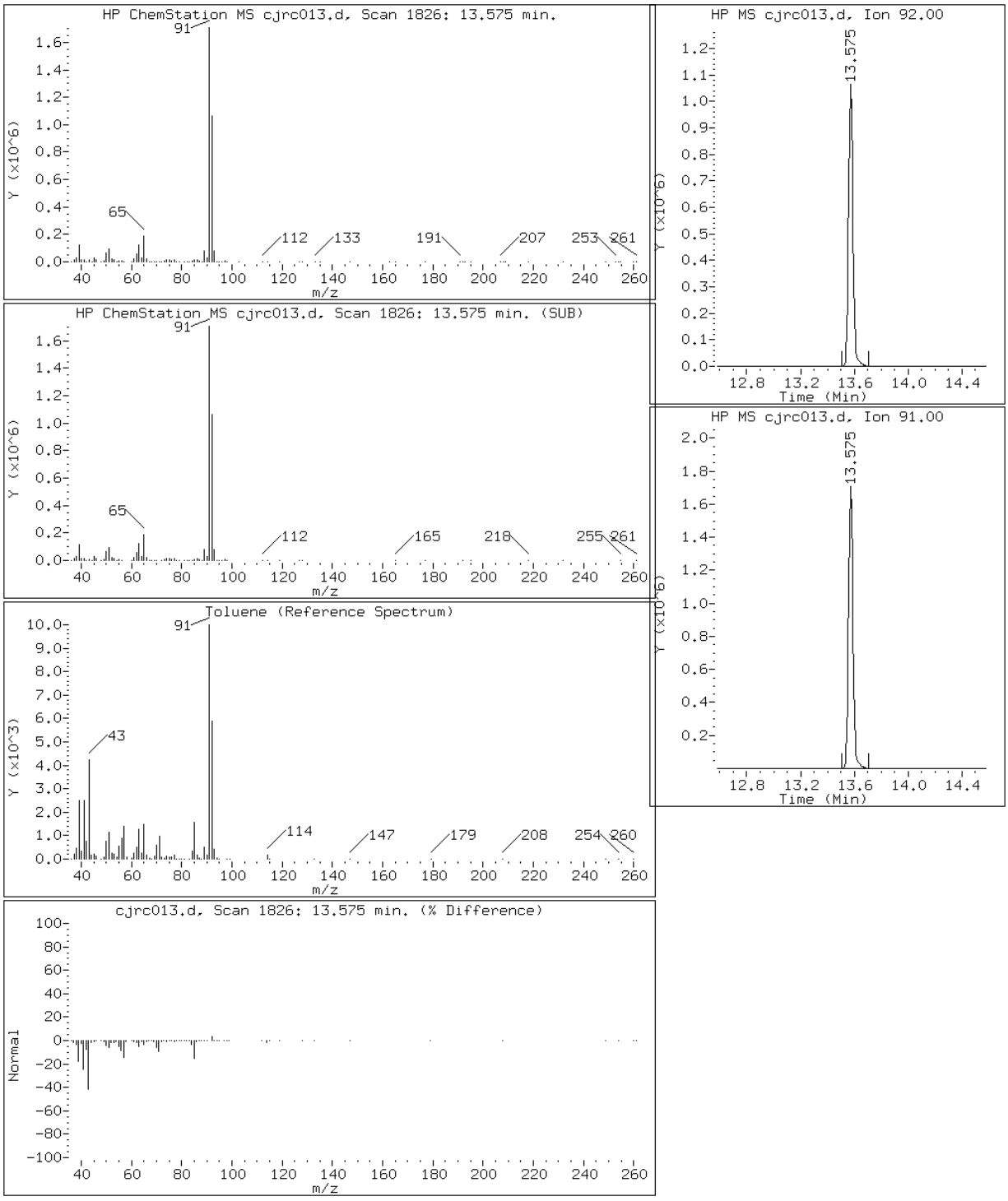
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Lab Sample ID: 200-4315-4 Date: 26-MAR-2011 03:36

Client ID: AS-SP1 Instrument: C.i

Sample Info: 200-4315-A-4@2802.02 Operator: sv

58 Toluene



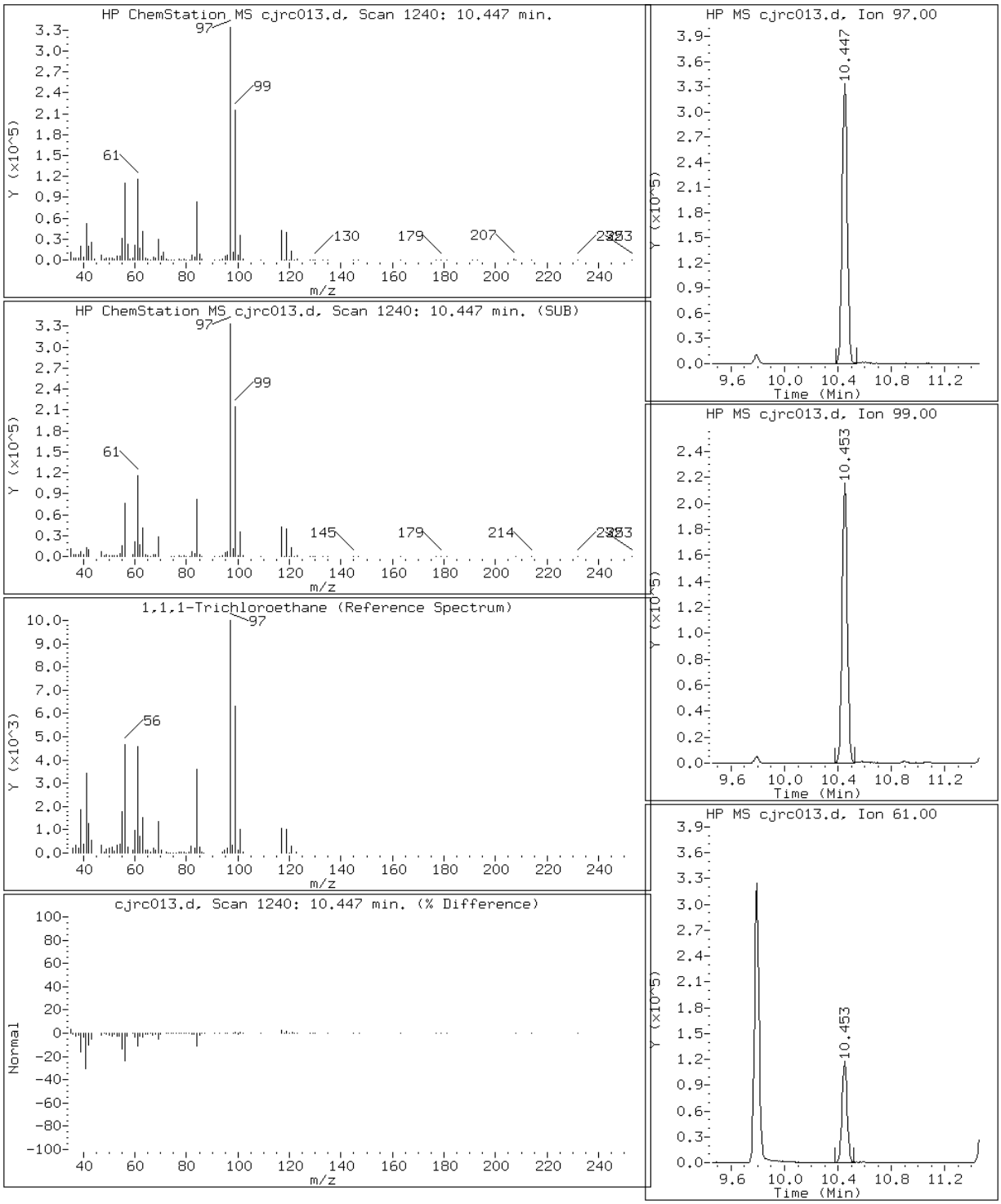
Data File: cjrc013.d

Lab Sample ID: 200-4315-4 Date: 26-MAR-2011 03:36

Client ID: AS-SP1 Instrument: C.i

Sample Info: 200-4315-A-4@2802.02 Operator: sv

41 1,1,1-Trichloroethane



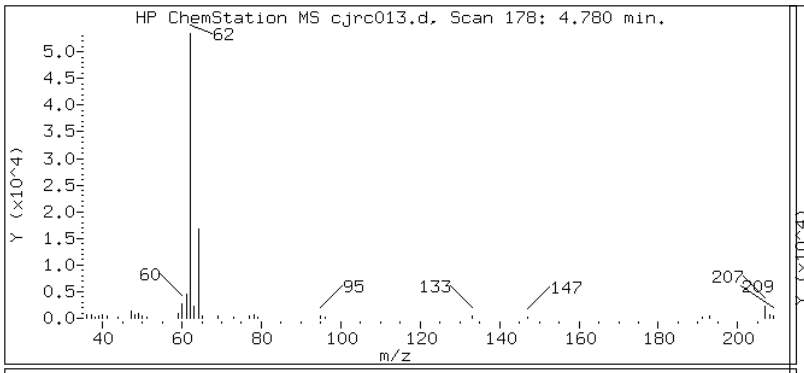
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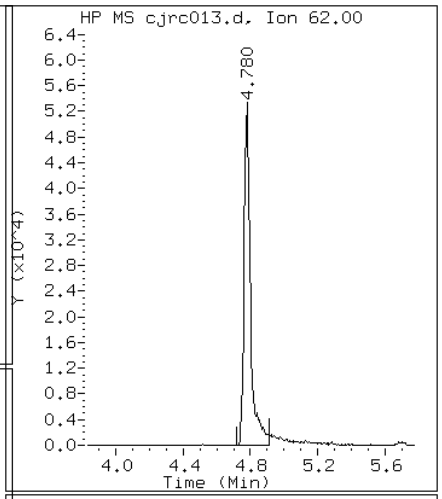
Lab Sample ID: 200-4315-4 Date: 26-MAR-2011 03:36

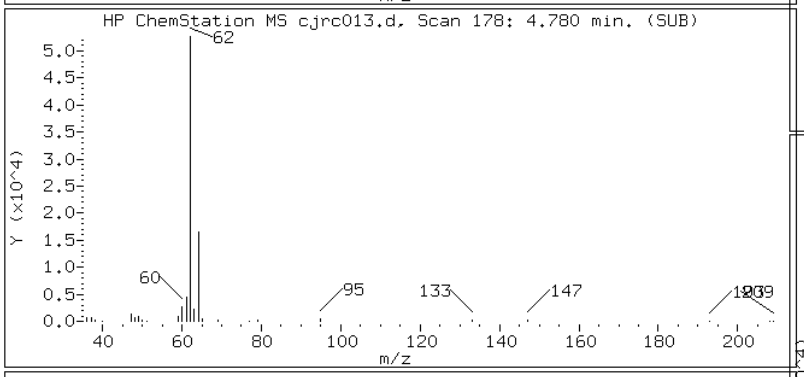
Client ID: AS-SP1 Instrument: C.i

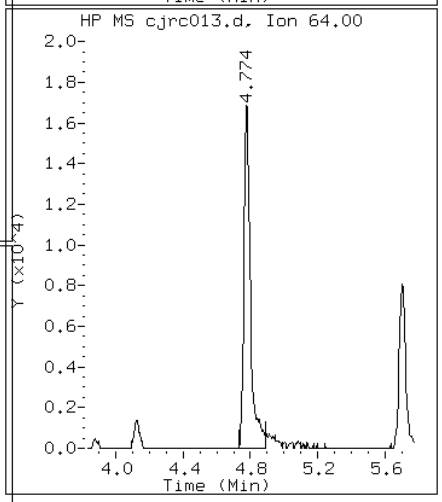
Sample Info: 200-4315-A-4@2802.02 Operator: sv

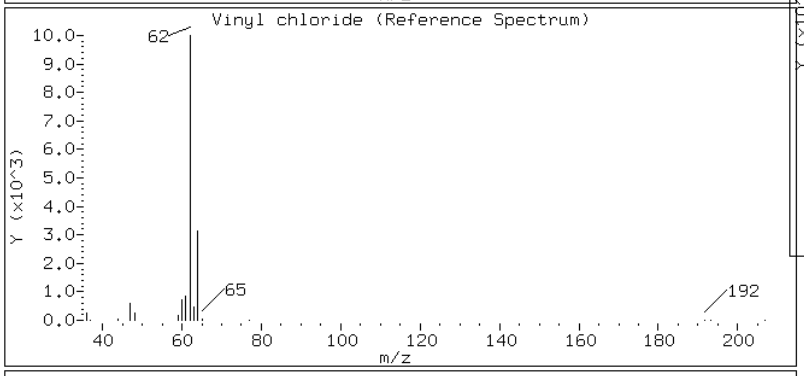
7 Vinyl chloride

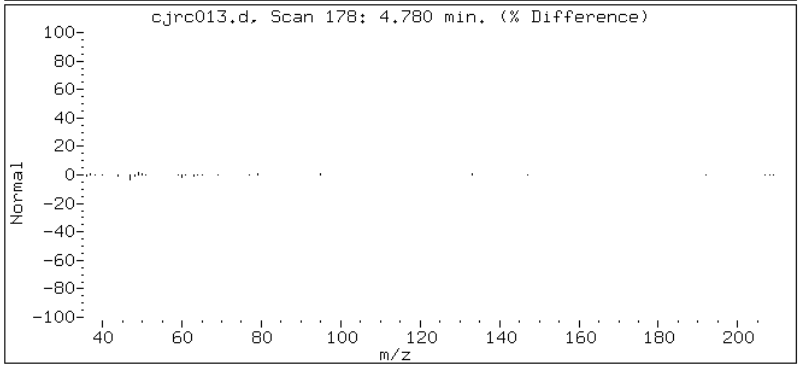












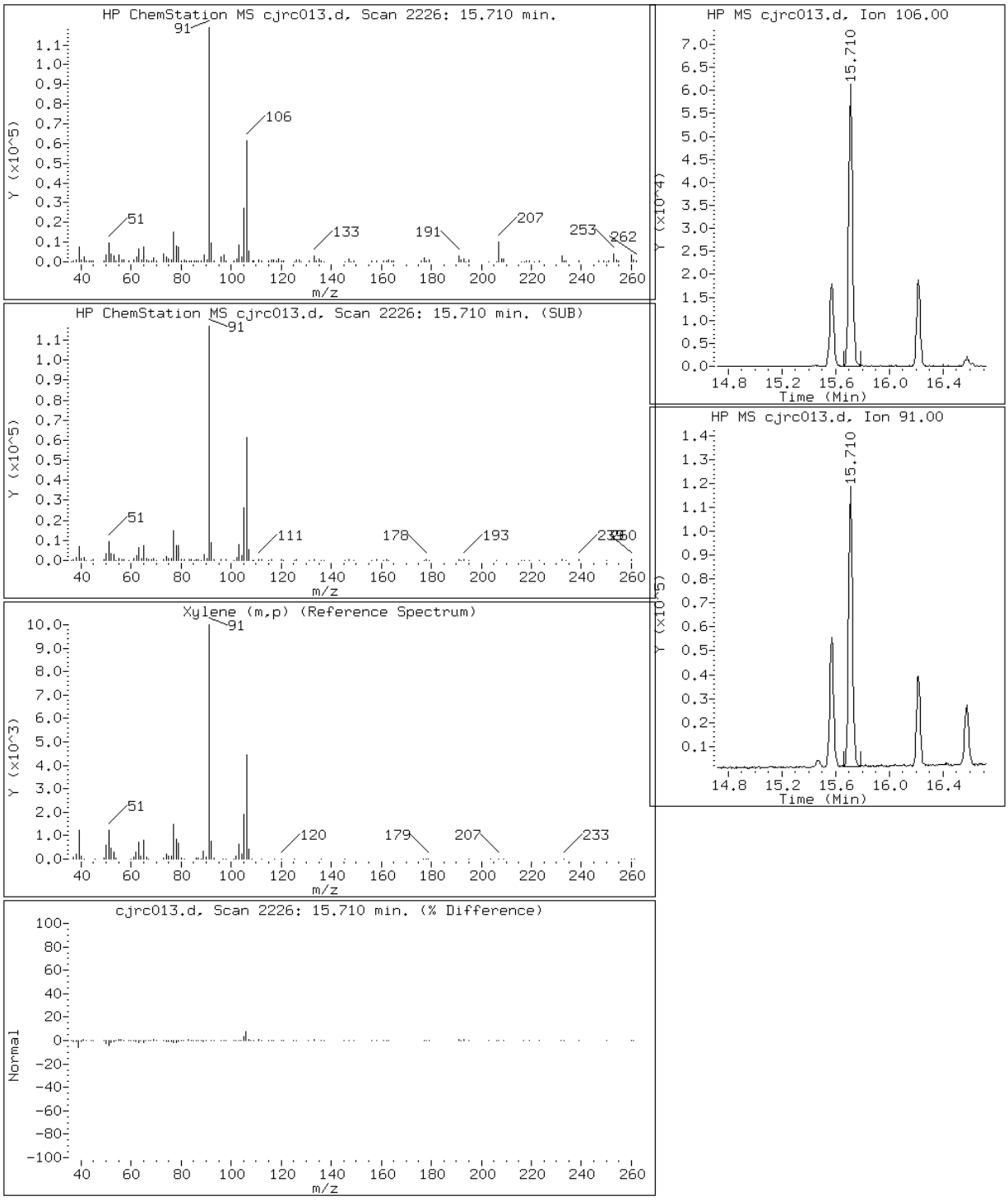
Data File: cjrc013.d

Lab Sample ID: 200-4315-4 Date: 26-MAR-2011 03:36

Client ID: AS-SP1 Instrument: C.i

Sample Info: 200-4315-A-4@2802.02 Operator: sv

69 Xylene (m,p)



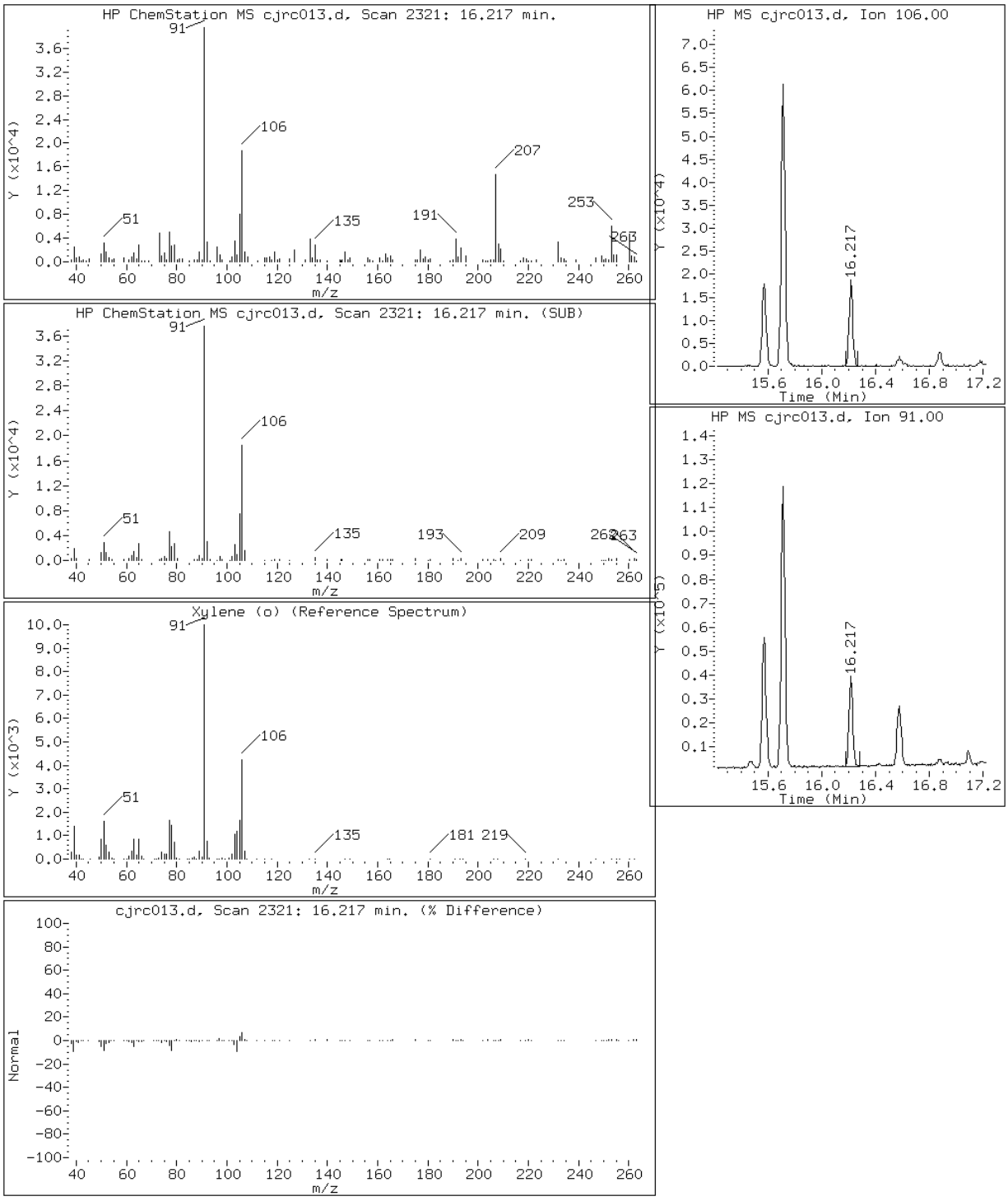
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Lab Sample ID: 200-4315-4 Date: 26-MAR-2011 03:36

Client ID: AS-SP1 Instrument: C.i

Sample Info: 200-4315-A-4@2802.02 Operator: sv

71 Xylene (o)



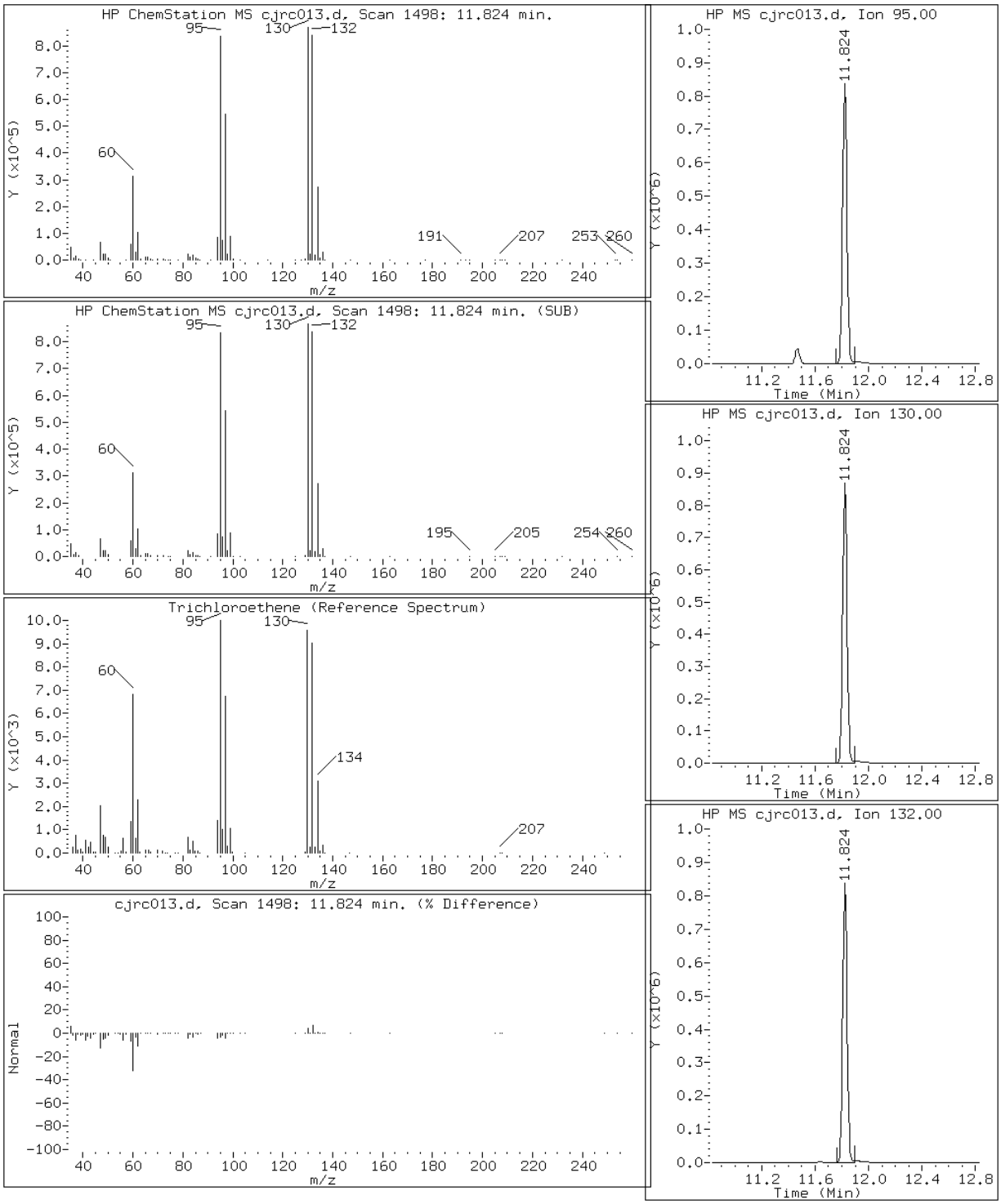
Data File: cjrc013.d

Lab Sample ID: 200-4315-4 Date: 26-MAR-2011 03:36

Client ID: AS-SP1 Instrument: C.i

Sample Info: 200-4315-A-4@2802.02 Operator: sv

49 Trichloroethene



FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Client Sample ID: AS-SP2 Lab Sample ID: 200-4315-5

Matrix: Air Lab File ID: cjrc014.d

Analysis Method: TO-15 Date Collected: 03/15/2011 15:55

Sample wt/vol: 26(mL) Date Analyzed: 03/26/2011 04:24

Soil Aliquot Vol: Dilution Factor: 6900

Soil Extract Vol.: GC Column: RTX-624 ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 15760 Units: ppb v/v

CAS NO.	COMPOUND NAME	MOLECULAR WEIGHT	RESULT	Q	RL	RL
71-43-2	Benzene	78.11	2300		1400	1400
75-25-2	Bromoform	252.75	1400	U	1400	1400
74-83-9	Bromomethane	94.94	1400	U	1400	1400
75-15-0	Carbon disulfide	76.14	3400	U	3400	3400
56-23-5	Carbon tetrachloride	153.81	1400	U	1400	1400
108-90-7	Chlorobenzene	112.30	1400	U	1400	1400
75-00-3	Chloroethane	64.52	4800		3400	3400
67-66-3	Chloroform	119.38	1400	U	1400	1400
74-87-3	Chloromethane	50.49	3400	U	3400	3400
106-46-7	1,4-Dichlorobenzene	147.00	1400	U	1400	1400
75-34-3	1,1-Dichloroethane	98.96	9500		1400	1400
107-06-2	1,2-Dichloroethane	98.96	1400	U	1400	1400
75-35-4	1,1-Dichloroethene	96.94	1400	U	1400	1400
78-87-5	1,2-Dichloropropane	112.99	1400	U	1400	1400
123-91-1	1,4-Dioxane	88.11	34000	U	34000	34000
100-41-4	Ethylbenzene	106.17	2200		1400	1400
87-68-3	Hexachlorobutadiene	260.76	1400	U	1400	1400
75-09-2	Methylene Chloride	84.93	6400		3400	3400
91-20-3	Naphthalene	128.17	3400	U	3400	3400
100-42-5	Styrene	104.15	1400	U	1400	1400
79-34-5	1,1,2,2-Tetrachloroethane	167.85	1400	U	1400	1400
127-18-4	Tetrachloroethene	165.83	4800		1400	1400
108-88-3	Toluene	92.14	97000		1400	1400
120-82-1	1,2,4-Trichlorobenzene	181.45	3400	U	3400	3400
71-55-6	1,1,1-Trichloroethane	133.41	40000		1400	1400
79-00-5	1,1,2-Trichloroethane	133.41	1400	U	1400	1400
75-01-4	Vinyl chloride	62.50	20000		1400	1400
1330-20-7	Xylene (total)	106.17	7600		1400	1400
79-01-6	Trichloroethene	131.39	130000		1400	1400

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Client Sample ID: AS-SP2 Lab Sample ID: 200-4315-5

Matrix: Air Lab File ID: cjrc014.d

Analysis Method: TO-15 Date Collected: 03/15/2011 15:55

Sample wt/vol: 26(mL) Date Analyzed: 03/26/2011 04:24

Soil Aliquot Vol: Dilution Factor: 6900

Soil Extract Vol.: GC Column: RTX-624 ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 15760 Units: ug/m3

CAS NO.	COMPOUND NAME	MOLECULAR WEIGHT	RESULT	Q	RL	RL
71-43-2	Benzene	78.11	7500		4400	4400
75-25-2	Bromoform	252.75	14000	U	14000	14000
74-83-9	Bromomethane	94.94	5400	U	5400	5400
75-15-0	Carbon disulfide	76.14	11000	U	11000	11000
56-23-5	Carbon tetrachloride	153.81	8700	U	8700	8700
108-90-7	Chlorobenzene	112.30	6300	U	6300	6300
75-00-3	Chloroethane	64.52	13000		9100	9100
67-66-3	Chloroform	119.38	6700	U	6700	6700
74-87-3	Chloromethane	50.49	7100	U	7100	7100
106-46-7	1,4-Dichlorobenzene	147.00	8300	U	8300	8300
75-34-3	1,1-Dichloroethane	98.96	38000		5600	5600
107-06-2	1,2-Dichloroethane	98.96	5600	U	5600	5600
75-35-4	1,1-Dichloroethene	96.94	5500	U	5500	5500
78-87-5	1,2-Dichloropropane	112.99	6400	U	6400	6400
123-91-1	1,4-Dioxane	88.11	120000	U	120000	120000
100-41-4	Ethylbenzene	106.17	9600		6000	6000
87-68-3	Hexachlorobutadiene	260.76	15000	U	15000	15000
75-09-2	Methylene Chloride	84.93	22000		12000	12000
91-20-3	Naphthalene	128.17	18000	U	18000	18000
100-42-5	Styrene	104.15	5900	U	5900	5900
79-34-5	1,1,2,2-Tetrachloroethane	167.85	9500	U	9500	9500
127-18-4	Tetrachloroethene	165.83	33000		9400	9400
108-88-3	Toluene	92.14	370000		5200	5200
120-82-1	1,2,4-Trichlorobenzene	181.45	26000	U	26000	26000
71-55-6	1,1,1-Trichloroethane	133.41	220000		7500	7500
79-00-5	1,1,2-Trichloroethane	133.41	7500	U	7500	7500
75-01-4	Vinyl chloride	62.50	52000		3500	3500
1330-20-7	Xylene (total)	106.17	33000		6000	6000
79-01-6	Trichloroethene	131.39	690000		7400	7400

TestAmerica Burlington

AIR TOXICS QUANTITATION REPORT

Lab Sample Id: 200-4315-5
Client Smp ID: AS-SP2
Inj Date : 26-MAR-2011 04:24
Operator : sv Inst ID: C.i
Smp Info : 200-4315-A-5@896.44
Misc Info : 26,6900, to15all cdf 896.44
Comment :
Method : /chem/C.i/Csvr.p/cjrcto15.b/to15v5.m
Meth Date : 30-Mar-2011 09:16 klp Quant Type: ISTD
Cal Date : 22-MAR-2011 22:39 Cal File: cjr009.d
Als bottle: 11
Dil Factor: 6900.00000
Integrator: HP RTE Compound Sublist: all74.sub
Target Version: 3.50
Processing Host: chemsvr6

Concentration Formula: Amt * DF * Uf*(Vo/Vo)*(Vf/Vf) * CpndVariable

Name	Value	Description
DF	6900.00000	Dilution Factor
Uf	1.00000	ng unit correction factor
Vo	26.00000	Sample Volume purged (mL)
Vf	200.00000	Final Volume (mL)

Cpnd Variable Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	FINAL (ppb v/v)
2 Dichlorodifluoromethane	85	Compound Not Detected.					
3 Chlorodifluoromethane	51	Compound Not Detected.					
4 1,2-Dichloro-1,1,2,2-tetraflu	85	Compound Not Detected.					
5 Chloromethane	50	Compound Not Detected.					
6 Butane	43	Compound Not Detected.					
7 Vinyl chloride	62	4.785	4.774	(0.471)	151643	2.93915	20000
8 1,3-Butadiene	54	Compound Not Detected.					
9 Bromomethane	94	Compound Not Detected.					
10 Chloroethane	64	5.714	5.703	(0.563)	21742	0.69219	4800
12 Vinyl bromide	106	Compound Not Detected.					
13 Trichlorofluoromethane	101	Compound Not Detected.					
17 1,1,2-Trichloro-1,2,2-trifluo	101	7.005	7.000	(0.690)	21480	0.17808	1200(a)
19 1,1-Dichloroethene	96	7.080	7.075	(0.698)	9917	0.16748	1200(a)
20 Acetone	43	Compound Not Detected.					

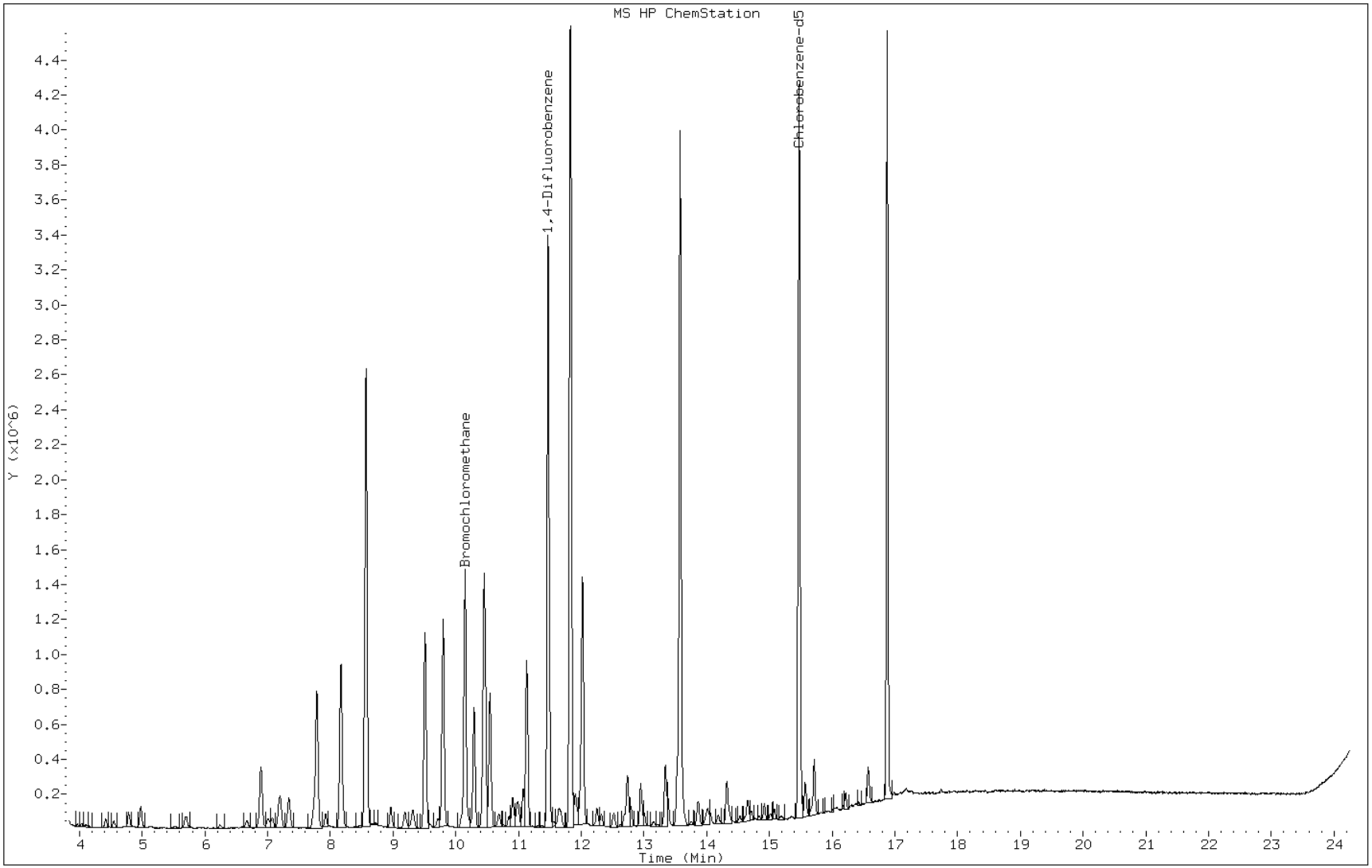
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	FINAL (ppb v/v)
	21 Carbon disulfide	76	Compound Not Detected.					
	22 Isopropanol	45	Compound Not Detected.					
	23 Allyl chloride	41	Compound Not Detected.					
	25 Methylene chloride	49	7.928	7.929	(0.781)	51941	0.93384	6400
	26 Tert-butyl alcohol	59	Compound Not Detected.					
	27 Methyl tert-butyl ether	73	Compound Not Detected.					
	28 1,2-Dichloroethene (trans)	61	Compound Not Detected.					
	30 n-Hexane	57	8.569	8.564	(0.844)	1852479	20.8102	140000
	31 1,1-Dichloroethane	63	8.969	8.969	(0.884)	147608	1.37651	9500
M	33 1,2-Dichloroethene,Total	61				737525	10.3811	72000
	34 1,2-Dichloroethene (cis)	96	9.796	9.802	(0.965)	737525	10.3811	72000
	36 Methyl Ethyl Ketone	72	Compound Not Detected.					
*	37 Bromochloromethane	128	10.149	10.154	(1.000)	580503	10.0000	
	38 Tetrahydrofuran	42	Compound Not Detected.					
	39 Chloroform	83	10.202	10.207	(1.005)	25308	0.18857	1300(aQMH)
	40 Cyclohexane	84	10.463	10.464	(0.912)	253726	2.33093	16000(Q)
	41 1,1,1-Trichloroethane	97	10.458	10.458	(0.912)	918634	5.77836	40000
	42 Carbon tetrachloride	117	Compound Not Detected.					
	43 2,2,4-Trimethylpentane	57	Compound Not Detected.					
	44 Benzene	78	10.965	10.965	(0.956)	82197	0.33805	2300
	45 1,2-Dichloroethane	62	Compound Not Detected.					
	46 n-Heptane	43	11.131	11.131	(0.970)	472207	4.75739	33000
*	47 1,4-Difluorobenzene	114	11.472	11.478	(1.000)	3667368	10.0000	
	49 Trichloroethene	95	11.830	11.830	(1.031)	1996503	18.5793	130000
	50 1,2-Dichloropropane	63	Compound Not Detected.					
	51 Methyl methacrylate	69	12.251	12.230	(1.068)	32221	0.48527	3300(aQ)
	53 1,4-Dioxane	88	Compound Not Detected.					
	54 Bromodichloromethane	83	Compound Not Detected.					
	55 1,3-Dichloropropene (cis)	75	Compound Not Detected.					
	56 Methyl isobutyl ketone	43	Compound Not Detected.					
	58 Toluene	92	13.575	13.580	(0.878)	2459254	14.0468	97000
	59 1,3-Dichloropropene (trans)	75	Compound Not Detected.					
	60 1,1,2-Trichloroethane	83	Compound Not Detected.					
	61 Tetrachloroethene	166	14.322	14.327	(0.926)	96047	0.70108	4800
	62 2-Hexanone	43	Compound Not Detected.					
	63 Dibromochloromethane	129	Compound Not Detected.					
	64 1,2-Dibromoethane	107	Compound Not Detected.					
*	65 Chlorobenzene-d5	117	15.469	15.480	(1.000)	3167942	10.0000	
	66 Chlorobenzene	112	15.512	15.518	(1.003)	20864	0.09304	640(a)
	68 Ethylbenzene	91	15.571	15.576	(1.007)	101000	0.31917	2200
	69 Xylene (m,p)	106	15.715	15.720	(1.016)	113139	0.86434	6000
M	70 Xylenes, Total	106				145382	1.10258	7600
	71 Xylene (o)	106	16.217	16.222	(1.048)	32243	0.23823	1600(Q)
	72 Styrene	104	Compound Not Detected.					
	73 Bromoform	173	Compound Not Detected.					
	74 Isopropylbenzene	105	Compound Not Detected.					
	75 1,1,2,2-Tetrachloroethane	83	Compound Not Detected.					

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	FINAL (ppb v/v)
76 n-Propylbenzene	91	Compound Not Detected.					
79 4-Ethyltoluene	105	Compound Not Detected.					
80 2-Chlorotoluene	91	Compound Not Detected.					
81 1,3,5-Trimethylbenzene	105	Compound Not Detected.					
83 tert-butylbenzene	119	Compound Not Detected.					
84 1,2,4-Trimethylbenzene	105	Compound Not Detected.					
85 sec-Butylbenzene	105	Compound Not Detected.					
86 4-Isopropyltoluene	119	Compound Not Detected.					
87 1,3-Dichlorobenzene	146	Compound Not Detected.					
88 1,4-Dichlorobenzene	146	18.282	18.287	(1.182)	8047	0.04126	280(a)
89 Benzyl chloride	91	Compound Not Detected.					
91 n-Butylbenzene	91	Compound Not Detected.					
92 1,2-Dichlorobenzene	146	Compound Not Detected.					
94 1,2,4-Trichlorobenzene	180	Compound Not Detected.					
95 1,3-Hexachlorobutadiene	225	Compound Not Detected.					
96 Naphthalene	128	Compound Not Detected.					

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
Q - Qualifier signal failed the ratio test.
M - Compound response manually integrated.
H - Operator selected an alternate compound hit.

Data File:	cjrc014.d	Date:	26-MAR-2011 04:24
Client ID:	AS-SP2	Instrument:	C.i
Operator:	sv	Inj Vol:	200.0
Column Type:	Capillary	Diameter:	0.32
Stationary Phase:	RTX-624		
Sample Info:	200-4315-A-5@896.44		
Lab Sample ID:	200-4315-5		



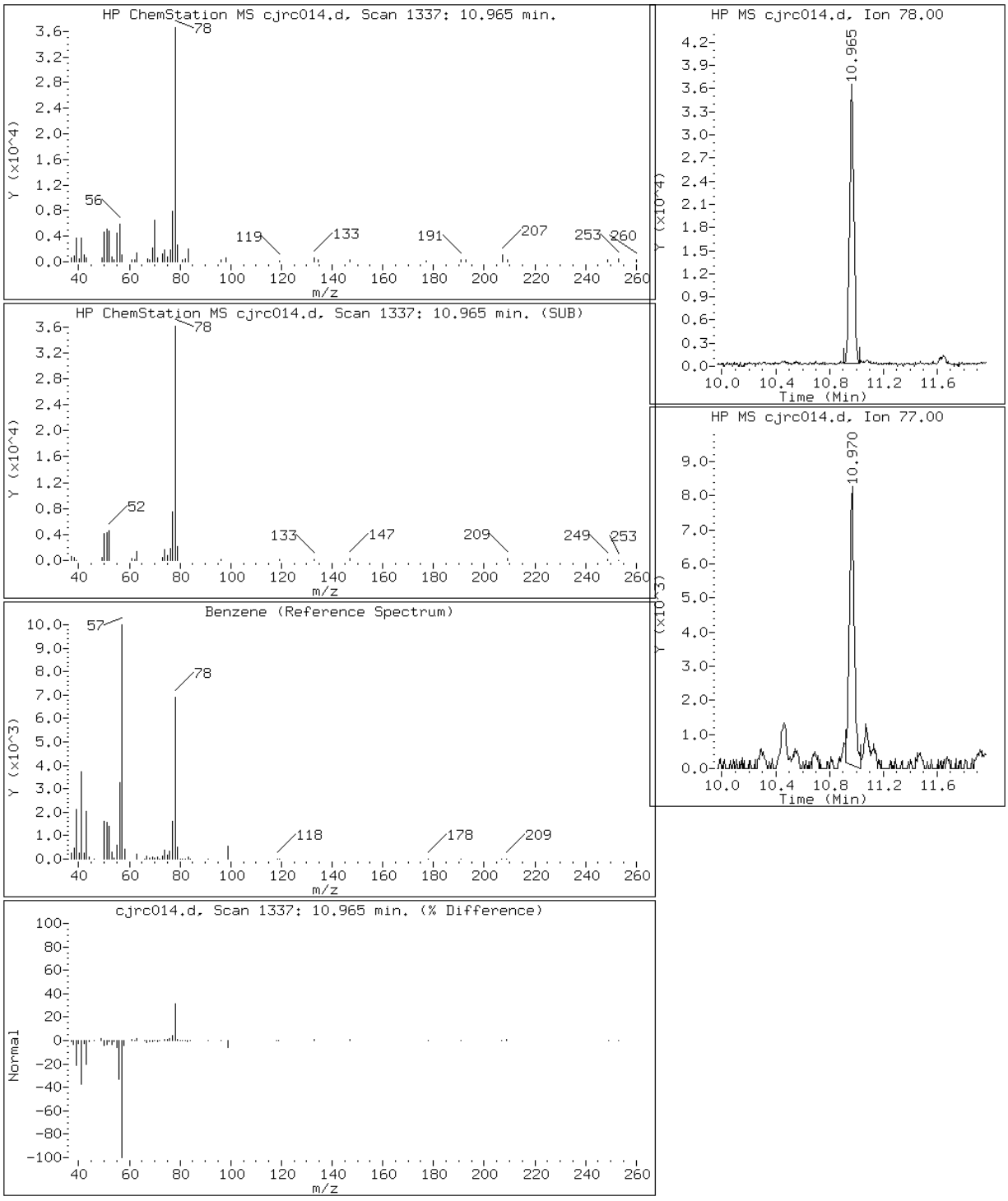
Data File: cjrc014.d

Lab Sample ID: 200-4315-5 Date: 26-MAR-2011 04:24

Client ID: AS-SP2 Instrument: C.i

Sample Info: 200-4315-A-5@896.44 Operator: sv

44 Benzene



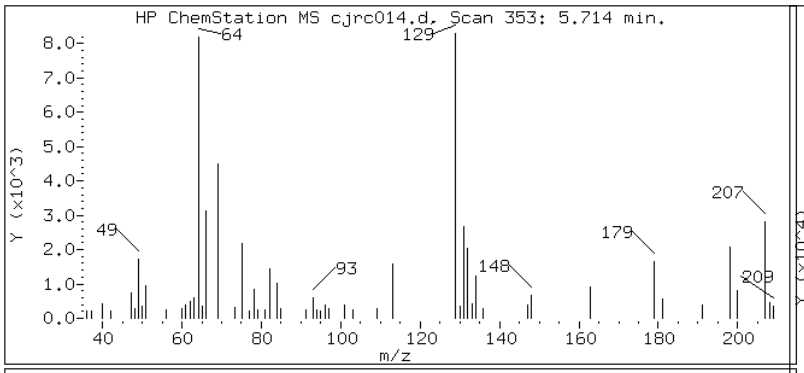
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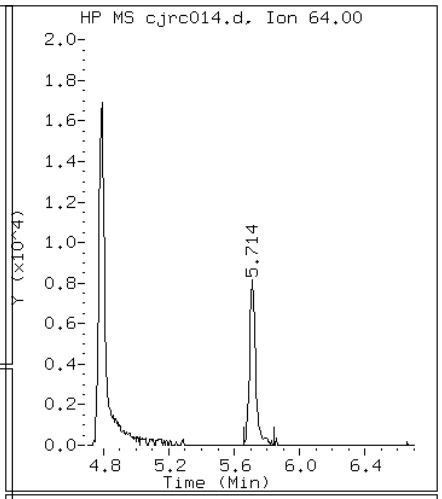
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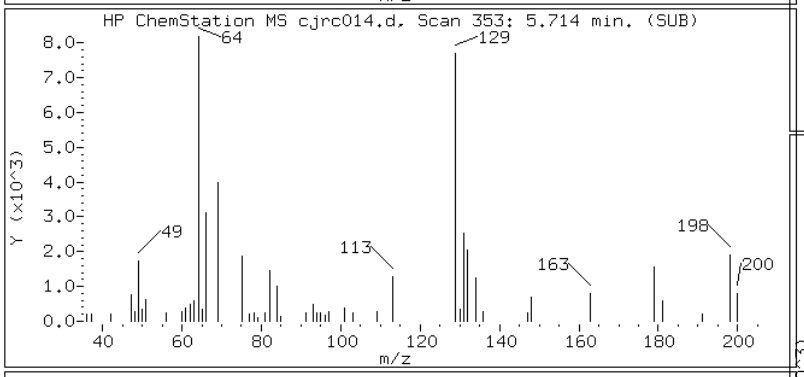
Client ID: AS-SP2 Instrument: C.i

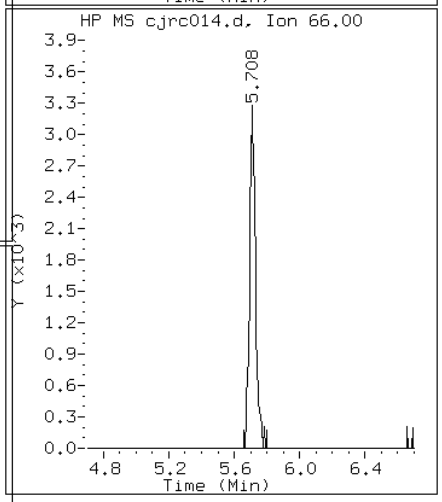
Sample Info: 200-4315-A-5@896.44 Operator: sv

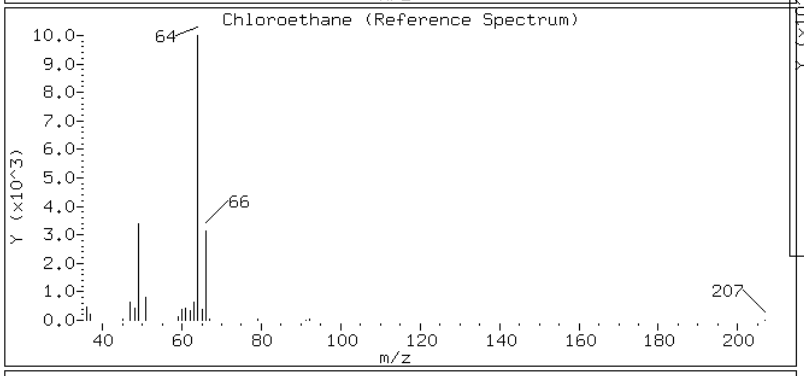
10 Chloroethane

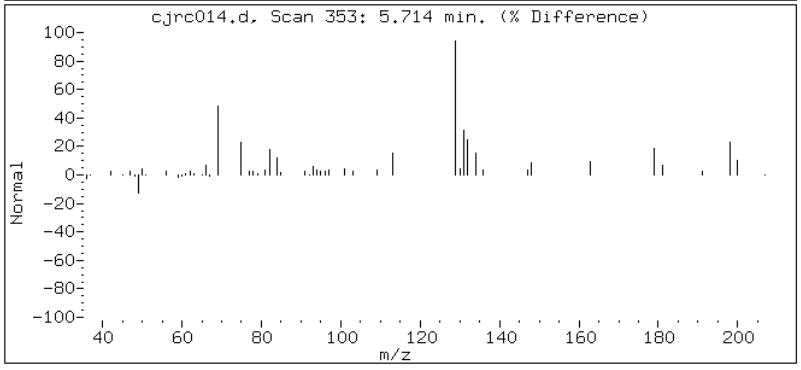












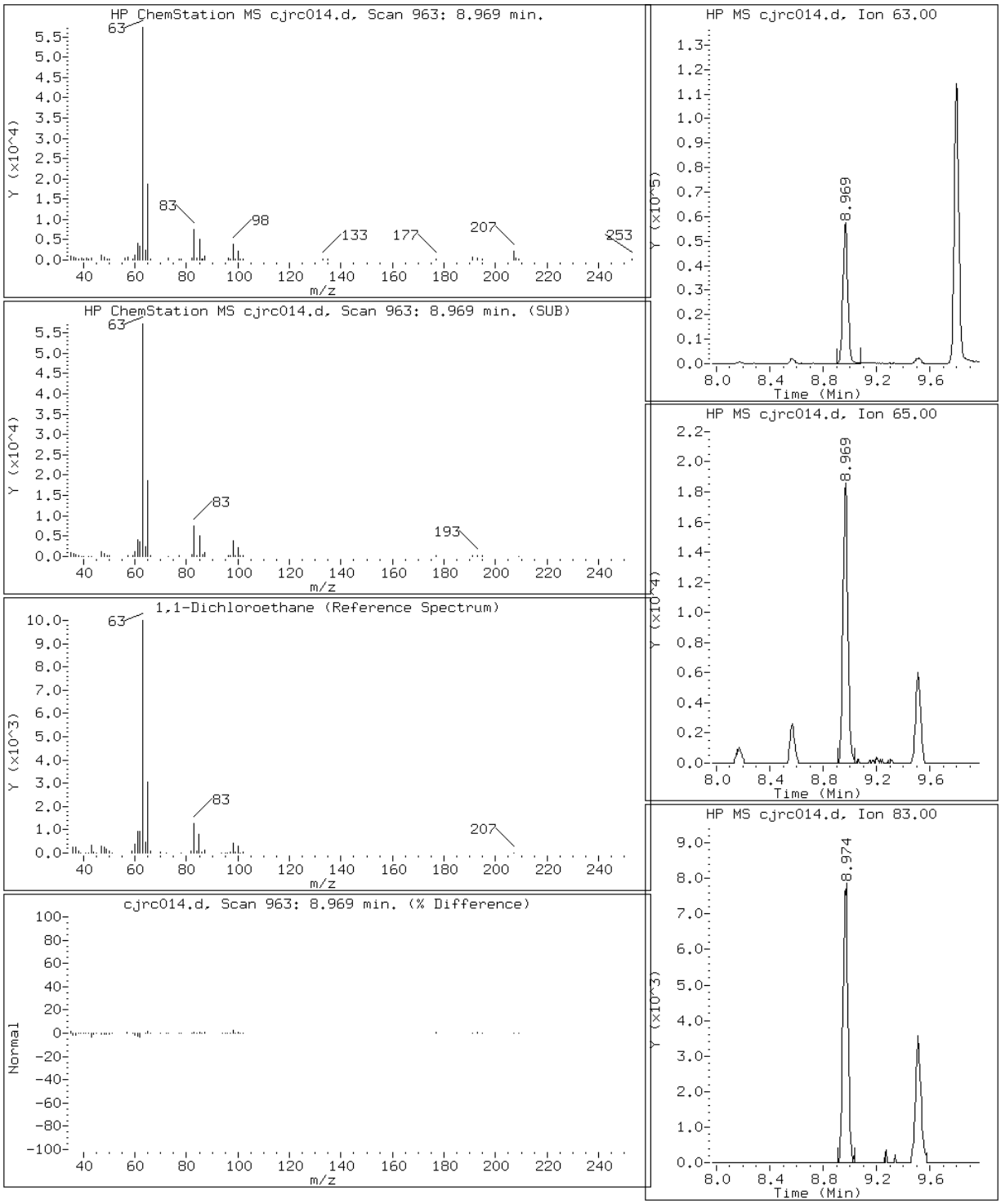
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Lab Sample ID: 200-4315-5 Date: 26-MAR-2011 04:24

Client ID: AS-SP2 Instrument: C.i

Sample Info: 200-4315-A-5@896.44 Operator: sv

31 1,1-Dichloroethane



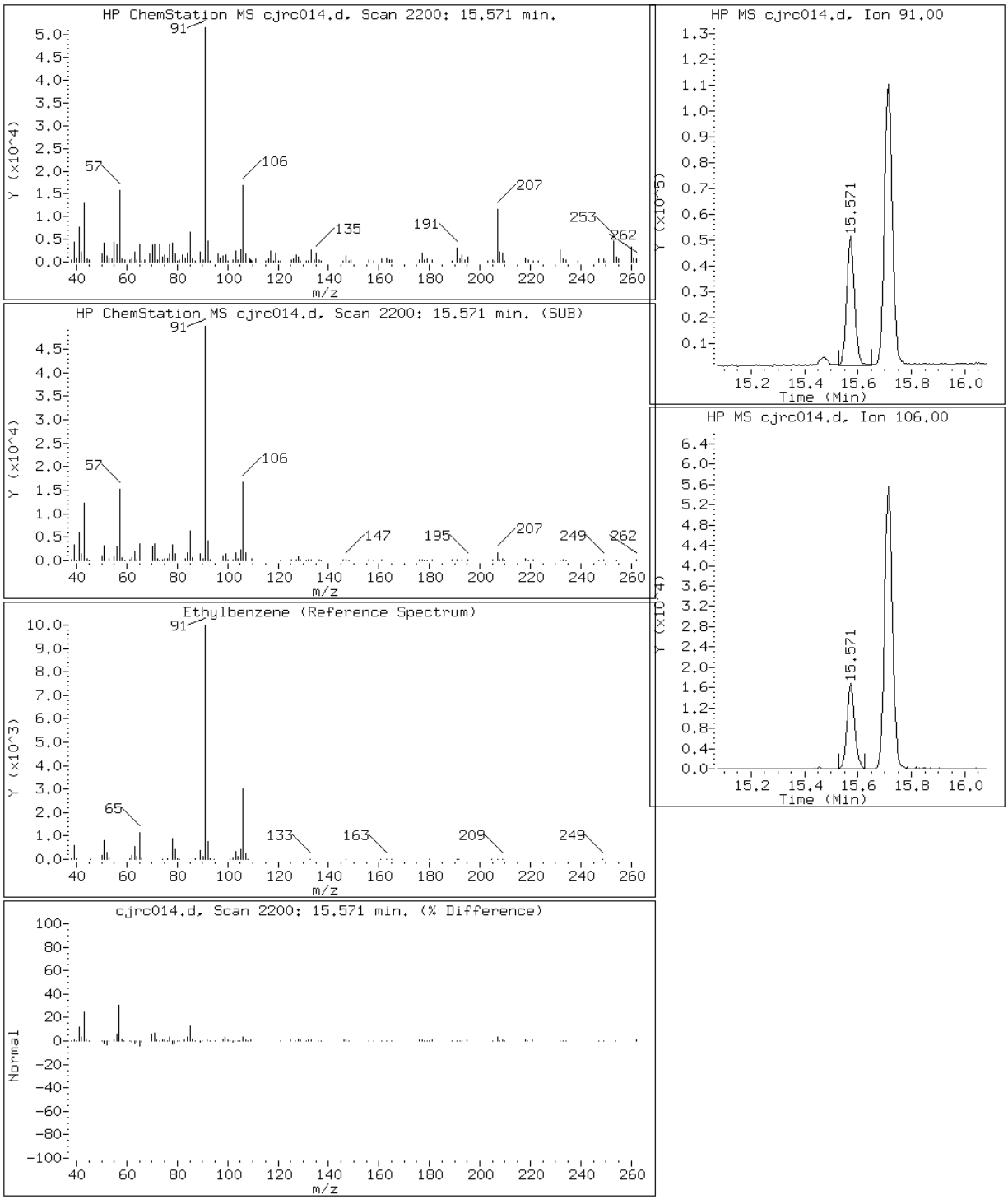
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Lab Sample ID: 200-4315-5 Date: 26-MAR-2011 04:24

Client ID: AS-SP2 Instrument: C.i

Sample Info: 200-4315-A-5@896.44 Operator: sv

68 Ethylbenzene



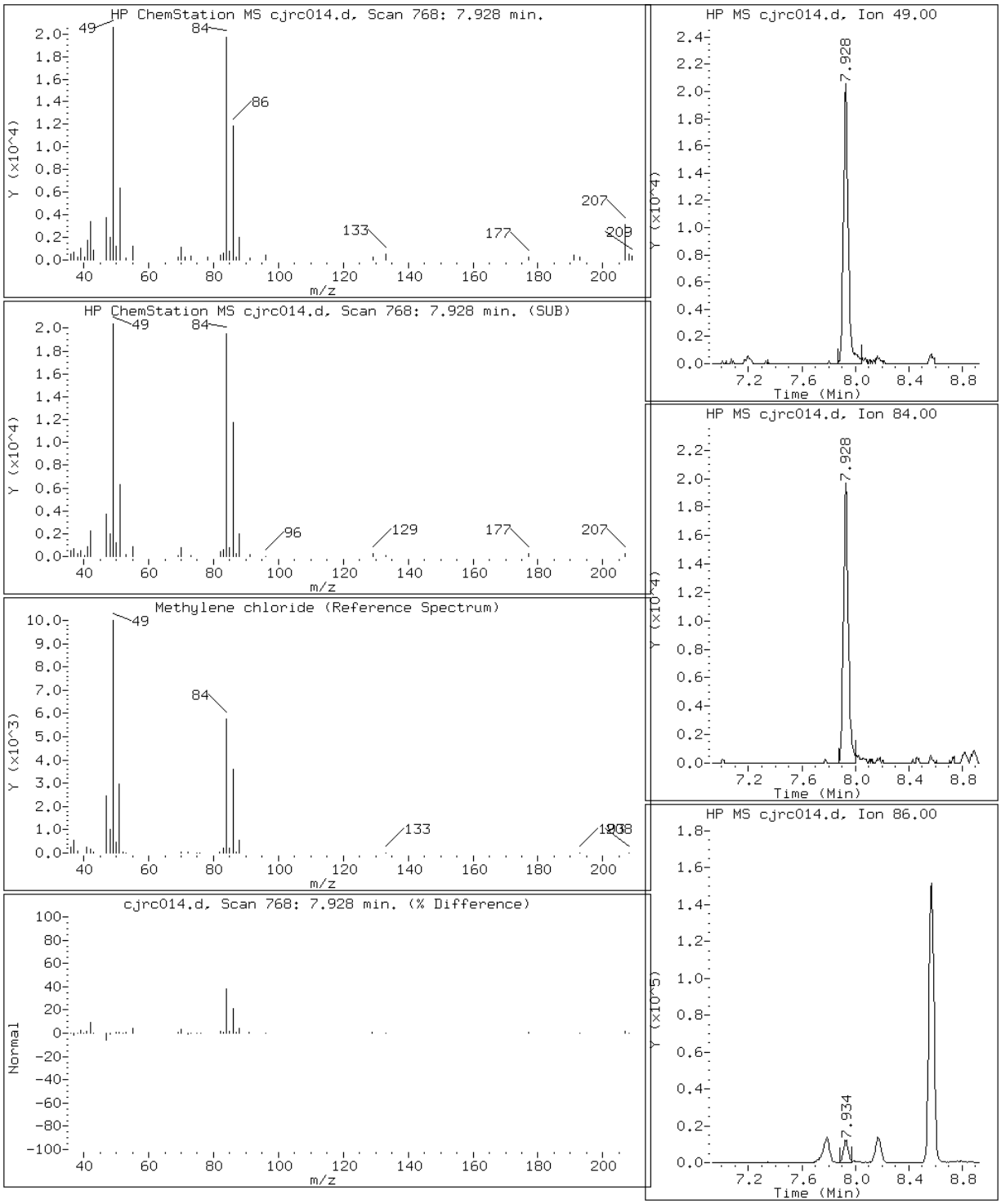
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Lab Sample ID: 200-4315-5 Date: 26-MAR-2011 04:24

Client ID: AS-SP2 Instrument: C.i

Sample Info: 200-4315-A-5@896.44 Operator: sv

25 Methylene chloride



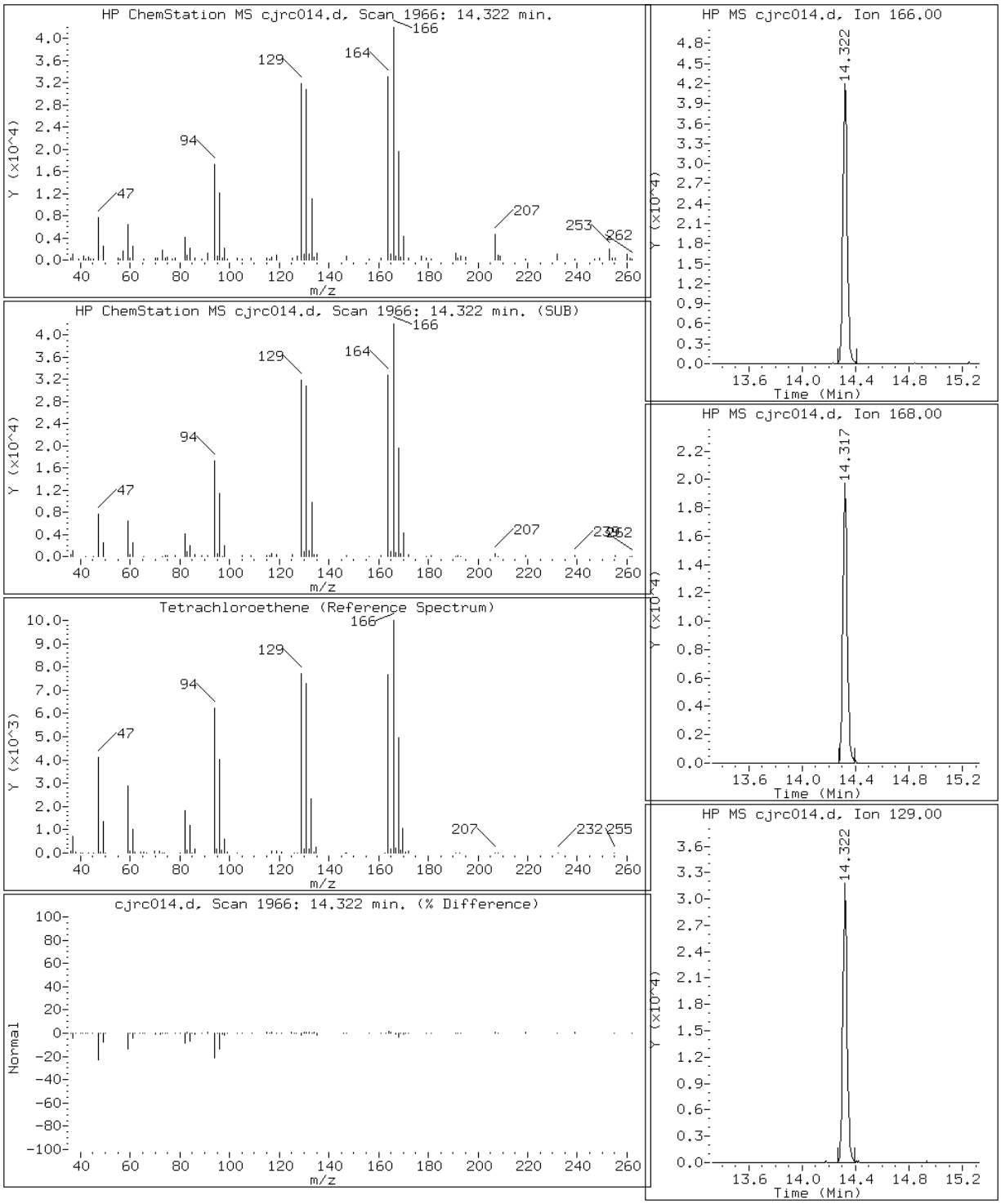
Data File: cjrc014.d

Lab Sample ID: 200-4315-5 Date: 26-MAR-2011 04:24

Client ID: AS-SP2 Instrument: C.i

Sample Info: 200-4315-A-5@896.44 Operator: sv

61 Tetrachloroethene



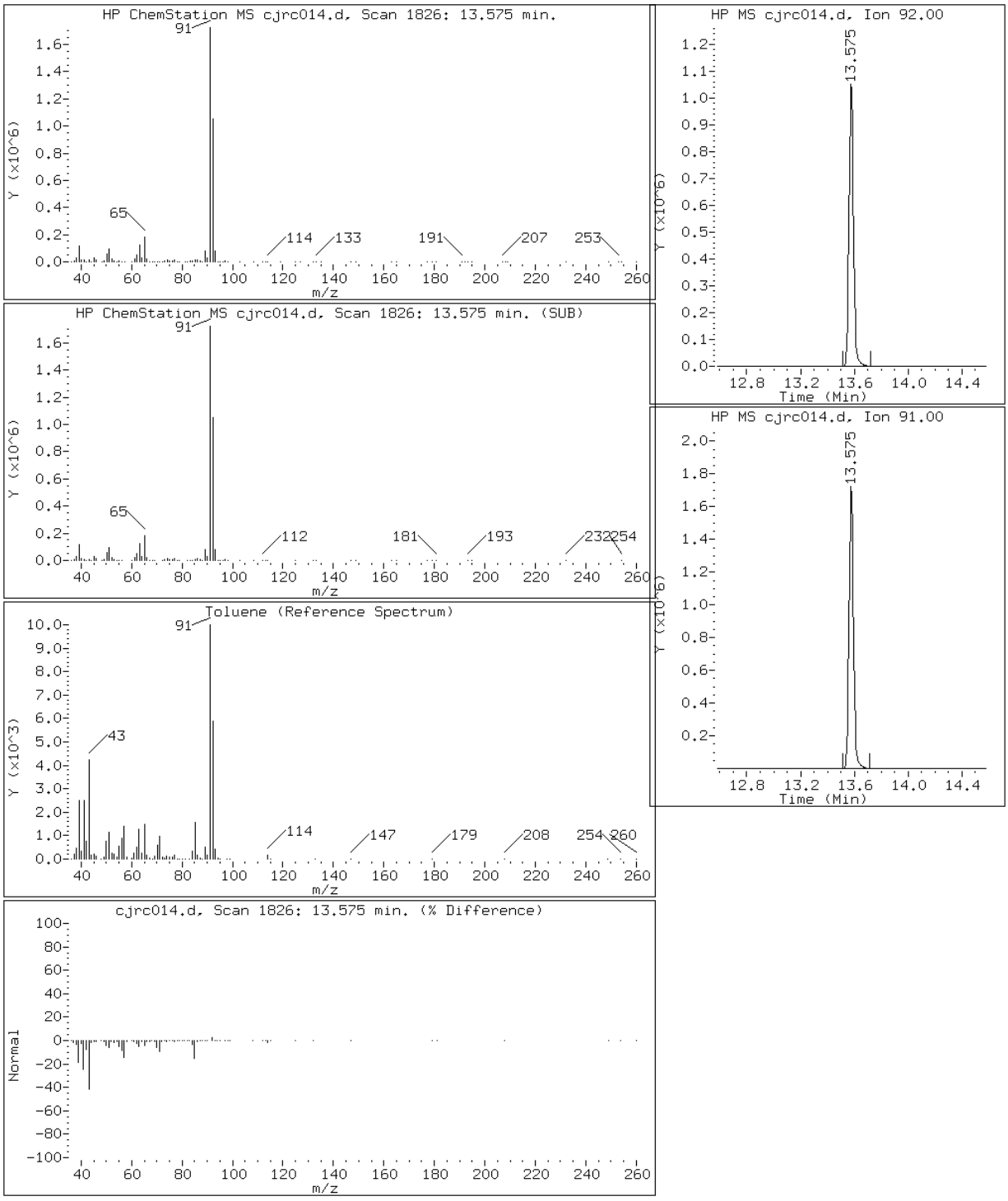
Data File: cjrc014.d

Lab Sample ID: 200-4315-5 Date: 26-MAR-2011 04:24

Client ID: AS-SP2 Instrument: C.i

Sample Info: 200-4315-A-5@896.44 Operator: sv

58 Toluene



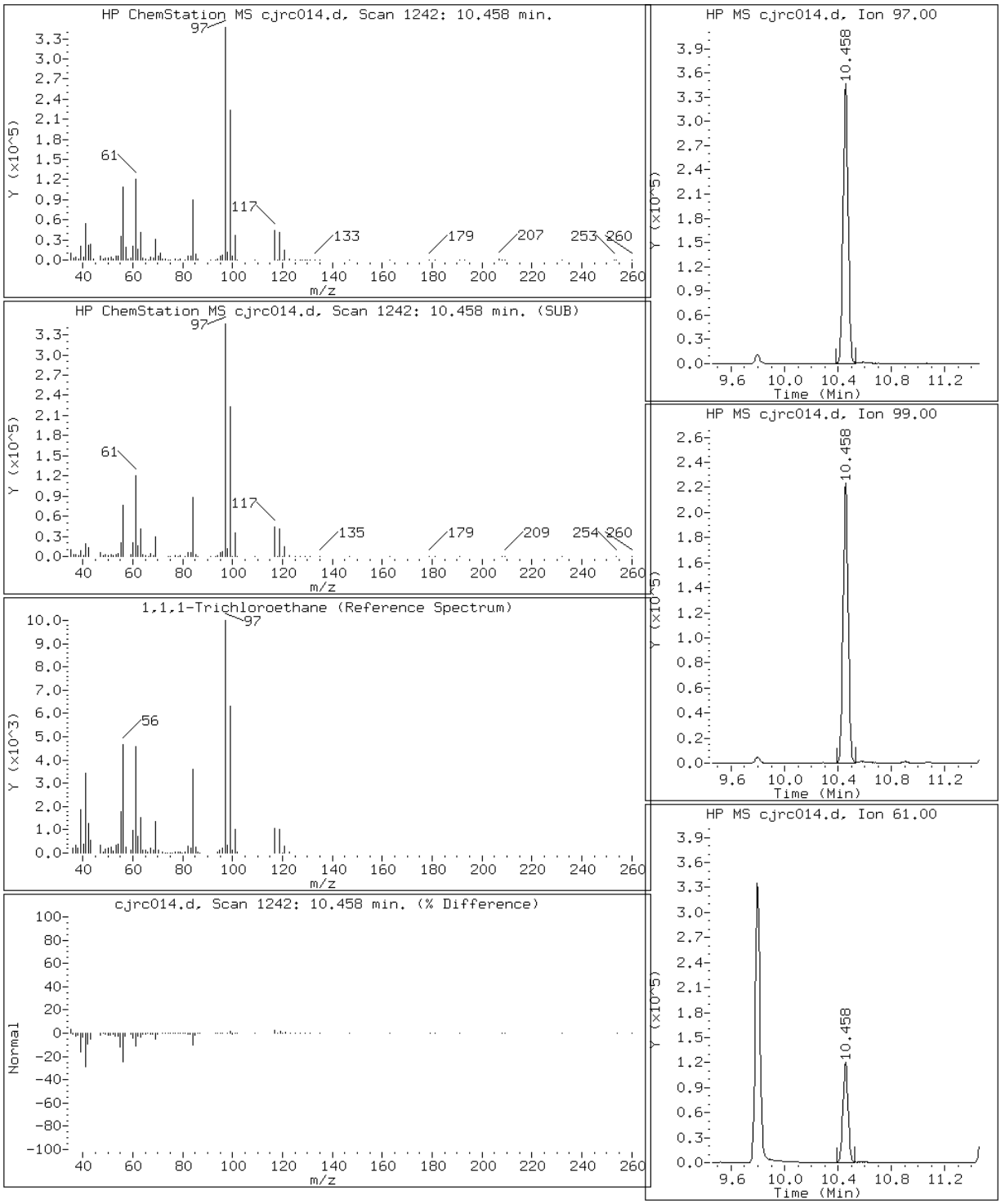
Data File: cjrc014.d

Lab Sample ID: 200-4315-5 Date: 26-MAR-2011 04:24

Client ID: AS-SP2 Instrument: C.i

Sample Info: 200-4315-A-5@896.44 Operator: sv

41 1,1,1-Trichloroethane



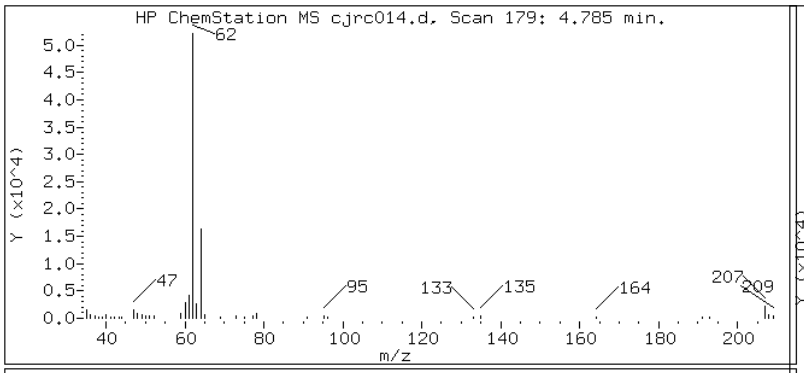
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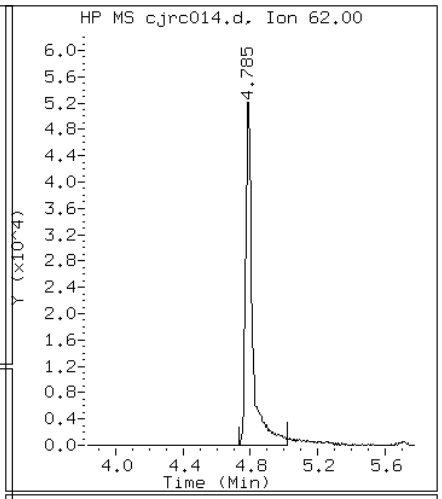
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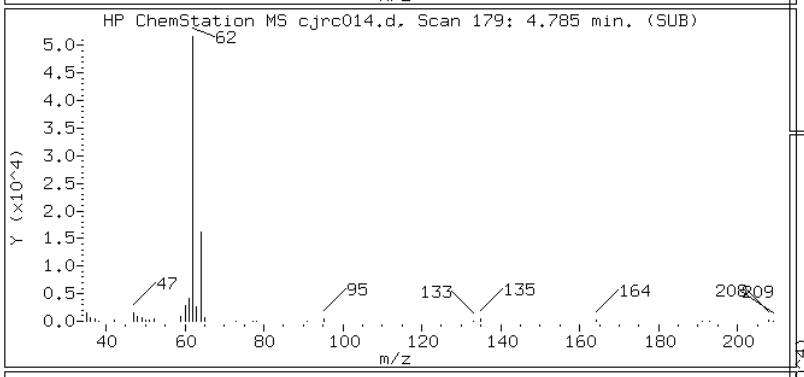
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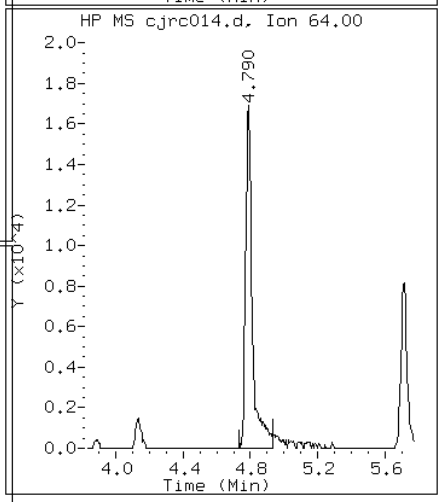
Sample Info: 200-4315-A-5@896.44 Operator: sv

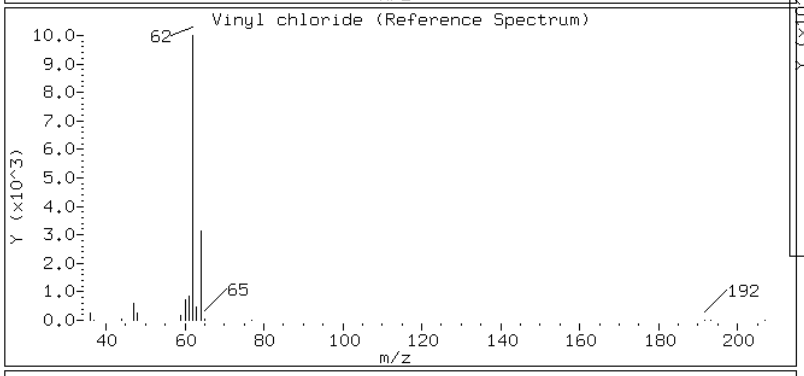
7 Vinyl chloride

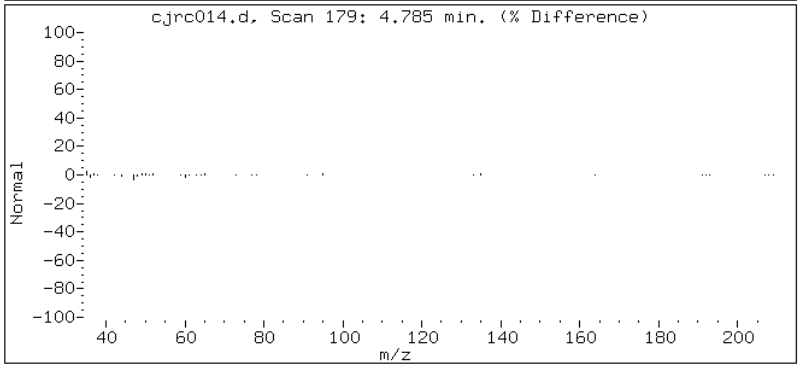












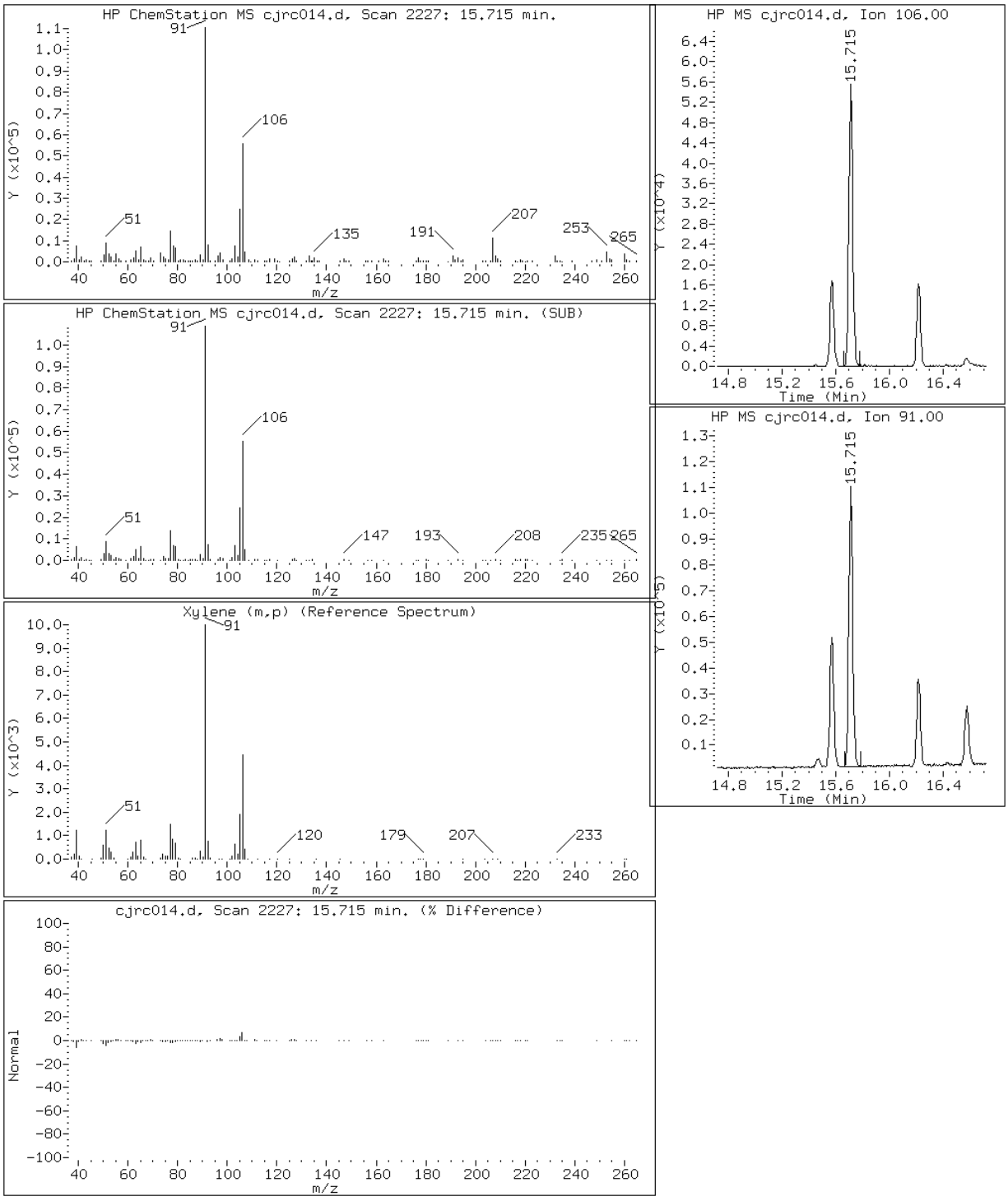
Data File: cjrc014.d

Lab Sample ID: 200-4315-5 Date: 26-MAR-2011 04:24

Client ID: AS-SP2 Instrument: C.i

Sample Info: 200-4315-A-5@896.44 Operator: sv

69 Xylene (m,p)



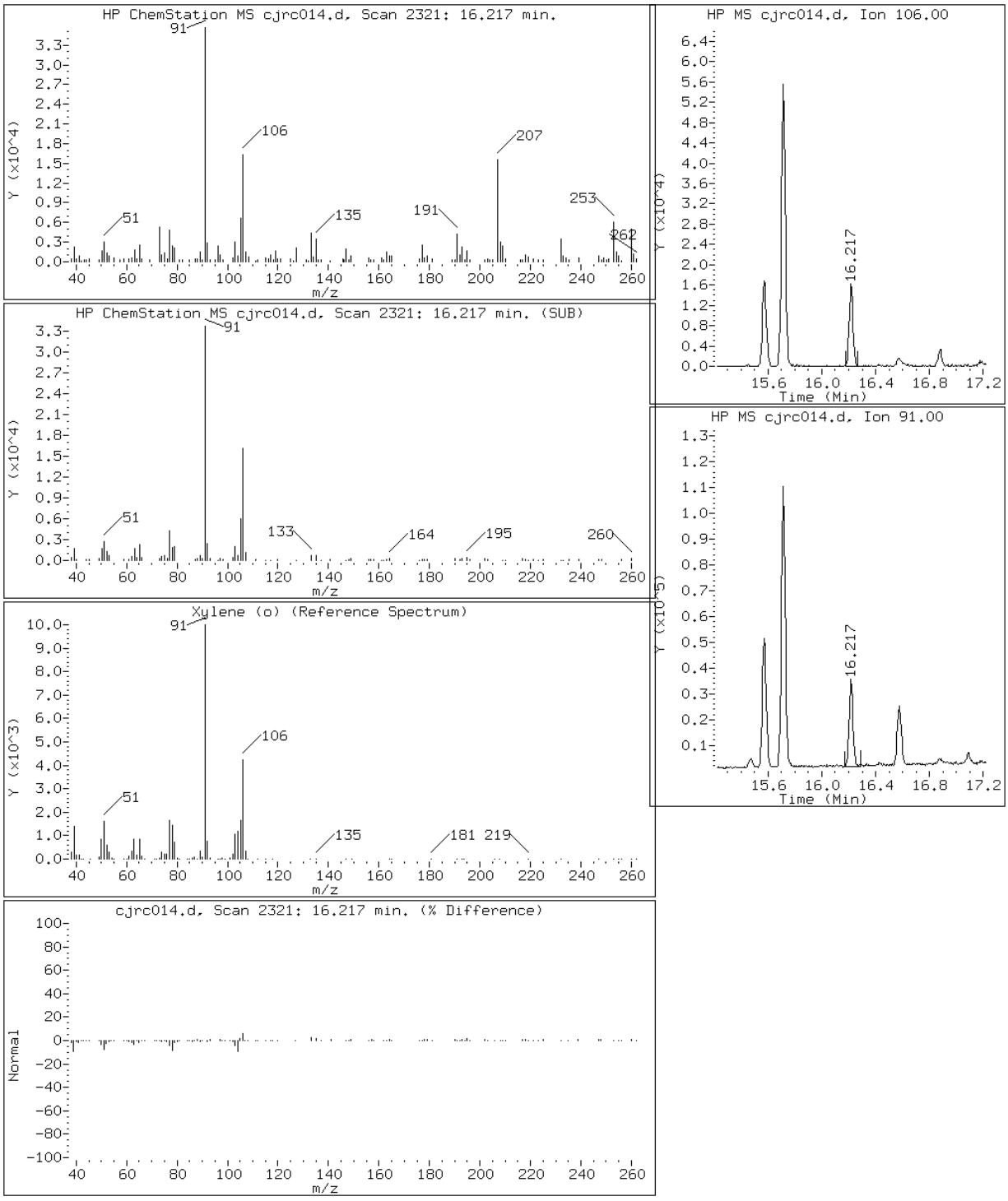
Data File: cjrc014.d

Lab Sample ID: 200-4315-5 Date: 26-MAR-2011 04:24

Client ID: AS-SP2 Instrument: C.i

Sample Info: 200-4315-A-5@896.44 Operator: sv

71 Xylene (o)



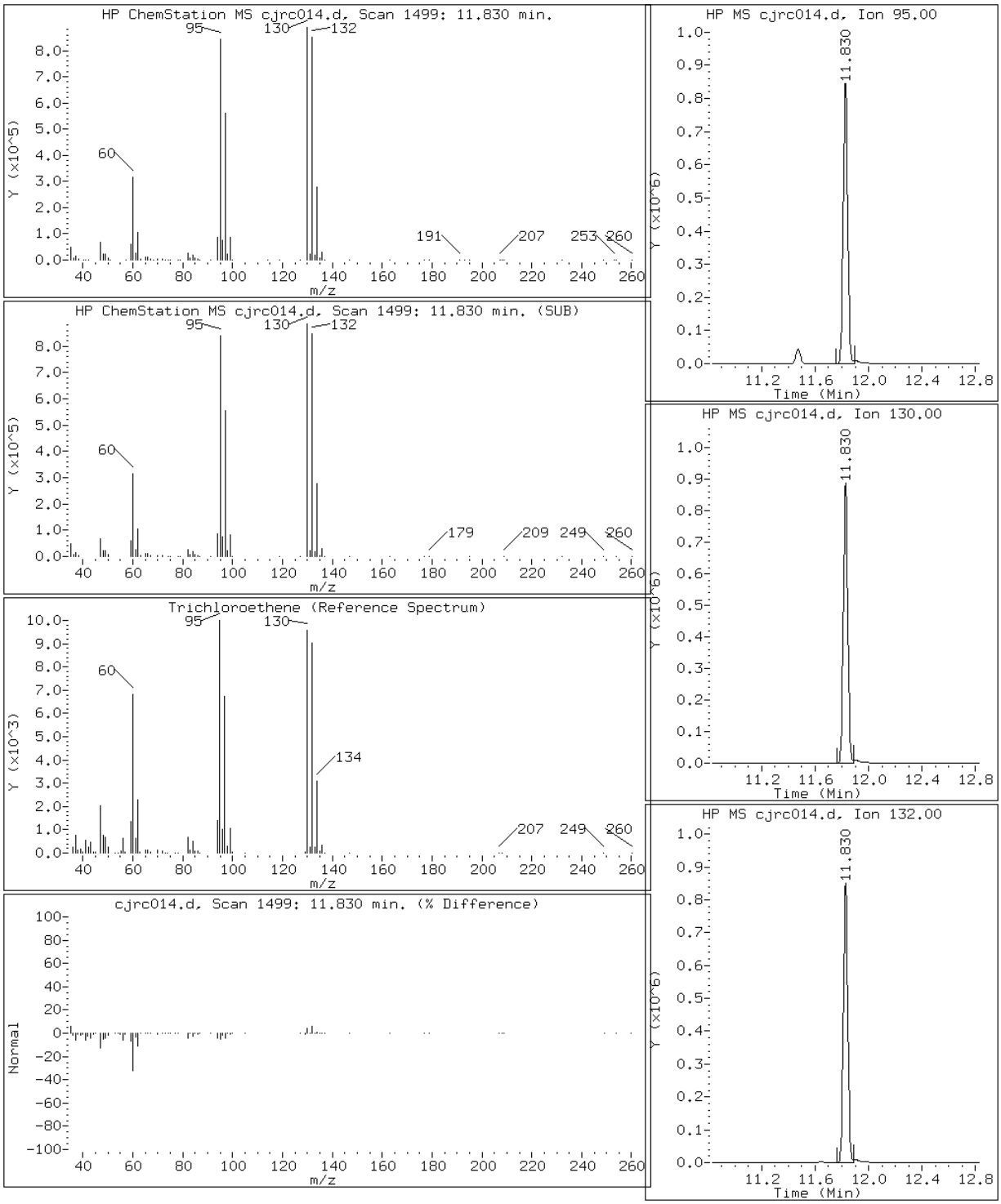
Data File: cjrc014.d

Lab Sample ID: 200-4315-5 Date: 26-MAR-2011 04:24

Client ID: AS-SP2 Instrument: C.i

Sample Info: 200-4315-A-5@896.44 Operator: sv

49 Trichloroethene



Manual Integration Report

Data File: cjrc014.d
Lab Sample ID: 200-4315-5
Inj. Date and Time: 26-MAR-2011 04:24
Instrument ID: C.i
Client ID: AS-SP2
Compound: 39 Chloroform
CAS #: 67-66-3
Report Date: 03/30/2011

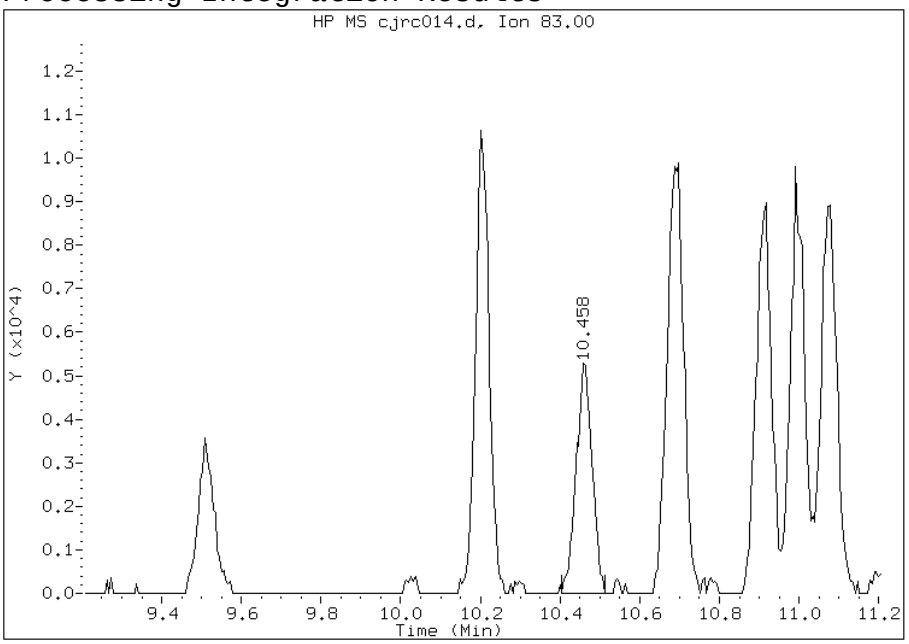
Processing Integration Results

RT: 10.46

Response: 14750

Amount: 0.109896

Conc: 758.29



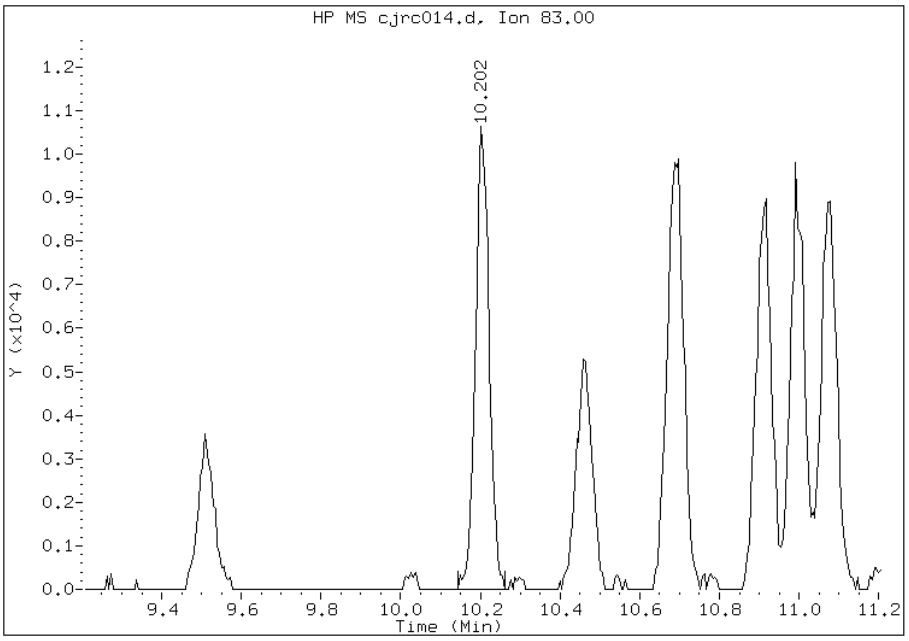
Manual Integration Results

RT: 10.20

Response: 25308

Amount: 0.188566

Conc: 1301.11



File Uploaded By: klp
Manual Integration Reason: Peak not found by the data system

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Client Sample ID: AS-SP3 Lab Sample ID: 200-4315-6

Matrix: Air Lab File ID: gffv005.d

Analysis Method: TO-15 Date Collected: 03/15/2011 15:55

Sample wt/vol: 69(mL) Date Analyzed: 03/29/2011 14:29

Soil Aliquot Vol: Dilution Factor: 3.97

Soil Extract Vol.: GC Column: RTX-624 ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 15787 Units: ppb v/v

CAS NO.	COMPOUND NAME	MOLECULAR WEIGHT	RESULT	Q	RL	RL
71-43-2	Benzene	78.11	0.79	U	0.79	0.79
75-25-2	Bromoform	252.75	0.79	U	0.79	0.79
74-83-9	Bromomethane	94.94	0.79	U	0.79	0.79
75-15-0	Carbon disulfide	76.14	2.0	U	2.0	2.0
56-23-5	Carbon tetrachloride	153.81	0.79	U	0.79	0.79
108-90-7	Chlorobenzene	112.30	0.79	U	0.79	0.79
75-00-3	Chloroethane	64.52	2.0	U	2.0	2.0
67-66-3	Chloroform	119.38	0.79	U	0.79	0.79
74-87-3	Chloromethane	50.49	3.8		2.0	2.0
106-46-7	1,4-Dichlorobenzene	147.00	0.79	U	0.79	0.79
75-34-3	1,1-Dichloroethane	98.96	0.79	U	0.79	0.79
107-06-2	1,2-Dichloroethane	98.96	0.79	U	0.79	0.79
75-35-4	1,1-Dichloroethene	96.94	0.79	U	0.79	0.79
78-87-5	1,2-Dichloropropane	112.99	0.79	U	0.79	0.79
123-91-1	1,4-Dioxane	88.11	20	U	20	20
100-41-4	Ethylbenzene	106.17	0.79	U	0.79	0.79
87-68-3	Hexachlorobutadiene	260.76	0.79	U	0.79	0.79
75-09-2	Methylene Chloride	84.93	2.0	U	2.0	2.0
91-20-3	Naphthalene	128.17	2.0	U	2.0	2.0
100-42-5	Styrene	104.15	0.79	U	0.79	0.79
79-34-5	1,1,2,2-Tetrachloroethane	167.85	0.79	U	0.79	0.79
127-18-4	Tetrachloroethene	165.83	0.79	U	0.79	0.79
108-88-3	Toluene	92.14	0.87		0.79	0.79
120-82-1	1,2,4-Trichlorobenzene	181.45	2.0	U	2.0	2.0
71-55-6	1,1,1-Trichloroethane	133.41	0.79	U	0.79	0.79
79-00-5	1,1,2-Trichloroethane	133.41	0.79	U	0.79	0.79
75-01-4	Vinyl chloride	62.50	120		0.79	0.79
1330-20-7	Xylene (total)	106.17	0.79	U	0.79	0.79
79-01-6	Trichloroethene	131.39	2.0		0.79	0.79

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Client Sample ID: AS-SP3 Lab Sample ID: 200-4315-6

Matrix: Air Lab File ID: gffv005.d

Analysis Method: TO-15 Date Collected: 03/15/2011 15:55

Sample wt/vol: 69(mL) Date Analyzed: 03/29/2011 14:29

Soil Aliquot Vol: Dilution Factor: 3.97

Soil Extract Vol.: GC Column: RTX-624 ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 15787 Units: ug/m3

CAS NO.	COMPOUND NAME	MOLECULAR WEIGHT	RESULT	Q	RL	RL
71-43-2	Benzene	78.11	2.5	U	2.5	2.5
75-25-2	Bromoform	252.75	8.2	U	8.2	8.2
74-83-9	Bromomethane	94.94	3.1	U	3.1	3.1
75-15-0	Carbon disulfide	76.14	6.2	U	6.2	6.2
56-23-5	Carbon tetrachloride	153.81	5.0	U	5.0	5.0
108-90-7	Chlorobenzene	112.30	3.6	U	3.6	3.6
75-00-3	Chloroethane	64.52	5.2	U	5.2	5.2
67-66-3	Chloroform	119.38	3.9	U	3.9	3.9
74-87-3	Chloromethane	50.49	7.8		4.1	4.1
106-46-7	1,4-Dichlorobenzene	147.00	4.8	U	4.8	4.8
75-34-3	1,1-Dichloroethane	98.96	3.2	U	3.2	3.2
107-06-2	1,2-Dichloroethane	98.96	3.2	U	3.2	3.2
75-35-4	1,1-Dichloroethene	96.94	3.1	U	3.1	3.1
78-87-5	1,2-Dichloropropane	112.99	3.7	U	3.7	3.7
123-91-1	1,4-Dioxane	88.11	72	U	72	72
100-41-4	Ethylbenzene	106.17	3.4	U	3.4	3.4
87-68-3	Hexachlorobutadiene	260.76	8.5	U	8.5	8.5
75-09-2	Methylene Chloride	84.93	6.9	U	6.9	6.9
91-20-3	Naphthalene	128.17	10	U	10	10
100-42-5	Styrene	104.15	3.4	U	3.4	3.4
79-34-5	1,1,2,2-Tetrachloroethane	167.85	5.5	U	5.5	5.5
127-18-4	Tetrachloroethene	165.83	5.4	U	5.4	5.4
108-88-3	Toluene	92.14	3.3		3.0	3.0
120-82-1	1,2,4-Trichlorobenzene	181.45	15	U	15	15
71-55-6	1,1,1-Trichloroethane	133.41	4.3	U	4.3	4.3
79-00-5	1,1,2-Trichloroethane	133.41	4.3	U	4.3	4.3
75-01-4	Vinyl chloride	62.50	300		2.0	2.0
1330-20-7	Xylene (total)	106.17	3.4	U	3.4	3.4
79-01-6	Trichloroethene	131.39	11		4.3	4.3

TestAmerica Burlington

AIR TOXICS QUANTITATION REPORT

Lab Sample Id: 200-4315-6
Client Smp ID: AS-SP3
Inj Date : 29-MAR-2011 14:29
Operator : wrd Inst ID: G.i
Smp Info : 200-4315-A-6@1.37
Misc Info : 69,3.97,all74 cdf 1.37
Comment :
Method : /chem/G.i/Gsvr.p/gffvto15.b/to15v5.m
Meth Date : 30-Mar-2011 09:27 wrd Quant Type: ISTD
Cal Date : 03-MAR-2011 10:00 Cal File: gff015.d
Als bottle: 5
Dil Factor: 3.97000
Integrator: HP RTE Compound Sublist: all74.sub
Target Version: 3.50
Processing Host: chemsvr6

Concentration Formula: Amt * DF * Uf*(Vo/Vo)*(Vf/Vf) * CpndVariable

Name	Value	Description
DF	3.97000	Dilution Factor
Uf	1.00000	ng unit correction factor
Vo	69.00000	Sample Volume purged (mL)
Vf	200.00000	Final Volume (mL)

Cpnd Variable Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	FINAL (ppb v/v)
2 Dichlorodifluoromethane	85	3.155	3.154	(0.332)	896147	10.6810	42
3 Chlorodifluoromethane	51	3.192	3.192	(0.336)	3676027	107.331	430(A)
4 1,2-Dichloro-1,1,2,2-tetraflu	85	Compound Not Detected.					
5 Chloromethane	50	3.502	3.502	(0.368)	15877	0.95175	3.8
6 Butane	43	Compound Not Detected.					
7 Vinyl chloride	62	3.716	3.716	(0.391)	711531	29.3246	120
8 1,3-Butadiene	54	Compound Not Detected.					
9 Bromomethane	94	Compound Not Detected.					
10 Chloroethane	64	Compound Not Detected.					
12 Vinyl bromide	106	Compound Not Detected.					
13 Trichlorofluoromethane	101	Compound Not Detected.					
17 1,1,2-Trichloro-1,2,2-trifluo	101	Compound Not Detected.					
19 1,1-Dichloroethene	96	Compound Not Detected.					
20 Acetone	43	Compound Not Detected.					

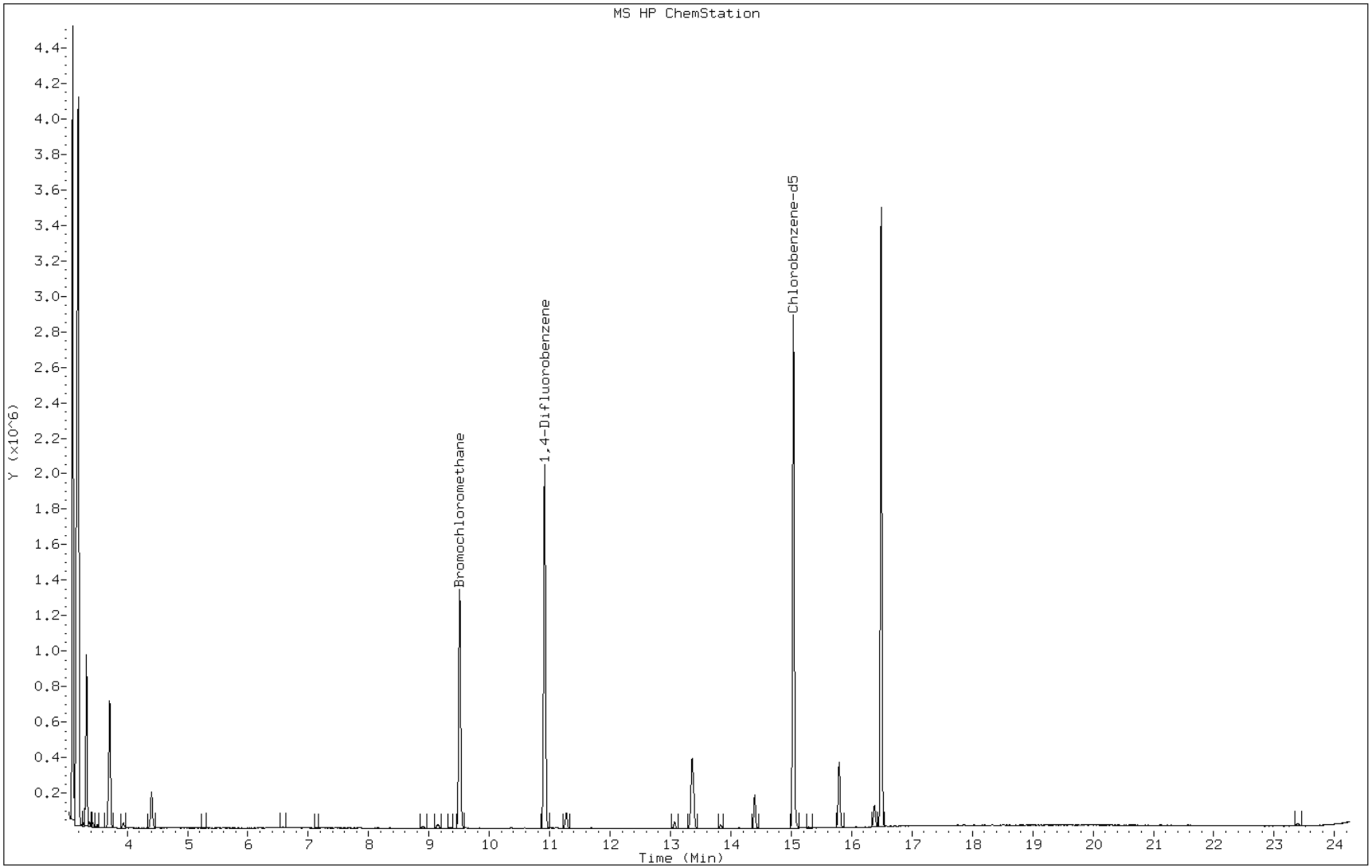
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	FINAL (ppb v/v)
	21 Carbon disulfide	76	Compound Not Detected.					
	22 Isopropanol	45	Compound Not Detected.					
	23 Allyl chloride	41	Compound Not Detected.					
	25 Methylene chloride	49	Compound Not Detected.					
	26 Tert-butyl alcohol	59	Compound Not Detected.					
	27 Methyl tert-butyl ether	73	Compound Not Detected.					
	28 1,2-Dichloroethene (trans)	61	Compound Not Detected.					
	30 n-Hexane	57	Compound Not Detected.					
	31 1,1-Dichloroethane	63	Compound Not Detected.					
M	33 1,2-Dichloroethene,Total	61				13197	0.25870	1.0
	34 1,2-Dichloroethene (cis)	96	9.141	9.162	(0.961)	13197	0.25870	1.0
	36 Methyl Ethyl Ketone	72	9.157	9.162	(0.963)	1557	0.10231	0.41(aQ)
*	37 Bromochloromethane	128	9.510	9.531	(1.000)	542901	10.0000	
	38 Tetrahydrofuran	42	Compound Not Detected.					
	39 Chloroform	83	Compound Not Detected.					
	40 Cyclohexane	84	Compound Not Detected.					
	41 1,1,1-Trichloroethane	97	Compound Not Detected.					
	42 Carbon tetrachloride	117	Compound Not Detected.					
	43 2,2,4-Trimethylpentane	57	Compound Not Detected.					
	44 Benzene	78	Compound Not Detected.					
	45 1,2-Dichloroethane	62	Compound Not Detected.					
	46 n-Heptane	43	Compound Not Detected.					
*	47 1,4-Difluorobenzene	114	10.912	10.933	(1.000)	2304903	10.0000	
	49 Trichloroethene	95	11.275	11.291	(1.033)	35169	0.51414	2.0
	50 1,2-Dichloropropane	63	Compound Not Detected.					
	51 Methyl methacrylate	69	Compound Not Detected.					
	53 1,4-Dioxane	88	Compound Not Detected.					
	54 Bromodichloromethane	83	Compound Not Detected.					
	55 1,3-Dichloropropene (cis)	75	Compound Not Detected.					
	56 Methyl isobutyl ketone	43	Compound Not Detected.					
	58 Toluene	92	13.073	13.089	(0.869)	20839	0.21847	0.87
	59 1,3-Dichloropropene (trans)	75	Compound Not Detected.					
	60 1,1,2-Trichloroethane	83	Compound Not Detected.					
	61 Tetrachloroethene	166	13.838	13.848	(0.920)	6962	0.08294	0.33(a)
	62 2-Hexanone	43	Compound Not Detected.					
	63 Dibromochloromethane	129	Compound Not Detected.					
	64 1,2-Dibromoethane	107	Compound Not Detected.					
*	65 Chlorobenzene-d5	117	15.036	15.052	(1.000)	2242500	10.0000	
	66 Chlorobenzene	112	Compound Not Detected.					
	68 Ethylbenzene	91	Compound Not Detected.					
	69 Xylene (m,p)	106	Compound Not Detected.					
M	70 Xylenes, Total	106	Compound Not Detected.					
	71 Xylene (o)	106	Compound Not Detected.					
	72 Styrene	104	Compound Not Detected.					
	73 Bromoform	173	Compound Not Detected.					
	74 Isopropylbenzene	105	Compound Not Detected.					
	75 1,1,2,2-Tetrachloroethane	83	Compound Not Detected.					

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	FINAL (ppb v/v)
76 n-Propylbenzene	91	Compound Not Detected.					
79 4-Ethyltoluene	105	Compound Not Detected.					
80 2-Chlorotoluene	91	Compound Not Detected.					
81 1,3,5-Trimethylbenzene	105	Compound Not Detected.					
83 tert-butylbenzene	119	Compound Not Detected.					
84 1,2,4-Trimethylbenzene	105	Compound Not Detected.					
85 sec-Butylbenzene	105	Compound Not Detected.					
86 4-Isopropyltoluene	119	Compound Not Detected.					
87 1,3-Dichlorobenzene	146	Compound Not Detected.					
88 1,4-Dichlorobenzene	146	Compound Not Detected.					
89 Benzyl chloride	91	Compound Not Detected.					
91 n-Butylbenzene	91	Compound Not Detected.					
92 1,2-Dichlorobenzene	146	Compound Not Detected.					
94 1,2,4-Trichlorobenzene	180	Compound Not Detected.					
95 1,3-Hexachlorobutadiene	225	Compound Not Detected.					
96 Naphthalene	128	Compound Not Detected.					

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
A - Target compound detected but, quantitated amount
exceeded maximum amount.
Q - Qualifier signal failed the ratio test.

Data File:	gffv005.d	Date:	29-MAR-2011 14:29
Client ID:	AS-SP3	Instrument:	G.i
Operator:	wrd	Inj Vol:	200.0
Column Type:	Capillary	Diameter:	0.32
Stationary Phase:	RTX-624		
Sample Info:	200-4315-A-6@1.37		
Lab Sample ID:	200-4315-6		



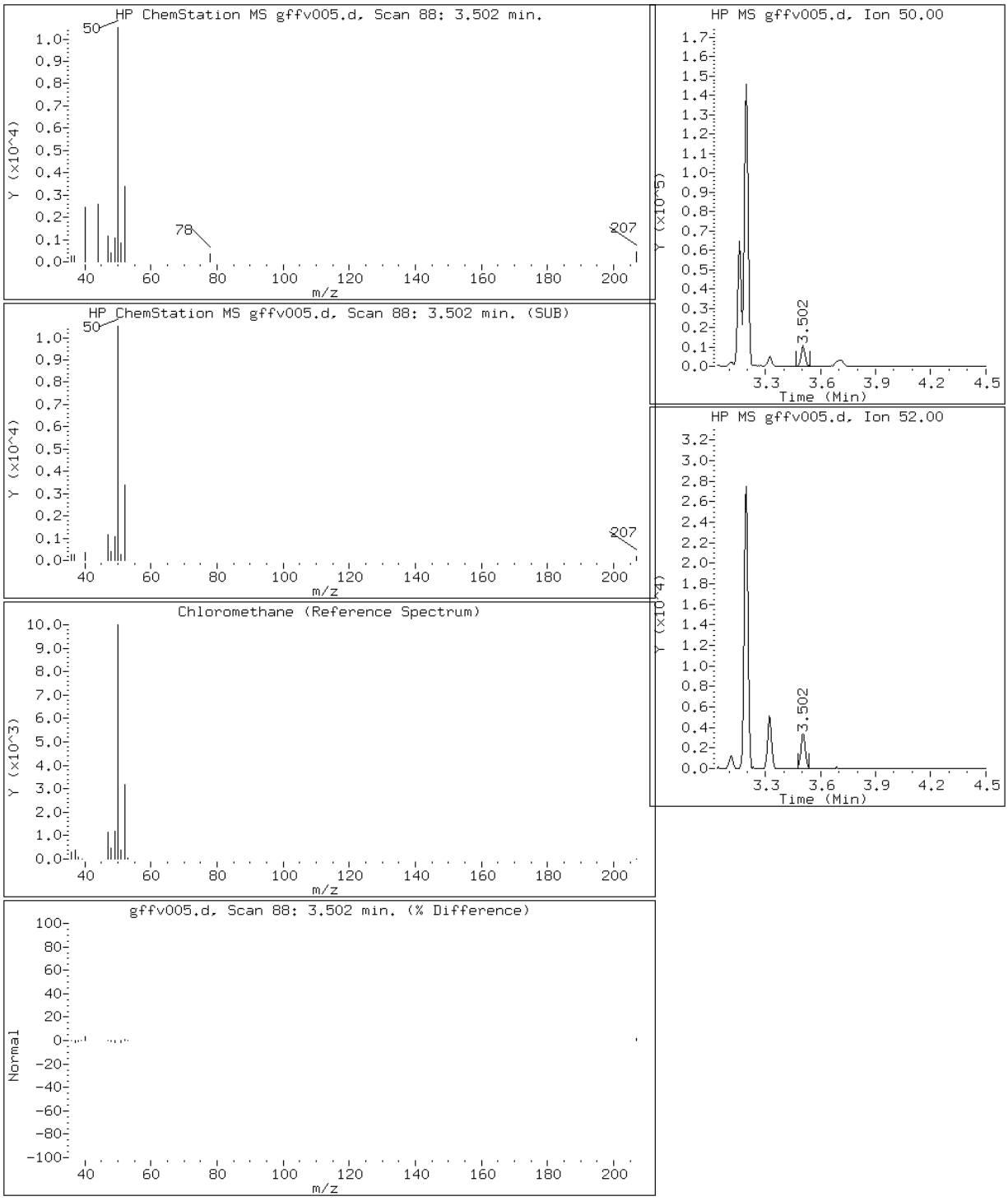
Data File: gffv005.d

Lab Sample ID: 200-4315-6 Date: 29-MAR-2011 14:29

Client ID: AS-SP3 Instrument: G.i

Sample Info: 200-4315-A-6@1.37 Operator: wrd

5 Chloromethane



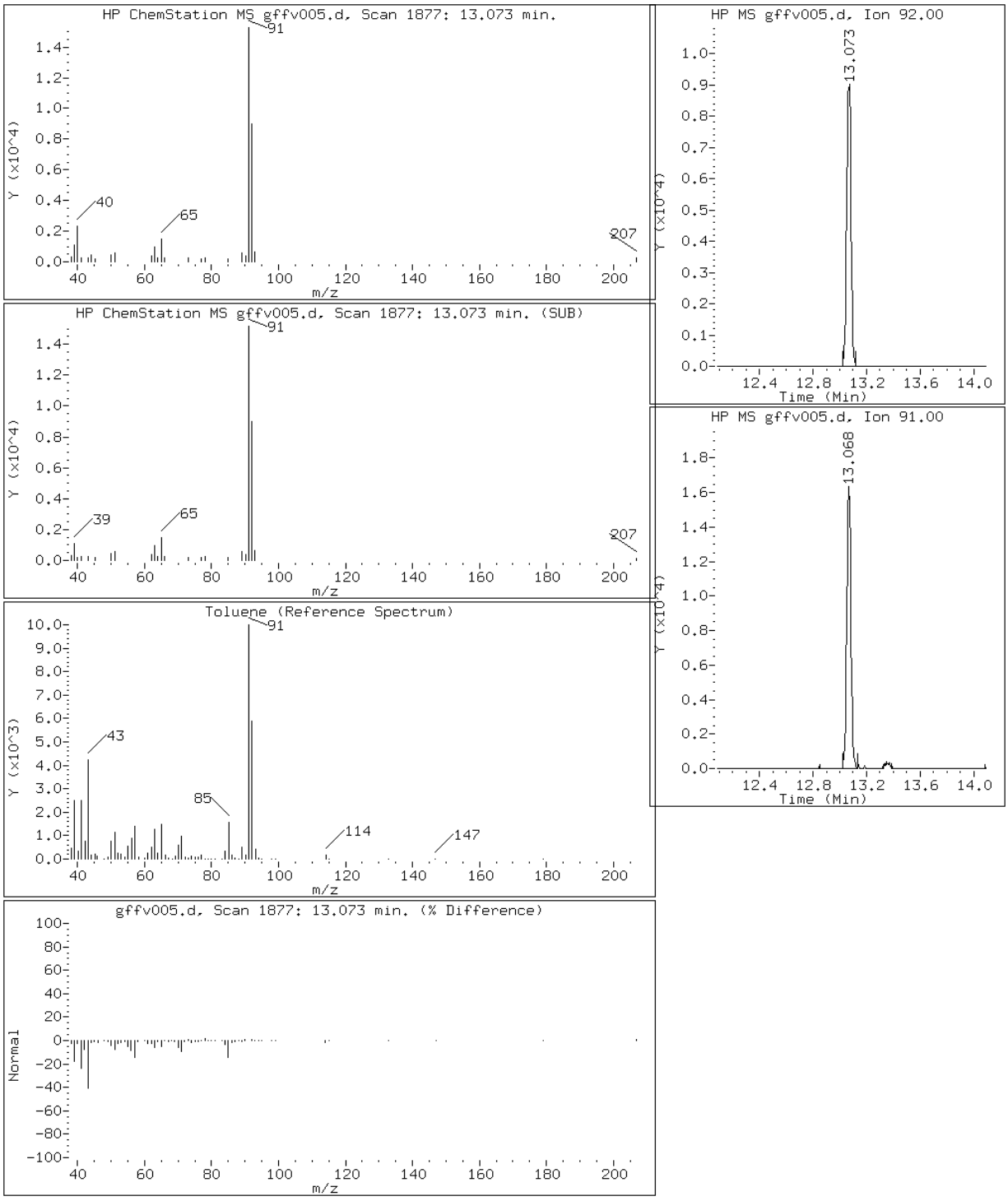
Data File: gffv005.d

Lab Sample ID: 200-4315-6 Date: 29-MAR-2011 14:29

Client ID: AS-SP3 Instrument: G.i

Sample Info: 200-4315-A-6@1.37 Operator: wrd

58 Toluene



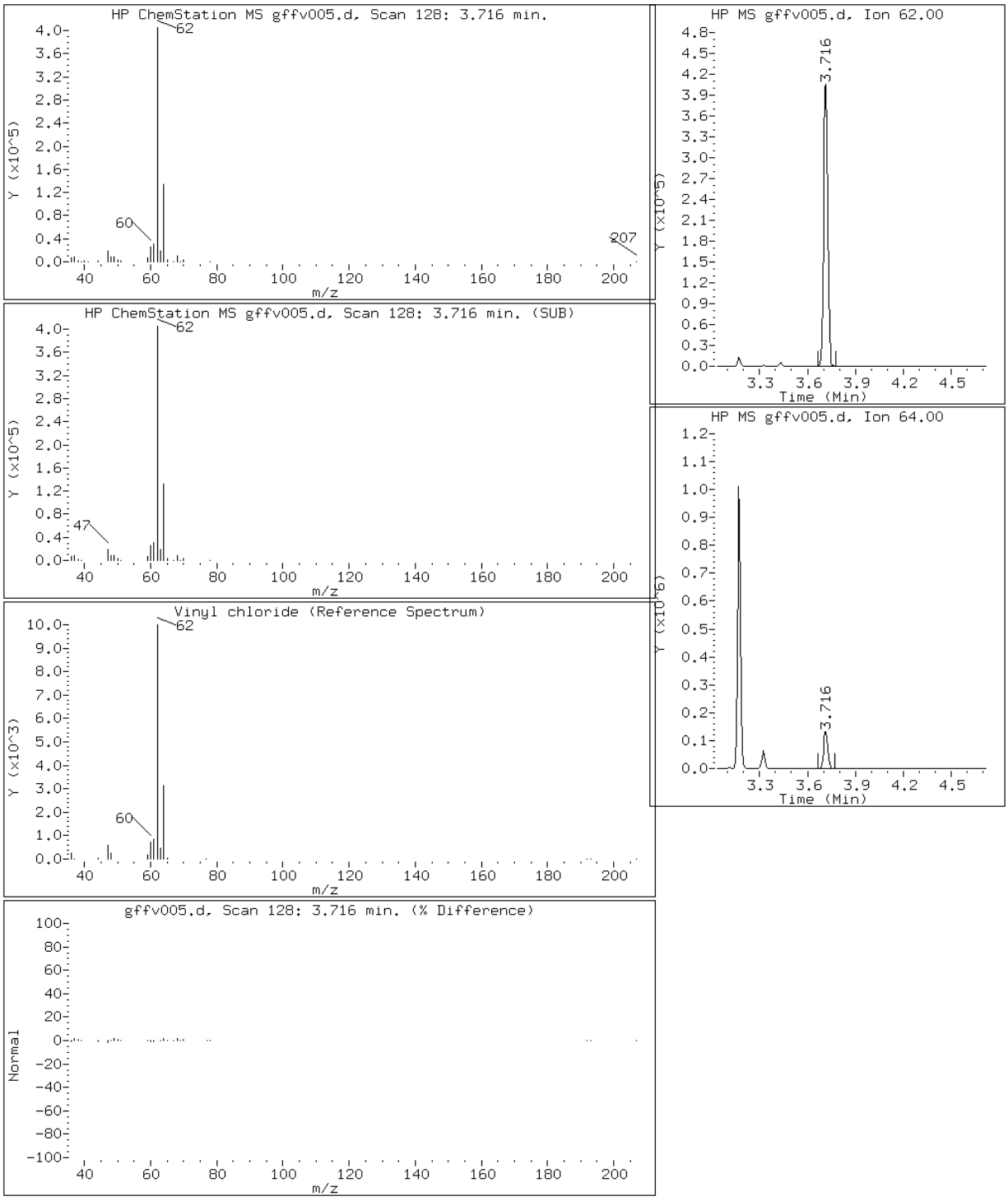
Data File: gffv005.d

Lab Sample ID: 200-4315-6 Date: 29-MAR-2011 14:29

Client ID: AS-SP3 Instrument: G.i

Sample Info: 200-4315-A-6@1.37 Operator: wrd

7 Vinyl chloride



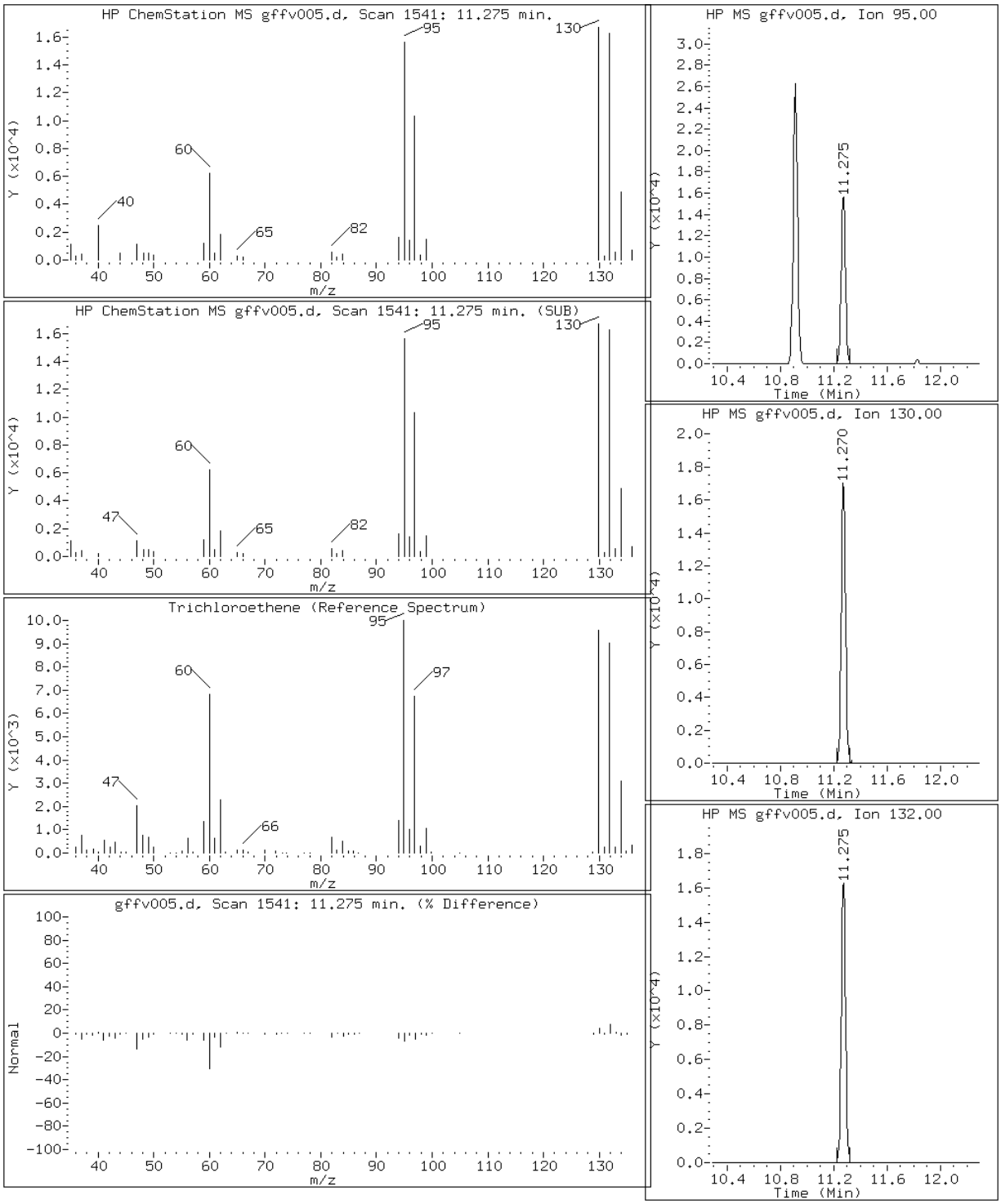
Data File: gffv005.d

Lab Sample ID: 200-4315-6 Date: 29-MAR-2011 14:29

Client ID: AS-SP3 Instrument: G.i

Sample Info: 200-4315-A-6@1.37 Operator: wrd

49 Trichloroethene



FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUTION

Lab Name: TestAmerica Burlington Job No.: 200-4315-1 Analy Batch No.: 15668

SDG No.: Narrowburg, NY

Instrument ID: C.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 03/22/2011 17:52 Calibration End Date: 03/22/2011 22:39 Calibration ID: 5511

Calibration Files:

LEVEL:	LAB SAMPLE ID:	EPA SAMPLE NO:	LAB FILE ID:
Level 1	IC 200-15668/3	ic 109459	cjr003.d
Level 2	IC 200-15668/4	ic 109450	cjr004.d
Level 3	IC 200-15668/5	ic 109440	cjr005.d
Level 4	ICIS 200-15668/6	icis 119922	cjr006.d
Level 5	IC 200-15668/7	ic 109427	cjr007.d
Level 6	IC 200-15668/8	ic 109425	cjr008.d
Level 7	IC 200-15668/9	ic 109424	cjr009.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Propylene	+++++ 0.4958	0.5302 0.4812	0.5329	0.5173	0.5126	Ave		0.5117				3.9		30.0			
Dichlorodifluoromethane	+++++ 2.6113	2.8826 2.3650	2.8402	2.7831	2.6839	Ave		2.6944				7.0		30.0			
Freon 22	+++++ 1.2553	1.3593 1.1695	1.3246	1.2920	1.2720	Ave		1.2788				5.1		30.0			
1,2-Dichlorotetrafluoroethane	2.8184 2.7820	2.9827 2.4813	2.9861	2.9387	2.8675	Ave		2.8367				6.2		30.0			
Chloromethane	+++++ 0.6769	0.8107 0.6934	0.7097	0.7053	0.6753	Ave		0.7119				7.1		30.0			
n-Butane	+++++ 1.0299	1.0131 0.9659	1.0803	1.0639	1.0377	Ave		1.0318				3.9		30.0			
Vinyl chloride	0.9504 0.8829	0.8702 0.8417	0.9023	0.8896	0.8843	Ave		0.8888				3.7		30.0			
1,3-Butadiene	0.6112 0.6045	0.5769 0.5758	0.5851	0.6271	0.6097	Ave		0.5986				3.3		30.0			
Bromomethane	1.0343 0.9771	1.0764 0.9461	1.0288	1.0305	1.0072	Ave		1.0143				4.2		30.0			
Chloroethane	+++++ 0.5210	0.5666 0.5007	0.5701	0.5489	0.5393	Ave		0.5411				5.0		30.0			
Isopentane	0.8599 0.8508	0.9343 0.7946	0.9787	0.9451	0.9102	Ave		0.8962				7.1		30.0			
Bromoethene(Vinyl Bromide)	1.0827 1.0721	1.0261 1.0458	1.1251	1.0973	1.0946	Ave		1.0777				3.1		30.0			
Trichlorofluoromethane	2.7061 2.6482	2.7632 2.4806	2.7781	2.7406	2.6939	Ave		2.6873				3.8		30.0			
n-Pentane	+++++ 1.4069	1.2239 1.2870	1.5365	1.5097	1.4667	Ave		1.4051				8.9		30.0			

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUTION

Lab Name: TestAmerica Burlington Job No.: 200-4315-1 Analy Batch No.: 15668

SDG No.: Narrowburg, NY

Instrument ID: C.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 03/22/2011 17:52 Calibration End Date: 03/22/2011 22:39 Calibration ID: 5511

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Ethanol	+++++ 0.2905	0.3102 0.2896	0.2735	0.2888	0.2996	Ave		0.2920				4.2		30.0			
Ethyl ether	0.7539 0.6683	0.7146 0.6365	0.7507	0.7005	0.6903	Ave		0.7021				6.0		30.0			
Acrolein	+++++ 0.3261	+++++ 0.2936	0.3644	0.2984	0.3383	Ave		0.3241				9.0		30.0			
Freon TF	2.0631 2.0728	2.1111 1.9289	2.1495	2.1283	2.0915	Ave		2.0779				3.5		30.0			
1,1-Dichloroethene	0.8463 1.0445	1.0569 1.0209	1.0603	1.0627	1.0486	Ave		1.0200				7.6		30.0			
Acetone	+++++ 1.0946	+++++ 0.9947	1.2575	1.1881	1.0430	Ave		1.1156				9.6		30.0			
Isopropyl alcohol	+++++ 0.7315	+++++ 0.7292	0.8940	0.9304	0.7753	Ave		0.8121				11.6		30.0			
Carbon disulfide	+++++ 3.1176	3.1448 2.8767	3.2819	3.2446	3.1686	Ave		3.1390				4.5		30.0			
3-Chloropropene	0.9296 0.9688	0.9056 0.9072	0.9965	0.9907	0.9661	Ave		0.9521				4.0		30.0			
Acetonitrile	+++++ 0.5774	+++++ 0.5586	0.6565	0.6259	0.5878	Ave		0.6012				6.6		30.0			
Methylene Chloride	+++++ 0.9050	1.1021 0.8498	0.9961	0.9701	0.9258	Ave		0.9582				9.1		30.0			
tert-Butyl alcohol	+++++ 1.1730	+++++ 1.1946	1.4040	1.5794	1.3282	Ave		1.3358				12.4		30.0			
Methyl tert-butyl ether	2.8715 2.7860	3.0968 2.6907	3.0743	2.8308	2.8127	Ave		2.8804				5.2		30.0			
trans-1,2-Dichloroethene	1.4251 1.3885	1.5160 1.2806	1.4937	1.4627	1.4215	Ave		1.4269				5.5		30.0			
Acrylonitrile	+++++ 0.6617	0.6875 0.6582	0.6989	0.6729	0.6731	Ave		0.6754				2.3		30.0			
n-Hexane	1.4860 1.5141	1.5340 1.3868	1.6204	1.6214	1.5715	Ave		1.5335				5.4		30.0			
1,1-Dichloroethane	1.9066 1.7688	1.9622 1.5943	1.9707	1.9115	1.8167	Ave		1.8473				7.2		30.0			
Vinyl acetate	+++++ 1.7255	+++++ 1.5720	1.9924	1.7410	1.7825	Ave		1.7627				8.6		30.0			
cis-1,2-Dichloroethene	1.2651 1.1912	1.2687 1.1009	1.2824	1.2408	1.2179	Ave		1.2239				5.1		30.0			
Ethyl acetate	+++++ 0.0956	+++++ 0.0927	0.1037	0.0951	0.0969	Ave		0.0968				4.3		30.0			

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUTION

Lab Name: TestAmerica Burlington Job No.: 200-4315-1 Analy Batch No.: 15668

SDG No.: Narrowburg, NY

Instrument ID: C.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 03/22/2011 17:52 Calibration End Date: 03/22/2011 22:39 Calibration ID: 5511

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Methyl Ethyl Ketone	+++++ 0.4700	0.5747 0.4403	0.5350	0.4898	0.4768	Ave		0.4978				9.8		30.0			
Tetrahydrofuran	+++++ 0.1391	+++++ 0.1335	0.1593	0.1446	0.1422	Ave		0.1437				6.7		30.0			
Chloroform	2.3023 2.2560	2.4635 2.0934	2.4124	2.3588	2.2982	Ave		2.3121				5.2		30.0			
1,1,1-Trichloroethane	0.4330 0.4296	0.4496 0.3980	0.4438	0.4477	0.4328	Ave		0.4335				4.0		30.0			
Cyclohexane	0.2847 0.2926	0.3120 0.2675	0.3094	0.3109	0.3005	Ave		0.2968				5.5		30.0			
Carbon tetrachloride	0.4080 0.4421	0.4252 0.4232	0.4406	0.4514	0.4455	Ave		0.4337				3.5		30.0			
2,2,4-Trimethylpentane	0.8773 0.8582	0.9150 0.7580	0.9334	0.9313	0.8906	Ave		0.8805				6.9		30.0			
Benzene	0.7272 0.6342	0.6946 0.5868	0.6795	0.6698	0.6490	Ave		0.6630				6.8		30.0			
1,2-Dichloroethane	0.2496 0.2348	0.2470 0.2248	0.2484	0.2457	0.2382	Ave		0.2412				3.8		30.0			
n-Heptane	0.2842 0.2588	0.2803 0.2281	0.2876	0.2855	0.2700	Ave		0.2707				7.9		30.0			
n-Butanol	+++++ 0.0554	+++++ 0.0603	0.0664	0.0743	0.0697	Ave		0.0652				11.5		30.0			
Trichloroethene	0.2867 0.2905	0.3046 0.2732	0.2982	0.3042	0.2936	Ave		0.2930				3.8		30.0			
1,2-Dichloropropane	0.2203 0.2088	0.2233 0.1877	0.2268	0.2228	0.2154	Ave		0.2150				6.2		30.0			
Methyl methacrylate	+++++ 0.1874	0.1508 0.1860	0.1898	0.1853	0.1871	Ave		0.1811				8.2		30.0			
1,4-Dioxane	+++++ 0.0740	+++++ 0.0769	0.0840	0.0872	0.0737	Ave		0.0792				7.8		30.0			
Dibromomethane	0.2172 0.2350	0.2160 0.2275	0.2313	0.2344	0.2344	Ave		0.2280				3.6		30.0			
Bromodichloromethane	0.3792 0.4485	0.4065 0.4168	0.4566	0.4647	0.4538	Ave		0.4323				7.4		30.0			
cis-1,3-Dichloropropene	0.3424 0.3455	0.3392 0.3293	0.3506	0.3498	0.3461	Ave		0.3433				2.1		30.0			
Methyl isobutyl ketone	+++++ 0.2659	0.2392 0.2654	0.2811	0.2824	0.2716	Ave		0.2676				5.9		30.0			
n-Octane	0.3831 0.3291	0.3842 0.2771	0.3830	0.3658	0.3454	Ave		0.3525				11.2		30.0			

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUTION

Lab Name: TestAmerica Burlington Job No.: 200-4315-1 Analy Batch No.: 15668

SDG No.: Narrowburg, NY

Instrument ID: C.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 03/22/2011 17:52 Calibration End Date: 03/22/2011 22:39 Calibration ID: 5511

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Toluene	0.6152 0.5086	0.6071 0.4805	0.5555	0.5676	0.5340	Ave		0.5526				8.9		30.0			
trans-1,3-Dichloropropene	0.3108 0.3268	0.3157 0.3174	0.3292	0.3241	0.3258	Ave		0.3214				2.1		30.0			
1,1,2-Trichloroethane	0.2645 0.2404	0.2730 0.2257	0.2592	0.2718	0.2520	Ave		0.2552				6.8		30.0			
Tetrachloroethene	0.4313 0.4172	0.4548 0.3849	0.4385	0.4649	0.4356	Ave		0.4325				6.0		30.0			
Methyl Butyl Ketone (2-Hexanone)	+++++ 0.2743	0.2263 0.2727	0.2889	0.3265	0.2930	Ave		0.2803				11.7		30.0			
Dibromochloromethane	0.4076 0.5013	0.4344 0.4723	0.5060	0.5492	0.5215	Ave		0.4846				10.3		30.0			
1,2-Dibromoethane	0.4443 0.4551	0.4658 0.4234	0.4813	0.5101	0.4751	Ave		0.4650				6.0		30.0			
Chlorobenzene	0.7397 0.6730	0.7633 0.6130	0.7197	0.7459	0.7006	Ave		0.7079				7.3		30.0			
n-Nonane	0.3779 0.3427	0.3715 0.2613	0.4050	0.4131	0.3777	Ave		0.3642				14.0		30.0			
Ethylbenzene	1.0243 0.9350	1.0755 0.7546	1.0829	1.1044	1.0156	Ave		0.9989				12.2		30.0			
m,p-Xylene	0.3927 0.4053	0.4254 0.3472	0.4401	0.4528	0.4290	Ave		0.4132				8.6		30.0			
Xylene, o-	0.4070 0.4173	0.4411 0.3970	0.4444	0.4518	0.4320	Ave		0.4272				4.8		30.0			
Styrene	0.4347 0.5989	0.5161 0.5668	0.6239	0.6478	0.6203	Ave		0.5726				13.0		30.0			
Bromoform	0.3270 0.4367	0.3554 0.3990	0.4404	0.4685	0.4573	Ave		0.4120				13.0		30.0			
Cumene	1.0279 1.1199	1.1345 0.9156	1.2298	1.2514	1.1971	Ave		1.1252				10.6		30.0			
1,1,2,2-Tetrachloroethane	0.5619 0.5682	0.6121 0.5036	0.6205	0.6340	0.5987	Ave		0.5856				7.6		30.0			
n-Propylbenzene	1.0878 1.2167	1.1974 0.9135	1.3923	1.4073	1.3173	Ave		1.2189				14.5		30.0			
1,2,3-Trichloropropane	+++++ 0.4009	0.4674 0.3340	0.4549	0.4583	0.4275	Ave		0.4238				11.9		30.0			
n-Decane	+++++ 0.4340	0.2818 0.3506	0.4596	0.4578	0.4633	Ave		0.4079				18.4		30.0			
4-Ethyltoluene	0.8566 1.0815	1.0021 0.8867	1.2035	1.2326	1.1522	Ave		1.0593				14.1		30.0			

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUTION

Lab Name: TestAmerica Burlington Job No.: 200-4315-1 Analy Batch No.: 15668

SDG No.: Narrowburg, NY

Instrument ID: C.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 03/22/2011 17:52 Calibration End Date: 03/22/2011 22:39 Calibration ID: 5511

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
2-Chlorotoluene	0.9005 0.9030	0.9707 0.7470	1.0131	1.0099	0.9414	Ave		0.9265				9.9		30.0			
1,3,5-Trimethylbenzene	0.7176 0.9193	0.8152 0.7509	1.0115	1.0191	0.9707	Ave		0.8863				14.1		30.0			
Alpha Methyl Styrene	0.2668 0.4747	0.3166 0.5047	0.4945	0.5261	0.5213	Ave		0.4435				23.9		30.0			
tert-Butylbenzene	0.7959 0.9145	0.8607 0.8023	0.9921	1.0067	0.9605	Ave		0.9047				9.6		30.0			
1,2,4-Trimethylbenzene	0.6486 0.8992	0.7460 0.7865	0.9842	1.0088	0.9523	Ave		0.8608				15.8		30.0			
sec-Butylbenzene	1.0044 1.2668	1.1416 1.0190	1.4280	1.4598	1.3568	Ave		1.2395				15.2		30.0			
4-Isopropyltoluene	0.7498 1.0807	0.8123 0.9122	1.1733	1.1992	1.1468	Ave		1.0106				18.2		30.0			
1,3-Dichlorobenzene	0.5903 0.6354	0.5909 0.5947	0.6418	0.6810	0.6572	Ave		0.6273				5.7		30.0			
1,4-Dichlorobenzene	0.5771 0.6310	0.5602 0.5922	0.6299	0.6676	0.6518	Ave		0.6157				6.5		30.0			
Benzyl chloride	0.4930 0.7617	0.5784 0.7371	0.7513	0.6807	0.8002	Ave		0.6861				16.2		30.0			
n-Undecane	+++++ 0.3425	+++++ 0.3573	0.3490	0.4276	0.3541	Ave		0.3661				9.5		30.0			
n-Butylbenzene	0.6260 0.8927	0.6515 0.7849	0.9134	0.9583	0.9347	Ave		0.8231				16.7		30.0			
1,2-Dichlorobenzene	0.5023 0.6161	0.5385 0.5914	0.6236	0.6580	0.6378	Ave		0.5954				9.4		30.0			
n-Dodecane	+++++ 0.2395	+++++ 0.0968	0.2243	0.3304	0.2757	Ave		0.2333				37.1	*	30.0			
1,2,4-Trichlorobenzene	+++++ 0.2883	0.3026 0.2263	0.2643	0.3480	0.3199	Ave		0.2916				14.7		30.0			
Hexachlorobutadiene	0.2558 0.2959	0.2619 0.1735	0.2888	0.3018	0.2998	Ave		0.2682				17.0		30.0			
Naphthalene	+++++ 0.6596	0.7389 0.5367	0.6087	0.8233	0.7853	Ave		0.6921				15.9		30.0			
1,2,3-Trichlorobenzene	0.2825 0.2456	0.3025 0.1390	0.2330	0.3156	0.2870	Ave		0.2579				23.3		30.0			

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Burlington Job No.: 200-4315-1 Analy Batch No.: 15668

SDG No.: Narrowburg, NY

Instrument ID: C.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 03/22/2011 17:52 Calibration End Date: 03/22/2011 22:39 Calibration ID: 5511

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 200-15668/3	cjr003.d
Level 2	IC 200-15668/4	cjr004.d
Level 3	IC 200-15668/5	cjr005.d
Level 4	ICIS 200-15668/6	cjr006.d
Level 5	IC 200-15668/7	cjr007.d
Level 6	IC 200-15668/8	cjr008.d
Level 7	IC 200-15668/9	cjr009.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (PPB V/V)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Propylene	BCM	Ave	+++++ 1029613	25596 2047190	262690	513803	785537	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Dichlorodifluoromethane	BCM	Ave	+++++ 5423090	139169 10061763	1400078	2764384	4112937	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Freon 22	BCM	Ave	+++++ 2607012	65623 4975739	652967	1283283	1949197	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
1,2-Dichlorotetrafluoroethane	BCM	Ave	52086 5777603	143998 10556693	1472019	2918851	4394340	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Chloromethane	BCM	Ave	+++++ 1405728	39139 2949862	349831	700582	1034799	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
n-Butane	BCM	Ave	+++++ 2138903	48912 4109370	532555	1056708	1590195	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Vinyl chloride	BCM	Ave	17565 1833656	42012 3580988	444809	883560	1355196	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,3-Butadiene	BCM	Ave	11295 1255517	27850 2449745	288435	622839	934381	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Bromomethane	BCM	Ave	19115 2029189	51965 4024999	507165	1023522	1543509	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Chloroethane	BCM	Ave	+++++ 1082040	27354 2130083	281017	545197	826470	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Isopentane	BCM	Ave	15892 1766906	45108 3380584	482439	938731	1394863	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Bromoethene(Vinyl Bromide)	BCM	Ave	20009 2226483	49537 4449178	554604	1089934	1677426	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Trichlorofluoromethane	BCM	Ave	50012 5499866	133405 10553717	1369467	2722089	4128282	0.200 20.0	0.500 40.0	5.00	10.0	15.0
n-Pentane	BCM	Ave	+++++ 2921876	59089 5475583	757410	1499548	2247571	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Ethanol	BCM	Ave	+++++ 1206559	149747 3080424	269637	430350	612195	+++++ 40.0	5.00 100	10.0	15.0	20.0

FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Burlington Job No.: 200-4315-1 Analy Batch No.: 15668

SDG No.: Narrowburg, NY

Instrument ID: C.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 03/22/2011 17:52 Calibration End Date: 03/22/2011 22:39 Calibration ID: 5511

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (PPB V/V)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Ethyl ether	BCM	Ave	13932 1387866	34501 2708091	370083	695796	1057914	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Acrolein	BCM	Ave	+++++ 677245	+++++ 1248906	179609	296387	518484	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
Freon TF	BCM	Ave	38128 4304749	101920 8206361	1059590	2113914	3205161	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,1-Dichloroethene	BCM	Ave	15641 2169212	51025 4343316	522674	1055508	1606891	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Acetone	BCM	Ave	+++++ 2273238	+++++ 4231931	619867	1180076	1598316	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
Isopropyl alcohol	BCM	Ave	+++++ 1519099	+++++ 3102387	440700	924100	1188083	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
Carbon disulfide	BCM	Ave	+++++ 6474626	151826 12238589	1617834	3222703	4855662	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
3-Chloropropene	BCM	Ave	17179 2012094	43720 3859649	491247	983987	1480425	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Acetonitrile	BCM	Ave	+++++ 1199199	+++++ 2376476	323601	621717	900774	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
Methylene Chloride	BCM	Ave	+++++ 1879552	53209 3615559	491024	963550	1418687	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
tert-Butyl alcohol	BCM	Ave	+++++ 2436155	+++++ 5082513	692089	1568745	2035360	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
Methyl tert-butyl ether	BCM	Ave	53069 5786012	149509 11447374	1515507	2811709	4310329	0.200 20.0	0.500 40.0	5.00	10.0	15.0
trans-1,2-Dichloroethene	BCM	Ave	26337 2883548	73191 5448197	736342	1452818	2178345	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Acrylonitrile	BCM	Ave	+++++ 1374214	33189 2800139	344536	668378	1031427	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
n-Hexane	BCM	Ave	27462 3144567	74059 5899820	798797	1610511	2408267	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,1-Dichloroethane	BCM	Ave	35235 3673423	94731 6783028	971441	1898624	2784061	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Vinyl acetate	BCM	Ave	+++++ 3583572	+++++ 6687768	982163	1729274	2731590	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
cis-1,2-Dichloroethene	BCM	Ave	23380 2473854	61250 4683587	632144	1232485	1866440	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Ethyl acetate	BCM	Ave	+++++ 198483	+++++ 394560	51104	94504	148505	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
Methyl Ethyl Ketone	BCM	Ave	+++++ 976162	27745 1873098	263707	486497	730712	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Tetrahydrofuran	DFB	Ave	+++++ 1610163	+++++ 3135148	443562	799737	1215905	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0

FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Burlington Job No.: 200-4315-1 Analy Batch No.: 15668

SDG No.: Narrowburg, NY

Instrument ID: C.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 03/22/2011 17:52 Calibration End Date: 03/22/2011 22:39 Calibration ID: 5511

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (PPB V/V)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Chloroform	BCM	Ave	42548 4685261	118933 8906177	1189216	2342914	3521925	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,1,1-Trichloroethane	DFB	Ave	46007 4970580	120910 9348072	1235912	2475543	3701301	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Cyclohexane	DFB	Ave	30249 3385986	83901 6283709	861588	1719253	2570296	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Carbon tetrachloride	DFB	Ave	43346 5115963	114349 9940180	1227065	2495820	3809893	0.200 20.0	0.500 40.0	5.00	10.0	15.0
2,2,4-Trimethylpentane	DFB	Ave	93218 9930279	246049 17803004	2599341	5149777	7616564	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Benzene	DFB	Ave	77265 7338199	186785 13782252	1892272	3703810	5550261	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,2-Dichloroethane	DFB	Ave	26520 2716958	66430 5279917	691784	1358379	2037524	0.200 20.0	0.500 40.0	5.00	10.0	15.0
n-Heptane	DFB	Ave	30197 2994450	75385 5357176	800947	1578791	2309337	0.200 20.0	0.500 40.0	5.00	10.0	15.0
n-Butanol	DFB	Ave	+++++ 641322	+++++ 1415287	184868	410807	596474	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
Trichloroethene	DFB	Ave	30457 3361208	81925 6417221	830523	1682300	2511132	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,2-Dichloropropane	DFB	Ave	23405 2416466	60039 4409313	631493	1232154	1842321	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Methyl methacrylate	DFB	Ave	+++++ 2168352	40565 4368023	528477	1024396	1599884	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
1,4-Dioxane	DFB	Ave	+++++ 856095	+++++ 1806843	234017	482404	629950	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
Dibromomethane	DFB	Ave	23080 2719214	58084 5342493	644079	1296368	2004412	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Bromodichloromethane	DFB	Ave	40292 5190338	109322 9790019	1271717	2569459	3881382	0.200 20.0	0.500 40.0	5.00	10.0	15.0
cis-1,3-Dichloropropene	DFB	Ave	36377 3997887	91218 7733179	976266	1934465	2959710	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Methyl isobutyl ketone	DFB	Ave	+++++ 3076377	64329 6232538	782939	1561603	2322790	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
n-Octane	DFB	Ave	40702 3808153	103321 6507867	1066618	2022629	2954043	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Toluene	CBZ	Ave	56828 5341594	138814 10310725	1352754	2582031	3980781	0.200 20.0	0.500 40.0	5.00	10.0	15.0
trans-1,3-Dichloropropene	DFB	Ave	33023 3781276	84901 7454789	916691	1792185	2786005	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,1,2-Trichloroethane	CBZ	Ave	24432 2524499	62419 4843450	631071	1236354	1878523	0.200 20.0	0.500 40.0	5.00	10.0	15.0

FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Burlington Job No.: 200-4315-1 Analy Batch No.: 15668

SDG No.: Narrowburg, NY

Instrument ID: C.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 03/22/2011 17:52 Calibration End Date: 03/22/2011 22:39 Calibration ID: 5511

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (PPB V/V)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Tetrachloroethene	CBZ	Ave	39844 4381005	103990 8259349	1067672	2114968	3247194	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Methyl Butyl Ketone (2-Hexanone)	CBZ	Ave	+++++ 2880807	51750 5850694	703392	1485324	2184337	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Dibromochloromethane	CBZ	Ave	37651 5264458	99328 10134866	1232002	2498649	3887584	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,2-Dibromoethane	CBZ	Ave	41040 4779617	106503 9085505	1172041	2320644	3541726	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Chlorobenzene	CBZ	Ave	68334 7067373	174542 13153784	1752423	3393463	5222795	0.200 20.0	0.500 40.0	5.00	10.0	15.0
n-Nonane	CBZ	Ave	34910 3598619	84948 5606623	986225	1879505	2815869	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Ethylbenzene	CBZ	Ave	94622 9819366	245913 16191420	2636795	5024393	7570541	0.200 20.0	0.500 40.0	5.00	10.0	15.0
m,p-Xylene	CBZ	Ave	72549 8512560	194534 14897636	2143048	4120041	6395318	0.400 40.0	1.00 80.0	10.0	20.0	30.0
Xylene, o-	CBZ	Ave	37594 4382516	100851 8517794	1082113	2055570	3220535	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Styrene	CBZ	Ave	40154 6289628	118012 12161476	1519227	2947142	4623730	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Bromoform	CBZ	Ave	30212 4586660	81256 8560752	1072389	2131443	3408689	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Cumene	CBZ	Ave	94960 11761269	259409 19646381	2994457	5693162	8923683	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,1,2,2-Tetrachloroethane	CBZ	Ave	51912 5967436	139966 10805177	1510967	2884168	4463019	0.200 20.0	0.500 40.0	5.00	10.0	15.0
n-Propylbenzene	CBZ	Ave	100488 12777423	273796 19600580	3390329	6402558	9819667	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,2,3-Trichloropropane	CBZ	Ave	+++++ 4210526	106873 7165543	1107781	2084922	3187047	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
n-Decane	CBZ	Ave	+++++ 4557996	64440 7523071	1119012	2082884	3453318	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
4-Ethyltoluene	CBZ	Ave	79132 11357993	229131 19026187	2930498	5607622	8588663	0.200 20.0	0.500 40.0	5.00	10.0	15.0
2-Chlorotoluene	CBZ	Ave	83190 9482751	221952 16027221	2466908	4594230	7017206	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,3,5-Trimethylbenzene	CBZ	Ave	66296 9654841	186395 16110821	2462992	4636107	7235976	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Alpha Methyl Styrene	CBZ	Ave	24643 4985131	72399 10828668	1204038	2393547	3886077	0.200 20.0	0.500 40.0	5.00	10.0	15.0
tert-Butylbenzene	CBZ	Ave	73529 9604140	196804 17213740	2415756	4579879	7159897	0.200 20.0	0.500 40.0	5.00	10.0	15.0

FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Burlington Job No.: 200-4315-1 Analy Batch No.: 15668

SDG No.: Narrowburg, NY

Instrument ID: C.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 03/22/2011 17:52 Calibration End Date: 03/22/2011 22:39 Calibration ID: 5511

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (PPB V/V)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
1,2,4-Trimethylbenzene	CBZ	Ave	59916 9443625	170566 16875360	2396519	4589229	7099093	0.200 20.0	0.500 40.0	5.00	10.0	15.0
sec-Butylbenzene	CBZ	Ave	92785 13303529	261035 21863948	3477136	6641083	10114277	0.200 20.0	0.500 40.0	5.00	10.0	15.0
4-Isopropyltoluene	CBZ	Ave	69267 11349803	185736 19572387	2857072	5455573	8548952	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,3-Dichlorobenzene	CBZ	Ave	54535 6672955	135117 12759755	1562783	3097982	4899009	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,4-Dichlorobenzene	CBZ	Ave	53312 6626413	128093 12707678	1533829	3037181	4858730	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Benzyl chloride	CBZ	Ave	45546 7999574	132265 15816643	1829333	3096980	5964686	0.200 20.0	0.500 40.0	5.00	10.0	15.0
n-Undecane	CBZ	Ave	+++++ 3596839	+++++ 7667177	849843	1945400	2639631	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
n-Butylbenzene	CBZ	Ave	57828 9375366	148976 16841103	2224149	4359452	6967501	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,2-Dichlorobenzene	CBZ	Ave	46401 6470431	123126 12689509	1518567	2993545	4754638	0.200 20.0	0.500 40.0	5.00	10.0	15.0
n-Dodecane	CBZ	Ave	+++++ 2514888	+++++ 2077273	546272	1503084	2054834	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
1,2,4-Trichlorobenzene	CBZ	Ave	+++++ 3027845	69192 4855629	643590	1583357	2384865	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Hexachlorobutadiene	CBZ	Ave	23627 3107827	59896 3722679	703276	1373019	2234951	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Naphthalene	CBZ	Ave	+++++ 6927142	168958 11516494	1482150	3745495	5854147	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
1,2,3-Trichlorobenzene	CBZ	Ave	26099 2578778	69158 2982018	567328	1435848	2139746	0.200 20.0	0.500 40.0	5.00	10.0	15.0

Curve Type Legend:
Ave = Average ISTD

TestAmerica Burlington

AIR TOXICS QUANTITATION REPORT

Data file : /chem/C.i/Csvr.p/cjrto15.b/cjr003.d
Lab Smp Id: ic 109459 Client Smp ID: ic 109459
Inj Date : 22-MAR-2011 17:52
Operator : pad Inst ID: C.i
Smp Info : ic 109459
Misc Info : 200,1, level 1
Comment :
Method : /chem/C.i/Csvr.p/cjrto15.b/to15v5.m
Meth Date : 28-Mar-2011 14:19 klp Quant Type: ISTD
Cal Date : 22-MAR-2011 17:52 Cal File: cjr003.d
Als bottle: 1 Calibration Sample, Level: 1
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 3.50
Processing Host: chemsvr6

Concentration Formula: Amt * DF * Uf*(Vo/Vo)*(Vf/Vf) * CpndVariable

Name	Value	Description
DF	1.00000	Dilution Factor
Uf	1.00000	ng unit correction factor
Vo	200.00000	Sample Volume purged (mL)
Vf	200.00000	Final Volume (mL)

Cpnd Variable Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	AMOUNTS ON-COL (ppb v/v)
2 Dichlorodifluoromethane	85	4.102	4.097	(0.404)	55717	0.20000	0.22(a)
3 Chlorodifluoromethane	51	4.150	4.145	(0.409)	21976	0.20000	0.19(a)
4 1,2-Dichloro-1,1,2,2-tetraflu	85	4.379	4.374	(0.432)	52086	0.20000	0.20
5 Chloromethane	50	4.545	4.534	(0.448)	15638	0.20000	0.24(a)
6 Butane	43	4.737	4.732	(0.467)	19565	0.20000	0.21(a)
7 Vinyl chloride	62	4.785	4.774	(0.471)	17565	0.20000	0.21
8 1,3-Butadiene	54	4.860	4.849	(0.479)	11295	0.20000	0.20
9 Bromomethane	94	5.505	5.500	(0.542)	19115	0.20000	0.20
10 Chloroethane	64	5.708	5.703	(0.562)	10842	0.20000	0.22(a)
11 2-Methylbutane	43	5.756	5.762	(0.567)	15892	0.20000	0.19(a)
12 Vinyl bromide	106	6.061	6.055	(0.597)	20009	0.20000	0.20
13 Trichlorofluoromethane	101	6.130	6.130	(0.604)	50012	0.20000	0.20
14 Pentane	43	6.242	6.237	(0.615)	22451	0.20000	0.17(a)
16 Ethyl ether	59	6.690	6.658	(0.659)	13932	0.20000	0.21

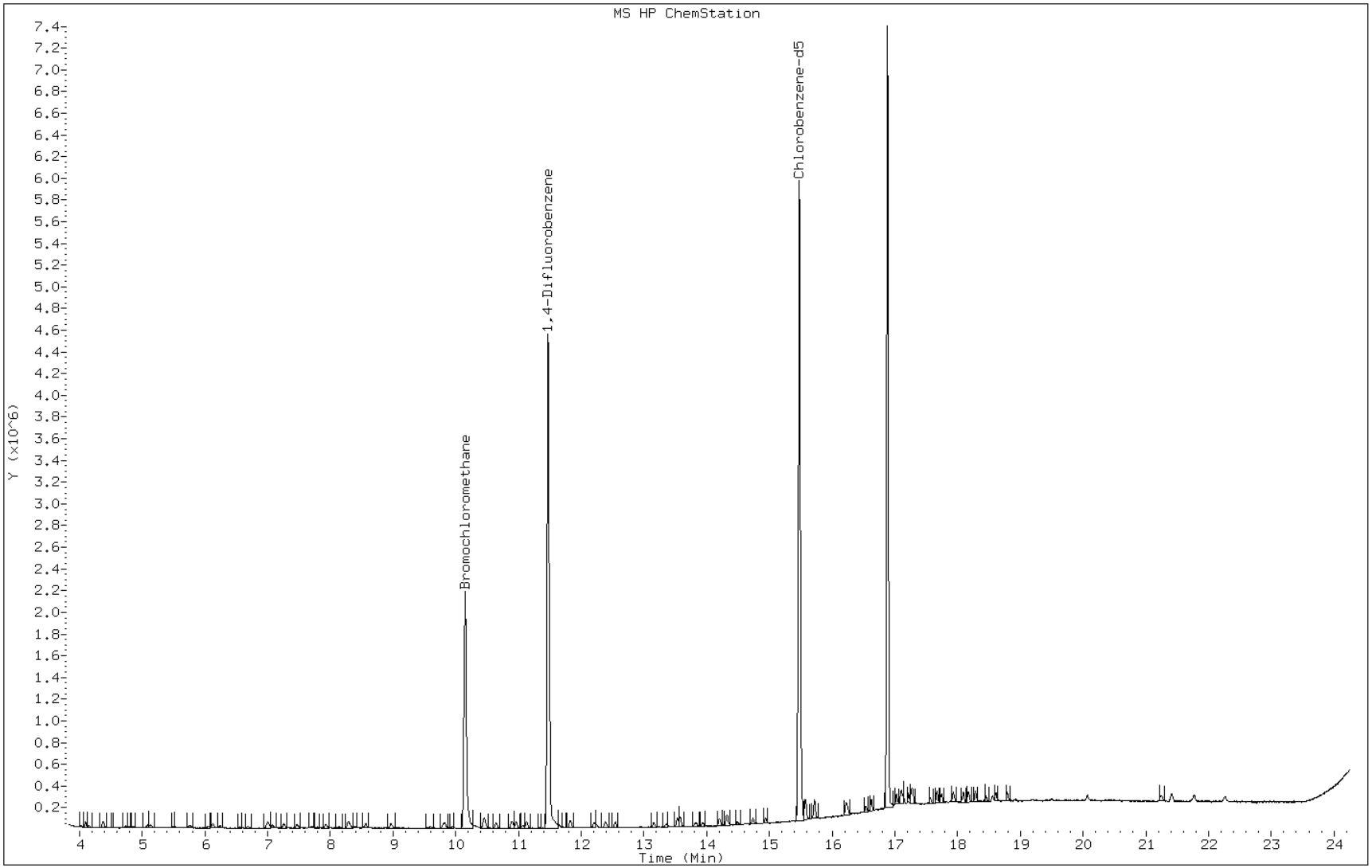
		QUANT SIG					AMOUNTS CAL-AMT	ON-COL
	Compounds	MASS	RT	EXP RT	REL RT	RESPONSE	(ppb v/v)	(ppb v/v)
	17 1,1,2-Trichloro-1,2,2-trifluo	101	7.000	7.000	(0.690)	38128	0.20000	0.20
	19 1,1-Dichloroethene	96	7.075	7.075	(0.697)	15641	0.20000	0.17(a)
	21 Carbon disulfide	76	7.469	7.470	(0.736)	56933	0.20000	0.20(a)
	23 Allyl chloride	41	7.699	7.694	(0.759)	17179	0.20000	0.20
	25 Methylene chloride	49	7.934	7.929	(0.782)	27489	0.20000	0.31(a)
	27 Methyl tert-butyl ether	73	8.302	8.238	(0.818)	53069	0.20000	0.20
	28 1,2-Dichloroethene (trans)	61	8.281	8.286	(0.816)	26337	0.20000	0.20
	29 Acrylonitrile	53	8.387	8.377	(0.826)	12163	0.20000	0.19(a)
	30 n-Hexane	57	8.564	8.564	(0.844)	27462	0.20000	0.19(a)
	31 1,1-Dichloroethane	63	8.969	8.969	(0.884)	35235	0.20000	0.21
M	33 1,2-Dichloroethene,Total	61				49717	0.40000	0.41
	34 1,2-Dichloroethene (cis)	96	9.796	9.802	(0.965)	23380	0.20000	0.21
	36 Methyl Ethyl Ketone	72	9.828	9.802	(0.968)	11002	0.20000	0.24(aQ)
*	37 Bromochloromethane	128	10.149	10.154	(1.000)	924049	10.0000	
	39 Chloroform	83	10.207	10.207	(1.006)	42548	0.20000	0.20
	40 Cyclohexane	84	10.458	10.464	(0.912)	30249	0.20000	0.19(a)
	41 1,1,1-Trichloroethane	97	10.453	10.458	(0.911)	46007	0.20000	0.20
	42 Carbon tetrachloride	117	10.645	10.650	(0.928)	43346	0.20000	0.19(a)
	43 2,2,4-Trimethylpentane	57	10.901	10.901	(0.950)	93218	0.20000	0.20
	44 Benzene	78	10.965	10.965	(0.956)	77265	0.20000	0.22
	45 1,2-Dichloroethane	62	11.061	11.067	(0.964)	26520	0.20000	0.21
	46 n-Heptane	43	11.131	11.131	(0.970)	30197	0.20000	0.21
*	47 1,4-Difluorobenzene	114	11.472	11.478	(1.000)	5312477	10.0000	
	49 Trichloroethene	95	11.830	11.830	(1.031)	30457	0.20000	0.20
	50 1,2-Dichloropropane	63	12.203	12.209	(1.064)	23405	0.20000	0.20
	51 Methyl methacrylate	69	12.246	12.230	(1.067)	13953	0.20000	0.15(aQ)
	52 Dibromomethane	174	12.390	12.390	(1.080)	23080	0.20000	0.19(a)
	54 Bromodichloromethane	83	12.545	12.545	(1.093)	40292	0.20000	0.18(a)
	55 1,3-Dichloropropene (cis)	75	13.159	13.159	(1.147)	36377	0.20000	0.20
	56 Methyl isobutyl ketone	43	13.356	13.319	(1.164)	23654	0.20000	0.17(a)
	57 n-Octane	43	13.538	13.538	(1.180)	40702	0.20000	0.22(a)
	58 Toluene	92	13.580	13.580	(0.878)	56828	0.20000	0.22
	59 1,3-Dichloropropene (trans)	75	13.938	13.938	(1.215)	33023	0.20000	0.19(a)
	60 1,1,2-Trichloroethane	83	14.205	14.210	(0.918)	24432	0.20000	0.21
	61 Tetrachloroethene	166	14.322	14.327	(0.926)	39844	0.20000	0.20
	62 2-Hexanone	43	14.488	14.466	(0.936)	19429	0.20000	0.15(a)
	63 Dibromochloromethane	129	14.738	14.738	(0.952)	37651	0.20000	0.17(a)
	64 1,2-Dibromoethane	107	14.941	14.941	(0.966)	41040	0.20000	0.19(a)
*	65 Chlorobenzene-d5	117	15.475	15.480	(1.000)	4618967	10.0000	
	66 Chlorobenzene	112	15.518	15.518	(1.003)	68334	0.20000	0.21
	67 n-Nonane	57	15.571	15.571	(1.006)	34910	0.20000	0.21
	68 Ethylbenzene	91	15.576	15.576	(1.007)	94622	0.20000	0.21
	69 Xylene (m,p)	106	15.715	15.720	(1.016)	72549	0.40000	0.38(a)
M	70 Xylenes, Total	106				110143	0.20000	0.57
	71 Xylene (o)	106	16.222	16.222	(1.048)	37594	0.20000	0.19(a)
	72 Styrene	104	16.249	16.249	(1.050)	40154	0.20000	0.15(a)
	73 Bromoform	173	16.542	16.542	(1.069)	30212	0.20000	0.16(a)

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	ON-COL (ppb v/v)
74 Isopropylbenzene	105	16.622	16.622	(1.074)	94960	0.20000	0.18(a)
75 1,1,2,2-Tetrachloroethane	83	17.028	17.033	(1.100)	51912	0.20000	0.19(a)
76 n-Propylbenzene	91	17.092	17.092	(1.104)	100488	0.20000	0.18(a)
77 1,2,3-Trichloropropane	75	17.119	17.119	(1.106)	42074	0.20000	0.21(a)
78 n-Decane	57	17.140	17.145	(1.108)	23311	0.20000	0.12(a)
79 4-Ethyltoluene	105	17.220	17.220	(1.113)	79132	0.20000	0.16(a)
80 2-Chlorotoluene	91	17.268	17.268	(1.116)	83190	0.20000	0.19(a)
81 1,3,5-Trimethylbenzene	105	17.289	17.289	(1.117)	66296	0.20000	0.16(a)
82 Alpha Methyl Styrene	118	17.567	17.567	(1.135)	24643	0.20000	0.12(a)
83 tert-butylbenzene	119	17.674	17.674	(1.142)	73529	0.20000	0.18(a)
84 1,2,4-Trimethylbenzene	105	17.743	17.743	(1.147)	59916	0.20000	0.15(a)
85 sec-Butylbenzene	105	17.935	17.935	(1.159)	92785	0.20000	0.16(a)
86 4-Isopropyltoluene	119	18.090	18.090	(1.169)	69267	0.20000	0.15(a)
87 1,3-Dichlorobenzene	146	18.175	18.175	(1.175)	54535	0.20000	0.19(a)
88 1,4-Dichlorobenzene	146	18.287	18.287	(1.182)	53312	0.20000	0.19(a)
89 Benzyl chloride	91	18.453	18.453	(1.192)	45546	0.20000	0.14(a)
91 n-Butylbenzene	91	18.613	18.613	(1.203)	57828	0.20000	0.15(a)
92 1,2-Dichlorobenzene	146	18.794	18.794	(1.214)	46401	0.20000	0.17(a)
94 1,2,4-Trichlorobenzene	180	21.255	21.249	(1.373)	27728	0.20000	0.21(a)
95 1,3-Hexachlorobutadiene	225	21.409	21.415	(1.383)	23627	0.20000	0.19(a)
96 Naphthalene	128	21.767	21.772	(1.407)	87457	0.20000	0.27(a)
97 1,2,3-Trichlorobenzene	180	22.258	22.263	(1.438)	26099	0.20000	0.22

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
Q - Qualifier signal failed the ratio test.

Data File:	cjr003.d	Date:	22-MAR-2011 17:52
Client ID:	ic 109459	Instrument:	C.i
Operator:	pad	Inj Vol:	200.0
Column Type:	Capillary	Diameter:	0.32
Stationary Phase:	RTX-624		
Sample Info:	ic 109459		
Lab Sample ID:	ic 109459		



TestAmerica Burlington

AIR TOXICS QUANTITATION REPORT

Data file : /chem/C.i/Csvr.p/cjrto15.b/cjr004.d
Lab Smp Id: ic 109450 Client Smp ID: ic 109450
Inj Date : 22-MAR-2011 18:40
Operator : pad Inst ID: C.i
Smp Info : ic 109450
Misc Info : 200,1, level 2
Comment :
Method : /chem/C.i/Csvr.p/cjrto15.b/to15v5.m
Meth Date : 28-Mar-2011 14:19 klp Quant Type: ISTD
Cal Date : 22-MAR-2011 18:40 Cal File: cjr004.d
Als bottle: 1 Calibration Sample, Level: 2
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 3.50
Processing Host: chemsvr6

Concentration Formula: Amt * DF * Uf*(Vo/Vo)*(Vf/Vf) * CpndVariable

Name	Value	Description
DF	1.00000	Dilution Factor
Uf	1.00000	ng unit correction factor
Vo	200.00000	Sample Volume purged (mL)
Vf	200.00000	Final Volume (mL)

Cpnd Variable Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	AMOUNTS ON-COL (ppb v/v)
2 Dichlorodifluoromethane	85	4.107	4.097	(0.404)	139169	0.50000	0.53
3 Chlorodifluoromethane	51	4.161	4.145	(0.410)	65623	0.50000	0.53
4 1,2-Dichloro-1,1,2,2-tetraflu	85	4.385	4.374	(0.432)	143998	0.50000	0.53
5 Chloromethane	50	4.545	4.534	(0.448)	39139	0.50000	0.57
6 Butane	43	4.737	4.732	(0.466)	48912	0.50000	0.49(a)
7 Vinyl chloride	62	4.790	4.774	(0.472)	42012	0.50000	0.49
8 1,3-Butadiene	54	4.860	4.849	(0.479)	27850	0.50000	0.48
9 Bromomethane	94	5.511	5.500	(0.543)	51965	0.50000	0.53
10 Chloroethane	64	5.714	5.703	(0.563)	27354	0.50000	0.52
11 2-Methylbutane	43	5.772	5.762	(0.568)	45108	0.50000	0.52
12 Vinyl bromide	106	6.060	6.055	(0.597)	49537	0.50000	0.48
13 Trichlorofluoromethane	101	6.141	6.130	(0.605)	133405	0.50000	0.51
14 Pentane	43	6.247	6.237	(0.615)	59089	0.50000	0.44(a)
15 Ethanol	45	6.562	6.525	(0.646)	149747	5.00000	5.3

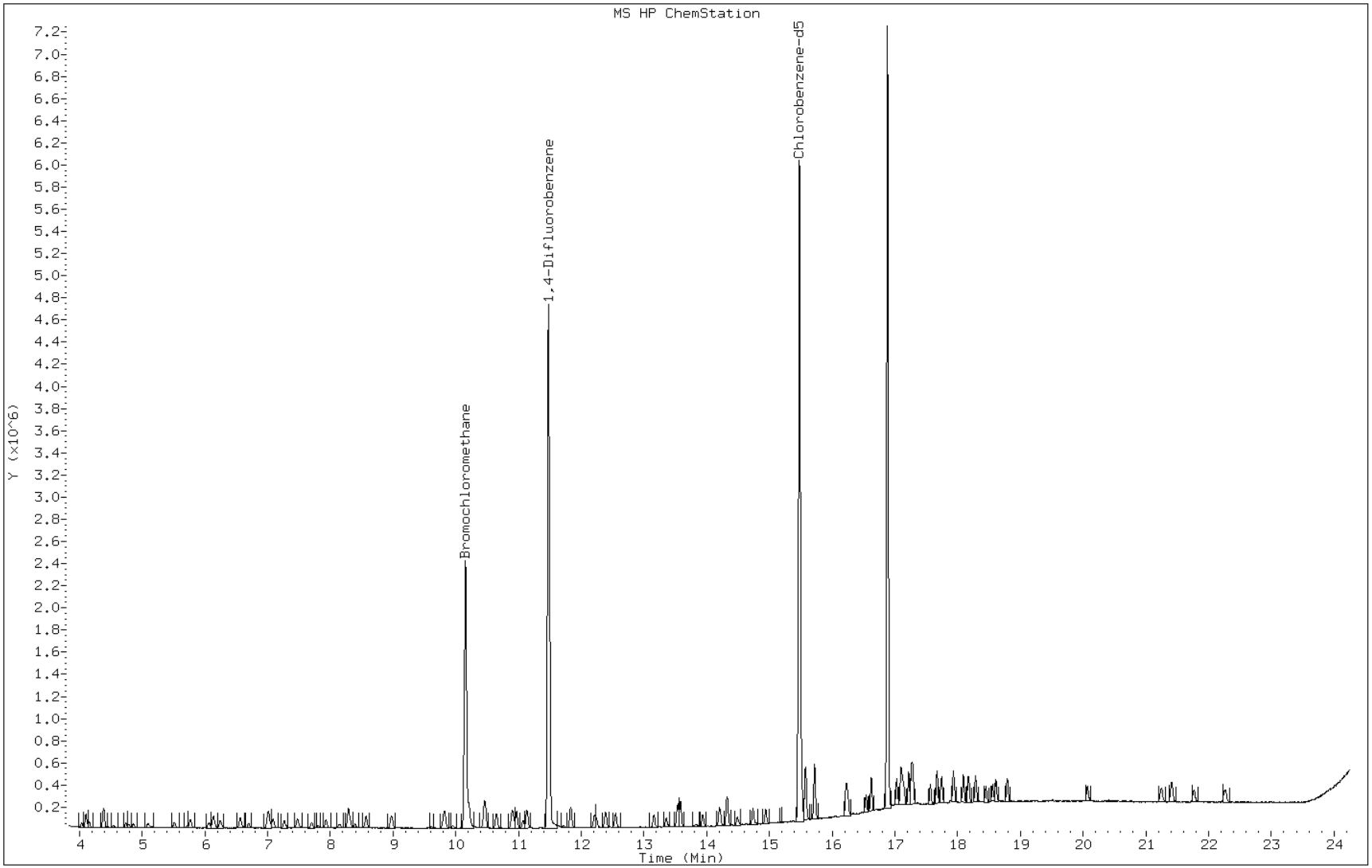
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	ON-COL (ppb v/v)
	16 Ethyl ether	59	6.696	6.658	(0.659)	34501	0.50000	0.51
	17 1,1,2-Trichloro-1,2,2-trifluo	101	7.016	7.000	(0.691)	101920	0.50000	0.51
	19 1,1-Dichloroethene	96	7.090	7.075	(0.698)	51025	0.50000	0.52
	21 Carbon disulfide	76	7.475	7.470	(0.736)	151826	0.50000	0.50
	23 Allyl chloride	41	7.704	7.694	(0.759)	43720	0.50000	0.48
	25 Methylene chloride	49	7.934	7.929	(0.781)	53209	0.50000	0.58
	27 Methyl tert-butyl ether	73	8.291	8.238	(0.817)	149509	0.50000	0.54
	28 1,2-Dichloroethene (trans)	61	8.291	8.286	(0.817)	73191	0.50000	0.53
	29 Acrylonitrile	53	8.393	8.377	(0.827)	33189	0.50000	0.51
	30 n-Hexane	57	8.569	8.564	(0.844)	74059	0.50000	0.50
	31 1,1-Dichloroethane	63	8.969	8.969	(0.883)	94731	0.50000	0.53
M	33 1,2-Dichloroethene,Total	61				134441	1.00000	1.0
	34 1,2-Dichloroethene (cis)	96	9.807	9.802	(0.966)	61250	0.50000	0.52
	36 Methyl Ethyl Ketone	72	9.828	9.802	(0.968)	27745	0.50000	0.58(Q)
*	37 Bromochloromethane	128	10.154	10.154	(1.000)	965568	10.0000	
	39 Chloroform	83	10.213	10.207	(1.006)	118933	0.50000	0.53
	40 Cyclohexane	84	10.469	10.464	(0.912)	83901	0.50000	0.53
	41 1,1,1-Trichloroethane	97	10.463	10.458	(0.912)	120910	0.50000	0.52
	42 Carbon tetrachloride	117	10.650	10.650	(0.928)	114349	0.50000	0.49
	43 2,2,4-Trimethylpentane	57	10.906	10.901	(0.950)	246049	0.50000	0.52
	44 Benzene	78	10.970	10.965	(0.956)	186785	0.50000	0.52
	45 1,2-Dichloroethane	62	11.072	11.067	(0.965)	66430	0.50000	0.51
	46 n-Heptane	43	11.136	11.131	(0.970)	75385	0.50000	0.52
*	47 1,4-Difluorobenzene	114	11.477	11.478	(1.000)	5378343	10.0000	
	49 Trichloroethene	95	11.830	11.830	(1.031)	81925	0.50000	0.52
	50 1,2-Dichloropropane	63	12.209	12.209	(1.064)	60039	0.50000	0.52(Q)
	51 Methyl methacrylate	69	12.246	12.230	(1.067)	40565	0.50000	0.42(aQ)
	52 Dibromomethane	174	12.390	12.390	(1.079)	58084	0.50000	0.47
	54 Bromodichloromethane	83	12.545	12.545	(1.093)	109322	0.50000	0.47
	55 1,3-Dichloropropene (cis)	75	13.159	13.159	(1.146)	91218	0.50000	0.49
	56 Methyl isobutyl ketone	43	13.356	13.319	(1.164)	64329	0.50000	0.45(a)
	57 n-Octane	43	13.537	13.538	(1.179)	103321	0.50000	0.54
	58 Toluene	92	13.580	13.580	(0.878)	138814	0.50000	0.55
	59 1,3-Dichloropropene (trans)	75	13.938	13.938	(1.214)	84901	0.50000	0.49
	60 1,1,2-Trichloroethane	83	14.210	14.210	(0.918)	62419	0.50000	0.53
	61 Tetrachloroethene	166	14.327	14.327	(0.926)	103990	0.50000	0.53
	62 2-Hexanone	43	14.493	14.466	(0.937)	51750	0.50000	0.40(a)
	63 Dibromochloromethane	129	14.738	14.738	(0.952)	99328	0.50000	0.45
	64 1,2-Dibromoethane	107	14.941	14.941	(0.966)	106503	0.50000	0.50
*	65 Chlorobenzene-d5	117	15.475	15.480	(1.000)	4573118	10.0000	
	66 Chlorobenzene	112	15.517	15.518	(1.003)	174542	0.50000	0.54
	67 n-Nonane	57	15.576	15.571	(1.007)	84948	0.50000	0.51
	68 Ethylbenzene	91	15.576	15.576	(1.007)	245913	0.50000	0.54
	69 Xylene (m,p)	106	15.720	15.720	(1.016)	194534	1.00000	1.0
M	70 Xylenes, Total	106				295385	0.50000	1.5
	71 Xylene (o)	106	16.222	16.222	(1.048)	100851	0.50000	0.52
	72 Styrene	104	16.249	16.249	(1.050)	118012	0.50000	0.45

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	AMOUNTS ON-COL (ppb v/v)
73 Bromoform	173	16.542	16.542	(1.069)	81256	0.50000	0.43
74 Isopropylbenzene	105	16.622	16.622	(1.074)	259409	0.50000	0.50
75 1,1,2,2-Tetrachloroethane	83	17.028	17.033	(1.100)	139966	0.50000	0.52
76 n-Propylbenzene	91	17.092	17.092	(1.104)	273796	0.50000	0.49
77 1,2,3-Trichloropropane	75	17.119	17.119	(1.106)	106873	0.50000	0.55
78 n-Decane	57	17.145	17.145	(1.108)	64440	0.50000	0.35(a)
79 4-Ethyltoluene	105	17.220	17.220	(1.113)	229131	0.50000	0.47
80 2-Chlorotoluene	91	17.268	17.268	(1.116)	221952	0.50000	0.52
81 1,3,5-Trimethylbenzene	105	17.284	17.289	(1.117)	186395	0.50000	0.46
82 Alpha Methyl Styrene	118	17.567	17.567	(1.135)	72399	0.50000	0.36
83 tert-butylbenzene	119	17.674	17.674	(1.142)	196804	0.50000	0.48
84 1,2,4-Trimethylbenzene	105	17.743	17.743	(1.147)	170566	0.50000	0.43
85 sec-Butylbenzene	105	17.935	17.935	(1.159)	261035	0.50000	0.46
86 4-Isopropyltoluene	119	18.090	18.090	(1.169)	185736	0.50000	0.40
87 1,3-Dichlorobenzene	146	18.175	18.175	(1.175)	135117	0.50000	0.47
88 1,4-Dichlorobenzene	146	18.287	18.287	(1.182)	128093	0.50000	0.45
89 Benzyl chloride	91	18.453	18.453	(1.192)	132265	0.50000	0.42
91 n-Butylbenzene	91	18.613	18.613	(1.203)	148976	0.50000	0.40
92 1,2-Dichlorobenzene	146	18.794	18.794	(1.214)	123126	0.50000	0.45
94 1,2,4-Trichlorobenzene	180	21.249	21.249	(1.373)	69192	0.50000	0.52
95 1,3-Hexachlorobutadiene	225	21.415	21.415	(1.384)	59896	0.50000	0.49
96 Naphthalene	128	21.767	21.772	(1.407)	168958	0.50000	0.53
97 1,2,3-Trichlorobenzene	180	22.269	22.263	(1.439)	69158	0.50000	0.59

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
Q - Qualifier signal failed the ratio test.

Data File:	cjr004.d	Date:	22-MAR-2011 18:40
Client ID:	ic 109450	Instrument:	C.i
Operator:	pad	Inj Vol:	200.0
Column Type:	Capillary	Diameter:	0.32
Stationary Phase:	RTX-624		
Sample Info:	ic 109450		
Lab Sample ID:	ic 109450		



TestAmerica Burlington

AIR TOXICS QUANTITATION REPORT

Data file : /chem/C.i/Csvr.p/cjrto15.b/cjr005.d
Lab Smp Id: ic 109440 Client Smp ID: ic 109440
Inj Date : 22-MAR-2011 19:27
Operator : pad Inst ID: C.i
Smp Info : ic 109440
Misc Info : 200,1, level 3
Comment :
Method : /chem/C.i/Csvr.p/cjrto15.b/to15v5.m
Meth Date : 28-Mar-2011 14:20 klp Quant Type: ISTD
Cal Date : 22-MAR-2011 19:27 Cal File: cjr005.d
Als bottle: 2 Calibration Sample, Level: 3
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 3.50
Processing Host: chemsvr6

Concentration Formula: Amt * DF * Uf*(Vo/Vo)*(Vf/Vf) * CpndVariable

Name	Value	Description
DF	1.00000	Dilution Factor
Uf	1.00000	ng unit correction factor
Vo	200.00000	Sample Volume purged (mL)
Vf	200.00000	Final Volume (mL)

Cpnd Variable Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	AMOUNTS ON-COL (ppb v/v)
1	Propene	41	4.027	4.022	(0.397)	262690	5.00000	5.2
2	Dichlorodifluoromethane	85	4.102	4.097	(0.404)	1400078	5.00000	5.3
3	Chlorodifluoromethane	51	4.150	4.145	(0.409)	652967	5.00000	5.2
4	1,2-Dichloro-1,1,2,2-tetraflu	85	4.380	4.374	(0.431)	1472019	5.00000	5.3
5	Chloromethane	50	4.540	4.534	(0.447)	349831	5.00000	5.0
6	Butane	43	4.737	4.732	(0.467)	532555	5.00000	5.2
7	Vinyl chloride	62	4.780	4.774	(0.471)	444809	5.00000	5.1
8	1,3-Butadiene	54	4.854	4.849	(0.478)	288435	5.00000	4.9
9	Bromomethane	94	5.506	5.500	(0.542)	507165	5.00000	5.1
10	Chloroethane	64	5.708	5.703	(0.562)	281017	5.00000	5.3
11	2-Methylbutane	43	5.772	5.762	(0.568)	482439	5.00000	5.5
12	Vinyl bromide	106	6.061	6.055	(0.597)	554604	5.00000	5.2
13	Trichlorofluoromethane	101	6.135	6.130	(0.604)	1369467	5.00000	5.2
14	Pentane	43	6.247	6.237	(0.615)	757410	5.00000	5.5

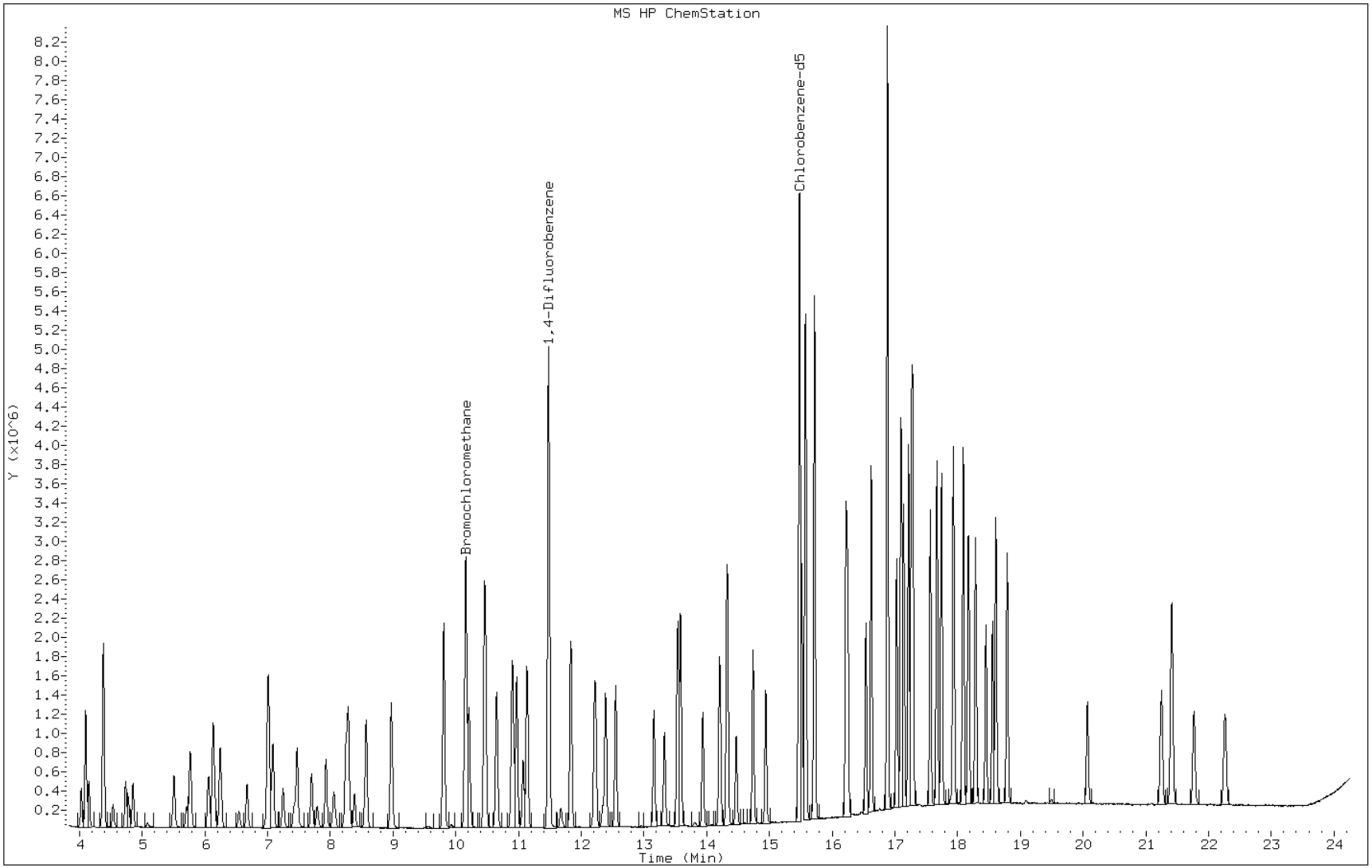
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	AMOUNTS ON-COL (ppb v/v)
	15 Ethanol	45	6.541	6.525	(0.644)	269637	10.0000	9.4
	16 Ethyl ether	59	6.674	6.658	(0.657)	370083	5.00000	5.3
	17 1,1,2-Trichloro-1,2,2-trifluo	101	7.011	7.000	(0.690)	1059590	5.00000	5.2
	18 Acrolein	56	7.005	6.989	(0.690)	179609	5.00000	5.6
	19 1,1-Dichloroethene	96	7.085	7.075	(0.698)	522674	5.00000	5.2
	20 Acetone	43	7.245	7.229	(0.714)	619867	5.00000	5.6
	21 Carbon disulfide	76	7.470	7.470	(0.736)	1617834	5.00000	5.2
	22 Isopropanol	45	7.427	7.400	(0.731)	440700	5.00000	5.5
	23 Allyl chloride	41	7.704	7.694	(0.759)	491247	5.00000	5.2
	24 Acetonitrile	41	7.795	7.779	(0.768)	323601	5.00000	5.5
	25 Methylene chloride	49	7.934	7.929	(0.781)	491024	5.00000	5.2
	26 Tert-butyl alcohol	59	8.057	8.035	(0.793)	692089	5.00000	5.3
	27 Methyl tert-butyl ether	73	8.254	8.238	(0.813)	1515507	5.00000	5.3
	28 1,2-Dichloroethene (trans)	61	8.291	8.286	(0.817)	736342	5.00000	5.2
	29 Acrylonitrile	53	8.388	8.377	(0.826)	344536	5.00000	5.2
	30 n-Hexane	57	8.569	8.564	(0.844)	798797	5.00000	5.3
	31 1,1-Dichloroethane	63	8.975	8.969	(0.884)	971441	5.00000	5.3
	32 Vinyl acetate	43	8.975	8.964	(0.884)	982163	5.00000	5.7
M	33 1,2-Dichloroethene,Total	61				1368486	10.0000	10
	34 1,2-Dichloroethene (cis)	96	9.807	9.802	(0.966)	632144	5.00000	5.2
	35 Ethyl acetate	88	9.807	9.802	(0.966)	51104	5.00000	5.4
	36 Methyl Ethyl Ketone	72	9.812	9.802	(0.966)	263707	5.00000	5.4
*	37 Bromochloromethane	128	10.154	10.154	(1.000)	985909	10.0000	
	38 Tetrahydrofuran	42	10.175	10.165	(0.886)	443562	5.00000	5.5
	39 Chloroform	83	10.213	10.207	(1.006)	1189216	5.00000	5.2
	40 Cyclohexane	84	10.464	10.464	(0.911)	861588	5.00000	5.2
	41 1,1,1-Trichloroethane	97	10.464	10.458	(0.911)	1235912	5.00000	5.1
	42 Carbon tetrachloride	117	10.650	10.650	(0.927)	1227065	5.00000	5.1
	43 2,2,4-Trimethylpentane	57	10.907	10.901	(0.950)	2599341	5.00000	5.3
	44 Benzene	78	10.971	10.965	(0.955)	1892272	5.00000	5.1
	45 1,2-Dichloroethane	62	11.072	11.067	(0.964)	691784	5.00000	5.1
	46 n-Heptane	43	11.136	11.131	(0.970)	800947	5.00000	5.3
*	47 1,4-Difluorobenzene	114	11.483	11.478	(1.000)	5569860	10.0000	
	48 n-Butanol	56	11.675	11.670	(1.017)	184868	5.00000	5.1
	49 Trichloroethene	95	11.835	11.830	(1.031)	830523	5.00000	5.1
	50 1,2-Dichloropropane	63	12.209	12.209	(1.063)	631493	5.00000	5.3
	51 Methyl methacrylate	69	12.235	12.230	(1.066)	528477	5.00000	5.2
	52 Dibromomethane	174	12.390	12.390	(1.079)	644079	5.00000	5.1
	53 1,4-Dioxane	88	12.342	12.337	(1.075)	234017	5.00000	5.3
	54 Bromodichloromethane	83	12.550	12.545	(1.093)	1271717	5.00000	5.3
	55 1,3-Dichloropropene (cis)	75	13.164	13.159	(1.146)	976266	5.00000	5.1
	56 Methyl isobutyl ketone	43	13.324	13.319	(1.160)	782939	5.00000	5.3
	57 n-Octane	43	13.538	13.538	(1.179)	1066618	5.00000	5.4
	58 Toluene	92	13.586	13.580	(0.878)	1352754	5.00000	5.0
	59 1,3-Dichloropropene (trans)	75	13.938	13.938	(1.214)	916691	5.00000	5.1
	60 1,1,2-Trichloroethane	83	14.210	14.210	(0.918)	631071	5.00000	5.1
	61 Tetrachloroethene	166	14.328	14.327	(0.926)	1067672	5.00000	5.1

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	ON-COL (ppb v/v)
62	2-Hexanone	43	14.472	14.466	(0.935)	703392	5.00000	5.2
63	Dibromochloromethane	129	14.738	14.738	(0.952)	1232002	5.00000	5.2
64	1,2-Dibromoethane	107	14.941	14.941	(0.965)	1172041	5.00000	5.2
* 65	Chlorobenzene-d5	117	15.480	15.480	(1.000)	4869972	10.0000	
66	Chlorobenzene	112	15.518	15.518	(1.002)	1752423	5.00000	5.1
67	n-Nonane	57	15.571	15.571	(1.006)	986225	5.00000	5.6
68	Ethylbenzene	91	15.576	15.576	(1.006)	2636795	5.00000	5.4
69	Xylene (m,p)	106	15.720	15.720	(1.016)	2143048	10.0000	11
M 70	Xylenes, Total	106				3225161	5.00000	16
71	Xylene (o)	106	16.222	16.222	(1.048)	1082113	5.00000	5.2
72	Styrene	104	16.249	16.249	(1.050)	1519227	5.00000	5.4
73	Bromoform	173	16.542	16.542	(1.069)	1072389	5.00000	5.3
74	Isopropylbenzene	105	16.622	16.622	(1.074)	2994457	5.00000	5.5
75	1,1,2,2-Tetrachloroethane	83	17.028	17.033	(1.100)	1510967	5.00000	5.3
76	n-Propylbenzene	91	17.092	17.092	(1.104)	3390329	5.00000	5.7
77	1,2,3-Trichloropropane	75	17.119	17.119	(1.106)	1107781	5.00000	5.4
78	n-Decane	57	17.140	17.145	(1.107)	1119012	5.00000	5.6
79	4-Ethyltoluene	105	17.220	17.220	(1.112)	2930498	5.00000	5.7
80	2-Chlorotoluene	91	17.263	17.268	(1.115)	2466908	5.00000	5.5
81	1,3,5-Trimethylbenzene	105	17.284	17.289	(1.117)	2462992	5.00000	5.7
82	Alpha Methyl Styrene	118	17.567	17.567	(1.135)	1204038	5.00000	5.6
83	tert-butylbenzene	119	17.674	17.674	(1.142)	2415756	5.00000	5.5
84	1,2,4-Trimethylbenzene	105	17.743	17.743	(1.146)	2396519	5.00000	5.7
85	sec-Butylbenzene	105	17.935	17.935	(1.159)	3477136	5.00000	5.8
86	4-Isopropyltoluene	119	18.090	18.090	(1.169)	2857072	5.00000	5.8
87	1,3-Dichlorobenzene	146	18.175	18.175	(1.174)	1562783	5.00000	5.1
88	1,4-Dichlorobenzene	146	18.287	18.287	(1.181)	1533829	5.00000	5.1
89	Benzyl chloride	91	18.453	18.453	(1.192)	1829333	5.00000	5.5
90	Undecane	57	18.554	18.554	(1.199)	849843	5.00000	4.8(a)
91	n-Butylbenzene	91	18.613	18.613	(1.202)	2224149	5.00000	5.5
92	1,2-Dichlorobenzene	146	18.789	18.794	(1.214)	1518567	5.00000	5.2
93	Dodecane	57	20.070	20.070	(1.296)	546272	5.00000	4.8(a)
94	1,2,4-Trichlorobenzene	180	21.249	21.249	(1.373)	643590	5.00000	4.5
95	1,3-Hexachlorobutadiene	225	21.415	21.415	(1.383)	703276	5.00000	5.4
96	Naphthalene	128	21.767	21.772	(1.406)	1482150	5.00000	4.4
97	1,2,3-Trichlorobenzene	180	22.263	22.263	(1.438)	567328	5.00000	4.5

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).

Data File:	cjr005.d	Date:	22-MAR-2011 19:27
Client ID:	ic 109440	Instrument:	C.i
Operator:	pad	Inj Vol:	200.0
Column Type:	Capillary	Diameter:	0.32
Stationary Phase:	RTX-624		
Sample Info:	ic 109440		
Lab Sample ID:	ic 109440		



TestAmerica Burlington

AIR TOXICS QUANTITATION REPORT

Data file : /chem/C.i/Csvr.p/cjrto15.b/cjr006.d
Lab Smp Id: icis 119922 Client Smp ID: icis 119922
Inj Date : 22-MAR-2011 20:15
Operator : pad Inst ID: C.i
Smp Info : icis 119922
Misc Info : 200,1, level 4
Comment :
Method : /chem/C.i/Csvr.p/cjrto15.b/to15v5.m
Meth Date : 25-Mar-2011 14:53 klp Quant Type: ISTD
Cal Date : 22-MAR-2011 20:15 Cal File: cjr006.d
Als bottle: 3 Calibration Sample, Level: 4
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 3.50
Processing Host: chemsvr6

Concentration Formula: Amt * DF * Uf*(Vo/Vo)*(Vf/Vf) * CpndVariable

Name	Value	Description
DF	1.00000	Dilution Factor
Uf	1.00000	ng unit correction factor
Vo	200.00000	Sample Volume purged (mL)
Vf	200.00000	Final Volume (mL)

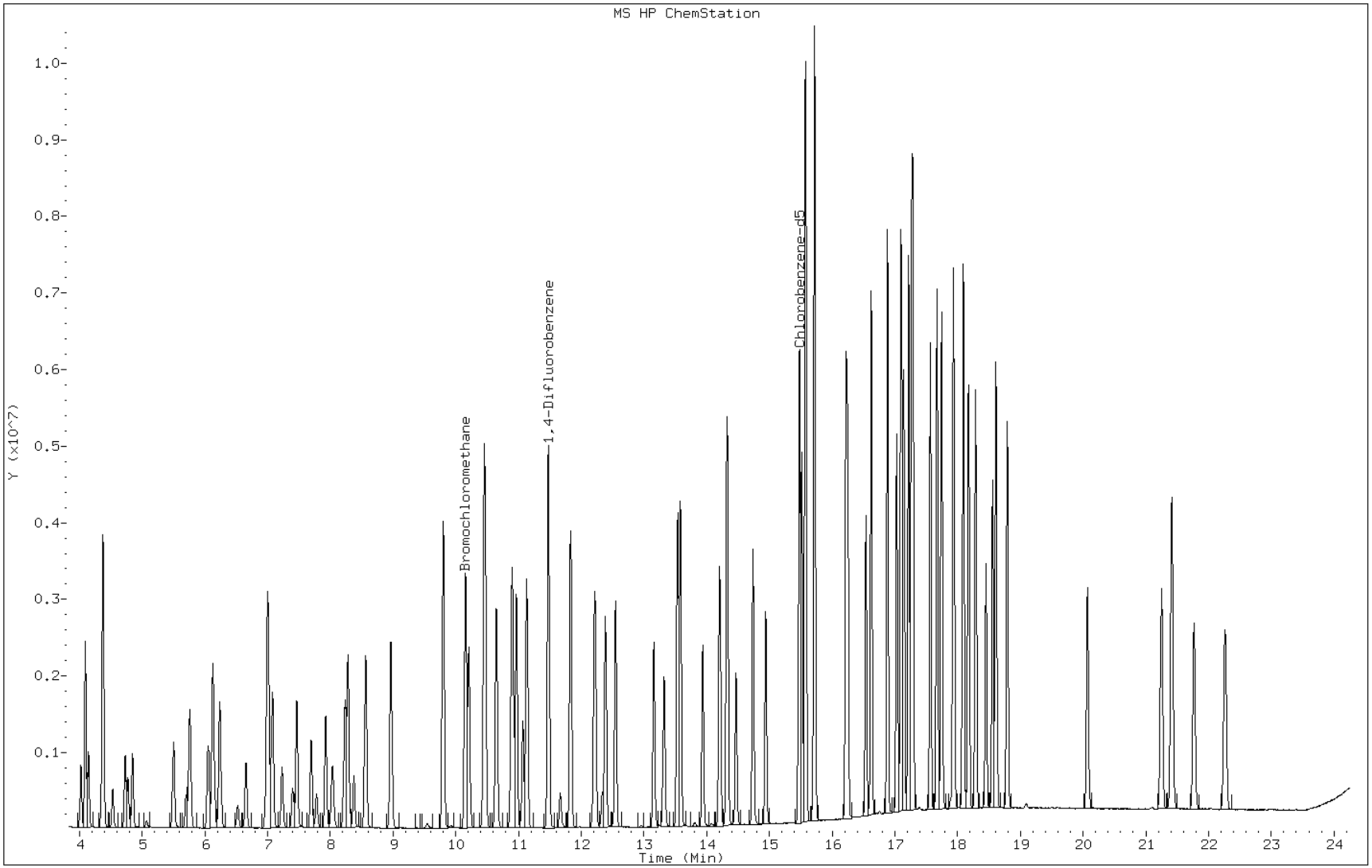
Cpnd Variable Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	AMOUNTS ON-COL (ppb v/v)
1	Propene	41	4.022	4.022	(0.396)	513803	10.0000	9.8
2	Dichlorodifluoromethane	85	4.097	4.097	(0.403)	2764384	10.0000	9.8
3	Chlorodifluoromethane	51	4.145	4.145	(0.408)	1283283	10.0000	9.7
4	1,2-Dichloro-1,1,2,2-tetraflu	85	4.374	4.374	(0.431)	2918851	10.0000	10
5	Chloromethane	50	4.534	4.534	(0.447)	700582	10.0000	9.5
6	Butane	43	4.732	4.732	(0.466)	1056708	10.0000	10
7	Vinyl chloride	62	4.774	4.774	(0.470)	883560	10.0000	9.8
8	1,3-Butadiene	54	4.849	4.849	(0.478)	622839	10.0000	10
9	Bromomethane	94	5.500	5.500	(0.542)	1023522	10.0000	9.9
10	Chloroethane	64	5.703	5.703	(0.562)	545197	10.0000	9.8
11	2-Methylbutane	43	5.762	5.762	(0.567)	938731	10.0000	10
12	Vinyl bromide	106	6.055	6.055	(0.596)	1089934	10.0000	10
13	Trichlorofluoromethane	101	6.130	6.130	(0.604)	2722089	10.0000	10
14	Pentane	43	6.237	6.237	(0.614)	1499548	10.0000	11

		QUANT SIG					AMOUNTS CAL-AMT	ON-COL
	Compounds	MASS	RT	EXP RT	REL RT	RESPONSE	(ppb v/v)	(ppb v/v)
	15 Ethanol	45	6.525	6.525	(0.643)	430350	15.0000	15
	16 Ethyl ether	59	6.658	6.658	(0.656)	695796	10.0000	9.6
	17 1,1,2-Trichloro-1,2,2-trifluo	101	7.000	7.000	(0.689)	2113914	10.0000	10
	18 Acrolein	56	6.989	6.989	(0.688)	296387	10.0000	9.0
	19 1,1-Dichloroethene	96	7.075	7.075	(0.697)	1055508	10.0000	11
	20 Acetone	43	7.229	7.229	(0.712)	1180076	10.0000	9.7
	21 Carbon disulfide	76	7.470	7.470	(0.736)	3222703	10.0000	10
	22 Isopropanol	45	7.400	7.400	(0.729)	924100	10.0000	10
	23 Allyl chloride	41	7.694	7.694	(0.758)	983987	10.0000	10
	24 Acetonitrile	41	7.779	7.779	(0.766)	621717	10.0000	9.8
	25 Methylene chloride	49	7.929	7.929	(0.781)	963550	10.0000	9.5
	26 Tert-butyl alcohol	59	8.035	8.035	(0.791)	1568745	10.0000	11
	27 Methyl tert-butyl ether	73	8.238	8.238	(0.811)	2811709	10.0000	9.5
	28 1,2-Dichloroethene (trans)	61	8.286	8.286	(0.816)	1452818	10.0000	9.9
	29 Acrylonitrile	53	8.377	8.377	(0.825)	668378	10.0000	9.8
	30 n-Hexane	57	8.564	8.564	(0.843)	1610511	10.0000	10
	31 1,1-Dichloroethane	63	8.969	8.969	(0.883)	1898624	10.0000	9.9
	32 Vinyl acetate	43	8.964	8.964	(0.883)	1729274	10.0000	9.3
M	33 1,2-Dichloroethene,Total	61				2685303	20.0000	20
	34 1,2-Dichloroethene (cis)	96	9.802	9.802	(0.965)	1232485	10.0000	9.8
	35 Ethyl acetate	88	9.802	9.802	(0.965)	94504	10.0000	9.6
	36 Methyl Ethyl Ketone	72	9.802	9.802	(0.965)	486497	10.0000	9.2
*	37 Bromochloromethane	128	10.154	10.154	(1.000)	993261	10.0000	
	38 Tetrahydrofuran	42	10.165	10.165	(0.886)	799737	10.0000	9.5
	39 Chloroform	83	10.207	10.207	(1.005)	2342914	10.0000	9.9
	40 Cyclohexane	84	10.464	10.464	(0.912)	1719253	10.0000	10
	41 1,1,1-Trichloroethane	97	10.458	10.458	(0.911)	2475543	10.0000	10
	42 Carbon tetrachloride	117	10.650	10.650	(0.928)	2495820	10.0000	10
	43 2,2,4-Trimethylpentane	57	10.901	10.901	(0.950)	5149777	10.0000	10
	44 Benzene	78	10.965	10.965	(0.955)	3703810	10.0000	9.7
	45 1,2-Dichloroethane	62	11.067	11.067	(0.964)	1358379	10.0000	9.9
	46 n-Heptane	43	11.131	11.131	(0.970)	1578791	10.0000	10
*	47 1,4-Difluorobenzene	114	11.478	11.478	(1.000)	5529549	10.0000	
	48 n-Butanol	56	11.670	11.670	(1.017)	410807	10.0000	11
	49 Trichloroethene	95	11.830	11.830	(1.031)	1682300	10.0000	10
	50 1,2-Dichloropropane	63	12.209	12.209	(1.064)	1232154	10.0000	10
	51 Methyl methacrylate	69	12.230	12.230	(1.066)	1024396	10.0000	11
	52 Dibromomethane	174	12.390	12.390	(1.079)	1296368	10.0000	10
	53 1,4-Dioxane	88	12.337	12.337	(1.075)	482404	10.0000	10
	54 Bromodichloromethane	83	12.545	12.545	(1.093)	2569459	10.0000	11
	55 1,3-Dichloropropene (cis)	75	13.159	13.159	(1.146)	1934465	10.0000	10
	56 Methyl isobutyl ketone	43	13.319	13.319	(1.160)	1561603	10.0000	11
	57 n-Octane	43	13.538	13.538	(1.179)	2022629	10.0000	9.7
	58 Toluene	92	13.580	13.580	(0.877)	2582031	10.0000	9.7
	59 1,3-Dichloropropene (trans)	75	13.938	13.938	(1.214)	1792185	10.0000	10
	60 1,1,2-Trichloroethane	83	14.210	14.210	(0.918)	1236354	10.0000	10
	61 Tetrachloroethene	166	14.327	14.327	(0.926)	2114968	10.0000	10

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	ON-COL (ppb v/v)
62	2-Hexanone	43	14.466	14.466	(0.934)	1485324	10.0000	12
63	Dibromochloromethane	129	14.738	14.738	(0.952)	2498649	10.0000	12
64	1,2-Dibromoethane	107	14.941	14.941	(0.965)	2320644	10.0000	11
* 65	Chlorobenzene-d5	117	15.480	15.480	(1.000)	4549383	10.0000	
66	Chlorobenzene	112	15.518	15.518	(1.002)	3393463	10.0000	10
67	n-Nonane	57	15.571	15.571	(1.006)	1879505	10.0000	11
68	Ethylbenzene	91	15.576	15.576	(1.006)	5024393	10.0000	10
69	Xylene (m,p)	106	15.720	15.720	(1.016)	4120041	20.0000	21
M 70	Xylenes, Total	106				6175611	10.0000	32
71	Xylene (o)	106	16.222	16.222	(1.048)	2055570	10.0000	10
72	Styrene	104	16.249	16.249	(1.050)	2947142	10.0000	12
73	Bromoform	173	16.542	16.542	(1.069)	2131443	10.0000	12
74	Isopropylbenzene	105	16.622	16.622	(1.074)	5693162	10.0000	11
75	1,1,2,2-Tetrachloroethane	83	17.033	17.033	(1.100)	2884168	10.0000	10
76	n-Propylbenzene	91	17.092	17.092	(1.104)	6402558	10.0000	11
77	1,2,3-Trichloropropane	75	17.119	17.119	(1.106)	2084922	10.0000	10
78	n-Decane	57	17.145	17.145	(1.108)	2082884	10.0000	11
79	4-Ethyltoluene	105	17.220	17.220	(1.112)	5607622	10.0000	11
80	2-Chlorotoluene	91	17.268	17.268	(1.115)	4594230	10.0000	10
81	1,3,5-Trimethylbenzene	105	17.289	17.289	(1.117)	4636107	10.0000	11
82	Alpha Methyl Styrene	118	17.567	17.567	(1.135)	2393547	10.0000	13
83	tert-butylbenzene	119	17.674	17.674	(1.142)	4579879	10.0000	11
84	1,2,4-Trimethylbenzene	105	17.743	17.743	(1.146)	4589229	10.0000	12
85	sec-Butylbenzene	105	17.935	17.935	(1.159)	6641083	10.0000	12
86	4-Isopropyltoluene	119	18.090	18.090	(1.169)	5455573	10.0000	12
87	1,3-Dichlorobenzene	146	18.175	18.175	(1.174)	3097982	10.0000	11
88	1,4-Dichlorobenzene	146	18.287	18.287	(1.181)	3037181	10.0000	11
89	Benzyl chloride	91	18.453	18.453	(1.192)	3096980	10.0000	11
90	Undecane	57	18.554	18.554	(1.199)	1945400	10.0000	11
91	n-Butylbenzene	91	18.613	18.613	(1.202)	4359452	10.0000	12
92	1,2-Dichlorobenzene	146	18.794	18.794	(1.214)	2993545	10.0000	11
93	Dodecane	57	20.070	20.070	(1.296)	1503084	10.0000	12
94	1,2,4-Trichlorobenzene	180	21.249	21.249	(1.373)	1583357	10.0000	11
95	1,3-Hexachlorobutadiene	225	21.415	21.415	(1.383)	1373019	10.0000	11
96	Naphthalene	128	21.772	21.772	(1.406)	3745495	10.0000	11
97	1,2,3-Trichlorobenzene	180	22.263	22.263	(1.438)	1435848	10.0000	11

Data File:	cjr006.d	Date:	22-MAR-2011 20:15
Client ID:	icis 119922	Instrument:	C.i
Operator:	pad	Inj Vol:	200.0
Column Type:	Capillary	Diameter:	0.32
Stationary Phase:	RTX-624		
Sample Info:	icis 119922		
Lab Sample ID:	icis 119922		



TestAmerica Burlington

AIR TOXICS QUANTITATION REPORT

Data file : /chem/C.i/Csvr.p/cjrto15.b/cjr007.d
Lab Smp Id: ic 109427 Client Smp ID: ic 109427
Inj Date : 22-MAR-2011 21:03
Operator : pad Inst ID: C.i
Smp Info : ic 109427
Misc Info : 200,1, level 5
Comment :
Method : /chem/C.i/Csvr.p/cjrto15.b/to15v5.m
Meth Date : 25-Mar-2011 14:53 klp Quant Type: ISTD
Cal Date : 22-MAR-2011 21:03 Cal File: cjr007.d
Als bottle: 4 Calibration Sample, Level: 5
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 3.50
Processing Host: chemsvr6

Concentration Formula: Amt * DF * Uf*(Vo/Vo)*(Vf/Vf) * CpndVariable

Name	Value	Description
DF	1.00000	Dilution Factor
Uf	1.00000	ng unit correction factor
Vo	200.00000	Sample Volume purged (mL)
Vf	200.00000	Final Volume (mL)

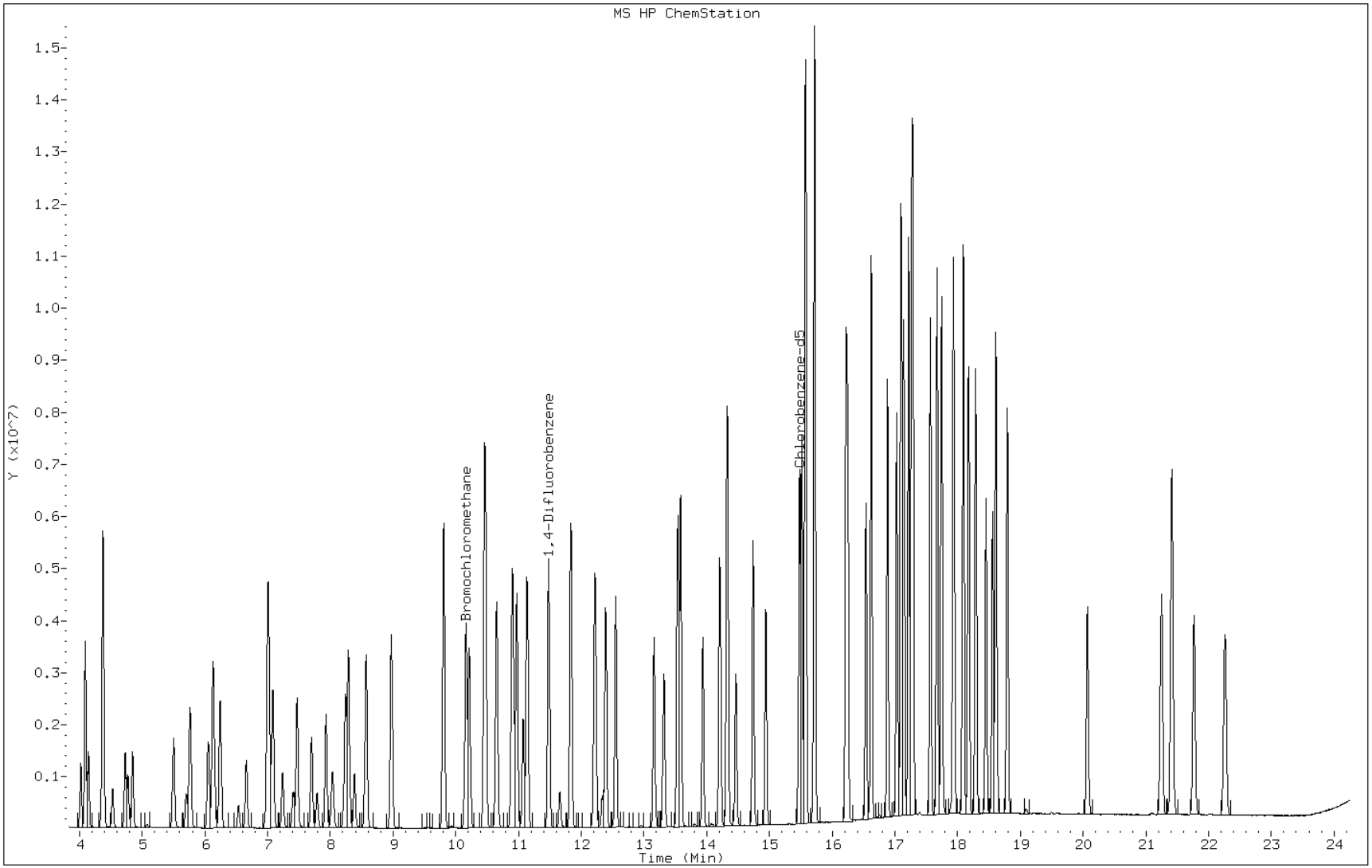
Cpnd Variable Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	AMOUNTS ON-COL (ppb v/v)
1	Propene	41	4.022	4.022	(0.396)	785537	15.0000	15
2	Dichlorodifluoromethane	85	4.097	4.097	(0.403)	4112937	15.0000	14
3	Chlorodifluoromethane	51	4.145	4.145	(0.408)	1949197	15.0000	15
4	1,2-Dichloro-1,1,2,2-tetraflu	85	4.374	4.374	(0.431)	4394340	15.0000	15
5	Chloromethane	50	4.529	4.534	(0.446)	1034799	15.0000	14
6	Butane	43	4.732	4.732	(0.466)	1590195	15.0000	15
7	Vinyl chloride	62	4.774	4.774	(0.470)	1355196	15.0000	15
8	1,3-Butadiene	54	4.849	4.849	(0.477)	934381	15.0000	15
9	Bromomethane	94	5.500	5.500	(0.541)	1543509	15.0000	15
10	Chloroethane	64	5.703	5.703	(0.561)	826470	15.0000	15
11	2-Methylbutane	43	5.767	5.762	(0.568)	1394863	15.0000	15
12	Vinyl bromide	106	6.055	6.055	(0.596)	1677426	15.0000	15
13	Trichlorofluoromethane	101	6.135	6.130	(0.604)	4128282	15.0000	15
14	Pentane	43	6.242	6.237	(0.614)	2247571	15.0000	15

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	ON-COL (ppb v/v)
	15 Ethanol	45	6.535	6.525	(0.643)	612195	20.0000	20
	16 Ethyl ether	59	6.664	6.658	(0.656)	1057914	15.0000	14
	17 1,1,2-Trichloro-1,2,2-trifluo	101	7.010	7.000	(0.690)	3205161	15.0000	15
	18 Acrolein	56	6.994	6.989	(0.688)	518484	15.0000	15
	19 1,1-Dichloroethene	96	7.085	7.075	(0.697)	1606891	15.0000	15
	20 Acetone	43	7.240	7.229	(0.713)	1598316	15.0000	13
	21 Carbon disulfide	76	7.469	7.470	(0.735)	4855662	15.0000	15
	22 Isopropanol	45	7.411	7.400	(0.729)	1188083	15.0000	13
	23 Allyl chloride	41	7.704	7.694	(0.758)	1480425	15.0000	15
	24 Acetonitrile	41	7.790	7.779	(0.767)	900774	15.0000	14
	25 Methylene chloride	49	7.934	7.929	(0.781)	1418687	15.0000	14
	26 Tert-butyl alcohol	59	8.035	8.035	(0.791)	2035360	15.0000	14
	27 Methyl tert-butyl ether	73	8.243	8.238	(0.811)	4310329	15.0000	14
	28 1,2-Dichloroethene (trans)	61	8.291	8.286	(0.816)	2178345	15.0000	15
	29 Acrylonitrile	53	8.387	8.377	(0.826)	1031427	15.0000	15
	30 n-Hexane	57	8.569	8.564	(0.843)	2408267	15.0000	15
	31 1,1-Dichloroethane	63	8.974	8.969	(0.883)	2784061	15.0000	14
	32 Vinyl acetate	43	8.974	8.964	(0.883)	2731590	15.0000	15
M	33 1,2-Dichloroethene,Total	61				4044785	30.0000	29
	34 1,2-Dichloroethene (cis)	96	9.807	9.802	(0.965)	1866440	15.0000	15
	35 Ethyl acetate	88	9.807	9.802	(0.965)	148505	15.0000	15
	36 Methyl Ethyl Ketone	72	9.807	9.802	(0.965)	730712	15.0000	14
*	37 Bromochloromethane	128	10.159	10.154	(1.000)	1021631	10.0000	
	38 Tetrahydrofuran	42	10.170	10.165	(0.886)	1215905	15.0000	14
	39 Chloroform	83	10.218	10.207	(1.006)	3521925	15.0000	15
	40 Cyclohexane	84	10.469	10.464	(0.912)	2570296	15.0000	15
	41 1,1,1-Trichloroethane	97	10.463	10.458	(0.911)	3701301	15.0000	15
	42 Carbon tetrachloride	117	10.656	10.650	(0.928)	3809893	15.0000	15
	43 2,2,4-Trimethylpentane	57	10.906	10.901	(0.950)	7616564	15.0000	15
	44 Benzene	78	10.976	10.965	(0.956)	5550261	15.0000	14
	45 1,2-Dichloroethane	62	11.072	11.067	(0.964)	2037524	15.0000	15
	46 n-Heptane	43	11.136	11.131	(0.970)	2309337	15.0000	14
*	47 1,4-Difluorobenzene	114	11.483	11.478	(1.000)	5701475	10.0000	
	48 n-Butanol	56	11.659	11.670	(1.015)	596474	15.0000	15
	49 Trichloroethene	95	11.835	11.830	(1.031)	2511132	15.0000	15
	50 1,2-Dichloropropane	63	12.209	12.209	(1.063)	1842321	15.0000	15
	51 Methyl methacrylate	69	12.230	12.230	(1.065)	1599884	15.0000	16
	52 Dibromomethane	174	12.390	12.390	(1.079)	2004412	15.0000	16
	53 1,4-Dioxane	88	12.337	12.337	(1.074)	629950	15.0000	14
	54 Bromodichloromethane	83	12.550	12.545	(1.093)	3881382	15.0000	16
	55 1,3-Dichloropropene (cis)	75	13.164	13.159	(1.146)	2959710	15.0000	15
	56 Methyl isobutyl ketone	43	13.319	13.319	(1.160)	2322790	15.0000	15
	57 n-Octane	43	13.538	13.538	(1.179)	2954043	15.0000	14
	58 Toluene	92	13.586	13.580	(0.878)	3980781	15.0000	14
	59 1,3-Dichloropropene (trans)	75	13.938	13.938	(1.214)	2786005	15.0000	15
	60 1,1,2-Trichloroethane	83	14.210	14.210	(0.918)	1878523	15.0000	14
	61 Tetrachloroethene	166	14.327	14.327	(0.926)	3247194	15.0000	15

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	ON-COL (ppb v/v)
	62 2-Hexanone	43	14.466	14.466	(0.934)	2184337	15.0000	15
	63 Dibromochloromethane	129	14.738	14.738	(0.952)	3887584	15.0000	16
	64 1,2-Dibromoethane	107	14.941	14.941	(0.965)	3541726	15.0000	15
*	65 Chlorobenzene-d5	117	15.480	15.480	(1.000)	4969572	10.0000	
	66 Chlorobenzene	112	15.518	15.518	(1.002)	5222795	15.0000	14
	67 n-Nonane	57	15.576	15.571	(1.006)	2815869	15.0000	15
	68 Ethylbenzene	91	15.576	15.576	(1.006)	7570541	15.0000	14
	69 Xylene (m,p)	106	15.720	15.720	(1.016)	6395318	30.0000	30
M	70 Xylenes, Total	106				9615853	15.0000	45
	71 Xylene (o)	106	16.222	16.222	(1.048)	3220535	15.0000	15
	72 Styrene	104	16.249	16.249	(1.050)	4623730	15.0000	16
	73 Bromoform	173	16.542	16.542	(1.069)	3408689	15.0000	17
	74 Isopropylbenzene	105	16.622	16.622	(1.074)	8923683	15.0000	15
	75 1,1,2,2-Tetrachloroethane	83	17.033	17.033	(1.100)	4463019	15.0000	15
	76 n-Propylbenzene	91	17.097	17.092	(1.104)	9819667	15.0000	15
	77 1,2,3-Trichloropropane	75	17.119	17.119	(1.106)	3187047	15.0000	14
	78 n-Decane	57	17.145	17.145	(1.108)	3453318	15.0000	17
	79 4-Ethyltoluene	105	17.220	17.220	(1.112)	8588663	15.0000	16
	80 2-Chlorotoluene	91	17.263	17.268	(1.115)	7017206	15.0000	15
	81 1,3,5-Trimethylbenzene	105	17.289	17.289	(1.117)	7235976	15.0000	16
	82 Alpha Methyl Styrene	118	17.567	17.567	(1.135)	3886077	15.0000	18
	83 tert-butylbenzene	119	17.674	17.674	(1.142)	7159897	15.0000	16
	84 1,2,4-Trimethylbenzene	105	17.743	17.743	(1.146)	7099093	15.0000	16
	85 sec-Butylbenzene	105	17.935	17.935	(1.159)	10114277	15.0000	16
	86 4-Isopropyltoluene	119	18.090	18.090	(1.169)	8548952	15.0000	17
	87 1,3-Dichlorobenzene	146	18.175	18.175	(1.174)	4899009	15.0000	16
	88 1,4-Dichlorobenzene	146	18.293	18.287	(1.182)	4858730	15.0000	16
	89 Benzyl chloride	91	18.453	18.453	(1.192)	5964686	15.0000	18
	90 Undecane	57	18.560	18.554	(1.199)	2639631	15.0000	14
	91 n-Butylbenzene	91	18.613	18.613	(1.202)	6967501	15.0000	17
	92 1,2-Dichlorobenzene	146	18.794	18.794	(1.214)	4754638	15.0000	16
	93 Dodecane	57	20.070	20.070	(1.296)	2054834	15.0000	15
	94 1,2,4-Trichlorobenzene	180	21.249	21.249	(1.373)	2384865	15.0000	16
	95 1,3-Hexachlorobutadiene	225	21.415	21.415	(1.383)	2234951	15.0000	16
	96 Naphthalene	128	21.772	21.772	(1.406)	5854147	15.0000	16
	97 1,2,3-Trichlorobenzene	180	22.263	22.263	(1.438)	2139746	15.0000	15

Data File:	cjr007.d	Date:	22-MAR-2011 21:03
Client ID:	ic 109427	Instrument:	C.i
Operator:	pad	Inj Vol:	200.0
Column Type:	Capillary	Diameter:	0.32
Stationary Phase:	RTX-624		
Sample Info:	ic 109427		
Lab Sample ID:	ic 109427		



TestAmerica Burlington

AIR TOXICS QUANTITATION REPORT

Data file : /chem/C.i/Csvr.p/cjrto15.b/cjr008.d
Lab Smp Id: ic 109425 Client Smp ID: ic 109425
Inj Date : 22-MAR-2011 21:51
Operator : pad Inst ID: C.i
Smp Info : ic 109425
Misc Info : 200,1, level 6
Comment :
Method : /chem/C.i/Csvr.p/cjrto15.b/to15v5.m
Meth Date : 25-Mar-2011 14:53 klp Quant Type: ISTD
Cal Date : 22-MAR-2011 21:51 Cal File: cjr008.d
Als bottle: 5 Calibration Sample, Level: 6
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 3.50
Processing Host: chemsvr6

Concentration Formula: Amt * DF * Uf*(Vo/Vo)*(Vf/Vf) * CpndVariable

Name	Value	Description
DF	1.00000	Dilution Factor
Uf	1.00000	ng unit correction factor
Vo	200.00000	Sample Volume purged (mL)
Vf	200.00000	Final Volume (mL)

Cpnd Variable Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	AMOUNTS ON-COL (ppb v/v)
1 Propene	41	4.022	4.022	(0.396)	1029613	20.0000	19
2 Dichlorodifluoromethane	85	4.096	4.097	(0.403)	5423090	20.0000	19
3 Chlorodifluoromethane	51	4.144	4.145	(0.408)	2607012	20.0000	19
4 1,2-Dichloro-1,1,2,2-tetraflu	85	4.374	4.374	(0.431)	5777603	20.0000	19
5 Chloromethane	50	4.534	4.534	(0.446)	1405728	20.0000	19
6 Butane	43	4.732	4.732	(0.466)	2138903	20.0000	20
7 Vinyl chloride	62	4.780	4.774	(0.470)	1833656	20.0000	20
8 1,3-Butadiene	54	4.849	4.849	(0.477)	1255517	20.0000	20
9 Bromomethane	94	5.505	5.500	(0.542)	2029189	20.0000	19
10 Chloroethane	64	5.708	5.703	(0.562)	1082040	20.0000	19
11 2-Methylbutane	43	5.767	5.762	(0.568)	1766906	20.0000	19
12 Vinyl bromide	106	6.055	6.055	(0.596)	2226483	20.0000	20
13 Trichlorofluoromethane	101	6.135	6.130	(0.604)	5499866	20.0000	19
14 Pentane	43	6.247	6.237	(0.615)	2921876	20.0000	20

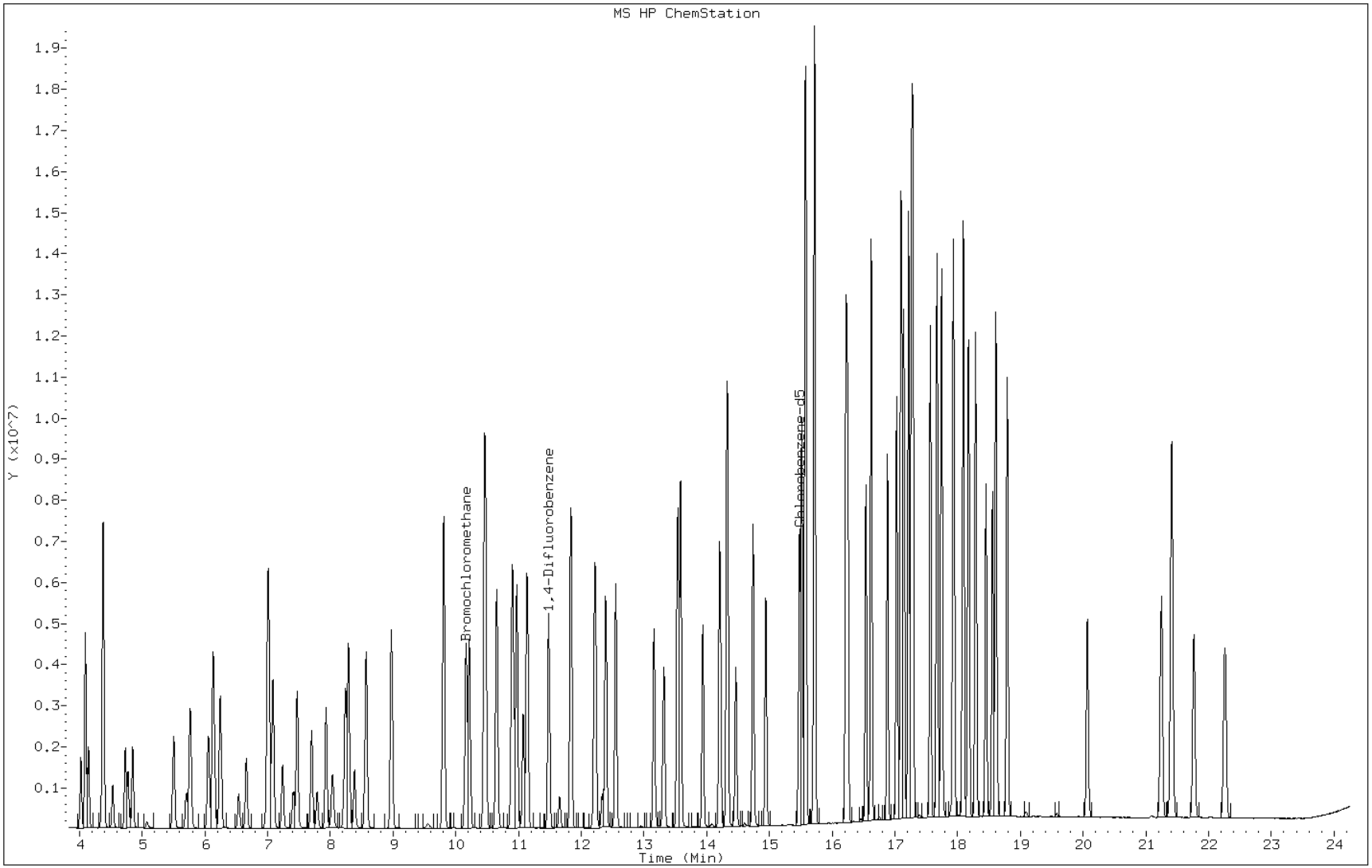
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	ON-COL (ppb v/v)
	15 Ethanol	45	6.541	6.525	(0.644)	1206559	40.0000	40
	16 Ethyl ether	59	6.664	6.658	(0.656)	1387866	20.0000	19
	17 1,1,2-Trichloro-1,2,2-trifluo	101	7.010	7.000	(0.690)	4304749	20.0000	20
	18 Acrolein	56	7.000	6.989	(0.689)	677245	20.0000	20
	19 1,1-Dichloroethene	96	7.085	7.075	(0.697)	2169212	20.0000	20
	20 Acetone	43	7.240	7.229	(0.713)	2273238	20.0000	19
	21 Carbon disulfide	76	7.475	7.470	(0.736)	6474626	20.0000	20
	22 Isopropanol	45	7.411	7.400	(0.729)	1519099	20.0000	18
	23 Allyl chloride	41	7.704	7.694	(0.758)	2012094	20.0000	20
	24 Acetonitrile	41	7.790	7.779	(0.767)	1199199	20.0000	19
	25 Methylene chloride	49	7.934	7.929	(0.781)	1879552	20.0000	18
	26 Tert-butyl alcohol	59	8.035	8.035	(0.791)	2436155	20.0000	17
	27 Methyl tert-butyl ether	73	8.243	8.238	(0.811)	5786012	20.0000	19
	28 1,2-Dichloroethene (trans)	61	8.291	8.286	(0.816)	2883548	20.0000	19
	29 Acrylonitrile	53	8.387	8.377	(0.826)	1374214	20.0000	19
	30 n-Hexane	57	8.569	8.564	(0.843)	3144567	20.0000	19
	31 1,1-Dichloroethane	63	8.974	8.969	(0.883)	3673423	20.0000	19
	32 Vinyl acetate	43	8.974	8.964	(0.883)	3583572	20.0000	19
M	33 1,2-Dichloroethene,Total	61				5357402	40.0000	38
	34 1,2-Dichloroethene (cis)	96	9.807	9.802	(0.965)	2473854	20.0000	19
	35 Ethyl acetate	88	9.802	9.802	(0.965)	198483	20.0000	20
	36 Methyl Ethyl Ketone	72	9.807	9.802	(0.965)	976162	20.0000	18(Q)
*	37 Bromochloromethane	128	10.159	10.154	(1.000)	1038405	10.0000	
	38 Tetrahydrofuran	42	10.170	10.165	(0.886)	1610163	20.0000	19
	39 Chloroform	83	10.218	10.207	(1.006)	4685261	20.0000	19
	40 Cyclohexane	84	10.463	10.464	(0.911)	3385986	20.0000	19
	41 1,1,1-Trichloroethane	97	10.463	10.458	(0.911)	4970580	20.0000	20
	42 Carbon tetrachloride	117	10.656	10.650	(0.928)	5115963	20.0000	20
	43 2,2,4-Trimethylpentane	57	10.906	10.901	(0.950)	9930279	20.0000	19
	44 Benzene	78	10.976	10.965	(0.956)	7338199	20.0000	19
	45 1,2-Dichloroethane	62	11.072	11.067	(0.964)	2716958	20.0000	19
	46 n-Heptane	43	11.136	11.131	(0.970)	2994450	20.0000	19
*	47 1,4-Difluorobenzene	114	11.483	11.478	(1.000)	5785781	10.0000	
	48 n-Butanol	56	11.654	11.670	(1.015)	641322	20.0000	17
	49 Trichloroethene	95	11.835	11.830	(1.031)	3361208	20.0000	20
	50 1,2-Dichloropropane	63	12.209	12.209	(1.063)	2416466	20.0000	19
	51 Methyl methacrylate	69	12.230	12.230	(1.065)	2168352	20.0000	21
	52 Dibromomethane	174	12.390	12.390	(1.079)	2719214	20.0000	21
	53 1,4-Dioxane	88	12.337	12.337	(1.074)	856095	20.0000	19
	54 Bromodichloromethane	83	12.550	12.545	(1.093)	5190338	20.0000	21
	55 1,3-Dichloropropene (cis)	75	13.164	13.159	(1.146)	3997887	20.0000	20
	56 Methyl isobutyl ketone	43	13.319	13.319	(1.160)	3076377	20.0000	20
	57 n-Octane	43	13.537	13.538	(1.179)	3808153	20.0000	18
	58 Toluene	92	13.585	13.580	(0.878)	5341594	20.0000	18
	59 1,3-Dichloropropene (trans)	75	13.938	13.938	(1.214)	3781276	20.0000	20
	60 1,1,2-Trichloroethane	83	14.210	14.210	(0.918)	2524499	20.0000	18
	61 Tetrachloroethene	166	14.327	14.327	(0.926)	4381005	20.0000	19

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	ON-COL (ppb v/v)
62	2-Hexanone	43	14.461	14.466	(0.934)	2880807	20.0000	19
63	Dibromochloromethane	129	14.738	14.738	(0.952)	5264458	20.0000	21
64	1,2-Dibromoethane	107	14.941	14.941	(0.965)	4779617	20.0000	19
* 65	Chlorobenzene-d5	117	15.480	15.480	(1.000)	5250963	10.0000	
66	Chlorobenzene	112	15.517	15.518	(1.002)	7067373	20.0000	19
67	n-Nonane	57	15.571	15.571	(1.006)	3598619	20.0000	18
68	Ethylbenzene	91	15.576	15.576	(1.006)	9819366	20.0000	18
69	Xylene (m,p)	106	15.720	15.720	(1.016)	8512560	40.0000	38
M 70	Xylenes, Total	106				12895076	20.0000	58
71	Xylene (o)	106	16.222	16.222	(1.048)	4382516	20.0000	19
72	Styrene	104	16.249	16.249	(1.050)	6289628	20.0000	21
73	Bromoform	173	16.537	16.542	(1.068)	4586660	20.0000	21
74	Isopropylbenzene	105	16.622	16.622	(1.074)	11761269	20.0000	19
75	1,1,2,2-Tetrachloroethane	83	17.028	17.033	(1.100)	5967436	20.0000	19
76	n-Propylbenzene	91	17.092	17.092	(1.104)	12777423	20.0000	19
77	1,2,3-Trichloropropane	75	17.119	17.119	(1.106)	4210526	20.0000	18
78	n-Decane	57	17.145	17.145	(1.108)	4557996	20.0000	21
79	4-Ethyltoluene	105	17.220	17.220	(1.112)	11357993	20.0000	20
80	2-Chlorotoluene	91	17.263	17.268	(1.115)	9482751	20.0000	19
81	1,3,5-Trimethylbenzene	105	17.284	17.289	(1.117)	9654841	20.0000	20
82	Alpha Methyl Styrene	118	17.567	17.567	(1.135)	4985131	20.0000	22
83	tert-butylbenzene	119	17.674	17.674	(1.142)	9604140	20.0000	20
84	1,2,4-Trimethylbenzene	105	17.743	17.743	(1.146)	9443625	20.0000	21
85	sec-Butylbenzene	105	17.935	17.935	(1.159)	13303529	20.0000	20
86	4-Isopropyltoluene	119	18.090	18.090	(1.169)	11349803	20.0000	21
87	1,3-Dichlorobenzene	146	18.175	18.175	(1.174)	6672955	20.0000	20
88	1,4-Dichlorobenzene	146	18.287	18.287	(1.181)	6626413	20.0000	20
89	Benzyl chloride	91	18.453	18.453	(1.192)	7999574	20.0000	22
90	Undecane	57	18.554	18.554	(1.199)	3596839	20.0000	19
91	n-Butylbenzene	91	18.613	18.613	(1.202)	9375366	20.0000	22
92	1,2-Dichlorobenzene	146	18.794	18.794	(1.214)	6470431	20.0000	21
93	Dodecane	57	20.070	20.070	(1.296)	2514888	20.0000	18
94	1,2,4-Trichlorobenzene	180	21.249	21.249	(1.373)	3027845	20.0000	19
95	1,3-Hexachlorobutadiene	225	21.415	21.415	(1.383)	3107827	20.0000	21
96	Naphthalene	128	21.767	21.772	(1.406)	6927142	20.0000	18
97	1,2,3-Trichlorobenzene	180	22.263	22.263	(1.438)	2578778	20.0000	18

QC Flag Legend

Q - Qualifier signal failed the ratio test.

Data File:	cjr008.d	Date:	22-MAR-2011 21:51
Client ID:	ic 109425	Instrument:	C.i
Operator:	pad	Inj Vol:	200.0
Column Type:	Capillary	Diameter:	0.32
Stationary Phase:	RTX-624		
Sample Info:	ic 109425		
Lab Sample ID:	ic 109425		



TestAmerica Burlington

AIR TOXICS QUANTITATION REPORT

Data file : /chem/C.i/Csvr.p/cjrto15.b/cjr009.d
Lab Smp Id: ic 109424 Client Smp ID: ic 109424
Inj Date : 22-MAR-2011 22:39
Operator : pad Inst ID: C.i
Smp Info : ic 109424
Misc Info : 200,1, level 7
Comment :
Method : /chem/C.i/Csvr.p/cjrto15.b/to15v5.m
Meth Date : 25-Mar-2011 14:53 klp Quant Type: ISTD
Cal Date : 22-MAR-2011 22:39 Cal File: cjr009.d
Als bottle: 6 Calibration Sample, Level: 7
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 3.50
Processing Host: chemsvr6

Concentration Formula: Amt * DF * Uf*(Vo/Vo)*(Vf/Vf) * CpndVariable

Name	Value	Description
DF	1.00000	Dilution Factor
Uf	1.00000	ng unit correction factor
Vo	200.00000	Sample Volume purged (mL)
Vf	200.00000	Final Volume (mL)

Cpnd Variable Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	AMOUNTS ON-COL (ppb v/v)
1 Propene	41	4.017	4.022	(0.396)	2047190	40.0000	38
2 Dichlorodifluoromethane	85	4.091	4.097	(0.403)	10061763	40.0000	35
3 Chlorodifluoromethane	51	4.139	4.145	(0.408)	4975739	40.0000	37
4 1,2-Dichloro-1,1,2,2-tetraflu	85	4.369	4.374	(0.430)	10556693	40.0000	35
5 Chloromethane	50	4.524	4.534	(0.445)	2949862	40.0000	39
6 Butane	43	4.721	4.732	(0.465)	4109370	40.0000	37
7 Vinyl chloride	62	4.769	4.774	(0.470)	3580988	40.0000	38
8 1,3-Butadiene	54	4.838	4.849	(0.476)	2449745	40.0000	38
9 Bromomethane	94	5.495	5.500	(0.541)	4024999	40.0000	37
10 Chloroethane	64	5.698	5.703	(0.561)	2130083	40.0000	37
11 2-Methylbutane	43	5.756	5.762	(0.567)	3380584	40.0000	35
12 Vinyl bromide	106	6.050	6.055	(0.596)	4449178	40.0000	39
13 Trichlorofluoromethane	101	6.125	6.130	(0.603)	10553717	40.0000	37
14 Pentane	43	6.237	6.237	(0.614)	5475583	40.0000	37

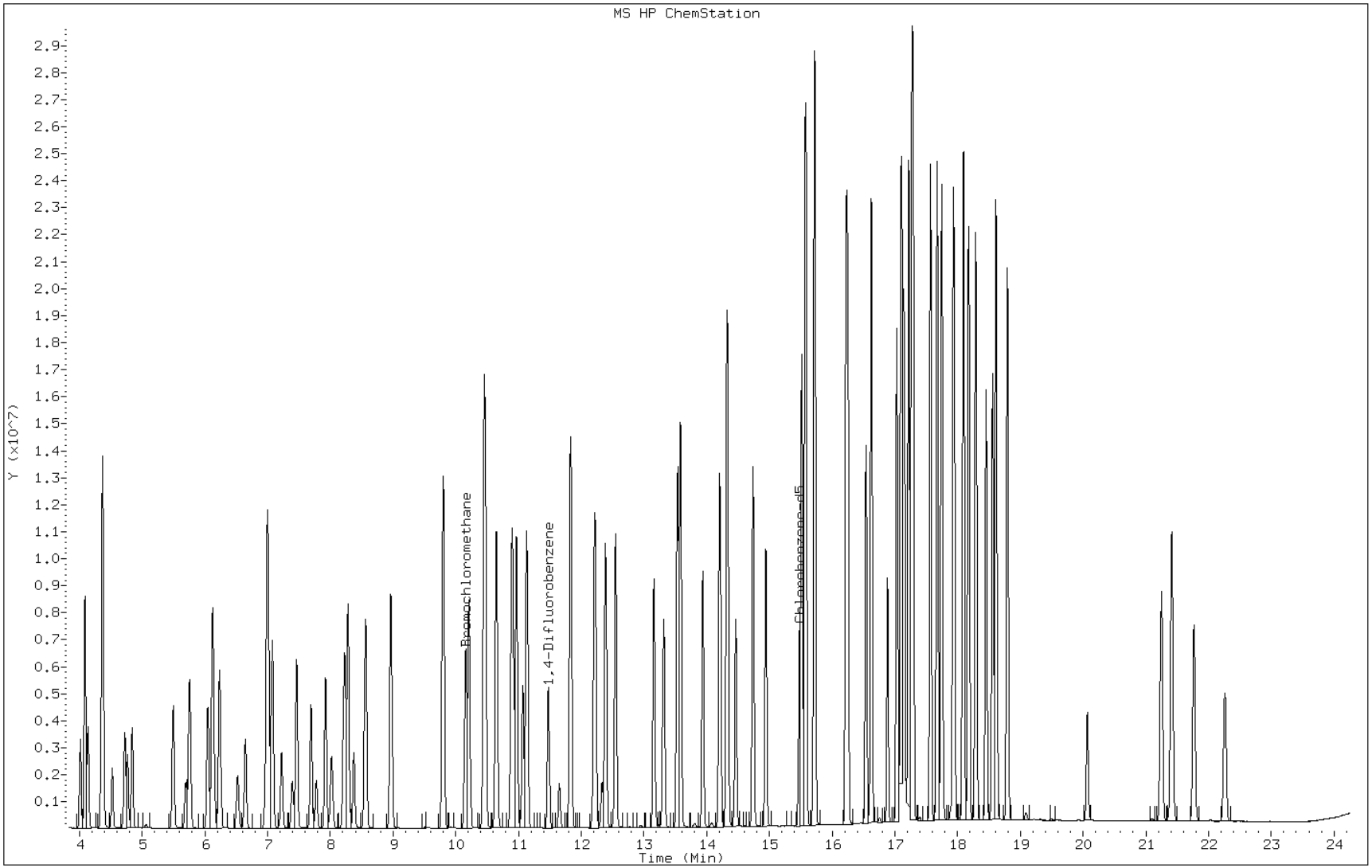
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	ON-COL (ppb v/v)
15	Ethanol	45	6.520	6.525	(0.642)	3080424	100.000	99
16	Ethyl ether	59	6.648	6.658	(0.655)	2708091	40.0000	36
17	1,1,2-Trichloro-1,2,2-trifluo	101	7.000	7.000	(0.689)	8206361	40.0000	37
18	Acrolein	56	6.984	6.989	(0.688)	1248906	40.0000	36
19	1,1-Dichloroethene	96	7.075	7.075	(0.697)	4343316	40.0000	40(A)
20	Acetone	43	7.224	7.229	(0.711)	4231931	40.0000	36
21	Carbon disulfide	76	7.464	7.470	(0.735)	12238589	40.0000	37
22	Isopropanol	45	7.395	7.400	(0.728)	3102387	40.0000	36
23	Allyl chloride	41	7.694	7.694	(0.758)	3859649	40.0000	38
24	Acetonitrile	41	7.779	7.779	(0.766)	2376476	40.0000	37
25	Methylene chloride	49	7.923	7.929	(0.780)	3615559	40.0000	35
26	Tert-butyl alcohol	59	8.019	8.035	(0.790)	5082513	40.0000	36
27	Methyl tert-butyl ether	73	8.227	8.238	(0.810)	11447374	40.0000	37
28	1,2-Dichloroethene (trans)	61	8.286	8.286	(0.816)	5448197	40.0000	36
29	Acrylonitrile	53	8.377	8.377	(0.825)	2800139	40.0000	39
30	n-Hexane	57	8.564	8.564	(0.843)	5899820	40.0000	36
31	1,1-Dichloroethane	63	8.969	8.969	(0.883)	6783028	40.0000	35
32	Vinyl acetate	43	8.964	8.964	(0.883)	6687768	40.0000	36
M 33	1,2-Dichloroethene,Total	61				10131784	80.0000	72
34	1,2-Dichloroethene (cis)	96	9.802	9.802	(0.965)	4683587	40.0000	36
35	Ethyl acetate	88	9.796	9.802	(0.965)	394560	40.0000	38(Q)
36	Methyl Ethyl Ketone	72	9.802	9.802	(0.965)	1873098	40.0000	35(Q)
* 37	Bromochloromethane	128	10.154	10.154	(1.000)	1063604	10.0000	
38	Tetrahydrofuran	42	10.159	10.165	(0.885)	3135148	40.0000	37
39	Chloroform	83	10.213	10.207	(1.006)	8906177	40.0000	36
40	Cyclohexane	84	10.458	10.464	(0.911)	6283709	40.0000	36
41	1,1,1-Trichloroethane	97	10.458	10.458	(0.911)	9348072	40.0000	37
42	Carbon tetrachloride	117	10.645	10.650	(0.927)	9940180	40.0000	39
43	2,2,4-Trimethylpentane	57	10.901	10.901	(0.950)	17803004	40.0000	34
44	Benzene	78	10.971	10.965	(0.956)	13782252	40.0000	35
45	1,2-Dichloroethane	62	11.072	11.067	(0.965)	5279917	40.0000	37
46	n-Heptane	43	11.131	11.131	(0.970)	5357176	40.0000	34
* 47	1,4-Difluorobenzene	114	11.478	11.478	(1.000)	5871669	10.0000	
48	n-Butanol	56	11.648	11.670	(1.015)	1415287	40.0000	37
49	Trichloroethene	95	11.830	11.830	(1.031)	6417221	40.0000	37
50	1,2-Dichloropropane	63	12.203	12.209	(1.063)	4409313	40.0000	35
51	Methyl methacrylate	69	12.230	12.230	(1.066)	4368023	40.0000	41(A)
52	Dibromomethane	174	12.390	12.390	(1.079)	5342493	40.0000	40
53	1,4-Dioxane	88	12.332	12.337	(1.074)	1806843	40.0000	39
54	Bromodichloromethane	83	12.545	12.545	(1.093)	9790019	40.0000	39
55	1,3-Dichloropropene (cis)	75	13.159	13.159	(1.146)	7733179	40.0000	38
56	Methyl isobutyl ketone	43	13.313	13.319	(1.160)	6232538	40.0000	40
57	n-Octane	43	13.538	13.538	(1.179)	6507867	40.0000	31
58	Toluene	92	13.580	13.580	(0.877)	10310725	40.0000	35
59	1,3-Dichloropropene (trans)	75	13.938	13.938	(1.214)	7454789	40.0000	40
60	1,1,2-Trichloroethane	83	14.210	14.210	(0.918)	4843450	40.0000	35
61	Tetrachloroethene	166	14.328	14.327	(0.926)	8259349	40.0000	36

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	ON-COL (ppb v/v)
62	2-Hexanone	43	14.461	14.466	(0.934)	5850694	40.0000	39
63	Dibromochloromethane	129	14.738	14.738	(0.952)	10134866	40.0000	39
64	1,2-Dibromoethane	107	14.941	14.941	(0.965)	9085505	40.0000	36
* 65	Chlorobenzene-d5	117	15.480	15.480	(1.000)	5364157	10.0000	
66	Chlorobenzene	112	15.518	15.518	(1.002)	13153784	40.0000	35
67	n-Nonane	57	15.571	15.571	(1.006)	5606623	40.0000	29
68	Ethylbenzene	91	15.582	15.576	(1.007)	16191420	40.0000	30
69	Xylene (m,p)	106	15.720	15.720	(1.016)	14897636	80.0000	67(Q)
M 70	Xylenes, Total	106				23415430	40.0000	100
71	Xylene (o)	106	16.222	16.222	(1.048)	8517794	40.0000	37(Q)
72	Styrene	104	16.249	16.249	(1.050)	12161476	40.0000	40
73	Bromoform	173	16.542	16.542	(1.069)	8560752	40.0000	39
74	Isopropylbenzene	105	16.622	16.622	(1.074)	19646381	40.0000	33
75	1,1,2,2-Tetrachloroethane	83	17.033	17.033	(1.100)	10805177	40.0000	34
76	n-Propylbenzene	91	17.092	17.092	(1.104)	19600580	40.0000	30
77	1,2,3-Trichloropropane	75	17.119	17.119	(1.106)	7165543	40.0000	32
78	n-Decane	57	17.145	17.145	(1.108)	7523071	40.0000	34
79	4-Ethyltoluene	105	17.220	17.220	(1.112)	19026187	40.0000	33
80	2-Chlorotoluene	91	17.268	17.268	(1.115)	16027221	40.0000	32
81	1,3,5-Trimethylbenzene	105	17.289	17.289	(1.117)	16110821	40.0000	34
82	Alpha Methyl Styrene	118	17.567	17.567	(1.135)	10828668	40.0000	46(A)
83	tert-butylbenzene	119	17.674	17.674	(1.142)	17213740	40.0000	35
84	1,2,4-Trimethylbenzene	105	17.748	17.743	(1.147)	16875360	40.0000	37
85	sec-Butylbenzene	105	17.930	17.935	(1.158)	21863948	40.0000	33
86	4-Isopropyltoluene	119	18.095	18.090	(1.169)	19572387	40.0000	36
87	1,3-Dichlorobenzene	146	18.175	18.175	(1.174)	12759755	40.0000	38
88	1,4-Dichlorobenzene	146	18.293	18.287	(1.182)	12707678	40.0000	38
89	Benzyl chloride	91	18.453	18.453	(1.192)	15816643	40.0000	43(A)
90	Undecane	57	18.560	18.554	(1.199)	7667177	40.0000	39
91	n-Butylbenzene	91	18.613	18.613	(1.202)	16841103	40.0000	38
92	1,2-Dichlorobenzene	146	18.794	18.794	(1.214)	12689509	40.0000	40
93	Dodecane	57	20.070	20.070	(1.296)	2077273	40.0000	17
94	1,2,4-Trichlorobenzene	180	21.249	21.249	(1.373)	4855629	40.0000	31
95	1,3-Hexachlorobutadiene	225	21.415	21.415	(1.383)	3722679	40.0000	26
96	Naphthalene	128	21.767	21.772	(1.406)	11516494	40.0000	31
97	1,2,3-Trichlorobenzene	180	22.263	22.263	(1.438)	2982018	40.0000	22

QC Flag Legend

A - Target compound detected but, quantitated amount exceeded maximum amount.
Q - Qualifier signal failed the ratio test.

Data File:	cjr009.d	Date:	22-MAR-2011 22:39
Client ID:	ic 109424	Instrument:	C.i
Operator:	pad	Inj Vol:	200.0
Column Type:	Capillary	Diameter:	0.32
Stationary Phase:	RTX-624		
Sample Info:	ic 109424		
Lab Sample ID:	ic 109424		



FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUTION

Lab Name: TestAmerica Burlington Job No.: 200-4315-1 Analy Batch No.: 14625

SDG No.: Narrowburg, NY

Instrument ID: G.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 03/02/2011 15:57 Calibration End Date: 03/03/2011 10:00 Calibration ID: 5167

Calibration Files:

LEVEL:	LAB SAMPLE ID:	EPA SAMPLE NO:	LAB FILE ID:
Level 1	IC 200-14625/3	ic 109459	gff003.d
Level 2	IC 200-14625/15	ic 109451	gff015.d
Level 3	IC 200-14625/5	ic 109449	gff005.d
Level 4	ICIS 200-14625/6	icis 109438	gff006.d
Level 5	IC 200-14625/7	ic 109427	gff007.d
Level 6	IC 200-14625/8	ic 109425	gff008.d
Level 7	IC 200-14625/9	ic 109424	gff009.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Propylene	+++++ 0.2022	0.2258 0.1984	0.2047	0.2166	0.1984	Ave		0.2077				5.3		30.0			
Dichlorodifluoromethane	+++++ 1.5170	1.5242 1.4428	1.5961	1.6764	1.5160	Ave		1.5454				5.2		30.0			
Freon 22	+++++ 0.6203	0.6606 0.5983	0.6396	0.6753	0.5911	Ave		0.6309				5.3		30.0			
1,2-Dichlorotetrafluoroethane	1.5969 1.4252	1.5149 1.3357	1.5223	1.5812	1.4001	Ave		1.4823				6.6		30.0			
Chloromethane	+++++ 0.2985	0.3308 0.2939	0.3100	0.3244	0.2861	Ave		0.3073				5.7		30.0			
n-Butane	+++++ 0.4704	0.4879 0.4588	0.4735	0.5074	0.4563	Ave		0.4757				4.0		30.0			
Vinyl chloride	0.4894 0.4312	0.4468 0.4184	0.4473	0.4749	0.4204	Ave		0.4469				6.0		30.0			
1,3-Butadiene	0.3088 0.2881	0.2849 0.2784	0.2975	0.3105	0.2736	Ave		0.2917				4.9		30.0			
Bromomethane	0.9927 0.8544	0.9261 0.8330	0.9026	0.9283	0.8147	Ave		0.8931				7.0		30.0			
Chloroethane	+++++ 0.2989	0.3230 0.2891	0.3221	0.3298	0.2863	Ave		0.3082				6.2		30.0			
Isopropyl alcohol	+++++ 0.5460	+++++ 0.5146	0.5595	0.5534	0.5456	Ave		0.5438				3.2		30.0			
Isopentane	0.6057 0.5417	0.5843 0.5194	0.5752	0.5899	0.5149	Ave		0.5616				6.4		30.0			
Bromoethene(Vinyl Bromide)	1.0401 0.9956	1.0242 0.9821	0.9805	1.0283	0.9201	Ave		0.9958				4.1		30.0			
Trichlorofluoromethane	2.8099 2.6261	2.6999 2.5867	2.6266	2.7557	2.4614	Ave		2.6523				4.4		30.0			

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUTION

Lab Name: TestAmerica Burlington Job No.: 200-4315-1 Analy Batch No.: 14625

SDG No.: Narrowburg, NY

Instrument ID: G.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 03/02/2011 15:57 Calibration End Date: 03/03/2011 10:00 Calibration ID: 5167

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
n-Pentane	+++++ 0.9271	0.9519 0.9003	0.9490	0.9788	0.8708	Ave		0.9296				4.2		30.0			
Ethanol	+++++ 0.2152	0.2210 0.2111	0.1855	0.2078	0.2203	Ave		0.2101				6.2		30.0			
Ethyl ether	0.3918 0.3794	0.4045 0.3808	0.4127	0.3777	0.3899	Ave		0.3910				3.4		30.0			
Acrolein	+++++ 0.1914	+++++ 0.1879	0.2095	0.1871	0.1972	Ave		0.1946				4.7		30.0			
Freon TF	1.9856 1.8667	1.9424 1.7827	1.8802	1.9461	1.7640	Ave		1.8811				4.5		30.0			
1,1-Dichloroethene	0.8960 0.8471	0.8587 0.8369	0.8201	0.8642	0.7832	Ave		0.8438				4.2		30.0			
tert-Butyl alcohol	+++++ 0.9383	+++++ 0.9128	0.9232	0.9415	0.9235	Ave		0.9279				1.3		30.0			
Acetone	+++++ 0.7104	+++++ 0.6767	0.8851	0.7146	0.7198	Ave		0.7413				11.1		30.0			
Carbon disulfide	+++++ 2.4161	2.5153 2.3447	3.4522	2.4949	2.2484	Ave		2.5786				17.0		30.0			
3-Chloropropene	0.6826 0.6393	0.6714 0.6271	0.6609	0.6704	0.6183	Ave		0.6529				3.8		30.0			
Acetonitrile	+++++ 0.3107	+++++ 0.3150	0.3498	0.3238	0.3208	Ave		0.3240				4.7		30.0			
Methylene Chloride	+++++ 0.6885	0.7938 0.6582	0.7246	0.7239	0.6523	Ave		0.7069				7.4		30.0			
Methyl tert-butyl ether	1.9579 1.7880	1.8248 1.7848	1.9033	1.7337	1.8551	Ave		1.8354				4.2		30.0			
trans-1,2-Dichloroethene	1.1331 1.0642	1.1106 1.0118	1.0934	1.1150	1.0045	Ave		1.0761				4.7		30.0			
Acrylonitrile	+++++ 0.3509	0.3665 0.3591	0.3796	0.3467	0.3574	Ave		0.3600				3.3		30.0			
n-Hexane	0.9853 0.9216	0.9220 0.8730	0.9474	0.9694	0.8905	Ave		0.9299				4.4		30.0			
1,1-Dichloroethane	1.4466 1.2651	1.3433 1.2143	1.3528	1.3382	1.2340	Ave		1.3135				6.2		30.0			
Vinyl acetate	+++++ 1.1176	+++++ 1.0935	1.2117	1.0981	1.1622	Ave		1.1366				4.4		30.0			
1,4-Dioxane	+++++ 0.0696	+++++ 0.0661	0.0772	0.0754	0.0719	Ave		0.0721				6.2		30.0			
cis-1,2-Dichloroethene	0.9963 0.9117	0.9837 0.8601	0.9583	0.9731	0.8943	Ave		0.9396				5.5		30.0			

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUTION

Lab Name: TestAmerica Burlington Job No.: 200-4315-1 Analy Batch No.: 14625

SDG No.: Narrowburg, NY

Instrument ID: G.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 03/02/2011 15:57 Calibration End Date: 03/03/2011 10:00 Calibration ID: 5167

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Methyl Ethyl Ketone	+++++ 0.2743	0.2886 0.2545	0.2985	0.2756	0.2904	Ave		0.2803				5.6		30.0			
Ethyl acetate	+++++ 0.0473	+++++ 0.0462	0.0515	0.0469	0.0503	Ave		0.0485				4.8		30.0			
n-Butanol	+++++ 0.0580	+++++ 0.0572	0.0537	0.0618	0.0575	Ave		0.0576				5.0		30.0			
Tetrahydrofuran	+++++ 0.1042	+++++ 0.1025	0.1190	0.1137	0.1108	Ave		0.1101				6.2		30.0			
Chloroform	2.1037 1.8465	1.9741 1.8214	1.9663	1.9403	1.8222	Ave		1.9249				5.4		30.0			
1,1,1-Trichloroethane	0.5054 0.4704	0.5136 0.4498	0.4990	0.5354	0.4606	Ave		0.4906				6.3		30.0			
Cyclohexane	0.2540 0.2373	0.2519 0.2163	0.2455	0.2681	0.2285	Ave		0.2431				7.1		30.0			
Carbon tetrachloride	0.5385 0.5436	0.5587 0.5316	0.5523	0.6032	0.5221	Ave		0.5500				4.8		30.0			
2,2,4-Trimethylpentane	0.7233 0.6284	0.7299 0.5917	0.7006	0.7206	0.6308	Ave		0.6751				8.4		30.0			
Benzene	0.6126 0.4993	0.5969 0.4812	0.5518	0.5569	0.4957	Ave		0.5421				9.5		30.0			
1,2-Dichloroethane	0.2606 0.2338	0.2725 0.2343	0.2567	0.2586	0.2318	Ave		0.2498				6.5		30.0			
n-Heptane	0.2432 0.1998	0.2456 0.1882	0.2263	0.2291	0.2015	Ave		0.2191				10.3		30.0			
Trichloroethene	0.3058 0.2840	0.3193 0.2709	0.3023	0.3185	0.2766	Ave		0.2968				6.6		30.0			
1,2-Dichloropropane	0.1883 0.1607	0.1868 0.1548	0.1774	0.1739	0.1614	Ave		0.1719				7.7		30.0			
Methyl methacrylate	+++++ 0.1364	0.1087 0.1366	0.1408	0.1398	0.1441	Ave		0.1344				9.6		30.0			
Dibromomethane	0.2378 0.2166	0.2365 0.2117	0.2313	0.2392	0.2128	Ave		0.2265				5.4		30.0			
Bromodichloromethane	0.4331 0.4503	0.4526 0.4411	0.4775	0.4892	0.4445	Ave		0.4555				4.5		30.0			
cis-1,3-Dichloropropene	0.2867 0.2878	0.2933 0.2847	0.3050	0.3036	0.2851	Ave		0.2923				3.0		30.0			
Methyl isobutyl ketone	+++++ 0.2101	0.1839 0.2089	0.2300	0.2280	0.2237	Ave		0.2141				8.1		30.0			
n-Octane	0.3052 0.2477	0.3071 0.2163	0.3013	0.2897	0.2556	Ave		0.2747				12.8		30.0			

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUTION

Lab Name: TestAmerica Burlington Job No.: 200-4315-1 Analy Batch No.: 14625

SDG No.: Narrowburg, NY

Instrument ID: G.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 03/02/2011 15:57 Calibration End Date: 03/03/2011 10:00 Calibration ID: 5167

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Toluene	0.4955 0.3846	0.4746 0.3479	0.4481	0.4242	0.4026	Ave		0.4254				12.2		30.0			
trans-1,3-Dichloropropene	0.2787 0.2980	0.2950 0.2982	0.3096	0.3128	0.2953	Ave		0.2982				3.7		30.0			
1,1,2-Trichloroethane	0.2435 0.2142	0.2418 0.2056	0.2387	0.2275	0.2216	Ave		0.2276				6.4		30.0			
Tetrachloroethene	0.4228 0.3490	0.4023 0.3333	0.3809	0.3777	0.3541	Ave		0.3743				8.4		30.0			
Methyl Butyl Ketone (2-Hexanone)	+++++ 0.2152	0.1798 0.2144	0.2282	0.2299	0.2292	Ave		0.2161				8.8		30.0			
Dibromochloromethane	0.4607 0.5469	0.4760 0.5323	0.5632	0.5709	0.5552	Ave		0.5293				8.2		30.0			
1,2-Dibromoethane	0.4452 0.4457	0.4552 0.4344	0.4744	0.4705	0.4545	Ave		0.4543				3.1		30.0			
Chlorobenzene	0.6822 0.5913	0.6624 0.5780	0.6456	0.6249	0.6071	Ave		0.6274				6.1		30.0			
Ethylbenzene	0.9739 0.8300	0.9393 0.7834	0.9375	0.8820	0.8696	Ave		0.8880				7.6		30.0			
n-Nonane	0.3243 0.2785	0.3153 0.2489	0.3362	0.3103	0.2964	Ave		0.3014				9.9		30.0			
m,p-Xylene	0.3842 0.3340	0.3857 0.3028	0.3849	0.3605	0.3551	Ave		0.3582				8.7		30.0			
Xylene, o-	0.3914 0.3415	0.3851 0.3232	0.3848	0.3605	0.3607	Ave		0.3639				6.9		30.0			
Styrene	0.3695 0.5096	0.4075 0.4970	0.5206	0.5196	0.5272	Ave		0.4787				13.2		30.0			
Bromoform	0.3385 0.4468	0.3592 0.4119	0.4615	0.4697	0.4619	Ave		0.4214				12.7		30.0			
Cumene	1.0661 0.9706	1.0799 0.9297	1.0873	1.0090	1.0282	Ave		1.0244				5.8		30.0			
1,1,2,2-Tetrachloroethane	0.5974 0.5216	0.5803 0.4853	0.6074	0.5579	0.5603	Ave		0.5586				7.7		30.0			
n-Propylbenzene	1.1645 1.0781	1.1632 0.9535	1.2618	1.1666	1.1722	Ave		1.1371				8.5		30.0			
1,2,3-Trichloropropane	+++++ 0.3359	0.4136 0.2975	0.4087	0.3716	0.3675	Ave		0.3658				12.1		30.0			
n-Decane	+++++ 0.3384	0.2650 0.3049	0.4032	0.3645	0.3638	Ave		0.3400				14.4		30.0			
n-Dodecane	+++++ 0.2173	+++++ 0.0476	0.2017	0.2451	0.2119	Ave		0.1847				42.4	*	30.0			

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUTION

Lab Name: TestAmerica Burlington Job No.: 200-4315-1 Analy Batch No.: 14625

SDG No.: Narrowburg, NY

Instrument ID: G.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 03/02/2011 15:57 Calibration End Date: 03/03/2011 10:00 Calibration ID: 5167

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
4-Ethyltoluene	0.9390 0.9790	0.9404 0.9168	1.0889	1.0051	1.0415	Ave		0.9872				6.3		30.0			
2-Chlorotoluene	1.0079 0.8911	0.9873 0.8359	1.0136	0.9482	0.9376	Ave		0.9460				6.9		30.0			
1,3,5-Trimethylbenzene	0.8314 0.8158	0.8324 0.7767	0.9179	0.8437	0.8745	Ave		0.8418				5.3		30.0			
Alpha Methyl Styrene	0.2645 0.4285	0.2755 0.4310	0.4164	0.4329	0.4576	Ave		0.3867				20.9		30.0			
tert-Butylbenzene	0.8948 0.7768	0.8594 0.7437	0.8869	0.8079	0.8283	Ave		0.8283				6.8		30.0			
1,2,4-Trimethylbenzene	0.7806 0.8092	0.7775 0.7798	0.9195	0.8412	0.8649	Ave		0.8247				6.5		30.0			
sec-Butylbenzene	1.2640 1.1581	1.2070 1.0898	1.3365	1.2192	1.2434	Ave		1.2169				6.4		30.0			
4-Isopropyltoluene	0.9215 0.9836	0.9070 0.9322	1.1082	1.0138	1.0557	Ave		0.9889				7.6		30.0			
1,3-Dichlorobenzene	0.4819 0.5809	0.4974 0.5695	0.5941	0.5848	0.5953	Ave		0.5577				8.5		30.0			
1,4-Dichlorobenzene	0.4240 0.5694	0.4383 0.5620	0.5582	0.5586	0.5758	Ave		0.5266				12.5		30.0			
Benzyl chloride	0.3977 0.6820	0.4257 0.6999	0.6482	0.6670	0.7161	Ave		0.6052				22.2		30.0			
n-Undecane	+++++ 0.2636	+++++ 0.2718	0.2667	0.2875	0.2517	Ave		0.2683				4.9		30.0			
n-Butylbenzene	0.5769 0.8263	0.6276 0.7539	0.9467	0.8700	0.8900	Ave		0.7845				17.7		30.0			
1,2-Dichlorobenzene	0.5150 0.5651	0.5087 0.5528	0.6003	0.5722	0.5847	Ave		0.5570				6.2		30.0			
1,2,4-Trichlorobenzene	+++++ 0.2995	0.1214 0.1822	0.2462	0.2658	0.2900	Ave		0.2342				29.6		30.0			
Hexachlorobutadiene	0.2253 0.2340	0.2264 0.1069	0.2830	0.2501	0.2473	Ave		0.2247				24.7		30.0			
Naphthalene	+++++ 0.7765	0.3375 0.4825	0.6634	0.7179	0.7740	Ave		0.6253				28.4		30.0			
1,2,3-Trichlorobenzene	0.1673 0.2834	0.1476 0.0956	0.2473	0.2627	0.2725	Ave		0.2109				34.8	*	30.0			

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Burlington Job No.: 200-4315-1 Analy Batch No.: 14625

SDG No.: Narrowburg, NY

Instrument ID: G.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 03/02/2011 15:57 Calibration End Date: 03/03/2011 10:00 Calibration ID: 5167

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 200-14625/3	gff003.d
Level 2	IC 200-14625/15	gff015.d
Level 3	IC 200-14625/5	gff005.d
Level 4	ICIS 200-14625/6	gff006.d
Level 5	IC 200-14625/7	gff007.d
Level 6	IC 200-14625/8	gff008.d
Level 7	IC 200-14625/9	gff009.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (PPB V/V)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Propylene	BCM	Ave	+++++ 247537	6894 486971	60237	127730	182113	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Dichlorodifluoromethane	BCM	Ave	+++++ 1856782	46545 3540738	469743	988462	1391634	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Freon 22	BCM	Ave	+++++ 759256	20174 1468173	188227	398163	542598	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
1,2-Dichlorotetrafluoroethane	BCM	Ave	19802 1744478	46261 3277690	448019	932370	1285218	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Chloromethane	BCM	Ave	+++++ 365342	10102 721158	91234	191257	262642	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
n-Butane	BCM	Ave	+++++ 575784	14900 1125998	139365	299180	418874	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Vinyl chloride	BCM	Ave	6069 527744	13644 1026867	131654	280049	385905	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,3-Butadiene	BCM	Ave	3829 352621	8699 683286	87541	183091	251193	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Bromomethane	BCM	Ave	12310 1045793	28282 2044268	265634	547350	747856	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Chloroethane	BCM	Ave	+++++ 365822	9864 709415	94783	194491	262798	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Isopropyl alcohol	BCM	Ave	+++++ 668353	+++++ 1262751	164646	326287	500802	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
Isopentane	BCM	Ave	7511 663019	17842 1274649	169272	347808	472678	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Bromoethene(Vinyl Bromide)	BCM	Ave	12898 1218538	31275 2410156	288562	606344	844609	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Trichlorofluoromethane	BCM	Ave	34844 3214337	82447 6347853	773007	1624901	2259467	0.200 20.0	0.500 40.0	5.00	10.0	15.0
n-Pentane	BCM	Ave	+++++ 1134746	29068 2209232	279304	577118	799366	+++++ 20.0	0.500 40.0	5.00	10.0	15.0

FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Burlington Job No.: 200-4315-1 Analy Batch No.: 14625

SDG No.: Narrowburg, NY

Instrument ID: G.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 03/02/2011 15:57 Calibration End Date: 03/03/2011 10:00 Calibration ID: 5167

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (PPB V/V)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Ethanol	BCM	Ave	+++++ 526800	67477 1295375	109167	183825	269612	+++++ 40.0	5.00 100	10.0	15.0	20.0
Ethyl ether	BCM	Ave	4858 464424	12351 934508	121459	222724	357882	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Acrolein	BCM	Ave	+++++ 234215	+++++ 461214	61669	110337	181045	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
Freon TF	BCM	Ave	24622 2284827	59317 4374646	553350	1147515	1619296	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,1-Dichloroethene	BCM	Ave	11111 1036868	26223 2053738	241369	509553	718967	0.200 20.0	0.500 40.0	5.00	10.0	15.0
tert-Butyl alcohol	BCM	Ave	+++++ 1148489	+++++ 2240114	271703	555141	847765	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
Acetone	BCM	Ave	+++++ 869474	+++++ 1660647	260476	421354	660747	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
Carbon disulfide	BCM	Ave	+++++ 2957289	76812 5753768	1015978	1471085	2063947	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
3-Chloropropene	BCM	Ave	8465 782484	20504 1539005	194495	395305	567610	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Acetonitrile	BCM	Ave	+++++ 380338	+++++ 772910	102953	190955	294523	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
Methylene Chloride	BCM	Ave	+++++ 842720	24240 1615249	213254	426830	598782	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Methyl tert-butyl ether	BCM	Ave	24279 2188425	55724 4379781	560142	1022270	1702898	0.200 20.0	0.500 40.0	5.00	10.0	15.0
trans-1,2-Dichloroethene	BCM	Ave	14051 1302515	33915 2482967	321778	657462	922123	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Acrylonitrile	BCM	Ave	+++++ 429473	11191 881328	111720	204435	328040	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
n-Hexane	BCM	Ave	12218 1127966	28157 2142320	278808	571591	817399	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,1-Dichloroethane	BCM	Ave	17939 1548407	41020 2979991	398134	789069	1132783	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Vinyl acetate	BCM	Ave	+++++ 1367956	+++++ 2683415	356603	647495	1066848	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
1,4-Dioxane	DFB	Ave	+++++ 376237	+++++ 715615	98508	183447	291703	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
cis-1,2-Dichloroethene	BCM	Ave	12354 1115915	30041 2110661	282019	573771	820894	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Methyl Ethyl Ketone	BCM	Ave	+++++ 335753	8813 624530	87859	162530	266531	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Ethyl acetate	BCM	Ave	+++++ 57877	+++++ 113497	15158	27644	46218	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0

FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Burlington Job No.: 200-4315-1 Analy Batch No.: 14625

SDG No.: Narrowburg, NY

Instrument ID: G.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 03/02/2011 15:57 Calibration End Date: 03/03/2011 10:00 Calibration ID: 5167

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (PPB V/V)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
n-Butanol	DFB	Ave	+++++ 313202	+++++ 618969	68510	150198	233302	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
Tetrahydrofuran	DFB	Ave	+++++ 562981	+++++ 1110382	151912	276588	449396	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
Chloroform	BCM	Ave	26087 2260041	60284 4469713	578677	1144116	1672730	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,1,1-Trichloroethane	DFB	Ave	27292 2541422	65258 4870032	636799	1301980	1867962	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Cyclohexane	DFB	Ave	13718 1281978	32008 2341909	313232	652081	926496	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Carbon tetrachloride	DFB	Ave	29080 2937015	70985 5755743	704731	1467058	2117315	0.200 20.0	0.500 40.0	5.00	10.0	15.0
2,2,4-Trimethylpentane	DFB	Ave	39061 3395143	92742 6407430	894085	1752405	2558329	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Benzene	DFB	Ave	33085 2697571	75845 5210691	704121	1354502	2010223	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,2-Dichloroethane	DFB	Ave	14075 1262935	34625 2536655	327632	628922	940252	0.200 20.0	0.500 40.0	5.00	10.0	15.0
n-Heptane	DFB	Ave	13132 1079214	31208 2037732	288740	557110	817090	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Trichloroethene	DFB	Ave	16513 1534563	40575 2932803	385806	774527	1121910	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,2-Dichloropropane	DFB	Ave	10167 868446	23729 1676662	226400	422965	654673	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Methyl methacrylate	DFB	Ave	+++++ 737181	13813 1479287	179685	339993	584503	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Dibromomethane	DFB	Ave	12840 1170349	30043 2292301	295164	581678	863174	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Bromodichloromethane	DFB	Ave	23391 2432940	57506 4776270	609319	1189771	1802497	0.200 20.0	0.500 40.0	5.00	10.0	15.0
cis-1,3-Dichloropropene	DFB	Ave	15485 1554765	37265 3082542	389146	738413	1156372	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Methyl isobutyl ketone	DFB	Ave	+++++ 1135325	23369 2262321	293524	554526	907241	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
n-Octane	DFB	Ave	16483 1338094	39020 2341773	384496	704537	1036634	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Toluene	CBZ	Ave	23909 1958056	55359 3557408	528417	975298	1492530	0.200 20.0	0.500 40.0	5.00	10.0	15.0
trans-1,3-Dichloropropene	DFB	Ave	15053 1610204	37481 3229155	395020	760702	1197780	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,1,2-Trichloroethane	CBZ	Ave	11751 1090665	28203 2101874	281444	523066	821487	0.200 20.0	0.500 40.0	5.00	10.0	15.0

FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Burlington Job No.: 200-4315-1 Analy Batch No.: 14625

SDG No.: Narrowburg, NY

Instrument ID: G.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 03/02/2011 15:57 Calibration End Date: 03/03/2011 10:00 Calibration ID: 5167

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (PPB V/V)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Tetrachloroethene	CBZ	Ave	20401 1776721	46934 3407889	449086	868531	1312712	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Methyl Butyl Ketone (2-Hexanone)	CBZ	Ave	+++++ 1095490	20976 2191682	269066	528502	849564	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Dibromochloromethane	CBZ	Ave	22227 2784540	55530 5442205	664110	1312705	2058219	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,2-Dibromoethane	CBZ	Ave	21479 2269407	53096 4441213	559394	1081909	1684927	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Chlorobenzene	CBZ	Ave	32916 3010551	77270 5910104	761309	1436688	2250376	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Ethylbenzene	CBZ	Ave	46989 4225933	109571 8009862	1105510	2027899	3223805	0.200 20.0	0.500 40.0	5.00	10.0	15.0
n-Nonane	CBZ	Ave	15647 1417965	36777 2544871	396406	713557	1098697	0.200 20.0	0.500 40.0	5.00	10.0	15.0
m,p-Xylene	CBZ	Ave	37074 3400877	89995 6191334	907608	1657656	2632611	0.400 40.0	1.00 80.0	10.0	20.0	30.0
Xylene, o-	CBZ	Ave	18885 1738833	44921 3304980	453791	828956	1337236	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Styrene	CBZ	Ave	17828 2594528	47532 5081566	613840	1194799	1954483	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Bromoform	CBZ	Ave	16332 2274982	41906 4211401	544144	1079902	1712172	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Cumene	CBZ	Ave	51440 4941808	125968 9505903	1282089	2319965	3811527	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,1,2,2-Tetrachloroethane	CBZ	Ave	28826 2655616	67695 4962039	716196	1282719	2077036	0.200 20.0	0.500 40.0	5.00	10.0	15.0
n-Propylbenzene	CBZ	Ave	56184 5489375	135683 9748559	1487876	2682368	4345404	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,2,3-Trichloropropane	CBZ	Ave	+++++ 1710358	48247 3041850	481941	854347	1362451	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
n-Decane	CBZ	Ave	+++++ 1722947	30907 3117701	475478	838119	1348735	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
n-Dodecane	CBZ	Ave	+++++ 1106235	+++++ 487083	237803	563499	785551	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
4-Ethyltoluene	CBZ	Ave	45307 4984818	109695 9373685	1283947	2310942	3860769	0.200 20.0	0.500 40.0	5.00	10.0	15.0
2-Chlorotoluene	CBZ	Ave	48631 4537014	115175 8546838	1195234	2180127	3475915	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,3,5-Trimethylbenzene	CBZ	Ave	40115 4153728	97106 7941399	1082308	1939798	3241948	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Alpha Methyl Styrene	CBZ	Ave	12762 2181933	32136 4407068	491050	995379	1696524	0.200 20.0	0.500 40.0	5.00	10.0	15.0

FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Burlington Job No.: 200-4315-1 Analy Batch No.: 14625

SDG No.: Narrowburg, NY

Instrument ID: G.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 03/02/2011 15:57 Calibration End Date: 03/03/2011 10:00 Calibration ID: 5167

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (PPB V/V)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
tert-Butylbenzene	CBZ	Ave	43171 3955322	100246 7604102	1045821	1857519	3070609	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,2,4-Trimethylbenzene	CBZ	Ave	37664 4120261	90694 7973201	1084247	1934156	3206232	0.200 20.0	0.500 40.0	5.00	10.0	15.0
sec-Butylbenzene	CBZ	Ave	60989 5896247	140803 11142695	1575970	2803341	4609320	0.200 20.0	0.500 40.0	5.00	10.0	15.0
4-Isopropyltoluene	CBZ	Ave	44464 5008257	105805 9531290	1306697	2330936	3913653	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,3-Dichlorobenzene	CBZ	Ave	23252 2957514	58017 5823224	700511	1344684	2206741	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,4-Dichlorobenzene	CBZ	Ave	20459 2899241	51126 5746382	658246	1284393	2134617	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Benzyl chloride	CBZ	Ave	19191 3472178	49655 7156035	764360	1533696	2654791	0.200 20.0	0.500 40.0	5.00	10.0	15.0
n-Undecane	CBZ	Ave	+++++ 1342267	+++++ 2778746	314438	661052	933148	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
n-Butylbenzene	CBZ	Ave	27837 4207303	73213 7707954	1116332	2000393	3299177	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,2-Dichlorobenzene	CBZ	Ave	24846 2877055	59341 5651743	707893	1315705	2167535	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,2,4-Trichlorobenzene	CBZ	Ave	+++++ 1525002	14159 1862424	290311	611035	1075152	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Hexachlorobutadiene	CBZ	Ave	10870 1191527	26415 1092658	333642	574929	916861	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Naphthalene	CBZ	Ave	+++++ 3953729	39372 4933703	782203	1650593	2869431	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
1,2,3-Trichlorobenzene	CBZ	Ave	8073 1442772	17217 977721	291600	603978	1010168	0.200 20.0	0.500 40.0	5.00	10.0	15.0

Curve Type Legend:
Ave = Average ISTD

TestAmerica Burlington

AIR TOXICS QUANTITATION REPORT

Data file : /chem/G.i/Gsvr.p/gffto15.b/gff003.d
Lab Smp Id: ic 109459 Client Smp ID: ic 109459
Inj Date : 02-MAR-2011 15:57
Operator : wrd Inst ID: G.i
Smp Info : ic 109459
Misc Info : 200,1,level 1
Comment :
Method : /chem/G.i/Gsvr.p/gffto15.b/to15v5.m
Meth Date : 04-Mar-2011 10:44 klp Quant Type: ISTD
Cal Date : 02-MAR-2011 15:57 Cal File: gff003.d
Als bottle: 4 Calibration Sample, Level: 1
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 3.50
Processing Host: chemsvr6

Concentration Formula: Amt * DF * Uf*(Vo/Vo)*(Vf/Vf) * CpndVariable

Name	Value	Description
DF	1.00000	Dilution Factor
Uf	1.00000	ng unit correction factor
Vo	200.00000	Sample Volume purged (mL)
Vf	200.00000	Final Volume (mL)

Cpnd Variable Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	AMOUNTS ON-COL (ppb v/v)
2 Dichlorodifluoromethane	85	3.160	3.154	(0.332)	20079	0.20000	0.21(a)
3 Chlorodifluoromethane	51	3.192	3.192	(0.335)	9282	0.20000	0.24(a)
4 1,2-Dichloro-1,1,2,2-tetraflu	85	3.379	3.379	(0.355)	19802	0.20000	0.22
5 Chloromethane	50	3.507	3.502	(0.368)	4633	0.20000	0.24(a)
6 Butane	43	3.679	3.679	(0.386)	6593	0.20000	0.22(a)
7 Vinyl chloride	62	3.716	3.716	(0.390)	6069	0.20000	0.22
8 1,3-Butadiene	54	3.791	3.780	(0.398)	3829	0.20000	0.21
9 Bromomethane	94	4.449	4.449	(0.467)	12310	0.20000	0.22
10 Chloroethane	64	4.679	4.668	(0.491)	4298	0.20000	0.22(a)
11 2-Methylbutane	43	4.743	4.743	(0.498)	7511	0.20000	0.22(Q)
12 Vinyl bromide	106	5.064	5.059	(0.532)	12898	0.20000	0.21
13 Trichlorofluoromethane	101	5.155	5.155	(0.541)	34844	0.20000	0.21
14 Pentane	43	5.278	5.284	(0.554)	12601	0.20000	0.22(a)
16 Ethyl ether	59	5.749	5.744	(0.604)	4858	0.20000	0.20

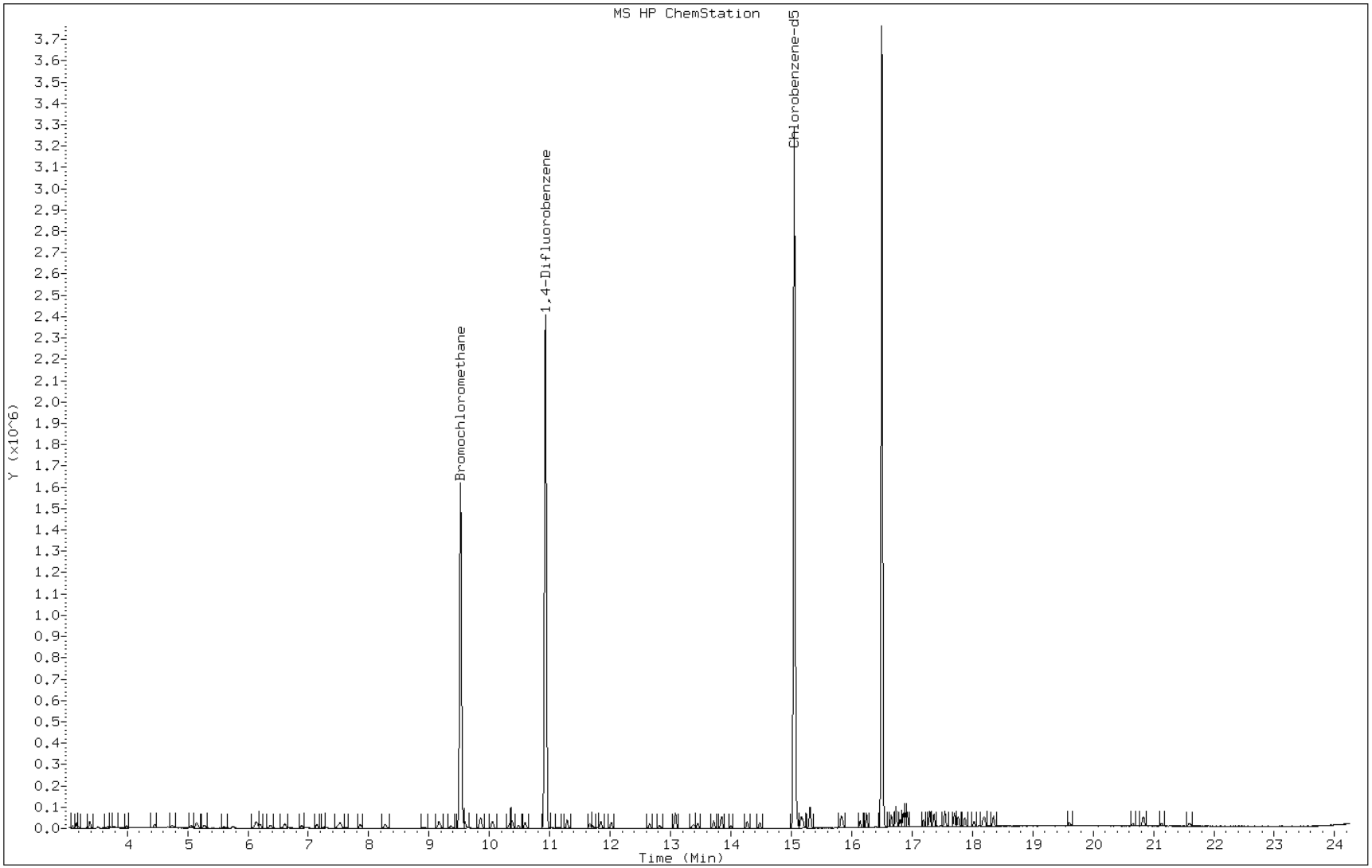
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	ON-COL (ppb v/v)
17	1,1,2-Trichloro-1,2,2-trifluo	101	6.139	6.139	(0.645)	24622	0.20000	0.21
19	1,1-Dichloroethene	96	6.204	6.209	(0.652)	11111	0.20000	0.21
21	Carbon disulfide	76	6.610	6.616	(0.694)	32642	0.20000	0.20(a)
22	Isopropanol	45	Compound Not Detected.					
23	Allyl chloride	41	6.894	6.894	(0.724)	8465	0.20000	0.21
25	Methylene chloride	49	7.140	7.145	(0.750)	11836	0.20000	0.27(a)
26	Tert-butyl alcohol	59	Compound Not Detected.					
27	Methyl tert-butyl ether	73	7.504	7.488	(0.788)	24279	0.20000	0.21
28	1,2-Dichloroethene (trans)	61	7.530	7.541	(0.791)	14051	0.20000	0.21
29	Acrylonitrile	53	7.621	7.627	(0.801)	4743	0.20000	0.21(a)
30	n-Hexane	57	7.857	7.862	(0.825)	12218	0.20000	0.21
31	1,1-Dichloroethane	63	8.274	8.274	(0.869)	17939	0.20000	0.22(M)
M 33	1,2-Dichloroethene,Total	61				26405	0.40000	0.42
34	1,2-Dichloroethene (cis)	96	9.157	9.162	(0.962)	12354	0.20000	0.21
36	Methyl Ethyl Ketone	72	9.167	9.162	(0.963)	4037	0.20000	0.23(a)
* 37	Bromochloromethane	128	9.520	9.531	(1.000)	620019	10.0000	
39	Chloroform	83	9.601	9.601	(1.008)	26087	0.20000	0.22
40	Cyclohexane	84	9.858	9.863	(0.902)	13718	0.20000	0.21
41	1,1,1-Trichloroethane	97	9.852	9.858	(0.902)	27292	0.20000	0.21
42	Carbon tetrachloride	117	10.050	10.055	(0.920)	29080	0.20000	0.20
43	2,2,4-Trimethylpentane	57	10.339	10.344	(0.946)	39061	0.20000	0.21
44	Benzene	78	10.382	10.387	(0.950)	33085	0.20000	0.23
45	1,2-Dichloroethane	62	10.483	10.489	(0.959)	14075	0.20000	0.21
46	n-Heptane	43	10.596	10.601	(0.970)	13132	0.20000	0.22
* 47	1,4-Difluorobenzene	114	10.927	10.933	(1.000)	2700273	10.0000	
48	n-Butanol	56	Compound Not Detected.					
49	Trichloroethene	95	11.291	11.291	(1.033)	16513	0.20000	0.21
50	1,2-Dichloropropane	63	11.660	11.671	(1.067)	10167	0.20000	0.22
51	Methyl methacrylate	69	11.725	11.719	(1.073)	6048	0.20000	0.17(a)
52	Dibromomethane	174	11.848	11.853	(1.084)	12840	0.20000	0.21
53	1,4-Dioxane	88	Compound Not Detected.					
54	Bromodichloromethane	83	12.013	12.024	(1.099)	23391	0.20000	0.19(a)
55	1,3-Dichloropropene (cis)	75	12.655	12.655	(1.158)	15485	0.20000	0.20
56	Methyl isobutyl ketone	43	12.827	12.816	(1.174)	10130	0.20000	0.18(a)
57	n-Octane	43	13.073	13.078	(1.196)	16483	0.20000	0.22(a)
58	Toluene	92	13.083	13.089	(0.870)	23909	0.20000	0.23
59	1,3-Dichloropropene (trans)	75	13.447	13.453	(1.231)	15053	0.20000	0.19(a)
60	1,1,2-Trichloroethane	83	13.715	13.720	(0.911)	11751	0.20000	0.21
61	Tetrachloroethene	166	13.843	13.848	(0.920)	20401	0.20000	0.23
62	2-Hexanone	43	13.998	13.998	(0.930)	8341	0.20000	0.16(a)
63	Dibromochloromethane	129	14.271	14.276	(0.948)	22227	0.20000	0.17(a)
64	1,2-Dibromoethane	107	14.480	14.480	(0.962)	21479	0.20000	0.20
* 65	Chlorobenzene-d5	117	15.047	15.052	(1.000)	2412459	10.0000	
66	Chlorobenzene	112	15.084	15.090	(1.002)	32916	0.20000	0.22
67	n-Nonane	57	15.197	15.197	(1.010)	15647	0.20000	0.22
68	Ethylbenzene	91	15.159	15.164	(1.007)	46989	0.20000	0.22
69	Xylene (m,p)	106	15.309	15.314	(1.017)	37074	0.40000	0.43

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	ON-COL (ppb v/v)
M	70 Xylenes, Total	106				55959	0.20000	0.64
	71 Xylene (o)	106	15.822	15.833	(1.052)	18885	0.20000	0.22
	72 Styrene	104	15.855	15.855	(1.054)	17828	0.20000	0.15(a)
	73 Bromoform	173	16.138	16.143	(1.073)	16332	0.20000	0.16(a)
	74 Isopropylbenzene	105	16.245	16.250	(1.080)	51440	0.20000	0.21
	75 1,1,2,2-Tetrachloroethane	83	16.657	16.657	(1.107)	28826	0.20000	0.21
	76 n-Propylbenzene	91	16.727	16.732	(1.112)	56184	0.20000	0.20
	77 1,2,3-Trichloropropane	75	16.737	16.743	(1.112)	21240	0.20000	0.24(a)
	78 n-Decane	57	16.807	16.807	(1.117)	12885	0.20000	0.16(a)
	79 4-Ethyltoluene	105	16.855	16.860	(1.120)	45307	0.20000	0.19(a)
	80 2-Chlorotoluene	91	16.887	16.892	(1.122)	48631	0.20000	0.21
	81 1,3,5-Trimethylbenzene	105	16.924	16.930	(1.125)	40115	0.20000	0.20
	82 Alpha Methyl Styrene	118	17.192	17.197	(1.143)	12762	0.20000	0.14(a)
	83 tert-butylbenzene	119	17.288	17.299	(1.149)	43171	0.20000	0.22
	84 1,2,4-Trimethylbenzene	105	17.363	17.369	(1.154)	37664	0.20000	0.19(a)
	85 sec-Butylbenzene	105	17.550	17.550	(1.166)	60989	0.20000	0.21
	86 4-Isopropyltoluene	119	17.700	17.706	(1.176)	44464	0.20000	0.19(a)
	87 1,3-Dichlorobenzene	146	17.764	17.770	(1.181)	23252	0.20000	0.17(a)
	88 1,4-Dichlorobenzene	146	17.877	17.882	(1.188)	20459	0.20000	0.16(a)
	89 Benzyl chloride	91	18.032	18.037	(1.198)	19191	0.20000	0.13(a)
	91 n-Butylbenzene	91	18.203	18.203	(1.210)	27837	0.20000	0.15(a)
	92 1,2-Dichlorobenzene	146	18.347	18.358	(1.219)	24846	0.20000	0.18(a)
	93 Dodecane	57	Compound Not Detected.					
	94 1,2,4-Trichlorobenzene	180	20.664	20.664	(1.373)	6271	0.20000	0.11(a)
	95 1,3-Hexachlorobutadiene	225	20.835	20.835	(1.385)	10870	0.20000	0.20
	96 Naphthalene	128	21.135	21.140	(1.405)	17871	0.20000	0.12(a)
	97 1,2,3-Trichlorobenzene	180	21.600	21.600	(1.436)	8073	0.20000	0.16(aQ)

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
Q - Qualifier signal failed the ratio test.
M - Compound response manually integrated.

Data File:	gff003.d	Date:	02-MAR-2011 15:57
Client ID:	ic 109459	Instrument:	G.i
Operator:	wrd	Inj Vol:	200.0
Column Type:	Capillary	Diameter:	0.32
Stationary Phase:	RTX-624		
Sample Info:	ic 109459		
Lab Sample ID:	ic 109459		



Manual Integration Report

Data File: gff003.d
Lab Sample ID: ic 109459
Inj. Date and Time: 02-MAR-2011 15:57
Instrument ID: G.i
Client ID: ic 109459
Compound: 31 1,1-Dichloroethane
CAS #: 75-34-3
Report Date: 03/04/2011

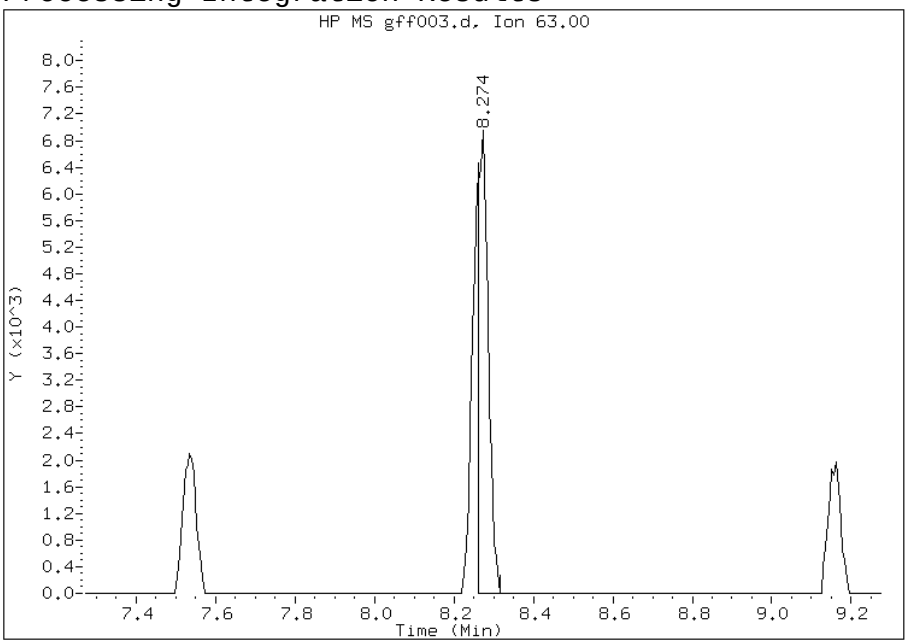
Processing Integration Results

RT: 8.27

Response: 11557

Amount: 0.164218

Conc: 0.164218



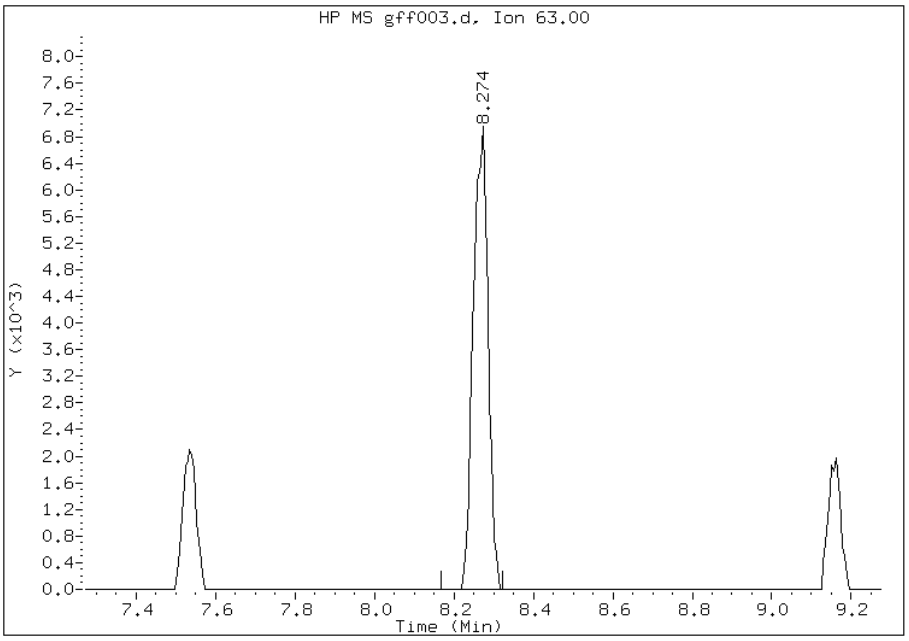
Manual Integration Results

RT: 8.27

Response: 17939

Amount: 0.220277

Conc: 0.220277



File Uploaded By: klp
Manual Integration Reason: Baseline event

TestAmerica Burlington

AIR TOXICS QUANTITATION REPORT

Data file : /chem/G.i/Gsvr.p/gffto15.b/gff005.d
Lab Smp Id: ic 109449 Client Smp ID: ic 109449
Inj Date : 02-MAR-2011 17:39
Operator : wrd Inst ID: G.i
Smp Info : ic 109449
Misc Info : 200,1,level 3
Comment :
Method : /chem/G.i/Gsvr.p/gffto15.b/to15v5.m
Meth Date : 04-Mar-2011 10:44 klp Quant Type: ISTD
Cal Date : 02-MAR-2011 17:39 Cal File: gff005.d
Als bottle: 6 Calibration Sample, Level: 3
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 3.50
Processing Host: chemsvr6

Concentration Formula: Amt * DF * Uf*(Vo/Vo)*(Vf/Vf) * CpndVariable

Name	Value	Description
DF	1.00000	Dilution Factor
Uf	1.00000	ng unit correction factor
Vo	200.00000	Sample Volume purged (mL)
Vf	200.00000	Final Volume (mL)

Cpnd Variable Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	AMOUNTS ON-COL (ppb v/v)
1	Propene	41	3.095	3.101	(0.325)	60237	5.00000	4.9(a)
2	Dichlorodifluoromethane	85	3.154	3.154	(0.331)	469743	5.00000	5.2
3	Chlorodifluoromethane	51	3.192	3.192	(0.335)	188227	5.00000	5.1
4	1,2-Dichloro-1,1,2,2-tetraflu	85	3.374	3.379	(0.354)	448019	5.00000	5.1
5	Chloromethane	50	3.502	3.502	(0.368)	91234	5.00000	5.0
6	Butane	43	3.679	3.679	(0.386)	139365	5.00000	5.0
7	Vinyl chloride	62	3.716	3.716	(0.390)	131654	5.00000	5.0
8	1,3-Butadiene	54	3.780	3.780	(0.397)	87541	5.00000	5.1
9	Bromomethane	94	4.449	4.449	(0.467)	265634	5.00000	5.1
10	Chloroethane	64	4.668	4.668	(0.490)	94783	5.00000	5.2
11	2-Methylbutane	43	4.743	4.743	(0.498)	169272	5.00000	5.1
12	Vinyl bromide	106	5.059	5.059	(0.531)	288562	5.00000	4.9
13	Trichlorofluoromethane	101	5.150	5.155	(0.541)	773007	5.00000	5.0
14	Pentane	43	5.278	5.284	(0.554)	279304	5.00000	5.1

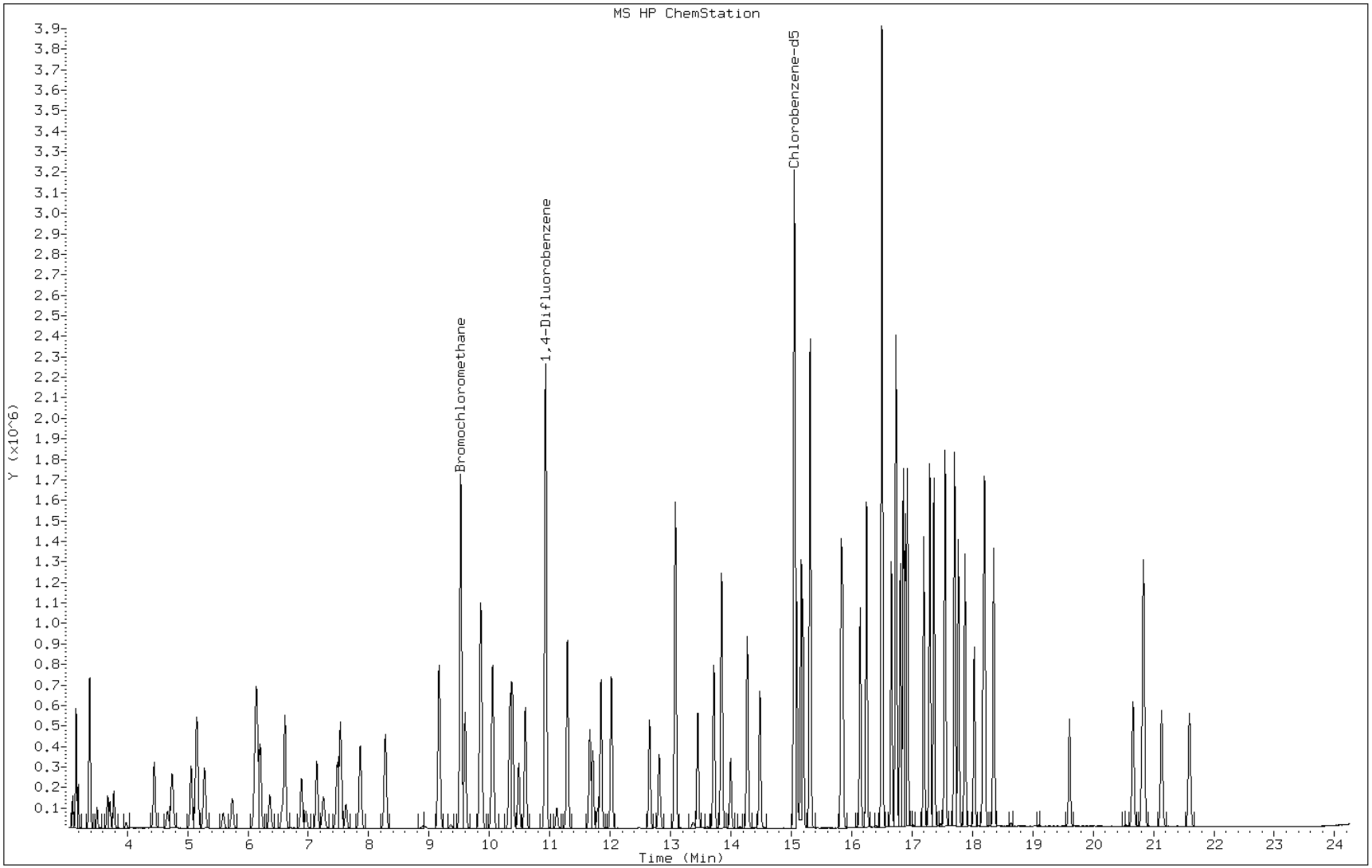
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	ON-COL (ppb v/v)
	15 Ethanol	45	5.588	5.594	(0.587)	109167	10.0000	8.8
	16 Ethyl ether	59	5.738	5.744	(0.602)	121459	5.00000	5.3
	17 1,1,2-Trichloro-1,2,2-trifluo	101	6.139	6.139	(0.644)	553350	5.00000	5.0
	18 Acrolein	56	6.091	6.097	(0.639)	61669	5.00000	5.4
	19 1,1-Dichloroethene	96	6.204	6.209	(0.651)	241369	5.00000	4.9
	20 Acetone	43	6.364	6.370	(0.668)	260476	5.00000	6.0
	21 Carbon disulfide	76	6.610	6.616	(0.694)	1015978	5.00000	6.7
	22 Isopropanol	45	6.567	6.567	(0.689)	164646	5.00000	5.1
	23 Allyl chloride	41	6.888	6.894	(0.723)	194495	5.00000	5.1
	24 Acetonitrile	41	6.963	6.969	(0.731)	102953	5.00000	5.4
	25 Methylene chloride	49	7.140	7.145	(0.750)	213254	5.00000	5.1
	26 Tert-butyl alcohol	59	7.247	7.252	(0.761)	271703	5.00000	5.0
	27 Methyl tert-butyl ether	73	7.482	7.488	(0.785)	560142	5.00000	5.2
	28 1,2-Dichloroethene (trans)	61	7.536	7.541	(0.791)	321778	5.00000	5.1
	29 Acrylonitrile	53	7.627	7.627	(0.801)	111720	5.00000	5.3
	30 n-Hexane	57	7.862	7.862	(0.825)	278808	5.00000	5.1
	31 1,1-Dichloroethane	63	8.269	8.274	(0.868)	398134	5.00000	5.1
	32 Vinyl acetate	43	8.285	8.290	(0.870)	356603	5.00000	5.3
M	33 1,2-Dichloroethene,Total	61				603797	10.0000	10
	34 1,2-Dichloroethene (cis)	96	9.162	9.162	(0.962)	282019	5.00000	5.1
	35 Ethyl acetate	88	9.178	9.183	(0.963)	15158	5.00000	5.3
	36 Methyl Ethyl Ketone	72	9.162	9.162	(0.962)	87859	5.00000	5.3
*	37 Bromochloromethane	128	9.526	9.531	(1.000)	588599	10.0000	
	38 Tetrahydrofuran	42	9.537	9.542	(0.872)	151912	5.00000	5.4
	39 Chloroform	83	9.601	9.601	(1.008)	578677	5.00000	5.1
	40 Cyclohexane	84	9.858	9.863	(0.902)	313232	5.00000	5.0
	41 1,1,1-Trichloroethane	97	9.852	9.858	(0.901)	636799	5.00000	5.1
	42 Carbon tetrachloride	117	10.055	10.055	(0.920)	704731	5.00000	5.0
	43 2,2,4-Trimethylpentane	57	10.344	10.344	(0.946)	894085	5.00000	5.2
	44 Benzene	78	10.382	10.387	(0.950)	704121	5.00000	5.1
	45 1,2-Dichloroethane	62	10.489	10.489	(0.959)	327632	5.00000	5.1
	46 n-Heptane	43	10.596	10.601	(0.969)	288740	5.00000	5.2
*	47 1,4-Difluorobenzene	114	10.933	10.933	(1.000)	2552194	10.0000	
	48 n-Butanol	56	11.120	11.115	(1.017)	68510	5.00000	4.7(a)
	49 Trichloroethene	95	11.291	11.291	(1.033)	385806	5.00000	5.1
	50 1,2-Dichloropropane	63	11.666	11.671	(1.067)	226400	5.00000	5.2
	51 Methyl methacrylate	69	11.714	11.719	(1.071)	179685	5.00000	5.2
	52 Dibromomethane	174	11.848	11.853	(1.084)	295164	5.00000	5.1
	53 1,4-Dioxane	88	11.794	11.794	(1.079)	98508	5.00000	5.4
	54 Bromodichloromethane	83	12.019	12.024	(1.099)	609319	5.00000	5.2
	55 1,3-Dichloropropene (cis)	75	12.655	12.655	(1.158)	389146	5.00000	5.2
	56 Methyl isobutyl ketone	43	12.816	12.816	(1.172)	293524	5.00000	5.4
	57 n-Octane	43	13.078	13.078	(1.196)	384496	5.00000	5.5
	58 Toluene	92	13.083	13.089	(0.870)	528417	5.00000	5.3
	59 1,3-Dichloropropene (trans)	75	13.453	13.453	(1.230)	395020	5.00000	5.2
	60 1,1,2-Trichloroethane	83	13.720	13.720	(0.912)	281444	5.00000	5.2
	61 Tetrachloroethene	166	13.848	13.848	(0.920)	449086	5.00000	5.1

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	ON-COL (ppb v/v)
62	2-Hexanone	43	13.993	13.998	(0.930)	269066	5.00000	5.3
63	Dibromochloromethane	129	14.271	14.276	(0.948)	664110	5.00000	5.3
64	1,2-Dibromoethane	107	14.480	14.480	(0.962)	559394	5.00000	5.2
* 65	Chlorobenzene-d5	117	15.047	15.052	(1.000)	2358305	10.0000	
66	Chlorobenzene	112	15.090	15.090	(1.003)	761309	5.00000	5.1
67	n-Nonane	57	15.191	15.197	(1.010)	396406	5.00000	5.6
68	Ethylbenzene	91	15.164	15.164	(1.008)	1105510	5.00000	5.3
69	Xylene (m,p)	106	15.314	15.314	(1.018)	907608	10.0000	11
M 70	Xylenes, Total	106				1361399	5.00000	16
71	Xylene (o)	106	15.828	15.833	(1.052)	453791	5.00000	5.3
72	Styrene	104	15.855	15.855	(1.054)	613840	5.00000	5.4
73	Bromoform	173	16.143	16.143	(1.073)	544144	5.00000	5.5
74	Isopropylbenzene	105	16.245	16.250	(1.080)	1282089	5.00000	5.3
75	1,1,2,2-Tetrachloroethane	83	16.657	16.657	(1.107)	716196	5.00000	5.4
76	n-Propylbenzene	91	16.732	16.732	(1.112)	1487876	5.00000	5.5
77	1,2,3-Trichloropropane	75	16.743	16.743	(1.113)	481941	5.00000	5.6
78	n-Decane	57	16.807	16.807	(1.117)	475478	5.00000	5.9
79	4-Ethyltoluene	105	16.855	16.860	(1.120)	1283947	5.00000	5.5
80	2-Chlorotoluene	91	16.892	16.892	(1.123)	1195234	5.00000	5.4
81	1,3,5-Trimethylbenzene	105	16.924	16.930	(1.125)	1082308	5.00000	5.5
82	Alpha Methyl Styrene	118	17.192	17.197	(1.143)	491050	5.00000	5.4
83	tert-butylbenzene	119	17.294	17.299	(1.149)	1045821	5.00000	5.4
84	1,2,4-Trimethylbenzene	105	17.363	17.369	(1.154)	1084247	5.00000	5.6
85	sec-Butylbenzene	105	17.550	17.550	(1.166)	1575970	5.00000	5.5
86	4-Isopropyltoluene	119	17.706	17.706	(1.177)	1306697	5.00000	5.6
87	1,3-Dichlorobenzene	146	17.764	17.770	(1.181)	700511	5.00000	5.3
88	1,4-Dichlorobenzene	146	17.877	17.882	(1.188)	658246	5.00000	5.3
89	Benzyl chloride	91	18.032	18.037	(1.198)	764360	5.00000	5.4
90	Undecane	57	18.176	18.176	(1.208)	314438	5.00000	5.0
91	n-Butylbenzene	91	18.203	18.203	(1.210)	1116332	5.00000	6.0
92	1,2-Dichlorobenzene	146	18.353	18.358	(1.220)	707893	5.00000	5.4
93	Dodecane	57	19.610	19.610	(1.303)	237803	5.00000	5.5
94	1,2,4-Trichlorobenzene	180	20.664	20.664	(1.373)	290311	5.00000	5.3
95	1,3-Hexachlorobutadiene	225	20.830	20.835	(1.384)	333642	5.00000	6.3
96	Naphthalene	128	21.135	21.140	(1.405)	782203	5.00000	5.3
97	1,2,3-Trichlorobenzene	180	21.595	21.600	(1.435)	291600	5.00000	5.9

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).

Data File:	gff005.d	Date:	02-MAR-2011 17:39
Client ID:	ic 109449	Instrument:	G.i
Operator:	wrd	Inj Vol:	200.0
Column Type:	Capillary	Diameter:	0.32
Stationary Phase:	RTX-624		
Sample Info:	ic 109449		
Lab Sample ID:	ic 109449		



TestAmerica Burlington

AIR TOXICS QUANTITATION REPORT

Data file : /chem/G.i/Gsvr.p/gffto15.b/gff006.d
Lab Smp Id: icis 109438 Client Smp ID: icis 109438
Inj Date : 02-MAR-2011 18:30
Operator : wrd Inst ID: G.i
Smp Info : icis 109438
Misc Info : 200,1,level 4
Comment :
Method : /chem/G.i/Gsvr.p/gffto15.b/to15v5.m
Meth Date : 04-Mar-2011 10:44 klp Quant Type: ISTD
Cal Date : 02-MAR-2011 18:30 Cal File: gff006.d
Als bottle: 1 Calibration Sample, Level: 4
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 3.50
Processing Host: chemsvr6

Concentration Formula: Amt * DF * Uf*(Vo/Vo)*(Vf/Vf) * CpndVariable

Name	Value	Description
DF	1.00000	Dilution Factor
Uf	1.00000	ng unit correction factor
Vo	200.00000	Sample Volume purged (mL)
Vf	200.00000	Final Volume (mL)

Cpnd Variable Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	AMOUNTS ON-COL (ppb v/v)
1 Propene	41	3.101	3.101	(0.325)	127730	10.0000	10
2 Dichlorodifluoromethane	85	3.154	3.154	(0.331)	988462	10.0000	11
3 Chlorodifluoromethane	51	3.192	3.192	(0.335)	398163	10.0000	11
4 1,2-Dichloro-1,1,2,2-tetraflu	85	3.379	3.379	(0.355)	932370	10.0000	11
5 Chloromethane	50	3.502	3.502	(0.367)	191257	10.0000	11
6 Butane	43	3.679	3.679	(0.386)	299180	10.0000	11
7 Vinyl chloride	62	3.716	3.716	(0.390)	280049	10.0000	11
8 1,3-Butadiene	54	3.780	3.780	(0.397)	183091	10.0000	11
9 Bromomethane	94	4.449	4.449	(0.467)	547350	10.0000	10
10 Chloroethane	64	4.668	4.668	(0.490)	194491	10.0000	11
11 2-Methylbutane	43	4.743	4.743	(0.498)	347808	10.0000	11
12 Vinyl bromide	106	5.059	5.059	(0.531)	606344	10.0000	10
13 Trichlorofluoromethane	101	5.155	5.155	(0.541)	1624901	10.0000	10
14 Pentane	43	5.284	5.284	(0.554)	577118	10.0000	11

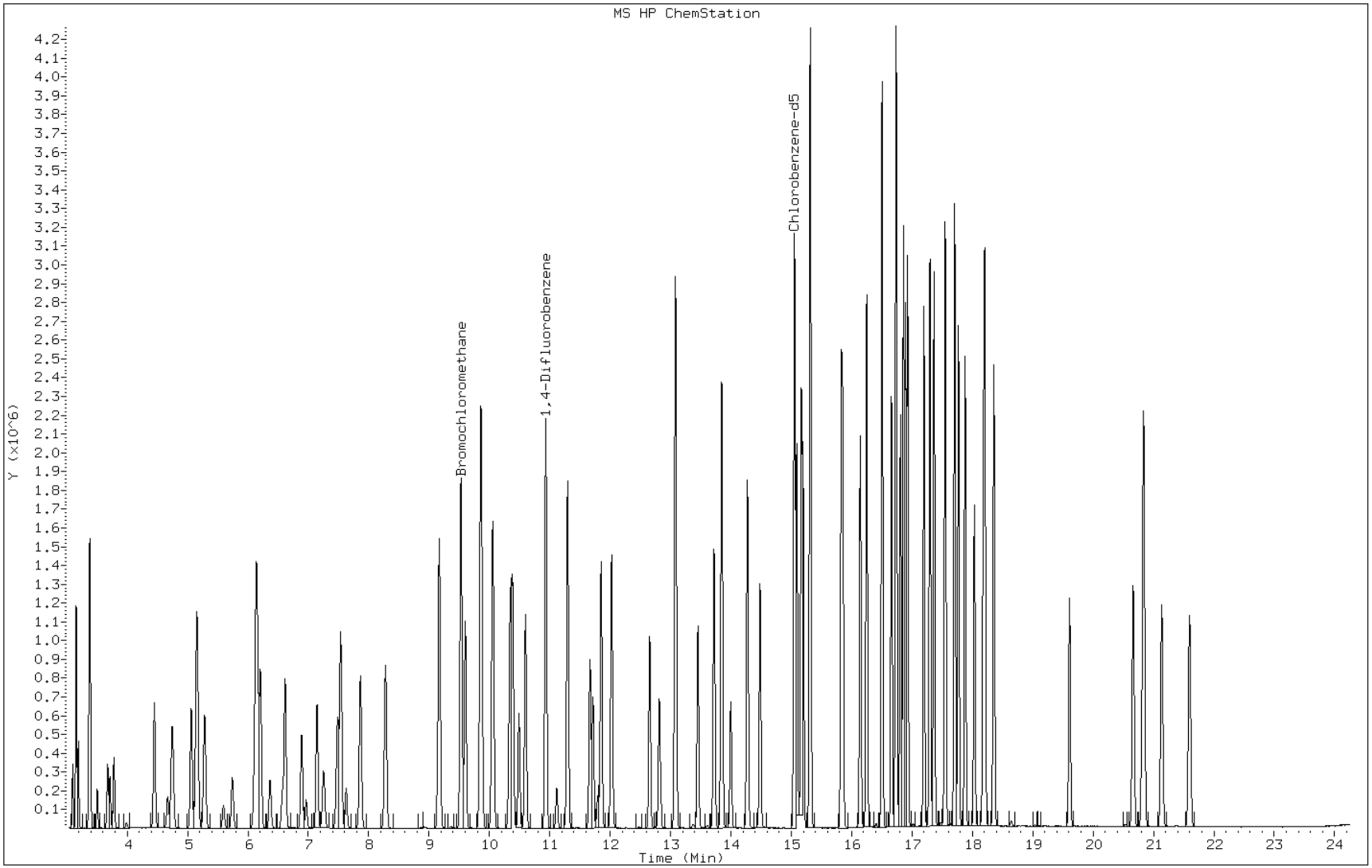
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	ON-COL (ppb v/v)
	15 Ethanol	45	5.594	5.594	(0.587)	183825	15.0000	15
	16 Ethyl ether	59	5.744	5.744	(0.603)	222724	10.0000	9.7
	17 1,1,2-Trichloro-1,2,2-trifluo	101	6.139	6.139	(0.644)	1147515	10.0000	10
	18 Acrolein	56	6.097	6.097	(0.640)	110337	10.0000	9.6
	19 1,1-Dichloroethene	96	6.209	6.209	(0.651)	509553	10.0000	10
	20 Acetone	43	6.370	6.370	(0.668)	421354	10.0000	9.6
	21 Carbon disulfide	76	6.616	6.616	(0.694)	1471085	10.0000	9.7
	22 Isopropanol	45	6.567	6.567	(0.689)	326287	10.0000	10
	23 Allyl chloride	41	6.894	6.894	(0.723)	395305	10.0000	10
	24 Acetonitrile	41	6.969	6.969	(0.731)	190955	10.0000	10
	25 Methylene chloride	49	7.145	7.145	(0.750)	426830	10.0000	10
	26 Tert-butyl alcohol	59	7.252	7.252	(0.761)	555141	10.0000	10
	27 Methyl tert-butyl ether	73	7.488	7.488	(0.786)	1022270	10.0000	9.4
	28 1,2-Dichloroethene (trans)	61	7.541	7.541	(0.791)	657462	10.0000	10
	29 Acrylonitrile	53	7.627	7.627	(0.800)	204435	10.0000	9.6
	30 n-Hexane	57	7.862	7.862	(0.825)	571591	10.0000	10
	31 1,1-Dichloroethane	63	8.274	8.274	(0.868)	789069	10.0000	10
	32 Vinyl acetate	43	8.290	8.290	(0.870)	647495	10.0000	9.7
M	33 1,2-Dichloroethene,Total	61				1231233	20.0000	21
	34 1,2-Dichloroethene (cis)	96	9.162	9.162	(0.961)	573771	10.0000	10
	35 Ethyl acetate	88	9.183	9.183	(0.964)	27644	10.0000	9.7
	36 Methyl Ethyl Ketone	72	9.162	9.162	(0.961)	162530	10.0000	9.8
*	37 Bromochloromethane	128	9.531	9.531	(1.000)	589645	10.0000	
	38 Tetrahydrofuran	42	9.542	9.542	(0.873)	276588	10.0000	10
	39 Chloroform	83	9.601	9.601	(1.007)	1144116	10.0000	10
	40 Cyclohexane	84	9.863	9.863	(0.902)	652081	10.0000	11
	41 1,1,1-Trichloroethane	97	9.858	9.858	(0.902)	1301980	10.0000	11
	42 Carbon tetrachloride	117	10.055	10.055	(0.920)	1467058	10.0000	11
	43 2,2,4-Trimethylpentane	57	10.344	10.344	(0.946)	1752405	10.0000	11
	44 Benzene	78	10.387	10.387	(0.950)	1354502	10.0000	10
	45 1,2-Dichloroethane	62	10.489	10.489	(0.959)	628922	10.0000	10
	46 n-Heptane	43	10.601	10.601	(0.970)	557110	10.0000	10
*	47 1,4-Difluorobenzene	114	10.933	10.933	(1.000)	2432014	10.0000	
	48 n-Butanol	56	11.115	11.115	(1.017)	150198	10.0000	11
	49 Trichloroethene	95	11.291	11.291	(1.033)	774527	10.0000	11
	50 1,2-Dichloropropane	63	11.671	11.671	(1.068)	422965	10.0000	10
	51 Methyl methacrylate	69	11.719	11.719	(1.072)	339993	10.0000	10
	52 Dibromomethane	174	11.853	11.853	(1.084)	581678	10.0000	11
	53 1,4-Dioxane	88	11.794	11.794	(1.079)	183447	10.0000	10
	54 Bromodichloromethane	83	12.024	12.024	(1.100)	1189771	10.0000	11
	55 1,3-Dichloropropene (cis)	75	12.655	12.655	(1.158)	738413	10.0000	10
	56 Methyl isobutyl ketone	43	12.816	12.816	(1.172)	554526	10.0000	11
	57 n-Octane	43	13.078	13.078	(1.196)	704537	10.0000	11
	58 Toluene	92	13.089	13.089	(0.870)	975298	10.0000	10
	59 1,3-Dichloropropene (trans)	75	13.453	13.453	(1.230)	760702	10.0000	10
	60 1,1,2-Trichloroethane	83	13.720	13.720	(0.912)	523066	10.0000	10
	61 Tetrachloroethene	166	13.848	13.848	(0.920)	868531	10.0000	10

			QUANT SIG					AMOUNTS	
		Compounds	MASS	RT	EXP RT	REL RT	RESPONSE	CAL-AMT (ppb v/v)	ON-COL (ppb v/v)
	62	2-Hexanone	43	13.998	13.998	(0.930)	528502	10.0000	11
	63	Dibromochloromethane	129	14.276	14.276	(0.948)	1312705	10.0000	11
	64	1,2-Dibromoethane	107	14.480	14.480	(0.962)	1081909	10.0000	10
*	65	Chlorobenzene-d5	117	15.052	15.052	(1.000)	2299244	10.0000	
	66	Chlorobenzene	112	15.090	15.090	(1.002)	1436688	10.0000	10
	67	n-Nonane	57	15.197	15.197	(1.010)	713557	10.0000	10
	68	Ethylbenzene	91	15.164	15.164	(1.007)	2027899	10.0000	9.9
	69	Xylene (m,p)	106	15.314	15.314	(1.017)	1657656	20.0000	20
M	70	Xylenes, Total	106				2486612	10.0000	30
	71	Xylene (o)	106	15.833	15.833	(1.052)	828956	10.0000	9.9
	72	Styrene	104	15.855	15.855	(1.053)	1194799	10.0000	11
	73	Bromoform	173	16.143	16.143	(1.073)	1079902	10.0000	11
	74	Isopropylbenzene	105	16.250	16.250	(1.080)	2319965	10.0000	9.8
	75	1,1,2,2-Tetrachloroethane	83	16.657	16.657	(1.107)	1282719	10.0000	10
	76	n-Propylbenzene	91	16.732	16.732	(1.112)	2682368	10.0000	10
	77	1,2,3-Trichloropropane	75	16.743	16.743	(1.112)	854347	10.0000	10
	78	n-Decane	57	16.807	16.807	(1.117)	838119	10.0000	11
	79	4-Ethyltoluene	105	16.860	16.860	(1.120)	2310942	10.0000	10
	80	2-Chlorotoluene	91	16.892	16.892	(1.122)	2180127	10.0000	10
	81	1,3,5-Trimethylbenzene	105	16.930	16.930	(1.125)	1939798	10.0000	10(H)
	82	Alpha Methyl Styrene	118	17.197	17.197	(1.143)	995379	10.0000	11
	83	tert-butylbenzene	119	17.299	17.299	(1.149)	1857519	10.0000	9.8
	84	1,2,4-Trimethylbenzene	105	17.369	17.369	(1.154)	1934156	10.0000	10
	85	sec-Butylbenzene	105	17.550	17.550	(1.166)	2803341	10.0000	10
	86	4-Isopropyltoluene	119	17.706	17.706	(1.176)	2330936	10.0000	10
	87	1,3-Dichlorobenzene	146	17.770	17.770	(1.181)	1344684	10.0000	10
	88	1,4-Dichlorobenzene	146	17.882	17.882	(1.188)	1284393	10.0000	11
	89	Benzyl chloride	91	18.037	18.037	(1.198)	1533696	10.0000	11
	90	Undecane	57	18.176	18.176	(1.208)	661052	10.0000	11
	91	n-Butylbenzene	91	18.203	18.203	(1.209)	2000393	10.0000	11
	92	1,2-Dichlorobenzene	146	18.358	18.358	(1.220)	1315705	10.0000	10
	93	Dodecane	57	19.610	19.610	(1.303)	563499	10.0000	13
	94	1,2,4-Trichlorobenzene	180	20.664	20.664	(1.373)	611035	10.0000	11
	95	1,3-Hexachlorobutadiene	225	20.835	20.835	(1.384)	574929	10.0000	11
	96	Naphthalene	128	21.140	21.140	(1.404)	1650593	10.0000	11
	97	1,2,3-Trichlorobenzene	180	21.600	21.600	(1.435)	603978	10.0000	12

QC Flag Legend

H - Operator selected an alternate compound hit.

Data File:	gff006.d	Date:	02-MAR-2011 18:30
Client ID:	icis 109438	Instrument:	G.i
Operator:	wrd	Inj Vol:	200.0
Column Type:	Capillary	Diameter:	0.32
Stationary Phase:	RTX-624		
Sample Info:	icis 109438		
Lab Sample ID:	icis 109438		



TestAmerica Burlington

AIR TOXICS QUANTITATION REPORT

Data file : /chem/G.i/Gsvr.p/gffto15.b/gff007.d
Lab Smp Id: ic 109427 Client Smp ID: ic 109427
Inj Date : 02-MAR-2011 19:21
Operator : wrd Inst ID: G.i
Smp Info : ic 109427
Misc Info : 200,1,level 5
Comment :
Method : /chem/G.i/Gsvr.p/gffto15.b/to15v5.m
Meth Date : 04-Mar-2011 10:44 klp Quant Type: ISTD
Cal Date : 02-MAR-2011 19:21 Cal File: gff007.d
Als bottle: 2 Calibration Sample, Level: 5
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 3.50
Processing Host: chemsvr6

Concentration Formula: Amt * DF * Uf*(Vo/Vo)*(Vf/Vf) * CpndVariable

Name	Value	Description
DF	1.00000	Dilution Factor
Uf	1.00000	ng unit correction factor
Vo	200.00000	Sample Volume purged (mL)
Vf	200.00000	Final Volume (mL)

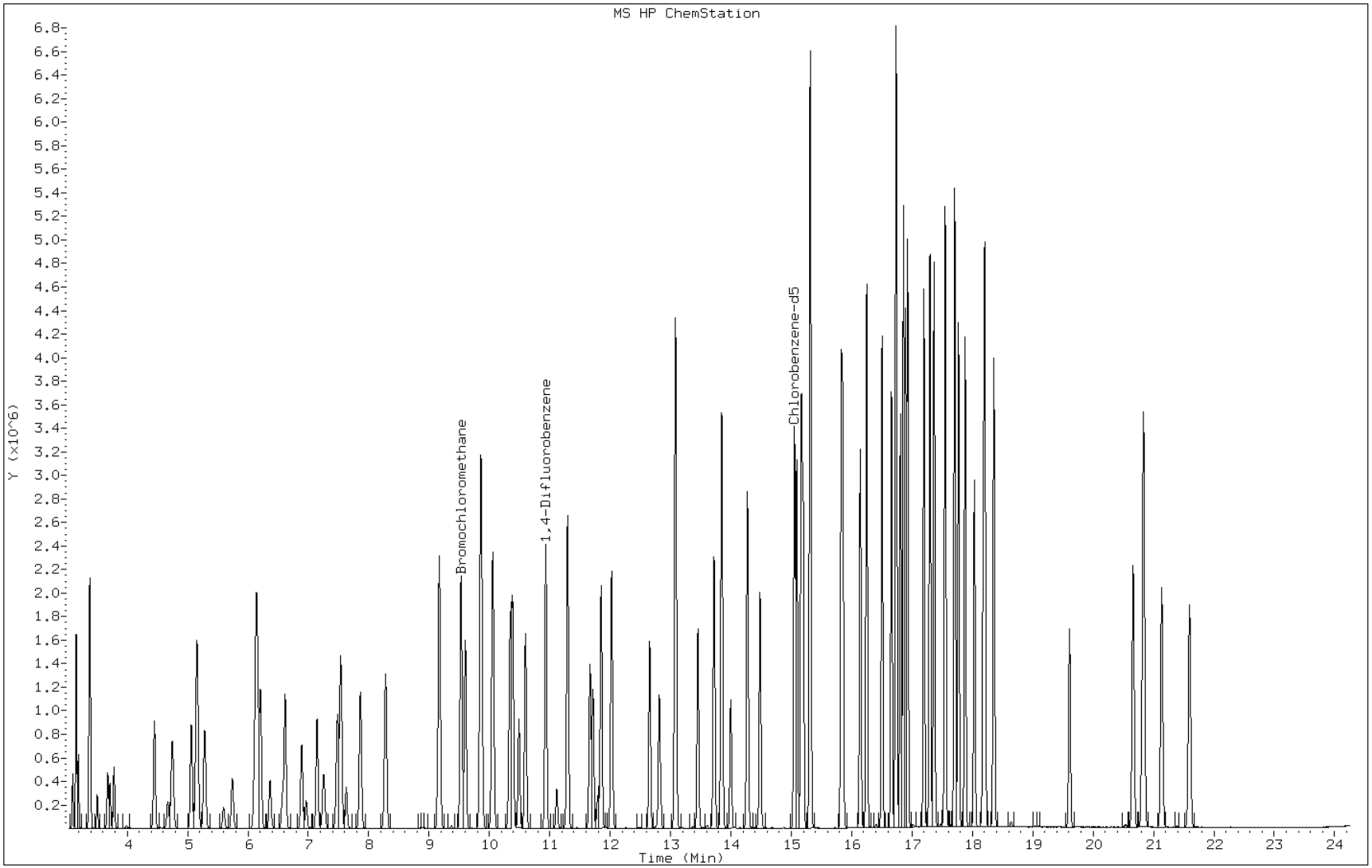
Cpnd Variable Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	AMOUNTS ON-COL (ppb v/v)
1 Propene	41	3.101	3.101	(0.325)	182113	15.0000	14
2 Dichlorodifluoromethane	85	3.154	3.154	(0.331)	1391634	15.0000	15
3 Chlorodifluoromethane	51	3.192	3.192	(0.335)	542598	15.0000	14
4 1,2-Dichloro-1,1,2,2-tetraflu	85	3.379	3.379	(0.355)	1285218	15.0000	14
5 Chloromethane	50	3.502	3.502	(0.367)	262642	15.0000	14
6 Butane	43	3.679	3.679	(0.386)	418874	15.0000	14
7 Vinyl chloride	62	3.716	3.716	(0.390)	385905	15.0000	14
8 1,3-Butadiene	54	3.786	3.780	(0.397)	251193	15.0000	14
9 Bromomethane	94	4.449	4.449	(0.467)	747856	15.0000	14
10 Chloroethane	64	4.674	4.668	(0.490)	262798	15.0000	14
11 2-Methylbutane	43	4.749	4.743	(0.498)	472678	15.0000	14
12 Vinyl bromide	106	5.059	5.059	(0.531)	844609	15.0000	14
13 Trichlorofluoromethane	101	5.155	5.155	(0.541)	2259467	15.0000	14
14 Pentane	43	5.284	5.284	(0.554)	799366	15.0000	14

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	ON-COL (ppb v/v)
	15 Ethanol	45	5.599	5.594	(0.587)	269612	20.0000	21
	16 Ethyl ether	59	5.744	5.744	(0.603)	357882	15.0000	15
	17 1,1,2-Trichloro-1,2,2-trifluo	101	6.139	6.139	(0.644)	1619296	15.0000	14
	18 Acrolein	56	6.097	6.097	(0.640)	181045	15.0000	15
	19 1,1-Dichloroethene	96	6.209	6.209	(0.651)	718967	15.0000	14
	20 Acetone	43	6.370	6.370	(0.668)	660747	15.0000	15
	21 Carbon disulfide	76	6.616	6.616	(0.694)	2063947	15.0000	13
	22 Isopropanol	45	6.573	6.567	(0.690)	500802	15.0000	15
	23 Allyl chloride	41	6.894	6.894	(0.723)	567610	15.0000	14
	24 Acetonitrile	41	6.969	6.969	(0.731)	294523	15.0000	15
	25 Methylene chloride	49	7.145	7.145	(0.750)	598782	15.0000	14
	26 Tert-butyl alcohol	59	7.252	7.252	(0.761)	847765	15.0000	15
	27 Methyl tert-butyl ether	73	7.488	7.488	(0.786)	1702898	15.0000	15
	28 1,2-Dichloroethene (trans)	61	7.541	7.541	(0.791)	922123	15.0000	14
	29 Acrylonitrile	53	7.627	7.627	(0.800)	328040	15.0000	15
	30 n-Hexane	57	7.862	7.862	(0.825)	817399	15.0000	14
	31 1,1-Dichloroethane	63	8.274	8.274	(0.868)	1132783	15.0000	14
	32 Vinyl acetate	43	8.290	8.290	(0.870)	1066848	15.0000	15
M	33 1,2-Dichloroethene,Total	61				1743017	30.0000	28
	34 1,2-Dichloroethene (cis)	96	9.162	9.162	(0.961)	820894	15.0000	14
	35 Ethyl acetate	88	9.178	9.183	(0.963)	46218	15.0000	16
	36 Methyl Ethyl Ketone	72	9.162	9.162	(0.961)	266531	15.0000	16
*	37 Bromochloromethane	128	9.531	9.531	(1.000)	611970	10.0000	
	38 Tetrahydrofuran	42	9.537	9.542	(0.872)	449396	15.0000	15
	39 Chloroform	83	9.601	9.601	(1.007)	1672730	15.0000	14
	40 Cyclohexane	84	9.863	9.863	(0.902)	926496	15.0000	14
	41 1,1,1-Trichloroethane	97	9.858	9.858	(0.902)	1867962	15.0000	14
	42 Carbon tetrachloride	117	10.055	10.055	(0.920)	2117315	15.0000	14
	43 2,2,4-Trimethylpentane	57	10.344	10.344	(0.946)	2558329	15.0000	14
	44 Benzene	78	10.387	10.387	(0.950)	2010223	15.0000	14
	45 1,2-Dichloroethane	62	10.489	10.489	(0.959)	940252	15.0000	14
	46 n-Heptane	43	10.596	10.601	(0.969)	817090	15.0000	14
*	47 1,4-Difluorobenzene	114	10.933	10.933	(1.000)	2703669	10.0000	
	48 n-Butanol	56	11.115	11.115	(1.017)	233302	15.0000	15
	49 Trichloroethene	95	11.291	11.291	(1.033)	1121910	15.0000	14
	50 1,2-Dichloropropane	63	11.671	11.671	(1.068)	654673	15.0000	14
	51 Methyl methacrylate	69	11.719	11.719	(1.072)	584503	15.0000	16
	52 Dibromomethane	174	11.848	11.853	(1.084)	863174	15.0000	14
	53 1,4-Dioxane	88	11.794	11.794	(1.079)	291703	15.0000	15
	54 Bromodichloromethane	83	12.024	12.024	(1.100)	1802497	15.0000	15
	55 1,3-Dichloropropene (cis)	75	12.655	12.655	(1.158)	1156372	15.0000	15
	56 Methyl isobutyl ketone	43	12.816	12.816	(1.172)	907241	15.0000	16
	57 n-Octane	43	13.078	13.078	(1.196)	1036634	15.0000	14
	58 Toluene	92	13.089	13.089	(0.870)	1492530	15.0000	14
	59 1,3-Dichloropropene (trans)	75	13.453	13.453	(1.230)	1197780	15.0000	15
	60 1,1,2-Trichloroethane	83	13.720	13.720	(0.912)	821487	15.0000	15
	61 Tetrachloroethene	166	13.848	13.848	(0.920)	1312712	15.0000	14

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	ON-COL (ppb v/v)
62	2-Hexanone	43	13.993	13.998	(0.930)	849564	15.0000	16
63	Dibromochloromethane	129	14.276	14.276	(0.948)	2058219	15.0000	16
64	1,2-Dibromoethane	107	14.480	14.480	(0.962)	1684927	15.0000	15
* 65	Chlorobenzene-d5	117	15.052	15.052	(1.000)	2471372	10.0000	
66	Chlorobenzene	112	15.090	15.090	(1.002)	2250376	15.0000	15
67	n-Nonane	57	15.197	15.197	(1.010)	1098697	15.0000	15
68	Ethylbenzene	91	15.164	15.164	(1.007)	3223805	15.0000	15
69	Xylene (m,p)	106	15.314	15.314	(1.017)	2632611	30.0000	30
M 70	Xylenes, Total	106				3969847	15.0000	45
71	Xylene (o)	106	15.833	15.833	(1.052)	1337236	15.0000	15
72	Styrene	104	15.855	15.855	(1.053)	1954483	15.0000	17
73	Bromoform	173	16.143	16.143	(1.073)	1712172	15.0000	16
74	Isopropylbenzene	105	16.250	16.250	(1.080)	3811527	15.0000	15
75	1,1,2,2-Tetrachloroethane	83	16.657	16.657	(1.107)	2077036	15.0000	15
76	n-Propylbenzene	91	16.732	16.732	(1.112)	4345404	15.0000	15
77	1,2,3-Trichloropropane	75	16.743	16.743	(1.112)	1362451	15.0000	15
78	n-Decane	57	16.807	16.807	(1.117)	1348735	15.0000	16
79	4-Ethyltoluene	105	16.860	16.860	(1.120)	3860769	15.0000	16
80	2-Chlorotoluene	91	16.892	16.892	(1.122)	3475915	15.0000	15
81	1,3,5-Trimethylbenzene	105	16.930	16.930	(1.125)	3241948	15.0000	16
82	Alpha Methyl Styrene	118	17.197	17.197	(1.143)	1696524	15.0000	18
83	tert-butylbenzene	119	17.299	17.299	(1.149)	3070609	15.0000	15
84	1,2,4-Trimethylbenzene	105	17.369	17.369	(1.154)	3206232	15.0000	16
85	sec-Butylbenzene	105	17.550	17.550	(1.166)	4609320	15.0000	15
86	4-Isopropyltoluene	119	17.706	17.706	(1.176)	3913653	15.0000	16
87	1,3-Dichlorobenzene	146	17.770	17.770	(1.181)	2206741	15.0000	16
88	1,4-Dichlorobenzene	146	17.882	17.882	(1.188)	2134617	15.0000	16
89	Benzyl chloride	91	18.037	18.037	(1.198)	2654791	15.0000	18
90	Undecane	57	18.176	18.176	(1.208)	933148	15.0000	14
91	n-Butylbenzene	91	18.203	18.203	(1.209)	3299177	15.0000	17
92	1,2-Dichlorobenzene	146	18.358	18.358	(1.220)	2167535	15.0000	16
93	Dodecane	57	19.610	19.610	(1.303)	785551	15.0000	17
94	1,2,4-Trichlorobenzene	180	20.664	20.664	(1.373)	1075152	15.0000	19
95	1,3-Hexachlorobutadiene	225	20.835	20.835	(1.384)	916861	15.0000	17
96	Naphthalene	128	21.135	21.140	(1.404)	2869431	15.0000	19
97	1,2,3-Trichlorobenzene	180	21.600	21.600	(1.435)	1010168	15.0000	19

Data File:	gff007.d	Date:	02-MAR-2011 19:21
Client ID:	ic 109427	Instrument:	G.i
Operator:	wrd	Inj Vol:	200.0
Column Type:	Capillary	Diameter:	0.32
Stationary Phase:	RTX-624		
Sample Info:	ic 109427		
Lab Sample ID:	ic 109427		



TestAmerica Burlington

AIR TOXICS QUANTITATION REPORT

Data file : /chem/G.i/Gsvr.p/gffto15.b/gff008.d
Lab Smp Id: ic 109425 Client Smp ID: ic 109425
Inj Date : 02-MAR-2011 20:12
Operator : wrd Inst ID: G.i
Smp Info : ic 109425
Misc Info : 200,1,level 6
Comment :
Method : /chem/G.i/Gsvr.p/gffto15.b/to15v5.m
Meth Date : 04-Mar-2011 10:44 klp Quant Type: ISTD
Cal Date : 02-MAR-2011 20:12 Cal File: gff008.d
Als bottle: 7 Calibration Sample, Level: 6
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 3.50
Processing Host: chemsvr6

Concentration Formula: Amt * DF * Uf*(Vo/Vo)*(Vf/Vf) * CpndVariable

Name	Value	Description
DF	1.00000	Dilution Factor
Uf	1.00000	ng unit correction factor
Vo	200.00000	Sample Volume purged (mL)
Vf	200.00000	Final Volume (mL)

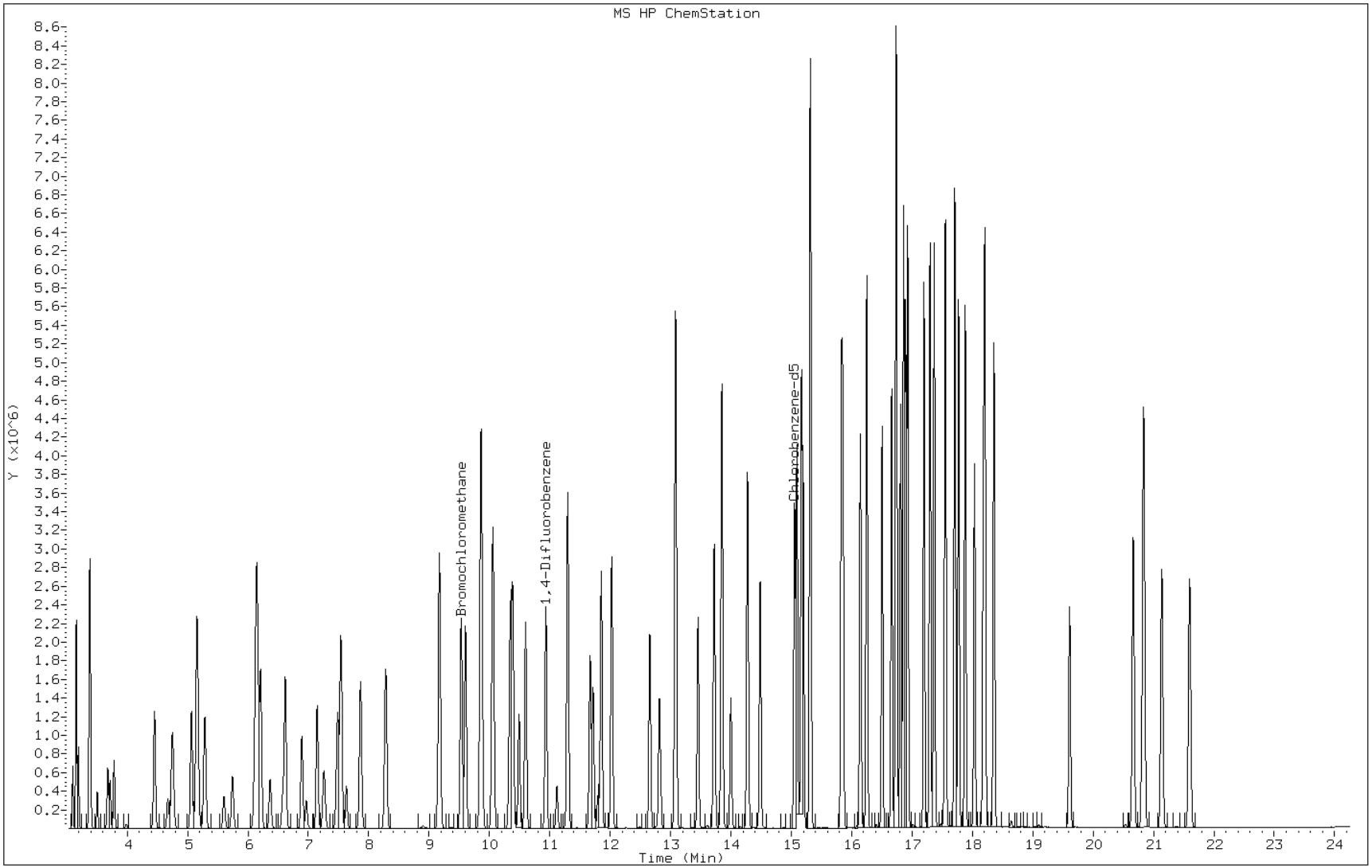
Cpnd Variable Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	AMOUNTS ON-COL (ppb v/v)
1 Propene	41	3.101	3.101	(0.325)	247537	20.0000	19
2 Dichlorodifluoromethane	85	3.160	3.154	(0.332)	1856782	20.0000	20
3 Chlorodifluoromethane	51	3.192	3.192	(0.335)	759256	20.0000	20
4 1,2-Dichloro-1,1,2,2-tetraflu	85	3.379	3.379	(0.355)	1744478	20.0000	19
5 Chloromethane	50	3.502	3.502	(0.367)	365342	20.0000	19
6 Butane	43	3.679	3.679	(0.386)	575784	20.0000	20
7 Vinyl chloride	62	3.716	3.716	(0.390)	527744	20.0000	19
8 1,3-Butadiene	54	3.786	3.780	(0.397)	352621	20.0000	20
9 Bromomethane	94	4.449	4.449	(0.467)	1045793	20.0000	19
10 Chloroethane	64	4.674	4.668	(0.490)	365822	20.0000	19
11 2-Methylbutane	43	4.749	4.743	(0.498)	663019	20.0000	19
12 Vinyl bromide	106	5.064	5.059	(0.531)	1218538	20.0000	20
13 Trichlorofluoromethane	101	5.155	5.155	(0.541)	3214337	20.0000	20
14 Pentane	43	5.289	5.284	(0.555)	1134746	20.0000	20

		QUANT SIG					AMOUNTS CAL-AMT	ON-COL
	Compounds	MASS	RT	EXP RT	REL RT	RESPONSE	(ppb v/v)	(ppb v/v)
	15 Ethanol	45	5.604	5.594	(0.588)	526800	40.0000	41
	16 Ethyl ether	59	5.744	5.744	(0.603)	464424	20.0000	19
	17 1,1,2-Trichloro-1,2,2-trifluo	101	6.145	6.139	(0.645)	2284827	20.0000	20
	18 Acrolein	56	6.102	6.097	(0.640)	234215	20.0000	20
	19 1,1-Dichloroethene	96	6.209	6.209	(0.651)	1036868	20.0000	20
	20 Acetone	43	6.370	6.370	(0.668)	869474	20.0000	19
	21 Carbon disulfide	76	6.616	6.616	(0.694)	2957289	20.0000	19
	22 Isopropanol	45	6.578	6.567	(0.690)	668353	20.0000	20
	23 Allyl chloride	41	6.894	6.894	(0.723)	782484	20.0000	20
	24 Acetonitrile	41	6.969	6.969	(0.731)	380338	20.0000	19
	25 Methylene chloride	49	7.145	7.145	(0.750)	842720	20.0000	19
	26 Tert-butyl alcohol	59	7.258	7.252	(0.761)	1148489	20.0000	20
	27 Methyl tert-butyl ether	73	7.488	7.488	(0.786)	2188425	20.0000	19
	28 1,2-Dichloroethene (trans)	61	7.541	7.541	(0.791)	1302515	20.0000	20
	29 Acrylonitrile	53	7.632	7.627	(0.801)	429473	20.0000	19
	30 n-Hexane	57	7.867	7.862	(0.825)	1127966	20.0000	20
	31 1,1-Dichloroethane	63	8.274	8.274	(0.868)	1548407	20.0000	19
	32 Vinyl acetate	43	8.290	8.290	(0.870)	1367956	20.0000	20
M	33 1,2-Dichloroethene,Total	61				2418430	40.0000	39
	34 1,2-Dichloroethene (cis)	96	9.167	9.162	(0.962)	1115915	20.0000	19
	35 Ethyl acetate	88	9.183	9.183	(0.964)	57877	20.0000	20
	36 Methyl Ethyl Ketone	72	9.167	9.162	(0.962)	335753	20.0000	20
*	37 Bromochloromethane	128	9.531	9.531	(1.000)	611991	10.0000	
	38 Tetrahydrofuran	42	9.542	9.542	(0.873)	562981	20.0000	19
	39 Chloroform	83	9.606	9.601	(1.008)	2260041	20.0000	19
	40 Cyclohexane	84	9.863	9.863	(0.902)	1281978	20.0000	20
	41 1,1,1-Trichloroethane	97	9.857	9.858	(0.902)	2541422	20.0000	19
	42 Carbon tetrachloride	117	10.061	10.055	(0.920)	2937015	20.0000	20
	43 2,2,4-Trimethylpentane	57	10.350	10.344	(0.947)	3395143	20.0000	19
	44 Benzene	78	10.387	10.387	(0.950)	2697571	20.0000	18
	45 1,2-Dichloroethane	62	10.494	10.489	(0.960)	1262935	20.0000	19
	46 n-Heptane	43	10.601	10.601	(0.970)	1079214	20.0000	18
*	47 1,4-Difluorobenzene	114	10.933	10.933	(1.000)	2701348	10.0000	
	48 n-Butanol	56	11.120	11.115	(1.017)	313202	20.0000	20
	49 Trichloroethene	95	11.297	11.291	(1.033)	1534563	20.0000	19
	50 1,2-Dichloropropane	63	11.671	11.671	(1.068)	868446	20.0000	19
	51 Methyl methacrylate	69	11.719	11.719	(1.072)	737181	20.0000	20
	52 Dibromomethane	174	11.853	11.853	(1.084)	1170349	20.0000	19
	53 1,4-Dioxane	88	11.799	11.794	(1.079)	376237	20.0000	19
	54 Bromodichloromethane	83	12.024	12.024	(1.100)	2432940	20.0000	20
	55 1,3-Dichloropropene (cis)	75	12.655	12.655	(1.158)	1554765	20.0000	20
	56 Methyl isobutyl ketone	43	12.816	12.816	(1.172)	1135325	20.0000	20
	57 n-Octane	43	13.078	13.078	(1.196)	1338094	20.0000	18
	58 Toluene	92	13.089	13.089	(0.870)	1958056	20.0000	18
	59 1,3-Dichloropropene (trans)	75	13.453	13.453	(1.230)	1610204	20.0000	20
	60 1,1,2-Trichloroethane	83	13.725	13.720	(0.912)	1090665	20.0000	19
	61 Tetrachloroethene	166	13.854	13.848	(0.920)	1776721	20.0000	19

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	ON-COL (ppb v/v)
62	2-Hexanone	43	13.998	13.998	(0.930)	1095490	20.0000	20
63	Dibromochloromethane	129	14.276	14.276	(0.948)	2784540	20.0000	21
64	1,2-Dibromoethane	107	14.485	14.480	(0.962)	2269407	20.0000	20
* 65	Chlorobenzene-d5	117	15.052	15.052	(1.000)	2545756	10.0000	
66	Chlorobenzene	112	15.095	15.090	(1.003)	3010551	20.0000	19
67	n-Nonane	57	15.197	15.197	(1.010)	1417965	20.0000	18
68	Ethylbenzene	91	15.164	15.164	(1.007)	4225933	20.0000	19
69	Xylene (m,p)	106	15.320	15.314	(1.018)	3400877	40.0000	37
M 70	Xylenes, Total	106				5139710	20.0000	56
71	Xylene (o)	106	15.833	15.833	(1.052)	1738833	20.0000	19
72	Styrene	104	15.860	15.855	(1.054)	2594528	20.0000	21
73	Bromoform	173	16.143	16.143	(1.073)	2274982	20.0000	21
74	Isopropylbenzene	105	16.250	16.250	(1.080)	4941808	20.0000	19
75	1,1,2,2-Tetrachloroethane	83	16.662	16.657	(1.107)	2655616	20.0000	19
76	n-Propylbenzene	91	16.732	16.732	(1.112)	5489375	20.0000	19
77	1,2,3-Trichloropropane	75	16.748	16.743	(1.113)	1710358	20.0000	18
78	n-Decane	57	16.812	16.807	(1.117)	1722947	20.0000	20
79	4-Ethyltoluene	105	16.860	16.860	(1.120)	4984818	20.0000	20
80	2-Chlorotoluene	91	16.892	16.892	(1.122)	4537014	20.0000	19
81	1,3,5-Trimethylbenzene	105	16.930	16.930	(1.125)	4153728	20.0000	19
82	Alpha Methyl Styrene	118	17.197	17.197	(1.143)	2181933	20.0000	22
83	tert-butylbenzene	119	17.299	17.299	(1.149)	3955322	20.0000	19
84	1,2,4-Trimethylbenzene	105	17.368	17.369	(1.154)	4120261	20.0000	20
85	sec-Butylbenzene	105	17.556	17.550	(1.166)	5896247	20.0000	19
86	4-Isopropyltoluene	119	17.706	17.706	(1.176)	5008257	20.0000	20
87	1,3-Dichlorobenzene	146	17.770	17.770	(1.181)	2957514	20.0000	21
88	1,4-Dichlorobenzene	146	17.882	17.882	(1.188)	2899241	20.0000	22
89	Benzyl chloride	91	18.037	18.037	(1.198)	3472178	20.0000	23
90	Undecane	57	18.176	18.176	(1.208)	1342267	20.0000	20
91	n-Butylbenzene	91	18.203	18.203	(1.209)	4207303	20.0000	21
92	1,2-Dichlorobenzene	146	18.358	18.358	(1.220)	2877055	20.0000	20
93	Dodecane	57	19.610	19.610	(1.303)	1106235	20.0000	24
94	1,2,4-Trichlorobenzene	180	20.664	20.664	(1.373)	1525002	20.0000	26
95	1,3-Hexachlorobutadiene	225	20.835	20.835	(1.384)	1191527	20.0000	21
96	Naphthalene	128	21.140	21.140	(1.404)	3953729	20.0000	25
97	1,2,3-Trichlorobenzene	180	21.600	21.600	(1.435)	1442772	20.0000	27

Data File:	gff008.d	Date:	02-MAR-2011 20:12
Client ID:	ic 109425	Instrument:	G.i
Operator:	wrd	Inj Vol:	200.0
Column Type:	Capillary	Diameter:	0.32
Stationary Phase:	RTX-624		
Sample Info:	ic 109425		
Lab Sample ID:	ic 109425		



TestAmerica Burlington

AIR TOXICS QUANTITATION REPORT

Data file : /chem/G.i/Gsvr.p/gffto15.b/gff009.d
Lab Smp Id: ic 109424 Client Smp ID: ic 109424
Inj Date : 02-MAR-2011 21:03
Operator : wrd Inst ID: G.i
Smp Info : ic 109424
Misc Info : 200,1,level 7
Comment :
Method : /chem/G.i/Gsvr.p/gffto15.b/to15v5.m
Meth Date : 04-Mar-2011 10:44 klp Quant Type: ISTD
Cal Date : 02-MAR-2011 21:03 Cal File: gff009.d
Als bottle: 8 Calibration Sample, Level: 7
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 3.50
Processing Host: chemsvr6

Concentration Formula: Amt * DF * Uf*(Vo/Vo)*(Vf/Vf) * CpndVariable

Name	Value	Description
DF	1.00000	Dilution Factor
Uf	1.00000	ng unit correction factor
Vo	200.00000	Sample Volume purged (mL)
Vf	200.00000	Final Volume (mL)

Cpnd Variable Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	AMOUNTS ON-COL (ppb v/v)
1 Propene	41	3.101	3.101	(0.325)	486971	40.0000	38
2 Dichlorodifluoromethane	85	3.154	3.154	(0.331)	3540738	40.0000	37
3 Chlorodifluoromethane	51	3.192	3.192	(0.335)	1468173	40.0000	38
4 1,2-Dichloro-1,1,2,2-tetraflu	85	3.379	3.379	(0.355)	3277690	40.0000	36
5 Chloromethane	50	3.502	3.502	(0.367)	721158	40.0000	38
6 Butane	43	3.679	3.679	(0.386)	1125998	40.0000	39
7 Vinyl chloride	62	3.716	3.716	(0.390)	1026867	40.0000	37
8 1,3-Butadiene	54	3.786	3.780	(0.397)	683286	40.0000	38
9 Bromomethane	94	4.449	4.449	(0.467)	2044268	40.0000	37
10 Chloroethane	64	4.674	4.668	(0.490)	709415	40.0000	38
11 2-Methylbutane	43	4.749	4.743	(0.498)	1274649	40.0000	37
12 Vinyl bromide	106	5.064	5.059	(0.531)	2410156	40.0000	39
13 Trichlorofluoromethane	101	5.155	5.155	(0.541)	6347853	40.0000	39
14 Pentane	43	5.289	5.284	(0.555)	2209232	40.0000	39

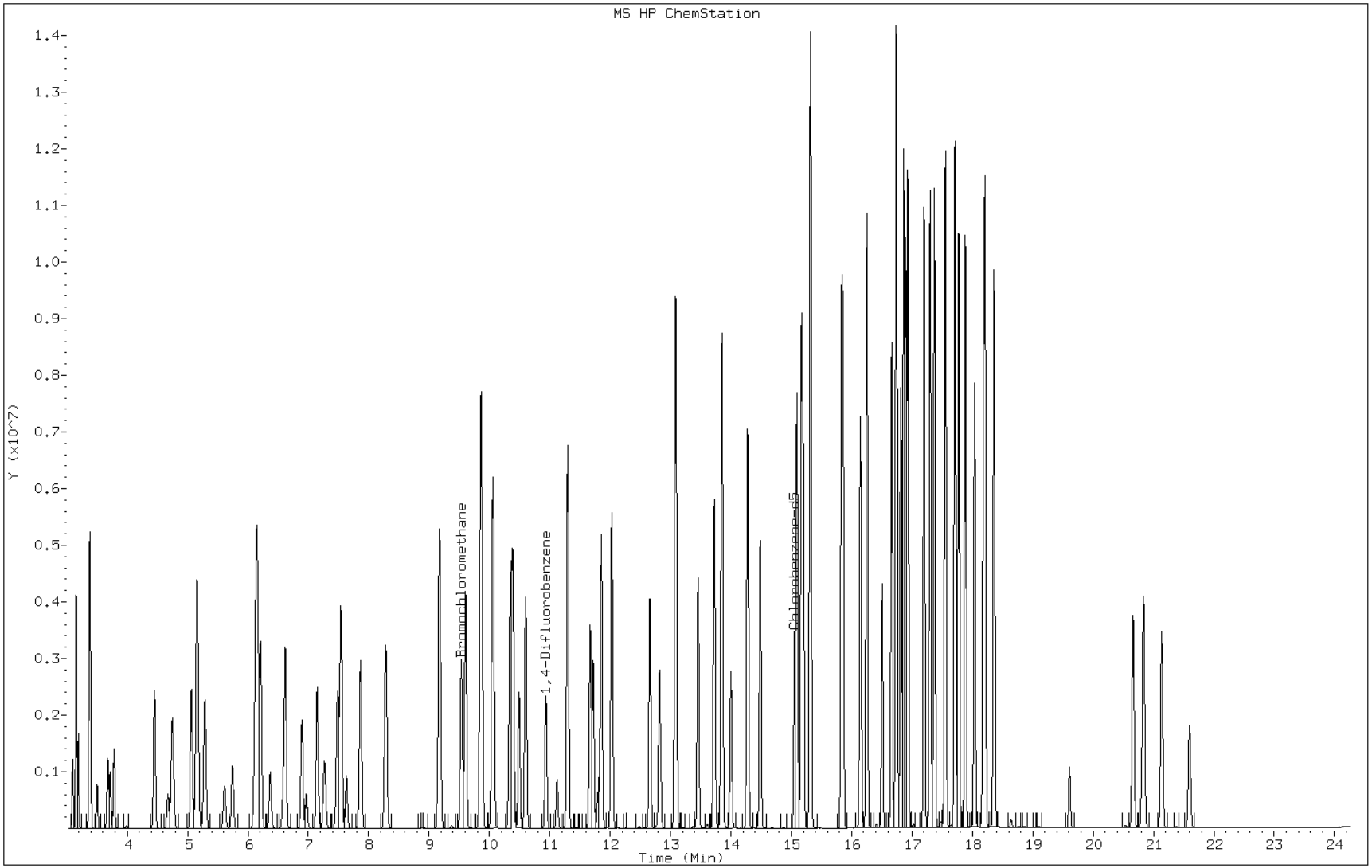
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	ON-COL (ppb v/v)
	15 Ethanol	45	5.610	5.594	(0.589)	1295375	100.000	100(A)
	16 Ethyl ether	59	5.744	5.744	(0.603)	934508	40.0000	39
	17 1,1,2-Trichloro-1,2,2-trifluo	101	6.145	6.139	(0.645)	4374646	40.0000	38
	18 Acrolein	56	6.102	6.097	(0.640)	461214	40.0000	39
	19 1,1-Dichloroethene	96	6.209	6.209	(0.651)	2053738	40.0000	40
	20 Acetone	43	6.370	6.370	(0.668)	1660647	40.0000	37
	21 Carbon disulfide	76	6.621	6.616	(0.695)	5753768	40.0000	36
	22 Isopropanol	45	6.583	6.567	(0.691)	1262751	40.0000	38
	23 Allyl chloride	41	6.894	6.894	(0.723)	1539005	40.0000	38
	24 Acetonitrile	41	6.969	6.969	(0.731)	772910	40.0000	39
	25 Methylene chloride	49	7.145	7.145	(0.750)	1615249	40.0000	37
	26 Tert-butyl alcohol	59	7.268	7.252	(0.763)	2240114	40.0000	39
	27 Methyl tert-butyl ether	73	7.488	7.488	(0.786)	4379781	40.0000	39
	28 1,2-Dichloroethene (trans)	61	7.541	7.541	(0.791)	2482967	40.0000	38
	29 Acrylonitrile	53	7.632	7.627	(0.801)	881328	40.0000	40
	30 n-Hexane	57	7.867	7.862	(0.825)	2142320	40.0000	38
	31 1,1-Dichloroethane	63	8.274	8.274	(0.868)	2979991	40.0000	37
	32 Vinyl acetate	43	8.295	8.290	(0.870)	2683415	40.0000	38
M	33 1,2-Dichloroethene,Total	61				4593628	80.0000	74
	34 1,2-Dichloroethene (cis)	96	9.167	9.162	(0.962)	2110661	40.0000	37
	35 Ethyl acetate	88	9.189	9.183	(0.964)	113497	40.0000	38
	36 Methyl Ethyl Ketone	72	9.167	9.162	(0.962)	624530	40.0000	36
*	37 Bromochloromethane	128	9.531	9.531	(1.000)	613498	10.0000	
	38 Tetrahydrofuran	42	9.542	9.542	(0.872)	1110382	40.0000	37
	39 Chloroform	83	9.606	9.601	(1.008)	4469713	40.0000	38
	40 Cyclohexane	84	9.868	9.863	(0.902)	2341909	40.0000	36
	41 1,1,1-Trichloroethane	97	9.858	9.858	(0.901)	4870032	40.0000	37
	42 Carbon tetrachloride	117	10.061	10.055	(0.920)	5755743	40.0000	39
	43 2,2,4-Trimethylpentane	57	10.350	10.344	(0.946)	6407430	40.0000	35
	44 Benzene	78	10.387	10.387	(0.950)	5210691	40.0000	36
	45 1,2-Dichloroethane	62	10.494	10.489	(0.959)	2536655	40.0000	38
	46 n-Heptane	43	10.601	10.601	(0.969)	2037732	40.0000	34
*	47 1,4-Difluorobenzene	114	10.938	10.933	(1.000)	2707033	10.0000	
	48 n-Butanol	56	11.120	11.115	(1.017)	618969	40.0000	40
	49 Trichloroethene	95	11.291	11.291	(1.032)	2932803	40.0000	37
	50 1,2-Dichloropropane	63	11.671	11.671	(1.067)	1676662	40.0000	36
	51 Methyl methacrylate	69	11.719	11.719	(1.071)	1479287	40.0000	41(A)
	52 Dibromomethane	174	11.853	11.853	(1.084)	2292301	40.0000	37
	53 1,4-Dioxane	88	11.799	11.794	(1.079)	715615	40.0000	37
	54 Bromodichloromethane	83	12.024	12.024	(1.099)	4776270	40.0000	39
	55 1,3-Dichloropropene (cis)	75	12.655	12.655	(1.157)	3082542	40.0000	39
	56 Methyl isobutyl ketone	43	12.821	12.816	(1.172)	2262321	40.0000	39
	57 n-Octane	43	13.078	13.078	(1.196)	2341773	40.0000	31
	58 Toluene	92	13.089	13.089	(0.870)	3557408	40.0000	33
	59 1,3-Dichloropropene (trans)	75	13.453	13.453	(1.230)	3229155	40.0000	40
	60 1,1,2-Trichloroethane	83	13.725	13.720	(0.912)	2101874	40.0000	36
	61 Tetrachloroethene	166	13.854	13.848	(0.920)	3407889	40.0000	36

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	ON-COL (ppb v/v)
62	2-Hexanone	43	13.998	13.998	(0.930)	2191682	40.0000	40
63	Dibromochloromethane	129	14.276	14.276	(0.948)	5442205	40.0000	40(A)
64	1,2-Dibromoethane	107	14.485	14.480	(0.962)	4441213	40.0000	38
* 65	Chlorobenzene-d5	117	15.052	15.052	(1.000)	2556105	10.0000	
66	Chlorobenzene	112	15.095	15.090	(1.003)	5910104	40.0000	37
67	n-Nonane	57	15.197	15.197	(1.010)	2544871	40.0000	33
68	Ethylbenzene	91	15.170	15.164	(1.008)	8009862	40.0000	35
69	Xylene (m,p)	106	15.320	15.314	(1.018)	6191334	80.0000	68
M 70	Xylenes, Total	106				9496314	40.0000	100
71	Xylene (o)	106	15.833	15.833	(1.052)	3304980	40.0000	36
72	Styrene	104	15.860	15.855	(1.054)	5081566	40.0000	42(A)
73	Bromoform	173	16.143	16.143	(1.073)	4211401	40.0000	39
74	Isopropylbenzene	105	16.250	16.250	(1.080)	9505903	40.0000	36
75	1,1,2,2-Tetrachloroethane	83	16.662	16.657	(1.107)	4962039	40.0000	35
76	n-Propylbenzene	91	16.732	16.732	(1.112)	9748559	40.0000	34
77	1,2,3-Trichloropropane	75	16.748	16.743	(1.113)	3041850	40.0000	33
78	n-Decane	57	16.812	16.807	(1.117)	3117701	40.0000	36
79	4-Ethyltoluene	105	16.860	16.860	(1.120)	9373685	40.0000	37
80	2-Chlorotoluene	91	16.898	16.892	(1.123)	8546838	40.0000	35
81	1,3,5-Trimethylbenzene	105	16.930	16.930	(1.125)	7941399	40.0000	37
82	Alpha Methyl Styrene	118	17.197	17.197	(1.143)	4407068	40.0000	45(A)
83	tert-butylbenzene	119	17.299	17.299	(1.149)	7604102	40.0000	36
84	1,2,4-Trimethylbenzene	105	17.369	17.369	(1.154)	7973201	40.0000	38
85	sec-Butylbenzene	105	17.556	17.550	(1.166)	11142695	40.0000	36
86	4-Isopropyltoluene	119	17.711	17.706	(1.177)	9531290	40.0000	38
87	1,3-Dichlorobenzene	146	17.775	17.770	(1.181)	5823224	40.0000	41(A)
88	1,4-Dichlorobenzene	146	17.882	17.882	(1.188)	5746382	40.0000	43(A)
89	Benzyl chloride	91	18.037	18.037	(1.198)	7156035	40.0000	46(A)
90	Undecane	57	18.182	18.176	(1.208)	2778746	40.0000	41(A)
91	n-Butylbenzene	91	18.208	18.203	(1.210)	7707954	40.0000	38
92	1,2-Dichlorobenzene	146	18.358	18.358	(1.220)	5651743	40.0000	40
93	Dodecane	57	19.610	19.610	(1.303)	487083	40.0000	10
94	1,2,4-Trichlorobenzene	180	20.664	20.664	(1.373)	1862424	40.0000	31
95	1,3-Hexachlorobutadiene	225	20.830	20.835	(1.384)	1092658	40.0000	19
96	Naphthalene	128	21.140	21.140	(1.404)	4933703	40.0000	31
97	1,2,3-Trichlorobenzene	180	21.595	21.600	(1.435)	977721	40.0000	18

QC Flag Legend

A - Target compound detected but, quantitated amount exceeded maximum amount.

Data File:	gff009.d	Date:	02-MAR-2011 21:03
Client ID:	ic 109424	Instrument:	G.i
Operator:	wrd	Inj Vol:	200.0
Column Type:	Capillary	Diameter:	0.32
Stationary Phase:	RTX-624		
Sample Info:	ic 109424		
Lab Sample ID:	ic 109424		



TestAmerica Burlington

AIR TOXICS QUANTITATION REPORT

Data file : /chem/G.i/Gsvr.p/gffto15.b/gff015.d
Lab Smp Id: ic 109451 Client Smp ID: ic 109451
Inj Date : 03-MAR-2011 10:00
Operator : wrd Inst ID: G.i
Smp Info : ic 109451
Misc Info : 200,1,level 2
Comment :
Method : /chem/G.i/Gsvr.p/gffto15.b/to15v5.m
Meth Date : 04-Mar-2011 10:44 klp Quant Type: ISTD
Cal Date : 03-MAR-2011 10:00 Cal File: gff015.d
Als bottle: 5 Calibration Sample, Level: 2
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 3.50
Processing Host: chemsvr6

Concentration Formula: Amt * DF * Uf*(Vo/Vo)*(Vf/Vf) * CpndVariable

Name	Value	Description
DF	1.00000	Dilution Factor
Uf	1.00000	ng unit correction factor
Vo	200.00000	Sample Volume purged (mL)
Vf	200.00000	Final Volume (mL)

Cpnd Variable Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	AMOUNTS ON-COL (ppb v/v)
2 Dichlorodifluoromethane	85	3.160	3.154	(0.332)	46545	0.50000	0.49(a)
3 Chlorodifluoromethane	51	3.197	3.192	(0.336)	20174	0.50000	0.52
4 1,2-Dichloro-1,1,2,2-tetraflu	85	3.379	3.379	(0.355)	46261	0.50000	0.51
5 Chloromethane	50	3.508	3.502	(0.368)	10102	0.50000	0.54
6 Butane	43	3.679	3.679	(0.386)	14900	0.50000	0.51
7 Vinyl chloride	62	3.716	3.716	(0.390)	13644	0.50000	0.50
8 1,3-Butadiene	54	3.786	3.780	(0.397)	8699	0.50000	0.49
9 Bromomethane	94	4.449	4.449	(0.467)	28282	0.50000	0.52
10 Chloroethane	64	4.679	4.668	(0.491)	9864	0.50000	0.52
11 2-Methylbutane	43	4.749	4.743	(0.498)	17842	0.50000	0.52(Q)
12 Vinyl bromide	106	5.059	5.059	(0.531)	31275	0.50000	0.51
13 Trichlorofluoromethane	101	5.155	5.155	(0.541)	82447	0.50000	0.51
14 Pentane	43	5.278	5.284	(0.554)	29068	0.50000	0.51
15 Ethanol	45	5.589	5.594	(0.587)	67477	5.00000	5.3

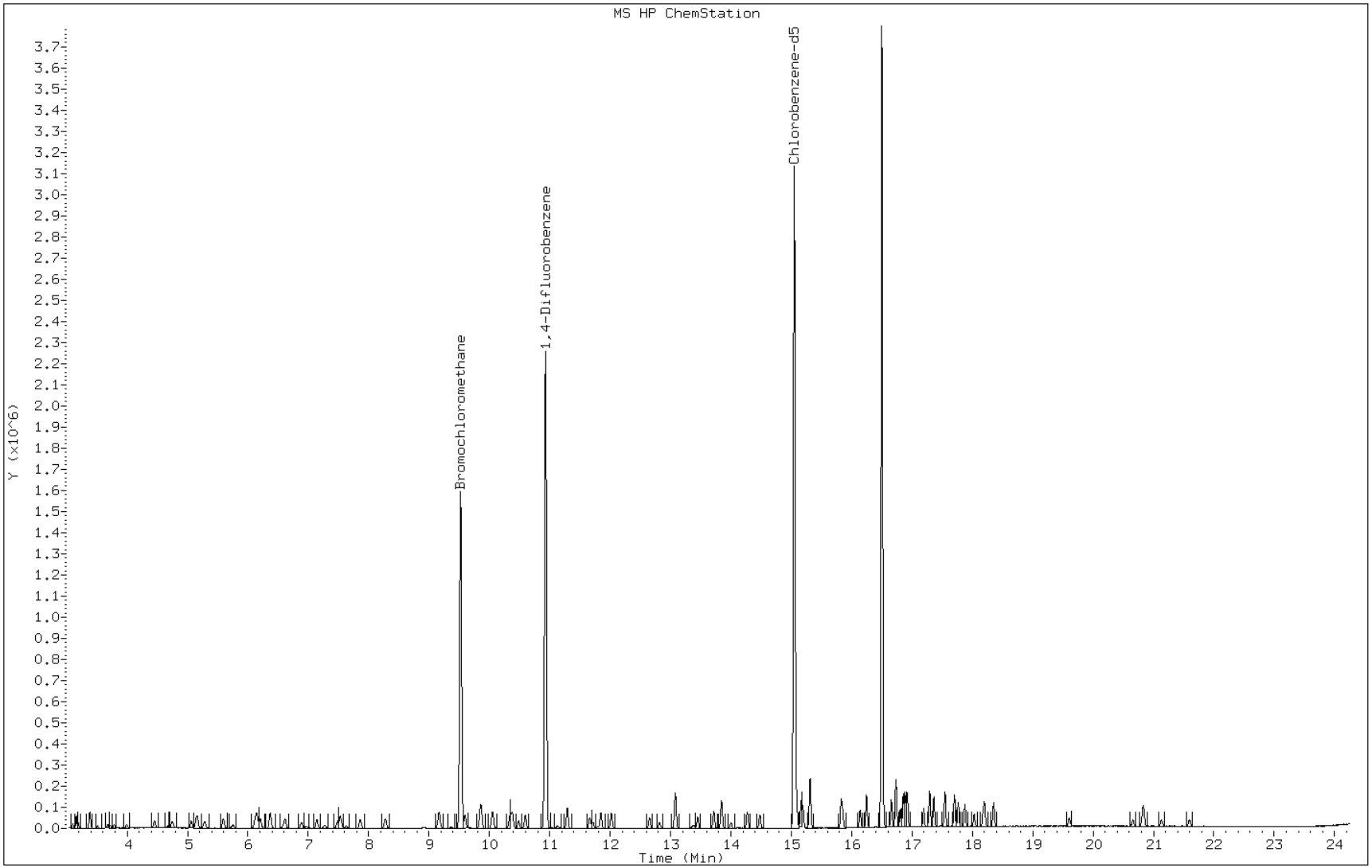
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	AMOUNTS ON-COL (ppb v/v)
	16 Ethyl ether	59	5.754	5.744	(0.604)	12351	0.50000	0.52
	17 1,1,2-Trichloro-1,2,2-trifluo	101	6.140	6.139	(0.644)	59317	0.50000	0.52
	19 1,1-Dichloroethene	96	6.209	6.209	(0.652)	26223	0.50000	0.51
	20 Acetone	43	6.370	6.370	(0.669)	115308	0.50000	2.5(a)
	21 Carbon disulfide	76	6.616	6.616	(0.694)	76812	0.50000	0.49(a)
	22 Isopropanol	45	Compound Not Detected.					
	23 Allyl chloride	41	6.894	6.894	(0.724)	20504	0.50000	0.51
	25 Methylene chloride	49	7.140	7.145	(0.750)	24240	0.50000	0.56
	27 Methyl tert-butyl ether	73	7.493	7.488	(0.787)	55724	0.50000	0.50
	28 1,2-Dichloroethene (trans)	61	7.536	7.541	(0.791)	33915	0.50000	0.52
	29 Acrylonitrile	53	7.627	7.627	(0.801)	11191	0.50000	0.51
	30 n-Hexane	57	7.862	7.862	(0.825)	28157	0.50000	0.50
	31 1,1-Dichloroethane	63	8.269	8.274	(0.868)	41020	0.50000	0.51
M	33 1,2-Dichloroethene,Total	61				63956	1.00000	1.0
	34 1,2-Dichloroethene (cis)	96	9.162	9.162	(0.962)	30041	0.50000	0.52
	36 Methyl Ethyl Ketone	72	9.168	9.162	(0.962)	8813	0.50000	0.51
*	37 Bromochloromethane	128	9.526	9.531	(1.000)	610749	10.0000	
	39 Chloroform	83	9.596	9.601	(1.007)	60284	0.50000	0.51
	40 Cyclohexane	84	9.858	9.863	(0.902)	32008	0.50000	0.52
	41 1,1,1-Trichloroethane	97	9.852	9.858	(0.902)	65258	0.50000	0.52
	42 Carbon tetrachloride	117	10.056	10.055	(0.920)	70985	0.50000	0.51
	43 2,2,4-Trimethylpentane	57	10.344	10.344	(0.947)	92742	0.50000	0.54
	44 Benzene	78	10.382	10.387	(0.950)	75845	0.50000	0.55
	45 1,2-Dichloroethane	62	10.484	10.489	(0.959)	34625	0.50000	0.55
	46 n-Heptane	43	10.596	10.601	(0.970)	31208	0.50000	0.56
*	47 1,4-Difluorobenzene	114	10.928	10.933	(1.000)	2541166	10.0000	
	49 Trichloroethene	95	11.286	11.291	(1.033)	40575	0.50000	0.54
	50 1,2-Dichloropropane	63	11.666	11.671	(1.068)	23729	0.50000	0.54
	51 Methyl methacrylate	69	11.719	11.719	(1.072)	13813	0.50000	0.40(a)
	52 Dibromomethane	174	11.848	11.853	(1.084)	30043	0.50000	0.52
	53 1,4-Dioxane	88	Compound Not Detected.					
	54 Bromodichloromethane	83	12.019	12.024	(1.100)	57506	0.50000	0.50
	55 1,3-Dichloropropene (cis)	75	12.650	12.655	(1.158)	37265	0.50000	0.50
	56 Methyl isobutyl ketone	43	12.821	12.816	(1.173)	23369	0.50000	0.43(a)
	57 n-Octane	43	13.078	13.078	(1.197)	39020	0.50000	0.56
	58 Toluene	92	13.084	13.089	(0.870)	55359	0.50000	0.56
	59 1,3-Dichloropropene (trans)	75	13.447	13.453	(1.231)	37481	0.50000	0.49
	60 1,1,2-Trichloroethane	83	13.720	13.720	(0.912)	28203	0.50000	0.53
	61 Tetrachloroethene	166	13.849	13.848	(0.920)	46934	0.50000	0.54
	62 2-Hexanone	43	13.998	13.998	(0.930)	20976	0.50000	0.42(a)
	63 Dibromochloromethane	129	14.271	14.276	(0.948)	55530	0.50000	0.45
	64 1,2-Dibromoethane	107	14.480	14.480	(0.962)	53096	0.50000	0.50
*	65 Chlorobenzene-d5	117	15.047	15.052	(1.000)	2333023	10.0000	
	66 Chlorobenzene	112	15.090	15.090	(1.003)	77270	0.50000	0.53
	67 n-Nonane	57	15.191	15.197	(1.010)	36777	0.50000	0.52
	68 Ethylbenzene	91	15.165	15.164	(1.008)	109571	0.50000	0.53
	69 Xylene (m,p)	106	15.314	15.314	(1.018)	89995	1.00000	1.1

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	ON-COL (ppb v/v)
M	70 Xylenes, Total	106				134916	0.50000	1.6
	71 Xylene (o)	106	15.828	15.833	(1.052)	44921	0.50000	0.53
	72 Styrene	104	15.855	15.855	(1.054)	47532	0.50000	0.43
	73 Bromoform	173	16.144	16.143	(1.073)	41906	0.50000	0.43
	74 Isopropylbenzene	105	16.245	16.250	(1.080)	125968	0.50000	0.53
	75 1,1,2,2-Tetrachloroethane	83	16.657	16.657	(1.107)	67695	0.50000	0.52
	76 n-Propylbenzene	91	16.727	16.732	(1.112)	135683	0.50000	0.51
	77 1,2,3-Trichloropropane	75	16.737	16.743	(1.112)	48247	0.50000	0.57
	78 n-Decane	57	16.807	16.807	(1.117)	30907	0.50000	0.39(a)
	79 4-Ethyltoluene	105	16.855	16.860	(1.120)	109695	0.50000	0.48
	80 2-Chlorotoluene	91	16.887	16.892	(1.122)	115175	0.50000	0.52
	81 1,3,5-Trimethylbenzene	105	16.925	16.930	(1.125)	97106	0.50000	0.49
	82 Alpha Methyl Styrene	118	17.192	17.197	(1.143)	32136	0.50000	0.36
	83 tert-butylbenzene	119	17.294	17.299	(1.149)	100246	0.50000	0.52
	84 1,2,4-Trimethylbenzene	105	17.363	17.369	(1.154)	90694	0.50000	0.47
	85 sec-Butylbenzene	105	17.551	17.550	(1.166)	140803	0.50000	0.50
	86 4-Isopropyltoluene	119	17.700	17.706	(1.176)	105805	0.50000	0.46
	87 1,3-Dichlorobenzene	146	17.765	17.770	(1.181)	58017	0.50000	0.45
	88 1,4-Dichlorobenzene	146	17.877	17.882	(1.188)	51126	0.50000	0.42
	89 Benzyl chloride	91	18.032	18.037	(1.198)	49655	0.50000	0.35
	91 n-Butylbenzene	91	18.203	18.203	(1.210)	73213	0.50000	0.40
	92 1,2-Dichlorobenzene	146	18.353	18.358	(1.220)	59341	0.50000	0.46
	94 1,2,4-Trichlorobenzene	180	20.664	20.664	(1.373)	14159	0.50000	0.26(a)
	95 1,3-Hexachlorobutadiene	225	20.830	20.835	(1.384)	26415	0.50000	0.50
	96 Naphthalene	128	21.130	21.140	(1.404)	39372	0.50000	0.27(a)
	97 1,2,3-Trichlorobenzene	180	21.595	21.600	(1.435)	17217	0.50000	0.35

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
Q - Qualifier signal failed the ratio test.

Data File:	gff015.d	Date:	03-MAR-2011 10:00
Client ID:	ic 109451	Instrument:	G.i
Operator:	wrd	Inj Vol:	200.0
Column Type:	Capillary	Diameter:	0.32
Stationary Phase:	RTX-624		
Sample Info:	ic 109451		
Lab Sample ID:	ic 109451		



FORM VII
AIR - GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Lab Sample ID: ICV 200-15668/12 Calibration Date: 03/23/2011 01:03

Instrument ID: C.i Calib Start Date: 03/22/2011 17:52

GC Column: RTX-624 ID: 0.32(mm) Calib End Date: 03/22/2011 22:39

Lab File ID: cjr012.d Conc. Units: ppb v/v Heated Purge: (Y/N) N

EPA Sample No.: icv 120404

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Propylene	Ave	0.5117	0.4996		9.76	10.0	-2.3	30.0
Dichlorodifluoromethane	Ave	2.694	2.717		10.1	10.0	0.8	30.0
Freon 22	Ave	1.279	1.287		10.1	10.0	0.7	30.0
1,2-Dichlorotetrafluoroethane	Ave	2.837	2.925		10.3	10.0	3.1	30.0
Chloromethane	Ave	0.7119	0.6782		9.52	10.0	-4.7	30.0
n-Butane	Ave	1.032	1.013		9.81	10.0	-1.8	30.0
Vinyl chloride	Ave	0.8888	0.8606		9.68	10.0	-3.2	30.0
1,3-Butadiene	Ave	0.5986	0.6122		10.2	10.0	2.3	30.0
Bromomethane	Ave	1.014	0.9544		9.41	10.0	-5.9	30.0
Chloroethane	Ave	0.5411	0.5130		9.48	10.0	-5.2	30.0
Isopentane	Ave	0.8962	0.8508		9.49	10.0	-5.1	30.0
Bromoethene(Vinyl Bromide)	Ave	1.078	1.067		9.90	10.0	-1.0	30.0
Trichlorofluoromethane	Ave	2.687	2.625		9.77	10.0	-2.3	30.0
n-Pentane	Ave	1.405	1.287		9.16	10.0	-8.4	30.0
Ethanol	Ave	0.2920	0.2477		12.8	15.0	-15.2	30.0
Ethyl ether	Ave	0.7021	0.6168		8.78	10.0	-12.2	30.0
Acrolein	Ave	0.3241	0.2532		7.81	10.0	-21.9	30.0
Freon TF	Ave	2.078	2.217		10.7	10.0	6.7	30.0
1,1-Dichloroethene	Ave	1.020	1.113		10.9	10.0	9.2	30.0
Acetone	Ave	1.116	1.059		9.49	10.0	-5.1	30.0
Isopropyl alcohol	Ave	0.8121	0.7088		8.73	10.0	-12.7	30.0
Carbon disulfide	Ave	3.139	3.095		9.86	10.0	-1.4	30.0
3-Chloropropene	Ave	0.9521	0.9026		9.48	10.0	-5.2	30.0
Acetonitrile	Ave	0.6012	0.5689		9.46	10.0	-5.4	30.0
Methylene Chloride	Ave	0.9582	0.9564		9.98	10.0	-0.2	30.0
tert-Butyl alcohol	Ave	1.336	1.229		9.20	10.0	-8.0	30.0
Methyl tert-butyl ether	Ave	2.880	2.725		9.46	10.0	-5.4	30.0
trans-1,2-Dichloroethene	Ave	1.427	1.386		9.71	10.0	-2.9	30.0
Acrylonitrile	Ave	0.5789	0.6459		9.56	10.0	11.6	30.0
n-Hexane	Ave	1.533	1.516		9.88	10.0	-1.2	30.0
1,1-Dichloroethane	Ave	1.847	1.803		9.76	10.0	-2.4	30.0
Vinyl acetate	Ave	1.763	1.746		9.90	10.0	-1.0	30.0
Ethyl acetate	Ave	0.0968	0.0941		9.72	10.0	-2.8	30.0
cis-1,2-Dichloroethene	Ave	1.224	1.240		10.1	10.0	1.3	30.0
Methyl Ethyl Ketone	Ave	0.4978	0.4791		9.62	10.0	-3.7	30.0
Tetrahydrofuran	Ave	0.1437	0.1393		9.69	10.0	-3.1	30.0
Chloroform	Ave	2.312	2.299		9.94	10.0	-0.6	30.0
1,1,1-Trichloroethane	Ave	0.4335	0.4350		10.0	10.0	0.3	30.0
Cyclohexane	Ave	0.2968	0.3041		10.2	10.0	2.4	30.0

FORM VII
AIR - GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Lab Sample ID: ICV 200-15668/12 Calibration Date: 03/23/2011 01:03

Instrument ID: C.i Calib Start Date: 03/22/2011 17:52

GC Column: RTX-624 ID: 0.32(mm) Calib End Date: 03/22/2011 22:39

Lab File ID: cjr012.d Conc. Units: ppb v/v Heated Purge: (Y/N) N

EPA Sample No.: icv 120404

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Carbon tetrachloride	Ave	0.4337	0.4358		10.0	10.0	0.5	30.0
2,2,4-Trimethylpentane	Ave	0.8805	0.8928		10.1	10.0	1.4	30.0
Benzene	Ave	0.6630	0.6431		9.70	10.0	-3.0	30.0
1,2-Dichloroethane	Ave	0.2412	0.2350		9.74	10.0	-2.6	30.0
n-Heptane	Ave	0.2707	0.2702		9.98	10.0	-0.2	30.0
n-Butanol	Ave	0.0652	0.0501		7.67	10.0	-23.3	30.0
Trichloroethene	Ave	0.2930	0.2905		9.91	10.0	-0.9	30.0
1,2-Dichloropropane	Ave	0.2150	0.2120		9.86	10.0	-1.4	30.0
Methyl methacrylate	Ave	0.1811	0.1779		9.83	10.0	-1.7	30.0
1,4-Dioxane	Ave	0.0792	0.0663		8.37	10.0	-16.3	30.0
Dibromomethane	Ave	0.2280	0.2297		10.1	10.0	0.7	30.0
Bromodichloromethane	Ave	0.4323	0.4611		10.7	10.0	6.6	30.0
cis-1,3-Dichloropropene	Ave	0.3433	0.3360		9.79	10.0	-2.1	30.0
Methyl isobutyl ketone	Ave	0.2676	0.2655		9.92	10.0	-0.8	30.0
n-Octane	Ave	0.3525	0.3529		10.0	10.0	0.0	30.0
Toluene	Ave	0.5526	0.5212		9.43	10.0	-5.7	30.0
trans-1,3-Dichloropropene	Ave	0.3214	0.3165		9.84	10.0	-1.5	30.0
1,1,2-Trichloroethane	Ave	0.2552	0.2394		9.38	10.0	-6.2	30.0
Tetrachloroethene	Ave	0.4325	0.4163		9.62	10.0	-3.7	30.0
Methyl Butyl Ketone (2-Hexanone)	Ave	0.2803	0.2733		9.75	10.0	-2.5	30.0
Dibromochloromethane	Ave	0.4846	0.5288		10.9	10.0	9.1	30.0
1,2-Dibromoethane	Ave	0.4650	0.4614		9.92	10.0	-0.8	30.0
Chlorobenzene	Ave	0.7079	0.6791		9.59	10.0	-4.1	30.0
Ethylbenzene	Ave	0.999	1.011		10.1	10.0	1.2	30.0
n-Nonane	Ave	0.3642	0.3774		10.4	10.0	3.6	30.0
m,p-Xylene	Ave	0.4132	0.4094		19.8	20.0	-0.9	30.0
Xylene, o-	Ave	0.4272	0.4101		9.60	10.0	-4.0	30.0
Styrene	Ave	0.5726	0.5973		10.4	10.0	4.3	30.0
Bromoform	Ave	0.4120	0.4514		11.0	10.0	9.5	30.0
Cumene	Ave	1.125	1.154		10.3	10.0	2.6	30.0
1,1,2,2-Tetrachloroethane	Ave	0.5856	0.5506		9.40	10.0	-6.0	30.0
n-Propylbenzene	Ave	1.219	1.288		10.6	10.0	5.7	30.0
1,2,3-Trichloropropane	Ave	0.4238	0.4118		9.71	10.0	-2.9	30.0
n-Decane	Ave	0.4079	0.4266		10.5	10.0	4.6	30.0
4-Ethyltoluene	Ave	1.059	1.143		10.8	10.0	7.9	30.0
2-Chlorotoluene	Ave	0.9265	0.9587		10.3	10.0	3.5	30.0
1,3,5-Trimethylbenzene	Ave	0.8863	0.9159		10.3	10.0	3.3	30.0
Alpha Methyl Styrene	Ave	0.4435	0.4834		10.9	10.0	9.0	30.0
tert-Butylbenzene	Ave	0.9047	0.9281		10.3	10.0	2.6	30.0

FORM VII
AIR - GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Lab Sample ID: ICV 200-15668/12 Calibration Date: 03/23/2011 01:03

Instrument ID: C.i Calib Start Date: 03/22/2011 17:52

GC Column: RTX-624 ID: 0.32(mm) Calib End Date: 03/22/2011 22:39

Lab File ID: cjr012.d Conc. Units: ppb v/v Heated Purge: (Y/N) N

EPA Sample No.: icv 120404

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
1,2,4-Trimethylbenzene	Ave	0.8608	0.8873		10.3	10.0	3.1	30.0
sec-Butylbenzene	Ave	1.239	1.319		10.6	10.0	6.4	30.0
4-Isopropyltoluene	Ave	1.011	1.102		10.9	10.0	9.0	30.0
1,3-Dichlorobenzene	Ave	0.6273	0.6121		9.76	10.0	-2.4	30.0
1,4-Dichlorobenzene	Ave	0.6157	0.5995		9.74	10.0	-2.6	30.0
Benzyl chloride	Ave	0.6861	0.6146		8.96	10.0	-10.4	30.0
n-Undecane	Ave	0.3661	0.3558		9.72	10.0	-2.8	30.0
n-Butylbenzene	Ave	0.8231	0.8925		10.8	10.0	8.4	30.0
1,2-Dichlorobenzene	Ave	0.5954	0.5765		9.68	10.0	-3.2	30.0
n-Dodecane	Ave	0.2333	0.2565		11.0	10.0	9.9	30.0
1,2,4-Trichlorobenzene	Ave	0.2916	0.2821		9.67	10.0	-3.3	30.0
Hexachlorobutadiene	Ave	0.2682	0.2683		10.0	10.0	0.0	30.0
Naphthalene	Ave	0.6921	0.7070		10.2	10.0	2.1	30.0
1,2,3-Trichlorobenzene	Ave	0.2579	0.2636		10.2	10.0	2.2	30.0

TestAmerica Burlington

AIR TOXICS QUANTITATION REPORT

Data file : /chem/C.i/Csvr.p/cjrto15.b/cjr012.d
Lab Smp Id: icv 120404 Client Smp ID: icv 120404
Inj Date : 23-MAR-2011 01:03
Operator : pad Inst ID: C.i
Smp Info : icv 120404
Misc Info : 200,1, icv
Comment :
Method : /chem/C.i/Csvr.p/cjrto15.b/to15v5.m
Meth Date : 25-Mar-2011 14:53 klp Quant Type: ISTD
Cal Date : 22-MAR-2011 22:39 Cal File: cjr009.d
Als bottle: 6 QC Sample: METHSPIKE
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 3.50
Processing Host: chemsvr6

Concentration Formula: Amt * DF * Uf*(Vo/Vo)*(Vf/Vf) * CpndVariable

Name	Value	Description
DF	1.00000	Dilution Factor
Uf	1.00000	ng unit correction factor
Vo	200.00000	Sample Volume purged (mL)
Vf	200.00000	Final Volume (mL)

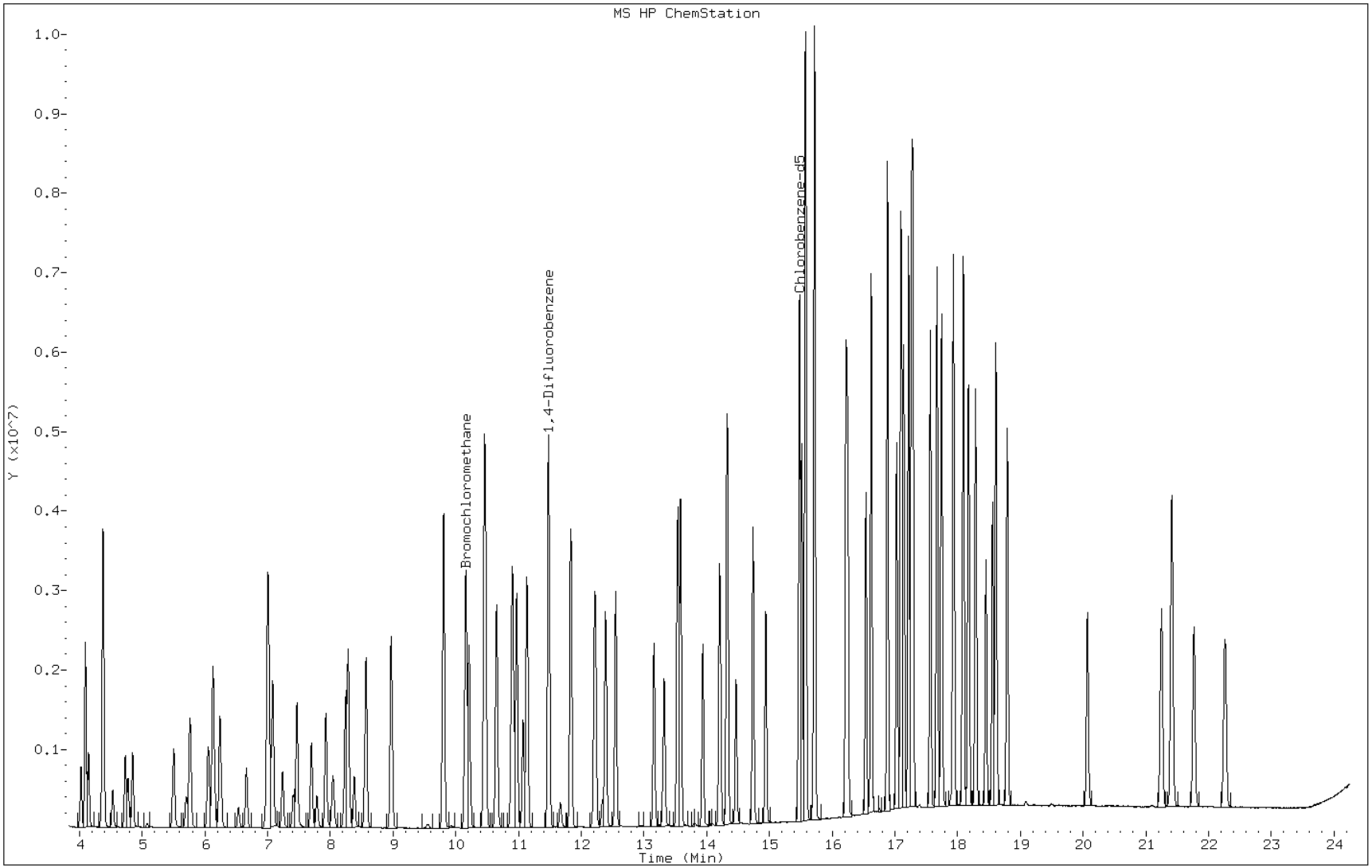
Cpnd Variable Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	CONCENTRATIONS FINAL (ppb v/v)
1	Propene	41	4.027	4.022	(0.397)	496686	9.76338	9.8
2	Dichlorodifluoromethane	85	4.096	4.097	(0.403)	2701023	10.0825	10
3	Chlorodifluoromethane	51	4.144	4.145	(0.408)	1279770	10.0654	10
4	1,2-Dichloro-1,1,2,2-tetraflu	85	4.374	4.374	(0.431)	2907211	10.3077	10
5	Chloromethane	50	4.534	4.534	(0.447)	674141	9.52461	9.5
6	Butane	43	4.732	4.732	(0.466)	1006772	9.81358	9.8
7	Vinyl chloride	62	4.774	4.774	(0.470)	855530	9.68127	9.7
8	1,3-Butadiene	54	4.849	4.849	(0.478)	608616	10.2256	10
9	Bromomethane	94	5.505	5.500	(0.542)	948723	9.40703	9.4
10	Chloroethane	64	5.703	5.703	(0.562)	509957	9.47886	9.5
11	2-Methylbutane	43	5.767	5.762	(0.568)	845724	9.49079	9.5
12	Vinyl bromide	106	6.055	6.055	(0.596)	1060693	9.89926	9.9
13	Trichlorofluoromethane	101	6.130	6.130	(0.604)	2609266	9.76568	9.8
14	Pentane	43	6.242	6.237	(0.615)	1279039	9.15513	9.2

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	FINAL (ppb v/v)
	15 Ethanol	45	6.535	6.525	(0.644)	370236	12.7506	13
	16 Ethyl ether	59	6.663	6.658	(0.656)	613097	8.78227	8.8
	17 1,1,2-Trichloro-1,2,2-trifluo	101	7.005	7.000	(0.690)	2203879	10.6675	11
	18 Acrolein	56	6.994	6.989	(0.689)	251662	7.80850	7.8
	19 1,1-Dichloroethene	96	7.080	7.075	(0.697)	1106895	10.9142	11
	20 Acetone	43	7.240	7.229	(0.713)	1052507	9.48909	9.5
	21 Carbon disulfide	76	7.469	7.470	(0.736)	3076958	9.85873	9.9
	22 Isopropanol	45	7.411	7.400	(0.730)	704562	8.72613	8.7
	23 Allyl chloride	41	7.699	7.694	(0.758)	897293	9.47900	9.5
	24 Acetonitrile	41	7.784	7.779	(0.767)	565501	9.45973	9.5
	25 Methylene chloride	49	7.928	7.929	(0.781)	950708	9.97942	10
	26 Tert-butyl alcohol	59	8.040	8.035	(0.792)	1221281	9.19506	9.2
	27 Methyl tert-butyl ether	73	8.243	8.238	(0.812)	2708637	9.45778	9.5
	28 1,2-Dichloroethene (trans)	61	8.286	8.286	(0.816)	1377686	9.71094	9.7
	29 Acrylonitrile	53	8.382	8.377	(0.825)	642066	9.56164	9.6
	30 n-Hexane	57	8.569	8.564	(0.844)	1506529	9.88094	9.9
	31 1,1-Dichloroethane	63	8.969	8.969	(0.883)	1792700	9.76056	9.8
	32 Vinyl acetate	43	8.969	8.964	(0.883)	1735287	9.90129	9.9
M	33 1,2-Dichloroethene,Total	61				2610691	19.8437	20
	34 1,2-Dichloroethene (cis)	96	9.807	9.802	(0.966)	1233005	10.1328	10
	35 Ethyl acetate	88	9.802	9.802	(0.965)	93570	9.72131	9.7
	36 Methyl Ethyl Ketone	72	9.807	9.802	(0.966)	476285	9.62365	9.6
*	37 Bromochloromethane	128	10.154	10.154	(1.000)	994275	10.0000	
	38 Tetrahydrofuran	42	10.170	10.165	(0.886)	772174	9.68691	9.7
	39 Chloroform	83	10.213	10.207	(1.006)	2284965	9.93961	9.9
	40 Cyclohexane	84	10.463	10.464	(0.911)	1685939	10.2427	10
	41 1,1,1-Trichloroethane	97	10.463	10.458	(0.911)	2411754	10.0324	10
	42 Carbon tetrachloride	117	10.650	10.650	(0.927)	2416503	10.0471	10
	43 2,2,4-Trimethylpentane	57	10.906	10.901	(0.950)	4950131	10.1373	10
	44 Benzene	78	10.970	10.965	(0.955)	3565515	9.69751	9.7
	45 1,2-Dichloroethane	62	11.072	11.067	(0.964)	1303115	9.74148	9.7
	46 n-Heptane	43	11.136	11.131	(0.970)	1498054	9.98097	10
*	47 1,4-Difluorobenzene	114	11.483	11.478	(1.000)	5545563	10.0000	
	48 n-Butanol	56	11.669	11.670	(1.016)	277475	7.67178	7.7
	49 Trichloroethene	95	11.835	11.830	(1.031)	1610469	9.91108	9.9
	50 1,2-Dichloropropane	63	12.209	12.209	(1.063)	1175322	9.85688	9.9
	51 Methyl methacrylate	69	12.235	12.230	(1.066)	986608	9.82649	9.8
	52 Dibromomethane	174	12.390	12.390	(1.079)	1273324	10.0721	10
	53 1,4-Dioxane	88	12.337	12.337	(1.074)	367396	8.36826	8.4
	54 Bromodichloromethane	83	12.550	12.545	(1.093)	2556355	10.6626	11
	55 1,3-Dichloropropene (cis)	75	13.158	13.159	(1.146)	1863179	9.78790	9.8
	56 Methyl isobutyl ketone	43	13.319	13.319	(1.160)	1472013	9.91938	9.9
	57 n-Octane	43	13.537	13.538	(1.179)	1956350	10.0072	10
	58 Toluene	92	13.585	13.580	(0.878)	2562988	9.42826	9.4
	59 1,3-Dichloropropene (trans)	75	13.938	13.938	(1.214)	1754606	9.84466	9.8
	60 1,1,2-Trichloroethane	83	14.210	14.210	(0.918)	1177115	9.37661	9.4
	61 Tetrachloroethene	166	14.327	14.327	(0.926)	2047213	9.62407	9.6

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	FINAL (ppb v/v)
	62 2-Hexanone	43	14.466	14.466	(0.934)	1344168	9.74970	9.7
	63 Dibromochloromethane	129	14.738	14.738	(0.952)	2600639	10.9098	11
	64 1,2-Dibromoethane	107	14.941	14.941	(0.965)	2269085	9.92002	9.9
*	65 Chlorobenzene-d5	117	15.480	15.480	(1.000)	4918879	10.0000	
	66 Chlorobenzene	112	15.517	15.518	(1.002)	3339801	9.59143	9.6
	67 n-Nonane	57	15.576	15.571	(1.006)	1855949	10.3605	10
	68 Ethylbenzene	91	15.576	15.576	(1.006)	4971734	10.1187	10
	69 Xylene (m,p)	106	15.720	15.720	(1.016)	4026311	19.8103	20
M	70 Xylenes, Total	106				6043101	29.4074	29
	71 Xylene (o)	106	16.222	16.222	(1.048)	2016790	9.59708	9.6
	72 Styrene	104	16.249	16.249	(1.050)	2937586	10.4290	10
	73 Bromoform	173	16.542	16.542	(1.069)	2219705	10.9517	11
	74 Isopropylbenzene	105	16.622	16.622	(1.074)	5675739	10.2550	10
	75 1,1,2,2-Tetrachloroethane	83	17.028	17.033	(1.100)	2707774	9.40065	9.4
	76 n-Propylbenzene	91	17.092	17.092	(1.104)	6333197	10.5630	11
	77 1,2,3-Trichloropropane	75	17.118	17.119	(1.106)	2024965	9.71287	9.7
	78 n-Decane	57	17.145	17.145	(1.108)	2097900	10.4572	10
	79 4-Ethyltoluene	105	17.220	17.220	(1.112)	5618870	10.7835	11
	80 2-Chlorotoluene	91	17.263	17.268	(1.115)	4714947	10.3459	10
	81 1,3,5-Trimethylbenzene	105	17.284	17.289	(1.117)	4504476	10.3320	10
	82 Alpha Methyl Styrene	118	17.567	17.567	(1.135)	2377084	10.8959	11
	83 tert-butylbenzene	119	17.674	17.674	(1.142)	4564261	10.2568	10
	84 1,2,4-Trimethylbenzene	105	17.743	17.743	(1.146)	4363809	10.3062	10
	85 sec-Butylbenzene	105	17.935	17.935	(1.159)	6488194	10.6419	11
	86 4-Isopropyltoluene	119	18.090	18.090	(1.169)	5418060	10.8990	11
	87 1,3-Dichlorobenzene	146	18.175	18.175	(1.174)	3010343	9.75560	9.8
	88 1,4-Dichlorobenzene	146	18.287	18.287	(1.181)	2948439	9.73562	9.7
	89 Benzyl chloride	91	18.453	18.453	(1.192)	3022584	8.95655	9.0
	90 Undecane	57	18.554	18.554	(1.199)	1749908	9.71704	9.7
	91 n-Butylbenzene	91	18.613	18.613	(1.202)	4389069	10.8410	11
	92 1,2-Dichlorobenzene	146	18.789	18.794	(1.214)	2835075	9.68037	9.7
	93 Dodecane	57	20.070	20.070	(1.296)	1261253	10.9890	11
	94 1,2,4-Trichlorobenzene	180	21.249	21.249	(1.373)	1387142	9.67150	9.7
	95 1,3-Hexachlorobutadiene	225	21.420	21.415	(1.384)	1319417	10.0004	10
	96 Naphthalene	128	21.772	21.772	(1.406)	3476724	10.2126	10
	97 1,2,3-Trichlorobenzene	180	22.263	22.263	(1.438)	1296325	10.2195	10

Data File:	cjr012.d	Date:	23-MAR-2011 01:03
Client ID:	icv 120404	Instrument:	C.i
Operator:	pad	Inj Vol:	200.0
Column Type:	Capillary	Diameter:	0.32
Stationary Phase:	RTX-624		
Sample Info:	icv 120404		
Lab Sample ID:	icv 120404		



FORM VII
AIR - GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Lab Sample ID: CCVIS 200-15760/4 Calibration Date: 03/25/2011 20:22

Instrument ID: C.i Calib Start Date: 03/22/2011 17:52

GC Column: RTX-624 ID: 0.32(mm) Calib End Date: 03/22/2011 22:39

Lab File ID: cjrc004.d Conc. Units: ppb v/v Heated Purge: (Y/N) N

EPA Sample No.: ccvis 119922

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Propylene	Ave	0.5117	0.5097		9.96	10.0	-0.4	30.0
Dichlorodifluoromethane	Ave	2.694	2.789		10.3	10.0	3.5	30.0
Freon 22	Ave	1.279	1.250		9.78	10.0	-2.2	30.0
1,2-Dichlorotetrafluoroethane	Ave	2.837	2.860		10.1	10.0	0.8	30.0
Chloromethane	Ave	0.7119	0.7057		9.91	10.0	-0.9	30.0
n-Butane	Ave	1.032	1.118		10.8	10.0	8.4	30.0
Vinyl chloride	Ave	0.8888	0.9025		10.2	10.0	1.5	30.0
1,3-Butadiene	Ave	0.5986	0.6351		10.6	10.0	6.1	30.0
Bromomethane	Ave	1.014	1.001		9.86	10.0	-1.3	30.0
Chloroethane	Ave	0.5411	0.5405		9.99	10.0	-0.1	30.0
Isopentane	Ave	0.8962	0.9248		10.3	10.0	3.2	30.0
Bromoethene(Vinyl Bromide)	Ave	1.078	1.067		9.90	10.0	-1.0	30.0
Trichlorofluoromethane	Ave	2.687	2.882		10.7	10.0	7.3	30.0
n-Pentane	Ave	1.405	1.450		10.3	10.0	3.2	30.0
Ethanol	Ave	0.2920	0.2389		12.3	15.0	-18.2	30.0
Ethyl ether	Ave	0.7021	0.6936		9.88	10.0	-1.2	30.0
Acrolein	Ave	0.3241	0.2828		8.72	10.0	-12.8	30.0
Freon TF	Ave	2.078	2.090		10.1	10.0	0.6	30.0
1,1-Dichloroethene	Ave	1.020	1.024		10.0	10.0	0.4	30.0
Acetone	Ave	1.116	1.277		11.4	10.0	14.5	30.0
Isopropyl alcohol	Ave	0.8121	0.7704		9.49	10.0	-5.1	30.0
Carbon disulfide	Ave	3.139	3.058		9.74	10.0	-2.6	30.0
3-Chloropropene	Ave	0.9521	0.9925		10.4	10.0	4.3	30.0
Acetonitrile	Ave	0.6012	0.6201		10.3	10.0	3.1	30.0
Methylene Chloride	Ave	0.9582	0.9503		9.92	10.0	-0.8	30.0
tert-Butyl alcohol	Ave	1.336	1.354		10.1	10.0	1.4	30.0
Methyl tert-butyl ether	Ave	2.880	2.970		10.3	10.0	3.1	30.0
trans-1,2-Dichloroethene	Ave	1.427	1.449		10.2	10.0	1.5	30.0
Acrylonitrile	Ave	0.5789	0.6676		9.88	10.0	15.3	30.0
n-Hexane	Ave	1.533	1.535		10.0	10.0	0.1	30.0
1,1-Dichloroethane	Ave	1.847	1.897		10.3	10.0	2.7	30.0
Vinyl acetate	Ave	1.763	1.901		10.8	10.0	7.8	30.0
cis-1,2-Dichloroethene	Ave	1.224	1.217		9.94	10.0	-0.6	30.0
Ethyl acetate	Ave	0.0968	0.0977		10.1	10.0	0.9	30.0
Methyl Ethyl Ketone	Ave	0.4978	0.4945		9.93	10.0	-0.7	30.0
Tetrahydrofuran	Ave	0.1437	0.1541		10.7	10.0	7.2	30.0
Chloroform	Ave	2.312	2.412		10.4	10.0	4.3	30.0
1,1,1-Trichloroethane	Ave	0.4335	0.4704		10.8	10.0	8.5	30.0
Cyclohexane	Ave	0.2968	0.2991		10.1	10.0	0.8	30.0

FORM VII
AIR - GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Lab Sample ID: CCVIS 200-15760/4 Calibration Date: 03/25/2011 20:22

Instrument ID: C.i Calib Start Date: 03/22/2011 17:52

GC Column: RTX-624 ID: 0.32(mm) Calib End Date: 03/22/2011 22:39

Lab File ID: cjrc004.d Conc. Units: ppb v/v Heated Purge: (Y/N) N

EPA Sample No.: ccvis 119922

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Carbon tetrachloride	Ave	0.4337	0.4827		11.1	10.0	11.3	30.0
2,2,4-Trimethylpentane	Ave	0.8805	0.9029		10.3	10.0	2.5	30.0
Benzene	Ave	0.6630	0.6518		9.83	10.0	-1.7	30.0
1,2-Dichloroethane	Ave	0.2412	0.2669		11.1	10.0	10.6	30.0
n-Heptane	Ave	0.2707	0.2879		10.6	10.0	6.4	30.0
n-Butanol	Ave	0.0652	0.0555		8.51	10.0	-14.9	30.0
Trichloroethene	Ave	0.2930	0.3001		10.2	10.0	2.4	30.0
1,2-Dichloropropane	Ave	0.2150	0.2212		10.3	10.0	2.9	30.0
Methyl methacrylate	Ave	0.1811	0.1898		10.5	10.0	4.8	30.0
1,4-Dioxane	Ave	0.0792	0.0718		9.07	10.0	-9.3	30.0
Dibromomethane	Ave	0.2280	0.2385		10.5	10.0	4.6	30.0
Bromodichloromethane	Ave	0.4323	0.4810		11.1	10.0	11.2	30.0
cis-1,3-Dichloropropene	Ave	0.3433	0.3654		10.6	10.0	6.5	30.0
Methyl isobutyl ketone	Ave	0.2676	0.3044		11.4	10.0	13.8	30.0
n-Octane	Ave	0.3525	0.3892		11.0	10.0	10.4	30.0
Toluene	Ave	0.5526	0.5257		9.51	10.0	-4.9	30.0
trans-1,3-Dichloropropene	Ave	0.3214	0.3549		11.0	10.0	10.4	30.0
1,1,2-Trichloroethane	Ave	0.2552	0.2477		9.70	10.0	-2.9	30.0
Tetrachloroethene	Ave	0.4325	0.4219		9.76	10.0	-2.4	30.0
Methyl Butyl Ketone (2-Hexanone)	Ave	0.2803	0.2938		10.5	10.0	4.8	30.0
Dibromochloromethane	Ave	0.4846	0.5223		10.8	10.0	7.8	30.0
1,2-Dibromoethane	Ave	0.4650	0.4757		10.2	10.0	2.3	30.0
Chlorobenzene	Ave	0.7079	0.7018		9.91	10.0	-0.9	30.0
Ethylbenzene	Ave	0.999	1.041		10.4	10.0	4.2	30.0
n-Nonane	Ave	0.3642	0.3903		10.7	10.0	7.2	30.0
m,p-Xylene	Ave	0.4132	0.4229		20.5	20.0	2.4	30.0
Xylene, o-	Ave	0.4272	0.4288		10.0	10.0	0.4	30.0
Styrene	Ave	0.5726	0.6196		10.8	10.0	8.2	30.0
Bromoform	Ave	0.4120	0.4480		10.9	10.0	8.7	30.0
Cumene	Ave	1.125	1.209		10.7	10.0	7.5	30.0
1,1,2,2-Tetrachloroethane	Ave	0.5856	0.5879		10.0	10.0	0.4	30.0
n-Propylbenzene	Ave	1.219	1.350		11.1	10.0	10.7	30.0
1,2,3-Trichloropropane	Ave	0.4238	0.4457		10.5	10.0	5.2	30.0
n-Decane	Ave	0.4079	0.4823		11.8	10.0	18.3	30.0
4-Ethyltoluene	Ave	1.059	1.181		11.1	10.0	11.5	30.0
2-Chlorotoluene	Ave	0.9265	0.9880		10.7	10.0	6.6	30.0
1,3,5-Trimethylbenzene	Ave	0.8863	0.9912		11.2	10.0	11.8	30.0
Alpha Methyl Styrene	Ave	0.4435	0.4930		11.1	10.0	11.2	30.0
tert-Butylbenzene	Ave	0.9047	0.9730		10.8	10.0	7.6	30.0

FORM VII
AIR - GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Lab Sample ID: CCVIS 200-15760/4 Calibration Date: 03/25/2011 20:22

Instrument ID: C.i Calib Start Date: 03/22/2011 17:52

GC Column: RTX-624 ID: 0.32(mm) Calib End Date: 03/22/2011 22:39

Lab File ID: cjrc004.d Conc. Units: ppb v/v Heated Purge: (Y/N) N

EPA Sample No.: ccvis 119922

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
1,2,4-Trimethylbenzene	Ave	0.8608	0.9745		11.3	10.0	13.2	30.0
sec-Butylbenzene	Ave	1.239	1.397		11.3	10.0	12.7	30.0
4-Isopropyltoluene	Ave	1.011	1.165		11.5	10.0	15.2	30.0
1,3-Dichlorobenzene	Ave	0.6273	0.6390		10.2	10.0	1.9	30.0
1,4-Dichlorobenzene	Ave	0.6157	0.6174		10.0	10.0	0.3	30.0
Benzyl chloride	Ave	0.6861	0.6297		9.18	10.0	-8.2	30.0
n-Undecane	Ave	0.3661	0.3372		9.21	10.0	-7.9	30.0
n-Butylbenzene	Ave	0.8231	0.9452		11.5	10.0	14.8	30.0
1,2-Dichlorobenzene	Ave	0.5954	0.6133		10.3	10.0	3.0	30.0
n-Dodecane	Ave	0.2333	0.2174		9.32	10.0	-6.8	30.0
1,2,4-Trichlorobenzene	Ave	0.2916	0.2376		8.15	10.0	-18.5	30.0
Hexachlorobutadiene	Ave	0.2682	0.2900		10.8	10.0	8.1	30.0
Naphthalene	Ave	0.6921	0.5364		7.75	10.0	-22.5	30.0
1,2,3-Trichlorobenzene	Ave	0.2579	0.2104		8.16	10.0	-18.4	30.0

TestAmerica Burlington

AIR TOXICS QUANTITATION REPORT

Data file : /chem/C.i/Csvr.p/cjrcto15.b/cjrc004.d
Lab Smp Id: ccvis 119922 Client Smp ID: ccvis 119922
Inj Date : 25-MAR-2011 20:22
Operator : sv Inst ID: C.i
Smp Info : ccvis 119922
Misc Info : 200,1, ccv
Comment :
Method : /chem/C.i/Csvr.p/cjrcto15.b/to15v5.m
Meth Date : 29-Mar-2011 20:13 sv Quant Type: ISTD
Cal Date : 22-MAR-2011 22:39 Cal File: cjr009.d
Als bottle: 1 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 3.50
Processing Host: chemsvr6

Concentration Formula: Amt * DF * Uf*(Vo/Vo)*(Vf/Vf) * CpndVariable

Name	Value	Description
DF	1.00000	Dilution Factor
Uf	1.00000	ng unit correction factor
Vo	200.00000	Sample Volume purged (mL)
Vf	200.00000	Final Volume (mL)

Cpnd Variable Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	AMOUNTS ON-COL (ppb v/v)
1	Propene	41	4.043	4.022	(0.398)	376174	10.0000	10
2	Dichlorodifluoromethane	85	4.113	4.097	(0.405)	2058307	10.0000	10
3	Chlorodifluoromethane	51	4.161	4.145	(0.410)	922672	10.0000	9.8
4	1,2-Dichloro-1,1,2,2-tetraflu	85	4.395	4.374	(0.433)	2110826	10.0000	10
5	Chloromethane	50	4.550	4.534	(0.448)	520790	10.0000	9.9
6	Butane	43	4.748	4.732	(0.467)	825247	10.0000	11
7	Vinyl chloride	62	4.790	4.774	(0.472)	666053	10.0000	10
8	1,3-Butadiene	54	4.865	4.849	(0.479)	468662	10.0000	11
9	Bromomethane	94	5.516	5.500	(0.543)	738583	10.0000	9.9
10	Chloroethane	64	5.719	5.703	(0.563)	398887	10.0000	10
11	2-Methylbutane	43	5.778	5.762	(0.569)	682487	10.0000	10
12	Vinyl bromide	106	6.066	6.055	(0.597)	787576	10.0000	9.9
13	Trichlorofluoromethane	101	6.146	6.130	(0.605)	2127254	10.0000	11
14	Pentane	43	6.258	6.237	(0.616)	1069932	10.0000	10

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	AMOUNTS ON-COL (ppb v/v)
	15 Ethanol	45	6.562	6.525	(0.646)	264564	15.0000	12
	16 Ethyl ether	59	6.680	6.658	(0.657)	511876	10.0000	9.9
	17 1,1,2-Trichloro-1,2,2-trifluo	101	7.021	7.000	(0.691)	1542395	10.0000	10
	18 Acrolein	56	7.010	6.989	(0.690)	208687	10.0000	8.7
	19 1,1-Dichloroethene	96	7.091	7.075	(0.698)	755539	10.0000	10
	20 Acetone	43	7.256	7.229	(0.714)	942704	10.0000	11
	21 Carbon disulfide	76	7.480	7.470	(0.736)	2256481	10.0000	9.7
	22 Isopropanol	45	7.448	7.400	(0.733)	568549	10.0000	9.5
	23 Allyl chloride	41	7.710	7.694	(0.759)	732476	10.0000	10
	24 Acetonitrile	41	7.795	7.779	(0.767)	457641	10.0000	10
	25 Methylene chloride	49	7.939	7.929	(0.781)	701312	10.0000	9.9
	26 Tert-butyl alcohol	59	8.089	8.035	(0.796)	999418	10.0000	10
	27 Methyl tert-butyl ether	73	8.259	8.238	(0.813)	2191573	10.0000	10
	28 1,2-Dichloroethene (trans)	61	8.297	8.286	(0.817)	1069242	10.0000	10
	29 Acrylonitrile	53	8.393	8.377	(0.826)	492659	10.0000	9.9
	30 n-Hexane	57	8.574	8.564	(0.844)	1132958	10.0000	10
	31 1,1-Dichloroethane	63	8.980	8.969	(0.884)	1400139	10.0000	10
	32 Vinyl acetate	43	8.980	8.964	(0.884)	1402768	10.0000	11
M	33 1,2-Dichloroethene,Total	61				1967218	20.0000	20
	34 1,2-Dichloroethene (cis)	96	9.807	9.802	(0.965)	897976	10.0000	9.9
	35 Ethyl acetate	88	9.818	9.802	(0.966)	72095	10.0000	10
	36 Methyl Ethyl Ketone	72	9.818	9.802	(0.966)	364924	10.0000	9.9(Q)
*	37 Bromochloromethane	128	10.159	10.154	(1.000)	738134	10.0000	
	38 Tetrahydrofuran	42	10.181	10.165	(0.887)	635982	10.0000	11
	39 Chloroform	83	10.218	10.207	(1.006)	1780330	10.0000	10
	40 Cyclohexane	84	10.469	10.464	(0.912)	1234026	10.0000	10
	41 1,1,1-Trichloroethane	97	10.469	10.458	(0.912)	1941178	10.0000	11
	42 Carbon tetrachloride	117	10.656	10.650	(0.928)	1991704	10.0000	11
	43 2,2,4-Trimethylpentane	57	10.906	10.901	(0.950)	3725793	10.0000	10
	44 Benzene	78	10.970	10.965	(0.955)	2689424	10.0000	9.8
	45 1,2-Dichloroethane	62	11.072	11.067	(0.964)	1101222	10.0000	11
	46 n-Heptane	43	11.136	11.131	(0.970)	1187807	10.0000	11
*	47 1,4-Difluorobenzene	114	11.483	11.478	(1.000)	4127225	10.0000	
	48 n-Butanol	56	11.702	11.670	(1.019)	229109	10.0000	8.5
	49 Trichloroethene	95	11.835	11.830	(1.031)	1238387	10.0000	10
	50 1,2-Dichloropropane	63	12.209	12.209	(1.063)	912545	10.0000	10
	51 Methyl methacrylate	69	12.235	12.230	(1.066)	783311	10.0000	10
	52 Dibromomethane	174	12.390	12.390	(1.079)	984189	10.0000	10
	53 1,4-Dioxane	88	12.347	12.337	(1.075)	296388	10.0000	9.1
	54 Bromodichloromethane	83	12.550	12.545	(1.093)	1984593	10.0000	11
	55 1,3-Dichloropropene (cis)	75	13.159	13.159	(1.146)	1507963	10.0000	11
	56 Methyl isobutyl ketone	43	13.329	13.319	(1.161)	1256209	10.0000	11
	57 n-Octane	43	13.537	13.538	(1.179)	1605931	10.0000	11
	58 Toluene	92	13.580	13.580	(0.878)	2003896	10.0000	9.5
	59 1,3-Dichloropropene (trans)	75	13.938	13.938	(1.214)	1464499	10.0000	11
	60 1,1,2-Trichloroethane	83	14.205	14.210	(0.918)	944213	10.0000	9.7
	61 Tetrachloroethene	166	14.327	14.327	(0.926)	1608278	10.0000	9.8

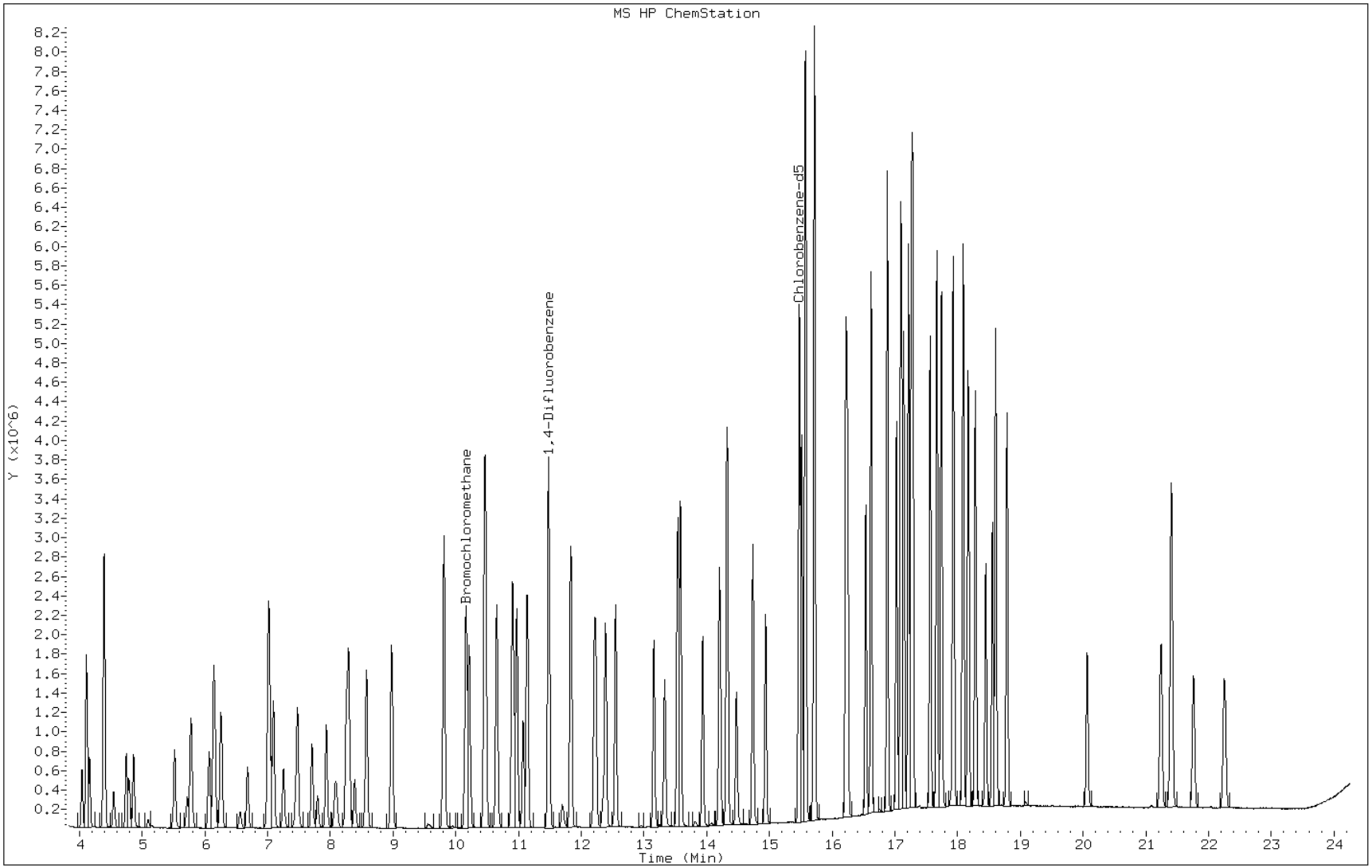
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	ON-COL (ppb v/v)
62	2-Hexanone	43	14.471	14.466	(0.935)	1119911	10.0000	10
63	Dibromochloromethane	129	14.738	14.738	(0.952)	1990928	10.0000	11
64	1,2-Dibromoethane	107	14.941	14.941	(0.966)	1813335	10.0000	10
* 65	Chlorobenzene-d5	117	15.475	15.480	(1.000)	3812341	10.0000	
66	Chlorobenzene	112	15.512	15.518	(1.002)	2674955	10.0000	9.9
67	n-Nonane	57	15.576	15.571	(1.007)	1487780	10.0000	11
68	Ethylbenzene	91	15.576	15.576	(1.007)	3967171	10.0000	10
69	Xylene (m,p)	106	15.720	15.720	(1.016)	3224080	20.0000	20
M 70	Xylenes, Total	106				4858593	10.0000	31
71	Xylene (o)	106	16.222	16.222	(1.048)	1634513	10.0000	10
72	Styrene	104	16.243	16.249	(1.050)	2361468	10.0000	11
73	Bromoform	173	16.537	16.542	(1.069)	1707559	10.0000	11
74	Isopropylbenzene	105	16.622	16.622	(1.074)	4608313	10.0000	11
75	1,1,2,2-Tetrachloroethane	83	17.028	17.033	(1.100)	2240928	10.0000	10
76	n-Propylbenzene	91	17.092	17.092	(1.104)	5144017	10.0000	11
77	1,2,3-Trichloropropane	75	17.113	17.119	(1.106)	1698716	10.0000	11
78	n-Decane	57	17.140	17.145	(1.108)	1838351	10.0000	12
79	4-Ethyltoluene	105	17.215	17.220	(1.112)	4502881	10.0000	11
80	2-Chlorotoluene	91	17.263	17.268	(1.116)	3765986	10.0000	11
81	1,3,5-Trimethylbenzene	105	17.284	17.289	(1.117)	3778049	10.0000	11
82	Alpha Methyl Styrene	118	17.562	17.567	(1.135)	1879141	10.0000	11
83	tert-butylbenzene	119	17.668	17.674	(1.142)	3708654	10.0000	11
84	1,2,4-Trimethylbenzene	105	17.743	17.743	(1.147)	3714510	10.0000	11
85	sec-Butylbenzene	105	17.930	17.935	(1.159)	5325600	10.0000	11
86	4-Isopropyltoluene	119	18.090	18.090	(1.169)	4439479	10.0000	12
87	1,3-Dichlorobenzene	146	18.170	18.175	(1.174)	2435722	10.0000	10
88	1,4-Dichlorobenzene	146	18.287	18.287	(1.182)	2353107	10.0000	10
89	Benzyl chloride	91	18.447	18.453	(1.192)	2400186	10.0000	9.2
90	Undecane	57	18.554	18.554	(1.199)	1285253	10.0000	9.2
91	n-Butylbenzene	91	18.608	18.613	(1.202)	3602783	10.0000	11
92	1,2-Dichlorobenzene	146	18.789	18.794	(1.214)	2337613	10.0000	10
93	Dodecane	57	20.065	20.070	(1.297)	828628	10.0000	9.3
94	1,2,4-Trichlorobenzene	180	21.244	21.249	(1.373)	905482	10.0000	8.1
95	1,3-Hexachlorobutadiene	225	21.409	21.415	(1.383)	1105386	10.0000	11
96	Naphthalene	128	21.762	21.772	(1.406)	2044497	10.0000	7.7
97	1,2,3-Trichlorobenzene	180	22.253	22.263	(1.438)	801773	10.0000	8.2

QC Flag Legend

Q - Qualifier signal failed the ratio test.

Data File: cjrc004.d
Client ID: ccvis 119922
Operator: sv
Column Type: Capillary
Stationary Phase: RTX-624
Sample Info: ccvis 119922
Lab Sample ID: ccvis 119922

Date: 25-MAR-2011 20:22
Instrument: C.i
Inj Vol: 200.0
Diameter: 0.32



FORM VII
AIR - GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Lab Sample ID: ICV 200-14625/18 Calibration Date: 03/03/2011 12:42

Instrument ID: G.i Calib Start Date: 03/02/2011 15:57

GC Column: RTX-624 ID: 0.32(mm) Calib End Date: 03/03/2011 10:00

Lab File ID: gff018.d Conc. Units: ppb v/v Heated Purge: (Y/N) N

EPA Sample No.: icv 117230

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Propylene	Ave	0.2077	0.2074		9.98	10.0	-0.1	30.0
Dichlorodifluoromethane	Ave	1.545	1.655		10.7	10.0	7.1	30.0
Freon 22	Ave	0.6309	0.6626		10.5	10.0	5.0	30.0
1,2-Dichlorotetrafluoroethane	Ave	1.482	1.566		10.6	10.0	5.6	30.0
Chloromethane	Ave	0.3073	0.3175		10.3	10.0	3.3	30.0
n-Butane	Ave	0.4757	0.4860		10.2	10.0	2.2	30.0
Vinyl chloride	Ave	0.4469	0.4640		10.4	10.0	3.8	30.0
1,3-Butadiene	Ave	0.2917	0.3201		11.0	10.0	9.8	30.0
Bromomethane	Ave	0.8931	0.9110		10.2	10.0	2.0	30.0
Chloroethane	Ave	0.3082	0.3211		10.4	10.0	4.2	30.0
Isopentane	Ave	0.5616	0.5763		10.3	10.0	2.6	30.0
Bromoethene(Vinyl Bromide)	Ave	0.996	1.040		10.4	10.0	4.4	30.0
Trichlorofluoromethane	Ave	2.652	2.731		10.3	10.0	3.0	30.0
n-Pentane	Ave	0.9296	0.9466		10.2	10.0	1.8	30.0
Ethanol	Ave	0.2101	0.1781		12.7	15.0	-15.2	30.0
Ethyl ether	Ave	0.3910	0.3493		8.93	10.0	-10.7	30.0
Acrolein	Ave	0.1946	0.1471		7.56	10.0	-24.4	30.0
Freon TF	Ave	1.881	2.102		11.2	10.0	11.7	30.0
1,1-Dichloroethene	Ave	0.8438	0.9529		11.3	10.0	12.9	30.0
Acetone	Ave	0.7413	0.6920		9.33	10.0	-6.6	30.0
Isopropyl alcohol	Ave	0.5438	0.4673		8.59	10.0	-14.1	30.0
Carbon disulfide	Ave	2.579	2.539		9.84	10.0	-1.5	30.0
3-Chloropropene	Ave	0.6529	0.6602		10.1	10.0	1.1	30.0
Acetonitrile	Ave	0.3240	0.3031		9.35	10.0	-6.5	30.0
Methylene Chloride	Ave	0.7069	0.7773		11.0	10.0	10.0	30.0
tert-Butyl alcohol	Ave	0.9279	0.8252		8.89	10.0	-11.1	30.0
Methyl tert-butyl ether	Ave	1.835	1.690		9.21	10.0	-7.9	30.0
trans-1,2-Dichloroethene	Ave	1.076	1.108		10.3	10.0	2.9	30.0
Acrylonitrile	Ave	0.3600	0.3327		9.24	10.0	-7.6	30.0
n-Hexane	Ave	0.9299	0.9628		10.4	10.0	3.5	30.0
1,1-Dichloroethane	Ave	1.313	1.349		10.3	10.0	2.7	30.0
Vinyl acetate	Ave	1.137	1.054		9.27	10.0	-7.3	30.0
cis-1,2-Dichloroethene	Ave	0.9396	0.9862		10.5	10.0	5.0	30.0
Methyl Ethyl Ketone	Ave	0.2803	0.2663		9.50	10.0	-5.0	30.0
Ethyl acetate	Ave	0.0485	0.0456		9.41	10.0	-5.9	30.0
Tetrahydrofuran	Ave	0.1101	0.1045		9.49	10.0	-5.1	30.0
Chloroform	Ave	1.925	1.905		9.90	10.0	-1.0	30.0
1,1,1-Trichloroethane	Ave	0.4906	0.5156		10.5	10.0	5.1	30.0
Cyclohexane	Ave	0.2431	0.2623		10.8	10.0	7.9	30.0

FORM VII
AIR - GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Lab Sample ID: ICV 200-14625/18 Calibration Date: 03/03/2011 12:42

Instrument ID: G.i Calib Start Date: 03/02/2011 15:57

GC Column: RTX-624 ID: 0.32(mm) Calib End Date: 03/03/2011 10:00

Lab File ID: gff018.d Conc. Units: ppb v/v Heated Purge: (Y/N) N

EPA Sample No.: icv 117230

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Carbon tetrachloride	Ave	0.5500	0.5750		10.5	10.0	4.6	30.0
2,2,4-Trimethylpentane	Ave	0.6751	0.6922		10.3	10.0	2.5	30.0
Benzene	Ave	0.5421	0.5363		9.89	10.0	-1.1	30.0
1,2-Dichloroethane	Ave	0.2498	0.2427		9.71	10.0	-2.8	30.0
n-Heptane	Ave	0.2191	0.2174		9.92	10.0	-0.8	30.0
n-Butanol	Ave	0.0576	0.0439		7.62	10.0	-23.8	30.0
Trichloroethene	Ave	0.2968	0.3005		10.1	10.0	1.3	30.0
1,2-Dichloropropane	Ave	0.1719	0.1619		9.42	10.0	-5.8	30.0
Methyl methacrylate	Ave	0.1344	0.1278		9.51	10.0	-4.9	30.0
1,4-Dioxane	Ave	0.0721	0.0560		7.76	10.0	-22.4	30.0
Dibromomethane	Ave	0.2265	0.2264		9.99	10.0	-0.0	30.0
Bromodichloromethane	Ave	0.4555	0.4715		10.4	10.0	3.5	30.0
cis-1,3-Dichloropropene	Ave	0.2923	0.2799		9.57	10.0	-4.2	30.0
Methyl isobutyl ketone	Ave	0.2141	0.2113		9.87	10.0	-1.3	30.0
n-Octane	Ave	0.2747	0.2758		10.0	10.0	0.4	30.0
Toluene	Ave	0.4254	0.4061		9.55	10.0	-4.5	30.0
trans-1,3-Dichloropropene	Ave	0.2982	0.2813		9.43	10.0	-5.7	30.0
1,1,2-Trichloroethane	Ave	0.2276	0.2100		9.23	10.0	-7.7	30.0
Tetrachloroethene	Ave	0.3743	0.3514		9.39	10.0	-6.1	30.0
Methyl Butyl Ketone (2-Hexanone)	Ave	0.2161	0.2147		9.93	10.0	-0.6	30.0
Dibromochloromethane	Ave	0.5293	0.5665		10.7	10.0	7.0	30.0
1,2-Dibromoethane	Ave	0.4543	0.4362		9.60	10.0	-4.0	30.0
Chlorobenzene	Ave	0.6274	0.5847		9.32	10.0	-6.8	30.0
Ethylbenzene	Ave	0.8880	0.8332		9.38	10.0	-6.2	30.0
n-Nonane	Ave	0.3014	0.3003		9.96	10.0	-0.4	30.0
m,p-Xylene	Ave	0.3582	0.3361		18.8	20.0	-6.2	30.0
Xylene, o-	Ave	0.3639	0.3337		9.17	10.0	-8.3	30.0
Styrene	Ave	0.4787	0.4854		10.1	10.0	1.4	30.0
Bromoform	Ave	0.4214	0.4578		10.9	10.0	8.7	30.0
Cumene	Ave	1.024	0.9621		9.39	10.0	-6.1	30.0
1,1,2,2-Tetrachloroethane	Ave	0.5586	0.5130		9.18	10.0	-8.2	30.0
n-Propylbenzene	Ave	1.137	1.110		9.76	10.0	-2.4	30.0
1,2,3-Trichloropropane	Ave	0.3658	0.3546		9.69	10.0	-3.1	30.0
n-Decane	Ave	0.3400	0.3457		10.2	10.0	1.7	30.0
4-Ethyltoluene	Ave	0.9872	0.9667		9.79	10.0	-2.1	30.0
2-Chlorotoluene	Ave	0.9460	0.9174		9.70	10.0	-3.0	30.0
1,3,5-Trimethylbenzene	Ave	0.8418	0.7862		9.34	10.0	-6.6	30.0
Alpha Methyl Styrene	Ave	0.3867	0.4019		10.4	10.0	3.9	30.0
tert-Butylbenzene	Ave	0.8283	0.7698		9.29	10.0	-7.1	30.0

FORM VII
AIR - GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Lab Sample ID: ICV 200-14625/18 Calibration Date: 03/03/2011 12:42

Instrument ID: G.i Calib Start Date: 03/02/2011 15:57

GC Column: RTX-624 ID: 0.32(mm) Calib End Date: 03/03/2011 10:00

Lab File ID: gff018.d Conc. Units: ppb v/v Heated Purge: (Y/N) N

EPA Sample No.: icv 117230

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
1,2,4-Trimethylbenzene	Ave	0.8247	0.7674		9.30	10.0	-6.9	30.0
sec-Butylbenzene	Ave	1.217	1.157		9.51	10.0	-4.9	30.0
4-Isopropyltoluene	Ave	0.9889	0.9641		9.75	10.0	-2.5	30.0
1,3-Dichlorobenzene	Ave	0.5577	0.5267		9.44	10.0	-5.6	30.0
1,4-Dichlorobenzene	Ave	0.5266	0.5048		9.58	10.0	-4.1	30.0
Benzyl chloride	Ave	0.6052	0.5361		8.86	10.0	-11.4	30.0
n-Undecane	Ave	0.2683	0.2725		10.2	10.0	1.6	30.0
n-Butylbenzene	Ave	0.7845	0.8208		10.5	10.0	4.6	30.0
1,2-Dichlorobenzene	Ave	0.5570	0.5047		9.06	10.0	-9.4	30.0
n-Dodecane	Ave	0.1847	0.2244		12.1	10.0	21.5	30.0
1,2,4-Trichlorobenzene	Ave	0.2342	0.2245		9.58	10.0	-4.1	30.0
Hexachlorobutadiene	Ave	0.2247	0.2259		10.1	10.0	0.5	30.0
Naphthalene	Ave	0.6253	0.6181		9.88	10.0	-1.2	30.0
1,2,3-Trichlorobenzene	Ave	0.2109	0.2318		11.0	10.0	9.9	30.0

TestAmerica Burlington

AIR TOXICS QUANTITATION REPORT

Data file : /chem/G.i/Gsvr.p/gffto15.b/gff018.d
Lab Smp Id: icv 117230 Client Smp ID: icv 117230
Inj Date : 03-MAR-2011 12:42
Operator : wrd Inst ID: G.i
Smp Info : icv 117230
Misc Info : 200,1, icv
Comment :
Method : /chem/G.i/Gsvr.p/gffto15.b/to15v5.m
Meth Date : 04-Mar-2011 10:44 klp Quant Type: ISTD
Cal Date : 03-MAR-2011 10:00 Cal File: gff015.d
Als bottle: 9 QC Sample: METHSPIKE
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 3.50
Processing Host: chemsvr6

Concentration Formula: Amt * DF * Uf*(Vo/Vo)*(Vf/Vf) * CpndVariable

Name	Value	Description
DF	1.00000	Dilution Factor
Uf	1.00000	ng unit correction factor
Vo	200.00000	Sample Volume purged (mL)
Vf	200.00000	Final Volume (mL)

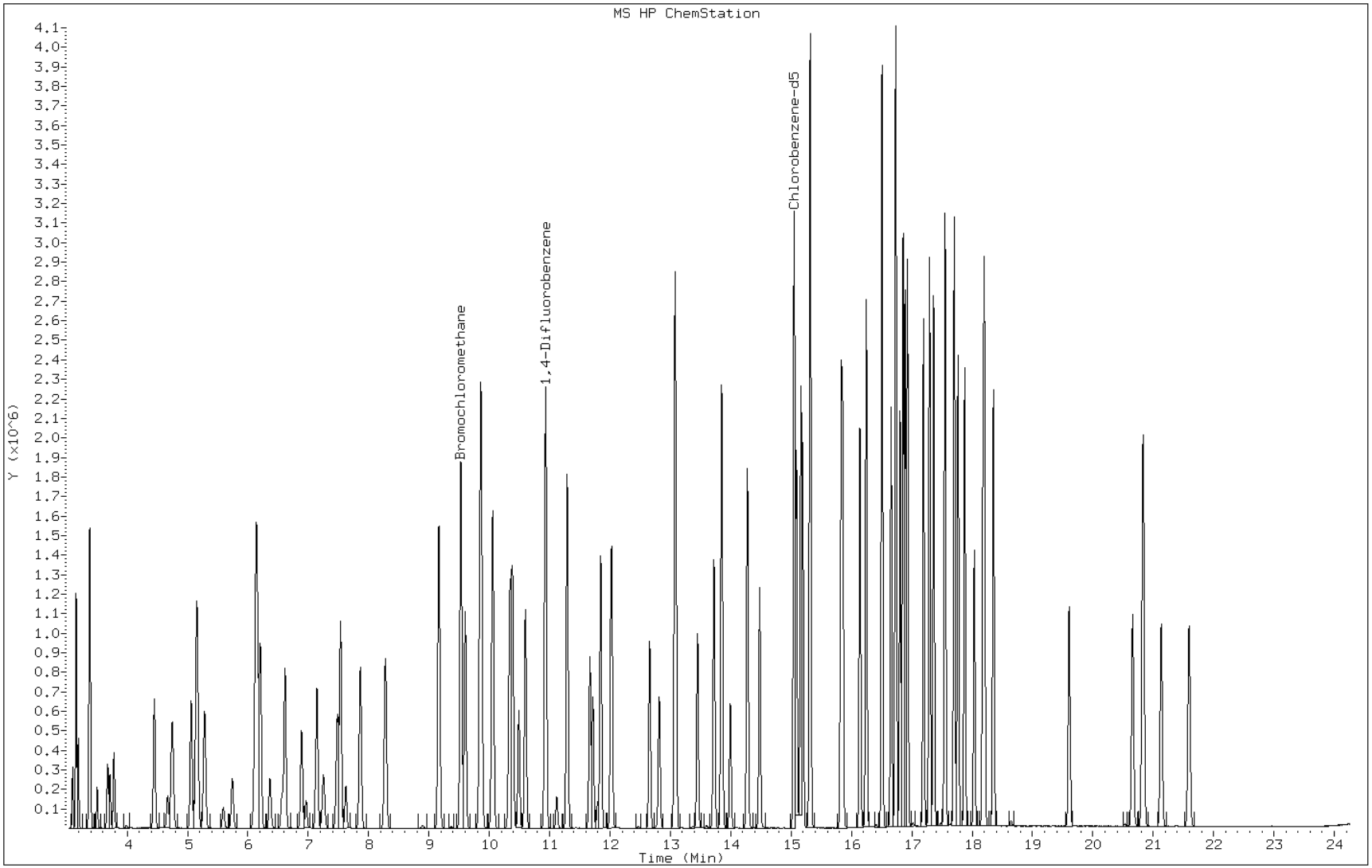
Cpnd Variable Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	CONCENTRATIONS FINAL (ppb v/v)
1	Propene	41	3.101	3.101	(0.326)	124444	9.98421	10
2	Dichlorodifluoromethane	85	3.154	3.154	(0.331)	992820	10.7046	11
3	Chlorodifluoromethane	51	3.192	3.192	(0.335)	397566	10.5009	11
4	1,2-Dichloro-1,1,2,2-tetraflu	85	3.374	3.379	(0.354)	939577	10.5618	11
5	Chloromethane	50	3.502	3.502	(0.368)	190517	10.3314	10
6	Butane	43	3.679	3.679	(0.386)	291597	10.2133	10
7	Vinyl chloride	62	3.716	3.716	(0.390)	278403	10.3797	10
8	1,3-Butadiene	54	3.786	3.780	(0.397)	192083	10.9730	11
9	Bromomethane	94	4.449	4.449	(0.467)	546630	10.1984	10
10	Chloroethane	64	4.674	4.668	(0.491)	192668	10.4168	10
11	2-Methylbutane	43	4.749	4.743	(0.498)	345790	10.2602	10
12	Vinyl bromide	106	5.059	5.059	(0.531)	623835	10.4383	10
13	Trichlorofluoromethane	101	5.155	5.155	(0.541)	1638729	10.2950	10
14	Pentane	43	5.284	5.284	(0.555)	567975	10.1804	10

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	FINAL (ppb v/v)
	15 Ethanol	45	5.594	5.594	(0.587)	160733	12.7446	13
	16 Ethyl ether	59	5.744	5.744	(0.603)	209558	8.93131	8.9
	17 1,1,2-Trichloro-1,2,2-trifluo	101	6.139	6.139	(0.644)	1261077	11.1706	11
	18 Acrolein	56	6.097	6.097	(0.640)	88269	7.55664	7.6
	19 1,1-Dichloroethene	96	6.204	6.209	(0.651)	571756	11.2913	11
	20 Acetone	43	6.364	6.370	(0.668)	415223	9.33325	9.3
	21 Carbon disulfide	76	6.616	6.616	(0.694)	1523241	9.84318	9.8
	22 Isopropanol	45	6.567	6.567	(0.689)	280377	8.59122	8.6
	23 Allyl chloride	41	6.888	6.894	(0.723)	396127	10.1100	10
	24 Acetonitrile	41	6.963	6.969	(0.731)	181858	9.35146	9.4
	25 Methylene chloride	49	7.140	7.145	(0.750)	466383	10.9938	11
	26 Tert-butyl alcohol	59	7.252	7.252	(0.761)	495124	8.89144	8.9
	27 Methyl tert-butyl ether	73	7.488	7.488	(0.786)	1014325	9.20887	9.2
	28 1,2-Dichloroethene (trans)	61	7.536	7.541	(0.791)	664520	10.2899	10
	29 Acrylonitrile	53	7.627	7.627	(0.801)	199639	9.23972	9.2
	30 n-Hexane	57	7.862	7.862	(0.825)	577701	10.3522	10
	31 1,1-Dichloroethane	63	8.269	8.274	(0.868)	809682	10.2717	10
	32 Vinyl acetate	43	8.290	8.290	(0.870)	632186	9.26782	9.3
M	33 1,2-Dichloroethene,Total	61				1256240	20.7831	21
	34 1,2-Dichloroethene (cis)	96	9.162	9.162	(0.962)	591720	10.4932	10
	35 Ethyl acetate	88	9.178	9.183	(0.963)	27356	9.40738	9.4
	36 Methyl Ethyl Ketone	72	9.162	9.162	(0.962)	159777	9.49745	9.5
*	37 Bromochloromethane	128	9.526	9.531	(1.000)	600136	10.0000	
	38 Tetrahydrofuran	42	9.537	9.542	(0.872)	263890	9.48802	9.5
	39 Chloroform	83	9.601	9.601	(1.008)	1143283	9.89663	9.9
	40 Cyclohexane	84	9.863	9.863	(0.902)	662648	10.7882	11
	41 1,1,1-Trichloroethane	97	9.858	9.858	(0.902)	1302523	10.5070	11
	42 Carbon tetrachloride	117	10.055	10.055	(0.920)	1452735	10.4531	10
	43 2,2,4-Trimethylpentane	57	10.344	10.344	(0.946)	1748830	10.2522	10
	44 Benzene	78	10.382	10.387	(0.950)	1354794	9.89073	9.9
	45 1,2-Dichloroethane	62	10.489	10.489	(0.959)	613147	9.71499	9.7
	46 n-Heptane	43	10.596	10.601	(0.969)	549130	9.91942	9.9
*	47 1,4-Difluorobenzene	114	10.933	10.933	(1.000)	2526919	10.0000	
	48 n-Butanol	56	11.115	11.115	(1.017)	110974	7.62158	7.6
	49 Trichloroethene	95	11.291	11.291	(1.033)	759214	10.1238	10
	50 1,2-Dichloropropane	63	11.666	11.671	(1.067)	409004	9.41539	9.4
	51 Methyl methacrylate	69	11.714	11.719	(1.071)	322937	9.50755	9.5
	52 Dibromomethane	174	11.848	11.853	(1.084)	571943	9.99077	10
	53 1,4-Dioxane	88	11.794	11.794	(1.079)	141363	7.76380	7.8
	54 Bromodichloromethane	83	12.024	12.024	(1.100)	1191303	10.3507	10
	55 1,3-Dichloropropene (cis)	75	12.655	12.655	(1.158)	707142	9.57345	9.6
	56 Methyl isobutyl ketone	43	12.816	12.816	(1.172)	533868	9.86694	9.9
	57 n-Octane	43	13.078	13.078	(1.196)	696774	10.0381	10
	58 Toluene	92	13.083	13.089	(0.869)	944066	9.54522	9.5
	59 1,3-Dichloropropene (trans)	75	13.453	13.453	(1.230)	710568	9.42870	9.4
	60 1,1,2-Trichloroethane	83	13.720	13.720	(0.912)	488279	9.22836	9.2
	61 Tetrachloroethene	166	13.848	13.848	(0.920)	816877	9.38581	9.4

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	FINAL (ppb v/v)
62	2-Hexanone	43	13.993	13.998	(0.930)	499090	9.93304	9.9
63	Dibromochloromethane	129	14.276	14.276	(0.948)	1316933	10.7001	11
64	1,2-Dibromoethane	107	14.480	14.480	(0.962)	1014097	9.60078	9.6
* 65	Chlorobenzene-d5	117	15.052	15.052	(1.000)	2325182	10.0000	
66	Chlorobenzene	112	15.090	15.090	(1.002)	1359173	9.31761	9.3
67	n-Nonane	57	15.197	15.197	(1.010)	698021	9.95988	10
68	Ethylbenzene	91	15.164	15.164	(1.007)	1937056	9.38186	9.4
69	Xylene (m,p)	106	15.314	15.314	(1.017)	1562809	18.7662	19
M 70	Xylenes, Total	106				2338459	27.9329	28
71	Xylene (o)	106	15.828	15.833	(1.052)	775650	9.16677	9.2
72	Styrene	104	15.855	15.855	(1.053)	1128399	10.1374	10
73	Bromoform	173	16.143	16.143	(1.073)	1064347	10.8638	11
74	Isopropylbenzene	105	16.245	16.250	(1.079)	2236719	9.39040	9.4
75	1,1,2,2-Tetrachloroethane	83	16.657	16.657	(1.107)	1192558	9.18164	9.2
76	n-Propylbenzene	91	16.732	16.732	(1.112)	2580569	9.76004	9.8
77	1,2,3-Trichloropropane	75	16.743	16.743	(1.112)	824451	9.69288	9.7
78	n-Decane	57	16.807	16.807	(1.117)	803540	10.1649	10
79	4-Ethyltoluene	105	16.860	16.860	(1.120)	2247289	9.78996	9.8
80	2-Chlorotoluene	91	16.892	16.892	(1.122)	2132640	9.69584	9.7
81	1,3,5-Trimethylbenzene	105	16.924	16.930	(1.124)	1827764	9.33824	9.3
82	Alpha Methyl Styrene	118	17.192	17.197	(1.142)	934298	10.3922	10
83	tert-butylbenzene	119	17.294	17.299	(1.149)	1789651	9.29278	9.3
84	1,2,4-Trimethylbenzene	105	17.363	17.369	(1.154)	1783934	9.30325	9.3
85	sec-Butylbenzene	105	17.550	17.550	(1.166)	2689832	9.50655	9.5
86	4-Isopropyltoluene	119	17.706	17.706	(1.176)	2241244	9.74747	9.7
87	1,3-Dichlorobenzene	146	17.770	17.770	(1.181)	1224313	9.44141	9.4
88	1,4-Dichlorobenzene	146	17.877	17.882	(1.188)	1173615	9.58429	9.6
89	Benzyl chloride	91	18.032	18.037	(1.198)	1246319	8.85613	8.9
90	Undecane	57	18.176	18.176	(1.208)	633382	10.1544	10
91	n-Butylbenzene	91	18.203	18.203	(1.209)	1908241	10.4612	10
92	1,2-Dichlorobenzene	146	18.353	18.358	(1.219)	1173196	9.05907	9.1
93	Dodecane	57	19.610	19.610	(1.303)	521548	12.1433	12
94	1,2,4-Trichlorobenzene	180	20.664	20.664	(1.373)	521799	9.58317	9.6
95	1,3-Hexachlorobutadiene	225	20.830	20.835	(1.384)	525209	10.0521	10
96	Naphthalene	128	21.135	21.140	(1.404)	1436972	9.88310	9.9
97	1,2,3-Trichlorobenzene	180	21.595	21.600	(1.435)	538857	10.9879	11

Data File:	gff018.d	Date:	03-MAR-2011 12:42
Client ID:	icv 117230	Instrument:	G.i
Operator:	wrd	Inj Vol:	200.0
Column Type:	Capillary	Diameter:	0.32
Stationary Phase:	RTX-624		
Sample Info:	icv 117230		
Lab Sample ID:	icv 117230		



FORM VII
AIR - GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Lab Sample ID: CCVIS 200-15787/2 Calibration Date: 03/29/2011 11:54

Instrument ID: G.i Calib Start Date: 03/02/2011 15:57

GC Column: RTX-624 ID: 0.32(mm) Calib End Date: 03/03/2011 10:00

Lab File ID: gffv002.d Conc. Units: ppb v/v Heated Purge: (Y/N) N

EPA Sample No.: ccvis 126754

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Propylene	Ave	0.2077	0.1839		8.85	10.0	-11.5	30.0
Dichlorodifluoromethane	Ave	1.545	1.370		8.87	10.0	-11.3	30.0
Freon 22	Ave	0.6309	0.5414		8.58	10.0	-14.2	30.0
1,2-Dichlorotetrafluoroethane	Ave	1.482	1.197		8.07	10.0	-19.3	30.0
Chloromethane	Ave	0.3073	0.2475		8.05	10.0	-19.5	30.0
n-Butane	Ave	0.4757	0.3711		7.80	10.0	-22.0	30.0
Vinyl chloride	Ave	0.4469	0.3468		7.76	10.0	-22.4	30.0
1,3-Butadiene	Ave	0.2917	0.2240		7.68	10.0	-23.2	30.0
Bromomethane	Ave	0.8931	0.7464		8.36	10.0	-16.4	30.0
Chloroethane	Ave	0.3082	0.2653		8.61	10.0	-13.9	30.0
Isopentane	Ave	0.5616	0.4619		8.22	10.0	-17.7	30.0
Bromoethene(Vinyl Bromide)	Ave	0.996	0.9474		9.51	10.0	-4.9	30.0
Trichlorofluoromethane	Ave	2.652	2.549		9.61	10.0	-3.9	30.0
n-Pentane	Ave	0.9296	0.8260		8.88	10.0	-11.1	30.0
Ethanol	Ave	0.2101	0.1761		12.6	15.0	-16.2	30.0
Ethyl ether	Ave	0.3910	0.3764		9.62	10.0	-3.7	30.0
Acrolein	Ave	0.1946	0.1564		8.03	10.0	-19.7	30.0
Freon TF	Ave	1.881	1.847		9.82	10.0	-1.8	30.0
1,1-Dichloroethene	Ave	0.8438	0.7937		9.41	10.0	-5.9	30.0
Acetone	Ave	0.7413	0.8207		11.1	10.0	10.7	30.0
Isopropyl alcohol	Ave	0.5438	0.5575		10.2	10.0	2.5	30.0
Carbon disulfide	Ave	2.579	2.317		8.98	10.0	-10.1	30.0
3-Chloropropene	Ave	0.6529	0.5636		8.63	10.0	-13.7	30.0
Acetonitrile	Ave	0.3240	0.3169		9.78	10.0	-2.2	30.0
Methylene Chloride	Ave	0.7069	0.6405		9.06	10.0	-9.4	30.0
tert-Butyl alcohol	Ave	0.9279	1.028		11.1	10.0	10.8	30.0
Methyl tert-butyl ether	Ave	1.835	1.814		9.88	10.0	-1.2	30.0
trans-1,2-Dichloroethene	Ave	1.076	0.996		9.25	10.0	-7.4	30.0
Acrylonitrile	Ave	0.3600	0.3348		9.30	10.0	-7.0	30.0
n-Hexane	Ave	0.9299	0.8721		9.38	10.0	-6.2	30.0
1,1-Dichloroethane	Ave	1.313	1.225		9.33	10.0	-6.7	30.0
Vinyl acetate	Ave	1.137	1.036		9.11	10.0	-8.9	30.0
cis-1,2-Dichloroethene	Ave	0.9396	0.8801		9.37	10.0	-6.3	30.0
Methyl Ethyl Ketone	Ave	0.2803	0.2725		9.72	10.0	-2.8	30.0
Ethyl acetate	Ave	0.0485	0.0487		10.1	10.0	0.5	30.0
Tetrahydrofuran	Ave	0.1101	0.0966		8.77	10.0	-12.3	30.0
Chloroform	Ave	1.925	1.787		9.28	10.0	-7.2	30.0
1,1,1-Trichloroethane	Ave	0.4906	0.4579		9.33	10.0	-6.7	30.0
Cyclohexane	Ave	0.2431	0.2262		9.30	10.0	-6.9	30.0

FORM VII
AIR - GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Lab Sample ID: CCVIS 200-15787/2 Calibration Date: 03/29/2011 11:54

Instrument ID: G.i Calib Start Date: 03/02/2011 15:57

GC Column: RTX-624 ID: 0.32(mm) Calib End Date: 03/03/2011 10:00

Lab File ID: gffv002.d Conc. Units: ppb v/v Heated Purge: (Y/N) N

EPA Sample No.: ccvis 126754

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Carbon tetrachloride	Ave	0.5500	0.5321		9.67	10.0	-3.3	30.0
2,2,4-Trimethylpentane	Ave	0.6751	0.5947		8.81	10.0	-11.9	30.0
Benzene	Ave	0.5421	0.4774		8.81	10.0	-11.9	30.0
1,2-Dichloroethane	Ave	0.2498	0.2307		9.23	10.0	-7.6	30.0
n-Heptane	Ave	0.2191	0.1857		8.47	10.0	-15.2	30.0
n-Butanol	Ave	0.0576	0.0502		8.71	10.0	-12.9	30.0
Trichloroethene	Ave	0.2968	0.2699		9.09	10.0	-9.1	30.0
1,2-Dichloropropane	Ave	0.1719	0.1567		9.12	10.0	-8.8	30.0
Methyl methacrylate	Ave	0.1344	0.1270		9.45	10.0	-5.5	30.0
1,4-Dioxane	Ave	0.0721	0.0725		10.1	10.0	0.6	30.0
Dibromomethane	Ave	0.2265	0.2295		10.1	10.0	1.3	30.0
Bromodichloromethane	Ave	0.4555	0.4283		9.40	10.0	-6.0	30.0
cis-1,3-Dichloropropene	Ave	0.2923	0.2754		9.42	10.0	-5.8	30.0
Methyl isobutyl ketone	Ave	0.2141	0.1941		9.06	10.0	-9.3	30.0
n-Octane	Ave	0.2747	0.2364		8.60	10.0	-13.9	30.0
Toluene	Ave	0.4254	0.3930		9.24	10.0	-7.6	30.0
trans-1,3-Dichloropropene	Ave	0.2982	0.2837		9.51	10.0	-4.9	30.0
1,1,2-Trichloroethane	Ave	0.2276	0.2135		9.38	10.0	-6.2	30.0
Tetrachloroethene	Ave	0.3743	0.3773		10.1	10.0	0.8	30.0
Methyl Butyl Ketone (2-Hexanone)	Ave	0.2161	0.2004		9.27	10.0	-7.3	30.0
Dibromochloromethane	Ave	0.5293	0.5503		10.4	10.0	4.0	30.0
1,2-Dibromoethane	Ave	0.4543	0.4427		9.74	10.0	-2.5	30.0
Chlorobenzene	Ave	0.6274	0.6110		9.74	10.0	-2.6	30.0
Ethylbenzene	Ave	0.8880	0.8573		9.65	10.0	-3.5	30.0
n-Nonane	Ave	0.3014	0.2816		9.34	10.0	-6.6	30.0
m,p-Xylene	Ave	0.3582	0.3491		19.5	20.0	-2.5	30.0
Xylene, o-	Ave	0.3639	0.3634		9.98	10.0	-0.2	30.0
Styrene	Ave	0.4787	0.5076		10.6	10.0	6.0	30.0
Bromoform	Ave	0.4214	0.4694		11.1	10.0	11.4	30.0
Cumene	Ave	1.024	1.035		10.1	10.0	1.1	30.0
1,1,2,2-Tetrachloroethane	Ave	0.5586	0.5412		9.69	10.0	-3.1	30.0
n-Propylbenzene	Ave	1.137	1.137		10.0	10.0	0.0	30.0
1,2,3-Trichloropropane	Ave	0.3658	0.3622		9.90	10.0	-1.0	30.0
n-Decane	Ave	0.3400	0.3515		10.3	10.0	3.4	30.0
4-Ethyltoluene	Ave	0.9872	1.028		10.4	10.0	4.1	30.0
2-Chlorotoluene	Ave	0.9460	0.9225		9.75	10.0	-2.5	30.0
1,3,5-Trimethylbenzene	Ave	0.8418	0.8659		10.3	10.0	2.9	30.0
Alpha Methyl Styrene	Ave	0.3867	0.4342		11.2	10.0	12.3	30.0
tert-Butylbenzene	Ave	0.8283	0.8438		10.2	10.0	1.9	30.0

FORM VII
AIR - GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Lab Sample ID: CCVIS 200-15787/2 Calibration Date: 03/29/2011 11:54

Instrument ID: G.i Calib Start Date: 03/02/2011 15:57

GC Column: RTX-624 ID: 0.32(mm) Calib End Date: 03/03/2011 10:00

Lab File ID: gffv002.d Conc. Units: ppb v/v Heated Purge: (Y/N) N

EPA Sample No.: ccvis 126754

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
1,2,4-Trimethylbenzene	Ave	0.8247	0.8646		10.5	10.0	4.8	30.0
sec-Butylbenzene	Ave	1.217	1.251		10.3	10.0	2.8	30.0
4-Isopropyltoluene	Ave	0.9889	1.046		10.6	10.0	5.8	30.0
1,3-Dichlorobenzene	Ave	0.5577	0.5884		10.5	10.0	5.5	30.0
1,4-Dichlorobenzene	Ave	0.5266	0.5643		10.7	10.0	7.1	30.0
Benzyl chloride	Ave	0.6052	0.4864		8.03	10.0	-19.6	30.0
n-Undecane	Ave	0.2683	0.2298		8.57	10.0	-14.3	30.0
n-Butylbenzene	Ave	0.7845	0.8513		10.8	10.0	8.5	30.0
1,2-Dichlorobenzene	Ave	0.5570	0.5933		10.6	10.0	6.5	30.0
n-Dodecane	Ave	0.1847	0.1586		8.58	10.0	-14.1	30.0
1,2,4-Trichlorobenzene	Ave	0.2342	0.2326		9.93	10.0	-0.7	30.0
Hexachlorobutadiene	Ave	0.2247	0.2835		12.6	10.0	26.2	30.0
Naphthalene	Ave	0.6253	0.5522		8.83	10.0	-11.7	30.0
1,2,3-Trichlorobenzene	Ave	0.2109	0.2115		10.0	10.0	0.3	30.0

TestAmerica Burlington

AIR TOXICS QUANTITATION REPORT

Data file : /chem/G.i/Gsvr.p/gffvto15.b/gffv002.d
Lab Smp Id: ccvis 126754 Client Smp ID: ccvis 126754
Inj Date : 29-MAR-2011 11:54
Operator : wrd Inst ID: G.i
Smp Info : ccvis 126754
Misc Info : 200,1,ccv
Comment :
Method : /chem/G.i/Gsvr.p/gffvto15.b/to15v5.m
Meth Date : 30-Mar-2011 09:27 wrd Quant Type: ISTD
Cal Date : 03-MAR-2011 10:00 Cal File: gff015.d
Als bottle: 1 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 3.50
Processing Host: chemsvr6

Concentration Formula: Amt * DF * Uf*(Vo/Vo)*(Vf/Vf) * CpndVariable

Name	Value	Description
DF	1.00000	Dilution Factor
Uf	1.00000	ng unit correction factor
Vo	200.00000	Sample Volume purged (mL)
Vf	200.00000	Final Volume (mL)

Cpnd Variable Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	AMOUNTS ON-COL (ppb v/v)
1 Propene	41	3.096	3.101	(0.326)	91936	10.0000	8.9
2 Dichlorodifluoromethane	85	3.154	3.154	(0.332)	685056	10.0000	8.9
3 Chlorodifluoromethane	51	3.186	3.192	(0.335)	270657	10.0000	8.6
4 1,2-Dichloro-1,1,2,2-tetraflu	85	3.374	3.379	(0.355)	598220	10.0000	8.1
5 Chloromethane	50	3.497	3.502	(0.368)	123726	10.0000	8.1
6 Butane	43	3.673	3.679	(0.386)	185512	10.0000	7.8
7 Vinyl chloride	62	3.711	3.716	(0.390)	173345	10.0000	7.8
8 1,3-Butadiene	54	3.775	3.780	(0.397)	111972	10.0000	7.7
9 Bromomethane	94	4.438	4.449	(0.467)	373124	10.0000	8.4
10 Chloroethane	64	4.658	4.668	(0.490)	132624	10.0000	8.6
11 2-Methylbutane	43	4.733	4.743	(0.498)	230929	10.0000	8.2
12 Vinyl bromide	106	5.048	5.059	(0.531)	473629	10.0000	9.5
13 Trichlorofluoromethane	101	5.144	5.155	(0.541)	1274274	10.0000	9.6
14 Pentane	43	5.273	5.284	(0.554)	412945	10.0000	8.9

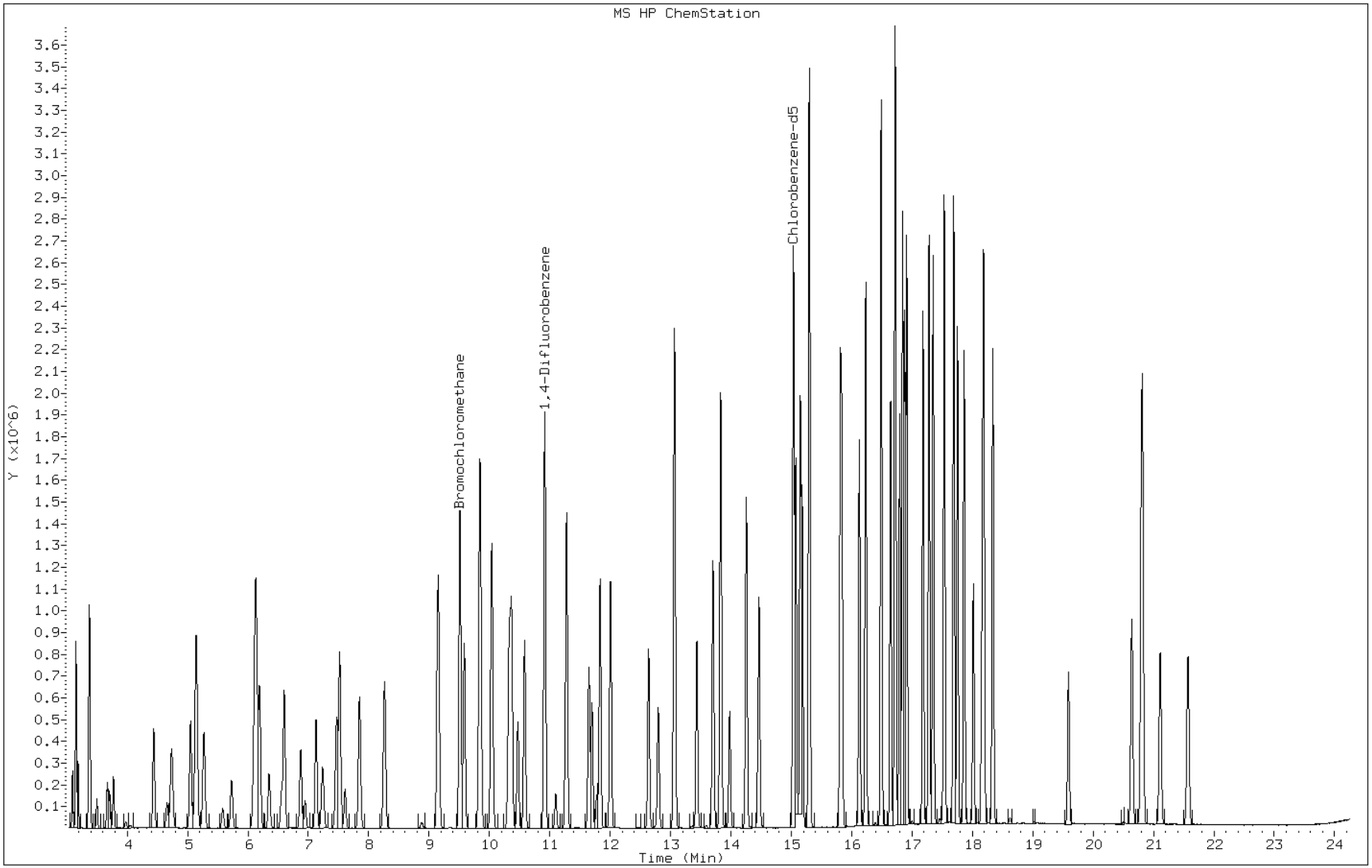
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	ON-COL (ppb v/v)
	15 Ethanol	45	5.578	5.594	(0.587)	132111	15.0000	13
	16 Ethyl ether	59	5.728	5.744	(0.602)	188156	10.0000	9.6
	17 1,1,2-Trichloro-1,2,2-trifluo	101	6.129	6.139	(0.644)	923304	10.0000	9.8
	18 Acrolein	56	6.086	6.097	(0.640)	78171	10.0000	8.0
	19 1,1-Dichloroethene	96	6.193	6.209	(0.651)	396801	10.0000	9.4
	20 Acetone	43	6.348	6.370	(0.668)	410289	10.0000	11
	21 Carbon disulfide	76	6.600	6.616	(0.694)	1158335	10.0000	9.0
	22 Isopropanol	45	6.557	6.567	(0.689)	278687	10.0000	10
	23 Allyl chloride	41	6.878	6.894	(0.723)	281763	10.0000	8.6
	24 Acetonitrile	41	6.947	6.969	(0.731)	158404	10.0000	9.8
	25 Methylene chloride	49	7.124	7.145	(0.749)	320181	10.0000	9.1
	26 Tert-butyl alcohol	59	7.236	7.252	(0.761)	513777	10.0000	11
	27 Methyl tert-butyl ether	73	7.472	7.488	(0.786)	906834	10.0000	9.9
	28 1,2-Dichloroethene (trans)	61	7.525	7.541	(0.791)	497941	10.0000	9.3
	29 Acrylonitrile	53	7.611	7.627	(0.800)	167385	10.0000	9.3
	30 n-Hexane	57	7.846	7.862	(0.825)	435985	10.0000	9.4
	31 1,1-Dichloroethane	63	8.258	8.274	(0.868)	612538	10.0000	9.3
	32 Vinyl acetate	43	8.274	8.290	(0.870)	517883	10.0000	9.1
M	33 1,2-Dichloroethene,Total	61				937936	20.0000	19
	34 1,2-Dichloroethene (cis)	96	9.146	9.162	(0.962)	439995	10.0000	9.4
	35 Ethyl acetate	88	9.162	9.183	(0.963)	24349	10.0000	10(Q)
	36 Methyl Ethyl Ketone	72	9.146	9.162	(0.962)	136223	10.0000	9.7(Q)
*	37 Bromochloromethane	128	9.510	9.531	(1.000)	500011	10.0000	
	38 Tetrahydrofuran	42	9.526	9.542	(0.873)	214967	10.0000	8.8
	39 Chloroform	83	9.585	9.601	(1.008)	893224	10.0000	9.3
	40 Cyclohexane	84	9.847	9.863	(0.902)	503657	10.0000	9.3
	41 1,1,1-Trichloroethane	97	9.841	9.858	(0.902)	1019500	10.0000	9.3
	42 Carbon tetrachloride	117	10.039	10.055	(0.920)	1184667	10.0000	9.7
	43 2,2,4-Trimethylpentane	57	10.328	10.344	(0.946)	1324177	10.0000	8.8
	44 Benzene	78	10.366	10.387	(0.950)	1062941	10.0000	8.8
	45 1,2-Dichloroethane	62	10.473	10.489	(0.959)	513653	10.0000	9.2
	46 n-Heptane	43	10.585	10.601	(0.970)	413423	10.0000	8.5
*	47 1,4-Difluorobenzene	114	10.917	10.933	(1.000)	2226967	10.0000	
	48 n-Butanol	56	11.099	11.115	(1.017)	111720	10.0000	8.7
	49 Trichloroethene	95	11.275	11.291	(1.033)	600888	10.0000	9.1
	50 1,2-Dichloropropane	63	11.650	11.671	(1.067)	348974	10.0000	9.1
	51 Methyl methacrylate	69	11.698	11.719	(1.072)	282842	10.0000	9.4
	52 Dibromomethane	174	11.832	11.853	(1.084)	511059	10.0000	10
	53 1,4-Dioxane	88	11.778	11.794	(1.079)	161464	10.0000	10
	54 Bromodichloromethane	83	12.003	12.024	(1.099)	953714	10.0000	9.4
	55 1,3-Dichloropropene (cis)	75	12.639	12.655	(1.158)	613081	10.0000	9.4
	56 Methyl isobutyl ketone	43	12.800	12.816	(1.172)	432223	10.0000	9.1
	57 n-Octane	43	13.062	13.078	(1.196)	526365	10.0000	8.6
	58 Toluene	92	13.067	13.089	(0.869)	796917	10.0000	9.2
	59 1,3-Dichloropropene (trans)	75	13.436	13.453	(1.231)	631739	10.0000	9.5
	60 1,1,2-Trichloroethane	83	13.704	13.720	(0.911)	432963	10.0000	9.4
	61 Tetrachloroethene	166	13.832	13.848	(0.920)	765085	10.0000	10

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ppb v/v)	ON-COL (ppb v/v)
62	2-Hexanone	43	13.977	13.998	(0.930)	406356	10.0000	9.3
63	Dibromochloromethane	129	14.260	14.276	(0.948)	1115910	10.0000	10
64	1,2-Dibromoethane	107	14.464	14.480	(0.962)	897792	10.0000	9.7
* 65	Chlorobenzene-d5	117	15.036	15.052	(1.000)	2028208	10.0000	
66	Chlorobenzene	112	15.073	15.090	(1.002)	1239051	10.0000	9.7
67	n-Nonane	57	15.181	15.197	(1.010)	571033	10.0000	9.3
68	Ethylbenzene	91	15.148	15.164	(1.007)	1738435	10.0000	9.7
69	Xylene (m,p)	106	15.298	15.314	(1.017)	1415724	20.0000	19
M 70	Xylenes, Total	106				2152554	10.0000	29
71	Xylene (o)	106	15.817	15.833	(1.052)	736830	10.0000	10
72	Styrene	104	15.838	15.855	(1.053)	1029404	10.0000	11
73	Bromoform	173	16.127	16.143	(1.073)	951916	10.0000	11
74	Isopropylbenzene	105	16.234	16.250	(1.080)	2099675	10.0000	10
75	1,1,2,2-Tetrachloroethane	83	16.641	16.657	(1.107)	1097344	10.0000	9.7
76	n-Propylbenzene	91	16.716	16.732	(1.112)	2306293	10.0000	10
77	1,2,3-Trichloropropane	75	16.727	16.743	(1.112)	734497	10.0000	9.9
78	n-Decane	57	16.796	16.807	(1.117)	712778	10.0000	10
79	4-Ethyltoluene	105	16.844	16.860	(1.120)	2084296	10.0000	10
80	2-Chlorotoluene	91	16.876	16.892	(1.122)	1870678	10.0000	9.8
81	1,3,5-Trimethylbenzene	105	16.914	16.930	(1.125)	1755875	10.0000	10
82	Alpha Methyl Styrene	118	17.181	17.197	(1.143)	880387	10.0000	11
83	tert-butylbenzene	119	17.283	17.299	(1.149)	1711044	10.0000	10
84	1,2,4-Trimethylbenzene	105	17.352	17.369	(1.154)	1753291	10.0000	10
85	sec-Butylbenzene	105	17.534	17.550	(1.166)	2537090	10.0000	10
86	4-Isopropyltoluene	119	17.689	17.706	(1.176)	2120805	10.0000	11
87	1,3-Dichlorobenzene	146	17.754	17.770	(1.181)	1193213	10.0000	11
88	1,4-Dichlorobenzene	146	17.866	17.882	(1.188)	1144193	10.0000	11
89	Benzyl chloride	91	18.016	18.037	(1.198)	986303	10.0000	8.0
90	Undecane	57	18.160	18.176	(1.208)	466039	10.0000	8.6
91	n-Butylbenzene	91	18.187	18.203	(1.210)	1726328	10.0000	11
92	1,2-Dichlorobenzene	146	18.337	18.358	(1.220)	1203018	10.0000	11
93	Dodecane	57	19.594	19.610	(1.303)	321613	10.0000	8.6
94	1,2,4-Trichlorobenzene	180	20.643	20.664	(1.373)	471567	10.0000	9.9
95	1,3-Hexachlorobutadiene	225	20.814	20.835	(1.384)	574896	10.0000	13
96	Naphthalene	128	21.113	21.140	(1.404)	1119670	10.0000	8.8
97	1,2,3-Trichlorobenzene	180	21.573	21.600	(1.435)	428925	10.0000	10

QC Flag Legend

Q - Qualifier signal failed the ratio test.

Data File:	gffv002.d	Date:	29-MAR-2011 11:54
Client ID:	ccvis 126754	Instrument:	G.i
Operator:	wrd	Inj Vol:	200.0
Column Type:	Capillary	Diameter:	0.32
Stationary Phase:	RTX-624		
Sample Info:	ccvis 126754		
Lab Sample ID:	ccvis 126754		



TestAmerica Burlington

Data file : /chem/C.i/Csvr.p/cjrto15.b/cjr001.d
Lab Smp Id: VBFB Client Smp ID: VBFB
Inj Date : 22-MAR-2011 16:18
Operator : pad Inst ID: C.i
Smp Info : VBFB
Misc Info : bfb
Comment :
Method : /chem/C.i/Csvr.p/cjrto15.b/bfbto15.m
Meth Date : 21-May-2010 13:11 mtp Quant Type: ESTD
Cal Date : Cal File:
Als bottle: 1 QC Sample: BFB
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 3.50 Sample Matrix: AIR
Processing Host: chemsvr6

Concentration Formula: Amt * DF * Uf * Vf * CpndVariable

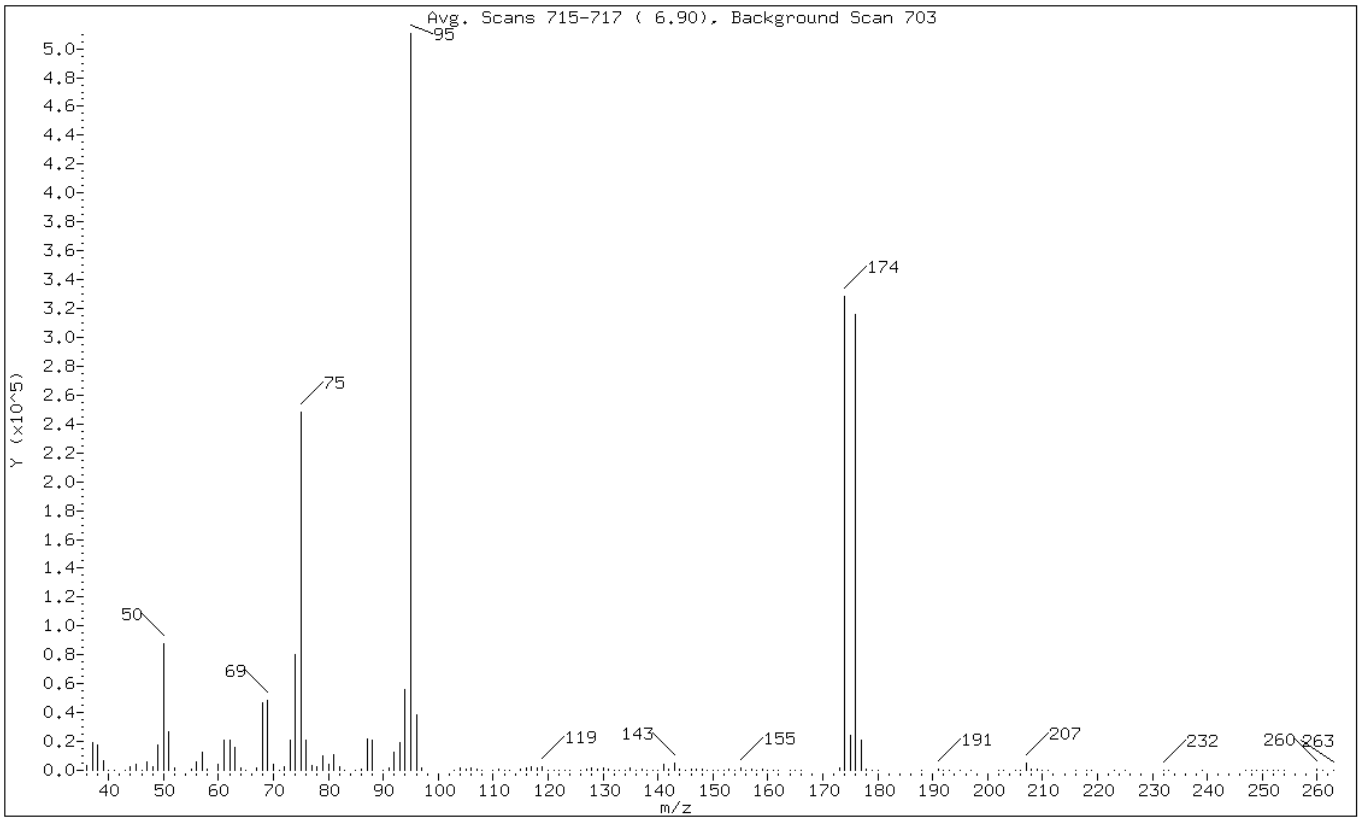
Name	Value	Description
DF	1.00000	Dilution Factor
Uf	1.00000	ng unit correction factor
Vf	1.00000	Volumetric correction factor

Cpnd Variable Local Compound Variable

					CONCENTRATIONS ON-COL	CONCENTRATIONS FINAL		
RT	EXP RT	DLT RT	MASS	RESPONSE	(ug/L)	(ug/L)	TARGET RANGE	RATIO
$ 1 bfb							CAS #: 460-00-4	
6.901	6.760	0.141	95	510533			100.00- 100.00	100.00
6.901	6.760	0.141	50	87423			8.00- 40.00	17.12
6.901	6.760	0.141	75	248337			30.00- 66.00	48.64
6.901	6.760	0.141	96	38298			5.00- 9.00	7.50
6.901	6.760	0.141	173	1900			0.00- 2.00	0.58
6.901	6.760	0.141	174	328533			50.00- 120.00	64.35
6.901	6.760	0.141	175	23965			4.00- 9.00	7.29
6.901	6.760	0.141	176	315899			93.00- 101.00	96.15
6.901	6.760	0.141	177	21028			5.00- 9.00	6.66

Data File: cjr001.d
Client ID: VBFB
Operator: pad
Column Type: Capillary
Stationary Phase: RTX-624
Sample Info: VBFB
Lab Sample ID: VBFB
1 bfb

Date: 22-MAR-2011 16:18
Instrument: C.i
Inj Vol: 0.0 (ul)
Diameter: 0.32 (mm)



m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
95	Base Peak, 100% relative abundance	100.00
50	8.00 - 40.00% of mass 95	17.12
75	30.00 - 66.00% of mass 95	48.64
96	5.00 - 9.00% of mass 95	7.50
173	Less than 2.00% of mass 174	0.37 (0.58)
174	50.00 - 120.00% of mass 95	64.35
175	4.00 - 9.00% of mass 174	4.69 (7.29)
176	93.00 - 101.00% of mass 174	61.88 (96.15)
177	5.00 - 9.00% of mass 176	4.12 (6.66)

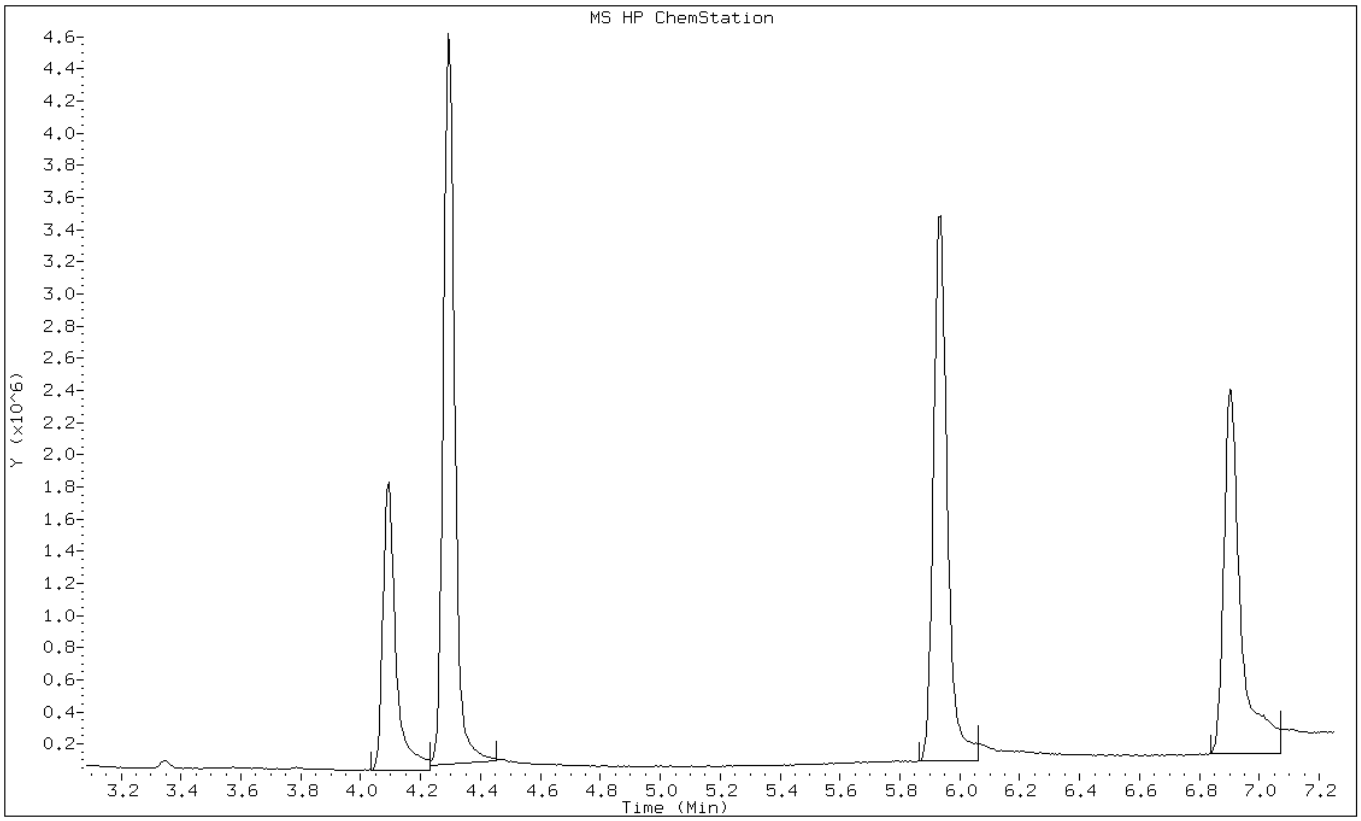
Data File: cjr001.d
Client ID: VBFB
Operator: pad
Column Type: Capillary
Stationary Phase: RTX-624
Sample Info: VBFB
Lab Sample ID: VBFB

Date: 22-MAR-2011 16:18
Instrument: C.i
Inj Vol: 0.0 (ul)
Diameter: 0.32 (mm)

Data File: /chem/C.i/Csvr.p/cjrto15.b/cjr001.d
Spectrum: Avg. Scans 715-717 (6.90), Background Scan 703
Location of Maximum: 95.00
Number of points: 157

m/z	Y	m/z	Y	m/z	Y	m/z	Y
36.00	3306	81.00	10863	131.00	447	178.00	734
37.00	18968	82.00	2795	132.00	76	179.00	5
38.00	17216	83.00	40	133.00	13	180.00	290
39.00	6815	85.00	46	134.00	312	188.00	166
40.00	193	86.00	545	135.00	1574	191.00	887
41.00	232	87.00	21568	136.00	112	192.00	284
43.00	108	88.00	20680	137.00	611	193.00	67
44.00	2343	90.00	149	138.00	89	195.00	210
45.00	3892	91.00	1731	139.00	238	197.00	61
46.00	324	92.00	12836	140.00	245	202.00	91
47.00	5658	93.00	19016	141.00	3884	203.00	56
48.00	2295	94.00	56256	142.00	561	205.00	182
49.00	17384	95.00	510528	143.00	4682	206.00	295
50.00	87416	96.00	38296	144.00	418	207.00	5277
51.00	26816	97.00	1906	145.00	325	208.00	768
52.00	1456	103.00	93	146.00	871	209.00	424
55.00	1012	104.00	1939	147.00	598	210.00	100
56.00	6002	105.00	569	148.00	1100	211.00	159
57.00	12239	106.00	1551	149.00	410	216.00	116
58.00	523	107.00	419	150.00	321	218.00	178
60.00	3785	108.00	329	151.00	68	219.00	274
61.00	20480	110.00	377	152.00	312	223.00	181
62.00	21000	111.00	454	153.00	445	225.00	67
63.00	15760	112.00	216	154.00	329	232.00	397
64.00	1437	113.00	411	155.00	1258	233.00	146
65.00	121	115.00	490	156.00	291	239.00	125
67.00	1392	116.00	1796	157.00	850	247.00	182
68.00	46568	117.00	2184	158.00	70	248.00	80
69.00	48056	118.00	1535	159.00	662	249.00	169
70.00	4445	119.00	2332	160.00	73	250.00	2
71.00	344	120.00	167	161.00	395	251.00	121
72.00	2497	121.00	76	162.00	68	252.00	81
73.00	20928	122.00	153	164.00	121	253.00	344
74.00	80088	123.00	76	165.00	148	254.00	92
75.00	248320	124.00	328	166.00	105	260.00	777
76.00	21160	126.00	203	173.00	1900	261.00	260
77.00	3032	127.00	492	174.00	328512	263.00	162
78.00	2132	128.00	1829	175.00	23960		
79.00	10169	129.00	892	176.00	315840		
80.00	3843	130.00	1675	177.00	21024		

Data File:	cjr001.d	Date:	22-MAR-2011 16:18
Client ID:	VBFB	Instrument:	C.i
Operator:	pad	Inj Vol:	0.0 (ul)
Column Type:	Capillary	Diameter:	0.32 (mm)
Stationary Phase:	RTX-624		
Sample Info:	VBFB		
Lab Sample ID:	VBFB		



TestAmerica Burlington

Data file : /chem/C.i/Csvr.p/cjrcto15.b/cjrc001.d
Lab Smp Id: BFB Client Smp ID: BFB
Inj Date : 25-MAR-2011 17:59
Operator : sv Inst ID: C.i
Smp Info : VBFB
Misc Info : bfb
Comment :
Method : /chem/C.i/Csvr.p/cjrcto15.b/bfbto15.m
Meth Date : 21-May-2010 13:11 mtp Quant Type: ESTD
Cal Date : Cal File:
Als bottle: 1 QC Sample: BFB
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 3.50 Sample Matrix: AIR
Processing Host: chemsvr6

Concentration Formula: Amt * DF * Uf * Vf * CpndVariable

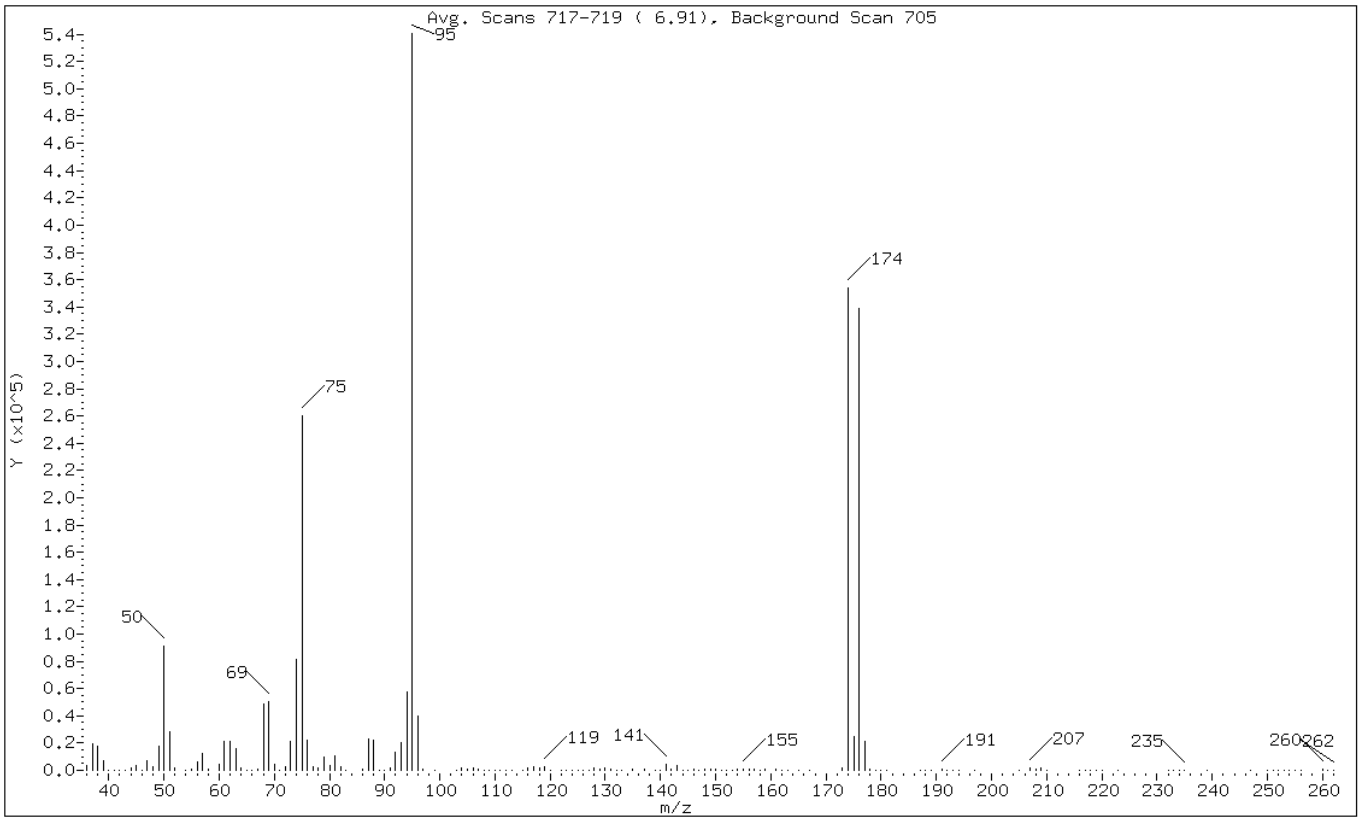
Name	Value	Description
DF	1.00000	Dilution Factor
Uf	1.00000	ng unit correction factor
Vf	1.00000	Volumetric correction factor

Cpnd Variable Local Compound Variable

					CONCENTRATIONS ON-COL	FINAL		
RT	EXP RT	DLT RT	MASS	RESPONSE	(ug/L)	(ug/L)	TARGET RANGE	RATIO
$ 1 bfb						CAS #: 460-00-4		
6.912	6.760	0.152	95	540671			100.00- 100.00	100.00
6.912	6.760	0.152	50	90809			8.00- 40.00	16.80
6.912	6.760	0.152	75	259902			30.00- 66.00	48.07
6.912	6.760	0.152	96	39656			5.00- 9.00	7.33
6.912	6.760	0.152	173	2022			0.00- 2.00	0.57
6.912	6.760	0.152	174	353888			50.00- 120.00	65.45
6.912	6.760	0.152	175	24655			4.00- 9.00	6.97
6.912	6.760	0.152	176	339105			93.00- 101.00	95.82
6.912	6.760	0.152	177	21557			5.00- 9.00	6.36

Data File:	cjrc001.d	Date:	25-MAR-2011 17:59
Client ID:	BFB	Instrument:	C.i
Operator:	sv	Inj Vol:	0.0 (ul)
Column Type:	Capillary	Diameter:	0.32 (mm)
Stationary Phase:	RTX-624		
Sample Info:	VBFB		
Lab Sample ID:	BFB		

1 bfb



m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
95	Base Peak, 100% relative abundance	100.00
50	8.00 - 40.00% of mass 95	16.80
75	30.00 - 66.00% of mass 95	48.07
96	5.00 - 9.00% of mass 95	7.33
173	Less than 2.00% of mass 174	0.37 (0.57)
174	50.00 - 120.00% of mass 95	65.45
175	4.00 - 9.00% of mass 174	4.56 (6.97)
176	93.00 - 101.00% of mass 174	62.72 (95.82)
177	5.00 - 9.00% of mass 176	3.99 (6.36)

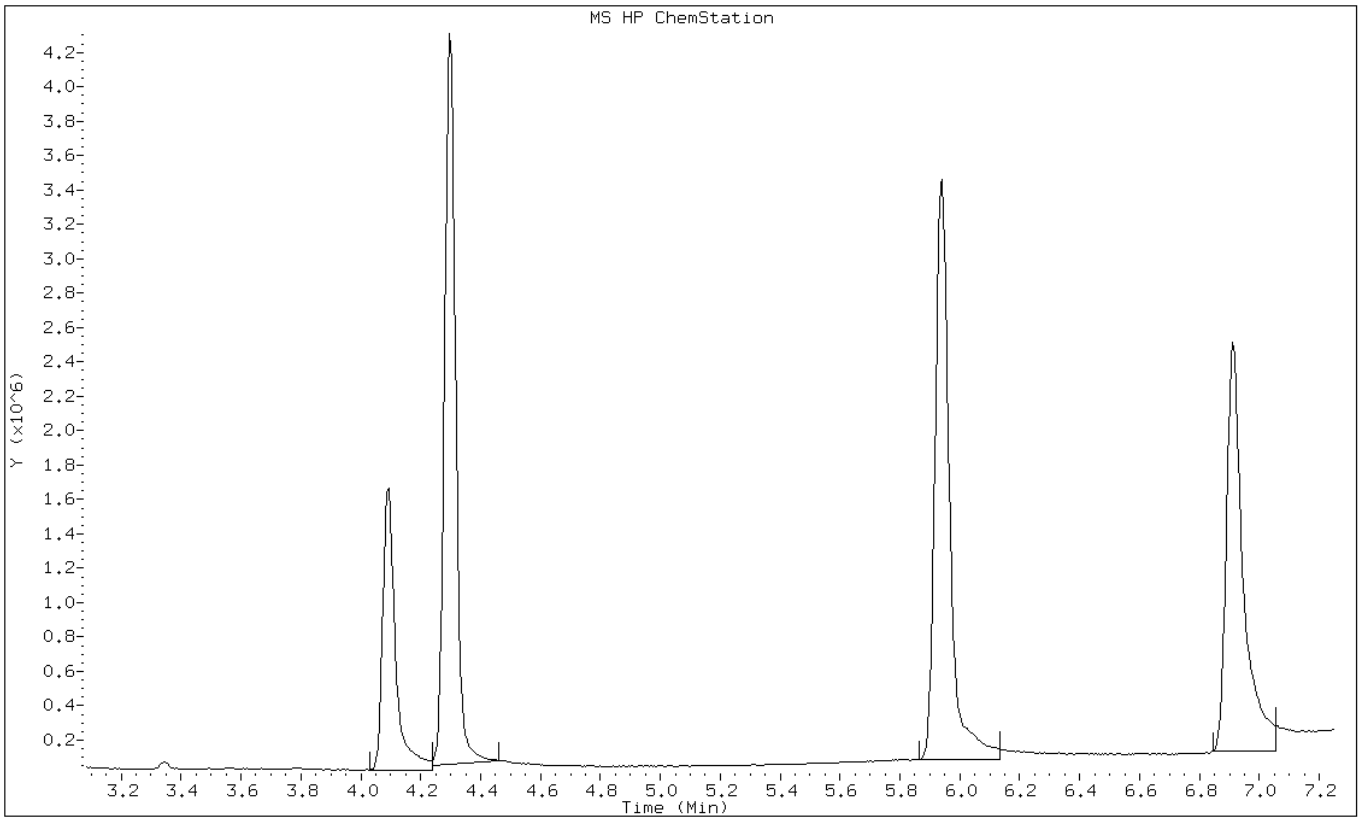
Data File: cjrc001.d
Client ID: BFB
Operator: sv
Column Type: Capillary
Stationary Phase: RTX-624
Sample Info: VBFB
Lab Sample ID: BFB

Date: 25-MAR-2011 17:59
Instrument: C.i
Inj Vol: 0.0 (ul)
Diameter: 0.32 (mm)

Data File: /chem/C.i/Csvr.p/cjrcto15.b/cjrc001.d
Spectrum: Avg. Scans 717-719 (6.91), Background Scan 705
Location of Maximum: 95.00
Number of points: 160

m/z	Y	m/z	Y	m/z	Y	m/z	Y
36.00	3262	79.00	9727	128.00	1612	180.00	123
37.00	19696	80.00	3798	129.00	840	181.00	49
38.00	18032	81.00	10398	130.00	1653	187.00	101
39.00	7470	82.00	3010	131.00	699	188.00	140
40.00	351	83.00	17	132.00	367	189.00	87
41.00	34	86.00	639	133.00	188	191.00	775
42.00	238	87.00	22896	135.00	822	192.00	210
43.00	177	88.00	21864	137.00	563	193.00	67
44.00	1962	89.00	113	139.00	49	194.00	238
45.00	3960	90.00	288	140.00	345	197.00	52
46.00	355	91.00	1434	141.00	4107	205.00	7
47.00	6638	92.00	12959	142.00	649	207.00	1909
48.00	2624	93.00	20104	143.00	3915	208.00	636
49.00	18112	94.00	57840	144.00	357	209.00	1444
50.00	90808	95.00	540608	145.00	360	210.00	79
51.00	28288	96.00	39656	146.00	599	216.00	11
52.00	1456	97.00	992	147.00	429	217.00	10
54.00	92	99.00	67	148.00	1023	218.00	101
55.00	822	103.00	161	149.00	582	219.00	213
56.00	6343	104.00	1697	150.00	653	220.00	53
57.00	12280	105.00	924	151.00	76	223.00	58
58.00	528	106.00	1819	152.00	331	232.00	235
60.00	4109	107.00	516	153.00	442	233.00	125
61.00	20856	108.00	149	154.00	457	234.00	37
62.00	21184	109.00	98	155.00	999	235.00	294
63.00	16278	110.00	62	156.00	524	239.00	34
64.00	1525	111.00	410	157.00	701	247.00	30
65.00	138	112.00	17	158.00	366	250.00	71
66.00	61	113.00	315	159.00	652	251.00	60
67.00	1079	115.00	197	161.00	582	252.00	147
68.00	48304	116.00	1794	162.00	113	253.00	291
69.00	50792	117.00	2259	163.00	236	254.00	302
70.00	4668	118.00	1524	165.00	289	255.00	276
71.00	185	119.00	2263	167.00	98	256.00	165
72.00	2453	120.00	156	173.00	2022	260.00	948
73.00	21552	122.00	67	174.00	353856	261.00	33
74.00	81016	123.00	266	175.00	24648	262.00	278
75.00	259840	124.00	264	176.00	339072		
76.00	22224	125.00	228	177.00	21552		
77.00	2999	126.00	142	178.00	563		
78.00	2171	127.00	302	179.00	283		

Data File:	cjrc001.d	Date:	25-MAR-2011 17:59
Client ID:	BFB	Instrument:	C.i
Operator:	sv	Inj Vol:	0.0 (ul)
Column Type:	Capillary	Diameter:	0.32 (mm)
Stationary Phase:	RTX-624		
Sample Info:	VBFB		
Lab Sample ID:	BFB		



TestAmerica Burlington

Data file : /chem/G.i/Gsvr.p/gffto15.b/gff001.d
Lab Smp Id: BFB Client Smp ID: BFB
Inj Date : 02-MAR-2011 14:04
Operator : wrd Inst ID: G.i
Smp Info : BFB
Misc Info :
Comment :
Method : /chem/G.i/Gsvr.p/gffto15.b/bfbto15.m
Meth Date : 24-Nov-2009 09:15 njr Quant Type: ESTD
Cal Date : 23-JUL-2003 17:23 Cal File: ai0005i4.d
Als bottle: 1 QC Sample: BFB
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 3.50 Sample Matrix: AIR
Processing Host: chemsvr6

Concentration Formula: Amt * DF * Uf * Vf * CpndVariable

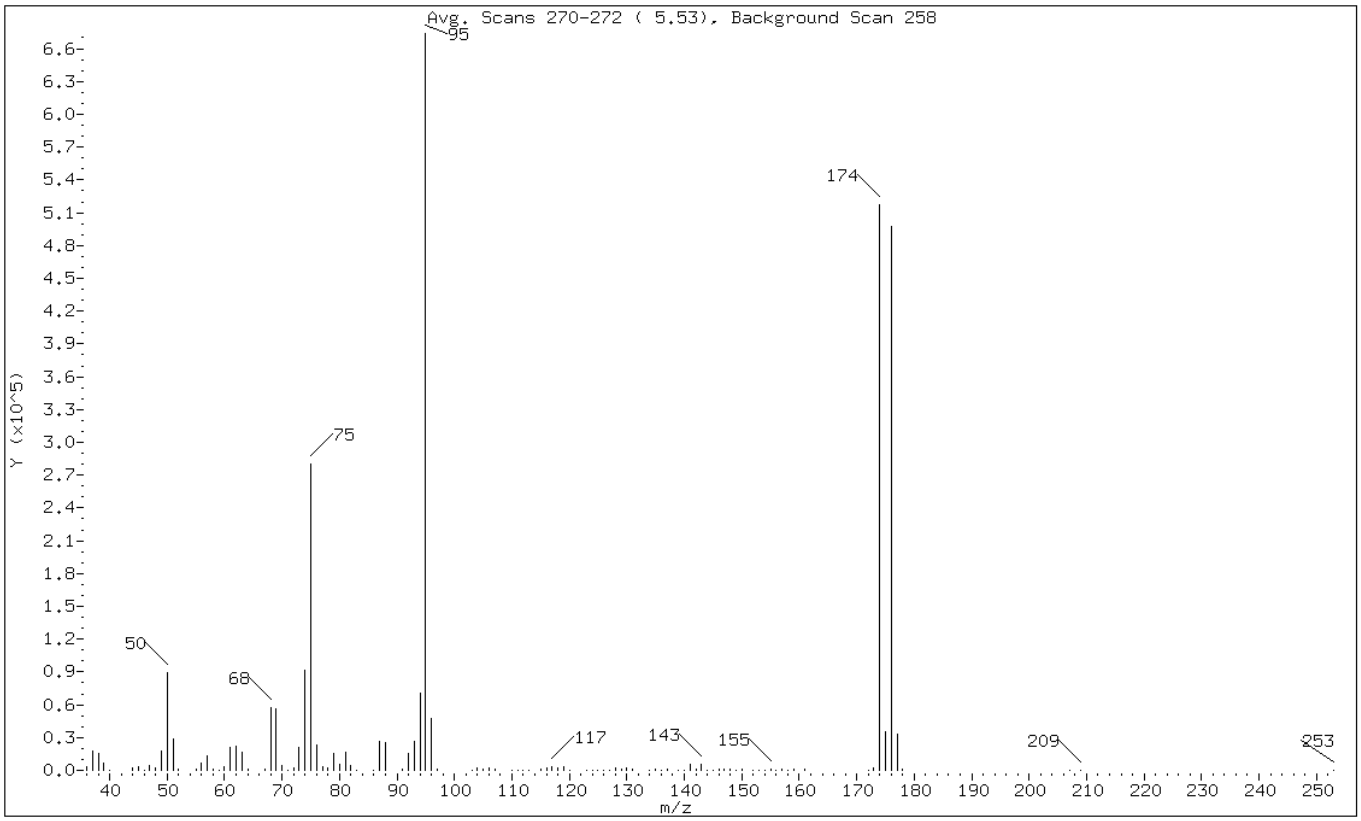
Name	Value	Description
DF	1.00000	Dilution Factor
Uf	1.00000	ng unit correction factor
Vf	1.00000	Volumetric correction factor

Cpnd Variable Local Compound Variable

					CONCENTRATIONS ON-COL	FINAL		
RT	EXP RT	DLT RT	MASS	RESPONSE	(ug/L)	(ug/L)	TARGET RANGE	RATIO
$ 1 bfb							CAS #: 460-00-4	
5.531	5.900	-0.369	95	673898			100.00- 100.00	100.00
5.531	5.900	-0.369	50	89696			8.00- 40.00	13.31
5.531	5.900	-0.369	75	279957			30.00- 66.00	41.54
5.531	5.900	-0.369	96	46907			5.00- 9.00	6.96
5.531	5.900	-0.369	173	2601			0.00- 2.00	0.50
5.531	5.900	-0.369	174	516757			50.00- 120.00	76.68
5.531	5.900	-0.369	175	35330			4.00- 9.00	6.84
5.531	5.900	-0.369	176	497472			93.00- 101.00	96.27
5.531	5.900	-0.369	177	32922			5.00- 9.00	6.62

Data File: gff001.d
Client ID: BFB
Operator: wrd
Column Type:
Stationary Phase: RTX-624
Sample Info: BFB
Lab Sample ID: BFB
1 bfb

Date: 02-MAR-2011 14:04
Instrument: G.i
Inj Vol: 0.0 (ul)
Diameter: 0.32 (mm)



m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
95	Base Peak, 100% relative abundance	100.00
50	8.00 - 40.00% of mass 95	13.31
75	30.00 - 66.00% of mass 95	41.54
96	5.00 - 9.00% of mass 95	6.96
173	Less than 2.00% of mass 174	0.39 (0.50)
174	50.00 - 120.00% of mass 95	76.68
175	4.00 - 9.00% of mass 174	5.24 (6.84)
176	93.00 - 101.00% of mass 174	73.82 (96.27)
177	5.00 - 9.00% of mass 176	4.89 (6.62)

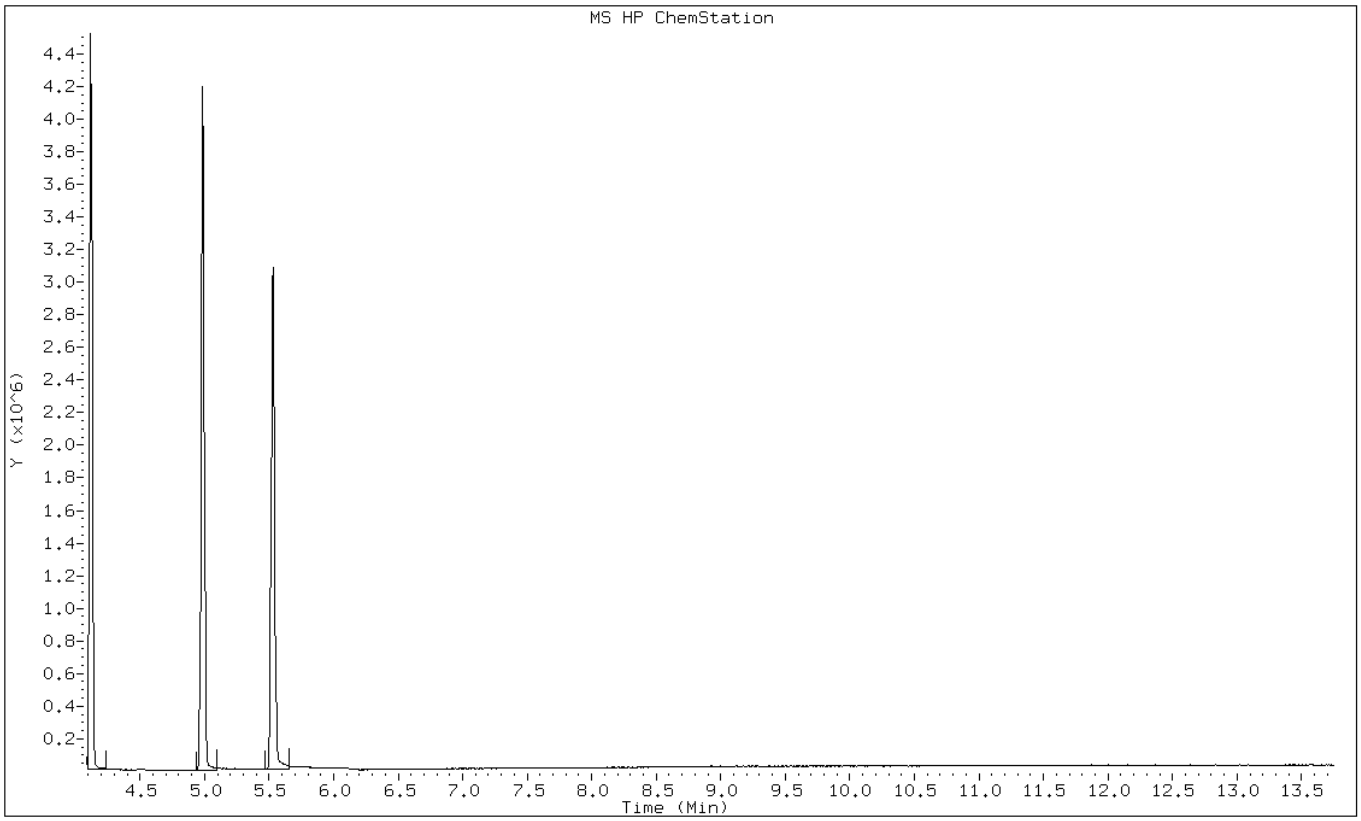
Data File: gff001.d
Client ID: BFB
Operator: wrd
Column Type:
Stationary Phase: RTX-624
Sample Info: BFB
Lab Sample ID: BFB

Date: 02-MAR-2011 14:04
Instrument: G.i
Inj Vol: 0.0 (ul)
Diameter: 0.32 (mm)

Data File: /chem/G.i/Gsvr.p/gffto15.b/gff001.d
Spectrum: Avg. Scans 270-272 (5.53), Background Scan 258
Location of Maximum: 95.00
Number of points: 110

m/z	Y	m/z	Y	m/z	Y	m/z	Y
36.00	3096	71.00	68	110.00	308	144.00	311
37.00	17344	72.00	2463	111.00	487	145.00	460
38.00	15338	73.00	21496	112.00	343	146.00	979
39.00	6452	74.00	91248	113.00	442	147.00	563
40.00	94	75.00	279936	115.00	730	148.00	1283
44.00	2131	76.00	23696	116.00	2220	149.00	421
45.00	3603	77.00	3195	117.00	3112	150.00	589
46.00	221	78.00	2100	118.00	1841	152.00	323
47.00	4246	79.00	15286	119.00	2864	153.00	450
48.00	2105	80.00	5657	120.00	168	154.00	336
49.00	17096	81.00	16264	123.00	264	155.00	1497
50.00	89696	82.00	3956	124.00	321	156.00	322
51.00	28408	83.00	382	125.00	100	157.00	1046
52.00	1185	86.00	544	126.00	350	158.00	141
55.00	1158	87.00	26224	127.00	210	159.00	739
56.00	6817	88.00	25800	128.00	2364	161.00	702
57.00	12709	91.00	1620	129.00	1096	172.00	92
58.00	581	92.00	15871	130.00	2585	173.00	2601
59.00	73	93.00	25992	131.00	997	174.00	516736
60.00	3461	94.00	70560	134.00	69	175.00	35328
61.00	20760	95.00	673856	135.00	1037	176.00	497472
62.00	21832	96.00	46904	136.00	78	177.00	32920
63.00	16824	97.00	1384	137.00	1083	178.00	857
64.00	1538	103.00	388	139.00	80	207.00	171
67.00	1369	104.00	2648	140.00	326	209.00	324
68.00	57456	105.00	988	141.00	5099	253.00	173
69.00	56056	106.00	2647	142.00	687		
70.00	4461	107.00	614	143.00	5503		

Data File:	gff001.d	Date:	02-MAR-2011 14:04
Client ID:	BFB	Instrument:	G.i
Operator:	wrd	Inj Vol:	0.0 (ul)
Column Type:		Diameter:	0.32 (mm)
Stationary Phase:	RTX-624		
Sample Info:	BFB		
Lab Sample ID:	BFB		



TestAmerica Burlington

Data file : /chem/G.i/Gsvr.p/gffvto15.b/gffv001.d
Lab Smp Id: BFB Client Smp ID: BFB
Inj Date : 29-MAR-2011 10:59
Operator : wrd Inst ID: G.i
Smp Info : BFB
Misc Info :
Comment :
Method : /chem/G.i/Gsvr.p/gffvto15.b/bfbto15.m
Meth Date : 24-Nov-2009 09:15 njr Quant Type: ESTD
Cal Date : 23-JUL-2003 17:23 Cal File: ai0005i4.d
Als bottle: 1 QC Sample: BFB
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 3.50 Sample Matrix: AIR
Processing Host: chemsvr6

Concentration Formula: Amt * DF * Uf * Vf * CpndVariable

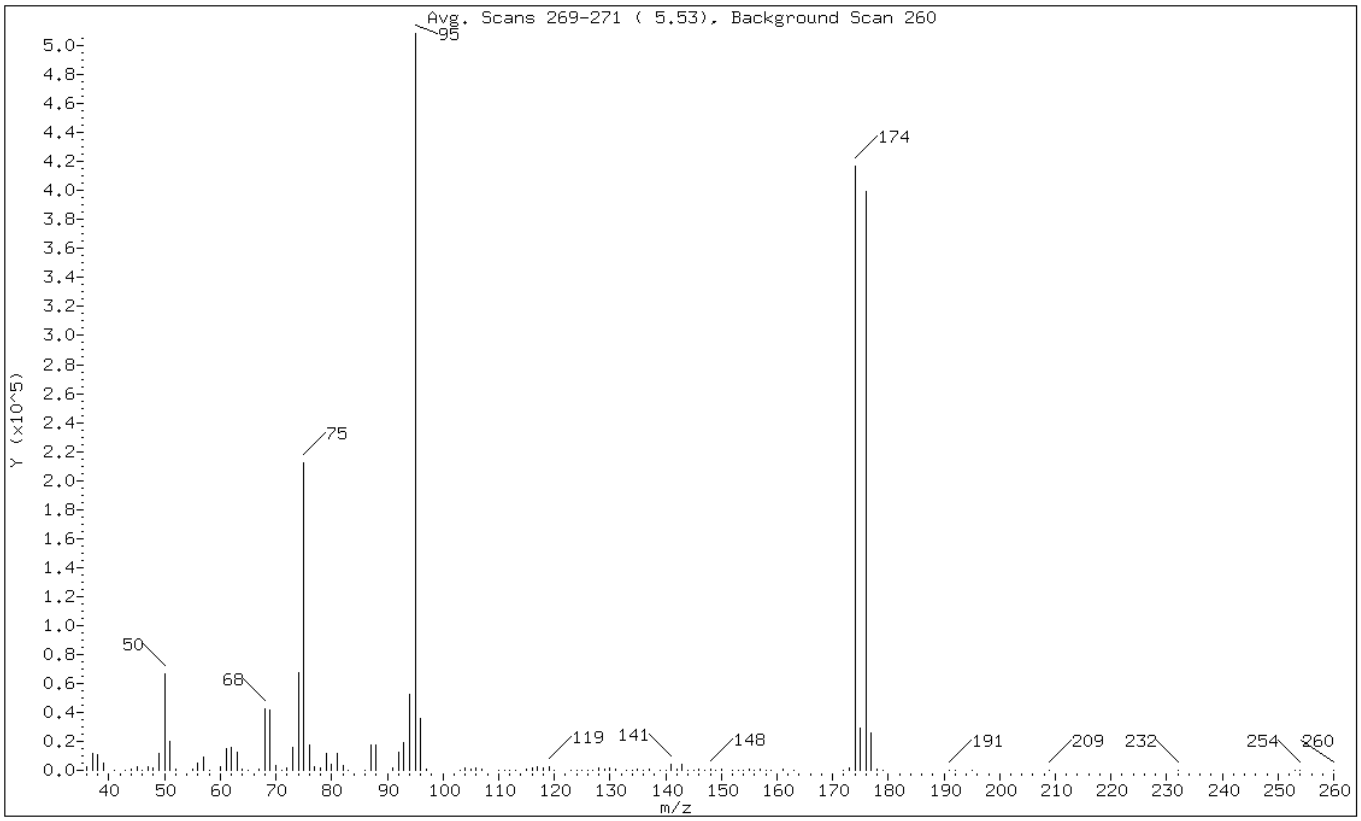
Name	Value	Description
DF	1.00000	Dilution Factor
Uf	1.00000	ng unit correction factor
Vf	1.00000	Volumetric correction factor

Cpnd Variable Local Compound Variable

					CONCENTRATIONS ON-COL	FINAL		
RT	EXP RT	DLT RT	MASS	RESPONSE	(ug/L)	(ug/L)	TARGET RANGE	RATIO
$ 1 bfb							CAS #: 460-00-4	
5.526	5.900	-0.374	95	508437			100.00- 100.00	100.00
5.526	5.900	-0.374	50	66893			8.00- 40.00	13.16
5.526	5.900	-0.374	75	212054			30.00- 66.00	41.71
5.526	5.900	-0.374	96	35443			5.00- 9.00	6.97
5.526	5.900	-0.374	173	1941			0.00- 2.00	0.47
5.526	5.900	-0.374	174	416981			50.00- 120.00	82.01
5.526	5.900	-0.374	175	29069			4.00- 9.00	6.97
5.526	5.900	-0.374	176	399274			93.00- 101.00	95.75
5.526	5.900	-0.374	177	25476			5.00- 9.00	6.38

Data File: gffv001.d
Client ID: BFB
Operator: wrd
Column Type:
Stationary Phase: RTX-624
Sample Info: BFB
Lab Sample ID: BFB
1 bfb

Date: 29-MAR-2011 10:59
Instrument: G.i
Inj Vol: 0.0 (ul)
Diameter: 0.32 (mm)



m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
95	Base Peak, 100% relative abundance	100.00
50	8.00 - 40.00% of mass 95	13.16
75	30.00 - 66.00% of mass 95	41.71
96	5.00 - 9.00% of mass 95	6.97
173	Less than 2.00% of mass 174	0.38 (0.47)
174	50.00 - 120.00% of mass 95	82.01
175	4.00 - 9.00% of mass 174	5.72 (6.97)
176	93.00 - 101.00% of mass 174	78.53 (95.75)
177	5.00 - 9.00% of mass 176	5.01 (6.38)

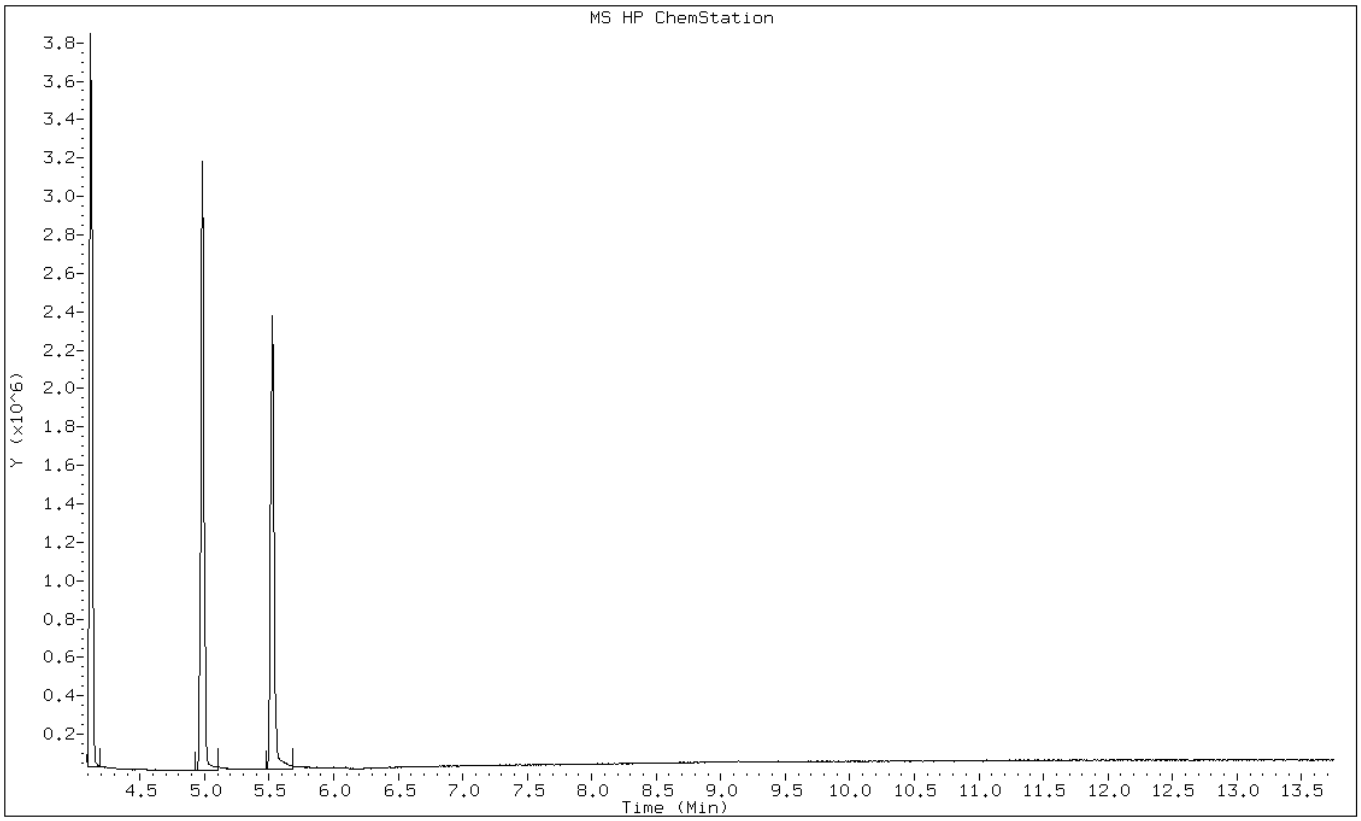
Data File: gffv001.d
Client ID: BFB
Operator: wrd
Column Type:
Stationary Phase: RTX-624
Sample Info: BFB
Lab Sample ID: BFB

Date: 29-MAR-2011 10:59
Instrument: G.i
Inj Vol: 0.0 (ul)
Diameter: 0.32 (mm)

Data File: /chem/G.i/Gsvr.p/gffvto15.b/gffv001.d
Spectrum: Avg. Scans 269-271 (5.53), Background Scan 260
Location of Maximum: 95.00
Number of points: 119

m/z	Y	m/z	Y	m/z	Y	m/z	Y
36.00	2130	72.00	1824	113.00	298	148.00	1135
37.00	11933	73.00	15655	115.00	555	149.00	404
38.00	11040	74.00	67384	116.00	1642	150.00	483
39.00	4860	75.00	212032	117.00	2187	152.00	185
41.00	96	76.00	17784	118.00	1452	153.00	374
43.00	76	77.00	2402	119.00	2355	154.00	310
44.00	1110	78.00	1322	120.00	78	155.00	1117
45.00	2716	79.00	11294	123.00	81	156.00	321
46.00	75	80.00	4245	124.00	256	157.00	845
47.00	2671	81.00	11626	125.00	278	158.00	73
48.00	1608	82.00	3033	126.00	86	159.00	409
49.00	12038	83.00	314	127.00	274	161.00	516
50.00	66888	86.00	415	128.00	2004	163.00	71
51.00	19888	87.00	17736	129.00	874	172.00	248
52.00	753	88.00	17824	130.00	1844	173.00	1941
55.00	768	91.00	1323	131.00	758	174.00	416960
56.00	4991	92.00	12139	133.00	121	175.00	29064
57.00	9257	93.00	19152	134.00	167	176.00	399232
58.00	357	94.00	52400	135.00	640	177.00	25472
60.00	2833	95.00	508416	136.00	247	178.00	780
61.00	15191	96.00	35440	137.00	834	179.00	73
62.00	15441	97.00	992	139.00	68	191.00	97
63.00	12211	103.00	63	140.00	273	192.00	90
64.00	1106	104.00	1905	141.00	3912	195.00	75
65.00	137	105.00	661	142.00	489	209.00	128
67.00	861	106.00	1922	143.00	3905	232.00	151
68.00	42240	107.00	550	144.00	100	253.00	55
69.00	41896	110.00	256	145.00	334	254.00	79
70.00	3297	111.00	349	146.00	602	260.00	4
71.00	69	112.00	270	147.00	241		

Data File:	gffv001.d	Date:	29-MAR-2011 10:59
Client ID:	BFB	Instrument:	G.i
Operator:	wrd	Inj Vol:	0.0 (ul)
Column Type:		Diameter:	0.32 (mm)
Stationary Phase:	RTX-624		
Sample Info:	BFB		
Lab Sample ID:	BFB		



FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Client Sample ID: Lab Sample ID: MB 200-15760/6

Matrix: Air Lab File ID: cjrc006.d

Analysis Method: TO-15 Date Collected:

Sample wt/vol: 200(mL) Date Analyzed: 03/25/2011 21:58

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-624 ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 15760 Units: ppb v/v

CAS NO.	COMPOUND NAME	MOLECULAR WEIGHT	RESULT	Q	RL	RL
71-43-2	Benzene	78.11	0.20	U	0.20	0.20
75-25-2	Bromoform	252.75	0.20	U	0.20	0.20
74-83-9	Bromomethane	94.94	0.20	U	0.20	0.20
75-15-0	Carbon disulfide	76.14	0.50	U	0.50	0.50
56-23-5	Carbon tetrachloride	153.81	0.20	U	0.20	0.20
108-90-7	Chlorobenzene	112.30	0.20	U	0.20	0.20
75-00-3	Chloroethane	64.52	0.50	U	0.50	0.50
67-66-3	Chloroform	119.38	0.20	U	0.20	0.20
74-87-3	Chloromethane	50.49	0.50	U	0.50	0.50
106-46-7	1,4-Dichlorobenzene	147.00	0.20	U	0.20	0.20
75-34-3	1,1-Dichloroethane	98.96	0.20	U	0.20	0.20
107-06-2	1,2-Dichloroethane	98.96	0.20	U	0.20	0.20
75-35-4	1,1-Dichloroethene	96.94	0.20	U	0.20	0.20
78-87-5	1,2-Dichloropropane	112.99	0.20	U	0.20	0.20
123-91-1	1,4-Dioxane	88.11	5.0	U	5.0	5.0
100-41-4	Ethylbenzene	106.17	0.20	U	0.20	0.20
87-68-3	Hexachlorobutadiene	260.76	0.20	U	0.20	0.20
75-09-2	Methylene Chloride	84.93	0.50	U	0.50	0.50
91-20-3	Naphthalene	128.17	0.50	U	0.50	0.50
100-42-5	Styrene	104.15	0.20	U	0.20	0.20
79-34-5	1,1,2,2-Tetrachloroethane	167.85	0.20	U	0.20	0.20
127-18-4	Tetrachloroethene	165.83	0.20	U	0.20	0.20
108-88-3	Toluene	92.14	0.20	U	0.20	0.20
120-82-1	1,2,4-Trichlorobenzene	181.45	0.50	U	0.50	0.50
71-55-6	1,1,1-Trichloroethane	133.41	0.20	U	0.20	0.20
79-00-5	1,1,2-Trichloroethane	133.41	0.20	U	0.20	0.20
75-01-4	Vinyl chloride	62.50	0.20	U	0.20	0.20
1330-20-7	Xylene (total)	106.17	0.20	U	0.20	0.20
79-01-6	Trichloroethene	131.39	0.20	U	0.20	0.20

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Client Sample ID: Lab Sample ID: MB 200-15760/6

Matrix: Air Lab File ID: cjrc006.d

Analysis Method: TO-15 Date Collected:

Sample wt/vol: 200(mL) Date Analyzed: 03/25/2011 21:58

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-624 ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 15760 Units: ug/m3

CAS NO.	COMPOUND NAME	MOLECULAR WEIGHT	RESULT	Q	RL	RL
71-43-2	Benzene	78.11	0.64	U	0.64	0.64
75-25-2	Bromoform	252.75	2.1	U	2.1	2.1
74-83-9	Bromomethane	94.94	0.78	U	0.78	0.78
75-15-0	Carbon disulfide	76.14	1.6	U	1.6	1.6
56-23-5	Carbon tetrachloride	153.81	1.3	U	1.3	1.3
108-90-7	Chlorobenzene	112.30	0.92	U	0.92	0.92
75-00-3	Chloroethane	64.52	1.3	U	1.3	1.3
67-66-3	Chloroform	119.38	0.98	U	0.98	0.98
74-87-3	Chloromethane	50.49	1.0	U	1.0	1.0
106-46-7	1,4-Dichlorobenzene	147.00	1.2	U	1.2	1.2
75-34-3	1,1-Dichloroethane	98.96	0.81	U	0.81	0.81
107-06-2	1,2-Dichloroethane	98.96	0.81	U	0.81	0.81
75-35-4	1,1-Dichloroethene	96.94	0.79	U	0.79	0.79
78-87-5	1,2-Dichloropropane	112.99	0.92	U	0.92	0.92
123-91-1	1,4-Dioxane	88.11	18	U	18	18
100-41-4	Ethylbenzene	106.17	0.87	U	0.87	0.87
87-68-3	Hexachlorobutadiene	260.76	2.1	U	2.1	2.1
75-09-2	Methylene Chloride	84.93	1.7	U	1.7	1.7
91-20-3	Naphthalene	128.17	2.6	U	2.6	2.6
100-42-5	Styrene	104.15	0.85	U	0.85	0.85
79-34-5	1,1,2,2-Tetrachloroethane	167.85	1.4	U	1.4	1.4
127-18-4	Tetrachloroethene	165.83	1.4	U	1.4	1.4
108-88-3	Toluene	92.14	0.75	U	0.75	0.75
120-82-1	1,2,4-Trichlorobenzene	181.45	3.7	U	3.7	3.7
71-55-6	1,1,1-Trichloroethane	133.41	1.1	U	1.1	1.1
79-00-5	1,1,2-Trichloroethane	133.41	1.1	U	1.1	1.1
75-01-4	Vinyl chloride	62.50	0.51	U	0.51	0.51
1330-20-7	Xylene (total)	106.17	0.87	U	0.87	0.87
79-01-6	Trichloroethene	131.39	1.1	U	1.1	1.1

TestAmerica Burlington

AIR TOXICS QUANTITATION REPORT

Data file : /chem/C.i/Csvr.p/cjrcto15.b/cjrc006.d
Lab Smp Id: mb Client Smp ID: mb
Inj Date : 25-MAR-2011 21:58
Operator : sv Inst ID: C.i
Smp Info : mb
Misc Info : 200,1,
Comment :
Method : /chem/C.i/Csvr.p/cjrcto15.b/to15v5.m
Meth Date : 30-Mar-2011 09:16 klp Quant Type: ISTD
Cal Date : 22-MAR-2011 22:39 Cal File: cjr009.d
Als bottle: 3 QC Sample: BLANK
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 3.50
Processing Host: chemsvr6

Concentration Formula: Amt * DF * Uf*(Vo/Vo)*(Vf/Vf) * CpndVariable

Name	Value	Description
DF	1.00000	Dilution Factor
Uf	1.00000	ng unit correction factor
Vo	200.00000	Sample Volume purged (mL)
Vf	200.00000	Final Volume (mL)

Cpnd Variable Local Compound Variable

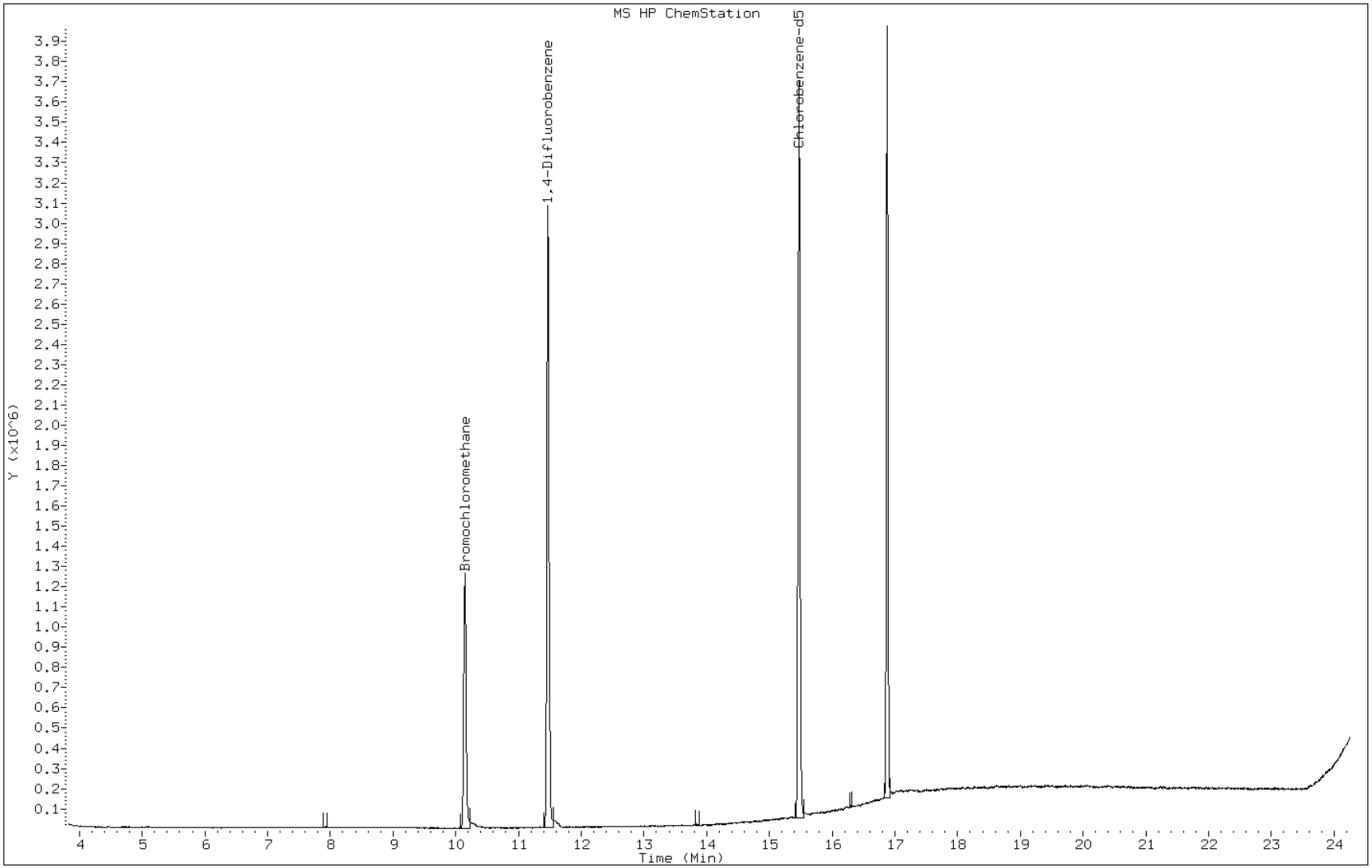
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	CONCENTRATIONS FINAL (ppb v/v)
1 Propene	41	Compound Not Detected.					
2 Dichlorodifluoromethane	85	Compound Not Detected.					
3 Chlorodifluoromethane	51	Compound Not Detected.					
4 1,2-Dichloro-1,1,2,2-tetraflu	85	Compound Not Detected.					
5 Chloromethane	50	Compound Not Detected.					
6 Butane	43	Compound Not Detected.					
7 Vinyl chloride	62	Compound Not Detected.					
8 1,3-Butadiene	54	Compound Not Detected.					
9 Bromomethane	94	Compound Not Detected.					
10 Chloroethane	64	Compound Not Detected.					
11 2-Methylbutane	43	Compound Not Detected.					
12 Vinyl bromide	106	Compound Not Detected.					
13 Trichlorofluoromethane	101	Compound Not Detected.					
14 Pentane	43	Compound Not Detected.					

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	FINAL (ppb v/v)
	15 Ethanol	45	Compound Not Detected.					
	16 Ethyl ether	59	Compound Not Detected.					
	17 1,1,2-Trichloro-1,2,2-trifluo	101	Compound Not Detected.					
	18 Acrolein	56	Compound Not Detected.					
	19 1,1-Dichloroethene	96	Compound Not Detected.					
	20 Acetone	43	Compound Not Detected.					
	21 Carbon disulfide	76	Compound Not Detected.					
	22 Isopropanol	45	Compound Not Detected.					
	23 Allyl chloride	41	Compound Not Detected.					
	24 Acetonitrile	41	Compound Not Detected.					
	25 Methylene chloride	49	Compound Not Detected.					
	26 Tert-butyl alcohol	59	Compound Not Detected.					
	27 Methyl tert-butyl ether	73	Compound Not Detected.					
	28 1,2-Dichloroethene (trans)	61	Compound Not Detected.					
	29 Acrylonitrile	53	Compound Not Detected.					
	30 n-Hexane	57	Compound Not Detected.					
	31 1,1-Dichloroethane	63	Compound Not Detected.					
	32 Vinyl acetate	43	Compound Not Detected.					
M	33 1,2-Dichloroethene,Total	61	Compound Not Detected.					
	34 1,2-Dichloroethene (cis)	96	Compound Not Detected.					
	35 Ethyl acetate	88	Compound Not Detected.					
	36 Methyl Ethyl Ketone	72	Compound Not Detected.					
*	37 Bromochloromethane	128	10.149	10.154	(1.000)	546702	10.0000	
	38 Tetrahydrofuran	42	Compound Not Detected.					
	39 Chloroform	83	Compound Not Detected.					
	40 Cyclohexane	84	Compound Not Detected.					
	41 1,1,1-Trichloroethane	97	Compound Not Detected.					
	42 Carbon tetrachloride	117	Compound Not Detected.					
	43 2,2,4-Trimethylpentane	57	Compound Not Detected.					
	44 Benzene	78	Compound Not Detected.					
	45 1,2-Dichloroethane	62	Compound Not Detected.					
	46 n-Heptane	43	Compound Not Detected.					
*	47 1,4-Difluorobenzene	114	11.472	11.478	(1.000)	3526705	10.0000	
	48 n-Butanol	56	Compound Not Detected.					
	49 Trichloroethene	95	Compound Not Detected.					
	50 1,2-Dichloropropane	63	Compound Not Detected.					
	51 Methyl methacrylate	69	Compound Not Detected.					
	52 Dibromomethane	174	Compound Not Detected.					
	53 1,4-Dioxane	88	Compound Not Detected.					
	54 Bromodichloromethane	83	Compound Not Detected.					
	55 1,3-Dichloropropene (cis)	75	Compound Not Detected.					
	56 Methyl isobutyl ketone	43	Compound Not Detected.					
	57 n-Octane	43	Compound Not Detected.					
	58 Toluene	92	Compound Not Detected.					
	59 1,3-Dichloropropene (trans)	75	Compound Not Detected.					
	60 1,1,2-Trichloroethane	83	Compound Not Detected.					
	61 Tetrachloroethene	166	Compound Not Detected.					

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	FINAL (ppb v/v)
62	2-Hexanone	43	Compound Not Detected.					
63	Dibromochloromethane	129	Compound Not Detected.					
64	1,2-Dibromoethane	107	Compound Not Detected.					
* 65	Chlorobenzene-d5	117	15.469	15.480	(1.000)	2803507	10.0000	
66	Chlorobenzene	112	Compound Not Detected.					
67	n-Nonane	57	Compound Not Detected.					
68	Ethylbenzene	91	Compound Not Detected.					
69	Xylene (m,p)	106	Compound Not Detected.					
M 70	Xylenes, Total	106	Compound Not Detected.					
71	Xylene (o)	106	Compound Not Detected.					
72	Styrene	104	Compound Not Detected.					
73	Bromoform	173	Compound Not Detected.					
74	Isopropylbenzene	105	Compound Not Detected.					
75	1,1,2,2-Tetrachloroethane	83	Compound Not Detected.					
76	n-Propylbenzene	91	Compound Not Detected.					
77	1,2,3-Trichloropropane	75	Compound Not Detected.					
78	n-Decane	57	Compound Not Detected.					
79	4-Ethyltoluene	105	Compound Not Detected.					
80	2-Chlorotoluene	91	Compound Not Detected.					
81	1,3,5-Trimethylbenzene	105	Compound Not Detected.					
82	Alpha Methyl Styrene	118	Compound Not Detected.					
83	tert-butylbenzene	119	Compound Not Detected.					
84	1,2,4-Trimethylbenzene	105	Compound Not Detected.					
85	sec-Butylbenzene	105	Compound Not Detected.					
86	4-Isopropyltoluene	119	Compound Not Detected.					
87	1,3-Dichlorobenzene	146	Compound Not Detected.					
88	1,4-Dichlorobenzene	146	Compound Not Detected.					
89	Benzyl chloride	91	Compound Not Detected.					
90	Undecane	57	Compound Not Detected.					
91	n-Butylbenzene	91	Compound Not Detected.					
92	1,2-Dichlorobenzene	146	Compound Not Detected.					
93	Dodecane	57	Compound Not Detected.					
94	1,2,4-Trichlorobenzene	180	Compound Not Detected.					
95	1,3-Hexachlorobutadiene	225	Compound Not Detected.					
96	Naphthalene	128	Compound Not Detected.					
97	1,2,3-Trichlorobenzene	180	Compound Not Detected.					

Data File: cjrc006.d
Client ID: mb
Operator: sv
Column Type: Capillary
Stationary Phase: RTX-624
Sample Info: mb
Lab Sample ID: mb

Date: 25-MAR-2011 21:58
Instrument: C.i
Inj Vol: 200.0
Diameter: 0.32



FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Client Sample ID: Lab Sample ID: MB 200-15787/4

Matrix: Air Lab File ID: gffv004.d

Analysis Method: TO-15 Date Collected:

Sample wt/vol: 200(mL) Date Analyzed: 03/29/2011 13:38

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-624 ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 15787 Units: ppb v/v

CAS NO.	COMPOUND NAME	MOLECULAR WEIGHT	RESULT	Q	RL	RL
71-43-2	Benzene	78.11	0.20	U	0.20	0.20
75-25-2	Bromoform	252.75	0.20	U	0.20	0.20
74-83-9	Bromomethane	94.94	0.20	U	0.20	0.20
75-15-0	Carbon disulfide	76.14	0.50	U	0.50	0.50
56-23-5	Carbon tetrachloride	153.81	0.20	U	0.20	0.20
108-90-7	Chlorobenzene	112.30	0.20	U	0.20	0.20
75-00-3	Chloroethane	64.52	0.50	U	0.50	0.50
67-66-3	Chloroform	119.38	0.20	U	0.20	0.20
74-87-3	Chloromethane	50.49	0.50	U	0.50	0.50
106-46-7	1,4-Dichlorobenzene	147.00	0.20	U	0.20	0.20
75-34-3	1,1-Dichloroethane	98.96	0.20	U	0.20	0.20
107-06-2	1,2-Dichloroethane	98.96	0.20	U	0.20	0.20
75-35-4	1,1-Dichloroethene	96.94	0.20	U	0.20	0.20
78-87-5	1,2-Dichloropropane	112.99	0.20	U	0.20	0.20
123-91-1	1,4-Dioxane	88.11	5.0	U	5.0	5.0
100-41-4	Ethylbenzene	106.17	0.20	U	0.20	0.20
87-68-3	Hexachlorobutadiene	260.76	0.20	U	0.20	0.20
75-09-2	Methylene Chloride	84.93	0.50	U	0.50	0.50
91-20-3	Naphthalene	128.17	0.50	U	0.50	0.50
100-42-5	Styrene	104.15	0.20	U	0.20	0.20
79-34-5	1,1,2,2-Tetrachloroethane	167.85	0.20	U	0.20	0.20
127-18-4	Tetrachloroethene	165.83	0.20	U	0.20	0.20
108-88-3	Toluene	92.14	0.20	U	0.20	0.20
120-82-1	1,2,4-Trichlorobenzene	181.45	0.50	U	0.50	0.50
71-55-6	1,1,1-Trichloroethane	133.41	0.20	U	0.20	0.20
79-00-5	1,1,2-Trichloroethane	133.41	0.20	U	0.20	0.20
75-01-4	Vinyl chloride	62.50	0.20	U	0.20	0.20
1330-20-7	Xylene (total)	106.17	0.20	U	0.20	0.20
79-01-6	Trichloroethene	131.39	0.20	U	0.20	0.20

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Client Sample ID: Lab Sample ID: MB 200-15787/4

Matrix: Air Lab File ID: gffv004.d

Analysis Method: TO-15 Date Collected:

Sample wt/vol: 200(mL) Date Analyzed: 03/29/2011 13:38

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-624 ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 15787 Units: ug/m3

CAS NO.	COMPOUND NAME	MOLECULAR WEIGHT	RESULT	Q	RL	RL
71-43-2	Benzene	78.11	0.64	U	0.64	0.64
75-25-2	Bromoform	252.75	2.1	U	2.1	2.1
74-83-9	Bromomethane	94.94	0.78	U	0.78	0.78
75-15-0	Carbon disulfide	76.14	1.6	U	1.6	1.6
56-23-5	Carbon tetrachloride	153.81	1.3	U	1.3	1.3
108-90-7	Chlorobenzene	112.30	0.92	U	0.92	0.92
75-00-3	Chloroethane	64.52	1.3	U	1.3	1.3
67-66-3	Chloroform	119.38	0.98	U	0.98	0.98
74-87-3	Chloromethane	50.49	1.0	U	1.0	1.0
106-46-7	1,4-Dichlorobenzene	147.00	1.2	U	1.2	1.2
75-34-3	1,1-Dichloroethane	98.96	0.81	U	0.81	0.81
107-06-2	1,2-Dichloroethane	98.96	0.81	U	0.81	0.81
75-35-4	1,1-Dichloroethene	96.94	0.79	U	0.79	0.79
78-87-5	1,2-Dichloropropane	112.99	0.92	U	0.92	0.92
123-91-1	1,4-Dioxane	88.11	18	U	18	18
100-41-4	Ethylbenzene	106.17	0.87	U	0.87	0.87
87-68-3	Hexachlorobutadiene	260.76	2.1	U	2.1	2.1
75-09-2	Methylene Chloride	84.93	1.7	U	1.7	1.7
91-20-3	Naphthalene	128.17	2.6	U	2.6	2.6
100-42-5	Styrene	104.15	0.85	U	0.85	0.85
79-34-5	1,1,2,2-Tetrachloroethane	167.85	1.4	U	1.4	1.4
127-18-4	Tetrachloroethene	165.83	1.4	U	1.4	1.4
108-88-3	Toluene	92.14	0.75	U	0.75	0.75
120-82-1	1,2,4-Trichlorobenzene	181.45	3.7	U	3.7	3.7
71-55-6	1,1,1-Trichloroethane	133.41	1.1	U	1.1	1.1
79-00-5	1,1,2-Trichloroethane	133.41	1.1	U	1.1	1.1
75-01-4	Vinyl chloride	62.50	0.51	U	0.51	0.51
1330-20-7	Xylene (total)	106.17	0.87	U	0.87	0.87
79-01-6	Trichloroethene	131.39	1.1	U	1.1	1.1

TestAmerica Burlington

AIR TOXICS QUANTITATION REPORT

Data file : /chem/G.i/Gsvr.p/gffvto15.b/gffv004.d
Lab Smp Id: mb Client Smp ID: mb
Inj Date : 29-MAR-2011 13:38
Operator : wrd Inst ID: G.i
Smp Info : mb
Misc Info : 200,1,mb
Comment :
Method : /chem/G.i/Gsvr.p/gffvto15.b/to15v5.m
Meth Date : 30-Mar-2011 09:27 wrd Quant Type: ISTD
Cal Date : 03-MAR-2011 10:00 Cal File: gff015.d
Als bottle: 4 QC Sample: BLANK
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 3.50
Processing Host: chemsvr6

Concentration Formula: Amt * DF * Uf*(Vo/Vo)*(Vf/Vf) * CpndVariable

Name	Value	Description
DF	1.00000	Dilution Factor
Uf	1.00000	ng unit correction factor
Vo	200.00000	Sample Volume purged (mL)
Vf	200.00000	Final Volume (mL)

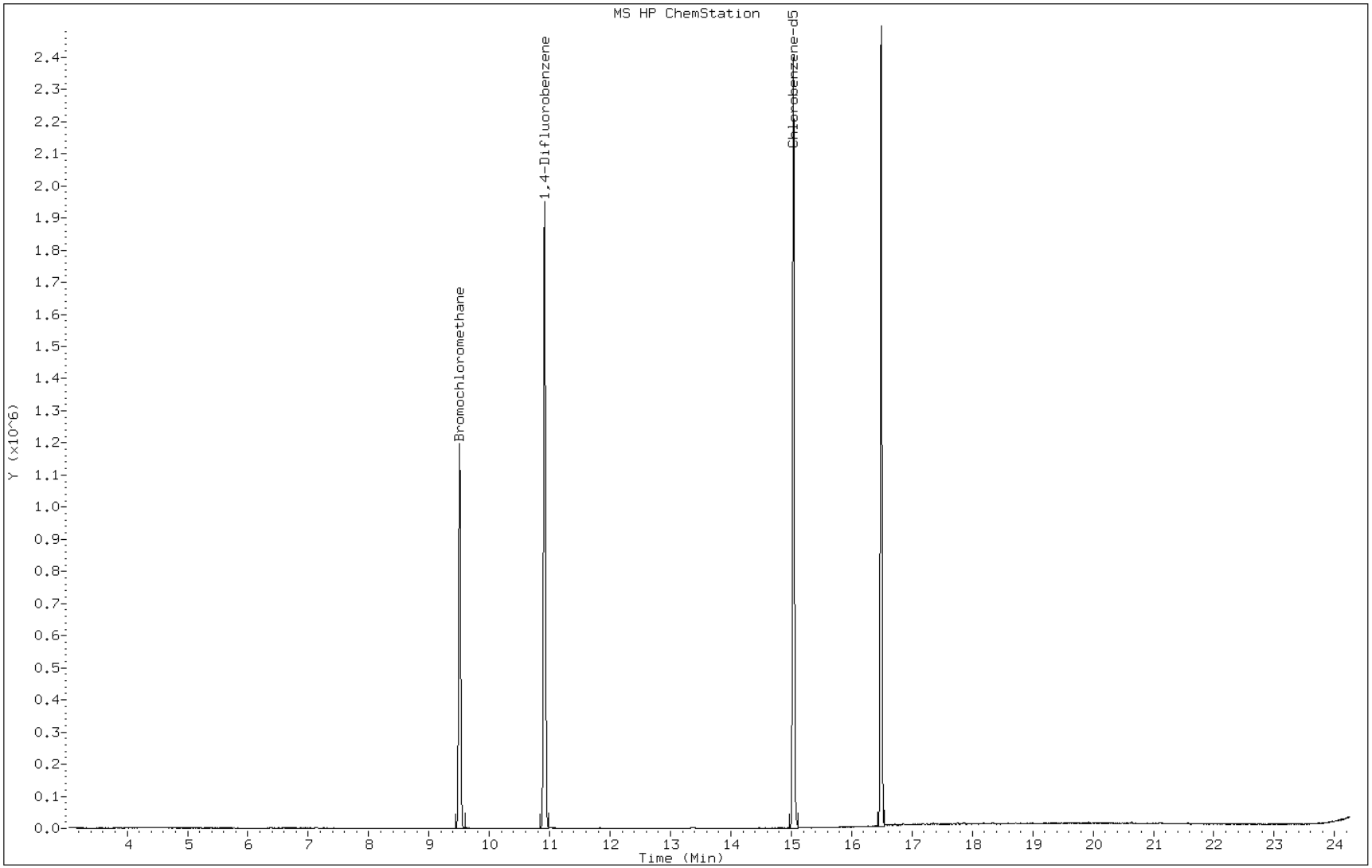
Cpnd Variable Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	CONCENTRATIONS FINAL (ppb v/v)
1 Propene	41	Compound Not Detected.					
2 Dichlorodifluoromethane	85	Compound Not Detected.					
3 Chlorodifluoromethane	51	Compound Not Detected.					
4 1,2-Dichloro-1,1,2,2-tetraflu	85	Compound Not Detected.					
5 Chloromethane	50	Compound Not Detected.					
6 Butane	43	Compound Not Detected.					
7 Vinyl chloride	62	Compound Not Detected.					
8 1,3-Butadiene	54	Compound Not Detected.					
9 Bromomethane	94	Compound Not Detected.					
10 Chloroethane	64	Compound Not Detected.					
11 2-Methylbutane	43	Compound Not Detected.					
12 Vinyl bromide	106	Compound Not Detected.					
13 Trichlorofluoromethane	101	Compound Not Detected.					
14 Pentane	43	Compound Not Detected.					

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	FINAL (ppb v/v)
	15 Ethanol	45	Compound Not Detected.					
	16 Ethyl ether	59	Compound Not Detected.					
	17 1,1,2-Trichloro-1,2,2-trifluo	101	Compound Not Detected.					
	18 Acrolein	56	Compound Not Detected.					
	19 1,1-Dichloroethene	96	Compound Not Detected.					
	20 Acetone	43	Compound Not Detected.					
	21 Carbon disulfide	76	Compound Not Detected.					
	22 Isopropanol	45	Compound Not Detected.					
	23 Allyl chloride	41	Compound Not Detected.					
	24 Acetonitrile	41	Compound Not Detected.					
	25 Methylene chloride	49	Compound Not Detected.					
	26 Tert-butyl alcohol	59	Compound Not Detected.					
	27 Methyl tert-butyl ether	73	Compound Not Detected.					
	28 1,2-Dichloroethene (trans)	61	Compound Not Detected.					
	29 Acrylonitrile	53	Compound Not Detected.					
	30 n-Hexane	57	Compound Not Detected.					
	31 1,1-Dichloroethane	63	Compound Not Detected.					
	32 Vinyl acetate	43	Compound Not Detected.					
M	33 1,2-Dichloroethene,Total	61	Compound Not Detected.					
	34 1,2-Dichloroethene (cis)	96	Compound Not Detected.					
	35 Ethyl acetate	88	Compound Not Detected.					
	36 Methyl Ethyl Ketone	72	Compound Not Detected.					
*	37 Bromochloromethane	128	9.505	9.531	(1.000)	481737	10.0000	
	38 Tetrahydrofuran	42	Compound Not Detected.					
	39 Chloroform	83	Compound Not Detected.					
	40 Cyclohexane	84	Compound Not Detected.					
	41 1,1,1-Trichloroethane	97	Compound Not Detected.					
	42 Carbon tetrachloride	117	Compound Not Detected.					
	43 2,2,4-Trimethylpentane	57	Compound Not Detected.					
	44 Benzene	78	Compound Not Detected.					
	45 1,2-Dichloroethane	62	Compound Not Detected.					
	46 n-Heptane	43	Compound Not Detected.					
*	47 1,4-Difluorobenzene	114	10.912	10.933	(1.000)	2253192	10.0000	
	48 n-Butanol	56	Compound Not Detected.					
	49 Trichloroethene	95	Compound Not Detected.					
	50 1,2-Dichloropropane	63	Compound Not Detected.					
	51 Methyl methacrylate	69	Compound Not Detected.					
	52 Dibromomethane	174	Compound Not Detected.					
	53 1,4-Dioxane	88	Compound Not Detected.					
	54 Bromodichloromethane	83	Compound Not Detected.					
	55 1,3-Dichloropropene (cis)	75	Compound Not Detected.					
	56 Methyl isobutyl ketone	43	Compound Not Detected.					
	57 n-Octane	43	Compound Not Detected.					
	58 Toluene	92	Compound Not Detected.					
	59 1,3-Dichloropropene (trans)	75	Compound Not Detected.					
	60 1,1,2-Trichloroethane	83	Compound Not Detected.					
	61 Tetrachloroethene	166	Compound Not Detected.					

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	FINAL (ppb v/v)
62	2-Hexanone	43	Compound Not Detected.					
63	Dibromochloromethane	129	Compound Not Detected.					
64	1,2-Dibromoethane	107	Compound Not Detected.					
* 65	Chlorobenzene-d5	117	15.036	15.052	(1.000)	1873565	10.0000	
66	Chlorobenzene	112	Compound Not Detected.					
67	n-Nonane	57	Compound Not Detected.					
68	Ethylbenzene	91	Compound Not Detected.					
69	Xylene (m,p)	106	Compound Not Detected.					
M 70	Xylenes, Total	106	Compound Not Detected.					
71	Xylene (o)	106	Compound Not Detected.					
72	Styrene	104	Compound Not Detected.					
73	Bromoform	173	Compound Not Detected.					
74	Isopropylbenzene	105	Compound Not Detected.					
75	1,1,2,2-Tetrachloroethane	83	Compound Not Detected.					
76	n-Propylbenzene	91	Compound Not Detected.					
77	1,2,3-Trichloropropane	75	Compound Not Detected.					
78	n-Decane	57	Compound Not Detected.					
79	4-Ethyltoluene	105	Compound Not Detected.					
80	2-Chlorotoluene	91	Compound Not Detected.					
81	1,3,5-Trimethylbenzene	105	Compound Not Detected.					
82	Alpha Methyl Styrene	118	Compound Not Detected.					
83	tert-butylbenzene	119	Compound Not Detected.					
84	1,2,4-Trimethylbenzene	105	Compound Not Detected.					
85	sec-Butylbenzene	105	Compound Not Detected.					
86	4-Isopropyltoluene	119	Compound Not Detected.					
87	1,3-Dichlorobenzene	146	Compound Not Detected.					
88	1,4-Dichlorobenzene	146	Compound Not Detected.					
89	Benzyl chloride	91	Compound Not Detected.					
90	Undecane	57	Compound Not Detected.					
91	n-Butylbenzene	91	Compound Not Detected.					
92	1,2-Dichlorobenzene	146	Compound Not Detected.					
93	Dodecane	57	Compound Not Detected.					
94	1,2,4-Trichlorobenzene	180	Compound Not Detected.					
95	1,3-Hexachlorobutadiene	225	Compound Not Detected.					
96	Naphthalene	128	Compound Not Detected.					
97	1,2,3-Trichlorobenzene	180	Compound Not Detected.					

Data File:	gffv004.d	Date:	29-MAR-2011 13:38
Client ID:	mb	Instrument:	G.i
Operator:	wrd	Inj Vol:	200.0
Column Type:	Capillary	Diameter:	0.32
Stationary Phase:	RTX-624		
Sample Info:	mb		
Lab Sample ID:	mb		



FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Client Sample ID: Lab Sample ID: LCS 200-15760/5

Matrix: Air Lab File ID: cjrc005.d

Analysis Method: TO-15 Date Collected:

Sample wt/vol: 200(mL) Date Analyzed: 03/25/2011 21:10

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-624 ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 15760 Units: ppb v/v

CAS NO.	COMPOUND NAME	MOLECULAR WEIGHT	RESULT	Q	RL	RL
71-43-2	Benzene	78.11	9.75		0.20	0.20
75-25-2	Bromoform	252.75	11.1		0.20	0.20
74-83-9	Bromomethane	94.94	9.51		0.20	0.20
75-15-0	Carbon disulfide	76.14	9.83		0.50	0.50
56-23-5	Carbon tetrachloride	153.81	10.9		0.20	0.20
108-90-7	Chlorobenzene	112.30	9.59		0.20	0.20
75-00-3	Chloroethane	64.52	9.78		0.50	0.50
67-66-3	Chloroform	119.38	10.4		0.20	0.20
74-87-3	Chloromethane	50.49	9.83		0.50	0.50
106-46-7	1,4-Dichlorobenzene	147.00	9.61		0.20	0.20
75-34-3	1,1-Dichloroethane	98.96	10.2		0.20	0.20
107-06-2	1,2-Dichloroethane	98.96	10.9		0.20	0.20
75-35-4	1,1-Dichloroethene	96.94	11.0		0.20	0.20
78-87-5	1,2-Dichloropropane	112.99	9.94		0.20	0.20
123-91-1	1,4-Dioxane	88.11	7.60		5.0	5.0
100-41-4	Ethylbenzene	106.17	10.2		0.20	0.20
87-68-3	Hexachlorobutadiene	260.76	10.5		0.20	0.20
75-09-2	Methylene Chloride	84.93	10.6		0.50	0.50
91-20-3	Naphthalene	128.17	7.62		0.50	0.50
100-42-5	Styrene	104.15	10.4		0.20	0.20
79-34-5	1,1,2,2-Tetrachloroethane	167.85	9.49		0.20	0.20
127-18-4	Tetrachloroethene	165.83	9.40		0.20	0.20
108-88-3	Toluene	92.14	9.36		0.20	0.20
120-82-1	1,2,4-Trichlorobenzene	181.45	7.65		0.50	0.50
71-55-6	1,1,1-Trichloroethane	133.41	10.7		0.20	0.20
79-00-5	1,1,2-Trichloroethane	133.41	9.18		0.20	0.20
75-01-4	Vinyl chloride	62.50	10.1		0.20	0.20
1330-20-7	Xylene (total)	106.17	29.2		0.20	0.20
79-01-6	Trichloroethene	131.39	10.0		0.20	0.20

TestAmerica Burlington

AIR TOXICS QUANTITATION REPORT

Data file : /chem/C.i/Csvr.p/cjrcto15.b/cjrc005.d
Lab Smp Id: lcs 120404 Client Smp ID: lcs 120404
Inj Date : 25-MAR-2011 21:10
Operator : sv Inst ID: C.i
Smp Info : lcs 120404
Misc Info : 200,1, lcs
Comment :
Method : /chem/C.i/Csvr.p/cjrcto15.b/to15v5.m
Meth Date : 29-Mar-2011 20:13 sv Quant Type: ISTD
Cal Date : 22-MAR-2011 22:39 Cal File: cjr009.d
Als bottle: 2 QC Sample: LCS
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 3.50
Processing Host: chemsvr6

Concentration Formula: Amt * DF * Uf*(Vo/Vo)*(Vf/Vf) * CpndVariable

Name	Value	Description
DF	1.00000	Dilution Factor
Uf	1.00000	ng unit correction factor
Vo	200.00000	Sample Volume purged (mL)
Vf	200.00000	Final Volume (mL)

Cpnd Variable Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	CONCENTRATIONS FINAL (ppb v/v)
1	Propene	41	4.022	4.022	(0.396)	381250	10.0811	10
2	Dichlorodifluoromethane	85	4.096	4.097	(0.404)	2063471	10.3613	10
3	Chlorodifluoromethane	51	4.145	4.145	(0.409)	926466	9.80186	9.8
4	1,2-Dichloro-1,1,2,2-tetraflu	85	4.369	4.374	(0.431)	2113296	10.0792	10
5	Chloromethane	50	4.529	4.534	(0.446)	517375	9.83289	9.8
6	Butane	43	4.726	4.732	(0.466)	795989	10.4372	10
7	Vinyl chloride	62	4.769	4.774	(0.470)	660482	10.0540	10
8	1,3-Butadiene	54	4.844	4.849	(0.478)	470288	10.6289	11
9	Bromomethane	94	5.495	5.500	(0.542)	712841	9.50791	9.5
10	Chloroethane	64	5.698	5.703	(0.562)	391157	9.78031	9.8
11	2-Methylbutane	43	5.756	5.762	(0.568)	676419	10.2110	10
12	Vinyl bromide	106	6.050	6.055	(0.596)	803963	10.0932	10
13	Trichlorofluoromethane	101	6.125	6.130	(0.604)	2126190	10.7045	11
14	Pentane	43	6.231	6.237	(0.614)	1029793	9.91539	9.9

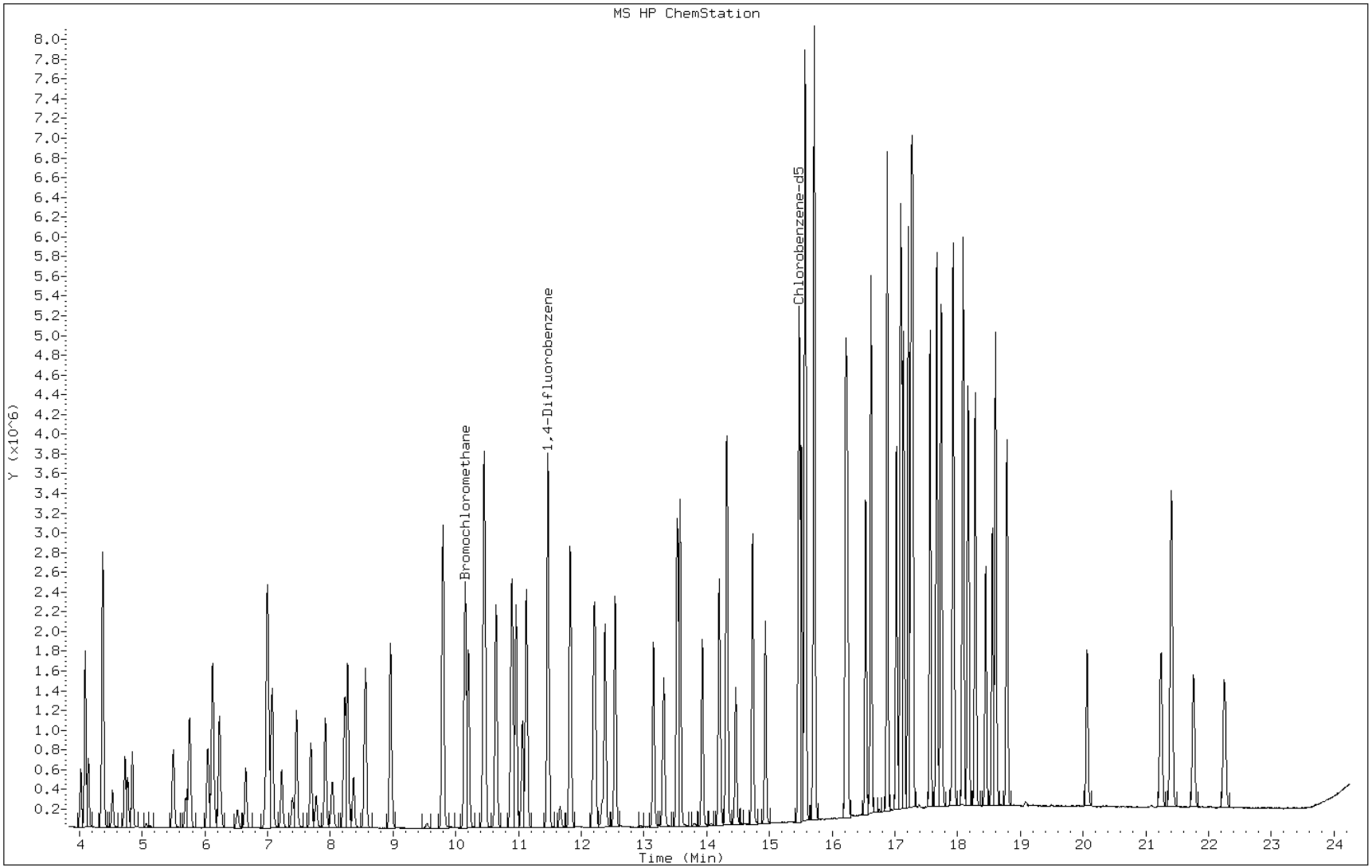
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	FINAL (ppb v/v)
	15 Ethanol	45	6.519	6.525	(0.643)	270898	12.5498	13
	16 Ethyl ether	59	6.653	6.658	(0.656)	486503	9.37438	9.4
	17 1,1,2-Trichloro-1,2,2-trifluo	101	7.000	7.000	(0.690)	1669008	10.8671	11
	18 Acrolein	56	6.984	6.989	(0.688)	193033	8.05676	8.1
	19 1,1-Dichloroethene	96	7.074	7.075	(0.697)	832521	11.0423	11
	20 Acetone	43	7.224	7.229	(0.712)	901135	10.9287	11
	21 Carbon disulfide	76	7.459	7.470	(0.735)	2281648	9.83394	9.8
	22 Isopropanol	45	7.400	7.400	(0.730)	523514	8.72188	8.7
	23 Allyl chloride	41	7.688	7.694	(0.758)	733588	10.4246	10
	24 Acetonitrile	41	7.774	7.779	(0.766)	448406	10.0901	10
	25 Methylene chloride	49	7.918	7.929	(0.781)	748015	10.5620	11
	26 Tert-butyl alcohol	59	8.035	8.035	(0.792)	862355	8.73382	8.7
	27 Methyl tert-butyl ether	73	8.233	8.238	(0.812)	2193365	10.3022	10
	28 1,2-Dichloroethene (trans)	61	8.281	8.286	(0.816)	1071635	10.1610	10
	29 Acrylonitrile	53	8.371	8.377	(0.825)	498484	9.98581	10
	30 n-Hexane	57	8.558	8.564	(0.844)	1132088	9.98804	10
	31 1,1-Dichloroethane	63	8.964	8.969	(0.884)	1389857	10.1793	10
	32 Vinyl acetate	43	8.958	8.964	(0.883)	1434604	11.0111	11
M	33 1,2-Dichloroethene,Total	61				1986901	20.2789	20
	34 1,2-Dichloroethene (cis)	96	9.796	9.802	(0.966)	915266	10.1179	10
	35 Ethyl acetate	88	9.791	9.802	(0.965)	71837	10.0396	10
	36 Methyl Ethyl Ketone	72	9.796	9.802	(0.966)	360737	9.80489	9.8(Q)
*	37 Bromochloromethane	128	10.143	10.154	(1.000)	739141	10.0000	
	38 Tetrahydrofuran	42	10.159	10.165	(0.886)	622476	10.4973	10
	39 Chloroform	83	10.202	10.207	(1.006)	1781336	10.4235	10
	40 Cyclohexane	84	10.458	10.464	(0.912)	1230669	10.0507	10
	41 1,1,1-Trichloroethane	97	10.453	10.458	(0.911)	1920914	10.7414	11
	42 Carbon tetrachloride	117	10.645	10.650	(0.928)	1948830	10.8921	11
	43 2,2,4-Trimethylpentane	57	10.896	10.901	(0.950)	3724066	10.2520	10
	44 Benzene	78	10.960	10.965	(0.955)	2666569	9.74931	9.7
	45 1,2-Dichloroethane	62	11.061	11.067	(0.964)	1087011	10.9234	11
	46 n-Heptane	43	11.125	11.131	(0.970)	1185771	10.6201	11
*	47 1,4-Difluorobenzene	114	11.472	11.478	(1.000)	4125366	10.0000	
	48 n-Butanol	56	11.664	11.670	(1.017)	187080	6.95317	7.0(R)
	49 Trichloroethene	95	11.824	11.830	(1.031)	1209203	10.0035	10
	50 1,2-Dichloropropane	63	12.198	12.209	(1.063)	881380	9.93640	9.9
	51 Methyl methacrylate	69	12.225	12.230	(1.066)	759698	10.1713	10
	52 Dibromomethane	174	12.379	12.390	(1.079)	973179	10.3481	10
	53 1,4-Dioxane	88	12.331	12.337	(1.075)	248310	7.60288	7.6
	54 Bromodichloromethane	83	12.539	12.545	(1.093)	2009243	11.2657	11
	55 1,3-Dichloropropene (cis)	75	13.153	13.159	(1.147)	1470798	10.3865	10
	56 Methyl isobutyl ketone	43	13.313	13.319	(1.160)	1249049	11.3145	11
	57 n-Octane	43	13.532	13.538	(1.180)	1580852	10.8703	11
	58 Toluene	92	13.575	13.580	(0.877)	1967518	9.35757	9.4
	59 1,3-Dichloropropene (trans)	75	13.932	13.938	(1.214)	1431119	10.7939	11
	60 1,1,2-Trichloroethane	83	14.199	14.210	(0.918)	891295	9.17927	9.2
	61 Tetrachloroethene	166	14.322	14.327	(0.926)	1546093	9.39704	9.4

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	FINAL (ppb v/v)
	62 2-Hexanone	43	14.461	14.466	(0.934)	1081725	10.1441	10
	63 Dibromochloromethane	129	14.733	14.738	(0.952)	2040947	11.0695	11
	64 1,2-Dibromoethane	107	14.936	14.941	(0.965)	1737076	9.81839	9.8
*	65 Chlorobenzene-d5	117	15.475	15.480	(1.000)	3804579	10.0000	
	66 Chlorobenzene	112	15.512	15.518	(1.002)	2581865	9.58641	9.6
	67 n-Nonane	57	15.571	15.571	(1.006)	1459050	10.5304	11
	68 Ethylbenzene	91	15.571	15.576	(1.006)	3883675	10.2192	10
	69 Xylene (m,p)	106	15.715	15.720	(1.016)	3096745	19.6992	20
M	70 Xylenes, Total	106				4643068	29.2127	29
	71 Xylene (o)	106	16.217	16.222	(1.048)	1546323	9.51345	9.5
	72 Styrene	104	16.243	16.249	(1.050)	2263849	10.3911	10
	73 Bromoform	173	16.537	16.542	(1.069)	1735270	11.0691	11
	74 Isopropylbenzene	105	16.617	16.622	(1.074)	4497755	10.5067	11
	75 1,1,2,2-Tetrachloroethane	83	17.028	17.033	(1.100)	2114214	9.48973	9.5
	76 n-Propylbenzene	91	17.092	17.092	(1.104)	5048540	10.8865	11
	77 1,2,3-Trichloropropane	75	17.113	17.119	(1.106)	1655682	10.2675	10
	78 n-Decane	57	17.140	17.145	(1.108)	1793299	11.5570	12
	79 4-Ethyltoluene	105	17.215	17.220	(1.112)	4462763	11.0732	11
	80 2-Chlorotoluene	91	17.263	17.268	(1.116)	3762430	10.6738	11
	81 1,3,5-Trimethylbenzene	105	17.284	17.289	(1.117)	3652691	10.8321	11
	82 Alpha Methyl Styrene	118	17.561	17.567	(1.135)	1841226	10.9115	11
	83 tert-butylbenzene	119	17.668	17.674	(1.142)	3666669	10.6530	11
	84 1,2,4-Trimethylbenzene	105	17.738	17.743	(1.146)	3521940	10.7542	11
	85 sec-Butylbenzene	105	17.930	17.935	(1.159)	5226720	11.0837	11
	86 4-Isopropyltoluene	119	18.084	18.090	(1.169)	4381949	11.3964	11
	87 1,3-Dichlorobenzene	146	18.170	18.175	(1.174)	2311105	9.68316	9.7
	88 1,4-Dichlorobenzene	146	18.282	18.287	(1.181)	2249918	9.60501	9.6
	89 Benzyl chloride	91	18.447	18.453	(1.192)	2326507	8.91304	8.9
	90 Undecane	57	18.554	18.554	(1.199)	1250577	8.97819	9.0
	91 n-Butylbenzene	91	18.608	18.613	(1.202)	3557202	11.3597	11
	92 1,2-Dichlorobenzene	146	18.789	18.794	(1.214)	2176990	9.61045	9.6
	93 Dodecane	57	20.064	20.070	(1.297)	814442	9.17433	9.2
	94 1,2,4-Trichlorobenzene	180	21.244	21.249	(1.373)	848645	7.64995	7.6
	95 1,3-Hexachlorobutadiene	225	21.409	21.415	(1.383)	1072881	10.5134	11
	96 Naphthalene	128	21.762	21.772	(1.406)	2005165	7.61512	7.6
	97 1,2,3-Trichlorobenzene	180	22.253	22.263	(1.438)	779726	7.94728	7.9

QC Flag Legend

Q - Qualifier signal failed the ratio test.
R - Spike/Surrogate failed recovery limits.

Data File:	cjrc005.d	Date:	25-MAR-2011 21:10
Client ID:	lcs 120404	Instrument:	C.i
Operator:	sv	Inj Vol:	200.0
Column Type:	Capillary	Diameter:	0.32
Stationary Phase:	RTX-624		
Sample Info:	lcs 120404		
Lab Sample ID:	lcs 120404		



FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Client Sample ID: Lab Sample ID: LCS 200-15787/3

Matrix: Air Lab File ID: gffv003.d

Analysis Method: TO-15 Date Collected:

Sample wt/vol: 200(mL) Date Analyzed: 03/29/2011 12:47

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-624 ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 15787 Units: ppb v/v

CAS NO.	COMPOUND NAME	MOLECULAR WEIGHT	RESULT	Q	RL	RL
71-43-2	Benzene	78.11	9.29		0.20	0.20
75-25-2	Bromoform	252.75	10.8		0.20	0.20
74-83-9	Bromomethane	94.94	8.50		0.20	0.20
75-15-0	Carbon disulfide	76.14	9.29		0.50	0.50
56-23-5	Carbon tetrachloride	153.81	11.3		0.20	0.20
108-90-7	Chlorobenzene	112.30	8.90		0.20	0.20
75-00-3	Chloroethane	64.52	8.39		0.50	0.50
67-66-3	Chloroform	119.38	9.38		0.20	0.20
74-87-3	Chloromethane	50.49	8.50		0.50	0.50
106-46-7	1,4-Dichlorobenzene	147.00	9.37		0.20	0.20
75-34-3	1,1-Dichloroethane	98.96	9.50		0.20	0.20
107-06-2	1,2-Dichloroethane	98.96	9.72		0.20	0.20
75-35-4	1,1-Dichloroethene	96.94	11.1		0.20	0.20
78-87-5	1,2-Dichloropropane	112.99	8.89		0.20	0.20
123-91-1	1,4-Dioxane	88.11	8.86		5.0	5.0
100-41-4	Ethylbenzene	106.17	8.66		0.20	0.20
87-68-3	Hexachlorobutadiene	260.76	10.6		0.20	0.20
75-09-2	Methylene Chloride	84.93	10.1		0.50	0.50
91-20-3	Naphthalene	128.17	9.81		0.50	0.50
100-42-5	Styrene	104.15	9.51		0.20	0.20
79-34-5	1,1,2,2-Tetrachloroethane	167.85	8.31		0.20	0.20
127-18-4	Tetrachloroethene	165.83	9.62		0.20	0.20
108-88-3	Toluene	92.14	8.48		0.20	0.20
120-82-1	1,2,4-Trichlorobenzene	181.45	9.44		0.50	0.50
71-55-6	1,1,1-Trichloroethane	133.41	10.8		0.20	0.20
79-00-5	1,1,2-Trichloroethane	133.41	8.38		0.20	0.20
75-01-4	Vinyl chloride	62.50	8.25		0.20	0.20
1330-20-7	Xylene (total)	106.17	25.8		0.20	0.20
79-01-6	Trichloroethene	131.39	10.0		0.20	0.20

TestAmerica Burlington

AIR TOXICS QUANTITATION REPORT

Data file : /chem/G.i/Gsvr.p/gffvto15.b/gffv003.d
Lab Smp Id: lcs 120404 Client Smp ID: lcs 120404
Inj Date : 29-MAR-2011 12:47
Operator : wrd Inst ID: G.i
Smp Info : lcs 120404
Misc Info : 200,1,lcs
Comment :
Method : /chem/G.i/Gsvr.p/gffvto15.b/to15v5.m
Meth Date : 30-Mar-2011 09:27 wrd Quant Type: ISTD
Cal Date : 03-MAR-2011 10:00 Cal File: gff015.d
Als bottle: 2 QC Sample: LCS
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 3.50
Processing Host: chemsvr6

Concentration Formula: Amt * DF * Uf*(Vo/Vo)*(Vf/Vf) * CpndVariable

Name	Value	Description
DF	1.00000	Dilution Factor
Uf	1.00000	ng unit correction factor
Vo	200.00000	Sample Volume purged (mL)
Vf	200.00000	Final Volume (mL)

Cpnd Variable Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	CONCENTRATIONS FINAL (ppb v/v)
1	Propene	41	3.095	3.101	(0.326)	93481	9.14776	9.1
2	Dichlorodifluoromethane	85	3.149	3.154	(0.331)	720910	9.48057	9.5
3	Chlorodifluoromethane	51	3.186	3.192	(0.335)	289611	9.33007	9.3
4	1,2-Dichloro-1,1,2,2-tetraflu	85	3.368	3.379	(0.354)	641315	8.79281	8.8
5	Chloromethane	50	3.497	3.502	(0.368)	128528	8.50108	8.5
6	Butane	43	3.673	3.679	(0.386)	188017	8.03212	8.0
7	Vinyl chloride	62	3.705	3.716	(0.390)	181531	8.25490	8.3
8	1,3-Butadiene	54	3.775	3.780	(0.397)	121097	8.43769	8.4
9	Bromomethane	94	4.438	4.449	(0.467)	373697	8.50373	8.5
10	Chloroethane	64	4.658	4.668	(0.490)	127257	8.39185	8.4
11	2-Methylbutane	43	4.732	4.743	(0.498)	225733	8.16936	8.2
12	Vinyl bromide	106	5.048	5.059	(0.531)	508977	10.3875	10
13	Trichlorofluoromethane	101	5.139	5.155	(0.540)	1367396	10.4777	10
14	Pentane	43	5.273	5.284	(0.554)	419645	9.17421	9.2

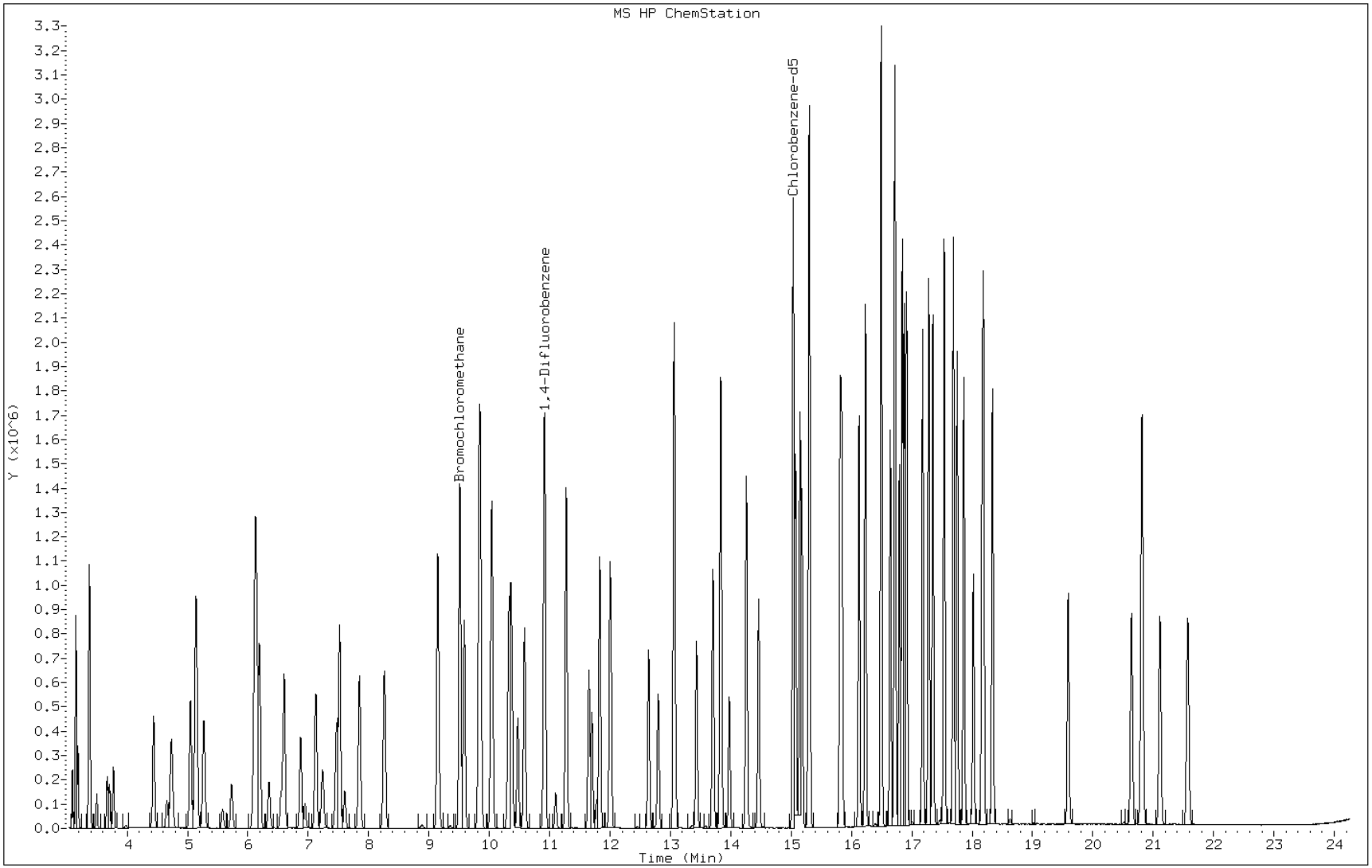
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	FINAL (ppb v/v)
	15 Ethanol	45	5.578	5.594	(0.587)	116025	11.2208	11
	16 Ethyl ether	59	5.728	5.744	(0.602)	151588	7.88003	7.9
	17 1,1,2-Trichloro-1,2,2-trifluo	101	6.123	6.139	(0.644)	1034747	11.1795	11
	18 Acrolein	56	6.081	6.097	(0.639)	62019	6.47585	6.5(R)
	19 1,1-Dichloroethene	96	6.193	6.209	(0.651)	460992	11.1040	11
	20 Acetone	43	6.348	6.370	(0.668)	313124	8.58459	8.6
	21 Carbon disulfide	76	6.600	6.616	(0.694)	1178899	9.29170	9.3
	22 Isopropanol	45	6.551	6.567	(0.689)	233822	8.73875	8.7
	23 Allyl chloride	41	6.878	6.894	(0.723)	289173	9.00178	9.0
	24 Acetonitrile	41	6.947	6.969	(0.731)	128837	8.08053	8.1
	25 Methylene chloride	49	7.124	7.145	(0.749)	350935	10.0898	10
	26 Tert-butyl alcohol	59	7.236	7.252	(0.761)	438793	9.61102	9.6
	27 Methyl tert-butyl ether	73	7.472	7.488	(0.786)	759315	8.40820	8.4
	28 1,2-Dichloroethene (trans)	61	7.520	7.541	(0.791)	519888	9.81894	9.8
	29 Acrylonitrile	53	7.605	7.627	(0.800)	143342	8.09168	8.1
	30 n-Hexane	57	7.846	7.862	(0.825)	444274	9.71026	9.7
	31 1,1-Dichloroethane	63	8.253	8.274	(0.868)	613928	9.49938	9.5
	32 Vinyl acetate	43	8.269	8.290	(0.869)	451992	8.08194	8.1
M	33 1,2-Dichloroethene,Total	61				978583	19.7402	20
	34 1,2-Dichloroethene (cis)	96	9.146	9.162	(0.962)	458695	9.92130	9.9
	35 Ethyl acetate	88	9.167	9.183	(0.964)	20058	8.41310	8.4
	36 Methyl Ethyl Ketone	72	9.146	9.162	(0.962)	116025	8.41194	8.4(Q)
*	37 Bromochloromethane	128	9.510	9.531	(1.000)	492037	10.0000	
	38 Tetrahydrofuran	42	9.526	9.542	(0.873)	176246	8.10936	8.1
	39 Chloroform	83	9.585	9.601	(1.008)	888872	9.38479	9.4
	40 Cyclohexane	84	9.847	9.863	(0.902)	518308	10.7986	11
	41 1,1,1-Trichloroethane	97	9.841	9.858	(0.902)	1048946	10.8284	11
	42 Carbon tetrachloride	117	10.039	10.055	(0.920)	1228984	11.3167	11
	43 2,2,4-Trimethylpentane	57	10.328	10.344	(0.946)	1289684	9.67538	9.7
	44 Benzene	78	10.366	10.387	(0.950)	994856	9.29458	9.3
	45 1,2-Dichloroethane	62	10.473	10.489	(0.959)	479327	9.71906	9.7
	46 n-Heptane	43	10.585	10.601	(0.970)	399647	9.23852	9.2
*	47 1,4-Difluorobenzene	114	10.917	10.933	(1.000)	1974589	10.0000	
	48 n-Butanol	56	11.099	11.115	(1.017)	98209	8.63157	8.6
	49 Trichloroethene	95	11.275	11.291	(1.033)	586617	10.0103	10
	50 1,2-Dichloropropane	63	11.650	11.671	(1.067)	301813	8.89126	8.9
	51 Methyl methacrylate	69	11.698	11.719	(1.072)	231369	8.71707	8.7
	52 Dibromomethane	174	11.832	11.853	(1.084)	487856	10.9057	11
	53 1,4-Dioxane	88	11.778	11.794	(1.079)	126061	8.86001	8.9
	54 Bromodichloromethane	83	12.003	12.024	(1.099)	917197	10.1983	10
	55 1,3-Dichloropropene (cis)	75	12.639	12.655	(1.158)	547739	9.48965	9.5
	56 Methyl isobutyl ketone	43	12.800	12.816	(1.172)	430161	10.1741	10
	57 n-Octane	43	13.062	13.078	(1.196)	485355	8.94814	8.9
	58 Toluene	92	13.067	13.089	(0.869)	707312	8.47629	8.5
	59 1,3-Dichloropropene (trans)	75	13.436	13.453	(1.231)	558112	9.47724	9.5
	60 1,1,2-Trichloroethane	83	13.704	13.720	(0.911)	374089	8.37998	8.4
	61 Tetrachloroethene	166	13.838	13.848	(0.920)	706736	9.62462	9.6

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	FINAL (ppb v/v)
	62 2-Hexanone	43	13.977	13.998	(0.930)	410654	9.68703	9.7
	63 Dibromochloromethane	129	14.255	14.276	(0.948)	1059134	10.1997	10
	64 1,2-Dibromoethane	107	14.464	14.480	(0.962)	798453	8.95958	9.0
*	65 Chlorobenzene-d5	117	15.036	15.052	(1.000)	1961759	10.0000	
	66 Chlorobenzene	112	15.073	15.090	(1.002)	1095473	8.90109	8.9
	67 n-Nonane	57	15.180	15.197	(1.010)	512134	8.66125	8.7
	68 Ethylbenzene	91	15.148	15.164	(1.007)	1509313	8.66438	8.7
	69 Xylene (m,p)	106	15.298	15.314	(1.017)	1200387	17.0845	17
M	70 Xylenes, Total	106				1819091	25.7510	26
	71 Xylene (o)	106	15.817	15.833	(1.052)	618704	8.66652	8.7
	72 Styrene	104	15.838	15.855	(1.053)	893264	9.51166	9.5
	73 Bromoform	173	16.127	16.143	(1.073)	893045	10.8039	11
	74 Isopropylbenzene	105	16.234	16.250	(1.080)	1773585	8.82543	8.8
	75 1,1,2,2-Tetrachloroethane	83	16.641	16.657	(1.107)	910984	8.31310	8.3
	76 n-Propylbenzene	91	16.716	16.732	(1.112)	1958760	8.78069	8.8
	77 1,2,3-Trichloropropane	75	16.727	16.743	(1.112)	618553	8.61939	8.6
	78 n-Decane	57	16.796	16.807	(1.117)	547074	8.20259	8.2
	79 4-Ethyltoluene	105	16.844	16.860	(1.120)	1749460	9.03311	9.0
	80 2-Chlorotoluene	91	16.876	16.892	(1.122)	1669290	8.99520	9.0
	81 1,3,5-Trimethylbenzene	105	16.914	16.930	(1.125)	1418770	8.59148	8.6
	82 Alpha Methyl Styrene	118	17.181	17.197	(1.143)	751499	9.90743	9.9
	83 tert-butylbenzene	119	17.283	17.299	(1.149)	1418019	8.72712	8.7
	84 1,2,4-Trimethylbenzene	105	17.352	17.369	(1.154)	1387457	8.57604	8.6
	85 sec-Butylbenzene	105	17.534	17.550	(1.166)	2106048	8.82221	8.8
	86 4-Isopropyltoluene	119	17.689	17.706	(1.176)	1752112	9.03183	9.0
	87 1,3-Dichlorobenzene	146	17.754	17.770	(1.181)	1009431	9.22641	9.2
	88 1,4-Dichlorobenzene	146	17.866	17.882	(1.188)	967875	9.36839	9.4
	89 Benzyl chloride	91	18.016	18.037	(1.198)	920475	7.75243	7.8
	90 Undecane	57	18.166	18.176	(1.208)	528494	10.0424	10
	91 n-Butylbenzene	91	18.187	18.203	(1.210)	1434230	9.31924	9.3
	92 1,2-Dichlorobenzene	146	18.337	18.358	(1.220)	975463	8.92761	8.9
	93 Dodecane	57	19.594	19.610	(1.303)	438315	12.0960	12
	94 1,2,4-Trichlorobenzene	180	20.642	20.664	(1.373)	433775	9.44239	9.4
	95 1,3-Hexachlorobutadiene	225	20.814	20.835	(1.384)	466004	10.5712	11
	96 Naphthalene	128	21.113	21.140	(1.404)	1203347	9.80950	9.8
	97 1,2,3-Trichlorobenzene	180	21.573	21.600	(1.435)	472303	11.4149	11

QC Flag Legend

Q - Qualifier signal failed the ratio test.
R - Spike/Surrogate failed recovery limits.

Data File:	gffv003.d	Date:	29-MAR-2011 12:47
Client ID:	lcs 120404	Instrument:	G.i
Operator:	wrd	Inj Vol:	200.0
Column Type:	Capillary	Diameter:	0.32
Stationary Phase:	RTX-624		
Sample Info:	lcs 120404		
Lab Sample ID:	lcs 120404		



GC/MS INSTRUMENT RUN LOG

Sequence				Standard Traceability		Instrument Information
Batch ID:	GFF	Start Date: 3/2/11	Time: 1404	ISTD Lot #:	80049	Instrument ID: G
Test Method:	TO15	End Date: 3/3/11	Time: 1404	CAL STD Lot #	see comments	Instrument: 5973
ICAL Date:	3/2/11			ICV / LCS Lot #	see comments	Column Type: RTX-624

	Manager	Analyst	Analyst	Analyst	Analyst
Name/Initial					
Signature					

	Sequence Information							Individual Sample Review			
Injection Time	TALS ID / File Name	Summa Can ID	ETR	Dilution Factor	Inlet #	Volume (mL)	Operator	Internal Std.	Result Conc.	Primary Anal.	Comments / Standard Traceability
1404	GFF001		BFB	NA	NA	NA	WND	NA	NA	WND	
1505	002	4634	VIBLK		3	200					
0557	003	5069	Level 1		4				✓		109459
1648	004	3482	not used		5						109451
1739	005	4114	Level 3		6				✓		109449
1830	006	4837	Level 4 IS		1				✓		109438
1921	007	3631	Level 5		2				✓		109427
2012	008	4319	Level 6		7				✓		109425
2103	009	4943	Level 7		8				✓		109424
2320	010	3482	not used	NA	5	200	SV		C/0		109451
0311	011	4634	VIBLK	NA	3						
0702	012	3366	not used		9						~~117230~~
0817	013	4634	VIBLK		3		WND				
0908	014	4634	VIBLK		3						
1000	015	3482	Level 2		5				✓		109451
1057	016	3366	not used		9						117230 com not attached
1150	017	4634	VIBLK		3						
1242	018	3366	FCV	NA	4	200	WM	✓	✓		117230
1332	019	4634	MB	1	3			✓	✓		
					3/3/11						

Legend: C=Complete ▪ R=Reanalyze ▪ ↑ = High ▪ ↓= Low ▪ ✓=Reviewed and Acceptable

GC/MS INSTRUMENT RUN LOG

Sequence			Standard Traceability	Instrument Information
Batch ID: CJR	Start Date: 03/22/11	Time: 1618	ISTD Lot #: 84578	Instrument ID: C
Test Method: TO15	End Date: 03/23/11	Time: 1618	CAL STD Lot # see comments	Instrument: 5973
ICAL Date: 03/22/11			ICV / LCS Lot # see comments	Column Type: RTX-624

	Manager MTP	Analyst	Analyst	Analyst WD	Analyst
Name/Initial	Mark Phillips	Paul Daigle	Sorel Vanjeune	William DesOrmeaux	
Signature	Mark Phillips	Paul D.			

	Sequence Information							Individual Sample Review			
Injection Time	TALS ID / File Name	Summa Can ID	ETR	Dilution Factor	Inlet #	Volume (mL)	Operator	Internal Std.	Result Conc.	Primary Anal.	Comments / Standard Traceability
1618	CJR001	—	BFB	NA	1	—	PAD		✓	PAD	
1704	002	4632	VIBLK		1	200		✓	✓	✓	
1752	003	5069	IC-1		2			—	✓		109459
1840	004	2703	IC-2		3			—	✓		109450
1927	005	3640	IC-3		4			✓	✓		109440
2015	006	2961	ICIS-4		5			✓	✓		119922
2103	007	3631	IC-5		6			✓	✓	↓	109427
2151	008	4319	IC-6		7			✓	✓	✓	109425
2239	009	4943	IC-7		8			✓	✓	↓	109424
2327	010	4632	VIBLK		91			✓	✓	PAD	
0015	011	4632	VIBLK		01			✓	✓		
0103	012	5014	ICV		9			✓	✓		120404 AG
2152	013	4632	VIBLK	↓	21	↓	↓	✓	✓		
0240	014	4632	MB	NA1	1	200	✓	✓	✓		
0328	015	5069	0.2LCS		2		✓	✓	✓		109459 AG
0416	016	2703	0.5LCS		3			✓	✓		1450 AG
0504	017	3640	5.0LCS	↓	4	↓		✓	✓		1440 AG
0553	018	4577	4330-5	0.4	10	500		✓	✓		Reject - matrix change!
0641	019	5042	4291-1	1.0	11	200		✓	✓	✓	
0729	020	4070	-2		12			✓	✓		
0817	021	3397	-3		13			✓	↑		Ace 100 R 1:3.6
0905	022	3394	-4	↓	14	↓		✓	✓	↓	
0953	023	5088	4300-01	1.0	15	200		✓	✓		
1042	024	4869	-02	10	16	20	↓	✓	✓	WD	
1130	025	4783	4342-01	0.4	1	500	PAD	✓	✓		
12 18	026	3397	4291-03	3.57	13	56		✓	✓		
1306	027	4824	4300-03	1	2	200	↓	✓	✓	↓	

Legend: C=Complete ▪ R=Reanalyze ▪ ↑ = High ▪ ↓= Low ▪ ✓=Reviewed and Acceptable

GC/MS INSTRUMENT RUN LOG

Sequence			Standard Traceability	Instrument Information
Batch ID: CJR	Start Date: 03/22/11	Time: 16/18	ISTD Lot #:	Instrument ID: C
Test Method: TO15	End Date: 03/23/11	Time: 16/18	CAL STD Lot #	Instrument: 5973
ICAL Date: 03/22/11			ICV / LCS Lot #	Column Type: RTX-624

	Manager	Analyst	Analyst	Analyst	Analyst
Name/Initial					
Signature					

Sequence Information								Individual Sample Review			
Injection Time	TALS ID / File Name	Summa Can ID	ETR	Dilution Factor	Inlet #	Volume (mL)	Operator	Internal Std.	Result Conc.	Primary Anal.	Comments / Standard Traceability
1353	CJR 028	4392	4300-04	10	3	20	PAD	✓	✓	WHD	
1442	029	2961	CCVC	N/A	4	200	"	NA	✓	"	1/9022
1530	030	"	NA	"	4	200	"	✓	✓	WHD	not required

3/24/11

Legend: C=Complete ▪ R=Reanalyze ▪ ↑ = High ▪ ↓= Low ▪ ✓=Reviewed and Acceptable

GC/MS INSTRUMENT RUN LOG

Sequence				Standard Traceability	Instrument Information
Batch ID: CJRC	Start Date: 03/25/11	Time: 1759		ISTD Lot #: 84578	Instrument ID: C
Test Method: To15	End Date: 03/26/11	Time: 1757		CAL STD Lot #: 119722	Instrument: 5973
ICAL Date: 03/22/11				ICV / LCS Lot #: 120404	Column Type: RTX-624

	Manager	Analyst SV	Analyst	Analyst	Analyst
Name/Initial		Sonal Valsaraj			
Signature					

Sequence Information								Individual Sample Review			
Injection Time	TALS ID / File Name	Summa Can ID	ETR	Dilution Factor	Inlet #	Volume (mL)	Operator	Internal Std.	Result Conc.	Primary Anal.	Comments / Standard Traceability
1759	CJRC001		BFB	NA	1	—	SV	—	✓	SV	
1845	002	2961	CCV		1	200		—	✓↑		Butane 9T
1933	003	5014	LCS		2			✓	✓		
2022	004	2961	CCV		1			—	✓		AG
2110	005	5014	LCS		2			✓	✓		n-Butanol ↓ (OK 2474+MN)
2158	006	4633	MB	—	3	—		✓	✓	WND	
2247	007	5135	4339-1	101	4	27		✓	✓	SV	CDF 13.57
2334	008	3370	-2	5.0	5	40		✓	✓		
0023	009	4863	-3	9.98	6	95		✓	✓		CDF 4.74
0111	010	5090	4315-1	15300	7	13		✓	✓		CDF 995
0159	011	4143	-2	6860	8	22		✓	✓		⊥ 754.12
0247	012	3161	-3	1.0	9	200		✓	✓		
0336	013	3462	-4	14000	10	40		✓	✓		CDF 2802.02
0424	014	4266	-5	6900	11	26		✓	✓		⊥ 896.44
0512	015	2632	-6	1.0	12	200	—	✓	↑	WND	VC 60 RA 1:2 A
0659	016	4309	4390-1	10	13	25	SV	✓	✓	SV	
0747	017	3542	4337-1	1.0	14	200	SV	✓	✓		on hold
0835	018	4812	-2	"	15	"	"	✓	✓		"
0923	019	3309	-3	—	16	—	—	✓	✓	—	⊥
0912	CJRC 020	2670	4381-2	1.0	1	200	SV	✓	✓	⊥	not needed
1000	021	2787	-4	20	2	10	⊥	✓	↑	WND	1:250 RA 1:35 A
1553	022	Bg	4415-3	2	3	200	WND	—	✓	WND	
1641	023	"	-2	5	4	40	"	✓	✓	"	
1730	024	"	-1	200	5	50	⊥	✓	✓	⊥	1:50 dil

SV 03/29/2011

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GC/MS INSTRUMENT RUN LOG

Sequence				Standard Traceability		Instrument Information
Batch ID:	GFFV	Start Date: 3/29/11	Time: 1059	ISTD Lot #:	80049	Instrument ID: G
Test Method:	TO15	End Date: 3/30/11	Time: 1059	CAL STD Lot #	126754	Instrument: 5973
ICAL Date:	3/2/11			ICV / LCS Lot #	120404	Column Type: RTX-624

	Manager	Analyst	Analyst	Analyst	Analyst
Name/Initial					
Signature					

Sequence Information								Individual Sample Review			
Injection Time	TALS ID / File Name	Summa Can ID	ETR	Dilution Factor	Inlet #	Volume (mL)	Operator	Internal Std.	Result Conc.	Primary Anal.	Comments / Standard Traceability
1059	GFFV001		BFB	NA	NA	NA	WRD	NA	NA	WRD	
1154	002	2225	CCV	"	1	200	"	NA	✓	1	AG
1247	003	5014	LCS	"	2	"	"	✓	✓	PAD	Acrolein ↓
1338	004	4635	MB	"	3	"	"	✓	✓	WRD	
1429	005	2632	4315-6	3.97	4	~~200~~	"	✓	✓		COF 1,3 C
1520	006	4544	4328-1	1	5	200	"	✓	✓		C
1611	007	5044	" -2	"	6	"	"	✓	↑ ✓		Acr ↑ 170 RA 1:10
1702	008	2660	" -3	"	7	"	"	✓	↑ ✓		Tol ↑ 58 RA 1:2
1754	009	Bey	4438-1	2.5	8	~~200~~	"	✓	✓		C 1,3 TIOS ✓
1845	010	3320	4265-5	1	9	200	"	✓	✓		C
1936	011	3327	" -7	"	10	"	"	✓	✓		C
2027	012	3313	" -9	"	11	"	"	✓	✓		C
2119	013	5080	4350-8	120	12	100	"	✓	↑ ✓		COF 59.98
2210	014	"	" -8	600	12	20	"	✓	✓		" "DL" C
2302	015	4415	" -9	10	13	60	"	✓	↑ ✓		3.00
2353	016	"	" -9	30	13	20	"	✓	✓		" DL C
0045	017	2604	" -10	318	14	100	"	✓	↑ ✓		158.76
0136	018	"	" -10	1590	14	20	"	✓	✓		" DL C
0228	019	5055	" -11	72.9	15	100	"	✓	↑ ✓		36.43
0319	020	"	" -11	364	15	20	"	✓	✓		" DL C
0411	021	acrolein	60-4030-1	200	16	50	"	✓	↓		1:50 dil
0502	022	4065	4391-1	90	1	100	"	✓	↑ ✓		COF 45.23
0554	023	4065	"	452	1	20	"	✓	✓		" " DL C
0645	024	4649	4429-7	1	2	200	"	✓	✓		
0736	025	4962	" -8	"	3	"	"	✓	✓	"	
	026	3586	" -9	"	4	"	"				MM 3/30/11
	027	4671	" -10	"	5	"	"				

Legend: C=Complete ▪ R=Reanalyze ▪ ↑ = High ▪ ↓= Low ▪ ✓=Reviewed and Acceptable

GC/MS INSTRUMENT RUN LOG

Sequence			Standard Traceability	Instrument Information
Batch ID: GFFV	Start Date: 3/29/11	Time: 1054	ISTD Lot #:	Instrument ID: G
Test Method: TO15	End Date: 3/30/11	Time: 1059	CAL STD Lot #	Instrument: 5973
ICAL Date: 3/2/11			ICV / LCS Lot #	Column Type: RTX-624

	Manager	Analyst	Analyst	Analyst	Analyst
Name/Initial					
Signature					

Sequence Information								Individual Sample Review			
Injection Time	TALS ID / File Name	Summa Can ID	ETR	Dilution Factor	Inlet #	Volume (mL)	Operator	Internal Std.	Result Conc.	Primary Anal.	Comments / Standard Traceability
0827	GFFV 02826	5044	43328-2	10	6	20	SV	✓	✓	WLD	DL C
0918	02927	2660	〃 -3	2	7	100	〃	✓	✓	〃	DL C
1009	〃 028	canister	660-40390-1	50	16	200	WLD	✓	✓	〃	1050 dil C

3/30/11

Legend: C=Complete ▪ R=Reanalyze ▪ ↑ = High ▪ ↓= Low ▪ ✓=Reviewed and Acceptable

AIR - GC/MS VOA ANALYSIS RUN LOG

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Instrument ID: C.i Start Date: 03/22/2011 16:18

Analysis Batch Number: 15668 End Date: 03/23/2011 15:30

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
BFB 200-15668/1		03/22/2011 16:18	1	cjr001.d	RTX-624 0.32(mm)
VIBLK 200-15668/2		03/22/2011 17:04	1		RTX-624 0.32(mm)
IC 200-15668/3		03/22/2011 17:52	1	cjr003.d	RTX-624 0.32(mm)
IC 200-15668/4		03/22/2011 18:40	1	cjr004.d	RTX-624 0.32(mm)
IC 200-15668/5		03/22/2011 19:27	1	cjr005.d	RTX-624 0.32(mm)
ICIS 200-15668/6		03/22/2011 20:15	1	cjr006.d	RTX-624 0.32(mm)
IC 200-15668/7		03/22/2011 21:03	1	cjr007.d	RTX-624 0.32(mm)
IC 200-15668/8		03/22/2011 21:51	1	cjr008.d	RTX-624 0.32(mm)
IC 200-15668/9		03/22/2011 22:39	1	cjr009.d	RTX-624 0.32(mm)
VIBLK 200-15668/10		03/22/2011 23:27	1		RTX-624 0.32(mm)
VIBLK 200-15668/11		03/23/2011 00:15	1		RTX-624 0.32(mm)
ICV 200-15668/12		03/23/2011 01:03	1	cjr012.d	RTX-624 0.32(mm)
VIBLK 200-15668/13		03/23/2011 01:52	1		RTX-624 0.32(mm)
ZZZZZ		03/23/2011 02:40	1		RTX-624 0.32(mm)
ZZZZZ		03/23/2011 03:28	1		RTX-624 0.32(mm)
ZZZZZ		03/23/2011 04:16	1		RTX-624 0.32(mm)
ZZZZZ		03/23/2011 05:04	1		RTX-624 0.32(mm)
ZZZZZ		03/23/2011 05:53	0.4		RTX-624 0.32(mm)
ZZZZZ		03/23/2011 06:41	1		RTX-624 0.32(mm)
ZZZZZ		03/23/2011 07:29	1		RTX-624 0.32(mm)
ZZZZZ		03/23/2011 08:17	1		RTX-624 0.32(mm)
ZZZZZ		03/23/2011 09:05	1		RTX-624 0.32(mm)
ZZZZZ		03/23/2011 09:53	1		RTX-624 0.32(mm)
ZZZZZ		03/23/2011 10:42	10		RTX-624 0.32(mm)
ZZZZZ		03/23/2011 11:30	0.4		RTX-624 0.32(mm)
ZZZZZ		03/23/2011 12:18	3.57		RTX-624 0.32(mm)
ZZZZZ		03/23/2011 13:06	1		RTX-624 0.32(mm)
ZZZZZ		03/23/2011 13:55	10		RTX-624 0.32(mm)
CCVC 200-15668/29		03/23/2011 14:42	1		RTX-624 0.32(mm)
CCVC 200-15668/30		03/23/2011 15:30	1		RTX-624 0.32(mm)

AIR - GC/MS VOA ANALYSIS RUN LOG

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Instrument ID: C.i Start Date: 03/25/2011 17:59

Analysis Batch Number: 15760 End Date: 03/26/2011 17:30

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
BFB 200-15760/1		03/25/2011 17:59	1	cjrc001.d	RTX-624 0.32(mm)
CCVIS 200-15760/2		03/25/2011 18:45	1		RTX-624 0.32(mm)
ZZZZZ		03/25/2011 19:33	1		RTX-624 0.32(mm)
CCVIS 200-15760/4		03/25/2011 20:22	1	cjrc004.d	RTX-624 0.32(mm)
LCS 200-15760/5		03/25/2011 21:10	1	cjrc005.d	RTX-624 0.32(mm)
MB 200-15760/6		03/25/2011 21:58	1	cjrc006.d	RTX-624 0.32(mm)
ZZZZZ		03/25/2011 22:47	101		RTX-624 0.32(mm)
ZZZZZ		03/25/2011 23:34	5		RTX-624 0.32(mm)
ZZZZZ		03/26/2011 00:23	9.98		RTX-624 0.32(mm)
200-4315-1	SVE-SP1	03/26/2011 01:11	15300	cjrc010.d	RTX-624 0.32(mm)
200-4315-2	SVE-SP2	03/26/2011 01:59	6860	cjrc011.d	RTX-624 0.32(mm)
200-4315-3	SVE-SP3	03/26/2011 02:47	1	cjrc012.d	RTX-624 0.32(mm)
200-4315-4	AS-SP1	03/26/2011 03:36	14000	cjrc013.d	RTX-624 0.32(mm)
200-4315-5	AS-SP2	03/26/2011 04:24	6900	cjrc014.d	RTX-624 0.32(mm)
ZZZZZ		03/26/2011 05:12	1		RTX-624 0.32(mm)
ZZZZZ		03/26/2011 05:59	10		RTX-624 0.32(mm)
ZZZZZ		03/26/2011 06:47	1		RTX-624 0.32(mm)
ZZZZZ		03/26/2011 07:35	1		RTX-624 0.32(mm)
ZZZZZ		03/26/2011 08:23	1		RTX-624 0.32(mm)
ZZZZZ		03/26/2011 09:12	1		RTX-624 0.32(mm)
ZZZZZ		03/26/2011 10:00	20		RTX-624 0.32(mm)
ZZZZZ		03/26/2011 15:53	2		RTX-624 0.32(mm)
ZZZZZ		03/26/2011 16:41	5		RTX-624 0.32(mm)
ZZZZZ		03/26/2011 17:30	200		RTX-624 0.32(mm)

AIR - GC/MS VOA ANALYSIS RUN LOG

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Instrument ID: G.i Start Date: 03/02/2011 14:04

Analysis Batch Number: 14625 End Date: 03/03/2011 13:32

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
BFB 200-14625/1		03/02/2011 14:04	1	gff001.d	RTX-624 0.32(mm)
VIBLK 200-14625/2		03/02/2011 15:05	1		RTX-624 0.32(mm)
IC 200-14625/3		03/02/2011 15:57	1	gff003.d	RTX-624 0.32(mm)
ZZZZZ		03/02/2011 16:48	1		RTX-624 0.32(mm)
IC 200-14625/5		03/02/2011 17:39	1	gff005.d	RTX-624 0.32(mm)
ICIS 200-14625/6		03/02/2011 18:30	1	gff006.d	RTX-624 0.32(mm)
IC 200-14625/7		03/02/2011 19:21	1	gff007.d	RTX-624 0.32(mm)
IC 200-14625/8		03/02/2011 20:12	1	gff008.d	RTX-624 0.32(mm)
IC 200-14625/9		03/02/2011 21:03	1	gff009.d	RTX-624 0.32(mm)
ZZZZZ		03/02/2011 23:20	1		RTX-624 0.32(mm)
VIBLK 200-14625/11		03/03/2011 00:11	1		RTX-624 0.32(mm)
ZZZZZ		03/03/2011 01:02	1		RTX-624 0.32(mm)
VIBLK 200-14625/13		03/03/2011 08:17	1		RTX-624 0.32(mm)
VIBLK 200-14625/14		03/03/2011 09:08	1		RTX-624 0.32(mm)
IC 200-14625/15		03/03/2011 10:00	1	gff015.d	RTX-624 0.32(mm)
ZZZZZ		03/03/2011 10:51	1		RTX-624 0.32(mm)
VIBLK 200-14625/17		03/03/2011 11:50	1		RTX-624 0.32(mm)
ICV 200-14625/18		03/03/2011 12:42	1	gff018.d	RTX-624 0.32(mm)
ZZZZZ		03/03/2011 13:32	1		RTX-624 0.32(mm)

AIR - GC/MS VOA ANALYSIS RUN LOG

Lab Name: TestAmerica Burlington Job No.: 200-4315-1

SDG No.: Narrowburg, NY

Instrument ID: G.i Start Date: 03/29/2011 10:59

Analysis Batch Number: 15787 End Date: 03/30/2011 10:09

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
BFB 200-15787/1		03/29/2011 10:59	1	gffv001.d	RTX-624 0.32(mm)
CCVIS 200-15787/2		03/29/2011 11:54	1	gffv002.d	RTX-624 0.32(mm)
LCS 200-15787/3		03/29/2011 12:47	1	gffv003.d	RTX-624 0.32(mm)
MB 200-15787/4		03/29/2011 13:38	1	gffv004.d	RTX-624 0.32(mm)
200-4315-6	AS-SP3	03/29/2011 14:29	3.97	gffv005.d	RTX-624 0.32(mm)
ZZZZZ		03/29/2011 15:20	1		RTX-624 0.32(mm)
ZZZZZ		03/29/2011 16:11	1		RTX-624 0.32(mm)
ZZZZZ		03/29/2011 17:02	1		RTX-624 0.32(mm)
ZZZZZ		03/29/2011 17:54	2.5		RTX-624 0.32(mm)
ZZZZZ		03/29/2011 18:45	1		RTX-624 0.32(mm)
ZZZZZ		03/29/2011 19:36	1		RTX-624 0.32(mm)
ZZZZZ		03/29/2011 20:27	1		RTX-624 0.32(mm)
ZZZZZ		03/29/2011 21:19	120		RTX-624 0.32(mm)
ZZZZZ		03/29/2011 22:10	600		RTX-624 0.32(mm)
ZZZZZ		03/29/2011 23:02	10		RTX-624 0.32(mm)
ZZZZZ		03/29/2011 23:53	30		RTX-624 0.32(mm)
ZZZZZ		03/30/2011 00:45	318		RTX-624 0.32(mm)
ZZZZZ		03/30/2011 01:36	1590		RTX-624 0.32(mm)
ZZZZZ		03/30/2011 02:28	72.9		RTX-624 0.32(mm)
ZZZZZ		03/30/2011 03:19	364		RTX-624 0.32(mm)
ZZZZZ		03/30/2011 04:11	200		RTX-624 0.32(mm)
ZZZZZ		03/30/2011 05:02	90		RTX-624 0.32(mm)
ZZZZZ		03/30/2011 05:54	452		RTX-624 0.32(mm)
ZZZZZ		03/30/2011 06:45	1		RTX-624 0.32(mm)
ZZZZZ		03/30/2011 07:36	1		RTX-624 0.32(mm)
ZZZZZ		03/30/2011 08:27	10		RTX-624 0.32(mm)
ZZZZZ		03/30/2011 09:18	2		RTX-624 0.32(mm)
ZZZZZ		03/30/2011 10:09	50		RTX-624 0.32(mm)

TO15

Post-Sampling Air Canister Pressure Check Record

Client ID	Job	Date	Time (Military)	Lab BP ("Hg)	Lab Temp (°C)	Pressure Gague ID	Analyst
Geosyntec	4315	03-18-11	1704	29.3	22	G5	J.J.

Sampling Information and Return Equipment Check	Yes	No	Comments
(1) Is a Field Test Data Sheet (FTDS) or similar sampling documentation present?	✓		
(2) Is the flow controller ID used for each canister recorded?	✓		
(3) Is visible sign of damage to canister and/or flow controller (FC) present?		✓	

If damage observed, list equipment IDs and describe condition:

Post-Sampling Return Pressure Check

Lab ID	Canister ID	Pressure[1] ("Hg)	Anomaly[2] (Y/N)	FC ID[3]	FC Return (Y/N)	Can Cert Batch ID	Comments
1	5090	-9.1	N	4698	Y	4805 BJXJ	200ml/min
2	4143	-2.5		4628		2919 BJXL	
3	3161	-6.7		4975		2919 BJXL	
4	3662	-8.5		4605		2919 BJXL	
5	4266	-10.8		4687		4805 BJXJ	
6	2632	-3.8		4697		4805 BJXJ	

JJ 03-18-2011

[1] Criteria: Return Pressure should be between -1 and -10 ("Hg)

[2] If return pressure is not within criteria, initiate anomaly report.

[3] Record the ID of the FC used for sampling if information is provided, otherwise leave blank.

Internal Use Only: Flow Controller Date and Page # _____

Summa Canister Dilution Worksheet

Client: Geosyntec Consultants, Inc.

TestAmerica Job ID: 200-4315-1
Client: Narrowburg, NY

Lab Sample ID	Canister Volume (L)	Preadjusted Pressure ("Hg)	Preadjusted Pressure (atm)	Preadjusted Volume (L)	Adjusted Pressure (psig)	Adjusted Pressure (atm)	Adjusted Volume (L)	Dilution Factor	Final Dilution Factor	Date	Analyst
200-4315-1	6	-9.5	0.68	4.09	39.2	3.67	22.00	5.37	5.37	03/21/11 10:43	Daigle, Paul A
200-4315-1	6	0.0	1.00	6.00	40.7	3.77	22.61	3.77	20.24	03/21/11 10:46	Daigle, Paul A
200-4315-1	6	0.0	1.00	6.00	40.1	3.73	22.37	3.73	75.51	03/21/11 10:49	Daigle, Paul A
200-4315-1	6	0.00	1.00	6.00	39.00	3.65	21.92	3.65	275.62	03/25/11 18:48	Valjevac, Sanel
200-4315-1	6	0.00	1.00	6.00	38.40	3.61	21.67	3.61	995.00	03/25/11 18:50	Valjevac, Sanel
200-4315-2	6	-2.7	0.91	5.46	39.8	3.71	22.24	4.08	4.08	03/21/11 10:52	Daigle, Paul A
200-4315-2	6	0.0	1.00	6.00	40.3	3.74	22.45	3.74	15.26	03/21/11 10:54	Daigle, Paul A
200-4315-2	6	0.0	1.00	6.00	40.1	3.73	22.37	3.73	56.92	03/21/11 10:55	Daigle, Paul A
200-4315-2	6	0.0	1.00	6.00	38.90	3.65	21.88	3.65	207.75	03/25/11 19:48	Valjevac, Sanel
200-4315-2	6	0.0	1.00	6.00	38.60	3.63	21.76	3.63	754.12	03/25/11 19:50	Valjevac, Sanel
200-4315-4	6	-8.3	0.72	4.34	33.5	3.28	19.67	4.54	4.54	03/21/11 10:58	Daigle, Paul A
200-4315-4	6	0.0	1.00	6.00	35.9	3.44	20.65	3.44	15.62	03/21/11 11:00	Daigle, Paul A
200-4315-4	6	0.0	1.00	6.00	39.1	3.66	21.96	3.66	57.16	03/21/11 11:01	Daigle, Paul A
200-4315-4	6	0.0	1.00	6.00	38.50	3.62	21.71	3.62	206.92	03/25/11 19:56	Valjevac, Sanel
200-4315-4	6	0.0	1.00	6.00	38.90	3.65	21.88	3.65	755.26	03/25/11 19:57	Valjevac, Sanel
200-4315-4	6	0.0	1.00	6.00	39.9	3.71	22.29	3.71	2802.02	03/25/11 20:00	Valjevac, Sanel
200-4315-5	6	-10.7	0.64	3.85	31.9	3.17	19.02	4.93	4.93	03/21/11 11:04	Daigle, Paul A
200-4315-5	6	0.0	1.00	6.00	35.9	3.44	20.65	3.44	16.96	03/21/11 11:06	Daigle, Paul A
200-4315-5	6	0.0	1.00	6.00	41.6	3.83	22.98	3.83	64.95	03/22/11 11:27	Daigle, Paul A
200-4315-5	6	0.0	1.00	6.00	40.00	3.72	22.33	3.72	241.63	03/25/11 20:09	Valjevac, Sanel
200-4315-5	6	0.00	1.00	6.00	39.80	3.71	22.24	3.71	896.44	03/25/11 20:13	Valjevac, Sanel
200-4315-6	6	-3.4	0.89	5.32	3.1	1.21	7.27	1.37	1.37	03/28/11 13:51	Veilleux, Michael R

Formulae:

Preadjusted Volume (L) = (Preadjusted Pressure ("Hg) + 29.92 "Hg * Vol L) / 29.92 "Hg
Adjusted Volume (L) = (Adjusted Pressure (psig) + 14.7 psig * Vol L) / 14.7 psig
Dilution Factor = Adjusted Volume (L) / Preadjusted Volume (L)

Where:

29.92 "Hg = Standard atmospheric pressure in inches of Mercury (“Hg)
14.7 psig = Standard atmospheric pressure in pounds per square inch gauge (psig)

Pre-Shipment Clean Canister Certification Report

Certification Type: ☒ Batch ☐ Individual

Canister Cleaning & Pre-Shipment Leak Test

System ID	# Cycles	Cleaning Date	Technician	Canister Size
T6P	10	2/25/11	UP	(6L) 1L 3L

Leak Test

Port	Can ID	Initial[1] ("Hg)	Final ("Hg)	Adjusted Initial[2] ("Hg)	Difference[3]
1	2659	-29.5	-29.0	-29.0	0.0
2	3264				
3	5090				
4	3274				
5	4805				
6	4371				
7	2632				
8	4872				
9	4291				
10	3396				
11	4266				
12	3434				

Initial Reading		Final Reading	
Gauge ID:	61	Gauge ID:	61
Date:	2/26/11	Date:	2/28/11
Time:	0730	Time:	1200
Tech:	S.M. 11	Tech:	UP
BP:	29.7 ("Hg)	BP:	29.2 ("Hg)
Temp	22 (°C)	Temp:	22 (°C)

[3]Acceptance Criteria:

(1) The difference must be less than or equal to + 0.5

(2) Pressure readings must be at least 24 hours apart.

If time frame was not met, the PM must authorize shipment of canister:

PM Authorization:

Signature Date

[1] Batch Certification: The reading is taken on the "batch" canister and this value is used as the initial pressure for all canisters in the batch.

[2] To calculate Adjusted Initial Pressure, subtract Final BP from Initial BP and add the result (positive or negative) to the initial pressure reading.

[3] To calculate Difference, subtract the Adjusted Initial Pressure from the Final Pressure (See Acceptance Criteria)

Clean Canister Certification Analysis & Authorization of Release to Inventory

Test Method: ☒ TO15 Routine ☐ TO15 LL ☐ NJDEP-LL TO15

Can ID	Date	Sequence	Analyst	Inventory Level 1	2	3	4	Limited	Secondary Review: Review Date	Reviewer
4805	02/24/11	BJXJ	SV		✓				03/01/11	KLP

Inventory Level 1: Individual Canister Certification Only. Certified clean to RLs listed in laboratory SOP for LLTO15.

Inventory Level 2: Individual or Batch Certification. Certified clean to 0.04 ppbv.

Inventory Level 3: Individual or Batch Certification. Certified clean to 0.20 ppbv.

Inventory Level 4: Individual or Batch Certification. Certified clean following procedures and RLs listed in laboratory SOP NJDEP-LLTO15.

Inventory Level Limited Use: Canisters may only be used for certain projects.

Comments:

Pre-Shipment Clean Canister Certification Report

Certification Type: ☒ Batch ☐ Individual

Canister Cleaning & Pre-Shipment Leak Test					
System ID	# Cycles	Cleaning Date	Technician	Canister Size	
Bottom Rack	5	2/27/11	SML 3	(6L)	1L 3L

Port	Can ID	Leak Test: Initial[1] ("Hg)	Final ("Hg)	Adjusted Initial[2] ("Hg)	Difference[3]
1	4473	-29.0	-29.5	-29.5	0.0
2	3662				
3	2919				
4	3457				
5	3259				
6	4336				
7	4437				
8	4143				
9	3538				
10	3161				
11	3149				
12	3095	↓	↓	↓	↓

Initial Reading		Final Reading	
Gauge ID:	G1	Gauge ID:	G1
Date:	2/28/11	Date:	3/1/11
Time:	0930	Time:	1115
Tech:	SM	Tech:	S
BP:	29.2 ("Hg)	BP:	29.7 ("Hg)
Temp	22 (°C)	Temp:	22 (°C)

[3]Acceptance Criteria:
(1) The difference must be less than or equal to + 0.5
(2) Pressure readings must be at least 24 hours apart.
If time frame was not met, the PM must authorize shipment of canister:
PM Authorization:

Signature Date

[1] Batch Certification: The reading is taken on the "batch" canister and this value is used as the initial pressure for all canisters in the batch.

[2] To calculate Adjusted Initial Pressure, subtract Final BP from Initial BP and add the result (positive or negative) to the initial pressure reading.

[3] To calculate Difference, subtract the Adjusted Initial Pressure from the Final Pressure (See Acceptance Criteria)

Clean Canister Certification Analysis & Authorization of Release to Inventory

Test Method: ☐TO15 Routine ☐ TO15 LL ☐ NJDEP-LL TO15

Can ID	Date	Sequence	Analyst	Inventory Level 1	2	3	4	Limited	Secondary Review: Review Date	Reviewer
2919	03/01/11	BJXL	PAD		✓				03/03/11	KLP

Inventory Level 1: Individual Canister Certification Only. Certified clean to RLs listed in laboratory SOP for LLTO15.

Inventory Level 2: Individual or Batch Certification. Certified clean to 0.04 ppbv.

Inventory Level 3: Individual or Batch Certification. Certified clean to 0.20 ppbv.

Inventory Level 4: Individual or Batch Certification. Certified clean following procedures and RLs listed in laboratory SOP NJDEP-LLTO15.

Inventory Level Limited Use: Canisters may only be used for certain projects.

Comments:

Loc: 200
4011
#3

BR-FAI023.10.19.0
TestAmerica
200-4011-A-3
2919
Location: Air-Storage
Bottle: Summa Canister 6L
Sampled: 2/28/2011 12 00 AM
200-116844

200-4011-A-3

FORM III
AIR - GC/MS VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Burlington Job No.: 200-3988-1

SDG No.:

Matrix: Air Level: Low Lab File ID: bjxj003.d

Lab ID: LCS 200-14276/3 Client ID:

COMPOUND	SPIKE ADDED (ppb v/v)	LCS CONCENTRATION (ppb v/v)	LCS % REC	QC LIMITS REC	#
Propylene	10.0	8.86	89	70-130	
Dichlorodifluoromethane	10.0	9.02	90	70-130	
Freon 22	10.0	9.14	91	70-130	
1,2-Dichlorotetrafluoroethane	10.0	8.77	88	70-130	
Chloromethane	10.0	9.05	90	70-130	
n-Butane	10.0	8.98	90	70-130	
Vinyl chloride	10.0	8.66	87	70-130	
1,3-Butadiene	10.0	9.05	91	70-130	
Bromomethane	10.0	8.22	82	70-130	
Chloroethane	10.0	9.00	90	70-130	
Bromoethene(Vinyl Bromide)	10.0	9.28	93	70-130	
Trichlorofluoromethane	10.0	8.91	89	70-130	
Ethanol	15.0	13.9	92	70-130	
Freon TF	10.0	9.97	100	70-130	
1,1-Dichloroethene	10.0	10.3	103	70-130	
Acetone	10.0	10.8	108	70-130	
Isopropyl alcohol	10.0	9.08	91	70-130	
Carbon disulfide	10.0	9.63	96	70-130	
3-Chloropropene	10.0	9.48	95	70-130	
Methylene Chloride	10.0	10.0	100	70-130	
tert-Butyl alcohol	10.0	9.27	93	70-130	
Methyl tert-butyl ether	10.0	9.57	96	70-130	
trans-1,2-Dichloroethene	10.0	9.29	93	70-130	
n-Hexane	10.0	9.46	95	70-130	
1,1-Dichloroethane	10.0	9.31	93	70-130	
Vinyl acetate	10.0	9.70	97	70-130	
Ethyl acetate	10.0	9.51	95	70-130	
Methyl Ethyl Ketone	10.0	9.87	99	70-130	
cis-1,2-Dichloroethene	10.0	9.57	96	70-130	
Chloroform	10.0	9.04	90	70-130	
Tetrahydrofuran	10.0	9.65	96	70-130	
1,1,1-Trichloroethane	10.0	8.94	89	70-130	
Cyclohexane	10.0	9.27	93	70-130	
Carbon tetrachloride	10.0	8.83	88	70-130	
2,2,4-Trimethylpentane	10.0	9.43	94	70-130	
Benzene	10.0	9.14	91	70-130	
1,2-Dichloroethane	10.0	8.84	88	70-130	
n-Heptane	10.0	9.28	93	70-130	
Trichloroethene	10.0	8.96	90	70-130	
Methyl methacrylate	10.0	9.52	95	70-130	
1,2-Dichloropropane	10.0	8.96	90	70-130	
1,4-Dioxane	10.0	8.00	80	70-130	

Column to be used to flag recovery and RPD values

FORM III TO-15

FORM III
AIR - GC/MS VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Burlington Job No.: 200-3988-1

SDG No.:

Matrix: Air Level: Low Lab File ID: bjxj003.d

Lab ID: LCS 200-14276/3 Client ID:

COMPOUND	SPIKE ADDED (ppb v/v)	LCS CONCENTRATION (ppb v/v)	LCS % REC	QC LIMITS REC	#
Bromodichloromethane	10.0	9.37	94	70-130	
cis-1,3-Dichloropropene	10.0	9.15	92	70-130	
methyl isobutyl ketone	10.0	9.67	97	70-130	
Toluene	10.0	9.39	94	70-130	
trans-1,3-Dichloropropene	10.0	8.97	90	70-130	
1,1,2-Trichloroethane	10.0	8.99	90	70-130	
Tetrachloroethene	10.0	9.19	92	70-130	
Methyl Butyl Ketone (2-Hexanone)	10.0	9.84	98	70-130	
Dibromochloromethane	10.0	10.0	100	70-130	
1,2-Dibromoethane	10.0	9.23	92	70-130	
Chlorobenzene	10.0	8.90	89	70-130	
Ethylbenzene	10.0	9.30	93	70-130	
m,p-Xylene	20.0	18.6	93	70-130	
Xylene, o-	10.0	9.35	94	70-130	
Styrene	10.0	9.72	97	70-130	
Bromoform	10.0	10.2	102	70-130	
Cumene	10.0	9.63	96	70-130	
1,1,2,2-Tetrachloroethane	10.0	9.20	92	70-130	
n-Propylbenzene	10.0	9.64	96	70-130	
4-Ethyltoluene	10.0	9.64	96	70-130	
1,3,5-Trimethylbenzene	10.0	9.24	92	70-130	
2-Chlorotoluene	10.0	9.47	95	70-130	
tert-Butylbenzene	10.0	9.48	95	70-130	
1,2,4-Trimethylbenzene	10.0	9.06	91	70-130	
sec-Butylbenzene	10.0	9.54	95	70-130	
4-Isopropyltoluene	10.0	9.63	96	70-130	
1,3-Dichlorobenzene	10.0	8.86	89	70-130	
1,4-Dichlorobenzene	10.0	8.78	88	70-130	
Benzyl chloride	10.0	8.07	81	70-130	
n-Butylbenzene	10.0	9.52	95	70-130	
1,2-Dichlorobenzene	10.0	8.67	87	70-130	
1,2,4-Trichlorobenzene	10.0	9.35	94	70-130	
Hexachlorobutadiene	10.0	9.21	92	70-130	
Naphthalene	10.0	9.71	97	70-130	

Column to be used to flag recovery and RPD values

FORM III TO-15

FORM III
AIR - GC/MS VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Burlington Job No.: 200-4011-1

SDG No.:

Matrix: Air Level: Low Lab File ID: bjxl003.d

Lab ID: LCS 200-14428/3 Client ID:

COMPOUND	SPIKE ADDED (ppb v/v)	LCS CONCENTRATION (ppb v/v)	LCS % REC	QC LIMITS REC	#
Propylene	10.0	10.3	103	70-130	
Dichlorodifluoromethane	10.0	10.4	104	70-130	
Freon 22	10.0	10.6	106	70-130	
1,2-Dichlorotetrafluoroethane	10.0	9.97	100	70-130	
Chloromethane	10.0	10.3	103	70-130	
n-Butane	10.0	10.3	103	70-130	
Vinyl chloride	10.0	9.89	99	70-130	
1,3-Butadiene	10.0	10.2	102	70-130	
Bromomethane	10.0	9.57	96	70-130	
Chloroethane	10.0	10.3	103	70-130	
Bromoethene(Vinyl Bromide)	10.0	10.3	103	70-130	
Trichlorofluoromethane	10.0	10.1	101	70-130	
Ethanol	15.0	16.2	107	70-130	
Freon TF	10.0	10.7	107	70-130	
1,1-Dichloroethene	10.0	11.1	111	70-130	
Acetone	10.0	12.3	123	70-130	
Isopropyl alcohol	10.0	10.3	103	70-130	
Carbon disulfide	10.0	10.5	105	70-130	
3-Chloropropene	10.0	10.6	106	70-130	
Methylene Chloride	10.0	11.3	113	70-130	
tert-Butyl alcohol	10.0	10.3	103	70-130	
Methyl tert-butyl ether	10.0	10.5	105	70-130	
trans-1,2-Dichloroethene	10.0	10.4	104	70-130	
n-Hexane	10.0	10.5	105	70-130	
1,1-Dichloroethane	10.0	10.4	104	70-130	
Vinyl acetate	10.0	10.9	109	70-130	
Ethyl acetate	10.0	10.3	103	70-130	
Methyl Ethyl Ketone	10.0	10.7	108	70-130	
cis-1,2-Dichloroethene	10.0	10.4	104	70-130	
Chloroform	10.0	10.1	101	70-130	
Tetrahydrofuran	10.0	11.1	111	70-130	
1,1,1-Trichloroethane	10.0	10.2	102	70-130	
Cyclohexane	10.0	10.2	102	70-130	
Carbon tetrachloride	10.0	10.0	100	70-130	
2,2,4-Trimethylpentane	10.0	10.7	107	70-130	
Benzene	10.0	10.2	102	70-130	
1,2-Dichloroethane	10.0	10.3	103	70-130	
n-Heptane	10.0	10.7	107	70-130	
Trichloroethene	10.0	9.92	99	70-130	
Methyl methacrylate	10.0	10.6	106	70-130	
1,2-Dichloropropane	10.0	10.1	101	70-130	
1,4-Dioxane	10.0	8.70	87	70-130	

Column to be used to flag recovery and RPD values

FORM III TO-15

FORM III
AIR - GC/MS VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Burlington Job No.: 200-4011-1

SDG No.:

Matrix: Air Level: Low Lab File ID: bjxl003.d

Lab ID: LCS 200-14428/3 Client ID:

COMPOUND	SPIKE ADDED (ppb v/v)	LCS CONCENTRATION (ppb v/v)	LCS % REC	QC LIMITS REC	#
Bromodichloromethane	10.0	10.6	106	70-130	
cis-1,3-Dichloropropene	10.0	10.1	101	70-130	
methyl isobutyl ketone	10.0	11.2	112	70-130	
Toluene	10.0	10.1	101	70-130	
trans-1,3-Dichloropropene	10.0	10.1	101	70-130	
1,1,2-Trichloroethane	10.0	9.62	96	70-130	
Tetrachloroethene	10.0	9.47	95	70-130	
Methyl Butyl Ketone (2-Hexanone)	10.0	10.9	110	70-130	
Dibromochloromethane	10.0	10.7	107	70-130	
1,2-Dibromoethane	10.0	9.79	98	70-130	
Chlorobenzene	10.0	9.44	94	70-130	
Ethylbenzene	10.0	9.92	99	70-130	
m,p-Xylene	20.0	19.8	99	70-130	
Xylene, o-	10.0	9.87	99	70-130	
Styrene	10.0	10.3	103	70-130	
Bromoform	10.0	10.7	107	70-130	
Cumene	10.0	10.2	102	70-130	
1,1,2,2-Tetrachloroethane	10.0	9.86	99	70-130	
n-Propylbenzene	10.0	10.4	104	70-130	
4-Ethyltoluene	10.0	10.2	103	70-130	
1,3,5-Trimethylbenzene	10.0	9.85	99	70-130	
2-Chlorotoluene	10.0	10.2	102	70-130	
tert-Butylbenzene	10.0	10.1	101	70-130	
1,2,4-Trimethylbenzene	10.0	9.71	97	70-130	
sec-Butylbenzene	10.0	10.1	101	70-130	
4-Isopropyltoluene	10.0	10.2	102	70-130	
1,3-Dichlorobenzene	10.0	9.25	93	70-130	
1,4-Dichlorobenzene	10.0	9.23	92	70-130	
Benzyl chloride	10.0	8.65	86	70-130	
n-Butylbenzene	10.0	10.3	103	70-130	
1,2-Dichlorobenzene	10.0	9.06	91	70-130	
1,2,4-Trichlorobenzene	10.0	9.77	98	70-130	
Hexachlorobutadiene	10.0	9.62	96	70-130	
Naphthalene	10.0	10.2	102	70-130	

Column to be used to flag recovery and RPD values

FORM III TO-15

FORM IV
AIR - GC/MS VOA METHOD BLANK SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-3988-1

SDG No.:

Lab File ID: bjxj004.d Lab Sample ID: MB 200-14276/4

Matrix: Air Heated Purge:(Y/N) N

Instrument ID: B.i Date Analyzed: 02/26/2011 12:35

GC Column: RTX-624 ID: 0.32(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 200-14276/3	bjxj003.d	02/26/2011 11:40
4805	200-3988-5	bjxj024.d	02/27/2011 06:22

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-3988-1

SDG No.:

Client Sample ID: Lab Sample ID: MB 200-14276/4

Matrix: Air Lab File ID: bjxj004.d

Analysis Method: TO-15 Date Collected:

Sample wt/vol: 200(mL) Date Analyzed: 02/26/2011 12:35

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-624 ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 14276 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
115-07-1	Propylene	5.0	U	5.0	5.0
75-71-8	Dichlorodifluoromethane	0.50	U	0.50	0.50
75-45-6	Freon 22	0.50	U	0.50	0.50
76-14-2	1,2-Dichlorotetrafluoroethane	0.20	U	0.20	0.20
74-87-3	Chloromethane	0.50	U	0.50	0.50
106-97-8	n-Butane	0.50	U	0.50	0.50
75-01-4	Vinyl chloride	0.20	U	0.20	0.20
106-99-0	1,3-Butadiene	0.20	U	0.20	0.20
74-83-9	Bromomethane	0.20	U	0.20	0.20
75-00-3	Chloroethane	0.50	U	0.50	0.50
593-60-2	Bromoethene(Vinyl Bromide)	0.20	U	0.20	0.20
75-69-4	Trichlorofluoromethane	0.20	U	0.20	0.20
64-17-5	Ethanol	5.0	U	5.0	5.0
76-13-1	Freon TF	0.20	U	0.20	0.20
75-35-4	1,1-Dichloroethene	0.20	U	0.20	0.20
67-64-1	Acetone	5.0	U	5.0	5.0
67-63-0	Isopropyl alcohol	5.0	U	5.0	5.0
75-15-0	Carbon disulfide	0.50	U	0.50	0.50
107-05-1	3-Chloropropene	0.50	U	0.50	0.50
75-09-2	Methylene Chloride	0.50	U	0.50	0.50
75-65-0	tert-Butyl alcohol	5.0	U	5.0	5.0
1634-04-4	Methyl tert-butyl ether	0.20	U	0.20	0.20
156-60-5	trans-1,2-Dichloroethene	0.20	U	0.20	0.20
110-54-3	n-Hexane	0.20	U	0.20	0.20
75-34-3	1,1-Dichloroethane	0.20	U	0.20	0.20
108-05-4	Vinyl acetate	5.0	U	5.0	5.0
141-78-6	Ethyl acetate	5.0	U	5.0	5.0
78-93-3	Methyl Ethyl Ketone	0.50	U	0.50	0.50
156-59-2	cis-1,2-Dichloroethene	0.20	U	0.20	0.20
540-59-0	1,2-Dichloroethene, Total	0.20	U	0.20	0.20
67-66-3	Chloroform	0.20	U	0.20	0.20
109-99-9	Tetrahydrofuran	5.0	U	5.0	5.0
71-55-6	1,1,1-Trichloroethane	0.20	U	0.20	0.20
110-82-7	Cyclohexane	0.20	U	0.20	0.20
56-23-5	Carbon tetrachloride	0.20	U	0.20	0.20
540-84-1	2,2,4-Trimethylpentane	0.20	U	0.20	0.20

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-3988-1

SDG No.:

Client Sample ID: Lab Sample ID: MB 200-14276/4

Matrix: Air Lab File ID: bjxj004.d

Analysis Method: TO-15 Date Collected:

Sample wt/vol: 200(mL) Date Analyzed: 02/26/2011 12:35

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-624 ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 14276 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
71-43-2	Benzene	0.20	U	0.20	0.20
107-06-2	1,2-Dichloroethane	0.20	U	0.20	0.20
142-82-5	n-Heptane	0.20	U	0.20	0.20
79-01-6	Trichloroethene	0.20	U	0.20	0.20
80-62-6	Methyl methacrylate	0.50	U	0.50	0.50
78-87-5	1,2-Dichloropropane	0.20	U	0.20	0.20
123-91-1	1,4-Dioxane	5.0	U	5.0	5.0
75-27-4	Bromodichloromethane	0.20	U	0.20	0.20
10061-01-5	cis-1,3-Dichloropropene	0.20	U	0.20	0.20
108-10-1	methyl isobutyl ketone	0.50	U	0.50	0.50
108-88-3	Toluene	0.20	U	0.20	0.20
10061-02-6	trans-1,3-Dichloropropene	0.20	U	0.20	0.20
79-00-5	1,1,2-Trichloroethane	0.20	U	0.20	0.20
127-18-4	Tetrachloroethene	0.20	U	0.20	0.20
591-78-6	Methyl Butyl Ketone (2-Hexanone)	0.50	U	0.50	0.50
124-48-1	Dibromochloromethane	0.20	U	0.20	0.20
106-93-4	1,2-Dibromoethane	0.20	U	0.20	0.20
108-90-7	Chlorobenzene	0.20	U	0.20	0.20
100-41-4	Ethylbenzene	0.20	U	0.20	0.20
179601-23-1	m,p-Xylene	0.50	U	0.50	0.50
95-47-6	Xylene, o-	0.20	U	0.20	0.20
1330-20-7	Xylene (total)	0.20	U	0.20	0.20
100-42-5	Styrene	0.20	U	0.20	0.20
75-25-2	Bromoform	0.20	U	0.20	0.20
98-82-8	Cumene	0.20	U	0.20	0.20
79-34-5	1,1,2,2-Tetrachloroethane	0.20	U	0.20	0.20
103-65-1	n-Propylbenzene	0.20	U	0.20	0.20
622-96-8	4-Ethyltoluene	0.20	U	0.20	0.20
108-67-8	1,3,5-Trimethylbenzene	0.20	U	0.20	0.20
95-49-8	2-Chlorotoluene	0.20	U	0.20	0.20
98-06-6	tert-Butylbenzene	0.20	U	0.20	0.20
95-63-6	1,2,4-Trimethylbenzene	0.20	U	0.20	0.20
135-98-8	sec-Butylbenzene	0.20	U	0.20	0.20
99-87-6	4-Isopropyltoluene	0.20	U	0.20	0.20
541-73-1	1,3-Dichlorobenzene	0.20	U	0.20	0.20
106-46-7	1,4-Dichlorobenzene	0.20	U	0.20	0.20

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-3988-1

SDG No.:

Client Sample ID: Lab Sample ID: MB 200-14276/4

Matrix: Air Lab File ID: bjxj004.d

Analysis Method: TO-15 Date Collected:

Sample wt/vol: 200(mL) Date Analyzed: 02/26/2011 12:35

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-624 ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 14276 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
100-44-7	Benzyl chloride	0.20	U	0.20	0.20
104-51-8	n-Butylbenzene	0.20	U	0.20	0.20
95-50-1	1,2-Dichlorobenzene	0.20	U	0.20	0.20
120-82-1	1,2,4-Trichlorobenzene	0.50	U	0.50	0.50
87-68-3	Hexachlorobutadiene	0.20	U	0.20	0.20
91-20-3	Naphthalene	0.50	U	0.50	0.50

TestAmerica Burlington

AIR TOXICS QUANTITATION REPORT

Data file : /chem/B.i/Bsvr.p/bjxjto15.b/bjxj004.d
Lab Smp Id: mb Client Smp ID: mb
Inj Date : 26-FEB-2011 12:35
Operator : pad Inst ID: B.i
Smp Info : mb
Misc Info : 200,1, mb
Comment :
Method : /chem/B.i/Bsvr.p/bjxjto15.b/to15v5.m
Meth Date : 27-Feb-2011 10:51 sv Quant Type: ISTD
Cal Date : 09-FEB-2011 20:19 Cal File: bjx011.d
Als bottle: 3 QC Sample: BLANK
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 3.50
Processing Host: chemsvr6

Concentration Formula: Amt * DF * Uf*(Vo/Vo)*(Vf/Vf) * CpndVariable

Name	Value	Description
DF	1.00000	Dilution Factor
Uf	1.00000	ng unit correction factor
Vo	200.00000	Sample Volume purged (mL)
Vf	200.00000	Final Volume (mL)

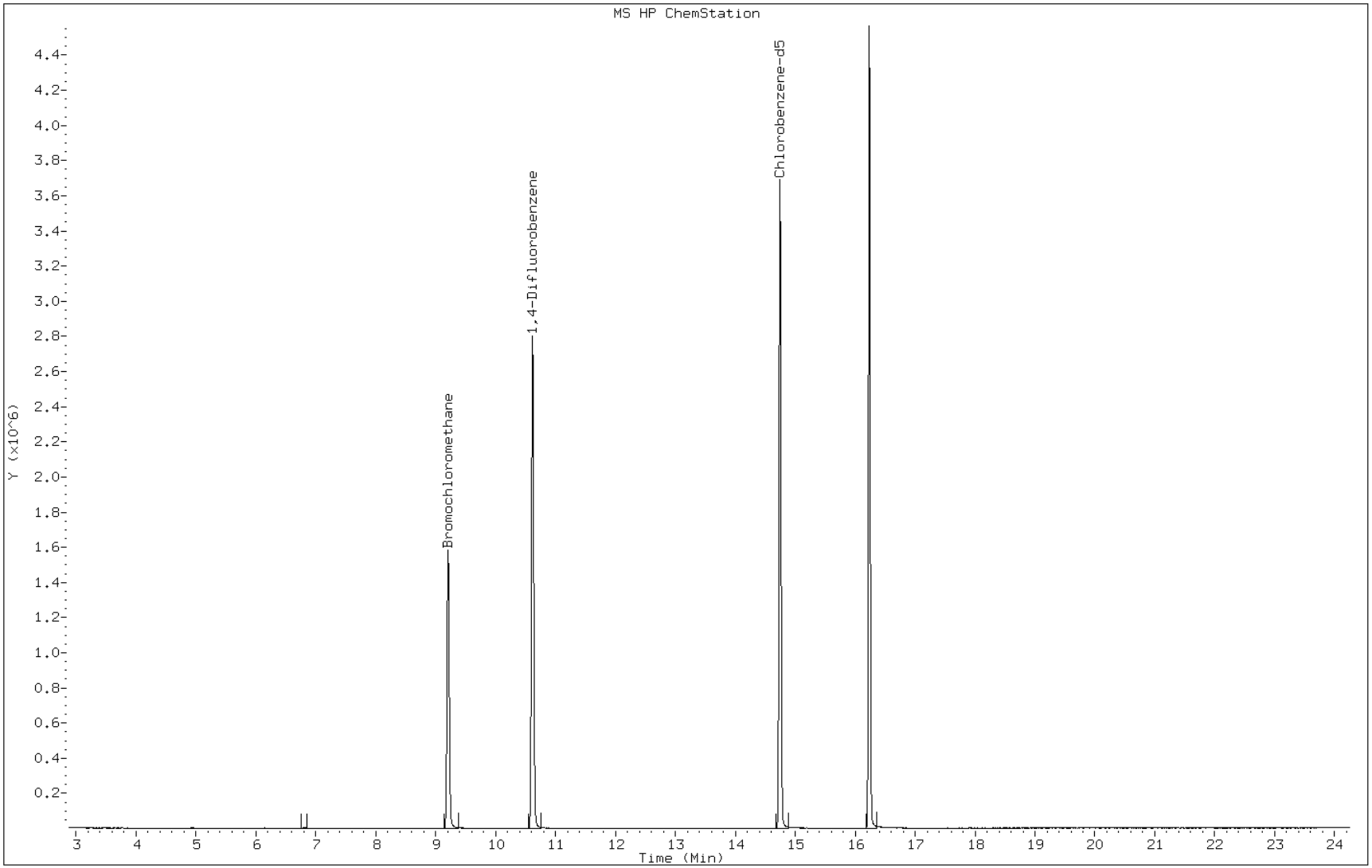
Cpnd Variable Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	CONCENTRATIONS FINAL (ppb v/v)
1 Propene	41	Compound Not Detected.					
2 Dichlorodifluoromethane	85	Compound Not Detected.					
3 Chlorodifluoromethane	51	Compound Not Detected.					
4 1,2-Dichloro-1,1,2,2-tetraflu	85	Compound Not Detected.					
5 Chloromethane	50	Compound Not Detected.					
6 Butane	43	Compound Not Detected.					
7 Vinyl chloride	62	Compound Not Detected.					
8 1,3-Butadiene	54	Compound Not Detected.					
9 Bromomethane	94	Compound Not Detected.					
10 Chloroethane	64	Compound Not Detected.					
11 2-Methylbutane	43	Compound Not Detected.					
12 Vinyl bromide	106	Compound Not Detected.					
13 Trichlorofluoromethane	101	Compound Not Detected.					
14 Pentane	43	Compound Not Detected.					

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	FINAL (ppb v/v)
	15 Ethanol	45	Compound Not Detected.					
	16 Ethyl ether	59	Compound Not Detected.					
	17 1,1,2-Trichloro-1,2,2-trifluo	101	Compound Not Detected.					
	18 Acrolein	56	Compound Not Detected.					
	19 1,1-Dichloroethene	96	Compound Not Detected.					
	20 Acetone	43	Compound Not Detected.					
	21 Carbon disulfide	76	Compound Not Detected.					
	22 Isopropanol	45	Compound Not Detected.					
	23 Allyl chloride	41	Compound Not Detected.					
	24 Acetonitrile	41	Compound Not Detected.					
	25 Methylene chloride	49	Compound Not Detected.					
	26 Tert-butyl alcohol	59	Compound Not Detected.					
	27 Methyl tert-butyl ether	73	Compound Not Detected.					
	28 1,2-Dichloroethene (trans)	61	Compound Not Detected.					
	29 Acrylonitrile	53	Compound Not Detected.					
	30 n-Hexane	57	Compound Not Detected.					
	31 1,1-Dichloroethane	63	Compound Not Detected.					
	32 Vinyl acetate	43	Compound Not Detected.					
M	33 1,2-Dichloroethene,Total	61	Compound Not Detected.					
	34 1,2-Dichloroethene (cis)	96	Compound Not Detected.					
	35 Ethyl acetate	88	Compound Not Detected.					
	36 Methyl Ethyl Ketone	72	Compound Not Detected.					
*	37 Bromochloromethane	128	9.209	9.215	(1.000)	601623	10.0000	
	38 Tetrahydrofuran	42	Compound Not Detected.					
	39 Chloroform	83	Compound Not Detected.					
	40 Cyclohexane	84	Compound Not Detected.					
	41 1,1,1-Trichloroethane	97	Compound Not Detected.					
	42 Carbon tetrachloride	117	Compound Not Detected.					
	43 2,2,4-Trimethylpentane	57	Compound Not Detected.					
	44 Benzene	78	Compound Not Detected.					
	45 1,2-Dichloroethane	62	Compound Not Detected.					
	46 n-Heptane	43	Compound Not Detected.					
*	47 1,4-Difluorobenzene	114	10.618	10.624	(1.000)	3120481	10.0000	
	48 n-Butanol	56	Compound Not Detected.					
	49 Trichloroethene	95	Compound Not Detected.					
	50 1,2-Dichloropropane	63	Compound Not Detected.					
	51 Methyl methacrylate	69	Compound Not Detected.					
	52 Dibromomethane	174	Compound Not Detected.					
	53 1,4-Dioxane	88	Compound Not Detected.					
	54 Bromodichloromethane	83	Compound Not Detected.					
	55 1,3-Dichloropropene (cis)	75	Compound Not Detected.					
	56 Methyl isobutyl ketone	43	Compound Not Detected.					
	57 n-Octane	43	Compound Not Detected.					
	58 Toluene	92	Compound Not Detected.					
	59 1,3-Dichloropropene (trans)	75	Compound Not Detected.					
	60 1,1,2-Trichloroethane	83	Compound Not Detected.					
	61 Tetrachloroethene	166	Compound Not Detected.					

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	FINAL (ppb v/v)
62	2-Hexanone	43	Compound Not Detected.					
63	Dibromochloromethane	129	Compound Not Detected.					
64	1,2-Dibromoethane	107	Compound Not Detected.					
* 65	Chlorobenzene-d5	117	14.749	14.754	(1.000)	2752801	10.0000	
66	Chlorobenzene	112	Compound Not Detected.					
67	n-Nonane	57	Compound Not Detected.					
68	Ethylbenzene	91	Compound Not Detected.					
69	Xylene (m,p)	106	Compound Not Detected.					
M 70	Xylenes, Total	106	Compound Not Detected.					
71	Xylene (o)	106	Compound Not Detected.					
72	Styrene	104	Compound Not Detected.					
73	Bromoform	173	Compound Not Detected.					
74	Isopropylbenzene	105	Compound Not Detected.					
75	1,1,2,2-Tetrachloroethane	83	Compound Not Detected.					
76	n-Propylbenzene	91	Compound Not Detected.					
77	1,2,3-Trichloropropane	75	Compound Not Detected.					
78	n-Decane	57	Compound Not Detected.					
79	4-Ethyltoluene	105	Compound Not Detected.					
80	2-Chlorotoluene	91	Compound Not Detected.					
81	1,3,5-Trimethylbenzene	105	Compound Not Detected.					
82	Alpha Methyl Styrene	118	Compound Not Detected.					
83	tert-butylbenzene	119	Compound Not Detected.					
84	1,2,4-Trimethylbenzene	105	Compound Not Detected.					
85	sec-Butylbenzene	105	Compound Not Detected.					
86	4-Isopropyltoluene	119	Compound Not Detected.					
87	1,3-Dichlorobenzene	146	Compound Not Detected.					
88	1,4-Dichlorobenzene	146	Compound Not Detected.					
89	Benzyl chloride	91	Compound Not Detected.					
90	Undecane	57	Compound Not Detected.					
91	n-Butylbenzene	91	Compound Not Detected.					
92	1,2-Dichlorobenzene	146	Compound Not Detected.					
93	Dodecane	57	Compound Not Detected.					
94	1,2,4-Trichlorobenzene	180	Compound Not Detected.					
95	1,3-Hexachlorobutadiene	225	Compound Not Detected.					
96	Naphthalene	128	Compound Not Detected.					
97	1,2,3-Trichlorobenzene	180	Compound Not Detected.					

Data File:	bjxj004.d	Date:	26-FEB-2011 12:35
Client ID:	mb	Instrument:	B.i
Operator:	pad	Inj Vol:	200.0
Column Type:	Capillary	Diameter:	0.32
Stationary Phase:	RTX-624		
Sample Info:	mb		
Lab Sample ID:	mb		



FORM IV
AIR - GC/MS VOA METHOD BLANK SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4011-1

SDG No.:

Lab File ID: bjxl004.d Lab Sample ID: MB 200-14428/4

Matrix: Air Heated Purge:(Y/N) N

Instrument ID: B.i Date Analyzed: 02/28/2011 17:13

GC Column: RTX-624 ID: 0.32(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 200-14428/3	bjxl003.d	02/28/2011 16:23
2919	200-4011-3	bjxl007.d	02/28/2011 20:03

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-4011-1

SDG No.:

Client Sample ID: Lab Sample ID: MB 200-14428/4

Matrix: Air Lab File ID: bjx1004.d

Analysis Method: TO-15 Date Collected:

Sample wt/vol: 200(mL) Date Analyzed: 02/28/2011 17:13

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-624 ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 14428 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
115-07-1	Propylene	5.0	U	5.0	5.0
75-71-8	Dichlorodifluoromethane	0.50	U	0.50	0.50
75-45-6	Freon 22	0.50	U	0.50	0.50
76-14-2	1,2-Dichlorotetrafluoroethane	0.20	U	0.20	0.20
74-87-3	Chloromethane	0.50	U	0.50	0.50
106-97-8	n-Butane	0.50	U	0.50	0.50
75-01-4	Vinyl chloride	0.20	U	0.20	0.20
106-99-0	1,3-Butadiene	0.20	U	0.20	0.20
74-83-9	Bromomethane	0.20	U	0.20	0.20
75-00-3	Chloroethane	0.50	U	0.50	0.50
593-60-2	Bromoethene(Vinyl Bromide)	0.20	U	0.20	0.20
75-69-4	Trichlorofluoromethane	0.20	U	0.20	0.20
64-17-5	Ethanol	5.0	U	5.0	5.0
76-13-1	Freon TF	0.20	U	0.20	0.20
75-35-4	1,1-Dichloroethene	0.20	U	0.20	0.20
67-64-1	Acetone	5.0	U	5.0	5.0
67-63-0	Isopropyl alcohol	5.0	U	5.0	5.0
75-15-0	Carbon disulfide	0.50	U	0.50	0.50
107-05-1	3-Chloropropene	0.50	U	0.50	0.50
75-09-2	Methylene Chloride	0.50	U	0.50	0.50
75-65-0	tert-Butyl alcohol	5.0	U	5.0	5.0
1634-04-4	Methyl tert-butyl ether	0.20	U	0.20	0.20
156-60-5	trans-1,2-Dichloroethene	0.20	U	0.20	0.20
110-54-3	n-Hexane	0.20	U	0.20	0.20
75-34-3	1,1-Dichloroethane	0.20	U	0.20	0.20
108-05-4	Vinyl acetate	5.0	U	5.0	5.0
141-78-6	Ethyl acetate	5.0	U	5.0	5.0
78-93-3	Methyl Ethyl Ketone	0.50	U	0.50	0.50
156-59-2	cis-1,2-Dichloroethene	0.20	U	0.20	0.20
540-59-0	1,2-Dichloroethene, Total	0.20	U	0.20	0.20
67-66-3	Chloroform	0.20	U	0.20	0.20
109-99-9	Tetrahydrofuran	5.0	U	5.0	5.0
71-55-6	1,1,1-Trichloroethane	0.20	U	0.20	0.20
110-82-7	Cyclohexane	0.20	U	0.20	0.20
56-23-5	Carbon tetrachloride	0.20	U	0.20	0.20
540-84-1	2,2,4-Trimethylpentane	0.20	U	0.20	0.20

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-4011-1

SDG No.:

Client Sample ID: Lab Sample ID: MB 200-14428/4

Matrix: Air Lab File ID: bjx1004.d

Analysis Method: TO-15 Date Collected:

Sample wt/vol: 200(mL) Date Analyzed: 02/28/2011 17:13

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-624 ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 14428 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
71-43-2	Benzene	0.20	U	0.20	0.20
107-06-2	1,2-Dichloroethane	0.20	U	0.20	0.20
142-82-5	n-Heptane	0.20	U	0.20	0.20
79-01-6	Trichloroethene	0.20	U	0.20	0.20
80-62-6	Methyl methacrylate	0.50	U	0.50	0.50
78-87-5	1,2-Dichloropropane	0.20	U	0.20	0.20
123-91-1	1,4-Dioxane	5.0	U	5.0	5.0
75-27-4	Bromodichloromethane	0.20	U	0.20	0.20
10061-01-5	cis-1,3-Dichloropropene	0.20	U	0.20	0.20
108-10-1	methyl isobutyl ketone	0.50	U	0.50	0.50
108-88-3	Toluene	0.20	U	0.20	0.20
10061-02-6	trans-1,3-Dichloropropene	0.20	U	0.20	0.20
79-00-5	1,1,2-Trichloroethane	0.20	U	0.20	0.20
127-18-4	Tetrachloroethene	0.20	U	0.20	0.20
591-78-6	Methyl Butyl Ketone (2-Hexanone)	0.50	U	0.50	0.50
124-48-1	Dibromochloromethane	0.20	U	0.20	0.20
106-93-4	1,2-Dibromoethane	0.20	U	0.20	0.20
108-90-7	Chlorobenzene	0.20	U	0.20	0.20
100-41-4	Ethylbenzene	0.20	U	0.20	0.20
179601-23-1	m,p-Xylene	0.50	U	0.50	0.50
95-47-6	Xylene, o-	0.20	U	0.20	0.20
1330-20-7	Xylene (total)	0.20	U	0.20	0.20
100-42-5	Styrene	0.20	U	0.20	0.20
75-25-2	Bromoform	0.20	U	0.20	0.20
98-82-8	Cumene	0.20	U	0.20	0.20
79-34-5	1,1,2,2-Tetrachloroethane	0.20	U	0.20	0.20
103-65-1	n-Propylbenzene	0.20	U	0.20	0.20
622-96-8	4-Ethyltoluene	0.20	U	0.20	0.20
108-67-8	1,3,5-Trimethylbenzene	0.20	U	0.20	0.20
95-49-8	2-Chlorotoluene	0.20	U	0.20	0.20
98-06-6	tert-Butylbenzene	0.20	U	0.20	0.20
95-63-6	1,2,4-Trimethylbenzene	0.20	U	0.20	0.20
135-98-8	sec-Butylbenzene	0.20	U	0.20	0.20
99-87-6	4-Isopropyltoluene	0.20	U	0.20	0.20
541-73-1	1,3-Dichlorobenzene	0.20	U	0.20	0.20
106-46-7	1,4-Dichlorobenzene	0.20	U	0.20	0.20

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-4011-1

SDG No.:

Client Sample ID: Lab Sample ID: MB 200-14428/4

Matrix: Air Lab File ID: bjx1004.d

Analysis Method: TO-15 Date Collected:

Sample wt/vol: 200(mL) Date Analyzed: 02/28/2011 17:13

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: RTX-624 ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 14428 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
100-44-7	Benzyl chloride	0.20	U	0.20	0.20
104-51-8	n-Butylbenzene	0.20	U	0.20	0.20
95-50-1	1,2-Dichlorobenzene	0.20	U	0.20	0.20
120-82-1	1,2,4-Trichlorobenzene	0.50	U	0.50	0.50
87-68-3	Hexachlorobutadiene	0.20	U	0.20	0.20
91-20-3	Naphthalene	0.50	U	0.50	0.50

TestAmerica Burlington

AIR TOXICS QUANTITATION REPORT

Data file : /chem/B.i/Bsvr.p/bjxlto15.b/bjxl004.d
Lab Smp Id: mb Client Smp ID: mb
Inj Date : 28-FEB-2011 17:13
Operator : wrd Inst ID: B.i
Smp Info : mb
Misc Info : 200,1, mb
Comment :
Method : /chem/B.i/Bsvr.p/bjxlto15GRN.b/to15v5.m
Meth Date : 01-Mar-2011 10:16 klp Quant Type: ISTD
Cal Date : 09-FEB-2011 20:19 Cal File: bjx011.d
Als bottle: 3 QC Sample: BLANK
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 3.50
Processing Host: chemsvr6

Concentration Formula: Amt * DF * Uf*(Vo/Vo)*(Vf/Vf) * CpndVariable

Name	Value	Description
DF	1.00000	Dilution Factor
Uf	1.00000	ng unit correction factor
Vo	200.00000	Sample Volume purged (mL)
Vf	200.00000	Final Volume (mL)

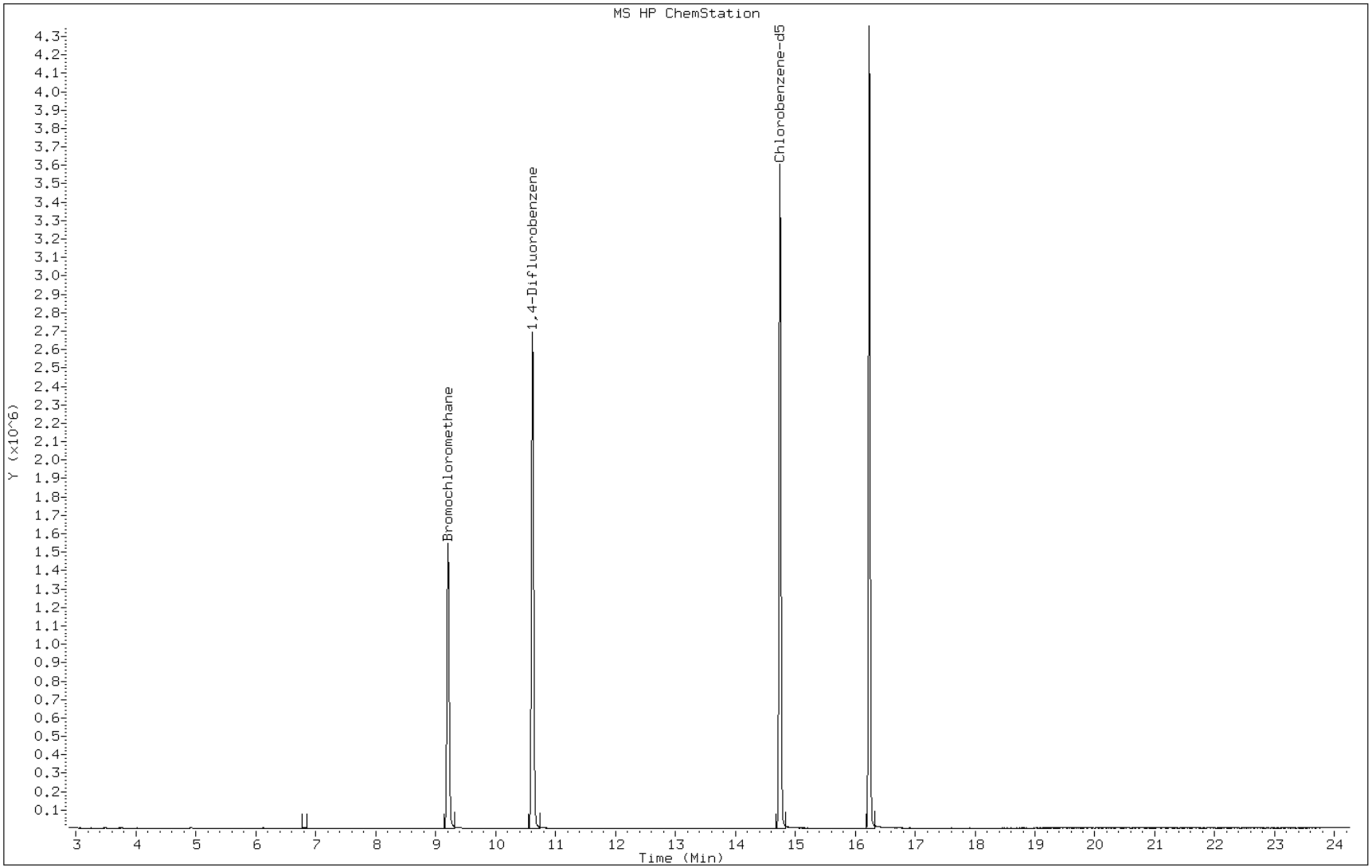
Cpnd Variable Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	CONCENTRATIONS FINAL (ppb v/v)
1 Propene	41	Compound Not Detected.					
2 Dichlorodifluoromethane	85	Compound Not Detected.					
3 Chlorodifluoromethane	51	Compound Not Detected.					
4 1,2-Dichloro-1,1,2,2-tetraflu	85	Compound Not Detected.					
5 Chloromethane	50	Compound Not Detected.					
6 Butane	43	Compound Not Detected.					
7 Vinyl chloride	62	Compound Not Detected.					
8 1,3-Butadiene	54	Compound Not Detected.					
9 Bromomethane	94	Compound Not Detected.					
10 Chloroethane	64	Compound Not Detected.					
11 2-Methylbutane	43	Compound Not Detected.					
12 Vinyl bromide	106	Compound Not Detected.					
13 Trichlorofluoromethane	101	Compound Not Detected.					
14 Pentane	43	Compound Not Detected.					

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	FINAL (ppb v/v)
	15 Ethanol	45	Compound Not Detected.					
	16 Ethyl ether	59	Compound Not Detected.					
	17 1,1,2-Trichloro-1,2,2-trifluo	101	Compound Not Detected.					
	18 Acrolein	56	Compound Not Detected.					
	19 1,1-Dichloroethene	96	Compound Not Detected.					
	20 Acetone	43	Compound Not Detected.					
	21 Carbon disulfide	76	Compound Not Detected.					
	22 Isopropanol	45	Compound Not Detected.					
	23 Allyl chloride	41	Compound Not Detected.					
	24 Acetonitrile	41	Compound Not Detected.					
	25 Methylene chloride	49	Compound Not Detected.					
	26 Tert-butyl alcohol	59	Compound Not Detected.					
	27 Methyl tert-butyl ether	73	Compound Not Detected.					
	28 1,2-Dichloroethene (trans)	61	Compound Not Detected.					
	29 Acrylonitrile	53	Compound Not Detected.					
	30 n-Hexane	57	Compound Not Detected.					
	31 1,1-Dichloroethane	63	Compound Not Detected.					
	32 Vinyl acetate	43	Compound Not Detected.					
M	33 1,2-Dichloroethene,Total	61	Compound Not Detected.					
	34 1,2-Dichloroethene (cis)	96	Compound Not Detected.					
	35 Ethyl acetate	88	Compound Not Detected.					
	36 Methyl Ethyl Ketone	72	Compound Not Detected.					
*	37 Bromochloromethane	128	9.209	9.215	(1.000)	565750	10.0000	
	38 Tetrahydrofuran	42	Compound Not Detected.					
	39 Chloroform	83	Compound Not Detected.					
	40 Cyclohexane	84	Compound Not Detected.					
	41 1,1,1-Trichloroethane	97	Compound Not Detected.					
	42 Carbon tetrachloride	117	Compound Not Detected.					
	43 2,2,4-Trimethylpentane	57	Compound Not Detected.					
	44 Benzene	78	Compound Not Detected.					
	45 1,2-Dichloroethane	62	Compound Not Detected.					
	46 n-Heptane	43	Compound Not Detected.					
*	47 1,4-Difluorobenzene	114	10.618	10.624	(1.000)	2958380	10.0000	
	48 n-Butanol	56	Compound Not Detected.					
	49 Trichloroethene	95	Compound Not Detected.					
	50 1,2-Dichloropropane	63	Compound Not Detected.					
	51 Methyl methacrylate	69	Compound Not Detected.					
	52 Dibromomethane	174	Compound Not Detected.					
	53 1,4-Dioxane	88	Compound Not Detected.					
	54 Bromodichloromethane	83	Compound Not Detected.					
	55 1,3-Dichloropropene (cis)	75	Compound Not Detected.					
	56 Methyl isobutyl ketone	43	Compound Not Detected.					
	57 n-Octane	43	Compound Not Detected.					
	58 Toluene	92	Compound Not Detected.					
	59 1,3-Dichloropropene (trans)	75	Compound Not Detected.					
	60 1,1,2-Trichloroethane	83	Compound Not Detected.					
	61 Tetrachloroethene	166	Compound Not Detected.					

			QUANT SIG					CONCENTRATIONS	
		Compounds	MASS	RT	EXP RT	REL RT	RESPONSE	ON-COLUMN (ppb v/v)	FINAL (ppb v/v)
	62	2-Hexanone	43	Compound Not Detected.					
	63	Dibromochloromethane	129	Compound Not Detected.					
	64	1,2-Dibromoethane	107	Compound Not Detected.					
*	65	Chlorobenzene-d5	117	14.744	14.754	(1.000)	2607944	10.0000	
	66	Chlorobenzene	112	Compound Not Detected.					
	67	n-Nonane	57	Compound Not Detected.					
	68	Ethylbenzene	91	Compound Not Detected.					
	69	Xylene (m,p)	106	Compound Not Detected.					
M	70	Xylenes, Total	106	Compound Not Detected.					
	71	Xylene (o)	106	Compound Not Detected.					
	72	Styrene	104	Compound Not Detected.					
	73	Bromoform	173	Compound Not Detected.					
	74	Isopropylbenzene	105	Compound Not Detected.					
	75	1,1,2,2-Tetrachloroethane	83	Compound Not Detected.					
	76	n-Propylbenzene	91	Compound Not Detected.					
	77	1,2,3-Trichloropropane	75	Compound Not Detected.					
	78	n-Decane	57	Compound Not Detected.					
	79	4-Ethyltoluene	105	Compound Not Detected.					
	80	2-Chlorotoluene	91	Compound Not Detected.					
	81	1,3,5-Trimethylbenzene	105	Compound Not Detected.					
	82	Alpha Methyl Styrene	118	Compound Not Detected.					
	83	tert-butylbenzene	119	Compound Not Detected.					
	84	1,2,4-Trimethylbenzene	105	Compound Not Detected.					
	85	sec-Butylbenzene	105	Compound Not Detected.					
	86	4-Isopropyltoluene	119	Compound Not Detected.					
	87	1,3-Dichlorobenzene	146	Compound Not Detected.					
	88	1,4-Dichlorobenzene	146	Compound Not Detected.					
	89	Benzyl chloride	91	Compound Not Detected.					
	90	Undecane	57	Compound Not Detected.					
	91	n-Butylbenzene	91	Compound Not Detected.					
	92	1,2-Dichlorobenzene	146	Compound Not Detected.					
	93	Dodecane	57	Compound Not Detected.					
	94	1,2,4-Trichlorobenzene	180	Compound Not Detected.					
	95	1,3-Hexachlorobutadiene	225	Compound Not Detected.					
	96	Naphthalene	128	Compound Not Detected.					
	97	1,2,3-Trichlorobenzene	180	Compound Not Detected.					
	199	1,1-Difluoroethane TIC	51	Compound Not Detected.					
	200	Chlorotrifluoroethene TIC	116	Compound Not Detected.					
	201	Pentafluoroethyl Chloride	85	Compound Not Detected.					
	202	22Dichloro111trifluoroethane	83	Compound Not Detected.					
	203	Acetic Acid Methyl Ester	43	Compound Not Detected.					
	204	Methylcyclohexane TIC	55	Compound Not Detected.					
	205	1,2Dibromo3chloropropane	75	Compound Not Detected.					

Data File:	bjxl004.d	Date:	28-FEB-2011 17:13
Client ID:	mb	Instrument:	B.i
Operator:	wrd	Inj Vol:	200.0
Column Type:	Capillary	Diameter:	0.32
Stationary Phase:	RTX-624		
Sample Info:	mb		
Lab Sample ID:	mb		



FORM V
AIR - GC/MS VOA INSTRUMENT PERFORMANCE CHECK

Lab Name: TestAmerica Burlington Job No.: 200-3988-1

SDG No.:

Lab File ID: bjx001.d BFB Injection Date: 02/09/2011

Instrument ID: B.i BFB Injection Time: 11:23

Analysis Batch No.: 13474

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	8.0 - 40.0% of mass 95	15.8	
75	30.0 - 66.0% of mass 95	45.4	
95	Base peak, 100% relative abundance	100.0	
96	5.0 - 9.0% of mass 95	6.8	
173	Less than 2.0% of mass 174	0.3	(0.4)1
174	50.0 - 120.0% of mass 95	79.2	
175	4.0 - 9.0 % of mass 174	5.6	(7.1)1
176	93.0 - 101.0% of mass 174	77.0	(97.2)1
177	5.0 - 9.0% of mass 176	5.0	(6.5)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	IC 200-13474/5	bjx005.d	02/09/2011	15:04
	IC 200-13474/6	bjx006.d	02/09/2011	15:56
	IC 200-13474/7	bjx007.d	02/09/2011	16:49
	ICIS 200-13474/8	bjx008.d	02/09/2011	17:41
	IC 200-13474/9	bjx009.d	02/09/2011	18:34
	IC 200-13474/10	bjx010.d	02/09/2011	19:26
	IC 200-13474/11	bjx011.d	02/09/2011	20:19
	ICV 200-13474/14	bjx014.d	02/09/2011	22:56

FORM V
AIR - GC/MS VOA INSTRUMENT PERFORMANCE CHECK

Lab Name: TestAmerica Burlington Job No.: 200-3988-1

SDG No.:

Lab File ID: bjxj001.d BFB Injection Date: 02/26/2011

Instrument ID: B.i BFB Injection Time: 09:59

Analysis Batch No.: 14276

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	8.0 - 40.0% of mass 95	16.1	
75	30.0 - 66.0% of mass 95	45.5	
95	Base peak, 100% relative abundance	100.0	
96	5.0 - 9.0% of mass 95	6.7	
173	Less than 2.0% of mass 174	0.4	(0.6)1
174	50.0 - 120.0% of mass 95	78.9	
175	4.0 - 9.0 % of mass 174	5.7	(7.2)1
176	93.0 - 101.0% of mass 174	76.9	(97.5)1
177	5.0 - 9.0% of mass 176	5.1	(6.6)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	CCVIS 200-14276/2	bjxj002.d	02/26/2011	10:50
	LCS 200-14276/3	bjxj003.d	02/26/2011	11:40
	MB 200-14276/4	bjxj004.d	02/26/2011	12:35
4805	200-3988-5	bjxj024.d	02/27/2011	06:22

FORM V
AIR - GC/MS VOA INSTRUMENT PERFORMANCE CHECK

Lab Name: TestAmerica Burlington Job No.: 200-4011-1

SDG No.:

Lab File ID: bjx001.d BFB Injection Date: 02/09/2011

Instrument ID: B.i BFB Injection Time: 11:23

Analysis Batch No.: 13474

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	8.0 - 40.0% of mass 95	15.8	
75	30.0 - 66.0% of mass 95	45.4	
95	Base peak, 100% relative abundance	100.0	
96	5.0 - 9.0% of mass 95	6.8	
173	Less than 2.0% of mass 174	0.3	(0.4)1
174	50.0 - 120.0% of mass 95	79.2	
175	4.0 - 9.0 % of mass 174	5.6	(7.1)1
176	93.0 - 101.0% of mass 174	77.0	(97.2)1
177	5.0 - 9.0% of mass 176	5.0	(6.5)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	IC 200-13474/5	bjx005.d	02/09/2011	15:04
	IC 200-13474/6	bjx006.d	02/09/2011	15:56
	IC 200-13474/7	bjx007.d	02/09/2011	16:49
	ICIS 200-13474/8	bjx008.d	02/09/2011	17:41
	IC 200-13474/9	bjx009.d	02/09/2011	18:34
	IC 200-13474/10	bjx010.d	02/09/2011	19:26
	IC 200-13474/11	bjx011.d	02/09/2011	20:19
	ICV 200-13474/14	bjx014.d	02/09/2011	22:56

FORM V
AIR - GC/MS VOA INSTRUMENT PERFORMANCE CHECK

Lab Name: TestAmerica Burlington Job No.: 200-4011-1

SDG No.:

Lab File ID: bjxl001.d BFB Injection Date: 02/28/2011

Instrument ID: B.i BFB Injection Time: 14:41

Analysis Batch No.: 14428

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	8.0 - 40.0% of mass 95	17.1	
75	30.0 - 66.0% of mass 95	46.8	
95	Base peak, 100% relative abundance	100.0	
96	5.0 - 9.0% of mass 95	6.8	
173	Less than 2.0% of mass 174	0.4	(0.6)1
174	50.0 - 120.0% of mass 95	74.5	
175	4.0 - 9.0 % of mass 174	5.3	(7.2)1
176	93.0 - 101.0% of mass 174	72.8	(97.7)1
177	5.0 - 9.0% of mass 176	4.8	(6.6)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	CCVIS 200-14428/2	bjxl002.d	02/28/2011	15:31
	LCS 200-14428/3	bjxl003.d	02/28/2011	16:23
	MB 200-14428/4	bjxl004.d	02/28/2011	17:13
2919	200-4011-3	bjxl007.d	02/28/2011	20:03

FORM VIII
AIR - GC/MS VOA INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-3988-1

SDG No.:

Sample No.: ICIS 200-13474/8 Date Analyzed: 02/09/2011 17:41

Instrument ID: B.i GC Column: RTX-624 ID: 0.32(mm)

Lab File ID (Standard): bjx008.d Heated Purge: (Y/N) N

Calibration ID: 4769

		BCM		DFB		CBZ	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT		611493	9.21	3090147	10.62	2798819	14.75
UPPER LIMIT		856090	9.54	4326206	10.95	3918347	15.08
LOWER LIMIT		366896	8.88	1854088	10.29	1679291	14.42
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICV 200-13474/14		661835	9.21	3384787	10.62	3025735	14.75

BCM = Bromochloromethane
DFB = 1,4-Difluorobenzene
CBZ = Chlorobenzene-d5

Area Limit = 60%-140% of internal standard area
RT Limit = ± 0.33 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII TO-15

FORM VIII
AIR - GC/MS VOA INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-3988-1

SDG No.:

Sample No.: CCVIS 200-14276/2 Date Analyzed: 02/26/2011 10:50

Instrument ID: B.i GC Column: RTX-624 ID: 0.32(mm)

Lab File ID (Standard): bjxj002.d Heated Purge: (Y/N) N

Calibration ID: 4769

		BCM		DFB		CBZ	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		624900	9.21	3163771	10.62	2865155	14.75
UPPER LIMIT		874860	9.54	4429279	10.95	4011217	15.08
LOWER LIMIT		374940	8.88	1898263	10.29	1719093	14.42
LAB SAMPLE ID	CLIENT SAMPLE ID						
LCS 200-14276/3		596364	9.21	3035066	10.62	2647213	14.75
MB 200-14276/4		601623	9.21	3120481	10.62	2752801	14.75
200-3988-5	4805	406974	9.20	2294638	10.62	2043166	14.75

BCM = Bromochloromethane
DFB = 1,4-Difluorobenzene
CBZ = Chlorobenzene-d5

Area Limit = 60%-140% of internal standard area
RT Limit = ± 0.33 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII TO-15

FORM VIII
AIR - GC/MS VOA INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4011-1

SDG No.:

Sample No.: ICIS 200-13474/8 Date Analyzed: 02/09/2011 17:41

Instrument ID: B.i GC Column: RTX-624 ID: 0.32(mm)

Lab File ID (Standard): bjx008.d Heated Purge: (Y/N) N

Calibration ID: 4769

		BCM		DFB		CBZ	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MID-POINT		611493	9.21	3090147	10.62	2798819	14.75
UPPER LIMIT		856090	9.54	4326206	10.95	3918347	15.08
LOWER LIMIT		366896	8.88	1854088	10.29	1679291	14.42
LAB SAMPLE ID	CLIENT SAMPLE ID						
ICV 200-13474/14		661835	9.21	3384787	10.62	3025735	14.75

BCM = Bromochloromethane
DFB = 1,4-Difluorobenzene
CBZ = Chlorobenzene-d5

Area Limit = 60%-140% of internal standard area
RT Limit = ± 0.33 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII TO-15

FORM VIII
AIR - GC/MS VOA INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Burlington Job No.: 200-4011-1

SDG No.:

Sample No.: CCVIS 200-14428/2 Date Analyzed: 02/28/2011 15:31

Instrument ID: B.i GC Column: RTX-624 ID: 0.32(mm)

Lab File ID (Standard): bjxl002.d Heated Purge: (Y/N) N

Calibration ID: 4769

		BCM		DFB		CBZ	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		581287	9.21	2945240	10.62	2639228	14.75
UPPER LIMIT		813802	9.54	4123336	10.95	3694919	15.08
LOWER LIMIT		348772	8.88	1767144	10.29	1583537	14.42
LAB SAMPLE ID	CLIENT SAMPLE ID						
LCS 200-14428/3		510130	9.21	2550912	10.62	2304970	14.75
MB 200-14428/4		565750	9.21	2958380	10.62	2607944	14.74
200-4011-3	2919	462021	9.20	2469123	10.62	2290194	14.74

BCM = Bromochloromethane
DFB = 1,4-Difluorobenzene
CBZ = Chlorobenzene-d5

Area Limit = 60%-140% of internal standard area
RT Limit = ± 0.33 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII TO-15

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-3988-1

SDG No.:

Client Sample ID: 4805 Lab Sample ID: 200-3988-5

Matrix: Air Lab File ID: bjxj024.d

Analysis Method: TO-15 Date Collected: 02/25/2011 00:00

Sample wt/vol: 1000(mL) Date Analyzed: 02/27/2011 06:22

Soil Aliquot Vol: Dilution Factor: 0.2

Soil Extract Vol.: GC Column: RTX-624 ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 14276 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
115-07-1	Propylene	1.0	U	1.0	1.0
75-71-8	Dichlorodifluoromethane	0.10	U	0.10	0.10
75-45-6	Freon 22	0.10	U	0.10	0.10
76-14-2	1,2-Dichlorotetrafluoroethane	0.040	U	0.040	0.040
74-87-3	Chloromethane	0.10	U	0.10	0.10
106-97-8	n-Butane	0.10	U	0.10	0.10
75-01-4	Vinyl chloride	0.040	U	0.040	0.040
106-99-0	1,3-Butadiene	0.040	U	0.040	0.040
74-83-9	Bromomethane	0.040	U	0.040	0.040
75-00-3	Chloroethane	0.10	U	0.10	0.10
593-60-2	Bromoethene(Vinyl Bromide)	0.040	U	0.040	0.040
75-69-4	Trichlorofluoromethane	0.040	U	0.040	0.040
64-17-5	Ethanol	1.0	U	1.0	1.0
76-13-1	Freon TF	0.040	U	0.040	0.040
75-35-4	1,1-Dichloroethene	0.040	U	0.040	0.040
67-64-1	Acetone	1.0	U	1.0	1.0
67-63-0	Isopropyl alcohol	1.0	U	1.0	1.0
75-15-0	Carbon disulfide	0.10	U	0.10	0.10
107-05-1	3-Chloropropene	0.10	U	0.10	0.10
75-09-2	Methylene Chloride	0.10	U	0.10	0.10
75-65-0	tert-Butyl alcohol	1.0	U	1.0	1.0
1634-04-4	Methyl tert-butyl ether	0.040	U	0.040	0.040
156-60-5	trans-1,2-Dichloroethene	0.040	U	0.040	0.040
110-54-3	n-Hexane	0.040	U	0.040	0.040
75-34-3	1,1-Dichloroethane	0.040	U	0.040	0.040
108-05-4	Vinyl acetate	1.0	U	1.0	1.0
141-78-6	Ethyl acetate	1.0	U	1.0	1.0
78-93-3	Methyl Ethyl Ketone	0.10	U	0.10	0.10
156-59-2	cis-1,2-Dichloroethene	0.040	U	0.040	0.040
540-59-0	1,2-Dichloroethene, Total	0.040	U	0.040	0.040
67-66-3	Chloroform	0.040	U	0.040	0.040
109-99-9	Tetrahydrofuran	1.0	U	1.0	1.0
71-55-6	1,1,1-Trichloroethane	0.040	U	0.040	0.040
110-82-7	Cyclohexane	0.040	U	0.040	0.040
56-23-5	Carbon tetrachloride	0.040	U	0.040	0.040
540-84-1	2,2,4-Trimethylpentane	0.040	U	0.040	0.040

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-3988-1

SDG No.:

Client Sample ID: 4805 Lab Sample ID: 200-3988-5

Matrix: Air Lab File ID: bjxj024.d

Analysis Method: TO-15 Date Collected: 02/25/2011 00:00

Sample wt/vol: 1000(mL) Date Analyzed: 02/27/2011 06:22

Soil Aliquot Vol: Dilution Factor: 0.2

Soil Extract Vol.: GC Column: RTX-624 ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 14276 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
71-43-2	Benzene	0.040	U	0.040	0.040
107-06-2	1,2-Dichloroethane	0.040	U	0.040	0.040
142-82-5	n-Heptane	0.040	U	0.040	0.040
79-01-6	Trichloroethene	0.040	U	0.040	0.040
80-62-6	Methyl methacrylate	0.10	U	0.10	0.10
78-87-5	1,2-Dichloropropane	0.040	U	0.040	0.040
123-91-1	1,4-Dioxane	1.0	U	1.0	1.0
75-27-4	Bromodichloromethane	0.040	U	0.040	0.040
10061-01-5	cis-1,3-Dichloropropene	0.040	U	0.040	0.040
108-10-1	methyl isobutyl ketone	0.10	U	0.10	0.10
108-88-3	Toluene	0.040	U	0.040	0.040
10061-02-6	trans-1,3-Dichloropropene	0.040	U	0.040	0.040
79-00-5	1,1,2-Trichloroethane	0.040	U	0.040	0.040
127-18-4	Tetrachloroethene	0.040	U	0.040	0.040
591-78-6	Methyl Butyl Ketone (2-Hexanone)	0.10	U	0.10	0.10
124-48-1	Dibromochloromethane	0.040	U	0.040	0.040
106-93-4	1,2-Dibromoethane	0.040	U	0.040	0.040
108-90-7	Chlorobenzene	0.040	U	0.040	0.040
100-41-4	Ethylbenzene	0.040	U	0.040	0.040
179601-23-1	m,p-Xylene	0.10	U	0.10	0.10
95-47-6	Xylene, o-	0.040	U	0.040	0.040
1330-20-7	Xylene (total)	0.040	U	0.040	0.040
100-42-5	Styrene	0.040	U	0.040	0.040
75-25-2	Bromoform	0.040	U	0.040	0.040
98-82-8	Cumene	0.040	U	0.040	0.040
79-34-5	1,1,2,2-Tetrachloroethane	0.040	U	0.040	0.040
103-65-1	n-Propylbenzene	0.040	U	0.040	0.040
622-96-8	4-Ethyltoluene	0.040	U	0.040	0.040
108-67-8	1,3,5-Trimethylbenzene	0.040	U	0.040	0.040
95-49-8	2-Chlorotoluene	0.040	U	0.040	0.040
98-06-6	tert-Butylbenzene	0.040	U	0.040	0.040
95-63-6	1,2,4-Trimethylbenzene	0.040	U	0.040	0.040
135-98-8	sec-Butylbenzene	0.040	U	0.040	0.040
99-87-6	4-Isopropyltoluene	0.040	U	0.040	0.040
541-73-1	1,3-Dichlorobenzene	0.040	U	0.040	0.040
106-46-7	1,4-Dichlorobenzene	0.040	U	0.040	0.040

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-3988-1

SDG No.:

Client Sample ID: 4805 Lab Sample ID: 200-3988-5

Matrix: Air Lab File ID: bjxj024.d

Analysis Method: TO-15 Date Collected: 02/25/2011 00:00

Sample wt/vol: 1000(mL) Date Analyzed: 02/27/2011 06:22

Soil Aliquot Vol: Dilution Factor: 0.2

Soil Extract Vol.: GC Column: RTX-624 ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 14276 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
100-44-7	Benzyl chloride	0.040	U	0.040	0.040
104-51-8	n-Butylbenzene	0.040	U	0.040	0.040
95-50-1	1,2-Dichlorobenzene	0.040	U	0.040	0.040
120-82-1	1,2,4-Trichlorobenzene	0.10	U	0.10	0.10
87-68-3	Hexachlorobutadiene	0.040	U	0.040	0.040
91-20-3	Naphthalene	0.10	U	0.10	0.10

TestAmerica Burlington

AIR TOXICS QUANTITATION REPORT

Lab Sample Id: 200-3988-5
Client Smp ID: 4805
Inj Date : 27-FEB-2011 06:22
Operator : pad Inst ID: B.i
Smp Info : 200-3988-A-5
Misc Info : 1000,0.2,all74+mn
Comment :
Method : /chem/B.i/Bsvr.p/bjxjto15.b/to15v5.m
Meth Date : 27-Feb-2011 10:51 sv Quant Type: ISTD
Cal Date : 09-FEB-2011 20:19 Cal File: bjx011.d
Als bottle: 7
Dil Factor: 0.20000
Integrator: HP RTE Compound Sublist: all74+MN.sub
Target Version: 3.50
Processing Host: chemsvr6

Concentration Formula: Amt * DF * Uf*(Vo/Vo)*(Vf/Vf) * CpndVariable

Name	Value	Description
DF	0.20000	Dilution Factor
Uf	1.00000	ng unit correction factor
Vo	1000.00000	Sample Volume purged (mL)
Vf	200.00000	Final Volume (mL)

Cpnd Variable Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	CONCENTRATIONS FINAL (ppb v/v)
1	Propene	41	Compound Not Detected.					
2	Dichlorodifluoromethane	85	Compound Not Detected.					
3	Chlorodifluoromethane	51	Compound Not Detected.					
4	1,2-Dichloro-1,1,2,2-tetraflu	85	Compound Not Detected.					
5	Chloromethane	50	Compound Not Detected.					
6	Butane	43	Compound Not Detected.					
7	Vinyl chloride	62	Compound Not Detected.					
8	1,3-Butadiene	54	Compound Not Detected.					
9	Bromomethane	94	Compound Not Detected.					
10	Chloroethane	64	Compound Not Detected.					
12	Vinyl bromide	106	Compound Not Detected.					
13	Trichlorofluoromethane	101	Compound Not Detected.					
15	Ethanol	45	Compound Not Detected.					
17	1,1,2-Trichloro-1,2,2-trifluo	101	Compound Not Detected.					

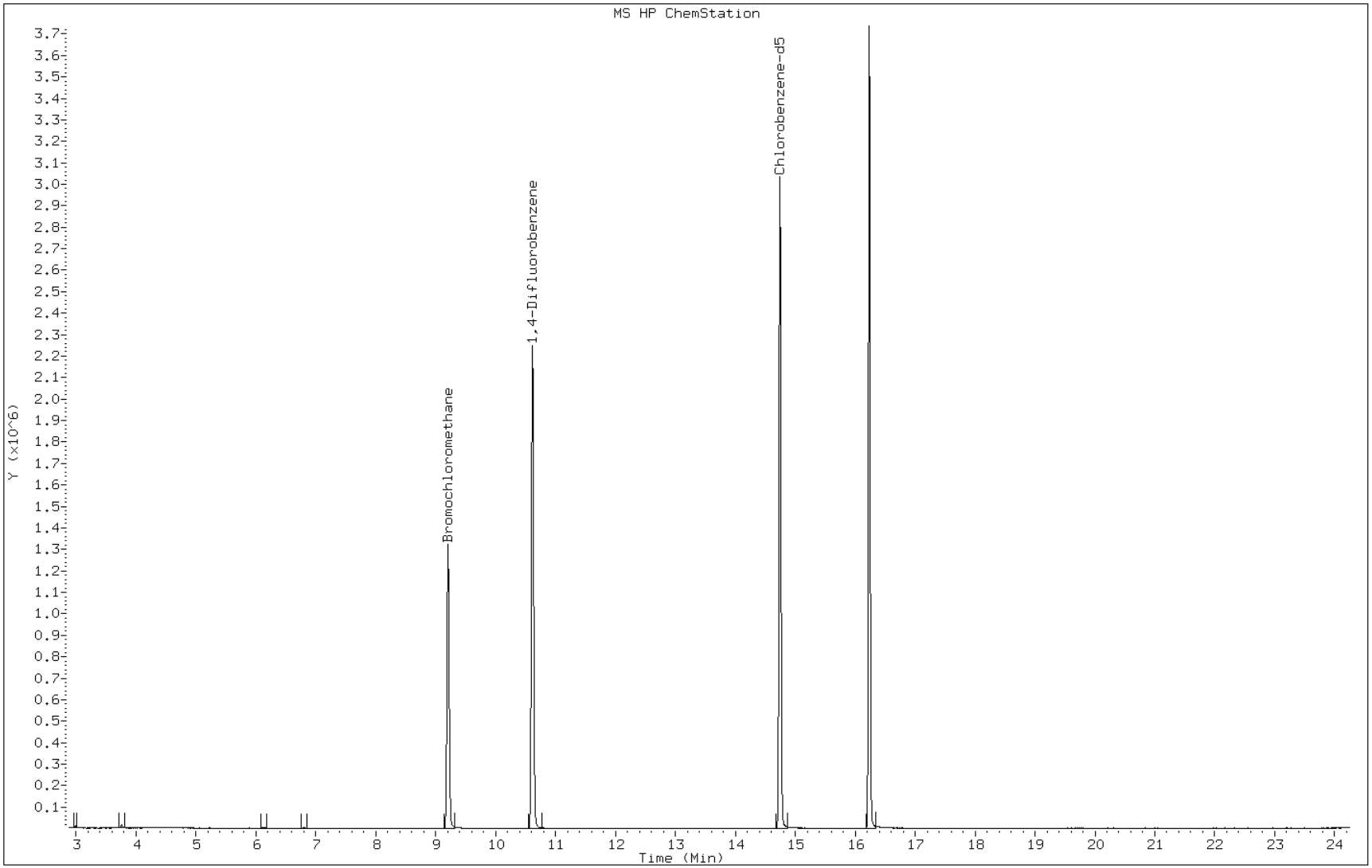
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	FINAL (ppb v/v)	
	19 1,1-Dichloroethene	96	Compound Not Detected.						
	20 Acetone	43	Compound Not Detected.						
	21 Carbon disulfide	76	Compound Not Detected.						
	22 Isopropanol	45	Compound Not Detected.						
	23 Allyl chloride	41	Compound Not Detected.						
	25 Methylene chloride	49	Compound Not Detected.						
	26 Tert-butyl alcohol	59	Compound Not Detected.						
	27 Methyl tert-butyl ether	73	Compound Not Detected.						
	28 1,2-Dichloroethene (trans)	61	Compound Not Detected.						
	30 n-Hexane	57	Compound Not Detected.						
	31 1,1-Dichloroethane	63	Compound Not Detected.						
	32 Vinyl acetate	43	Compound Not Detected.						
M	33 1,2-Dichloroethene,Total	61	Compound Not Detected.						
	34 1,2-Dichloroethene (cis)	96	Compound Not Detected.						
	35 Ethyl acetate	88	Compound Not Detected.						
	36 Methyl Ethyl Ketone	72	Compound Not Detected.						
*	37 Bromochloromethane	128	9.204	9.215	(1.000)	406974	10.0000		(Q)
	38 Tetrahydrofuran	42	Compound Not Detected.						
	39 Chloroform	83	Compound Not Detected.						
	40 Cyclohexane	84	Compound Not Detected.						
	41 1,1,1-Trichloroethane	97	Compound Not Detected.						
	42 Carbon tetrachloride	117	Compound Not Detected.						
	43 2,2,4-Trimethylpentane	57	Compound Not Detected.						
	44 Benzene	78	Compound Not Detected.						
	45 1,2-Dichloroethane	62	Compound Not Detected.						
	46 n-Heptane	43	Compound Not Detected.						
*	47 1,4-Difluorobenzene	114	10.618	10.624	(1.000)	2294638	10.0000		
	49 Trichloroethene	95	Compound Not Detected.						
	50 1,2-Dichloropropane	63	Compound Not Detected.						
	51 Methyl methacrylate	69	Compound Not Detected.						
	53 1,4-Dioxane	88	Compound Not Detected.						
	54 Bromodichloromethane	83	Compound Not Detected.						
	55 1,3-Dichloropropene (cis)	75	Compound Not Detected.						
	56 Methyl isobutyl ketone	43	Compound Not Detected.						
	58 Toluene	92	Compound Not Detected.						
	59 1,3-Dichloropropene (trans)	75	Compound Not Detected.						
	60 1,1,2-Trichloroethane	83	Compound Not Detected.						
	61 Tetrachloroethene	166	Compound Not Detected.						
	62 2-Hexanone	43	Compound Not Detected.						
	63 Dibromochloromethane	129	Compound Not Detected.						
	64 1,2-Dibromoethane	107	Compound Not Detected.						
*	65 Chlorobenzene-d5	117	14.749	14.754	(1.000)	2043166	10.0000		
	66 Chlorobenzene	112	Compound Not Detected.						
	68 Ethylbenzene	91	Compound Not Detected.						
	69 Xylene (m,p)	106	Compound Not Detected.						
M	70 Xylenes, Total	106	Compound Not Detected.						
	71 Xylene (o)	106	Compound Not Detected.						

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	FINAL (ppb v/v)
72 Styrene	104	Compound Not Detected.					
73 Bromoform	173	Compound Not Detected.					
74 Isopropylbenzene	105	Compound Not Detected.					
75 1,1,2,2-Tetrachloroethane	83	Compound Not Detected.					
76 n-Propylbenzene	91	Compound Not Detected.					
79 4-Ethyltoluene	105	Compound Not Detected.					
80 2-Chlorotoluene	91	Compound Not Detected.					
81 1,3,5-Trimethylbenzene	105	Compound Not Detected.					
83 tert-butylbenzene	119	Compound Not Detected.					
84 1,2,4-Trimethylbenzene	105	Compound Not Detected.					
85 sec-Butylbenzene	105	Compound Not Detected.					
86 4-Isopropyltoluene	119	Compound Not Detected.					
87 1,3-Dichlorobenzene	146	Compound Not Detected.					
88 1,4-Dichlorobenzene	146	Compound Not Detected.					
89 Benzyl chloride	91	Compound Not Detected.					
91 n-Butylbenzene	91	Compound Not Detected.					
92 1,2-Dichlorobenzene	146	Compound Not Detected.					
94 1,2,4-Trichlorobenzene	180	Compound Not Detected.					
95 1,3-Hexachlorobutadiene	225	Compound Not Detected.					
96 Naphthalene	128	Compound Not Detected.					

QC Flag Legend

Q - Qualifier signal failed the ratio test.

Data File:	bjxj024.d	Date:	27-FEB-2011 06:22
Client ID:	4805	Instrument:	B.i
Operator:	pad	Inj Vol:	200.0
Column Type:	Capillary	Diameter:	0.32
Stationary Phase:	RTX-624		
Sample Info:	200-3988-A-5		
Lab Sample ID:	200-3988-5		



FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-4011-1

SDG No.:

Client Sample ID: 2919 Lab Sample ID: 200-4011-3

Matrix: Air Lab File ID: bjx1007.d

Analysis Method: TO-15 Date Collected: 02/28/2011 00:00

Sample wt/vol: 1000(mL) Date Analyzed: 02/28/2011 20:03

Soil Aliquot Vol: Dilution Factor: 0.2

Soil Extract Vol.: GC Column: RTX-624 ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 14428 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
115-07-1	Propylene	1.0	U	1.0	1.0
75-71-8	Dichlorodifluoromethane	0.10	U	0.10	0.10
75-45-6	Freon 22	0.10	U	0.10	0.10
76-14-2	1,2-Dichlorotetrafluoroethane	0.040	U	0.040	0.040
74-87-3	Chloromethane	0.10	U	0.10	0.10
106-97-8	n-Butane	0.10	U	0.10	0.10
75-01-4	Vinyl chloride	0.040	U	0.040	0.040
106-99-0	1,3-Butadiene	0.040	U	0.040	0.040
74-83-9	Bromomethane	0.040	U	0.040	0.040
75-00-3	Chloroethane	0.10	U	0.10	0.10
593-60-2	Bromoethene(Vinyl Bromide)	0.040	U	0.040	0.040
75-69-4	Trichlorofluoromethane	0.040	U	0.040	0.040
64-17-5	Ethanol	1.0	U	1.0	1.0
76-13-1	Freon TF	0.040	U	0.040	0.040
75-35-4	1,1-Dichloroethene	0.040	U	0.040	0.040
67-64-1	Acetone	1.0	U	1.0	1.0
67-63-0	Isopropyl alcohol	1.0	U	1.0	1.0
75-15-0	Carbon disulfide	0.10	U	0.10	0.10
107-05-1	3-Chloropropene	0.10	U	0.10	0.10
75-09-2	Methylene Chloride	0.10	U	0.10	0.10
75-65-0	tert-Butyl alcohol	1.0	U	1.0	1.0
1634-04-4	Methyl tert-butyl ether	0.040	U	0.040	0.040
156-60-5	trans-1,2-Dichloroethene	0.040	U	0.040	0.040
110-54-3	n-Hexane	0.040	U	0.040	0.040
75-34-3	1,1-Dichloroethane	0.040	U	0.040	0.040
108-05-4	Vinyl acetate	1.0	U	1.0	1.0
141-78-6	Ethyl acetate	1.0	U	1.0	1.0
78-93-3	Methyl Ethyl Ketone	0.10	U	0.10	0.10
156-59-2	cis-1,2-Dichloroethene	0.040	U	0.040	0.040
540-59-0	1,2-Dichloroethene, Total	0.040	U	0.040	0.040
67-66-3	Chloroform	0.040	U	0.040	0.040
109-99-9	Tetrahydrofuran	1.0	U	1.0	1.0
71-55-6	1,1,1-Trichloroethane	0.040	U	0.040	0.040
110-82-7	Cyclohexane	0.040	U	0.040	0.040
56-23-5	Carbon tetrachloride	0.040	U	0.040	0.040
540-84-1	2,2,4-Trimethylpentane	0.040	U	0.040	0.040

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-4011-1

SDG No.:

Client Sample ID: 2919 Lab Sample ID: 200-4011-3

Matrix: Air Lab File ID: bjx1007.d

Analysis Method: TO-15 Date Collected: 02/28/2011 00:00

Sample wt/vol: 1000(mL) Date Analyzed: 02/28/2011 20:03

Soil Aliquot Vol: Dilution Factor: 0.2

Soil Extract Vol.: GC Column: RTX-624 ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 14428 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
71-43-2	Benzene	0.040	U	0.040	0.040
107-06-2	1,2-Dichloroethane	0.040	U	0.040	0.040
142-82-5	n-Heptane	0.040	U	0.040	0.040
79-01-6	Trichloroethene	0.040	U	0.040	0.040
80-62-6	Methyl methacrylate	0.10	U	0.10	0.10
78-87-5	1,2-Dichloropropane	0.040	U	0.040	0.040
123-91-1	1,4-Dioxane	1.0	U	1.0	1.0
75-27-4	Bromodichloromethane	0.040	U	0.040	0.040
10061-01-5	cis-1,3-Dichloropropene	0.040	U	0.040	0.040
108-10-1	methyl isobutyl ketone	0.10	U	0.10	0.10
108-88-3	Toluene	0.040	U	0.040	0.040
10061-02-6	trans-1,3-Dichloropropene	0.040	U	0.040	0.040
79-00-5	1,1,2-Trichloroethane	0.040	U	0.040	0.040
127-18-4	Tetrachloroethene	0.040	U	0.040	0.040
591-78-6	Methyl Butyl Ketone (2-Hexanone)	0.10	U	0.10	0.10
124-48-1	Dibromochloromethane	0.040	U	0.040	0.040
106-93-4	1,2-Dibromoethane	0.040	U	0.040	0.040
108-90-7	Chlorobenzene	0.040	U	0.040	0.040
100-41-4	Ethylbenzene	0.040	U	0.040	0.040
179601-23-1	m,p-Xylene	0.10	U	0.10	0.10
95-47-6	Xylene, o-	0.040	U	0.040	0.040
1330-20-7	Xylene (total)	0.040	U	0.040	0.040
100-42-5	Styrene	0.040	U	0.040	0.040
75-25-2	Bromoform	0.040	U	0.040	0.040
98-82-8	Cumene	0.040	U	0.040	0.040
79-34-5	1,1,2,2-Tetrachloroethane	0.040	U	0.040	0.040
103-65-1	n-Propylbenzene	0.040	U	0.040	0.040
622-96-8	4-Ethyltoluene	0.040	U	0.040	0.040
108-67-8	1,3,5-Trimethylbenzene	0.040	U	0.040	0.040
95-49-8	2-Chlorotoluene	0.040	U	0.040	0.040
98-06-6	tert-Butylbenzene	0.040	U	0.040	0.040
95-63-6	1,2,4-Trimethylbenzene	0.040	U	0.040	0.040
135-98-8	sec-Butylbenzene	0.040	U	0.040	0.040
99-87-6	4-Isopropyltoluene	0.040	U	0.040	0.040
541-73-1	1,3-Dichlorobenzene	0.040	U	0.040	0.040
106-46-7	1,4-Dichlorobenzene	0.040	U	0.040	0.040

FORM I
AIR - GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 200-4011-1

SDG No.:

Client Sample ID: 2919 Lab Sample ID: 200-4011-3

Matrix: Air Lab File ID: bjx1007.d

Analysis Method: TO-15 Date Collected: 02/28/2011 00:00

Sample wt/vol: 1000(mL) Date Analyzed: 02/28/2011 20:03

Soil Aliquot Vol: Dilution Factor: 0.2

Soil Extract Vol.: GC Column: RTX-624 ID: 0.32(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 14428 Units: ppb v/v

CAS NO.	COMPOUND NAME	RESULT	Q	RL	RL
100-44-7	Benzyl chloride	0.040	U	0.040	0.040
104-51-8	n-Butylbenzene	0.040	U	0.040	0.040
95-50-1	1,2-Dichlorobenzene	0.040	U	0.040	0.040
120-82-1	1,2,4-Trichlorobenzene	0.10	U	0.10	0.10
87-68-3	Hexachlorobutadiene	0.040	U	0.040	0.040
91-20-3	Naphthalene	0.10	U	0.10	0.10

TestAmerica Burlington

AIR TOXICS QUANTITATION REPORT

Lab Sample Id: 200-4011-3
Client Smp ID: 2919
Inj Date : 28-FEB-2011 20:03
Operator : wrd Inst ID: B.i
Smp Info : 200-4011-A-3
Misc Info : 1000,0.2, all74+mn
Comment :
Method : /chem/B.i/Bsvr.p/bjxlto15.b/to15v5.m
Meth Date : 02-Mar-2011 09:22 pd Quant Type: ISTD
Cal Date : 09-FEB-2011 20:19 Cal File: bjx011.d
Als bottle: 6
Dil Factor: 0.20000
Integrator: HP RTE Compound Sublist: all74+MN.sub
Target Version: 3.50
Processing Host: chemsvr6

Concentration Formula: Amt * DF * Uf*(Vo/Vo)*(Vf/Vf) * CpndVariable

Name	Value	Description
DF	0.20000	Dilution Factor
Uf	1.00000	ng unit correction factor
Vo	1000.00000	Sample Volume purged (mL)
Vf	200.00000	Final Volume (mL)

Cpnd Variable Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	CONCENTRATIONS FINAL (ppb v/v)
1	Propene	41	Compound Not Detected.					
2	Dichlorodifluoromethane	85	Compound Not Detected.					
3	Chlorodifluoromethane	51	Compound Not Detected.					
4	1,2-Dichloro-1,1,2,2-tetraflu	85	Compound Not Detected.					
5	Chloromethane	50	Compound Not Detected.					
6	Butane	43	Compound Not Detected.					
7	Vinyl chloride	62	Compound Not Detected.					
8	1,3-Butadiene	54	Compound Not Detected.					
9	Bromomethane	94	Compound Not Detected.					
10	Chloroethane	64	Compound Not Detected.					
12	Vinyl bromide	106	Compound Not Detected.					
13	Trichlorofluoromethane	101	Compound Not Detected.					
15	Ethanol	45	Compound Not Detected.					
17	1,1,2-Trichloro-1,2,2-trifluo	101	Compound Not Detected.					

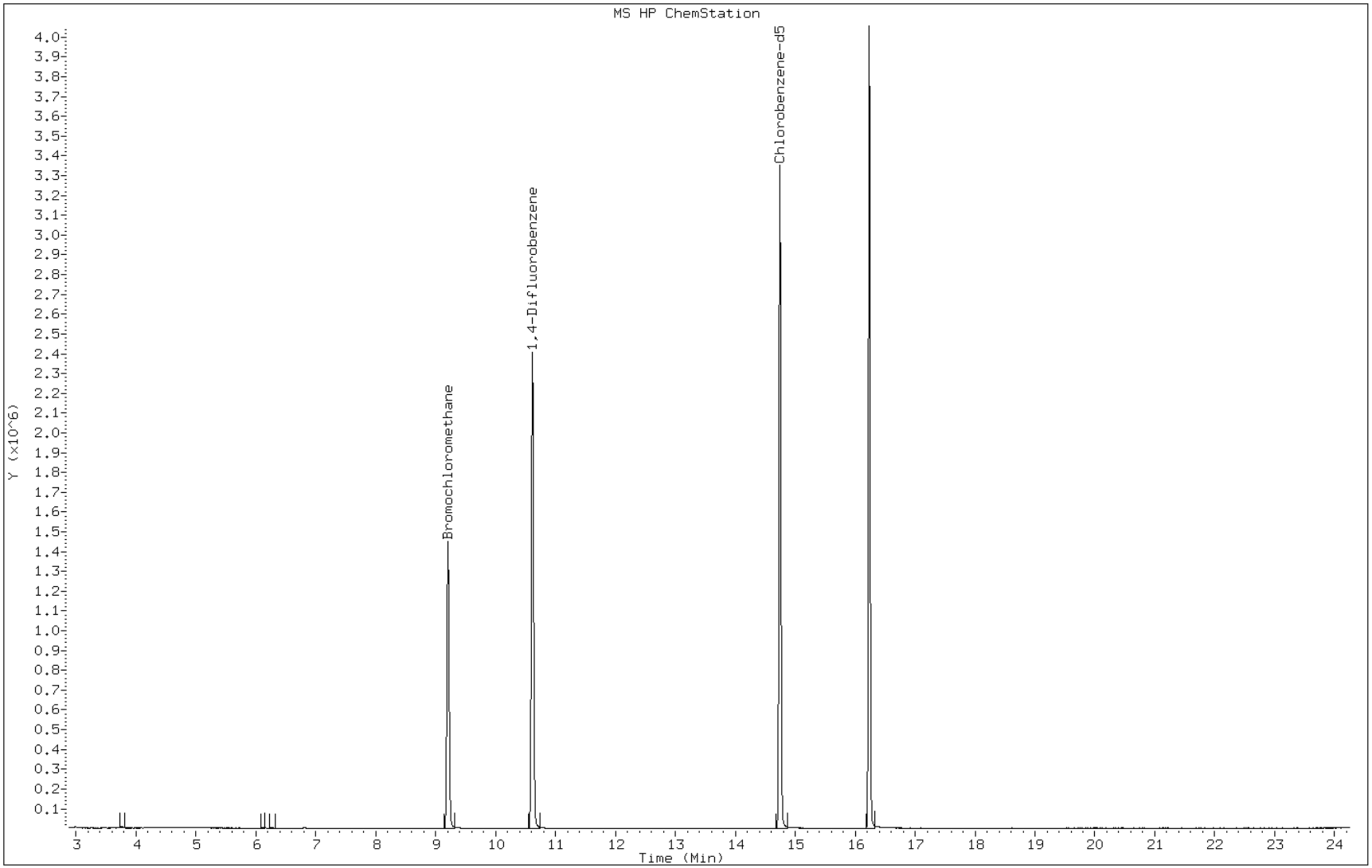
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	FINAL (ppb v/v)	
	19 1,1-Dichloroethene	96	Compound Not Detected.						
	20 Acetone	43	Compound Not Detected.						
	21 Carbon disulfide	76	Compound Not Detected.						
	22 Isopropanol	45	Compound Not Detected.						
	23 Allyl chloride	41	Compound Not Detected.						
	25 Methylene chloride	49	Compound Not Detected.						
	26 Tert-butyl alcohol	59	Compound Not Detected.						
	27 Methyl tert-butyl ether	73	Compound Not Detected.						
	28 1,2-Dichloroethene (trans)	61	Compound Not Detected.						
	30 n-Hexane	57	Compound Not Detected.						
	31 1,1-Dichloroethane	63	Compound Not Detected.						
	32 Vinyl acetate	43	Compound Not Detected.						
M	33 1,2-Dichloroethene,Total	61	Compound Not Detected.						
	34 1,2-Dichloroethene (cis)	96	Compound Not Detected.						
	35 Ethyl acetate	88	Compound Not Detected.						
	36 Methyl Ethyl Ketone	72	Compound Not Detected.						
*	37 Bromochloromethane	128	9.204	9.215	(1.000)	462021	10.0000		(Q)
	38 Tetrahydrofuran	42	Compound Not Detected.						
	39 Chloroform	83	Compound Not Detected.						
	40 Cyclohexane	84	Compound Not Detected.						
	41 1,1,1-Trichloroethane	97	Compound Not Detected.						
	42 Carbon tetrachloride	117	Compound Not Detected.						
	43 2,2,4-Trimethylpentane	57	Compound Not Detected.						
	44 Benzene	78	Compound Not Detected.						
	45 1,2-Dichloroethane	62	Compound Not Detected.						
	46 n-Heptane	43	Compound Not Detected.						
*	47 1,4-Difluorobenzene	114	10.618	10.624	(1.000)	2469123	10.0000		
	49 Trichloroethene	95	Compound Not Detected.						
	50 1,2-Dichloropropane	63	Compound Not Detected.						
	51 Methyl methacrylate	69	Compound Not Detected.						
	53 1,4-Dioxane	88	Compound Not Detected.						
	54 Bromodichloromethane	83	Compound Not Detected.						
	55 1,3-Dichloropropene (cis)	75	Compound Not Detected.						
	56 Methyl isobutyl ketone	43	Compound Not Detected.						
	58 Toluene	92	Compound Not Detected.						
	59 1,3-Dichloropropene (trans)	75	Compound Not Detected.						
	60 1,1,2-Trichloroethane	83	Compound Not Detected.						
	61 Tetrachloroethene	166	Compound Not Detected.						
	62 2-Hexanone	43	Compound Not Detected.						
	63 Dibromochloromethane	129	Compound Not Detected.						
	64 1,2-Dibromoethane	107	Compound Not Detected.						
*	65 Chlorobenzene-d5	117	14.744	14.754	(1.000)	2290194	10.0000		
	66 Chlorobenzene	112	Compound Not Detected.						
	68 Ethylbenzene	91	Compound Not Detected.						
	69 Xylene (m,p)	106	Compound Not Detected.						
M	70 Xylenes, Total	106	Compound Not Detected.						
	71 Xylene (o)	106	Compound Not Detected.						

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ppb v/v)	FINAL (ppb v/v)
72 Styrene	104	Compound Not Detected.					
73 Bromoform	173	Compound Not Detected.					
74 Isopropylbenzene	105	Compound Not Detected.					
75 1,1,2,2-Tetrachloroethane	83	Compound Not Detected.					
76 n-Propylbenzene	91	Compound Not Detected.					
79 4-Ethyltoluene	105	Compound Not Detected.					
80 2-Chlorotoluene	91	Compound Not Detected.					
81 1,3,5-Trimethylbenzene	105	Compound Not Detected.					
83 tert-butylbenzene	119	Compound Not Detected.					
84 1,2,4-Trimethylbenzene	105	Compound Not Detected.					
85 sec-Butylbenzene	105	Compound Not Detected.					
86 4-Isopropyltoluene	119	Compound Not Detected.					
87 1,3-Dichlorobenzene	146	Compound Not Detected.					
88 1,4-Dichlorobenzene	146	Compound Not Detected.					
89 Benzyl chloride	91	Compound Not Detected.					
91 n-Butylbenzene	91	Compound Not Detected.					
92 1,2-Dichlorobenzene	146	Compound Not Detected.					
94 1,2,4-Trichlorobenzene	180	Compound Not Detected.					
95 1,3-Hexachlorobutadiene	225	Compound Not Detected.					
96 Naphthalene	128	Compound Not Detected.					

QC Flag Legend

Q - Qualifier signal failed the ratio test.

Data File:	bjxl007.d	Date:	28-FEB-2011 20:03
Client ID:	2919	Instrument:	B.i
Operator:	wrd	Inj Vol:	200.0
Column Type:	Capillary	Diameter:	0.32
Stationary Phase:	RTX-624		
Sample Info:	200-4011-A-3		
Lab Sample ID:	200-4011-3		



FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUTION

Lab Name: TestAmerica Burlington Job No.: 200-3988-1 Analy Batch No.: 13474

SDG No.:

Instrument ID: B.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/09/2011 15:04 Calibration End Date: 02/09/2011 20:19 Calibration ID: 4769

Calibration Files:

LEVEL:	LAB SAMPLE ID:	EPA SAMPLE NO:	LAB FILE ID:
Level 1	IC 200-13474/5	ic 109459	bjx005.d
Level 2	IC 200-13474/6	ic 109450	bjx006.d
Level 3	IC 200-13474/7	ic 109440	bjx007.d
Level 4	ICIS 200-13474/8	icis 109439	bjx008.d
Level 5	IC 200-13474/9	ic 109427	bjx009.d
Level 6	IC 200-13474/10	ic 109426	bjx010.d
Level 7	IC 200-13474/11	ic 109424	bjx011.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Propylene	+++++ 0.3221	0.4634 0.2968	0.4013	0.3586	0.3439	Ave		0.3643				16.5		30.0			
Dichlorodifluoromethane	+++++ 1.6987	2.2587 1.5123	2.1243	1.9852	1.8235	Ave		1.9005				14.6		30.0			
Freon 22	+++++ 0.8069	1.0409 0.7364	0.9970	0.9239	0.8668	Ave		0.8953				12.9		30.0			
1,2-Dichlorotetrafluoroethane	2.3536 1.7219	2.2114 1.5448	2.1107	1.9814	1.8362	Ave		1.9657				14.5		30.0			
Chloromethane	+++++ 0.4180	0.5216 0.3954	0.5031	0.4656	0.4505	Ave		0.4590				10.5		30.0			
n-Butane	+++++ 0.7202	0.8982 0.6598	0.8723	0.8026	0.7647	Ave		0.7863				11.5		30.0			
Vinyl chloride	0.7546 0.5692	0.7257 0.5236	0.6929	0.6395	0.6030	Ave		0.6441				13.2		30.0			
1,3-Butadiene	0.5283 0.4060	0.4973 0.3748	0.4863	0.4555	0.4279	Ave		0.4537				12.0		30.0			
Bromomethane	1.2204 0.8849	1.1188 0.8062	1.0605	1.0127	0.9373	Ave		1.0058				14.1		30.0			
Chloroethane	+++++ 0.5072	0.6382 0.4583	0.6050	0.5775	0.5370	Ave		0.5539				11.9		30.0			
Isopentane	1.4311 0.9949	1.3073 0.8842	1.2247	1.1682	1.0886	Ave		1.1570				16.1		30.0			
Bromoethene(Vinyl Bromide)	1.3586 1.0796	1.2833 1.0164	1.2230	1.1991	1.1390	Ave		1.1856				9.9		30.0			
Trichlorofluoromethane	3.8680 2.7661	3.4195 2.5391	3.2972	3.1484	2.9531	Ave		3.1416				14.0		30.0			
n-Pentane	+++++ 1.7212	2.2944 1.5324	2.1111	2.0330	1.9233	Ave		1.9359				14.2		30.0			

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUTION

Lab Name: TestAmerica Burlington Job No.: 200-3988-1 Analy Batch No.: 13474

SDG No.:

Instrument ID: B.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/09/2011 15:04 Calibration End Date: 02/09/2011 20:19 Calibration ID: 4769

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Ethanol	+++++ 0.4812	0.5230 0.4482	0.4416	0.4870	0.5116	Ave		0.4821				6.8		30.0			
Ethyl ether	1.1216 0.8987	1.0052 0.8295	1.0104	0.9735	0.9475	Ave		0.9695				9.5		30.0			
Acrolein	+++++ 0.4742	+++++ 0.4327	0.5302	0.5194	0.4972	Ave		0.4908				7.9		30.0			
Freon TF	2.5645 2.1070	2.2913 2.0179	2.2107	2.1815	2.1427	Ave		2.2165				7.9		30.0			
1,1-Dichloroethene	1.1747 1.0402	1.0699 1.0161	1.0744	1.0664	1.0571	Ave		1.0713				4.7		30.0			
Acetone	+++++ 1.6068	+++++ 1.4914	2.0286	1.8282	1.7438	Ave		1.7397				11.9		30.0			
Carbon disulfide	+++++ 3.4526	3.8028 3.2885	3.7142	3.6039	3.5609	Ave		3.5705				5.2		30.0			
Isopropyl alcohol	+++++ 1.3019	+++++ 1.2193	1.5433	1.4690	1.4094	Ave		1.3886				9.3		30.0			
3-Chloropropene	1.7182 1.3494	1.5814 1.2496	1.5630	1.5032	1.4645	Ave		1.4899				10.4		30.0			
Acetonitrile	+++++ 0.8035	+++++ 0.7368	0.9928	0.9089	0.9147	Ave		0.8713				11.6		30.0			
Methylene Chloride	+++++ 1.1784	1.5910 1.0823	1.4102	1.3131	1.2625	Ave		1.3062				13.7		30.0			
tert-Butyl alcohol	+++++ 2.0320	+++++ 1.9189	2.2887	2.2459	2.1778	Ave		2.1327				7.2		30.0			
trans-1,2-Dichloroethene	2.1513 1.7167	2.0598 1.5669	1.9822	1.9054	1.8211	Ave		1.8862				10.7		30.0			
Methyl tert-butyl ether	3.9207 3.4720	3.7619 3.2562	3.8127	3.7191	3.6086	Ave		3.6502				6.2		30.0			
Acrylonitrile	+++++ 0.8438	0.9481 0.7859	0.9221	0.9014	0.8807	Ave		0.8803				6.6		30.0			
n-Hexane	2.3574 1.8893	2.1924 1.7192	2.1638	2.0664	1.9796	Ave		2.0526				10.3		30.0			
1,1-Dichloroethane	2.6815 2.1349	2.5069 1.9609	2.4276	2.3440	2.2418	Ave		2.3282				10.3		30.0			
Vinyl acetate	+++++ 2.7520	+++++ 2.4792	3.1895	3.0727	2.9338	Ave		2.8854				9.7		30.0			
1,4-Dioxane	+++++ 0.1042	+++++ 0.0995	0.1148	0.1135	0.1089	Ave		0.1082				5.9		30.0			
cis-1,2-Dichloroethene	1.3382 1.2148	1.2606 1.1453	1.2482	1.2543	1.2346	Ave		1.2423				4.6		30.0			

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUTION

Lab Name: TestAmerica Burlington Job No.: 200-3988-1 Analy Batch No.: 13474

SDG No.:

Instrument ID: B.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/09/2011 15:04 Calibration End Date: 02/09/2011 20:19 Calibration ID: 4769

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Methyl Ethyl Ketone	+++++ 0.5971	0.6284 0.5398	0.6540	0.6347	0.6133	Ave		0.6112				6.5		30.0			
Ethyl acetate	+++++ 0.1113	+++++ 0.1039	0.1092	0.1156	0.1116	Ave		0.1103				3.9		30.0			
Tetrahydrofuran	+++++ 0.2429	+++++ 0.2238	0.2802	0.2684	0.2553	Ave		0.2541				8.6		30.0			
Chloroform	3.0205 2.3863	2.7457 2.2431	2.6581	2.5561	2.4720	Ave		2.5831				9.9		30.0			
1,1,1-Trichloroethane	0.5625 0.4899	0.5336 0.4686	0.5272	0.5168	0.5011	Ave		0.5142				6.0		30.0			
Cyclohexane	0.4046 0.3458	0.3591 0.3280	0.3599	0.3566	0.3489	Ave		0.3575				6.6		30.0			
Carbon tetrachloride	0.5354 0.4827	0.5094 0.4776	0.5113	0.5073	0.4908	Ave		0.5021				4.0		30.0			
2,2,4-Trimethylpentane	1.3582 1.1500	1.2918 1.0586	1.2953	1.2427	1.1943	Ave		1.2273				8.3		30.0			
Benzene	0.8880 0.7368	0.8219 0.6960	0.7913	0.7694	0.7506	Ave		0.7791				8.0		30.0			
1,2-Dichloroethane	0.4112 0.3288	0.3807 0.3137	0.3679	0.3554	0.3411	Ave		0.3570				9.3		30.0			
n-Heptane	0.5152 0.4017	0.4821 0.3637	0.4713	0.4425	0.4228	Ave		0.4427				11.6		30.0			
n-Butanol	+++++ 0.1287	+++++ 0.1301	0.1364	0.1370	0.1367	Ave		0.1338				3.0		30.0			
Trichloroethene	0.3813 0.3180	0.3253 0.3078	0.3283	0.3284	0.3216	Ave		0.3301				7.2		30.0			
1,2-Dichloropropane	0.3278 0.2700	0.3021 0.2553	0.2951	0.2861	0.2771	Ave		0.2876				8.2		30.0			
Methyl methacrylate	+++++ 0.2720	0.2273 0.2602	0.2827	0.2831	0.2769	Ave		0.2670				7.9		30.0			
Dibromomethane	0.2404 0.2558	0.2141 0.2615	0.2306	0.2427	0.2465	Ave		0.2417				6.6		30.0			
Bromodichloromethane	0.5563 0.5311	0.5463 0.5099	0.5660	0.5563	0.5424	Ave		0.5440				3.5		30.0			
cis-1,3-Dichloropropene	0.4378 0.4363	0.4140 0.4201	0.4518	0.4480	0.4397	Ave		0.4354				3.2		30.0			
methyl isobutyl ketone	+++++ 0.4918	0.4917 0.4544	0.5653	0.5430	0.5189	Ave		0.5108				7.8		30.0			
Toluene	0.7004 0.6012	0.6254 0.5469	0.6248	0.6243	0.6102	Ave		0.6190				7.3		30.0			

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUTION

Lab Name: TestAmerica Burlington Job No.: 200-3988-1 Analy Batch No.: 13474

SDG No.:

Instrument ID: B.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/09/2011 15:04 Calibration End Date: 02/09/2011 20:19 Calibration ID: 4769

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
n-Octane	0.7149 0.4958	0.6485 0.4182	0.6336	0.5762	0.5361	Ave		0.5748				17.5		30.0			
trans-1,3-Dichloropropene	0.4697 0.4586	0.4360 0.4376	0.4787	0.4737	0.4676	Ave		0.4603				3.7		30.0			
1,1,2-Trichloroethane	0.3255 0.2942	0.3048 0.2771	0.3044	0.3003	0.2966	Ave		0.3004				4.8		30.0			
Tetrachloroethene	0.4410 0.4544	0.4035 0.4573	0.4140	0.4336	0.4401	Ave		0.4348				4.6		30.0			
Methyl Butyl Ketone (2-Hexanone)	+++++ 0.5399	0.4767 0.5004	0.5939	0.5825	0.5659	Ave		0.5432				8.6		30.0			
Dibromochloromethane	0.4506 0.5674	0.4424 0.5585	0.5385	0.5571	0.5617	Ave		0.5252				10.4		30.0			
1,2-Dibromoethane	0.5197 0.5272	0.4745 0.5128	0.5165	0.5256	0.5240	Ave		0.5143				3.6		30.0			
Chlorobenzene	0.9632 0.8051	0.8206 0.7820	0.8030	0.8029	0.7955	Ave		0.8246				7.5		30.0			
Ethylbenzene	1.4900 1.3313	1.3660 1.2463	1.3715	1.3585	1.3346	Ave		1.3569				5.3		30.0			
n-Nonane	0.7605 0.5811	0.7081 0.5071	0.6768	0.6353	0.6093	Ave		0.6398				13.2		30.0			
m,p-Xylene	0.5786 0.5203	0.5114 0.4614	0.5295	0.5344	0.5253	Ave		0.5230				6.6		30.0			
Xylene, o-	0.5150 0.5103	0.4837 0.4744	0.5083	0.5140	0.5102	Ave		0.5023				3.2		30.0			
Styrene	0.6482 0.8106	0.6401 0.7530	0.7824	0.8073	0.8076	Ave		0.7499				10.0		30.0			
Bromoform	0.3610 0.5391	0.3478 0.5270	0.4799	0.5153	0.5244	Ave		0.4706				17.3		30.0			
Cumene	1.4729 1.4828	1.4165 1.3770	1.4950	1.4981	1.4812	Ave		1.4605				3.1		30.0			
1,1,2,2-Tetrachloroethane	0.8595 0.7540	0.7899 0.6787	0.7990	0.7835	0.7700	Ave		0.7764				7.0		30.0			
n-Propylbenzene	2.0255 1.7671	1.8452 1.4761	1.8979	1.8742	1.8282	Ave		1.8163				9.3		30.0			
1,2,3-Trichloropropane	+++++ 0.5723	0.6737 0.4789	0.6569	0.6304	0.6014	Ave		0.6023				11.7		30.0			
n-Decane	+++++ 0.7261	0.9175 0.6007	0.8829	0.8135	0.7743	Ave		0.7858				14.6		30.0			
4-Ethyltoluene	1.6966 1.5373	1.5028 1.3628	1.5573	1.5646	1.5526	Ave		1.5391				6.4		30.0			

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUTION

Lab Name: TestAmerica Burlington Job No.: 200-3988-1 Analy Batch No.: 13474

SDG No.:

Instrument ID: B.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/09/2011 15:04 Calibration End Date: 02/09/2011 20:19 Calibration ID: 4769

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
2-Chlorotoluene	1.6396 1.3579	1.4617 1.2051	1.4507	1.4134	1.3889	Ave		1.4167				9.2		30.0			
1,3,5-Trimethylbenzene	1.3807 1.2582	1.2323 1.1398	1.2823	1.2760	1.2613	Ave		1.2615				5.7		30.0			
Alpha Methyl Styrene	0.4456 0.6551	0.4432 0.6171	0.6174	0.6409	0.6469	Ave		0.5809				16.2		30.0			
tert-Butylbenzene	1.2597 1.1601	1.1353 1.0710	1.1631	1.1775	1.1619	Ave		1.1612				4.8		30.0			
1,2,4-Trimethylbenzene	1.3807 1.2378	1.2268 1.1285	1.2735	1.2615	1.2478	Ave		1.2509				5.9		30.0			
sec-Butylbenzene	2.0197 1.7650	1.7759 1.5361	1.8414	1.8196	1.7938	Ave		1.7931				7.9		30.0			
4-Isopropyltoluene	1.5268 1.5018	1.3941 1.3481	1.5115	1.5220	1.5067	Ave		1.4730				4.8		30.0			
1,3-Dichlorobenzene	0.9468 0.8262	0.7333 0.7765	0.7824	0.8000	0.8084	Ave		0.8105				8.3		30.0			
1,4-Dichlorobenzene	0.9821 0.8366	0.7455 0.7838	0.7850	0.8009	0.8170	Ave		0.8216				9.3		30.0			
Benzyl chloride	1.3303 1.1813	1.1036 1.0877	1.2429	1.2247	1.2046	Ave		1.1964				7.0		30.0			
n-Undecane	+++++ 0.6944	+++++ 0.5410	0.9589	0.8094	0.7633	Ave		0.7534				20.4		30.0			
n-Butylbenzene	1.7768 1.3036	1.5198 1.0490	1.5344	1.4562	1.3845	Ave		1.4321				15.7		30.0			
1,2-Dichlorobenzene	0.9016 0.7805	0.7189 0.7370	0.7485	0.7567	0.7644	Ave		0.7725				7.8		30.0			
n-Dodecane	+++++ 0.7488	+++++ 0.4295	0.8944	0.6974	0.7686	Ave		0.7077				24.2		30.0			
1,2,4-Trichlorobenzene	+++++ 0.6713	0.5436 0.5763	0.5880	0.5494	0.6263	Ave		0.5925				8.2		30.0			
Hexachlorobutadiene	0.5268 0.4762	0.4442 0.4059	0.4377	0.4280	0.4410	Ave		0.4514				8.7		30.0			
Naphthalene	+++++ 1.6197	1.3953 1.3516	1.4627	1.2667	1.5352	Ave		1.4385				8.9		30.0			
1,2,3-Trichlorobenzene	0.6966 0.6148	0.5322 0.4632	0.5402	0.4904	0.5666	Ave		0.5577				14.1		30.0			

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Burlington Job No.: 200-3988-1 Analy Batch No.: 13474

SDG No.:

Instrument ID: B.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/09/2011 15:04 Calibration End Date: 02/09/2011 20:19 Calibration ID: 4769

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 200-13474/5	bjx005.d
Level 2	IC 200-13474/6	bjx006.d
Level 3	IC 200-13474/7	bjx007.d
Level 4	ICIS 200-13474/8	bjx008.d
Level 5	IC 200-13474/9	bjx009.d
Level 6	IC 200-13474/10	bjx010.d
Level 7	IC 200-13474/11	bjx011.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (PPB V/V)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Propylene	BCM	Ave	+++++ 434488	13147 818228	114715	219264	323376	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Dichlorodifluoromethane	BCM	Ave	+++++ 2291560	64074 4169055	607320	1213937	1714698	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Freon 22	BCM	Ave	+++++ 1088466	29528 2030018	285025	564944	815096	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
1,2-Dichlorotetrafluoroethane	BCM	Ave	26883 2322893	62733 4258588	603437	1211618	1726639	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Chloromethane	BCM	Ave	+++++ 563857	14797 1089942	143829	284700	423605	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
n-Butane	BCM	Ave	+++++ 971484	25481 1818845	249378	490789	719021	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Vinyl chloride	BCM	Ave	8619 767904	20587 1443391	198096	391036	566999	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,3-Butadiene	BCM	Ave	6034 547702	14106 1033177	139037	278528	402315	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Bromomethane	BCM	Ave	13939 1193759	31738 2222419	303173	619285	881358	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Chloroethane	BCM	Ave	+++++ 684182	18103 1263508	172962	353164	504913	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Isopentane	BCM	Ave	16346 1342096	37085 2437477	350117	714361	1023624	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Bromoethene(Vinyl Bromide)	BCM	Ave	15518 1456368	36403 2801914	349652	733242	1070985	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Trichlorofluoromethane	BCM	Ave	44181 3731410	97003 6999514	942632	1925207	2776881	0.200 20.0	0.500 40.0	5.00	10.0	15.0
n-Pentane	BCM	Ave	+++++ 2321859	65088 4224339	603541	1243155	1808518	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Ethanol	BCM	Ave	+++++ 1298326	148355 3089208	252504	446653	641418	+++++ 40.0	5.00 100	10.0	15.0	20.0

FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Burlington Job No.: 200-3988-1 Analy Batch No.: 13474

SDG No.:

Instrument ID: B.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/09/2011 15:04 Calibration End Date: 02/09/2011 20:19 Calibration ID: 4769

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (PPB V/V)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Ethyl ether	BCM	Ave	12811 1212335	28516 2286639	288877	595277	890928	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Acrolein	BCM	Ave	+++++ 639751	+++++ 1192898	151578	317595	467553	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
Freon TF	BCM	Ave	29292 2842340	64999 5562723	632030	1333971	2014826	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,1-Dichloroethene	BCM	Ave	13417 1403215	30352 2801029	307169	652102	994034	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Acetone	BCM	Ave	+++++ 2167509	+++++ 4111494	579957	1117917	1639678	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
Carbon disulfide	BCM	Ave	+++++ 4657555	107878 9065661	1061851	2203742	3348404	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Isopropyl alcohol	BCM	Ave	+++++ 1756291	+++++ 3361214	441227	898290	1325265	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
3-Chloropropene	BCM	Ave	19625 1820295	44861 3444925	446861	919211	1377121	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Acetonitrile	BCM	Ave	+++++ 1083889	+++++ 2031052	283835	555810	860134	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
Methylene Chloride	BCM	Ave	+++++ 1589668	45133 2983609	403150	802926	1187174	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
tert-Butyl alcohol	BCM	Ave	+++++ 2741224	+++++ 5289949	654315	1373369	2047834	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
trans-1,2-Dichloroethene	BCM	Ave	24572 2315875	58432 4319426	566698	1165124	1712371	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Methyl tert-butyl ether	BCM	Ave	44783 4683706	106717 8976517	1090018	2274185	3393250	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Acrylonitrile	BCM	Ave	+++++ 1138333	26894 2166518	263610	551208	828134	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
n-Hexane	BCM	Ave	26927 2548596	62192 4739410	618609	1263578	1861407	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,1-Dichloroethane	BCM	Ave	30628 2880007	71114 5405647	694030	1433343	2108021	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Vinyl acetate	BCM	Ave	+++++ 3712423	+++++ 6834592	911841	1878921	2758674	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
1,4-Dioxane	DFB	Ave	+++++ 700236	+++++ 1328603	167304	350747	513774	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
cis-1,2-Dichloroethene	BCM	Ave	15285 1638788	35760 3157260	356858	766984	1160896	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Methyl Ethyl Ketone	BCM	Ave	+++++ 805504	17827 1487970	186973	388092	576674	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Ethyl acetate	BCM	Ave	+++++ 150173	+++++ 286443	31231	70679	104971	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0

FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Burlington Job No.: 200-3988-1 Analy Batch No.: 13474

SDG No.:

Instrument ID: B.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/09/2011 15:04 Calibration End Date: 02/09/2011 20:19 Calibration ID: 4769

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (PPB V/V)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Tetrahydrofuran	DFB	Ave	+++++ 1631734	+++++ 2989858	408247	829371	1204789	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
Chloroform	BCM	Ave	34500 3219071	77889 6183560	759920	1563052	2324468	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,1,1-Trichloroethane	DFB	Ave	33206 3291184	77580 6259099	768140	1596898	2364874	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Cyclohexane	DFB	Ave	23886 2322680	52205 4381469	524347	1101922	1646568	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Carbon tetrachloride	DFB	Ave	31610 3242588	74056 6379778	745044	1567730	2316150	0.200 20.0	0.500 40.0	5.00	10.0	15.0
2,2,4-Trimethylpentane	DFB	Ave	80184 7725231	187801 14141338	1887361	3840095	5635680	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Benzene	DFB	Ave	52426 4949901	119483 9296726	1152945	2377666	3542011	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,2-Dichloroethane	DFB	Ave	24278 2208828	55341 4189973	536122	1098210	1609749	0.200 20.0	0.500 40.0	5.00	10.0	15.0
n-Heptane	DFB	Ave	30418 2698629	70082 4857749	686718	1367282	1995167	0.200 20.0	0.500 40.0	5.00	10.0	15.0
n-Butanol	DFB	Ave	+++++ 864866	+++++ 1738166	198804	423422	644982	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
Trichloroethene	DFB	Ave	22513 2136452	47294 4111318	478366	1014948	1517682	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,2-Dichloropropane	DFB	Ave	19351 1813825	43922 3410098	429943	884199	1307498	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Methyl methacrylate	DFB	Ave	+++++ 1827267	33050 3475594	411871	874831	1306472	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Dibromomethane	DFB	Ave	14191 1718237	31125 3493618	335934	749996	1163397	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Bromodichloromethane	DFB	Ave	32840 3567664	79414 6811668	824664	1718997	2559614	0.200 20.0	0.500 40.0	5.00	10.0	15.0
cis-1,3-Dichloropropene	DFB	Ave	25844 2930688	60180 5612024	658296	1384346	2075065	0.200 20.0	0.500 40.0	5.00	10.0	15.0
methyl isobutyl ketone	DFB	Ave	+++++ 3304003	71483 6069872	823654	1678035	2448466	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Toluene	CBZ	Ave	37070 3632323	82411 6573877	825370	1747178	2596736	0.200 20.0	0.500 40.0	5.00	10.0	15.0
n-Octane	DFB	Ave	42207 3330964	94272 5586045	923229	1780655	2529951	0.200 20.0	0.500 40.0	5.00	10.0	15.0
trans-1,3-Dichloropropene	DFB	Ave	27730 3080776	63385 5846047	697447	1463869	2206515	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,1,2-Trichloroethane	CBZ	Ave	17228 1777773	40159 3330025	402067	840462	1262034	0.200 20.0	0.500 40.0	5.00	10.0	15.0

FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Burlington Job No.: 200-3988-1 Analy Batch No.: 13474

SDG No.:

Instrument ID: B.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/09/2011 15:04 Calibration End Date: 02/09/2011 20:19 Calibration ID: 4769

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (PPB V/V)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Tetrachloroethene	CBZ	Ave	23338 2745285	53169 5496168	546868	1213586	1872660	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Methyl Butyl Ketone (2-Hexanone)	CBZ	Ave	+++++ 3262477	62812 6015064	784530	1630444	2408176	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Dibromochloromethane	CBZ	Ave	23850 3428090	58288 6712809	711404	1559332	2390294	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,2-Dibromoethane	CBZ	Ave	27505 3185165	62519 6163903	682265	1471049	2229932	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Chlorobenzene	CBZ	Ave	50977 4864789	108130 9399072	1060860	2247283	3384958	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Ethylbenzene	CBZ	Ave	78857 8044078	179990 14980233	1811830	3802125	5679266	0.200 20.0	0.500 40.0	5.00	10.0	15.0
n-Nonane	CBZ	Ave	40248 3511101	93305 6095135	894109	1778192	2592849	0.200 20.0	0.500 40.0	5.00	10.0	15.0
m,p-Xylene	CBZ	Ave	61240 6287785	134780 11092494	1398912	2991231	4470560	0.400 40.0	1.00 80.0	10.0	20.0	30.0
Xylene, o-	CBZ	Ave	27255 3083580	63741 5701392	671439	1438531	2170963	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Styrene	CBZ	Ave	34304 4897630	84349 9050348	1033532	2259371	3436791	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Bromoform	CBZ	Ave	19106 3257154	45835 6333815	633933	1442279	2231539	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Cumene	CBZ	Ave	77953 8959288	186654 16550907	1974949	4192888	6302998	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,1,2,2-Tetrachloroethane	CBZ	Ave	45487 4555675	104080 8157905	1055545	2192836	3276684	0.200 20.0	0.500 40.0	5.00	10.0	15.0
n-Propylbenzene	CBZ	Ave	107197 10676867	243134 17741470	2507226	5245537	7779802	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,2,3-Trichloropropane	CBZ	Ave	+++++ 3458010	88772 5755683	867860	1764356	2559369	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
n-Decane	CBZ	Ave	+++++ 4387113	120893 7220379	1166296	2276964	3295005	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
4-Ethyltoluene	CBZ	Ave	89790 9288737	198020 16380370	2057318	4378939	6606758	0.200 20.0	0.500 40.0	5.00	10.0	15.0
2-Chlorotoluene	CBZ	Ave	86775 8204910	192599 14484033	1916438	3955819	5910150	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,3,5-Trimethylbenzene	CBZ	Ave	73075 7602105	162380 13700248	1693982	3571246	5367303	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Alpha Methyl Styrene	CBZ	Ave	23585 3958505	58405 7417227	815559	1793699	2752734	0.200 20.0	0.500 40.0	5.00	10.0	15.0
tert-Butylbenzene	CBZ	Ave	66669 7009584	149589 12873188	1536549	3295743	4944345	0.200 20.0	0.500 40.0	5.00	10.0	15.0

FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Burlington Job No.: 200-3988-1 Analy Batch No.: 13474

SDG No.:

Instrument ID: B.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/09/2011 15:04 Calibration End Date: 02/09/2011 20:19 Calibration ID: 4769

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (PPB V/V)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
1,2,4-Trimethylbenzene	CBZ	Ave	73075 7479038	161653 13564126	1682407	3530586	5309760	0.200 20.0	0.500 40.0	5.00	10.0	15.0
sec-Butylbenzene	CBZ	Ave	106893 10664333	234007 18463545	2432578	5092739	7633411	0.200 20.0	0.500 40.0	5.00	10.0	15.0
4-Isopropyltoluene	CBZ	Ave	80806 9074168	183703 16202814	1996822	4259732	6411372	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,3-Dichlorobenzene	CBZ	Ave	50109 4992295	96631 9333085	1033612	2238953	3440117	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,4-Dichlorobenzene	CBZ	Ave	51976 5054884	98237 9421295	1037091	2241469	3476744	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Benzyl chloride	CBZ	Ave	70406 7137634	145414 13073070	1641952	3427669	5126118	0.200 20.0	0.500 40.0	5.00	10.0	15.0
n-Undecane	CBZ	Ave	+++++ 4195711	+++++ 6502589	1266771	2265455	3248038	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
n-Butylbenzene	CBZ	Ave	94035 7876638	200261 12608458	2027034	4075716	5891718	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,2-Dichlorobenzene	CBZ	Ave	47717 4715657	94724 8857913	988795	2117730	3252873	0.200 20.0	0.500 40.0	5.00	10.0	15.0
n-Dodecane	CBZ	Ave	+++++ 4524522	+++++ 5162602	1181486	1951852	3270474	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
1,2,4-Trichlorobenzene	CBZ	Ave	+++++ 4056417	71626 6927306	776823	1537557	2665016	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Hexachlorobutadiene	CBZ	Ave	27881 2877272	58525 4878202	578192	1197842	1876452	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Naphthalene	CBZ	Ave	+++++ 9786673	183860 16244939	1932290	3545288	6532787	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
1,2,3-Trichlorobenzene	CBZ	Ave	36867 3714691	70133 5567561	713685	1372473	2411286	0.200 20.0	0.500 40.0	5.00	10.0	15.0

Curve Type Legend:
Ave = Average ISTD

FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUTION

Lab Name: TestAmerica Burlington Job No.: 200-4011-1 Analy Batch No.: 13474

SDG No.:

Instrument ID: B.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/09/2011 15:04 Calibration End Date: 02/09/2011 20:19 Calibration ID: 4769

Calibration Files:

LEVEL:	LAB SAMPLE ID:	EPA SAMPLE NO:	LAB FILE ID:
Level 1	IC 200-13474/5	ic 109459	bjx005.d
Level 2	IC 200-13474/6	ic 109450	bjx006.d
Level 3	IC 200-13474/7	ic 109440	bjx007.d
Level 4	ICIS 200-13474/8	icis 109439	bjx008.d
Level 5	IC 200-13474/9	ic 109427	bjx009.d
Level 6	IC 200-13474/10	ic 109426	bjx010.d
Level 7	IC 200-13474/11	ic 109424	bjx011.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Propylene	+++++ 0.3221	0.4634 0.2968	0.4013	0.3586	0.3439	Ave		0.3643				16.5		30.0			
Dichlorodifluoromethane	+++++ 1.6987	2.2587 1.5123	2.1243	1.9852	1.8235	Ave		1.9005				14.6		30.0			
Freon 22	+++++ 0.8069	1.0409 0.7364	0.9970	0.9239	0.8668	Ave		0.8953				12.9		30.0			
1,2-Dichlorotetrafluoroethane	2.3536 1.7219	2.2114 1.5448	2.1107	1.9814	1.8362	Ave		1.9657				14.5		30.0			
Chloromethane	+++++ 0.4180	0.5216 0.3954	0.5031	0.4656	0.4505	Ave		0.4590				10.5		30.0			
n-Butane	+++++ 0.7202	0.8982 0.6598	0.8723	0.8026	0.7647	Ave		0.7863				11.5		30.0			
Vinyl chloride	0.7546 0.5692	0.7257 0.5236	0.6929	0.6395	0.6030	Ave		0.6441				13.2		30.0			
1,3-Butadiene	0.5283 0.4060	0.4973 0.3748	0.4863	0.4555	0.4279	Ave		0.4537				12.0		30.0			
Bromomethane	1.2204 0.8849	1.1188 0.8062	1.0605	1.0127	0.9373	Ave		1.0058				14.1		30.0			
Chloroethane	+++++ 0.5072	0.6382 0.4583	0.6050	0.5775	0.5370	Ave		0.5539				11.9		30.0			
Isopentane	1.4311 0.9949	1.3073 0.8842	1.2247	1.1682	1.0886	Ave		1.1570				16.1		30.0			
Bromoethene(Vinyl Bromide)	1.3586 1.0796	1.2833 1.0164	1.2230	1.1991	1.1390	Ave		1.1856				9.9		30.0			
Trichlorofluoromethane	3.8680 2.7661	3.4195 2.5391	3.2972	3.1484	2.9531	Ave		3.1416				14.0		30.0			
n-Pentane	+++++ 1.7212	2.2944 1.5324	2.1111	2.0330	1.9233	Ave		1.9359				14.2		30.0			

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUTION

Lab Name: TestAmerica Burlington Job No.: 200-4011-1 Analy Batch No.: 13474

SDG No.:

Instrument ID: B.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/09/2011 15:04 Calibration End Date: 02/09/2011 20:19 Calibration ID: 4769

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Ethanol	+++++ 0.4812	0.5230 0.4482	0.4416	0.4870	0.5116	Ave		0.4821				6.8		30.0			
Ethyl ether	1.1216 0.8987	1.0052 0.8295	1.0104	0.9735	0.9475	Ave		0.9695				9.5		30.0			
Acrolein	+++++ 0.4742	+++++ 0.4327	0.5302	0.5194	0.4972	Ave		0.4908				7.9		30.0			
Freon TF	2.5645 2.1070	2.2913 2.0179	2.2107	2.1815	2.1427	Ave		2.2165				7.9		30.0			
1,1-Dichloroethene	1.1747 1.0402	1.0699 1.0161	1.0744	1.0664	1.0571	Ave		1.0713				4.7		30.0			
Acetone	+++++ 1.6068	+++++ 1.4914	2.0286	1.8282	1.7438	Ave		1.7397				11.9		30.0			
Carbon disulfide	+++++ 3.4526	3.8028 3.2885	3.7142	3.6039	3.5609	Ave		3.5705				5.2		30.0			
Isopropyl alcohol	+++++ 1.3019	+++++ 1.2193	1.5433	1.4690	1.4094	Ave		1.3886				9.3		30.0			
3-Chloropropene	1.7182 1.3494	1.5814 1.2496	1.5630	1.5032	1.4645	Ave		1.4899				10.4		30.0			
Acetonitrile	+++++ 0.8035	+++++ 0.7368	0.9928	0.9089	0.9147	Ave		0.8713				11.6		30.0			
Methylene Chloride	+++++ 1.1784	1.5910 1.0823	1.4102	1.3131	1.2625	Ave		1.3062				13.7		30.0			
tert-Butyl alcohol	+++++ 2.0320	+++++ 1.9189	2.2887	2.2459	2.1778	Ave		2.1327				7.2		30.0			
trans-1,2-Dichloroethene	2.1513 1.7167	2.0598 1.5669	1.9822	1.9054	1.8211	Ave		1.8862				10.7		30.0			
Methyl tert-butyl ether	3.9207 3.4720	3.7619 3.2562	3.8127	3.7191	3.6086	Ave		3.6502				6.2		30.0			
Acrylonitrile	+++++ 0.8438	0.9481 0.7859	0.9221	0.9014	0.8807	Ave		0.8803				6.6		30.0			
n-Hexane	2.3574 1.8893	2.1924 1.7192	2.1638	2.0664	1.9796	Ave		2.0526				10.3		30.0			
1,1-Dichloroethane	2.6815 2.1349	2.5069 1.9609	2.4276	2.3440	2.2418	Ave		2.3282				10.3		30.0			
Vinyl acetate	+++++ 2.7520	+++++ 2.4792	3.1895	3.0727	2.9338	Ave		2.8854				9.7		30.0			
1,4-Dioxane	+++++ 0.1042	+++++ 0.0995	0.1148	0.1135	0.1089	Ave		0.1082				5.9		30.0			
cis-1,2-Dichloroethene	1.3382 1.2148	1.2606 1.1453	1.2482	1.2543	1.2346	Ave		1.2423				4.6		30.0			

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUTION

Lab Name: TestAmerica Burlington Job No.: 200-4011-1 Analy Batch No.: 13474

SDG No.:

Instrument ID: B.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/09/2011 15:04 Calibration End Date: 02/09/2011 20:19 Calibration ID: 4769

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Methyl Ethyl Ketone	+++++ 0.5971	0.6284 0.5398	0.6540	0.6347	0.6133	Ave		0.6112				6.5		30.0			
Ethyl acetate	+++++ 0.1113	+++++ 0.1039	0.1092	0.1156	0.1116	Ave		0.1103				3.9		30.0			
Tetrahydrofuran	+++++ 0.2429	+++++ 0.2238	0.2802	0.2684	0.2553	Ave		0.2541				8.6		30.0			
Chloroform	3.0205 2.3863	2.7457 2.2431	2.6581	2.5561	2.4720	Ave		2.5831				9.9		30.0			
1,1,1-Trichloroethane	0.5625 0.4899	0.5336 0.4686	0.5272	0.5168	0.5011	Ave		0.5142				6.0		30.0			
Cyclohexane	0.4046 0.3458	0.3591 0.3280	0.3599	0.3566	0.3489	Ave		0.3575				6.6		30.0			
Carbon tetrachloride	0.5354 0.4827	0.5094 0.4776	0.5113	0.5073	0.4908	Ave		0.5021				4.0		30.0			
2,2,4-Trimethylpentane	1.3582 1.1500	1.2918 1.0586	1.2953	1.2427	1.1943	Ave		1.2273				8.3		30.0			
Benzene	0.8880 0.7368	0.8219 0.6960	0.7913	0.7694	0.7506	Ave		0.7791				8.0		30.0			
1,2-Dichloroethane	0.4112 0.3288	0.3807 0.3137	0.3679	0.3554	0.3411	Ave		0.3570				9.3		30.0			
n-Heptane	0.5152 0.4017	0.4821 0.3637	0.4713	0.4425	0.4228	Ave		0.4427				11.6		30.0			
n-Butanol	+++++ 0.1287	+++++ 0.1301	0.1364	0.1370	0.1367	Ave		0.1338				3.0		30.0			
Trichloroethene	0.3813 0.3180	0.3253 0.3078	0.3283	0.3284	0.3216	Ave		0.3301				7.2		30.0			
1,2-Dichloropropane	0.3278 0.2700	0.3021 0.2553	0.2951	0.2861	0.2771	Ave		0.2876				8.2		30.0			
Methyl methacrylate	+++++ 0.2720	0.2273 0.2602	0.2827	0.2831	0.2769	Ave		0.2670				7.9		30.0			
Dibromomethane	0.2404 0.2558	0.2141 0.2615	0.2306	0.2427	0.2465	Ave		0.2417				6.6		30.0			
Bromodichloromethane	0.5563 0.5311	0.5463 0.5099	0.5660	0.5563	0.5424	Ave		0.5440				3.5		30.0			
cis-1,3-Dichloropropene	0.4378 0.4363	0.4140 0.4201	0.4518	0.4480	0.4397	Ave		0.4354				3.2		30.0			
methyl isobutyl ketone	+++++ 0.4918	0.4917 0.4544	0.5653	0.5430	0.5189	Ave		0.5108				7.8		30.0			
Toluene	0.7004 0.6012	0.6254 0.5469	0.6248	0.6243	0.6102	Ave		0.6190				7.3		30.0			

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUTION

Lab Name: TestAmerica Burlington Job No.: 200-4011-1 Analy Batch No.: 13474

SDG No.:

Instrument ID: B.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/09/2011 15:04 Calibration End Date: 02/09/2011 20:19 Calibration ID: 4769

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
n-Octane	0.7149 0.4958	0.6485 0.4182	0.6336	0.5762	0.5361	Ave		0.5748				17.5		30.0			
trans-1,3-Dichloropropene	0.4697 0.4586	0.4360 0.4376	0.4787	0.4737	0.4676	Ave		0.4603				3.7		30.0			
1,1,2-Trichloroethane	0.3255 0.2942	0.3048 0.2771	0.3044	0.3003	0.2966	Ave		0.3004				4.8		30.0			
Tetrachloroethene	0.4410 0.4544	0.4035 0.4573	0.4140	0.4336	0.4401	Ave		0.4348				4.6		30.0			
Methyl Butyl Ketone (2-Hexanone)	+++++ 0.5399	0.4767 0.5004	0.5939	0.5825	0.5659	Ave		0.5432				8.6		30.0			
Dibromochloromethane	0.4506 0.5674	0.4424 0.5585	0.5385	0.5571	0.5617	Ave		0.5252				10.4		30.0			
1,2-Dibromoethane	0.5197 0.5272	0.4745 0.5128	0.5165	0.5256	0.5240	Ave		0.5143				3.6		30.0			
Chlorobenzene	0.9632 0.8051	0.8206 0.7820	0.8030	0.8029	0.7955	Ave		0.8246				7.5		30.0			
Ethylbenzene	1.4900 1.3313	1.3660 1.2463	1.3715	1.3585	1.3346	Ave		1.3569				5.3		30.0			
n-Nonane	0.7605 0.5811	0.7081 0.5071	0.6768	0.6353	0.6093	Ave		0.6398				13.2		30.0			
m,p-Xylene	0.5786 0.5203	0.5114 0.4614	0.5295	0.5344	0.5253	Ave		0.5230				6.6		30.0			
Xylene, o-	0.5150 0.5103	0.4837 0.4744	0.5083	0.5140	0.5102	Ave		0.5023				3.2		30.0			
Styrene	0.6482 0.8106	0.6401 0.7530	0.7824	0.8073	0.8076	Ave		0.7499				10.0		30.0			
Bromoform	0.3610 0.5391	0.3478 0.5270	0.4799	0.5153	0.5244	Ave		0.4706				17.3		30.0			
Cumene	1.4729 1.4828	1.4165 1.3770	1.4950	1.4981	1.4812	Ave		1.4605				3.1		30.0			
1,1,2,2-Tetrachloroethane	0.8595 0.7540	0.7899 0.6787	0.7990	0.7835	0.7700	Ave		0.7764				7.0		30.0			
n-Propylbenzene	2.0255 1.7671	1.8452 1.4761	1.8979	1.8742	1.8282	Ave		1.8163				9.3		30.0			
1,2,3-Trichloropropane	+++++ 0.5723	0.6737 0.4789	0.6569	0.6304	0.6014	Ave		0.6023				11.7		30.0			
n-Decane	+++++ 0.7261	0.9175 0.6007	0.8829	0.8135	0.7743	Ave		0.7858				14.6		30.0			
4-Ethyltoluene	1.6966 1.5373	1.5028 1.3628	1.5573	1.5646	1.5526	Ave		1.5391				6.4		30.0			

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUTION

Lab Name: TestAmerica Burlington Job No.: 200-4011-1 Analy Batch No.: 13474

SDG No.:

Instrument ID: B.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/09/2011 15:04 Calibration End Date: 02/09/2011 20:19 Calibration ID: 4769

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
2-Chlorotoluene	1.6396 1.3579	1.4617 1.2051	1.4507	1.4134	1.3889	Ave		1.4167				9.2		30.0			
1,3,5-Trimethylbenzene	1.3807 1.2582	1.2323 1.1398	1.2823	1.2760	1.2613	Ave		1.2615				5.7		30.0			
Alpha Methyl Styrene	0.4456 0.6551	0.4432 0.6171	0.6174	0.6409	0.6469	Ave		0.5809				16.2		30.0			
tert-Butylbenzene	1.2597 1.1601	1.1353 1.0710	1.1631	1.1775	1.1619	Ave		1.1612				4.8		30.0			
1,2,4-Trimethylbenzene	1.3807 1.2378	1.2268 1.1285	1.2735	1.2615	1.2478	Ave		1.2509				5.9		30.0			
sec-Butylbenzene	2.0197 1.7650	1.7759 1.5361	1.8414	1.8196	1.7938	Ave		1.7931				7.9		30.0			
4-Isopropyltoluene	1.5268 1.5018	1.3941 1.3481	1.5115	1.5220	1.5067	Ave		1.4730				4.8		30.0			
1,3-Dichlorobenzene	0.9468 0.8262	0.7333 0.7765	0.7824	0.8000	0.8084	Ave		0.8105				8.3		30.0			
1,4-Dichlorobenzene	0.9821 0.8366	0.7455 0.7838	0.7850	0.8009	0.8170	Ave		0.8216				9.3		30.0			
Benzyl chloride	1.3303 1.1813	1.1036 1.0877	1.2429	1.2247	1.2046	Ave		1.1964				7.0		30.0			
n-Undecane	+++++ 0.6944	+++++ 0.5410	0.9589	0.8094	0.7633	Ave		0.7534				20.4		30.0			
n-Butylbenzene	1.7768 1.3036	1.5198 1.0490	1.5344	1.4562	1.3845	Ave		1.4321				15.7		30.0			
1,2-Dichlorobenzene	0.9016 0.7805	0.7189 0.7370	0.7485	0.7567	0.7644	Ave		0.7725				7.8		30.0			
n-Dodecane	+++++ 0.7488	+++++ 0.4295	0.8944	0.6974	0.7686	Ave		0.7077				24.2		30.0			
1,2,4-Trichlorobenzene	+++++ 0.6713	0.5436 0.5763	0.5880	0.5494	0.6263	Ave		0.5925				8.2		30.0			
Hexachlorobutadiene	0.5268 0.4762	0.4442 0.4059	0.4377	0.4280	0.4410	Ave		0.4514				8.7		30.0			
Naphthalene	+++++ 1.6197	1.3953 1.3516	1.4627	1.2667	1.5352	Ave		1.4385				8.9		30.0			
1,2,3-Trichlorobenzene	0.6966 0.6148	0.5322 0.4632	0.5402	0.4904	0.5666	Ave		0.5577				14.1		30.0			

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Burlington Job No.: 200-4011-1 Analy Batch No.: 13474

SDG No.:

Instrument ID: B.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/09/2011 15:04 Calibration End Date: 02/09/2011 20:19 Calibration ID: 4769

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 200-13474/5	bjx005.d
Level 2	IC 200-13474/6	bjx006.d
Level 3	IC 200-13474/7	bjx007.d
Level 4	ICIS 200-13474/8	bjx008.d
Level 5	IC 200-13474/9	bjx009.d
Level 6	IC 200-13474/10	bjx010.d
Level 7	IC 200-13474/11	bjx011.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (PPB V/V)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Propylene	BCM	Ave	+++++ 434488	13147 818228	114715	219264	323376	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Dichlorodifluoromethane	BCM	Ave	+++++ 2291560	64074 4169055	607320	1213937	1714698	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Freon 22	BCM	Ave	+++++ 1088466	29528 2030018	285025	564944	815096	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
1,2-Dichlorotetrafluoroethane	BCM	Ave	26883 2322893	62733 4258588	603437	1211618	1726639	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Chloromethane	BCM	Ave	+++++ 563857	14797 1089942	143829	284700	423605	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
n-Butane	BCM	Ave	+++++ 971484	25481 1818845	249378	490789	719021	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Vinyl chloride	BCM	Ave	8619 767904	20587 1443391	198096	391036	566999	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,3-Butadiene	BCM	Ave	6034 547702	14106 1033177	139037	278528	402315	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Bromomethane	BCM	Ave	13939 1193759	31738 2222419	303173	619285	881358	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Chloroethane	BCM	Ave	+++++ 684182	18103 1263508	172962	353164	504913	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Isopentane	BCM	Ave	16346 1342096	37085 2437477	350117	714361	1023624	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Bromoethene(Vinyl Bromide)	BCM	Ave	15518 1456368	36403 2801914	349652	733242	1070985	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Trichlorofluoromethane	BCM	Ave	44181 3731410	97003 6999514	942632	1925207	2776881	0.200 20.0	0.500 40.0	5.00	10.0	15.0
n-Pentane	BCM	Ave	+++++ 2321859	65088 4224339	603541	1243155	1808518	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Ethanol	BCM	Ave	+++++ 1298326	148355 3089208	252504	446653	641418	+++++ 40.0	5.00 100	10.0	15.0	20.0

FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Burlington Job No.: 200-4011-1 Analy Batch No.: 13474

SDG No.:

Instrument ID: B.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/09/2011 15:04 Calibration End Date: 02/09/2011 20:19 Calibration ID: 4769

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (PPB V/V)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Ethyl ether	BCM	Ave	12811 1212335	28516 2286639	288877	595277	890928	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Acrolein	BCM	Ave	+++++ 639751	+++++ 1192898	151578	317595	467553	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
Freon TF	BCM	Ave	29292 2842340	64999 5562723	632030	1333971	2014826	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,1-Dichloroethene	BCM	Ave	13417 1403215	30352 2801029	307169	652102	994034	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Acetone	BCM	Ave	+++++ 2167509	+++++ 4111494	579957	1117917	1639678	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
Carbon disulfide	BCM	Ave	+++++ 4657555	107878 9065661	1061851	2203742	3348404	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Isopropyl alcohol	BCM	Ave	+++++ 1756291	+++++ 3361214	441227	898290	1325265	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
3-Chloropropene	BCM	Ave	19625 1820295	44861 3444925	446861	919211	1377121	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Acetonitrile	BCM	Ave	+++++ 1083889	+++++ 2031052	283835	555810	860134	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
Methylene Chloride	BCM	Ave	+++++ 1589668	45133 2983609	403150	802926	1187174	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
tert-Butyl alcohol	BCM	Ave	+++++ 2741224	+++++ 5289949	654315	1373369	2047834	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
trans-1,2-Dichloroethene	BCM	Ave	24572 2315875	58432 4319426	566698	1165124	1712371	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Methyl tert-butyl ether	BCM	Ave	44783 4683706	106717 8976517	1090018	2274185	3393250	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Acrylonitrile	BCM	Ave	+++++ 1138333	26894 2166518	263610	551208	828134	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
n-Hexane	BCM	Ave	26927 2548596	62192 4739410	618609	1263578	1861407	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,1-Dichloroethane	BCM	Ave	30628 2880007	71114 5405647	694030	1433343	2108021	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Vinyl acetate	BCM	Ave	+++++ 3712423	+++++ 6834592	911841	1878921	2758674	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
1,4-Dioxane	DFB	Ave	+++++ 700236	+++++ 1328603	167304	350747	513774	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
cis-1,2-Dichloroethene	BCM	Ave	15285 1638788	35760 3157260	356858	766984	1160896	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Methyl Ethyl Ketone	BCM	Ave	+++++ 805504	17827 1487970	186973	388092	576674	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Ethyl acetate	BCM	Ave	+++++ 150173	+++++ 286443	31231	70679	104971	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0

FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Burlington Job No.: 200-4011-1 Analy Batch No.: 13474

SDG No.:

Instrument ID: B.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/09/2011 15:04 Calibration End Date: 02/09/2011 20:19 Calibration ID: 4769

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (PPB V/V)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Tetrahydrofuran	DFB	Ave	+++++ 1631734	+++++ 2989858	408247	829371	1204789	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
Chloroform	BCM	Ave	34500 3219071	77889 6183560	759920	1563052	2324468	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,1,1-Trichloroethane	DFB	Ave	33206 3291184	77580 6259099	768140	1596898	2364874	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Cyclohexane	DFB	Ave	23886 2322680	52205 4381469	524347	1101922	1646568	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Carbon tetrachloride	DFB	Ave	31610 3242588	74056 6379778	745044	1567730	2316150	0.200 20.0	0.500 40.0	5.00	10.0	15.0
2,2,4-Trimethylpentane	DFB	Ave	80184 7725231	187801 14141338	1887361	3840095	5635680	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Benzene	DFB	Ave	52426 4949901	119483 9296726	1152945	2377666	3542011	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,2-Dichloroethane	DFB	Ave	24278 2208828	55341 4189973	536122	1098210	1609749	0.200 20.0	0.500 40.0	5.00	10.0	15.0
n-Heptane	DFB	Ave	30418 2698629	70082 4857749	686718	1367282	1995167	0.200 20.0	0.500 40.0	5.00	10.0	15.0
n-Butanol	DFB	Ave	+++++ 864866	+++++ 1738166	198804	423422	644982	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
Trichloroethene	DFB	Ave	22513 2136452	47294 4111318	478366	1014948	1517682	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,2-Dichloropropane	DFB	Ave	19351 1813825	43922 3410098	429943	884199	1307498	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Methyl methacrylate	DFB	Ave	+++++ 1827267	33050 3475594	411871	874831	1306472	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Dibromomethane	DFB	Ave	14191 1718237	31125 3493618	335934	749996	1163397	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Bromodichloromethane	DFB	Ave	32840 3567664	79414 6811668	824664	1718997	2559614	0.200 20.0	0.500 40.0	5.00	10.0	15.0
cis-1,3-Dichloropropene	DFB	Ave	25844 2930688	60180 5612024	658296	1384346	2075065	0.200 20.0	0.500 40.0	5.00	10.0	15.0
methyl isobutyl ketone	DFB	Ave	+++++ 3304003	71483 6069872	823654	1678035	2448466	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Toluene	CBZ	Ave	37070 3632323	82411 6573877	825370	1747178	2596736	0.200 20.0	0.500 40.0	5.00	10.0	15.0
n-Octane	DFB	Ave	42207 3330964	94272 5586045	923229	1780655	2529951	0.200 20.0	0.500 40.0	5.00	10.0	15.0
trans-1,3-Dichloropropene	DFB	Ave	27730 3080776	63385 5846047	697447	1463869	2206515	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,1,2-Trichloroethane	CBZ	Ave	17228 1777773	40159 3330025	402067	840462	1262034	0.200 20.0	0.500 40.0	5.00	10.0	15.0

FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Burlington Job No.: 200-4011-1 Analy Batch No.: 13474

SDG No.:

Instrument ID: B.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/09/2011 15:04 Calibration End Date: 02/09/2011 20:19 Calibration ID: 4769

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (PPB V/V)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Tetrachloroethene	CBZ	Ave	23338 2745285	53169 5496168	546868	1213586	1872660	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Methyl Butyl Ketone (2-Hexanone)	CBZ	Ave	+++++ 3262477	62812 6015064	784530	1630444	2408176	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Dibromochloromethane	CBZ	Ave	23850 3428090	58288 6712809	711404	1559332	2390294	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,2-Dibromoethane	CBZ	Ave	27505 3185165	62519 6163903	682265	1471049	2229932	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Chlorobenzene	CBZ	Ave	50977 4864789	108130 9399072	1060860	2247283	3384958	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Ethylbenzene	CBZ	Ave	78857 8044078	179990 14980233	1811830	3802125	5679266	0.200 20.0	0.500 40.0	5.00	10.0	15.0
n-Nonane	CBZ	Ave	40248 3511101	93305 6095135	894109	1778192	2592849	0.200 20.0	0.500 40.0	5.00	10.0	15.0
m,p-Xylene	CBZ	Ave	61240 6287785	134780 11092494	1398912	2991231	4470560	0.400 40.0	1.00 80.0	10.0	20.0	30.0
Xylene, o-	CBZ	Ave	27255 3083580	63741 5701392	671439	1438531	2170963	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Styrene	CBZ	Ave	34304 4897630	84349 9050348	1033532	2259371	3436791	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Bromoform	CBZ	Ave	19106 3257154	45835 6333815	633933	1442279	2231539	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Cumene	CBZ	Ave	77953 8959288	186654 16550907	1974949	4192888	6302998	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,1,2,2-Tetrachloroethane	CBZ	Ave	45487 4555675	104080 8157905	1055545	2192836	3276684	0.200 20.0	0.500 40.0	5.00	10.0	15.0
n-Propylbenzene	CBZ	Ave	107197 10676867	243134 17741470	2507226	5245537	7779802	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,2,3-Trichloropropane	CBZ	Ave	+++++ 3458010	88772 5755683	867860	1764356	2559369	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
n-Decane	CBZ	Ave	+++++ 4387113	120893 7220379	1166296	2276964	3295005	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
4-Ethyltoluene	CBZ	Ave	89790 9288737	198020 16380370	2057318	4378939	6606758	0.200 20.0	0.500 40.0	5.00	10.0	15.0
2-Chlorotoluene	CBZ	Ave	86775 8204910	192599 14484033	1916438	3955819	5910150	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,3,5-Trimethylbenzene	CBZ	Ave	73075 7602105	162380 13700248	1693982	3571246	5367303	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Alpha Methyl Styrene	CBZ	Ave	23585 3958505	58405 7417227	815559	1793699	2752734	0.200 20.0	0.500 40.0	5.00	10.0	15.0
tert-Butylbenzene	CBZ	Ave	66669 7009584	149589 12873188	1536549	3295743	4944345	0.200 20.0	0.500 40.0	5.00	10.0	15.0

FORM VI
AIR - GC/MS VOA INITIAL CALIBRATION DATA
INTERNAL STANDARD RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Burlington Job No.: 200-4011-1 Analy Batch No.: 13474

SDG No.:

Instrument ID: B.i GC Column: RTX-624 ID: 0.32(mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/09/2011 15:04 Calibration End Date: 02/09/2011 20:19 Calibration ID: 4769

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (PPB V/V)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
1,2,4-Trimethylbenzene	CBZ	Ave	73075 7479038	161653 13564126	1682407	3530586	5309760	0.200 20.0	0.500 40.0	5.00	10.0	15.0
sec-Butylbenzene	CBZ	Ave	106893 10664333	234007 18463545	2432578	5092739	7633411	0.200 20.0	0.500 40.0	5.00	10.0	15.0
4-Isopropyltoluene	CBZ	Ave	80806 9074168	183703 16202814	1996822	4259732	6411372	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,3-Dichlorobenzene	CBZ	Ave	50109 4992295	96631 9333085	1033612	2238953	3440117	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,4-Dichlorobenzene	CBZ	Ave	51976 5054884	98237 9421295	1037091	2241469	3476744	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Benzyl chloride	CBZ	Ave	70406 7137634	145414 13073070	1641952	3427669	5126118	0.200 20.0	0.500 40.0	5.00	10.0	15.0
n-Undecane	CBZ	Ave	+++++ 4195711	+++++ 6502589	1266771	2265455	3248038	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
n-Butylbenzene	CBZ	Ave	94035 7876638	200261 12608458	2027034	4075716	5891718	0.200 20.0	0.500 40.0	5.00	10.0	15.0
1,2-Dichlorobenzene	CBZ	Ave	47717 4715657	94724 8857913	988795	2117730	3252873	0.200 20.0	0.500 40.0	5.00	10.0	15.0
n-Dodecane	CBZ	Ave	+++++ 4524522	+++++ 5162602	1181486	1951852	3270474	+++++ 20.0	+++++ 40.0	5.00	10.0	15.0
1,2,4-Trichlorobenzene	CBZ	Ave	+++++ 4056417	71626 6927306	776823	1537557	2665016	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
Hexachlorobutadiene	CBZ	Ave	27881 2877272	58525 4878202	578192	1197842	1876452	0.200 20.0	0.500 40.0	5.00	10.0	15.0
Naphthalene	CBZ	Ave	+++++ 9786673	183860 16244939	1932290	3545288	6532787	+++++ 20.0	0.500 40.0	5.00	10.0	15.0
1,2,3-Trichlorobenzene	CBZ	Ave	36867 3714691	70133 5567561	713685	1372473	2411286	0.200 20.0	0.500 40.0	5.00	10.0	15.0

Curve Type Legend:
Ave = Average ISTD

FORM VII
AIR - GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Burlington Job No.: 200-3988-1

SDG No.:

Lab Sample ID: ICV 200-13474/14 Calibration Date: 02/09/2011 22:56

Instrument ID: B.i Calib Start Date: 02/09/2011 15:04

GC Column: RTX-624 ID: 0.32(mm) Calib End Date: 02/09/2011 20:19

Lab File ID: bjx014.d Conc. Units: ppb v/v Heated Purge: (Y/N) N

EPA Sample No.: icv 97891

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Propylene	Ave	0.3643	0.3077		8.44	10.0	-15.6	30.0
Dichlorodifluoromethane	Ave	1.900	1.645		8.66	10.0	-13.4	30.0
Freon 22	Ave	0.8953	0.7950		8.88	10.0	-11.2	30.0
1,2-Dichlorotetrafluoroethane	Ave	1.966	1.695		8.62	10.0	-13.8	30.0
Chloromethane	Ave	0.4590	0.4154		9.05	10.0	-9.5	30.0
n-Butane	Ave	0.7863	0.6958		8.85	10.0	-11.5	30.0
Vinyl chloride	Ave	0.6441	0.5616		8.72	10.0	-12.8	30.0
1,3-Butadiene	Ave	0.4537	0.4090		9.01	10.0	-9.8	30.0
Bromomethane	Ave	1.006	0.8483		8.43	10.0	-15.7	30.0
Chloroethane	Ave	0.5539	0.4994		9.02	10.0	-9.8	30.0
Isopentane	Ave	1.157	1.009		8.72	10.0	-12.8	30.0
Bromoethene(Vinyl Bromide)	Ave	1.186	1.096		9.24	10.0	-7.5	30.0
Trichlorofluoromethane	Ave	3.142	2.686		8.55	10.0	-14.5	30.0
n-Pentane	Ave	1.936	1.740		8.99	10.0	-10.1	30.0
Ethanol	Ave	0.4821	0.4571		14.3	15.0	-5.2	30.0
Ethyl ether	Ave	0.9695	0.9061		9.34	10.0	-6.5	30.0
Acrolein	Ave	0.4908	0.3844		7.83	10.0	-21.7	30.0
Freon TF	Ave	2.217	2.278		10.3	10.0	2.8	30.0
1,1-Dichloroethene	Ave	1.071	1.164		10.9	10.0	8.6	30.0
Acetone	Ave	1.740	1.897		10.9	10.0	9.0	30.0
Carbon disulfide	Ave	3.570	3.592		10.1	10.0	0.6	30.0
Isopropyl alcohol	Ave	1.389	1.280		9.22	10.0	-7.8	30.0
3-Chloropropene	Ave	1.490	1.462		9.81	10.0	-1.9	30.0
Acetonitrile	Ave	0.8713	0.8946		10.3	10.0	2.7	30.0
Methylene Chloride	Ave	1.306	1.353		10.4	10.0	3.6	30.0
tert-Butyl alcohol	Ave	2.133	2.023		9.48	10.0	-5.2	30.0
Methyl tert-butyl ether	Ave	3.650	3.570		9.78	10.0	-2.2	30.0
trans-1,2-Dichloroethene	Ave	1.886	1.816		9.62	10.0	-3.7	30.0
Acrylonitrile	Ave	0.7546	0.8836		10.0	10.0	17.1	30.0
n-Hexane	Ave	2.053	2.033		9.90	10.0	-0.9	30.0
1,1-Dichloroethane	Ave	2.328	2.251		9.67	10.0	-3.3	30.0
Vinyl acetate	Ave	2.885	2.896		10.0	10.0	0.4	30.0
cis-1,2-Dichloroethene	Ave	1.242	1.236		9.95	10.0	-0.5	30.0
Methyl Ethyl Ketone	Ave	0.6112	0.6273		10.3	10.0	2.6	30.0
Ethyl acetate	Ave	0.1103	0.1104		10.0	10.0	0.0	30.0
Tetrahydrofuran	Ave	0.2541	0.2481		9.76	10.0	-2.4	30.0
Chloroform	Ave	2.583	2.385		9.23	10.0	-7.7	30.0
1,1,1-Trichloroethane	Ave	0.5142	0.4613		8.97	10.0	-10.3	30.0
Cyclohexane	Ave	0.3575	0.3437		9.61	10.0	-3.9	30.0

FORM VII
AIR - GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Burlington Job No.: 200-3988-1

SDG No.:

Lab Sample ID: ICV 200-13474/14 Calibration Date: 02/09/2011 22:56

Instrument ID: B.i Calib Start Date: 02/09/2011 15:04

GC Column: RTX-624 ID: 0.32(mm) Calib End Date: 02/09/2011 20:19

Lab File ID: bjx014.d Conc. Units: ppb v/v Heated Purge: (Y/N) N

EPA Sample No.: icv 97891

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Carbon tetrachloride	Ave	0.5021	0.4403		8.77	10.0	-12.3	30.0
2,2,4-Trimethylpentane	Ave	1.227	1.199		9.77	10.0	-2.3	30.0
Benzene	Ave	0.7791	0.7405		9.50	10.0	-5.0	30.0
1,2-Dichloroethane	Ave	0.3570	0.3194		8.94	10.0	-10.5	30.0
n-Heptane	Ave	0.4427	0.4217		9.52	10.0	-4.8	30.0
n-Butanol	Ave	0.1338	0.1039		7.76	10.0	-22.4	30.0
Trichloroethene	Ave	0.3301	0.3030		9.18	10.0	-8.2	30.0
1,2-Dichloropropane	Ave	0.2876	0.2670		9.28	10.0	-7.2	30.0
Methyl methacrylate	Ave	0.2670	0.2607		9.76	10.0	-2.4	30.0
1,4-Dioxane	Ave	0.1082	0.0891		8.23	10.0	-17.7	30.0
Dibromomethane	Ave	0.2417	0.2266		9.38	10.0	-6.2	30.0
Bromodichloromethane	Ave	0.5440	0.5153		9.47	10.0	-5.3	30.0
cis-1,3-Dichloropropene	Ave	0.4354	0.4071		9.35	10.0	-6.5	30.0
methyl isobutyl ketone	Ave	0.5108	0.5053		9.89	10.0	-1.1	30.0
Toluene	Ave	0.6190	0.5817		9.40	10.0	-6.0	30.0
n-Octane	Ave	0.5748	0.5382		9.36	10.0	-6.4	30.0
trans-1,3-Dichloropropene	Ave	0.4603	0.4212		9.15	10.0	-8.5	30.0
1,1,2-Trichloroethane	Ave	0.3004	0.2704		9.00	10.0	-10.0	30.0
Tetrachloroethene	Ave	0.4348	0.3953		9.09	10.0	-9.1	30.0
Methyl Butyl Ketone (2-Hexanone)	Ave	0.5432	0.5385		9.91	10.0	-0.9	30.0
Dibromochloromethane	Ave	0.5252	0.5168		9.84	10.0	-1.6	30.0
1,2-Dibromoethane	Ave	0.5143	0.4739		9.21	10.0	-7.9	30.0
Chlorobenzene	Ave	0.8246	0.7351		8.91	10.0	-10.9	30.0
Ethylbenzene	Ave	1.357	1.257		9.26	10.0	-7.4	30.0
n-Nonane	Ave	0.6398	0.6041		9.44	10.0	-5.6	30.0
m,p-Xylene	Ave	0.5230	0.4818		18.4	20.0	-7.9	30.0
Xylene, o-	Ave	0.5023	0.4658		9.27	10.0	-7.3	30.0
Styrene	Ave	0.7499	0.7282		9.71	10.0	-2.9	30.0
Bromoform	Ave	0.4706	0.4737		10.1	10.0	0.6	30.0
Cumene	Ave	1.461	1.390		9.52	10.0	-4.8	30.0
1,1,2,2-Tetrachloroethane	Ave	0.7764	0.7108		9.15	10.0	-8.5	30.0
n-Propylbenzene	Ave	1.816	1.725		9.50	10.0	-5.0	30.0
1,2,3-Trichloropropane	Ave	0.6023	0.5780		9.59	10.0	-4.0	30.0
n-Decane	Ave	0.7858	0.7743		9.85	10.0	-1.5	30.0
4-Ethyltoluene	Ave	1.539	1.472		9.56	10.0	-4.3	30.0
2-Chlorotoluene	Ave	1.417	1.321		9.33	10.0	-6.7	30.0
1,3,5-Trimethylbenzene	Ave	1.262	1.151		9.12	10.0	-8.8	30.0
Alpha Methyl Styrene	Ave	0.5809	0.5817		10.0	10.0	0.1	30.0
tert-Butylbenzene	Ave	1.161	1.083		9.33	10.0	-6.7	30.0

FORM VII
AIR - GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Burlington Job No.: 200-3988-1

SDG No.:

Lab Sample ID: ICV 200-13474/14 Calibration Date: 02/09/2011 22:56

Instrument ID: B.i Calib Start Date: 02/09/2011 15:04

GC Column: RTX-624 ID: 0.32(mm) Calib End Date: 02/09/2011 20:19

Lab File ID: bjx014.d Conc. Units: ppb v/v Heated Purge: (Y/N) N

EPA Sample No.: icv 97891

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
1,2,4-Trimethylbenzene	Ave	1.251	1.122		8.97	10.0	-10.3	30.0
sec-Butylbenzene	Ave	1.793	1.685		9.40	10.0	-6.0	30.0
4-Isopropyltoluene	Ave	1.473	1.403		9.53	10.0	-4.7	30.0
1,3-Dichlorobenzene	Ave	0.8105	0.7111		8.77	10.0	-12.3	30.0
1,4-Dichlorobenzene	Ave	0.8216	0.7165		8.72	10.0	-12.8	30.0
Benzyl chloride	Ave	1.196	0.9541		7.97	10.0	-20.3	30.0
n-Undecane	Ave	0.7534	0.8079		10.7	10.0	7.2	30.0
n-Butylbenzene	Ave	1.432	1.337		9.34	10.0	-6.6	30.0
1,2-Dichlorobenzene	Ave	0.7725	0.6637		8.59	10.0	-14.1	30.0
n-Dodecane	Ave	0.7077	0.7640		10.8	10.0	7.9	30.0
1,2,4-Trichlorobenzene	Ave	0.5925	0.5414		9.14	10.0	-8.6	30.0
Hexachlorobutadiene	Ave	0.4514	0.3958		8.77	10.0	-12.3	30.0
Naphthalene	Ave	1.439	1.386		9.63	10.0	-3.7	30.0
1,2,3-Trichlorobenzene	Ave	0.5577	0.5306		9.51	10.0	-4.9	30.0

FORM VII
AIR - GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Burlington Job No.: 200-3988-1

SDG No.:

Lab Sample ID: CCVIS 200-14276/2 Calibration Date: 02/26/2011 10:50

Instrument ID: B.i Calib Start Date: 02/09/2011 15:04

GC Column: RTX-624 ID: 0.32(mm) Calib End Date: 02/09/2011 20:19

Lab File ID: bjxj002.d Conc. Units: ppb v/v Heated Purge: (Y/N) N

EPA Sample No.: ccvis 109439

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Propylene	Ave	0.3643	0.3569		9.79	10.0	-2.0	30.0
Dichlorodifluoromethane	Ave	1.900	1.823		9.59	10.0	-4.1	30.0
Freon 22	Ave	0.8953	0.8782		9.81	10.0	-1.9	30.0
1,2-Dichlorotetrafluoroethane	Ave	1.966	1.849		9.41	10.0	-5.9	30.0
Chloromethane	Ave	0.4590	0.4529		9.86	10.0	-1.3	30.0
n-Butane	Ave	0.7863	0.7820		9.94	10.0	-0.5	30.0
Vinyl chloride	Ave	0.6441	0.6073		9.43	10.0	-5.7	30.0
1,3-Butadiene	Ave	0.4537	0.4334		9.55	10.0	-4.5	30.0
Bromomethane	Ave	1.006	0.9262		9.21	10.0	-7.9	30.0
Chloroethane	Ave	0.5539	0.5283		9.54	10.0	-4.6	30.0
Isopentane	Ave	1.157	1.076		9.30	10.0	-7.0	30.0
Bromoethene(Vinyl Bromide)	Ave	1.186	1.145		9.65	10.0	-3.5	30.0
Trichlorofluoromethane	Ave	3.142	2.945		9.37	10.0	-6.2	30.0
n-Pentane	Ave	1.936	1.969		10.2	10.0	1.7	30.0
Ethanol	Ave	0.4821	0.4901		15.3	15.0	1.7	30.0
Ethyl ether	Ave	0.9695	0.9878		10.2	10.0	1.9	30.0
Acrolein	Ave	0.4908	0.5188		10.6	10.0	5.7	30.0
Freon TF	Ave	2.217	2.191		9.88	10.0	-1.1	30.0
1,1-Dichloroethene	Ave	1.071	1.071		10.0	10.0	0.0	30.0
Acetone	Ave	1.740	1.849		10.6	10.0	6.3	30.0
Carbon disulfide	Ave	3.570	3.628		10.2	10.0	1.6	30.0
Isopropyl alcohol	Ave	1.389	1.456		10.5	10.0	4.8	30.0
3-Chloropropene	Ave	1.490	1.505		10.1	10.0	1.0	30.0
Acetonitrile	Ave	0.8713	0.9121		10.5	10.0	4.7	30.0
Methylene Chloride	Ave	1.306	1.310		10.0	10.0	0.3	30.0
tert-Butyl alcohol	Ave	2.133	2.196		10.3	10.0	3.0	30.0
Methyl tert-butyl ether	Ave	3.650	3.682		10.1	10.0	0.9	30.0
trans-1,2-Dichloroethene	Ave	1.886	1.863		9.87	10.0	-1.2	30.0
Acrylonitrile	Ave	0.7546	0.9080		10.3	10.0	20.3	30.0
n-Hexane	Ave	2.053	2.063		10.0	10.0	0.5	30.0
1,1-Dichloroethane	Ave	2.328	2.301		9.88	10.0	-1.2	30.0
Vinyl acetate	Ave	2.885	3.036		10.5	10.0	5.2	30.0
cis-1,2-Dichloroethene	Ave	1.242	1.234		9.93	10.0	-0.7	30.0
Methyl Ethyl Ketone	Ave	0.6112	0.6268		10.3	10.0	2.5	30.0
Ethyl acetate	Ave	0.1103	0.1136		10.3	10.0	2.9	30.0
Tetrahydrofuran	Ave	0.2541	0.2636		10.4	10.0	3.7	30.0
Chloroform	Ave	2.583	2.463		9.53	10.0	-4.7	30.0
1,1,1-Trichloroethane	Ave	0.5142	0.4922		9.57	10.0	-4.3	30.0
Cyclohexane	Ave	0.3575	0.3532		9.88	10.0	-1.2	30.0

FORM VII
AIR - GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Burlington Job No.: 200-3988-1

SDG No.:

Lab Sample ID: CCVIS 200-14276/2 Calibration Date: 02/26/2011 10:50

Instrument ID: B.i Calib Start Date: 02/09/2011 15:04

GC Column: RTX-624 ID: 0.32(mm) Calib End Date: 02/09/2011 20:19

Lab File ID: bjxj002.d Conc. Units: ppb v/v Heated Purge: (Y/N) N

EPA Sample No.: ccvis 109439

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Carbon tetrachloride	Ave	0.5021	0.4815		9.59	10.0	-4.1	30.0
2,2,4-Trimethylpentane	Ave	1.227	1.232		10.0	10.0	0.4	30.0
Benzene	Ave	0.7791	0.7599		9.75	10.0	-2.5	30.0
1,2-Dichloroethane	Ave	0.3570	0.3389		9.49	10.0	-5.1	30.0
n-Heptane	Ave	0.4427	0.4390		9.91	10.0	-0.9	30.0
n-Butanol	Ave	0.1338	0.1358		10.1	10.0	1.5	30.0
Trichloroethene	Ave	0.3301	0.3175		9.62	10.0	-3.8	30.0
1,2-Dichloropropane	Ave	0.2876	0.2810		9.77	10.0	-2.3	30.0
Methyl methacrylate	Ave	0.2670	0.2766		10.4	10.0	3.6	30.0
1,4-Dioxane	Ave	0.1082	0.1104		10.2	10.0	2.0	30.0
Dibromomethane	Ave	0.2417	0.2388		9.88	10.0	-1.2	30.0
Bromodichloromethane	Ave	0.5440	0.5321		9.78	10.0	-2.2	30.0
cis-1,3-Dichloropropene	Ave	0.4354	0.4391		10.1	10.0	0.9	30.0
methyl isobutyl ketone	Ave	0.5108	0.5297		10.4	10.0	3.7	30.0
Toluene	Ave	0.6190	0.6095		9.84	10.0	-1.5	30.0
n-Octane	Ave	0.5748	0.5674		9.87	10.0	-1.3	30.0
trans-1,3-Dichloropropene	Ave	0.4603	0.4628		10.1	10.0	0.6	30.0
1,1,2-Trichloroethane	Ave	0.3004	0.2950		9.82	10.0	-1.8	30.0
Tetrachloroethene	Ave	0.4348	0.4248		9.77	10.0	-2.3	30.0
Methyl Butyl Ketone (2-Hexanone)	Ave	0.5432	0.5726		10.5	10.0	5.4	30.0
Dibromochloromethane	Ave	0.5252	0.5326		10.1	10.0	1.4	30.0
1,2-Dibromoethane	Ave	0.5143	0.5066		9.85	10.0	-1.5	30.0
Chlorobenzene	Ave	0.8246	0.7854		9.52	10.0	-4.8	30.0
Ethylbenzene	Ave	1.357	1.321		9.73	10.0	-2.7	30.0
n-Nonane	Ave	0.6398	0.6256		9.78	10.0	-2.2	30.0
m,p-Xylene	Ave	0.5230	0.5147		19.7	20.0	-1.6	30.0
Xylene, o-	Ave	0.5023	0.5007		9.97	10.0	-0.3	30.0
Styrene	Ave	0.7499	0.7728		10.3	10.0	3.1	30.0
Bromoform	Ave	0.4706	0.4906		10.4	10.0	4.2	30.0
Cumene	Ave	1.461	1.449		9.92	10.0	-0.8	30.0
1,1,2,2-Tetrachloroethane	Ave	0.7764	0.7617		9.81	10.0	-1.9	30.0
n-Propylbenzene	Ave	1.816	1.795		9.88	10.0	-1.2	30.0
1,2,3-Trichloropropane	Ave	0.6023	0.6016		9.99	10.0	-0.1	30.0
n-Decane	Ave	0.7858	0.7953		10.1	10.0	1.2	30.0
4-Ethyltoluene	Ave	1.539	1.501		9.75	10.0	-2.5	30.0
2-Chlorotoluene	Ave	1.417	1.357		9.57	10.0	-4.2	30.0
1,3,5-Trimethylbenzene	Ave	1.262	1.224		9.70	10.0	-3.0	30.0
Alpha Methyl Styrene	Ave	0.5809	0.6104		10.5	10.0	5.1	30.0
tert-Butylbenzene	Ave	1.161	1.121		9.66	10.0	-3.4	30.0

FORM VII
AIR - GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Burlington Job No.: 200-3988-1

SDG No.:

Lab Sample ID: CCVIS 200-14276/2 Calibration Date: 02/26/2011 10:50

Instrument ID: B.i Calib Start Date: 02/09/2011 15:04

GC Column: RTX-624 ID: 0.32(mm) Calib End Date: 02/09/2011 20:19

Lab File ID: bjxj002.d Conc. Units: ppb v/v Heated Purge: (Y/N) N

EPA Sample No.: ccvis 109439

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
1,2,4-Trimethylbenzene	Ave	1.251	1.198		9.57	10.0	-4.3	30.0
sec-Butylbenzene	Ave	1.793	1.741		9.71	10.0	-2.9	30.0
4-Isopropyltoluene	Ave	1.473	1.448		9.83	10.0	-1.7	30.0
1,3-Dichlorobenzene	Ave	0.8105	0.7610		9.39	10.0	-6.1	30.0
1,4-Dichlorobenzene	Ave	0.8216	0.7653		9.31	10.0	-6.9	30.0
Benzyl chloride	Ave	1.196	1.159		9.69	10.0	-3.1	30.0
n-Undecane	Ave	0.7534	0.7732		10.3	10.0	2.6	30.0
n-Butylbenzene	Ave	1.432	1.369		9.56	10.0	-4.4	30.0
1,2-Dichlorobenzene	Ave	0.7725	0.7201		9.32	10.0	-6.8	30.0
n-Dodecane	Ave	0.7077	0.6310		8.91	10.0	-10.8	30.0
1,2,4-Trichlorobenzene	Ave	0.5925	0.5301		8.95	10.0	-10.5	30.0
Hexachlorobutadiene	Ave	0.4514	0.4204		9.31	10.0	-6.9	30.0
Naphthalene	Ave	1.439	1.108		7.70	10.0	-23.0	30.0
1,2,3-Trichlorobenzene	Ave	0.5577	0.4683		8.39	10.0	-16.0	30.0

FORM VII
AIR - GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Burlington Job No.: 200-4011-1

SDG No.:

Lab Sample ID: ICV 200-13474/14 Calibration Date: 02/09/2011 22:56

Instrument ID: B.i Calib Start Date: 02/09/2011 15:04

GC Column: RTX-624 ID: 0.32(mm) Calib End Date: 02/09/2011 20:19

Lab File ID: bjx014.d Conc. Units: ppb v/v Heated Purge: (Y/N) N

EPA Sample No.: icv 97891

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Propylene	Ave	0.3643	0.3077		8.44	10.0	-15.6	30.0
Dichlorodifluoromethane	Ave	1.900	1.645		8.66	10.0	-13.4	30.0
Freon 22	Ave	0.8953	0.7950		8.88	10.0	-11.2	30.0
1,2-Dichlorotetrafluoroethane	Ave	1.966	1.695		8.62	10.0	-13.8	30.0
Chloromethane	Ave	0.4590	0.4154		9.05	10.0	-9.5	30.0
n-Butane	Ave	0.7863	0.6958		8.85	10.0	-11.5	30.0
Vinyl chloride	Ave	0.6441	0.5616		8.72	10.0	-12.8	30.0
1,3-Butadiene	Ave	0.4537	0.4090		9.01	10.0	-9.8	30.0
Bromomethane	Ave	1.006	0.8483		8.43	10.0	-15.7	30.0
Chloroethane	Ave	0.5539	0.4994		9.02	10.0	-9.8	30.0
Isopentane	Ave	1.157	1.009		8.72	10.0	-12.8	30.0
Bromoethene(Vinyl Bromide)	Ave	1.186	1.096		9.24	10.0	-7.5	30.0
Trichlorofluoromethane	Ave	3.142	2.686		8.55	10.0	-14.5	30.0
n-Pentane	Ave	1.936	1.740		8.99	10.0	-10.1	30.0
Ethanol	Ave	0.4821	0.4571		14.3	15.0	-5.2	30.0
Ethyl ether	Ave	0.9695	0.9061		9.34	10.0	-6.5	30.0
Acrolein	Ave	0.4908	0.3844		7.83	10.0	-21.7	30.0
Freon TF	Ave	2.217	2.278		10.3	10.0	2.8	30.0
1,1-Dichloroethene	Ave	1.071	1.164		10.9	10.0	8.6	30.0
Acetone	Ave	1.740	1.897		10.9	10.0	9.0	30.0
Carbon disulfide	Ave	3.570	3.592		10.1	10.0	0.6	30.0
Isopropyl alcohol	Ave	1.389	1.280		9.22	10.0	-7.8	30.0
3-Chloropropene	Ave	1.490	1.462		9.81	10.0	-1.9	30.0
Acetonitrile	Ave	0.8713	0.8946		10.3	10.0	2.7	30.0
Methylene Chloride	Ave	1.306	1.353		10.4	10.0	3.6	30.0
tert-Butyl alcohol	Ave	2.133	2.023		9.48	10.0	-5.2	30.0
Methyl tert-butyl ether	Ave	3.650	3.570		9.78	10.0	-2.2	30.0
trans-1,2-Dichloroethene	Ave	1.886	1.816		9.62	10.0	-3.7	30.0
Acrylonitrile	Ave	0.7546	0.8836		10.0	10.0	17.1	30.0
n-Hexane	Ave	2.053	2.033		9.90	10.0	-0.9	30.0
1,1-Dichloroethane	Ave	2.328	2.251		9.67	10.0	-3.3	30.0
Vinyl acetate	Ave	2.885	2.896		10.0	10.0	0.4	30.0
cis-1,2-Dichloroethene	Ave	1.242	1.236		9.95	10.0	-0.5	30.0
Methyl Ethyl Ketone	Ave	0.6112	0.6273		10.3	10.0	2.6	30.0
Ethyl acetate	Ave	0.1103	0.1104		10.0	10.0	0.0	30.0
Tetrahydrofuran	Ave	0.2541	0.2481		9.76	10.0	-2.4	30.0
Chloroform	Ave	2.583	2.385		9.23	10.0	-7.7	30.0
1,1,1-Trichloroethane	Ave	0.5142	0.4613		8.97	10.0	-10.3	30.0
Cyclohexane	Ave	0.3575	0.3437		9.61	10.0	-3.9	30.0

FORM VII
AIR - GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Burlington Job No.: 200-4011-1

SDG No.:

Lab Sample ID: ICV 200-13474/14 Calibration Date: 02/09/2011 22:56

Instrument ID: B.i Calib Start Date: 02/09/2011 15:04

GC Column: RTX-624 ID: 0.32(mm) Calib End Date: 02/09/2011 20:19

Lab File ID: bjx014.d Conc. Units: ppb v/v Heated Purge: (Y/N) N

EPA Sample No.: icv 97891

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Carbon tetrachloride	Ave	0.5021	0.4403		8.77	10.0	-12.3	30.0
2,2,4-Trimethylpentane	Ave	1.227	1.199		9.77	10.0	-2.3	30.0
Benzene	Ave	0.7791	0.7405		9.50	10.0	-5.0	30.0
1,2-Dichloroethane	Ave	0.3570	0.3194		8.94	10.0	-10.5	30.0
n-Heptane	Ave	0.4427	0.4217		9.52	10.0	-4.8	30.0
n-Butanol	Ave	0.1338	0.1039		7.76	10.0	-22.4	30.0
Trichloroethene	Ave	0.3301	0.3030		9.18	10.0	-8.2	30.0
1,2-Dichloropropane	Ave	0.2876	0.2670		9.28	10.0	-7.2	30.0
Methyl methacrylate	Ave	0.2670	0.2607		9.76	10.0	-2.4	30.0
1,4-Dioxane	Ave	0.1082	0.0891		8.23	10.0	-17.7	30.0
Dibromomethane	Ave	0.2417	0.2266		9.38	10.0	-6.2	30.0
Bromodichloromethane	Ave	0.5440	0.5153		9.47	10.0	-5.3	30.0
cis-1,3-Dichloropropene	Ave	0.4354	0.4071		9.35	10.0	-6.5	30.0
methyl isobutyl ketone	Ave	0.5108	0.5053		9.89	10.0	-1.1	30.0
Toluene	Ave	0.6190	0.5817		9.40	10.0	-6.0	30.0
n-Octane	Ave	0.5748	0.5382		9.36	10.0	-6.4	30.0
trans-1,3-Dichloropropene	Ave	0.4603	0.4212		9.15	10.0	-8.5	30.0
1,1,2-Trichloroethane	Ave	0.3004	0.2704		9.00	10.0	-10.0	30.0
Tetrachloroethene	Ave	0.4348	0.3953		9.09	10.0	-9.1	30.0
Methyl Butyl Ketone (2-Hexanone)	Ave	0.5432	0.5385		9.91	10.0	-0.9	30.0
Dibromochloromethane	Ave	0.5252	0.5168		9.84	10.0	-1.6	30.0
1,2-Dibromoethane	Ave	0.5143	0.4739		9.21	10.0	-7.9	30.0
Chlorobenzene	Ave	0.8246	0.7351		8.91	10.0	-10.9	30.0
Ethylbenzene	Ave	1.357	1.257		9.26	10.0	-7.4	30.0
n-Nonane	Ave	0.6398	0.6041		9.44	10.0	-5.6	30.0
m,p-Xylene	Ave	0.5230	0.4818		18.4	20.0	-7.9	30.0
Xylene, o-	Ave	0.5023	0.4658		9.27	10.0	-7.3	30.0
Styrene	Ave	0.7499	0.7282		9.71	10.0	-2.9	30.0
Bromoform	Ave	0.4706	0.4737		10.1	10.0	0.6	30.0
Cumene	Ave	1.461	1.390		9.52	10.0	-4.8	30.0
1,1,2,2-Tetrachloroethane	Ave	0.7764	0.7108		9.15	10.0	-8.5	30.0
n-Propylbenzene	Ave	1.816	1.725		9.50	10.0	-5.0	30.0
1,2,3-Trichloropropane	Ave	0.6023	0.5780		9.59	10.0	-4.0	30.0
n-Decane	Ave	0.7858	0.7743		9.85	10.0	-1.5	30.0
4-Ethyltoluene	Ave	1.539	1.472		9.56	10.0	-4.3	30.0
2-Chlorotoluene	Ave	1.417	1.321		9.33	10.0	-6.7	30.0
1,3,5-Trimethylbenzene	Ave	1.262	1.151		9.12	10.0	-8.8	30.0
Alpha Methyl Styrene	Ave	0.5809	0.5817		10.0	10.0	0.1	30.0
tert-Butylbenzene	Ave	1.161	1.083		9.33	10.0	-6.7	30.0

FORM VII
AIR - GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Burlington Job No.: 200-4011-1

SDG No.:

Lab Sample ID: ICV 200-13474/14 Calibration Date: 02/09/2011 22:56

Instrument ID: B.i Calib Start Date: 02/09/2011 15:04

GC Column: RTX-624 ID: 0.32(mm) Calib End Date: 02/09/2011 20:19

Lab File ID: bjx014.d Conc. Units: ppb v/v Heated Purge: (Y/N) N

EPA Sample No.: icv 97891

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
1,2,4-Trimethylbenzene	Ave	1.251	1.122		8.97	10.0	-10.3	30.0
sec-Butylbenzene	Ave	1.793	1.685		9.40	10.0	-6.0	30.0
4-Isopropyltoluene	Ave	1.473	1.403		9.53	10.0	-4.7	30.0
1,3-Dichlorobenzene	Ave	0.8105	0.7111		8.77	10.0	-12.3	30.0
1,4-Dichlorobenzene	Ave	0.8216	0.7165		8.72	10.0	-12.8	30.0
Benzyl chloride	Ave	1.196	0.9541		7.97	10.0	-20.3	30.0
n-Undecane	Ave	0.7534	0.8079		10.7	10.0	7.2	30.0
n-Butylbenzene	Ave	1.432	1.337		9.34	10.0	-6.6	30.0
1,2-Dichlorobenzene	Ave	0.7725	0.6637		8.59	10.0	-14.1	30.0
n-Dodecane	Ave	0.7077	0.7640		10.8	10.0	7.9	30.0
1,2,4-Trichlorobenzene	Ave	0.5925	0.5414		9.14	10.0	-8.6	30.0
Hexachlorobutadiene	Ave	0.4514	0.3958		8.77	10.0	-12.3	30.0
Naphthalene	Ave	1.439	1.386		9.63	10.0	-3.7	30.0
1,2,3-Trichlorobenzene	Ave	0.5577	0.5306		9.51	10.0	-4.9	30.0

FORM VII
AIR - GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Burlington Job No.: 200-4011-1

SDG No.:

Lab Sample ID: CCVIS 200-14428/2 Calibration Date: 02/28/2011 15:31

Instrument ID: B.i Calib Start Date: 02/09/2011 15:04

GC Column: RTX-624 ID: 0.32(mm) Calib End Date: 02/09/2011 20:19

Lab File ID: bjxl002.d Conc. Units: ppb v/v Heated Purge: (Y/N) N

EPA Sample No.: ccvis 109439

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Propylene	Ave	0.3643	0.3818		10.5	10.0	4.8	30.0
Dichlorodifluoromethane	Ave	1.900	1.991		10.5	10.0	4.8	30.0
Freon 22	Ave	0.8953	0.9435		10.5	10.0	5.4	30.0
1,2-Dichlorotetrafluoroethane	Ave	1.966	1.968		10.0	10.0	0.0	30.0
Chloromethane	Ave	0.4590	0.4754		10.4	10.0	3.6	30.0
n-Butane	Ave	0.7863	0.8341		10.6	10.0	6.1	30.0
Vinyl chloride	Ave	0.6441	0.6487		10.1	10.0	0.7	30.0
1,3-Butadiene	Ave	0.4537	0.4678		10.3	10.0	3.1	30.0
Bromomethane	Ave	1.006	1.006		10.0	10.0	0.0	30.0
Chloroethane	Ave	0.5539	0.5802		10.5	10.0	4.8	30.0
Isopentane	Ave	1.157	1.176		10.2	10.0	1.7	30.0
Bromoethene(Vinyl Bromide)	Ave	1.186	1.187		10.0	10.0	0.1	30.0
Trichlorofluoromethane	Ave	3.142	3.142		10.0	10.0	0.0	30.0
n-Pentane	Ave	1.936	2.038		10.5	10.0	5.3	30.0
Ethanol	Ave	0.4821	0.5212		16.2	15.0	8.1	30.0
Ethyl ether	Ave	0.9695	0.9746		10.1	10.0	0.5	30.0
Acrolein	Ave	0.4908	0.5129		10.4	10.0	4.5	30.0
Freon TF	Ave	2.217	2.048		9.24	10.0	-7.6	30.0
1,1-Dichloroethene	Ave	1.071	0.997		9.31	10.0	-6.9	30.0
Acetone	Ave	1.740	1.898		10.9	10.0	9.1	30.0
Carbon disulfide	Ave	3.570	3.462		9.69	10.0	-3.0	30.0
Isopropyl alcohol	Ave	1.389	1.496		10.8	10.0	7.7	30.0
3-Chloropropene	Ave	1.490	1.548		10.4	10.0	3.9	30.0
Acetonitrile	Ave	0.8713	0.9266		10.6	10.0	6.3	30.0
Methylene Chloride	Ave	1.306	1.313		10.0	10.0	0.5	30.0
tert-Butyl alcohol	Ave	2.133	2.202		10.3	10.0	3.2	30.0
Methyl tert-butyl ether	Ave	3.650	3.665		10.0	10.0	0.4	30.0
trans-1,2-Dichloroethene	Ave	1.886	1.891		10.0	10.0	0.2	30.0
Acrylonitrile	Ave	0.7546	0.9132		10.4	10.0	21.0	30.0
n-Hexane	Ave	2.053	2.061		10.0	10.0	0.4	30.0
1,1-Dichloroethane	Ave	2.328	2.322		9.97	10.0	-0.3	30.0
Vinyl acetate	Ave	2.885	3.120		10.8	10.0	8.1	30.0
cis-1,2-Dichloroethene	Ave	1.242	1.225		9.86	10.0	-1.4	30.0
Methyl Ethyl Ketone	Ave	0.6112	0.6356		10.4	10.0	4.0	30.0
Ethyl acetate	Ave	0.1103	0.1115		10.1	10.0	1.0	30.0
Tetrahydrofuran	Ave	0.2541	0.2711		10.7	10.0	6.7	30.0
Chloroform	Ave	2.583	2.502		9.68	10.0	-3.1	30.0
1,1,1-Trichloroethane	Ave	0.5142	0.5016		9.75	10.0	-2.5	30.0
Cyclohexane	Ave	0.3575	0.3487		9.75	10.0	-2.5	30.0

FORM VII
AIR - GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Burlington Job No.: 200-4011-1

SDG No.:

Lab Sample ID: CCVIS 200-14428/2 Calibration Date: 02/28/2011 15:31

Instrument ID: B.i Calib Start Date: 02/09/2011 15:04

GC Column: RTX-624 ID: 0.32(mm) Calib End Date: 02/09/2011 20:19

Lab File ID: bjxl002.d Conc. Units: ppb v/v Heated Purge: (Y/N) N

EPA Sample No.: ccvis 109439

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Carbon tetrachloride	Ave	0.5021	0.4923		9.80	10.0	-1.9	30.0
2,2,4-Trimethylpentane	Ave	1.227	1.239		10.1	10.0	1.0	30.0
Benzene	Ave	0.7791	0.7557		9.70	10.0	-3.0	30.0
1,2-Dichloroethane	Ave	0.3570	0.3514		9.84	10.0	-1.6	30.0
n-Heptane	Ave	0.4427	0.4486		10.1	10.0	1.3	30.0
n-Butanol	Ave	0.1338	0.1348		10.1	10.0	0.8	30.0
Trichloroethene	Ave	0.3301	0.3150		9.54	10.0	-4.6	30.0
1,2-Dichloropropane	Ave	0.2876	0.2844		9.88	10.0	-1.1	30.0
Methyl methacrylate	Ave	0.2670	0.2749		10.3	10.0	2.9	30.0
1,4-Dioxane	Ave	0.1082	0.1105		10.2	10.0	2.2	30.0
Dibromomethane	Ave	0.2417	0.2288		9.47	10.0	-5.3	30.0
Bromodichloromethane	Ave	0.5440	0.5380		9.89	10.0	-1.1	30.0
cis-1,3-Dichloropropene	Ave	0.4354	0.4371		10.0	10.0	0.4	30.0
methyl isobutyl ketone	Ave	0.5108	0.5435		10.6	10.0	6.4	30.0
Toluene	Ave	0.6190	0.6081		9.82	10.0	-1.8	30.0
n-Octane	Ave	0.5748	0.5810		10.1	10.0	1.1	30.0
trans-1,3-Dichloropropene	Ave	0.4603	0.4631		10.1	10.0	0.6	30.0
1,1,2-Trichloroethane	Ave	0.3004	0.2946		9.80	10.0	-1.9	30.0
Tetrachloroethene	Ave	0.4348	0.4106		9.44	10.0	-5.6	30.0
Methyl Butyl Ketone (2-Hexanone)	Ave	0.5432	0.5901		10.9	10.0	8.6	30.0
Dibromochloromethane	Ave	0.5252	0.5341		10.2	10.0	1.7	30.0
1,2-Dibromoethane	Ave	0.5143	0.5024		9.77	10.0	-2.3	30.0
Chlorobenzene	Ave	0.8246	0.7731		9.37	10.0	-6.3	30.0
Ethylbenzene	Ave	1.357	1.323		9.75	10.0	-2.5	30.0
n-Nonane	Ave	0.6398	0.6395		9.99	10.0	-0.0	30.0
m,p-Xylene	Ave	0.5230	0.5161		19.7	20.0	-1.3	30.0
Xylene, o-	Ave	0.5023	0.4983		9.92	10.0	-0.8	30.0
Styrene	Ave	0.7499	0.7716		10.3	10.0	2.9	30.0
Bromoform	Ave	0.4706	0.4849		10.3	10.0	3.0	30.0
Cumene	Ave	1.461	1.448		9.91	10.0	-0.9	30.0
1,1,2,2-Tetrachloroethane	Ave	0.7764	0.7632		9.83	10.0	-1.7	30.0
n-Propylbenzene	Ave	1.816	1.818		10.0	10.0	0.1	30.0
1,2,3-Trichloropropane	Ave	0.6023	0.6186		10.3	10.0	2.7	30.0
n-Decane	Ave	0.7858	0.8185		10.4	10.0	4.2	30.0
4-Ethyltoluene	Ave	1.539	1.504		9.77	10.0	-2.3	30.0
2-Chlorotoluene	Ave	1.417	1.374		9.69	10.0	-3.0	30.0
1,3,5-Trimethylbenzene	Ave	1.262	1.223		9.69	10.0	-3.1	30.0
Alpha Methyl Styrene	Ave	0.5809	0.6032		10.4	10.0	3.8	30.0
tert-Butylbenzene	Ave	1.161	1.121		9.65	10.0	-3.4	30.0

FORM VII
AIR - GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Burlington Job No.: 200-4011-1

SDG No.:

Lab Sample ID: CCVIS 200-14428/2 Calibration Date: 02/28/2011 15:31

Instrument ID: B.i Calib Start Date: 02/09/2011 15:04

GC Column: RTX-624 ID: 0.32(mm) Calib End Date: 02/09/2011 20:19

Lab File ID: bjxl002.d Conc. Units: ppb v/v Heated Purge: (Y/N) N

EPA Sample No.: ccvis 109439

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
1,2,4-Trimethylbenzene	Ave	1.251	1.208		9.65	10.0	-3.4	30.0
sec-Butylbenzene	Ave	1.793	1.744		9.72	10.0	-2.7	30.0
4-Isopropyltoluene	Ave	1.473	1.439		9.77	10.0	-2.3	30.0
1,3-Dichlorobenzene	Ave	0.8105	0.7507		9.26	10.0	-7.4	30.0
1,4-Dichlorobenzene	Ave	0.8216	0.7550		9.19	10.0	-8.1	30.0
Benzyl chloride	Ave	1.196	1.167		9.76	10.0	-2.4	30.0
n-Undecane	Ave	0.7534	0.8134		10.8	10.0	8.0	30.0
n-Butylbenzene	Ave	1.432	1.406		9.82	10.0	-1.8	30.0
1,2-Dichlorobenzene	Ave	0.7725	0.7086		9.17	10.0	-8.3	30.0
n-Dodecane	Ave	0.7077	0.6595		9.32	10.0	-6.8	30.0
1,2,4-Trichlorobenzene	Ave	0.5925	0.5170		8.72	10.0	-12.7	30.0
Hexachlorobutadiene	Ave	0.4514	0.4119		9.12	10.0	-8.7	30.0
Naphthalene	Ave	1.439	1.094		7.60	10.0	-24.0	30.0
1,2,3-Trichlorobenzene	Ave	0.5577	0.4550		8.16	10.0	-18.4	30.0

GC/MS INSTRUMENT RUN LOG

Sequence				Standard Traceability	Instrument Information
Batch ID: BJX	Start Date: 02/09/11	Time: 1123		ISTD Lot #: 84580	Instrument ID: B
Test Method: TO15	End Date: 02/10/11	Time: 1123		CAL STD Lot # See comments	Instrument: 5973
ICAL Date: 02/09/11				ICV / LCS Lot # See comments	Column Type: RTX-624

	Manager	Analyst	Analyst	Analyst	Analyst
Name/Initial		Paul Daigle	Steve Walgrave		
Signature		P.L.D. / PAD	SW		

Sequence Information								Individual Sample Review			
Injection Time	TALS ID / File Name	Summa Can ID	ETR	Dilution Factor	Inlet #	Volume (mL)	Operator	Internal Std.	Result Conc.	Primary Anal.	Comments / Standard Traceability
1123	BJX001	4634	BFB	NA	1	—	PAD	N/A	✓	PAD	
1223	002	4634	VIBLK		1	200			—	SW	
1315	003	4634	VIBLK		1				✓	✓	
1405	004	4634	VIBLK		1				✓	✓	
1504	005	5069	IC-1		2				—	SW	#109459
1556	006	2705	IC-2		3				✓		#109450
1649	007	3640	IC-3		4				✓		#107440
1741	008	3152	ICIS-4		5				✓		#109439
1834	009	3631	IC-5		6				✓		#109427
1926	010	3089	IC-6		7				✓		#109426
2019	011	4445	IC-7		8				✓	✓	#109424
2111	012	4634	VIBLK		1			NA	✓	SW	
2203	013	4634	VIBLK		1				✓		
2256	014	3305	ICV		9				✓		#97891
2348	015	4634	VIBLK		1		↓		✓		
0041	016	3305	LCS		9		SW		✓		#97891
0133	017	4634	MB	↓	1	↓		↓	✓		
0226	018	3343	3739-1	1.0	10	200		✓	✓		
0318	019	5079	3739-2		11			✓	A ✓		100 A
0411	020	4361	3739-3		12			✓	✓		
0503	021	5096	3739-4		13			✓	✓		
0555	022	2959	3739-5		14			✓	✓		
0648	023	5165	3739-6		15			✓	✓		
0741	024	4911	3739-7		16			✓	✓		
0833	025	3327	3739-8		1			✓	✓		
0925	026	2521	3739-9		3			✓	✓		
1018	027	5104	3739-10	↓	4	↓	↓	✓	✓	↓	

Legend: C=Complete ▪ R=Reanalyze ▪ = High ▪ ↓= Low ▪ ✓=Reviewed and Acceptable

GC/MS INSTRUMENT RUN LOG

Sequence	PAD 2/26/11			Standard Traceability	Instrument Information
Batch ID: ~~BJXJ~~ BJXJ	Start Date: 02/26/11	Time: 0757		ISTD Lot #: 84580	Instrument ID: B
Test Method: TO15	End Date: 02/27/11	Time: 0959		CAL STD Lot # 109437	Instrument: 5973
ICAL Date: 02/09/11				ICV / LCS Lot # 97891	Column Type: RTX-624

	Manager	Analyst SV	Analyst	Analyst	Analyst
Name/Initial		Sonal Valjeve			
Signature		Sal			

Sequence Information								Individual Sample Review			
Injection Time	TALS ID / File Name	Summa Can ID	ETR	Dilution Factor	Inlet #	Volume (mL)	Operator	Internal Std.	Result Conc.	Primary Anal.	Comments / Standard Traceability
0959	BJXJ 001	N/A	BFB	N/A			PAD	N/A	✓	PAD	
1050	002	3152	CCV		1	200		✓	✓	✓	AG
1140	003	3308	LCS		2	200		✓	✓	CV	AG
1235	004	4634	MB		3	200		✓	✓		
1327	005	2515	3882-03	8	4	25		✓	✓		C
1420	006	2741	14752-01	1480	5	29		✓	✓		cdf 214.97
1512	007	2516	-02	746	6	50		✓	✓		cdf 186.40
1604	008	3552	-03	4	7	50		✓	✓		
1657	009	2604	3924-01	1	8	200		✓	✓		
1749	010	4553	-02		9			✓	✓		
1841	011	3975	-03		10			✓	✓		
1934	012	3043	-04		11			✓	✓	CV	
2026	013	4955	3918-01	1	12	200		✓	✓		
2119	014	2984	-02		13			✓	✓		
2211	015	3722	-03		14			✓	✓		
2304	016	4391	-04		15			✓	✓		
2356	017	4658	-05	10	16	20		✓	✓		
0048	018	4647	-6	5	1 2/27/11	40		✓	✓	CV	
0141	019	4668	-7	3.03 6/11	2	6633		✓	KAP 3/01/11	KAP	"A" (R 1) 1117632
0233	020	3513	-8		3	200		✓	✓	03/01 11	
0326	021	acrolein	3906-1	200	4	20	WRM	✓	✓	CV	1.20 cdf
0425	022	2887	3951-6	0.2	5	1000		✓	✓		
0524	023	3036	3973-9		6			✓	✓		
0622	024	4805	3988-5		7			✓	✓		
0721	025	4921	3989-9		8			✓	✓		
0821	026	2845	3994-1		9			✓	✓		
0920	027	5790	4007-11		10			✓	✓		

Legend: C=Complete ▪ R=Reanalyze ▪ = High ▪ ↓= Low ▪ ✓=Reviewed and Acceptable

SV 02/27/11

AIR - GC/MS VOA ANALYSIS RUN LOG

Lab Name: TestAmerica Burlington Job No.: 200-3988-1

SDG No.:

Instrument ID: B.i Start Date: 02/09/2011 11:23

Analysis Batch Number: 13474 End Date: 02/10/2011 10:18

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
BFB 200-13474/1		02/09/2011 11:23	1	bjx001.d	RTX-624 0.32(mm)
VIBLK 200-13474/2		02/09/2011 12:23	1		RTX-624 0.32(mm)
VIBLK 200-13474/3		02/09/2011 13:15	1		RTX-624 0.32(mm)
VIBLK 200-13474/4		02/09/2011 14:05	1		RTX-624 0.32(mm)
IC 200-13474/5		02/09/2011 15:04	1	bjx005.d	RTX-624 0.32(mm)
IC 200-13474/6		02/09/2011 15:56	1	bjx006.d	RTX-624 0.32(mm)
IC 200-13474/7		02/09/2011 16:49	1	bjx007.d	RTX-624 0.32(mm)
ICIS 200-13474/8		02/09/2011 17:41	1	bjx008.d	RTX-624 0.32(mm)
IC 200-13474/9		02/09/2011 18:34	1	bjx009.d	RTX-624 0.32(mm)
IC 200-13474/10		02/09/2011 19:26	1	bjx010.d	RTX-624 0.32(mm)
IC 200-13474/11		02/09/2011 20:19	1	bjx011.d	RTX-624 0.32(mm)
VIBLK 200-13474/12		02/09/2011 21:11	1		RTX-624 0.32(mm)
VIBLK 200-13474/13		02/09/2011 22:03	1		RTX-624 0.32(mm)
ICV 200-13474/14		02/09/2011 22:56	1	bjx014.d	RTX-624 0.32(mm)
VIBLK 200-13474/15		02/09/2011 23:48	1		RTX-624 0.32(mm)
ZZZZZ		02/10/2011 00:41	1		RTX-624 0.32(mm)
ZZZZZ		02/10/2011 01:33	1		RTX-624 0.32(mm)
ZZZZZ		02/10/2011 02:26	1		RTX-624 0.32(mm)
ZZZZZ		02/10/2011 03:18	1		RTX-624 0.32(mm)
ZZZZZ		02/10/2011 04:11	1		RTX-624 0.32(mm)
ZZZZZ		02/10/2011 05:03	1		RTX-624 0.32(mm)
ZZZZZ		02/10/2011 05:56	1		RTX-624 0.32(mm)
ZZZZZ		02/10/2011 06:48	1		RTX-624 0.32(mm)
ZZZZZ		02/10/2011 07:41	1		RTX-624 0.32(mm)
ZZZZZ		02/10/2011 08:33	1		RTX-624 0.32(mm)
ZZZZZ		02/10/2011 09:25	1		RTX-624 0.32(mm)
ZZZZZ		02/10/2011 10:18	1		RTX-624 0.32(mm)

AIR - GC/MS VOA ANALYSIS RUN LOG

Lab Name: TestAmerica Burlington Job No.: 200-3988-1

SDG No.:

Instrument ID: B.i Start Date: 02/26/2011 09:59

Analysis Batch Number: 14276 End Date: 02/27/2011 09:20

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
BFB 200-14276/1		02/26/2011 09:59	1	bjxj001.d	RTX-624 0.32(mm)
CCVIS 200-14276/2		02/26/2011 10:50	1	bjxj002.d	RTX-624 0.32(mm)
LCS 200-14276/3		02/26/2011 11:40	1	bjxj003.d	RTX-624 0.32(mm)
MB 200-14276/4		02/26/2011 12:35	1	bjxj004.d	RTX-624 0.32(mm)
ZZZZZ		02/26/2011 13:27	8		RTX-624 0.32(mm)
ZZZZZ		02/26/2011 14:20	1480		RTX-624 0.32(mm)
ZZZZZ		02/26/2011 15:12	746		RTX-624 0.32(mm)
ZZZZZ		02/26/2011 16:04	4		RTX-624 0.32(mm)
ZZZZZ		02/26/2011 16:57	1		RTX-624 0.32(mm)
ZZZZZ		02/26/2011 17:49	1		RTX-624 0.32(mm)
ZZZZZ		02/26/2011 18:41	1		RTX-624 0.32(mm)
ZZZZZ		02/26/2011 19:34	1		RTX-624 0.32(mm)
ZZZZZ		02/26/2011 20:26	1		RTX-624 0.32(mm)
ZZZZZ		02/26/2011 21:19	1		RTX-624 0.32(mm)
ZZZZZ		02/26/2011 22:11	1		RTX-624 0.32(mm)
ZZZZZ		02/26/2011 23:04	1		RTX-624 0.32(mm)
ZZZZZ		02/26/2011 23:56	10		RTX-624 0.32(mm)
ZZZZZ		02/27/2011 00:48	5		RTX-624 0.32(mm)
ZZZZZ		02/27/2011 01:41	6.06		RTX-624 0.32(mm)
ZZZZZ		02/27/2011 02:33	1		RTX-624 0.32(mm)
ZZZZZ		02/27/2011 03:26	200		RTX-624 0.32(mm)
ZZZZZ		02/27/2011 04:25	0.2		RTX-624 0.32(mm)
ZZZZZ		02/27/2011 05:24	0.2		RTX-624 0.32(mm)
200-3988-5	4805	02/27/2011 06:22	0.2	bjxj024.d	RTX-624 0.32(mm)
ZZZZZ		02/27/2011 07:21	0.2		RTX-624 0.32(mm)
ZZZZZ		02/27/2011 08:21	0.2		RTX-624 0.32(mm)
ZZZZZ		02/27/2011 09:20	0.2		RTX-624 0.32(mm)

AIR - GC/MS VOA ANALYSIS RUN LOG

Lab Name: TestAmerica Burlington Job No.: 200-4011-1

SDG No.:

Instrument ID: B.i Start Date: 02/09/2011 11:23

Analysis Batch Number: 13474 End Date: 02/10/2011 10:18

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
BFB 200-13474/1		02/09/2011 11:23	1	bjx001.d	RTX-624 0.32(mm)
VIBLK 200-13474/2		02/09/2011 12:23	1		RTX-624 0.32(mm)
VIBLK 200-13474/3		02/09/2011 13:15	1		RTX-624 0.32(mm)
VIBLK 200-13474/4		02/09/2011 14:05	1		RTX-624 0.32(mm)
IC 200-13474/5		02/09/2011 15:04	1	bjx005.d	RTX-624 0.32(mm)
IC 200-13474/6		02/09/2011 15:56	1	bjx006.d	RTX-624 0.32(mm)
IC 200-13474/7		02/09/2011 16:49	1	bjx007.d	RTX-624 0.32(mm)
ICIS 200-13474/8		02/09/2011 17:41	1	bjx008.d	RTX-624 0.32(mm)
IC 200-13474/9		02/09/2011 18:34	1	bjx009.d	RTX-624 0.32(mm)
IC 200-13474/10		02/09/2011 19:26	1	bjx010.d	RTX-624 0.32(mm)
IC 200-13474/11		02/09/2011 20:19	1	bjx011.d	RTX-624 0.32(mm)
VIBLK 200-13474/12		02/09/2011 21:11	1		RTX-624 0.32(mm)
VIBLK 200-13474/13		02/09/2011 22:03	1		RTX-624 0.32(mm)
ICV 200-13474/14		02/09/2011 22:56	1	bjx014.d	RTX-624 0.32(mm)
VIBLK 200-13474/15		02/09/2011 23:48	1		RTX-624 0.32(mm)
ZZZZZ		02/10/2011 00:41	1		RTX-624 0.32(mm)
ZZZZZ		02/10/2011 01:33	1		RTX-624 0.32(mm)
ZZZZZ		02/10/2011 02:26	1		RTX-624 0.32(mm)
ZZZZZ		02/10/2011 03:18	1		RTX-624 0.32(mm)
ZZZZZ		02/10/2011 04:11	1		RTX-624 0.32(mm)
ZZZZZ		02/10/2011 05:03	1		RTX-624 0.32(mm)
ZZZZZ		02/10/2011 05:56	1		RTX-624 0.32(mm)
ZZZZZ		02/10/2011 06:48	1		RTX-624 0.32(mm)
ZZZZZ		02/10/2011 07:41	1		RTX-624 0.32(mm)
ZZZZZ		02/10/2011 08:33	1		RTX-624 0.32(mm)
ZZZZZ		02/10/2011 09:25	1		RTX-624 0.32(mm)
ZZZZZ		02/10/2011 10:18	1		RTX-624 0.32(mm)

AIR - GC/MS VOA ANALYSIS RUN LOG

Lab Name: TestAmerica Burlington Job No.: 200-4011-1

SDG No.:

Instrument ID: B.i Start Date: 02/28/2011 14:41

Analysis Batch Number: 14428 End Date: 03/01/2011 13:42

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
BFB 200-14428/1		02/28/2011 14:41	1	bjxl001.d	RTX-624 0.32(mm)
CCVIS 200-14428/2		02/28/2011 15:31	1	bjxl002.d	RTX-624 0.32(mm)
LCS 200-14428/3		02/28/2011 16:23	1	bjxl003.d	RTX-624 0.32(mm)
MB 200-14428/4		02/28/2011 17:13	1	bjxl004.d	RTX-624 0.32(mm)
ZZZZZ		02/28/2011 18:05	38.8		RTX-624 0.32(mm)
ZZZZZ		02/28/2011 19:04	0.2		RTX-624 0.32(mm)
200-4011-3	2919	02/28/2011 20:03	0.2	bjxl007.d	RTX-624 0.32(mm)
ZZZZZ		02/28/2011 20:56	99.5		RTX-624 0.32(mm)
ZZZZZ		02/28/2011 21:48	1		RTX-624 0.32(mm)
ZZZZZ		02/28/2011 22:40	1		RTX-624 0.32(mm)
ZZZZZ		02/28/2011 23:33	1		RTX-624 0.32(mm)
ZZZZZ		03/01/2011 00:26	1		RTX-624 0.32(mm)
ZZZZZ		03/01/2011 01:18	1		RTX-624 0.32(mm)
ZZZZZ		03/01/2011 02:10	1		RTX-624 0.32(mm)
ZZZZZ		03/01/2011 03:03	1		RTX-624 0.32(mm)
ZZZZZ		03/01/2011 03:56	1		RTX-624 0.32(mm)
ZZZZZ		03/01/2011 04:48	2		RTX-624 0.32(mm)
ZZZZZ		03/01/2011 05:41	10		RTX-624 0.32(mm)
ZZZZZ		03/01/2011 06:34	1		RTX-624 0.32(mm)
ZZZZZ		03/01/2011 07:27	1		RTX-624 0.32(mm)
ZZZZZ		03/01/2011 08:26	0.2		RTX-624 0.32(mm)
ZZZZZ		03/01/2011 09:18	10		RTX-624 0.32(mm)
ZZZZZ		03/01/2011 10:11	10		RTX-624 0.32(mm)
ZZZZZ		03/01/2011 11:03	10		RTX-624 0.32(mm)
ZZZZZ		03/01/2011 11:56	1.6		RTX-624 0.32(mm)
ZZZZZ		03/01/2011 12:49	2		RTX-624 0.32(mm)
ZZZZZ		03/01/2011 13:42	6.06		RTX-624 0.32(mm)

GC/MS INSTRUMENT RUN LOG

Sequence				Standard Traceability	Instrument Information
Batch ID: BJX	Start Date: 02/09/11	Time: 1123		ISTD Lot #: 84580	Instrument ID: B
Test Method: TO15	End Date: 02/10/11	Time: 1123		CAL STD Lot # See comments	Instrument: 5973
ICAL Date: 02/09/11				ICV / LCS Lot # See comments	Column Type: RTX-624

	Manager	Analyst	Analyst SV	Analyst	Analyst
Name/Initial		Paul Daigle	SoneWalyeme		
Signature		PaulD. PAD	SW		

Sequence Information								Individual Sample Review			
Injection Time	TALS ID / File Name	Summa Can ID	ETR	Dilution Factor	Inlet #	Volume (mL)	Operator	Internal Std.	Result Conc.	Primary Anal.	Comments / Standard Traceability
1123	BJX001	4634	BFB	NA	1	—	PAD	N/A	✓	PAD	
1223	002	4634	VIBLK		1	200			—	SV	
1315	003	4634	VIBLK		1				✓		
1405	004	4634	VIBLK		1				✓		
1504	005	5069	IC-1		2				—	SV	#109459
1556	006	2705	IC-2		3				✓		#109450
1649	007	3640	IC-3		4				✓		#109440
1741	008	3152	ICIS-4		5				✓		#109439
1834	009	3631	IC-5		6				✓		#109427
1926	010	3089	IC-6		7				✓		#109426
2019	011	4943	IC-7		8				✓		#109424
2111	012	4634	VIBLK		1			NA	✓	SV	
2203	013	4634	VIBLK		1				✓		
2256	014	3308	ICV		9				✓		#97891
2348	015	4634	VIBLK		1				✓		
0041	016	3308	LCS		9		SV		✓		#97891
0133	017	4634	MB	—	1	—		—	✓		
0226	018	3343	3739-1	1.0	10	200		✓	✓		
0318	019	5079	3739-2		11			✓	✓		
0411	020	4361	3739-3		12			✓	✓		
0503	021	5096	3739-4		13			✓	✓		
0556	022	2959	3739-5		14			✓	✓		
0648	023	5165	3739-6		15			✓	✓		
0741	024	4911	3739-7		16			✓	✓		
0833	025	3322	3739-8		17			✓	✓		
0926	026	2521	3739-9		3			✓	✓		
1018	027	5104	3739-10	—	4	—	—	✓	—	—	

Legend: C=Complete ▪ R=Reanalyze ▪ = High ▪ ↓= Low ▪ ✓=Reviewed and Acceptable

GC/MS INSTRUMENT RUN LOG

Sequence				Standard Traceability		Instrument Information
Batch ID:	BJXL	Start Date: 2/28/11	Time: 1441	ISTD Lot #:	84,550	Instrument ID: B
Test Method:	To15	End Date: 3/1/11	Time: 1441	CAL STD Lot #	109439	Instrument: 5973
ICAL Date:	02/09/11			ICV / LCS Lot #	92841	Column Type: RTX-624

	Manager	Analyst	Analyst	Analyst	Analyst
Name/Initial					
Signature					

Sequence Information								Individual Sample Review			
Injection Time	TALS ID / File Name	Summa Can ID	ETR	Dilution Factor	Inlet #	Volume (mL)	Operator	Internal Std.	Result Conc.	Primary Anal.	Comments / Standard Traceability
1441	BJXL001		BFB	NA	NA	NA	WMG	NA	NA	WMG	
1531	002	3152	CCV		1	200					AG
1623	003	3308	LCS		2						AG
1713	004	4635	MB		3					SV	
1805	005	5085	3971-3	38.8	4	20	SV			PAD	CDF 38.8 C
1904	006	3547	4012-2	0.2	5	1000	SV				C.O.? R
2003	007	2919	4011-03	0.2	6	1000	SV				~~CDF~~ SV 02/28/11
2056	008	3337	3976-1	99.5	7	21	SV			PAD/KP	CDF 10.45
2148	009	3291	-2	1.0	8	200					
2240	010	4801	-3	1.0	9						
2333	011	3296	3976-1	1.0	10	200	SV			PAD	C
0026	012	3627	-2		11		SV				R 1:1.6
0118	013	4866	-3		12						C
0210	014	5080	-4		13						C
0303	015	3310	-5	1.0	14	200					C
0356	016	4561	-6		15						Ace 58 1:2
0448	017	2639	-7	2.0	16	100					Ace 74 1:6
0541	BJXL 018	3304	4001-1	10	1	20	SV				C
0634	019	3559	-2	1.0	2	200					etoh 120 R 1:2
0727	020	5156	-3	1.0	3						etoh 120 R 1:2
0826	021	3547	4012-2	0.2	5	1000	SV				
0918	022	4461	4000-1	10	6	20					C
1011	023	4211	-2		7						C
1103	024	3602	-3		8						C
1156	BJXL 025	3627	3976-02	1.6	11	125	PAD				C
1249	026	4561	-06	2	15	100					C
1342	027	2639	3976-07	6.06	16	3.3					C

Legend: C=Complete ▪ R=Reanalyze ▪ = High ▪ ↓= Low ▪ ✓=Reviewed and Acceptable

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Megan Fogg
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FRI - 18 MAR A4
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Ship Date: 17MAR11
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0263

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0263

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30 Community Drive
Suite 11
South Burlington, VT 05403
phone 802-660-1990 fax 802-660-1919

Canister Samples Chain of Custody Record

TestAmerica Analytical Testing Corp. assumes no liability with respect to the collection and shipment of these samples.

Client Contact Information	Project Manager: Robert Glazier	Samples Collected By: Aron Krasnopolet	1 of 1 COCs
Company: Geosyntec Consultants	Phone: 410-381-4333		
Address: 10220 old Columbia Rd. Ste A	Email: rglazier@geosyntec.com		
City/State/Zip Columbia, MD			
Phone: 410-381-4333	Site Contact: Aron Krasnopolet		
FAX: 410-381-4499	TA Contact: Mark Nemec		
Project Name: Cortese NPL Site	**Analysis Turnaround Time**		
Site: Narrowsburg, NY	Standard (Specify)		
PO # MR05628O	Rush (Specify)		

Sample Identification	Sample Date(s)	Time Start	Time Stop	Canister Vacuum in Field, "Hg (Start)	Canister Vacuum in Field, 'Hg (Stop)	Flow Controller ID	Canister ID	TO-15	TO-14A	EPA 3C	EPA 25C	ASTM D-1946	Other (Please specify in notes section)	Sample Type	Indoor Air	Ambient Air	Soil Gas	Landfill Gas	Other (Please specify in notes section)
SVE-SP1	3/9/11	16:11	16:38	-30.08	-10.34	4698	5090	X									X		
SVE-SP2	3/9/11	16:13	16:37	-29.10	-3.93	4628	4143	X									X		
SVE-SP3	3/9/11	16:14	16:39	-29.95	-7.85	4975	3161	X									X		
AS-SP1	3/15/11	15:25	15:55	-29.22	-8.60	4605	3662	X					X				X		
AS-SP2	3/15/11	15:25	15:55	-30.06	-10.78	4687	4266	X					X				X		
AS-SP3	3/15/11	15:25	15:55	-29.58	-3.94	4697	2632	X					X				X		

Temperature (Fahrenheit)			
	Interior	Ambient	
Start			
Stop			

Pressure (inches of Hg)			
	Interior	Ambient	
Start			
Stop			

other: Helium

Special Instructions/QC Requirements & Comments:

Samples Shipped by:	Date/Time: 3/17/11 14:45	Samples Received by:	3/18/11 1045
Samples Relinquished by:	Date/Time:	Received by:	
Relinquished by:	Date/Time:	Received by:	

Lab Use Only Shipper Name: Opened by: Condition:

Login Sample Receipt Checklist

Client: Geosyntec Consultants, Inc.

Job Number: 200-4315-1
SDG Number: Narrowburg, NY

Login Number: 4315
List Number: 2
Creator: Keeton, Jamie

List Source: TestAmerica Burlington

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	True	853391, 392, 393
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	Thermal preservation not required.
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	Ambient
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	False	See NCM
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	N/A	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	Check done at department level as required.

Login Sample Receipt Checklist

Client: Geosyntec Consultants, Inc.

Job Number: 200-4315-1
SDG Number: Narrowburg, NY

Login Number: 4315
List Number: 3
Creator: Keeton, Jamie

List Source: TestAmerica Burlington

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background		
The cooler's custody seal, if present, is intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the sample IDs on the containers and the COC.		
Samples are received within Holding Time.		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.		
If necessary, staff have been informed of any short hold time or quick TAT needs		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		

Appendix E
Electronic Source Files

Appendix F
Calculation Package for Air Permeability and Air-Filled Porosity

MR0562B – CORTESE LANDFILL
AIR SPARGE AND SOIL VAPOR EXTRACTION PILOT TEST
CALCULATION PACKAGE FOR
AIR PERMEABILITY, AIR POROSITY, AND SVE ROI

GEOSYNTEC CONSULTANTS

COMPUTATION COVER SHEET

Client: Cortese PRP **Project:** Cortese Landfill **Project/Proposal #:** MR0562B **Task #:** 3*3

TITLE OF COMPUTATIONS Air Permeability and Air Porosity

COMPUTATIONS BY:
Signature  DATE
Printed Name Adam Gray
and Title Senior Staff Scientist

ASSUMPTIONS AND PROCEDURES CHECKED BY:
(Peer Reviewer)
Signature  DATE
Printed Name Aron Krasnopoler
and Title Project Engineer

COMPUTATIONS CHECKED BY:
Signature  DATE
Printed Name Aron Krasnopoler
and Title Project Engineer

COMPUTATIONS BACKCHECKED BY:
(Originator)
Signature  DATE
Printed Name Adam Gray
and Title Senior Staff Scientist

APPROVED BY:
(PM or Designate)
Signature  DATE
Printed Name Robert Glazier
and Title Associate

APPROVAL NOTES:

REVISIONS (Number and initial all revisions)

NO.	SHEET	DATE	BY	CHECKED BY	APPROVAL

Prepared by: Adam Gray **Date: 4/11/2011** **Reviewed by:** Aron Krasnopoler **Date: 9/17/2010**

Client: Cortese PRP **Project: Cortese Landfill** **Project/Proposal No.: MR0562B** **Task No.: 3*3**

PURPOSE

The purpose of this calculation package is to calculate air permeability and air porosity using data collected during the soil vapor extraction (SVE) well constant rate tests implemented on 9 March 2010 as part of the AS/SVE pilot test conducted at the Cortese Landfill Site in Narrowsburg, New York. Air permeability and air porosity were then used to determine the achievable SVE radius of influence (ROI) for a given extraction flow rate.

BACKGROUND

Two major vadose zone geologic layers have been identified within the pilot test area. The upper layer that occurs just below the landfill cap is a silty fine sand and silt material that was used to backfill the former IDDA 1b excavation to a depth of 14 to 25 ft bgs. Surrounding the backfill material is a more permeable mixture of waste material and/or Sand. To determine air permeability, air-filled porosity, and SVE ROI in each layer, vacuum constant rate tests were conducted on SVE vents installed into the respective layers. The constant rate tests were completed by running the SVE pilot system at the maximum achievable extraction rate (determined during the SVE step rate tests) and periodically measuring the vacuum change in soil gas probes (SGPs) installed through the pilot test area. The transient vacuum response data collected from the SGPs was then evaluated for air permeability and air-filled porosity as specified below.

AIR PERMEABILITY AND AIR FILLED POROSITY PROCEDURE

Air permeability and air porosity were calculated using the transient solution specified in equations D-13 and D-14 presented in Appendix D (Recommended Estimation Methods for Air Permeability) of the US Army Corp of Engineers Engineering Manual for Engineering and Design of Soil Vapor Extraction and Bioventing published on June 3, 2002 (SVE guidance). The equations utilize the Theis type-curve matching technique that is often used to determine the hydraulic conductivity of aquifers. However, the Theis curve does not account for the frequent site conditions of air leakage from adjacent lithologic units or permeable surface conditions. Thus, as noted in the SVE guidance (Section 2-4e) using the leaky well function W(u,r/B) (after Hantush-Jacob, 1955) instead of the Theis well function W(u) often yields a better fit for field permeability test data. Thus, the data were matched to the leaky well function curves provided in Attachment 1.

The curve matching technique is completed by first graphing the change in pressure at a given observation point versus time on a log-log plot. The resulting curve is then visually matched to one of the curves for the leaky well function (Attachment 1) and a matchpoint value is chosen. The match point u value and curve r/B value are then used to find the corresponding leaky well function W(u,r/B) value on the table provided in Attachment 2 (from Fetter, 2001). The other match point values are inserted into equation D-13 to determine air permeability and D-14 to determine air-filled porosity. The log-log data plots and corresponding match point values for each observation point are included in Attachment 3.

$$\textbf{D-13} \quad k_a = [Q_v \mu W(u,r/B)]/[4\pi b(P-P_{atm})]$$

$$\textbf{D-14} \quad n_a = [(4k_a P_{atm} t)/(r^2 \mu)]u$$

Where:

k_a= apparent gas permeability reflecting the air-filled and not the water-filled pore space
n_a= air-filled porosity
μ= dynamic viscosity of air
Q_v= volumetric flow rate
W(u,r/B)= Leaky well function at match point, Hantush and Jacob, 1955
b= thickness of the vadose zone or stratum of interest
P= absolute pressure
P_{atm}= atmospheric pressure
t= time at match point
r= radial distance from extraction well
u= match point value for from leaky well curve

Prepared by: Adam Gray **Date:** 4/11/2011 **Reviewed by:** Aron Krasnopoler **Date:** 9/17/2010

Client: Cortese PRP **Project:** Cortese Landfill **Project/Proposal No.:** MR0562B **Task No.:** 3*3

BACKFILL INPUT PARAMETERS and RESULTS

Input parameters for the backfill material were based on the data collected during the SVE-1 constant rate test (Section 6.3.1). Since SVE-1 only penetrates into the backfill material and not completely through the unsaturated zone, it is considered a partial penetrating condition with regard to the complete unsaturated zone. However, SVE-1 does penetrate completely through the backfill material and can be considered fully penetrating if only the backfill material is analyzed. Thus, for this analysis the thickness of the backfill material (i.e. b) was used in the calculations instead of the entire thickness of the unsaturated zone.

The following assumptions were made for the calculations presented below:

1. SVE-1 Well – discharged at a constant rate of 70 ft^3/min for the entire test, the effects of the well diameter were negligible and had no wellbore storage, and fully penetrated the backfill.
2. The backfill layer – In this particular case, the backfill is the pumping zone of interest and serves as its own confining layer. It is assumed that the backfill layer has an infinite areal extent, is isotropic and homogenenous, is overlain by the impervious landfill liner (i.e. non-leaky), has a constant thickness of 13 ft (backfill is 15 ft bgs minus 2 ft for landfill liner), and flow toward the well is radial in the backfill.
3. The sand layer – The sand layer occurs directly beneath the backfill and serves as a source bed. For this analysis, it is assumed that the sand layer provides an infinite source of air to the backfill and flow in the sand layer is vertical.

Input parameters from SVE-1 Constant Rate Test

All input parameters were converted from field measured units to like units for calculations.

$$\mathbf{Q_v}= 70\ ft^3/min * 0.0283\ ft^3/m^3 * 0.0167\ min/sec = \mathbf{0.0330\ m^3/sec}$$

$$\mathbf{b}= 13\ ft * 0.3048\ ft/m = \mathbf{3.96\ m}$$

$$\mathbf{P_{atm}}= 29.8\ inHg * 3386.389\ inHg/(Kg/m\text{-}s^2) = \mathbf{100914.4\ Kg/m\text{-}s^2}$$

$$\mathbf{\mu = 1.76*10^{-5}\ kg/m\text{-}s\ at\ 40°F}$$

Table 1 Backfill Calculated Parameters

Parameter	Units	Calculation	SGP-1B	SGP-5B	SGP-6B	Average
r/B	-	curve match	0.4	0.4	0.4	
u	**-**	**match point**	**0.01**	**0.01**	**0.01**	
W(u,r/B)	**-**	**Attachment 2 (Fetter, 2001)**	**2.23**	**2.23**	**2.23**	
t	minutes	match point	30	47	55	
t	**seconds**	**t minutes * 60 second/min**	**1,800**	**2,820**	**3,300**	
$P-P_{atm}$	inH_2O	match point	22	18.75	16.5	
$P-P_{atm}$	**$Kg/m\text{-}s^2$**	**P-Patm inH_20 * 248.8 $Kg/m\text{-}s^2$ per inH20**	**5,473.6**	**4,665.0**	**4,105.2**	
r	**m**	**survey data**	**3.1**	**4.6**	**6.3**	
k_a	m^2	Equation D-13	$4.76 * 10^{-12}$	$5.58 * 10^{-12}$	$6.34 * 10^{-12}$	$4.98 * 10^{-12}$
n_a	m^3/m^3	Equation D-14	0.211	0.173	0.123	0.169
k_a	cm^2	$K_a\ m^2 * 10{,}000\ cm^2/m^2$	$4.76 * 10^{-8}$	$5.58 * 10^{-8}$	$6.34 * 10^{-8}$	$4.98 * 10^{-8}$

bold – indicates use in final k_a or n_a calculation

Prepared by: Adam Gray **Date: 4/11/2011** **Reviewed by:** Aron Krasnopoler **Date: 9/17/2010**

Client: Cortese PRP **Project: Cortese Landfill** **Project/Proposal No.: MR0562B** **Task No.: 3*3**

SAND/WASTE INPUT PARAMETERS and RESULTS

Input parameters for the Sand/Waste layer that occurs below and/or outside the limits of the backfill were based on the data collected during the SVE-2 constant rate test (Section 6.3.2). Since the SVE-2 well penetrated into the deeper sand material, it was considered as fully penetrating and the entire thickness of the unsaturated zone was used in the calculation.

The following assumptions were made for the calculations presented below:

1. SVE-2 Well – discharged at a constant rate of 150 ft^3/min for the entire test, the effects of the well diameter were negligible and had no wellbore storage, and fully penetrated the unsaturated zone.
2. The sand/waste layer –In this case, the sand/waste layer is the pumping zone of interest. It is assumed that the sand/waste layer has an infinite areal extent, is isotropic and homogenenous, is underlain by the confining (i.e. non-leaky) water-table and overlain by the confining but leaky backfill material, the unsaturated zone has a constant thickness of 20 ft, and the flow toward the well is radial in the sand/waste layer.
3. The backfill layer – It is assumed that the backfill overlies the sand/waste layer and serves as the confining layer, the backfill layer is overlain by the impermeable landfill liner, the flow of air in the backfill material is vertical.

Input parameters from SVE-2 Constant Rate Test

Qv= 150 ft^3/min * 0.0283 ft^3/m^3 * 0.0167 min/sec = **0.0708 m^3/sec**

b= 20 ft * 0.3048 ft/m = **6.10 m**

P_{atm}= 29.7 inHg * 3386.389 inHg/(Kg/m-s^2) = **100575.8 Kg/m-s^2**

μ= 1.76*10^{-5} kg/m-s at 40°F

Table 2 Sand/Waste Calculated Parameters

Parameter	Units	Calculation	SGP-2C	SGP-4C	SGP-7	Average
r/B	-	curve match	0.2	0.2	0.4	
u	**-**	**match point**	**0.01**	**0.01**	**0.01**	
W(u,r/B)	**-**	**Attachment 2 (Fetter, 2001)**	**3.29**	**3.29**	**2.23**	
t	minutes	match point	22	22	17	
t	**seconds**	**t minutes * 60 sec/min**	**1,320**	**1,320**	**1,020**	
$P-P_{atm}$	inH_2O	match point	5.2	3.5	8.2	
$P-P_{atm}$	**Kg/m-s^2**	**P-Patm inH_20 * 248.8 Kg/m-s^2 per inH20**	**1,293.8**	**870.8**	**2,040.2**	
r	**m**	**survey data**	**3.1**	**4.6**	**6.3**	
k_a	m^2	Equation D-13	4.13 * 10^{-11}	6.15 * 10^{-11}	1.78 * 10^{-11}	4.02 * 10^{-11}
n_a	m^3/m^3	Equation D-14	0.160	0.138	0.337	0.212
k_a	cm^2	K_a m^2 * 10,000	4.13 * 10^{-7}	6.15 * 10^{-7}	1.78 *10^{-7}	4.02 * 10^{-7}

bold – indicates use in final k_a or n_a calculation

ANALYSIS OF AIR PERMEABILITY AND AIR-FILLED POROSITY

As shown above in Table 1, the average air permeability and air-filled porosity of the backfill are 5.0 x 10^{-8} cm^2 and 17 % respectively. The air-filled porosity values are consistent with average values for silty materials (0.16-0.18) published in the SVE guidance (ACOE, 2002). It is also noteworthy that the calculated air permeability in the backfill is greater than the minimum threshold (10^{-10} cm^2) presented in the SVE guidance for SVE feasibility.

Table 2 shows that the average air permeability and air-filled porosity of the backfill are 4.0 x 10^{-7} cm^2 and 21 % respectively. These values indicate that the sand/waste material is approximately 10 times more permeable than the compacted backfill material. The air porosity values of the sand/waste material are consistent with the average values for sandy materials (0.20-0.24) published in the SVE guidance (ACOE, 2002). The calculated air permeability in the sand/waste is also greater than the minimum threshold (10^{-10} cm^2) presented in the SVE guidance for SVE feasibility.

SVE RADIUS OF INFLUENCE

PROCEDURE

Using the air-filled porosity calculated for each lithologic layer above, it is possible to determine a ROI for an SVE well installed into either the backfill or the sand/waste layer for a given flow rate. The achievable ROI for a well installed into each layer was calculated using Equation 5-1 presented in the SVE guidance (ACOE, 2002). Equation 5-1 (shown below) is used at sites with impermeable surface covers to calculate the flow rate needed to achieve a specific ROI for a single SVE well system.

5-1 $$\mathbf{Q_v = (\pi\ r^2 b\ n_a)/t_{ex}} \quad \text{or} \quad \mathbf{r = \sqrt{[(Q_v t_{ex})/(\pi b\ n_a)]}}$$

Where:

Q_v= volumetric flow rate

r= radius of influence

b= thickness of the unsaturated zone; 20 ft

n_a= average air-filled porosity calculated above in Table 1 for the backfill and Table 2 for the sand/trash.

t_{ex}= time required for one pore volume exchange in the unsaturated zone

To evaluate the ROI for a given flow rate, it was also necessary to calculate t_{ex}. Since the goal of the SVE system is to collect the vapors that are generated from air sparging, at a minimum t_{ex} needs to be equal to the time required to fill the pore space (t_{fill}) during air sparging. Overlap in the AS ROI is neglected so t_{fill} is independent of the number of air sparging wells within the SVE ROI. To determine t_{fill} the rate of air sparging ($Q_{v,\ airsparge}$) and the air sparge ROI were inserted into the equation below.

$$\mathbf{t_{ex}\ Backfill = t_{fill} = (\pi r^2 b n_a)/Q_{vairsparge} = 299\ minutes}$$

$$\mathbf{t_{ex}\ Sand/Trash = t_{fill} = (\pi r^2 b n_a)/Q_{vairsparge} = 374\ minutes}$$

Where:

$Q_{v,\ airsparge}$= air sparging rate; 8 acfm

r= air sparging radius of influence; 15 ft as shown in Section 7.1

b= thickness of the unsaturated zone; 20 ft

n_a= average air-filled porosity of backfill (Table 1 and 2 above); Backfill = 0.169 and Sand/Trash = 0.212

Table 3 ROI for various flow rates in each lithologic layer calculated using equation 5-1 above.

SVE Q_v (cfm)	Backfill		Sand/Trash	
	ROI (ft)	SVE-1 Step Rate Test Well Head Vacuum (inH_2O)	ROI (ft)	SVE-2 Step Rate Test Well Head Vacuum (inH_2O)
30	23.7	-30	23.7	-4
40	29	-42	29	-7
50	37.5	-55	37.5	-9
60	41.1	-70	41.1	-11
70	44.3	-88	44.3	-14
80	Maximum achievable extraction rate of 70 cfm during SVE-1 Step Rate Test		47.4	-17
90			50.3	-20
100			53	-23
110			55.6	-27
120			58.1	-31
130			60.5	-37
140			62.8	-45

Because t_{fill} and t_{ex} are both a function of n_a, the SVE ROI is the same for both the backfill and sand/waste layers. The difference in air permeability and air-filled porosity is reflected in the SVE vacuum that will be needed to achieve SVE Q_v for the desired ROI.

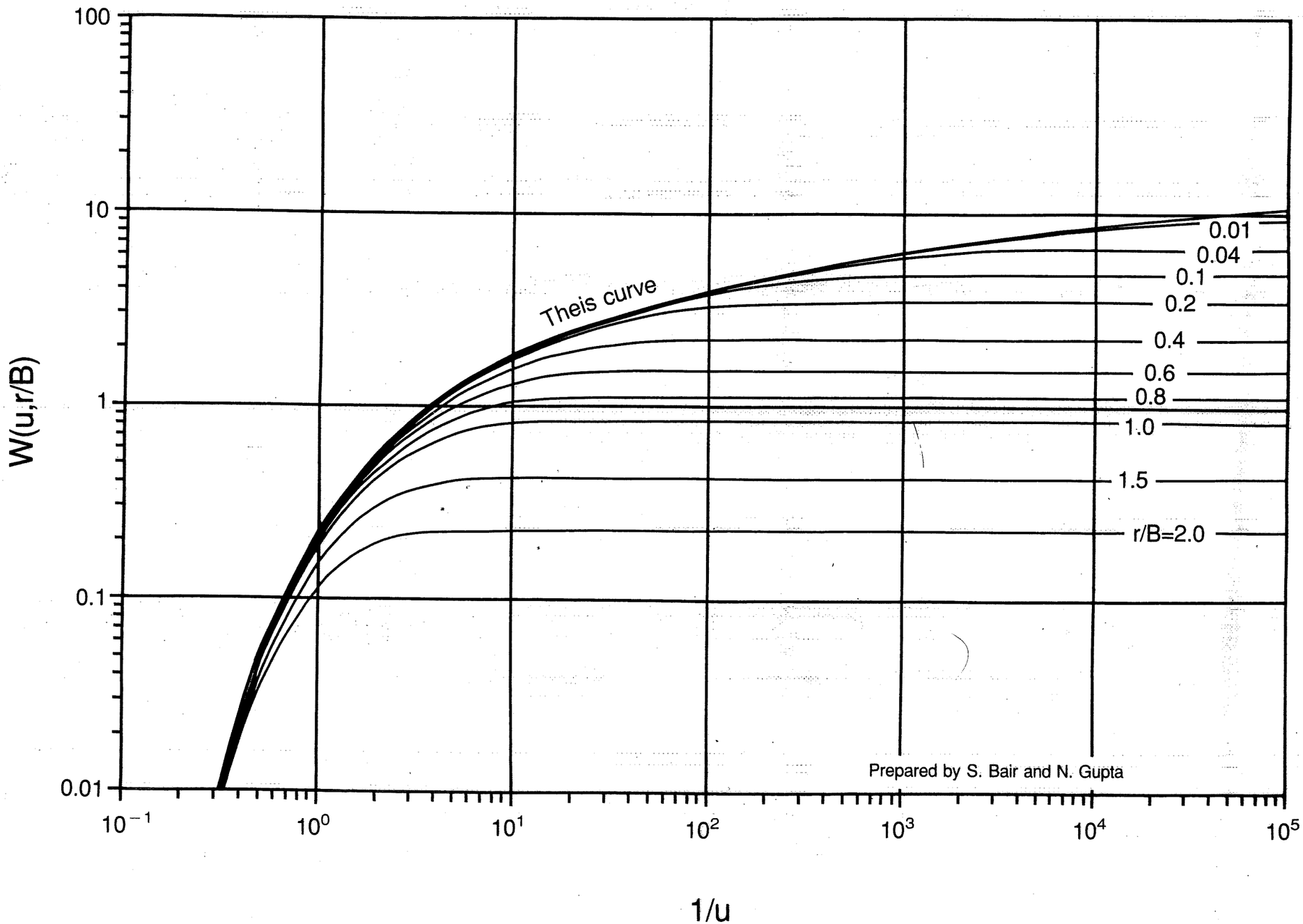
REFERENCES

Fetter, C.W. 2001. Applied Hydrogeology, Fourth Edition

US Army Corps of Engineers. 2002. Engineering and Design Soil Vapor Extraction and Bioventing. EM 1110-1-4001.

Attachment 1
Leaky Well Function Curves

Selected Type Curves of Dimensionless Drawdown (W(u,r/B)) vs. Dimensionless Time (1/u) for Constant Discharge from a Fully Penetrating Well in a Leaky Confined Aquifer with No Storage in the Confining Layer (after Hantush and Jacob, 1955)



Prepared by: Adam Gray **Date:** 4/11/2011 **Reviewed by:** Aron Krasnopoler **Date:** 9/17/2010

Client: Cortese PRP **Project:** Cortese Landfill **Project/Proposal No.:** MR0562B **Task No.:** 3*3

Attachment 2
Leaky Well Function Values
(from Fetter, 2001)

Appendix 3 Values of the functions $W(u, r/B)$ for various values of u

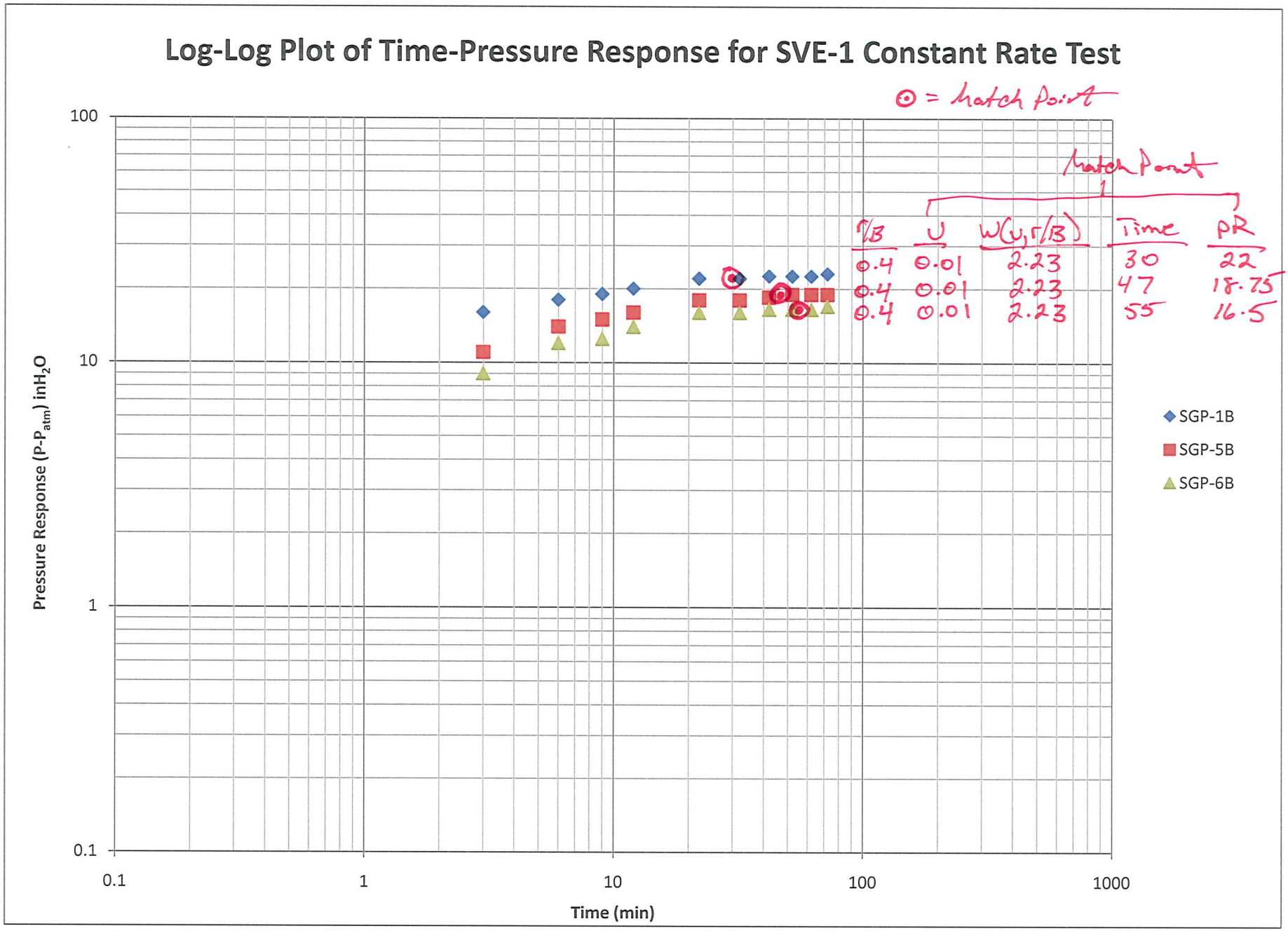
u \ r/B	0.002	0.004	0.006	0.008	0.01	0.02	0.04	0.06	0.08	0.1	0.2	0.4	0.6	0.8	1	2	4	6	8
0	12.7	11.3	10.5	9.89	9.44	8.06	6.67	5.87	5.29	4.85	3.51	2.23	1.55	1.13	0.842	0.228	0.0223	0.0025	0.0003
0.000002	12.1	11.2	10.5	9.89	9.44														
0.000004	11.6	11.1	10.4	9.88	9.44														
0.000006	11.3	10.9	10.4	9.87	9.44														
0.000008	11.0	10.7	10.3	9.84	9.43														
0.00001	10.8	10.6	10.2	9.80	9.42	8.06													
0.00002	10.2	10.1	9.84	9.58	9.30	8.06													
0.00004	9.52	9.45	9.34	9.19	9.01	8.03	6.67												
0.00006	9.13	9.08	9.00	8.89	8.77	7.98	6.67												
0.00008	8.84	8.81	8.75	8.67	8.57	7.91	6.67												
0.0001	8.62	8.59	8.55	8.48	8.40	7.84	6.67	5.87	5.29										
0.0002	7.94	7.92	7.90	7.86	7.82	7.50	6.62	5.86	5.29										
0.0004	7.24	7.24	7.22	7.21	7.19	7.01	6.45	5.83	5.29	4.85									
0.0006	6.84	6.84	6.83	6.82	6.80	6.68	6.27	5.77	5.27	4.85									
0.0008	6.55	6.55	6.54	6.53	6.52	6.43	6.11	5.69	5.25	4.84									
0.001	6.33	6.33	6.32	6.32	6.31	6.23	5.97	5.61	5.21	4.83	3.51								
0.002	5.64	5.64	5.63	5.63	5.63	5.59	5.45	5.24	4.98	4.71	3.50								
0.004	4.95	4.95	4.95	4.94	4.94	4.92	4.85	4.74	4.59	4.42	3.48	2.23							
0.006	4.54				4.54	4.53	4.48	4.41	4.30	4.18	3.43	2.23							
0.008	4.26				4.26	4.25	4.21	4.15	4.08	3.98	3.36	2.23							
0.01	4.04				4.04	4.03	4.00	3.95	3.89	3.81	3.29	2.23	1.55	1.13					
0.02	3.35				3.35	3.35	3.34	3.31	3.28	3.24	2.95	2.18	1.55	1.13					
0.04	2.68				2.68	2.68	2.67	2.66	2.65	2.63	2.48	2.02	1.52	1.13	0.842				
0.06	2.30				2.30	2.29	2.29	2.28	2.27	2.26	2.17	1.85	1.46	1.11	0.839				
0.08	2.03					2.03	2.02	2.02	2.01	2.00	1.94	1.69	1.39	1.08	0.832				
0.1	1.82						1.82	1.82	1.81	1.80	1.75	1.56	1.31	1.05	0.819	0.228			
0.2	1.22						1.22	1.22	1.22	1.22	1.19	1.11	0.996	0.857	0.715	0.227			
0.4	0.702						0.702	0.702	0.701	0.700	0.693	0.665	0.621	0.565	0.502	0.210			
0.6	0.454						0.454	0.454	0.454	0.453	0.450	0.436	0.415	0.387	0.354	0.177	0.0222		
0.8	0.311						0.311	0.310	0.310	0.310	0.308	0.301	0.289	0.273	0.254	0.144	0.0218		
1	0.219									0.219	0.218	0.213	0.206	0.197	0.185	0.114	0.0207	0.0025	
2	0.049										0.049	0.048	0.047	0.046	0.044	0.034	0.011	0.0021	0.0003
4	0.0038											0.0038	0.0037	0.0037	0.0036	0.0031	0.0016	0.0006	0.0002
6	0.0004														0.0004	0.0003	0.0002	0.0001	0
8	0																		0

Source: After M. S. Hantush, "Analysis of Data from Pumping Test in Leaky Aquifers," *Transactions, American Geophysical Union,* 37 (1956):702–14.

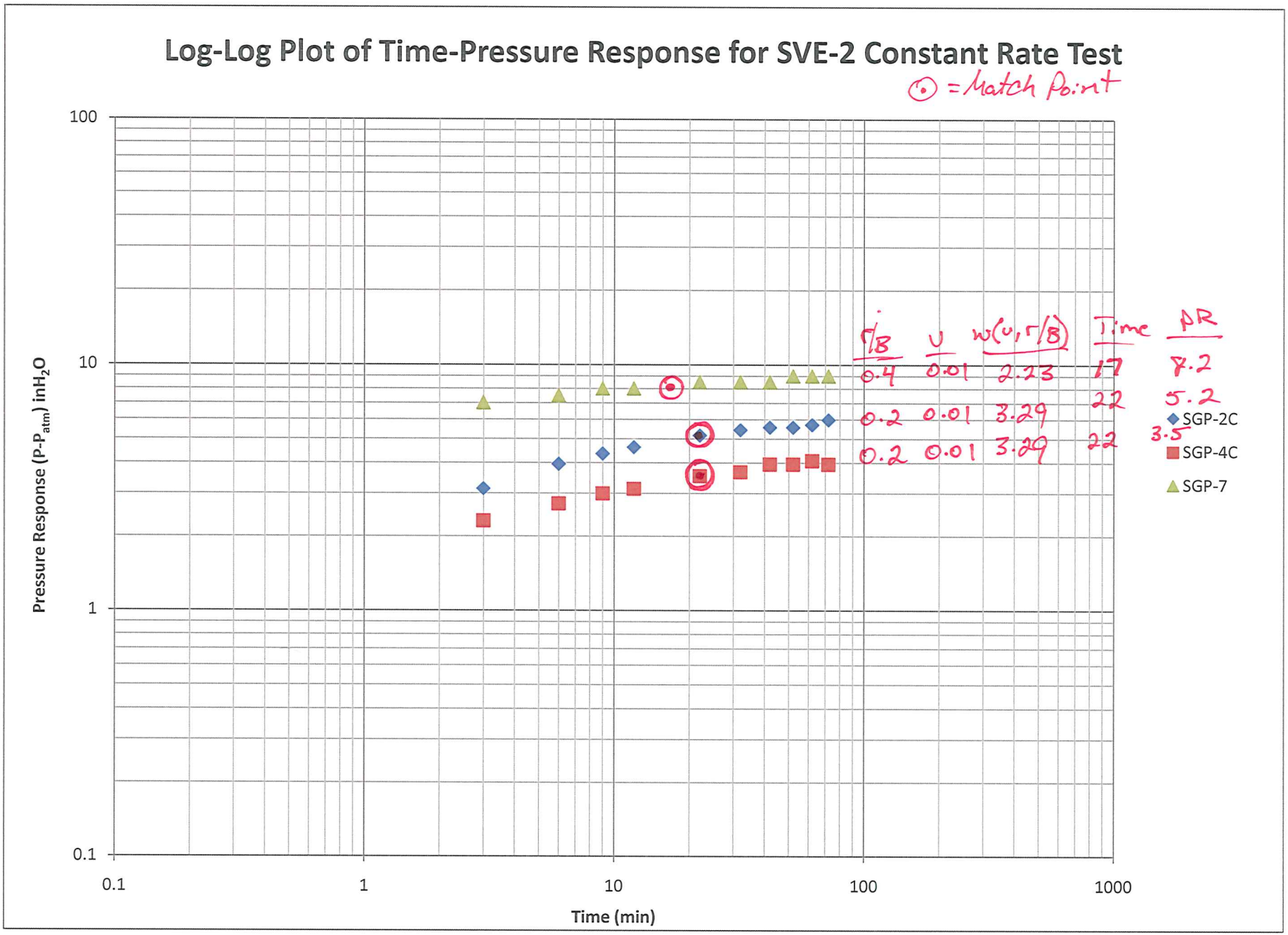
Prepared by: Adam Gray **Date:** 4/11/2011 **Reviewed by:** Aron Krasnopoler **Date:** 9/17/2010

Client: Cortese PRP **Project:** Cortese Landfill **Project/Proposal No.:** MR0562B **Task No.:** 3*3

Attachment 3
Vacuum Constant Rate Test
Log-log Data Plots


Log-Log Plot of Time-Pressure Response for SVE-1 Constant Rate Test
⊙ = match point
Match Point 1
r/B U W(u,r/B) Time PR
0.4 0.01 2.23 30 22
0.4 0.01 2.23 47 18.75
0.4 0.01 2.23 55 16.5
SGP-1B
SGP-5B
SGP-6B
Pressure Response (P-P$_{atm}$) inH$_2$O
100
10
1
0.1
0.1
1
10
100
1000
Time (min)

Log-Log Plot of Time-Pressure Response for SVE-2 Constant Rate Test



APPENDIX B

Design Calculations

Geosyntec consultants

COMPUTATION COVER SHEET

Client: Cortese PRP Group **Project:** Cortese **Project #:** MR0562B **Task #:** 03

TITLE OF COMPUTATIONS HYDROGEN PEROXIDE REQUIRED FOR REDOX "SHOCK"

COMPUTATIONS BY:
Signature [signature] Date
Printed Name and Title: Lauren Wellborn, Staff Engineer

ASSUMPTIONS AND PROCEDURES CHECKED BY: (Peer Reviewer)
Signature [signature] Date
Printed Name and Title: Aron Krasnopoler, Project Engineer

COMPUTATIONS CHECKED BY:
Signature [signature] Date
Printed Name and Title: Aron Krasnopoler, Project Engineer

COMPUTATIONS BACKCHECKED BY: (Originator)
Signature [signature] Date
Printed Name and Title: Lauren Wellborn, Staff Engineer

APPROVED BY: (PM or Designate)
Signature [signature] Date
Printed Name and Title: Robert Glazier, Associate

APPROVAL NOTES:

REVISIONS (Number and initial all revisions)

NO.	SHEET	DATE	BY	CHECKED BY	APPROVAL

HYDROGEN PEROXIDE REQUIRED FOR REDOX "SHOCK"

PURPOSE

An array of air sparging wells (ASWs) will be installed throughout former source areas at the Cortese NPL Site to deliver air to the saturated zone in order to promote volatilization and aerobic biodegradation. In order to mitigate the potential for iron fouling (i.e., iron precipitate crusting) of the ASWs, an initial application of hydrogen peroxide may be performed to rapidly change (i.e., shock) the groundwater redox regime from anaerobic to aerobic if the redox regime does not become aerobic in a short period of time after sparging begins. This is more likely to occur in the former IDDA 1b source area based on historical iron and manganese concentrations (Geosyntec, 2011). A total of 37 ASWs are planned for the former IDDA 1b source area with an assumed air sparging radius of influence (ROI) of 15 feet and a well spacing of 25 feet. The purpose of this calculation is to determine the dose of hydrogen peroxide required to meet the oxygen demand within one pore volume of the former IDDA 1b source treatment area. Spreadsheets of data used in the calculations are included at the end.

PROCEDURE

Pore volume calculation

As indicated by Figure 1, a cylindrical configuration of the influence zone for each injection well is assumed. The objective of the injection step is to dose sufficient peroxide to meet the chemical oxygen demand (COD) in the pore space of the treatment area.

The pore volume of groundwater can be calculated as

$$V = \varepsilon \cdot \pi \cdot r^2 \cdot h$$

Where V is the pore volume (ft^3), ε is the effective porosity, r (ft) is the influence radius, and h (ft) is the plume height at the injection well location. We estimate the average value of r as 15 ft and h as 5 ft based on the proposed screen interval of 2 feet.. The calculated pore volume is 1060 ft^3 or 30,015 L.

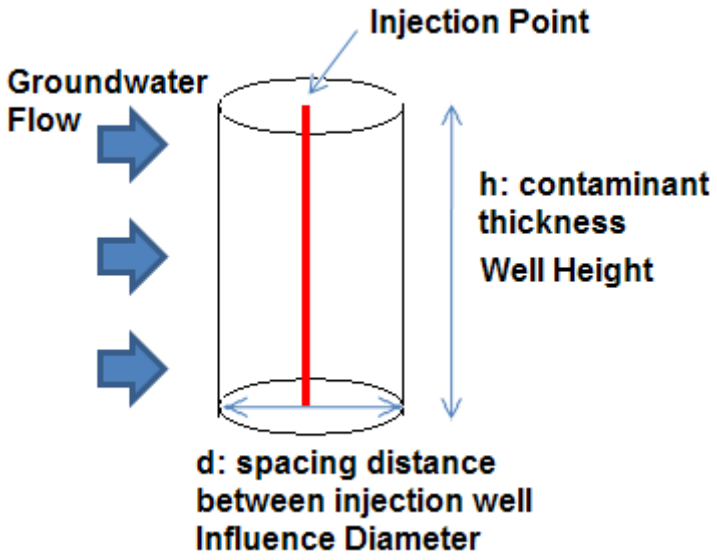


Figure 1: Conceptual Model of Injection Influence Zone

Oxygen Demand

In order to achieve aerobic conditions in the aquifer, we need to supply enough oxygen for aqueous-phase contaminant degradation and other untargeted consumption. Note that other significant non-aqueous source of oxygen demand, including NAPL and aquifer solids, are not included in this calculation since the intent is for a short-term "instantaneous" shock to the aqueous phase geochemical environment that is assumed to be sustained by subsequent air sparge operation. The major components of aqueous-phase oxygen demand in the source area are reduced forms of iron and manganese, which are oxidized according to the following equations:

$$4Fe^{2+} + 3O_2 + 8e^- = 2Fe_2O_3$$

$$Mn^{2+} + O_2 + 2e^- = MnO_2$$

Other organic compounds in groundwater will be oxidized simultaneously. Therefore, chemical oxygen demand (COD) is likely more representative of the total oxygen demand than iron and manganese.

Table 1 lists the sampling results for iron, manganese and COD in representative wells in the former IDDA 1b source area. The following equations were used to determine the oxygen demand for iron, manganese and COD. The results from these calculations are also provided in Table 1.

- Oxygen demand from iron: [$O_{2, Fe}$] (mg/L)
  Molecular Weight of Fe = 55.85 gram/mol
  [$O_{2, Fe}$] (mg/L) = [Fe^{2+}]g/L * mol Fe/g Fe * 3mol O_2/4mol Fe * 32g O_2/mol O_2 * 1g/1000mg

- Oxygen demand from manganese: [$O_{2,Mn}$] (mg/L)
  Molecular Weight of Mn = 54.94 gram/mol
  [$O_{2,Mn}$] (mg/L) = [Mn^{2+}]g/L * mol Mn/g Mn * mol O_2/mol Mn * 32g O_2/mol O_2 * 1g/1000mg

- Oxygen demand from COD : [$O_{2, COD}$] (mg/L)
  [$O_{2, COD}$] (mg/L) = [COD]

COD includes the oxygen demand from iron and manganese. Table 1 illustrates that approximately 20% of the oxygen demand is supplied by iron. Total oxygen demand will be considered to be equivalent to the COD.

Table 1 Representative Chemical Concentrations

	Fe	Mn	**COD**
Average Concentration (mg/L)	63.3	13.5	**125.6**
Oxygen Demand Per Component (mg O_2/L)	27.2	7.9	**125.6**
H_2O_2 Demand Per Component (mg O_2/L)	57.8	16.7	**267.0**

Note: Average monitoring data between May and October 2010 for Ex-1, S-1 and S-2
Molecular Weight: Fe – 55.8 g/mol; Mn - 54.94 g/mol; O_2 - 32.00 g/mol; H_2O_2 – 34.02 g/mol

Hydrogen Peroxide Dosing

Oxygen demand will be supplied using hydrogen peroxide. Oxygen is released by the decomposition of hydrogen peroxide as follows:

$$2H_2O_2 = 2\ H_2O + O_2$$

- [$H_2O_{2, Fe}$] (mg/L) = [O_2 Demand]g/L * mol O_2/32g O_2 * 2mol H_2O_2/mol O_2 * 34.02g H_2O_2/molH_2O_2 * 1g/1000mg

Table 1 illustrates the peroxide required to meet the oxygen demand. Complete conversion of hydrogen peroxide to oxygen is assumed.

Peroxide Requirements

The peroxide demand will be used to calculate the mass of H_2O_2 necessary to provide oxygen to area IDDA1B on a per well basis.

The total peroxide requirements per well are calculated by

$$m = V_1 * C$$

Where m is the mass of H_2O_2 required, V_1 is the pore volume and C is the concentration of peroxide demanded.

$$m = (30{,}015\ L)(267\ mg//L) = 8\ kg$$

With a factor of safety of 15%, the mass of H_2O_2 is

$$m = 1.15*(8\ kg) = 9.2\ kg$$

The required mass of peroxide per well is 8 kg. With a 15% safety factor, total mass is 9.2 kg/well. For the 37 wells in IDDA1b, a total of 340 kg of peroxide will be required.

The required volume of peroxide depends on the concentration of the H_2O_2 solution. Dilute solutions (3-10% by weight) will be considered for safety in handling and to minimize potential effects of heat and corrosion on the well materials. Table 2 lists the required volume of peroxide per well and the total required volume for 3% and 10% H_2O_2 solutions.

Table 2 Required H2O2 Dosing Volume

H_2O_2 Concentration (% by wt)	3	10
Density (kg/m^3)[1]	30	104
Dosing volume per well (L)	307	88
Total Dosing Volume (m^3)	11	3.3
Dosing time per well (min)	77	22
Total Dosing Time (hr)	47	14

For peroxide concentrations of 3%, the volume of peroxide solution required to meet the oxygen demand in IDDA1B is approximately 34 m^3. For a peroxide concentration of 10%, the volume of peroxide required is approximately 10 m^3.

[1] Hydrogen Peroxide Handling & Storage, http://www.solvaychemicals.com/Chemicals%20Literature%20Documents/Peroxygen/H2O2/h202_handling_and_storage_english.pdf

Dosing Time

The dosing time (t_1) required to deliver a given volume (V_2) at a given injection I can be expressed as:

$$t_1 = V_2/I$$

where I (gpm) is the injection rate, t_1 is the injection duration, V_2 is the volume of peroxide solution required. I is assumed to be 4 liters per minute (lpm). Per well and overall dosing times are presented in Table 2 for 3% and 10% H_2O_2 solutions.

GEOSYNTEC CONSULTANTS

COMPUTATION COVER SHEET

Client: Cortese Landfill PRP Group **Project:** Cortese Landfill **Project/Proposal #:** MR0562B **Task #:** 03

TITLE OF COMPUTATIONS **PIPE SIZING AND FRICTION LOSS CALCULATIONS**

COMPUTATIONS BY:
Signature [signature] DATE
Printed Name and Title: Lauren Wellborn, Staff Engineer

ASSUMPTIONS AND PROCEDURES CHECKED BY:
(Peer Reviewer)
Signature [signature] DATE
Printed Name and Title: Aron Krasnopoler, Ph.D., P,E, Project Engineer

COMPUTATIONS CHECKED BY:
Signature [signature] DATE
Printed Name and Title: Aron Krasnopoler, Ph.D., P,E, Project Engineer

COMPUTATIONS BACKCHECKED BY:
(Originator)
Signature [signature] DATE
Printed Name and Title: Lauren Wellborn, Staff Engineer

APPROVED BY:
(PM or Designate)
Signature [signature] DATE
Printed Name and Title: Chapman Ross, P.E., Senior Engineer

APPROVAL NOTES:

REVISIONS (Number and initial all revisions)

NO.	SHEET	DATE	BY	CHECKED BY	APPROVAL

Written By: Lauren Wellborn Date: Reviewed by: Date:

Client: Cortese Landfill PRP Group Project: Cortese Landfill Project/Proposal No.: MR0562B Task No.: 3

Pipe Sizing and Friction Loss Calculations
Cortese Landfill Air Sparge Design

PURPOSE

The purpose of this calculation package is to calculate the friction losses in the distribution piping for air sparging (AS) systems to be constructed at the Cortese Landfill Site in Narrowsburg, New York. Friction loss due to flow over the length of the pipe will be limited to 10% of the total pressure in order to assume incompressible flow. The calculated friction losses will be used to size the distribution piping between the air compressors and the AS wells.

BACKGROUND

Two separate AS systems will constructed to treat residual source material in three former source areas. One AS system will be constructed in the vicinity of former Intact Drum Disposal Area (IDDA) 1b and the other will be constructed in the vicinity of the former IDDA 2 and the former septage lagoons. Each AS system will include an air compressor to provide compressed air at 100 pounds per square inch gauge (psig) headers connected to a network of AS wells in each area. Air distribution piping will connect each AS well to a header in the AS equipment trailer. The injection pressure and flow rate for each AS well will be controlled individually in the AS trailer. Each AS well network is divided into two headers or zones with air injection to be conducted in cycles, alternating between the two zones. This will reduce the size of the air compressor needed for each area. The air injection zones are as follows:

Former IDDA 1b

Zone 1 includes wells ASW20-ASW37
Zone 2 includes wells ASW01-ASW19

Former IDDA 2 and Septage Lagoons

Zone 3 includes wells ASW38-ASW48
Zone 4 includes wells ASW49-ASW61

PROCEDURE

Friction loss in piping

Calculations of friction loss due to flow in pipes were performed using the Fanning equation for friction loss of compressed air traveling through smooth walled piping:

$$f = D\,\Delta P/(2*\rho*U_m^2*L)$$

Solving for ΔP:

$$\mathbf{\Delta P = (f * L/D)* 2*\rho U_m^2 / g}$$

Where:

ΔP = change in head

f = Fanning friction factor

L = length of pipe

D = **inner** diameter of pipe

ρ = Average air density at nominal flow conditions of 28.2 psi and 68°F

$\mathbf{U_m}$ = velocity

$\mathbf{U_m = Q/A}$

Where:

Q = volumetric flow rate

A = cross-sectional area

g = acceleration of gravity

The Fanning friction factor (**f**) is calculated by a Churchill equation for smooth and rough pipes:

$$\frac{1}{\sqrt{f}} = -4 \log\left[\frac{0.27\epsilon}{D} + (7/\mathrm{Re})^{0.9}\right]$$

Where :

ε = surface roughness coefficient (ft)

Re = Reynolds number

$\mathbf{Re} = D*U_m*\rho/\mu$

Where:

μ = air viscosity at flow conditions (lb-sec/ft^2)

The following assumptions were made for these calculations:

1. The pipe is new, smooth-walled HDPE.
2. The temperature is assumed to be 68^{o}F.
3. Temperature is assumed to be constant.
4. Pressure drop due to pipe welds and reductions were neglected.

Friction loss due to fittings

Friction loss due to flow in pipes is refined by accounting for friction losses to associated pipe fittings by converting the losses in the fitting due to an equivalent length of pipe (L_{eq}) as follows.

$$L_{eq}\,(ft) = K'*D\,(ft)$$

Where:

K' = fitting-specific friction loss coefficient

D = **inner** diameter of pipe

INPUT PARAMETERS AND ANALYSIS

The design flow rate for each air sparge well is 15 standard cubic feet per minute (scfm) at 28.2 psia (13.5 psig) based on pilot test results (Geosyntec, 2011).

The flow rate is corrected for pressure by converting units of scfm to actual cubic feet per minute (acfm). It is assumed that temperature and relative humidity are at standard conditions.

15 scfm * 14.7 psia / 28.2 psia= 7.82 acfm @ 28.2 psia

Three sizes of pipe were chosen with a nominal diameter of 1-in, 1.5-in and 2-in, corresponding to an inner diameter (ID) of 1.01 in, 1.46 in and 1.83 in. The input parameters and calculated parameters are listed in Tables 1 and 2, respectively.

The air sparge design includes sixty-one (61) air sparging wells, connected each on a separate manifold to one of two air injection systems. Attachment 2 lists the anticipated pipe lengths and the associated calculated head loss for 1-in, 1.5-in, and 2-in HDPE pipe.

Table 1 Input Parameters

Parameter	Value	Units
Q (per well)	15	scfm
Q (per well)	7.82	acfm
μ	3.84E-07	lbf-sec/ft^2
ρ	0.1882	lb/ft^3
g	32.2	ft/sec^2
P	28.2	psia

Table 2 Calculated Parameters

	1"	1.5"	2"
D (ft)	0.084	0.122	0.153
$u_{m=Q/A}$(ft/sec)	23.42	11.21	7.13
Re	3.00E-04	2.08E+04	1.66E+04
f[1]	0.0064	0.0067	0.0070
Δ_P/L 1"(lb/ft^2 per ft)	0.484	0.081	0.027

1. Calculated from Perry's Chemical Engineers' Handbook, Seventh Edition, Robert H. Perry et al. 1997; Equation 6-32

As shown in Attachment 2, all values of ΔP/P are less than 10%, so flow is considered as incompressible for all pipe larger than 1-in nominal diameter. 1-in diameter HDPE pipe is selected since it meets the criterion for the allowable pressure drop while minimizing the pipe size.

The pressure drop analysis was then refined to account for pressure drop due to fittings. Frictional losses inside the air sparge wells were not considered since the design pressure for each AS well is measured at the wellhead. Table 4 lists the coefficient (K) for the various piping components included in the analysis.

Table 3 Friction Loss Coefficient for Piping Components

Piping Component	K'
90° Molded Elbow	24
45° Molded elbow	12
Equal Outlet Tee, Branch Flow	60
Equal Outlet Tee,Thru Flow	20
Gate Valve, fully open	8
Swing Check valve	100
Ball valve, full bore, full open	3

Source: Table B-3 http://www.hdpe-pipe.com/D&E%20Guide.pdf

As an example, the section of piping supplying compressed air to AS well ASW52 originates at the AS trailer in the former IDDA2/Septage Lagoons treatment area. The section of piping between the trailer and ASW52 is approximately 362 ft long. Since each well is connected to the

AS trailer by a dedicated pipe, the assumed flow rate in the pipe is 15 scfm. Calculating Δp/L (psi/ft pipe) using a calculated Reynolds number and the Fanning friction factor, pressure loss per foot of 1" pipe at 15 scfm is approximately 0.0034 psi.

Other elements needed to supply air to ASW52 include:

- One branch tee = K' *D (ft) = 60 * 1.01" * 1 ft/12" = 5.05 ft equivalent pipe length
- Three 90-degree elbows = 3*K' *D (ft) = 3*24 * 1.01" * 1 ft/12" = 6.06 ft equivalent pipe length

Total equivalent pipe length at ASW52:

- 1-in diameter pipe = 362 ft +5.05 ft + 6.06 ft = 373 ft

Total frictional loss through ASW52 = 376.0 ft * 0.0034 psi/ft equivalent pipe length = 1.3 psi

Refined pressure drops for each AS well are presented in Attachment 2

It is assumed that the compressor will be sized to provide 100 psig to each header and that the injection pressure to each AS well will be regulated individually. Therefore, the pressure drop to the AS wells in each zone are considered as lines in parallel and the pressure drop between lines on the header is neglected. The injection pressure needed in the AS trailer to provide the necessary pressure at the wellhead is at most the maximum pressure drop for each zone as shown in Table 5. A degradation factor of 10% is assumed in order to determine the final maximum pressure loss.

Table 4 Maximum Pressure Drop for each AS Zone

	IDDA 1b		IDDA 2/Septage Lagoons	
	Zone 1	**Zone 2**	**Zone 3**	**Zone 4**
Piping Frictional Loss (psi)	1.12	0.65	0.67	1.25
Total Pressure with 10% degradation factor (psi)	**1.23**	**0.72**	**0.74**	**1.38**

Allowable pressure loss is 10% of the absolute injection pressure inside the wells.

Allowable pressure loss = (Injection pressure (13.5psig) + 14.7 (to convert to psia))*10% = 2.82 psi. Pressure drops in all of the zones are less than the allowable pressure loss.

REFERENCES

Perry's Chemical Engineers' Handbook, Seventh Edition, Robert H. Perry et al. 1997.

Polypipe, Inc. Design and Engineering Guide for Polyethylene Piping. June 2006. http://www.hdpe-pipe.com/D&E%20Guide.pdf

Plastics Pipe Institute. Design of PE Piping Systems. http://plasticpipe.org/pdf/chapter06.pdf

Attachment 1

Calculated Head Loss in Air Injection Piping for 1”, 1.5” and 2” Nominal HDPE Piping

(Losses due to pipe fittings are neglected)

Well ID	Pipe Length (ft)	1"		1.5"		2"	
		ΔP (PSI)	ΔP/P	**ΔP (PSI)**	ΔP/P	**ΔP (PSI)**	ΔP/P
1	187	**0.583**	2.07%	**0.101**	0.36%	**0.034**	0.12%
2	165	**0.515**	1.83%	**0.089**	0.32%	**0.030**	0.11%
3	140	**0.437**	1.55%	**0.075**	0.27%	**0.026**	0.09%
4	115	**0.359**	1.27%	**0.062**	0.22%	**0.021**	0.08%
5	128	**0.399**	1.42%	**0.069**	0.24%	**0.024**	0.08%
6	152	**0.474**	1.68%	**0.082**	0.29%	**0.028**	0.10%
7	176	**0.549**	1.95%	**0.095**	0.34%	**0.032**	0.11%
8	152	**0.474**	1.68%	**0.082**	0.29%	**0.028**	0.10%
9	128	**0.399**	1.42%	**0.069**	0.24%	**0.024**	0.08%
10	104	**0.324**	1.15%	**0.056**	0.20%	**0.019**	0.07%
11	90	**0.281**	1.00%	**0.048**	0.17%	**0.017**	0.06%
12	114	**0.356**	1.26%	**0.061**	0.22%	**0.021**	0.07%
13	138	**0.430**	1.53%	**0.074**	0.26%	**0.025**	0.09%
14	143	**0.446**	1.58%	**0.077**	0.27%	**0.026**	0.09%
15	118	**0.368**	1.31%	**0.064**	0.23%	**0.022**	0.08%
16	95	**0.296**	1.05%	**0.051**	0.18%	**0.017**	0.06%
17	70	**0.218**	0.77%	**0.038**	0.13%	**0.013**	0.05%
18	75	**0.234**	0.83%	**0.040**	0.14%	**0.014**	0.05%
19	100	**0.312**	1.11%	**0.054**	0.19%	**0.018**	0.07%
20	100	**0.312**	1.11%	**0.054**	0.19%	**0.018**	0.07%
21	75	**0.234**	0.83%	**0.040**	0.14%	**0.014**	0.05%
22	50	**0.156**	0.55%	**0.027**	0.10%	**0.009**	0.03%
23	45	**0.140**	0.50%	**0.024**	0.09%	**0.008**	0.03%
24	70	**0.218**	0.77%	**0.038**	0.13%	**0.013**	0.05%
25	90	**0.281**	1.00%	**0.048**	0.17%	**0.017**	0.06%
26	115	**0.359**	1.27%	**0.062**	0.22%	**0.021**	0.08%
27	145	**0.452**	1.60%	**0.078**	0.28%	**0.027**	0.09%
28	170	**0.530**	1.88%	**0.092**	0.32%	**0.031**	0.11%
29	200	**0.624**	2.21%	**0.108**	0.38%	**0.037**	0.13%
30	225	**0.702**	2.49%	**0.121**	0.43%	**0.041**	0.15%
31	250	**0.780**	2.77%	**0.135**	0.48%	**0.046**	0.16%
32	295	**0.920**	3.26%	**0.159**	0.56%	**0.054**	0.19%
33	270	**0.842**	2.99%	**0.145**	0.52%	**0.050**	0.18%
34	245	**0.764**	2.71%	**0.132**	0.47%	**0.045**	0.16%
35	320	**0.998**	3.54%	**0.172**	0.61%	**0.059**	0.21%
36	175	**0.546**	1.94%	**0.094**	0.33%	**0.032**	0.11%
37	125	**0.390**	1.38%	**0.067**	0.24%	**0.023**	0.08%

Well ID	Pipe Length (ft)	1"		1.5"		2"	
		ΔP (PSI)	ΔP/P	**ΔP (PSI)**	ΔP/P	**ΔP (PSI)**	ΔP/P
38	118	**0.368**	1.31%	**0.064**	0.23%	**0.022**	0.08%
39	142	**0.443**	1.57%	**0.077**	0.27%	**0.026**	0.09%
40	166	**0.518**	1.84%	**0.089**	0.32%	**0.031**	0.11%
41	190	**0.593**	2.10%	**0.102**	0.36%	**0.035**	0.12%
42	82	**0.256**	0.91%	**0.044**	0.16%	**0.015**	0.05%
43	106	**0.331**	1.17%	**0.057**	0.20%	**0.020**	0.07%
44	130	**0.405**	1.44%	**0.070**	0.25%	**0.024**	0.08%
45	155	**0.483**	1.71%	**0.084**	0.30%	**0.029**	0.10%
46	72	**0.225**	0.80%	**0.039**	0.14%	**0.013**	0.05%
47	95	**0.296**	1.05%	**0.051**	0.18%	**0.017**	0.06%
48	120	**0.374**	1.33%	**0.065**	0.23%	**0.022**	0.08%
49	290	**0.905**	3.21%	**0.156**	0.55%	**0.053**	0.19%
50	314	**0.979**	3.47%	**0.169**	0.60%	**0.058**	0.21%
51	338	**1.054**	3.74%	**0.182**	0.65%	**0.062**	0.22%
52	362	**1.129**	4.00%	**0.195**	0.69%	**0.067**	0.24%
53	254	**0.792**	2.81%	**0.137**	0.49%	**0.047**	0.17%
54	278	**0.867**	3.07%	**0.150**	0.53%	**0.051**	0.18%
55	303	**0.945**	3.35%	**0.163**	0.58%	**0.056**	0.20%
56	327	**1.020**	3.62%	**0.176**	0.62%	**0.060**	0.21%
57	350	**1.092**	3.87%	**0.189**	0.67%	**0.064**	0.23%
58	242	**0.755**	2.68%	**0.130**	0.46%	**0.045**	0.16%
59	267	**0.833**	2.95%	**0.144**	0.51%	**0.049**	0.17%
60	290	**0.905**	3.21%	**0.156**	0.55%	**0.053**	0.19%
61	315	**0.983**	3.48%	**0.170**	0.60%	**0.058**	0.21%

Attachment 2

Calculated Head Loss in Air Injection Piping for 1” Nominal HDPE Piping

(including pipe fittings)

Pipe Size and Head Loss Calculations

Well Design Flow Rate (cfm)	**15.0**	
ASW Well Depth (ft)	**35**	
Depth to Water (ft)	**24**	approximated from pilot test
Pressure Loss Through System IDDA1b(psi)	**1.23**	
Pressure Loss Through System IDDA2(psi)	**1.38**	
Design Flow Rate IDDA1b(cfm)	**285.0**	Designed for loop with most wells
Design Flow Rate IDDA2(cfm)	**195.0**	Designed for loop with most wells
Injection Pressure (psig)	**13.5**	

Piping Options	**0.75**
	1
	1.5
	2
	3

Zone 1 (Galvanized Piping)	**ASW20**	**ASW21**	**ASW22**	**ASW23**	**ASW24**	**ASW25**	**ASW26**	**ASW27**	**ASW28**	**ASW29**	**ASW30**	**ASW31**	**ASW32**	**ASW33**	**ASW34**	**ASW35**	**ASW36**	**ASW37**
Air Flow Rate (cfm)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Pipe Diameter (in)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Friction loss/ft pipe (psi)	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034
Conservative Pipe Length (ft)	100	75	50	45	70	90	115	145	170	200	225	250	295	270	245	320	175	125
No of branch tees	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Equivalent pipe length per tee (ft)	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05
Length (ft)	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05
No of thru tees	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Equivalent pipe length per tee (ft)	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68
Length (ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Ball Valves (fully open)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Equivalent pipe length per valve (ft)	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Length (ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of 45 degree elbows	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	1	1	0
Equivalent pipe length per elbow (ft)	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Length (ft)	0	0	0	0	0	0	0	0	0	0	0	0	2.02	2.02	2.02	1.01	1.01	0
Number of 90 degree elbows	1	1	1	1	1	1	1	2	2	3	3	4	3	3	3	3	2	2
Equivalent pipe length per elbow	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02
Length (ft)	2.02	2.02	2.02	2.02	2.02	2.02	2.02	4.04	4.04	6.06	6.06	8.08	6.06	6.06	6.06	6.06	4.04	4.04
Total Equivalent Length (ft)	107	82	57	52	77	97	122	154	179	211	236	263	308	283	258	332	185	134
Friction loss (psi)	0.4	0.3	0.2	0.2	0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.0	0.9	1.1	0.6	0.5

Zone 2 (Galvanized Piping)	**ASW01**	**ASW02**	**ASW03**	**ASW04**	**ASW05**	**ASW06**	**ASW07**	**ASW08**	**ASW09**	**ASW10**	**ASW11**	**ASW12**	**ASW13**	**ASW14**	**ASW15**	**ASW16**	**ASW17**	**ASW18**	**ASW19**
Air Flow Rate (cfm)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Pipe Diameter (in)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Friction loss/ft pipe (psi)	0.00336	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034
Conservative Pipe Length (ft)	187	165	140	115	128	152	176	152	128	104	90	114	138	143	118	95	70	75	100
No of branch tees	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Equivalent pipe length per tee (ft)	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05
Length (ft)	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05
No of thru tees	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Equivalent pipe length per tee (ft)	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68
Length (ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Ball Valves (fully open)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Equivalent pipe length per valve (ft)	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Length (ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of 45 degree elbows	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Equivalent pipe length per elbow (ft)	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Length (ft)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of 90 degree elbows	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Equivalent pipe length per elbow	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02
Length (ft)	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02
Total Equivalent Length (ft)	194	172	147	122	135	159	183	159	135	111	97	121	145	150	125	102	77	82	107
Friction loss (psi)	0.7	0.6	0.5	0.4	0.5	0.5	0.6	0.5	0.5	0.4	0.3	0.4	0.5	0.5	0.4	0.3	0.3	0.3	0.4

Zone 3 (Galvanized Piping)	**ASW38**	**ASW39**	**ASW40**	**ASW41**	**ASW42**	**ASW43**	**ASW44**	**ASW45**	**ASW46**	**ASW47**	**ASW48**
Air Flow Rate (cfm)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Pipe Diameter (in)	1	1	1	1	1	1	1	1	1	1	1
Friction loss/ft pipe (psi)	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034
Conservative Pipe Length (ft)	118	142	166	190	82	106	130	155	72	95	120
No of branch tees	1	1	1	1	1	1	1	1	1	1	1
Equivalent pipe length per tee (ft)	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05
Length (ft)	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05
No of thru tees	0	0	0	0	0	0	0	0	0	0	0
Equivalent pipe length per tee (ft)	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68
Length (ft)	0	0	0	0	0	0	0	0	0	0	0
Number of Ball Valves (fully open)	0	0	0	0	0	0	0	0	0	0	0
Equivalent pipe length per valve (ft)	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Length (ft)	0	0	0	0	0	0	0	0	0	0	0
Number of 45 degree elbows	0	0	0	0	0	0	0	0	0	0	0
Equivalent pipe length per elbow (ft)	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Length (ft)	0	0	0	0	0	0	0	0	0	0	0
Number of 90 degree elbows	1	2	2	2	1	2	2	2	0	0	0
Equivalent pipe length per elbow	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02
Length (ft)	2.02	4.04	4.04	4.04	2.02	4.04	4.04	4.04	0	0	0
Total Equivalent Length (ft)	125	151	175	199	89	115	139	164	77	100	125
Friction loss (psi)	0.4	0.5	0.6	0.7	0.3	0.4	0.5	0.6	0.3	0.3	0.4

Zone 4 (Galvanized Piping)	**ASW49**	**ASW50**	**ASW51**	**ASW52**	**ASW53**	**ASW54**	**ASW55**	**ASW56**	**ASW57**	**ASW58**	**ASW59**	**ASW60**	**ASW61**
Air Flow Rate (cfm)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Pipe Diameter (in)	1	1	1	1	1	1	1	1	1	1	1	1	1
Friction loss/ft pipe (psi)	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034	0.0034
Conservative Pipe Length (ft)	290	314	338	362	254	278	303	327	350	242	267	290	315
No of branch tees	1	1	1	1	1	1	1	1	1	1	1	1	1
Equivalent pipe length per tee (ft)	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05
Length (ft)	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05	5.05
No of thru tees	0	0	0	0	0	0	0	0	0	0	0	0	0
Equivalent pipe length per tee (ft)	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68	1.68
Length (ft)	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Ball Valves (fully open)	0	0	0	0	0	0	0	0	0	0	0	0	0
Equivalent pipe length per valve (ft)	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Length (ft)	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of 45 degree elbows	0	0	0	0	0	0	0	0	0	0	0	0	0
Equivalent pipe length per elbow (ft)	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Length (ft)	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of 90 degree elbows	2	3	3	3	2	3	3	3	3	1	1	1	1
Equivalent pipe length per elbow	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02
Length (ft)	4.04	6.06	6.06	6.06	4.04	6.06	6.06	6.06	6.06	2.02	2.02	2.02	2.02
Total Equivalent Length (ft)	299	325	349	373	263	289	314	338	361	249	274	297	322
Friction loss (psi)	1.0	1.1	1.2	1.3	0.9	1.0	1.1	1.1	1.2	0.8	0.9	1.0	1.1

	IDDA1B		**IDDA2**	
	Zone 1	**Zone 2**	**Zone 3**	**Zone 4**
Piping Frictional Loss (psi)	1.12	0.65	0.67	1.25

GEOSYNTEC CONSULTANTS

COMPUTATION COVER SHEET

Client:	Cortese Landfill PRP Group	**Project:**	Cortese Landfill AS/SVE	**Project/Proposal #:**	MR0562B	**Task #:**	03

TITLE OF COMPUTATIONS **SVE FRICTION LOSS CALCULATIONS**

COMPUTATIONS BY:
Signature
Printed Name and Title: Lauren Wellborn, Staff Engineer
DATE

ASSUMPTIONS AND PROCEDURES CHECKED BY:
(Peer Reviewer)
Signature
Printed Name and Title: Aron Krasnopoler, Ph.D., P,E, Project Engineer
DATE

COMPUTATIONS CHECKED BY:
Signature
Printed Name and Title: Aron Krasnopoler, Ph.D., P,E, Project Engineer
DATE

COMPUTATIONS BACKCHECKED BY:
(Originator)
Signature
Printed Name and Title: Lauren Wellborn, Staff Engineer
DATE

APPROVED BY:
(PM or Designate)
Signature
Printed Name and Title: Chapman Ross, P.E., Senior Engineer
DATE

APPROVAL NOTES:

REVISIONS (Number and initial all revisions)

NO.	SHEET	DATE	BY	CHECKED BY	APPROVAL

Written By: Lauren Wellborn Date: Reviewed by: Date:

Client: Cortese Landfill PRP Group Project: Cortese Landfill SVE Design Project/Proposal No.: MR0562B Task No.: 3

Pipe Sizing and Friction Loss Calculations
Cortese Landfill Soil Vapor Extraction Design

PURPOSE

The purpose of this calculation package is to calculate the friction losses in the distribution piping for soil vapor extraction (SVE) systems to be constructed at the Cortese Landfill Site in Narrowsburg, New York. Friction loss due to flow over the length of the pipe will be limited to 10% of the total pressure in order to assume incompressible flow. The calculated friction losses will be used to size the distribution piping between the SVE blowers and the SVE wells and to determine the operating vacuum of the SVE blowers.

BACKGROUND

Two separate SVE systems will be constructed to treat residual source material in three former source areas. One SVE system will be constructed in the vicinity of former Intact Drum Disposal Area (IDDA) 1b and the other will be constructed in the vicinity of the former IDDA 2 and the former septage lagoons. The SVE system for the former IDDA 1b will include two SVE blowers due to the presence of materials with differing air permeability and air-filled porosity in the vadose zone. These include the sand/waste layer within the former landfill and the compacted backfill placed following a drum removal action. SVE wells completed in the same vadose zone material will be connected to the same SVE blower. Separate headers from the SVE trailer will connect each set of SVE wells to the corresponding SVE blower.

The vadose zone material in the vicinity of former IDDA 2 and the former septage lagoons is assumed to be similar to the sand/waste layer observed in the former IDDA 1b. Therefore, it is expected that only one SVE blower will be required in this area. Separate headers will connect the SVE wells installed in the former IDDA 2 and former septage lagoon source areas. All zones will operate continuously.

Header pipes will connect the SVE blowers to four SVE well networks or zones. The SVE zones are as follows:

Former IDDA 1b

Zone 1: SVE wells completed in compacted backfill (SVE11, SVE12, SVE13, SVE14)
Zone 2: SVE wells completed sand/waste (SVE02, SVE03, SVE04, SVE05, SVE06, SVE07, SVE08, SVE09, SVE10

Former IDDA 2

Zone 3: SVE wells completed in sand/waste (SVE15, SVE16, SVE17, SVE18, SVE19)

Written By: Lauren Wellborn Date: Reviewed by: Date:

Client: Cortese Landfill PRP Group Project: Cortese Landfill SVE Design Project/Proposal No.: MR0562B Task No.: 3

Former Septage Lagoons

Zone 4: Former septage lagoon SVE wells (SVE20, SVE21, SVE22, SVE23, SVE24, SVE25)

It is noted that SVE01 was installed for the pilot test but will not be used in the full-scale system.

PROCEDURE

Friction loss in piping

Calculations of friction loss due to flow in pipes were performed using the Fanning equation for friction loss of compressed air traveling through smooth walled piping:

$$\mathbf{f = D\ \Delta P/(2*\rho*\ U_m^{2}*\ L)}$$

Solving for ΔP:

$$\mathbf{\Delta P = (f\ *\ L/D)*\ 2*\rho U_m^{2}/\ g}$$

Where:

ΔP = change in head

f = Fanning friction factor

L = length of pipe

D = **inner** diameter of pipe

ρ = Average air density at nominal flow conditions of 28.2 psi and 68^{o}F

$\mathbf{U_m}$ = velocity

$$\mathbf{U_m = Q/A}$$

Where:

Q = volumetric flow rate

A = cross-sectional area

g = acceleration of gravity

The Fanning friction factor (**f**) is calculated by the Churchill equation for smooth and rough pipes:

$$\frac{1}{\sqrt{f}} = -4 \log\left[\frac{0.27\epsilon}{D} + (7/\mathrm{Re})^{0.9}\right]$$

Where :

ε = surface roughness coefficient (ft)

Re = Reynolds number

Re=D*U_m*ρ/μ

Where:

μ = air viscosity at flow conditions (lb-sec/ft^2)

The following assumptions were made for these calculations:

1. The pipe is new, smooth-walled HDPE.
2. The temperature is assumed to be 68°F.
3. Temperature is assumed to be constant.

Friction loss due to fittings

Friction loss due to flow in pipes is refined by accounting for friction losses to associated pipe fittings by converting the losses in the fitting due to an equivalent length of pipe (L_{eq}) as follows:

$$L_{eq}\,(ft) = K'*D\,(ft)$$

Where:

K' = fitting-specific friction loss coefficient

D = **inner** diameter of pipe

Frictional losses inside the SVE wells were not considered. The pilot test provided information for what pressure was required at the wellhead to extract a particular flow rate.

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INPUT PARAMETERS AND ANALYSIS

The design flow rate for each SVE well zone is based on the radius of influence (ROI) needed to collect the soil gas generated by the air sparging systems to be constructed in each area. For the SVE wells in the former IDDA 1b source area, the SVE ROI is assumed to be 37.5 feet which requires an extraction flow rate of 50 cubic feet per minute (cfm). For the SVE wells in the former IDDA 2 and septage lagoon source areas, the SVE ROI is assumed to be 29 feet which requires an extraction flow rate of 40 cfm.

These and other input parameters are listed in Table 1.

Table 1 Input Parameters

Parameter	Value	Units	Notes
Q (per well)	50	cfm	IDDA 1b
P (per well)	55	in H2O	IDDA 1b backfill
P (per well)	9	in H2O	IDDA 1b sand/waste
Q (per well)	40	cfm	IDDA 2/Septage Lagoons
P (per well)	7	in H2O	IDDA 2/Septage Lagoons
Q (Zone 1)	200	cfm	SVE11, SVE12, SVE13, SVE14
Q (Zone 2)	450	cfm	SVE02, SVE03, SVE04, SVE05, SVE06, SVE07, SVE08, SVE09, SVE10
Q (Zone 3)	200	cfm	SVE15, SVE16, SVE17, SVE18, SVE19
Q (Zone 4)	240	cfm	SVE20, SVE21, SVE22, SVE23, SVE24, SVE25
μ	3.84E-07	lbf-sec/ft^2	http://www.lmnoeng.com/Flow/GasViscosity.htm
ρ	0.1462	lb/ft^3	http://www.engineeringtoolbox.com/air-temperature-pressure-density-d_771.html
g	32.2	ft/sec^2	

Pipe diameters were selected for the above ground extraction systems in each zone through an iterative process such that total frictional losses through the zone summed to less than 10% of the total absolute pressure applied at the wellhead. Total frictional losses of less than 10% of total pressure are required to assume incompressible flow conditions in calculating the pressure drop. Frictional losses for each piping section were calculated based on the airflow rate, the piping diameter, and any additional hardware losses within the section. Pipe diameters were used to calculate the corresponding velocity $\mathbf{U_m}$, **Re**, Fanning's friction factor **f**, and equivalent lengths for fittings. Frictional losses inside the soil vapor extraction wells were not considered since the design pressure for each SVE well is measured at the wellhead.

The pressure drop analysis included the pressure drop due to fittings. Table 2 lists the coefficient (K) for the various piping components included in the analysis.

Table 2 Friction Loss Coefficient for Piping Components

Piping Component	K'
90° Molded Elbow	24
45° Molded elbow	12
Equal Outlet Tee, Branch Flow	60
Equal Outlet Tee,Thru Flow	20
Gate Valve, fully open	8
Swing Check valve	100
Ball valve, full bore, full open	3

Source: Table B-3 http://www.hdpe-pipe.com/D&E%20Guide.pdf

Below is an explanation of the friction loss calculations.

Example Zone 1: IDDA1b Wells in Backfill

The section of piping supplying vacuum to SVE14 originates in the SVE trailer in the former IDDA 1b source area. The pipe extends from the trailer to SVE14, where it branches to extend to SVE12, and SVE13 on one leg and to SVE 11 on the other. Since each well requires an extraction rate of 50 cfm, the flow rate in the header is 50 cfm at the end of each leg at SVE 11 and SVE13. After SVE12, the total flow in the SVE12/SVE13 leg increases to 100 cfm. The total flow rate from SVE14 is 200 cfm.

The frictional losses through Zone 1 were then calculated as follows:

1. The length of pipe to each SVE well was measured from site figures.

2. Effective lengths of fittings and valves used in the distribution system were calculated using industry supplied constants and inner diameters for each type of fitting.

3. Frictional loss per foot of pipe was calculated using the Reynolds equation and the Fanning friction factor.

4. The length of pipe to each well from the preceding well (for SVE11, SVE12, SVE13) or equipment trailer (SVE14) was added to the effective length of fittings and valves in the piping supplying vacuum to each well individually. The total equivalent length was multiplied by the determined friction loss per foot of pipe. This yielded the total frictional loss through the system to each well.

5. Friction loss from the header pipe to the wellhead was calculated similarly to Step 4.

6. Total frictional loss per zone was calculated as the maximum frictional loss through the longest branch in the system. For Zone 1, the frictional losses from wells in the

branch from the equipment trailer through SVE14, SVE13, and SVE12 represents the largest frictional loss.

Numerically, frictional loss to SVE 12:

1. Length of pipe from SVE13 to SVE12 = 55 ft
2. Effective length of one branch tee = K' *D (ft) = 60 * 3.67" * 1 ft/12" =18.35 ft

   Effective length of one thru tee = K' *D (ft) = 20 * 3.67" * 1 ft/12" = 6.12 ft

   Total effective length of fittings and valves = 24.47 ft
3. Frictional loss/foot of pipe = 0.0152 psi/ft
4. Total equivalent pipe = 55 ft + 24.47 ft = 79.47

   Frictional loss/foot of pipe = 0.0152 psi/ft

   79.47 ft * 0.0152 psi/ft pipe = 1.36 psi frictional loss
5. Frictional loss from the header pipe to the wellhead :

   Length of piping = 5 ft

   Effective length of one thru tee = K' *D (ft) = 20 * 1.83" * 1 ft/12" = 3.05 ft

   Effective length of one ball valve = K' *D (ft) = 3 * 1.83" * 1 ft/12" =0.46 ft

   Total effective length of fittings and valves = 9 ft

   Frictional loss/foot of pipe = 0.034 psi/ft

   9 ft * 0.034 psi/ft pipe = 0.95 psi frictional loss
6. Total frictional loss in longest branch = friction loss to SVE14, SVE13, SVE12 + frictional loss to wellhead = 0.17 psi + 0.048 psi + 0.015 psi + 0.034 psi = 0.29 psi = **7.47 in H_2O**.

A nominal HDPE pipe diameter of 4-in was selected for Zone 1, which maintains total frictional loss through the system at less than 10% of the total absolute pressure at the SVE wellhead.

Attachment 1 presents the selected pipe diameters and calculated frictional losses in Zones 1 through 4. Table 3 shows the maximum frictional losses through each Zone. A 10% degradation factor was applied after the total frictional loss was determined. This final value was compared with the allowable loss of 10%. The maximum loss per blower is provided as well.

Table 3 Frictional Losses through SVE System

	Zone 1	Zone 2	Zone 3	Zone 4
Piping Frictional Loss (in H2O)	7.47	5.58	2.23	2.17
Total Pressure with 10% degradation factor (in H2O)	8.22	6.13	2.45	2.39
Pressure at SVE Wellhead (psia)	12.71	14.37	14.45	14.45
Allowable Loss (in H20) (10% of pressure at SVE Wellhead)	35.19	39.79	39.99	39.99
Total Per Blower (in H2O)	8.22	6.13	2.45	

REFERENCES

Perry's Chemical Engineers' Handbook, Seventh Edition, Robert H. Perry et al. 1997.

Polypipe, Inc. Design and Engineering Guide for Polyethylene Piping. June 2006. http://www.hdpe-pipe.com/D&E%20Guide.pdf

Plastics Pipe Institute. Design of PE Piping Systems. http://plasticpipe.org/pdf/chapter06.pdf

Attachment 1

Calculated Head Loss in SVE Distribution Piping

Pipe Size and Head Loss Calculations for SVE System

SVE Well Design Flow Rate (acfm)	IDDA 1b	50.0
SVE Well Design Flow Rate (acfm)	IDDA 2	40.0
SVE Well Depth (ft)		15
Design Flow Rate IDDA1b(acfm)		650.0
Design Flow Rate IDDA2(acfm)		440.0

Pressure Loss Through Wells in Waste IDDA1B(inH2O)	8.22
Pressure Loss Through Wells in Backfill IDDA1B(in H2O)	6.13
Pressure Loss Through System IDDA2(psi)	2.45

Vacuum	in H2O	scfm
Backfill	55	50
Waste	9	50
IDDA 2	7	40

Piping Options
1
1.5
2
3
4
5
6
8
10
12

Zone 1 - IDDA1B Backfill Wells (HDPE Piping)	Pump to SVE14	SVE14 to SVE13	SVE13 to SVE12	SVE14 to SVE11	Wellhead	
Air Flow Rate (cfm)	200.0	100.0	50.0	50.0	50.0	
Pipe Diameter (in)	4	4	4	4	2	
Friction loss/ft pipe (psi)	0.0023	0.0007	0.0002	0.0002	0.0040	
Conservative Pipe Length (ft)	75	55	55	75	5	
No of branch tees	0	1	1	0	0	
Equivalent pipe length per tee (ft)	17.30	17.30	17.30	17.30	9.15	
Length (ft)	0	17.3	17.3	0	0	
No of thru tees	0	0	1	1	1	
Equivalent pipe length per tee (ft)	5.77	5.77	5.77	5.77	3.05	
Length (ft)	0	0	5.77	5.77	3.05	
Number of Ball Valves (fully open)	0	1	0	1	1	
Equivalent pipe length per valve (ft)	0.87	0.87	0.87	0.87	0.46	
Length (ft)	0	0.865	0	0.865	0.4575	
Number of 45 degree elbows	0	0	0	1	0	
Equivalent pipe length per elbow (ft)	3.46	3.46	3.46	3.46	1.83	
Length (ft)	0	0	0	3.46	0	
Number of 90 degree elbows	0	0	0	0	0	
Equivalent pipe length per elbow	6.92	6.92	6.92	6.92	3.66	
Length (ft)	0	0	0	0	0	
Total Equivalent Length (ft)	75	73	78	85	9	
Friction loss (psi)	0.1723	0.0482	0.0150	0.0	0.034	Total
Friction Loss (in H2O)	**4.77**	**1.34**	**0.41**	**0.45**	**0.95**	**7.47**

Zone 2 - IDDA1B Wells in Waste (HDPE Piping)	Pump to T	T to SVE09	SVE9 to SVE10		T to SVE05	SVE05 to SVE04	SVE04 to SVE03	SVE03 to SVE02	SVE05 to SVE08	SVE08 to SVE07	SVE07 to SVE06	Wellhead	
Air Flow Rate (cfm)	450.0	100.0	50.0		350.0	150.0	100.0	50.0	150.0	100.0	50.0	50.0	
Pipe Diameter (in)	6	6	6		6	6	6	6	6	6	6	2	
Friction loss/ft pipe (psi)	0.0016	0.0001	0.0000		0.0010	0.0002	0.0001	0.0000	0.0002	0.0001	0.0000	0.0040	
Conservative Pipe Length (ft)	25	38	55		29	65	60	130	60	65	58	5	
No of branch tees	0	1	1		1	1	1	1	1	1	1	0	
Equivalent pipe length per tee (ft)	25.45	25.45	25.45		25.45	25.45	25.45	25.45	25.45	25.45	25.45	9.15	
Length (ft)	0	25.45	25.45		25.45	25.45	25.45	25.45	25.45	25.45	25.45	0	
No of thru tees	0	0	1		0	1	1	1	1	1	1	1	
Equivalent pipe length per tee (ft)	8.48	8.48	8.48		8.48	8.48	8.48	8.48	8.48	8.48	8.48	3.05	
Length (ft)	0	0	8.48		0	8.48	8.48	8.48	8.48	8.48	8.48	3.05	
Number of Ball Valves (fully open)	0	1	0		0	1	0	0	1	0	0	1	
Equivalent pipe length per valve (ft)	1.27	1.27	1.27		1.27	1.27	1.27	1.27	1.27	1.27	1.27	0.46	
Length (ft)	0	1.2725	0		0	1.2725	0	0	1.2725	0	0	0.4575	
Number of 45 degree elbows	0	0	0		0	0	0	1	0	0	1	0	
Equivalent pipe length per elbow (ft)	5.09	5.09	5.09		5.09	5.09	5.09	5.09	5.09	5.09	5.09	1.83	
Length (ft)	0	0	0		0	0	0	5.09	0	0	5.09	0	
Number of 90 degree elbows	0	0	0		0	1	1	1	1	1	0	0	
Equivalent pipe length per elbow	10.18	10.18	10.18		10.18	10.18	10.18	10.18	10.18	10.18	10.18	3.66	
Length (ft)	0	0	0		0	10.18	10.18	10.18	0	10.18	0	0	
Total Equivalent Length (ft)	25	65	89		54	110	104	179	95	109	97	9	
Friction loss (psi)	0.0389	0.0067	0.0027		0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Total
Friction Loss (in H2O)	**1.08**	**0.19**	**0.07**		**1.48**	**0.65**	**0.30**	**0.15**	**0.56**	**0.31**	**0.08**	**0.95**	**5.58**

Zone 3 - IDDA2 Wells in Waste (HDPE Piping)	Pump to T	T to SVE16	SVE16 to SVE15		T to SVE17	SVE17 to SVE18	SVE18 to SVE19	Wellhead	
Air Flow Rate (cfm)	200.0	80.0	40.0		120.0	80.0	40.0	40.0	
Pipe Diameter (in)	8	8	4		8	4	4	2	
Friction loss/ft pipe (psi)	0.0001	0.0000	0.0001		0.0000	0.0004	0.0001	0.0027	
Conservative Pipe Length (ft)	70	30	56		31	55	52	5	
No of branch tees	0	1	1		1	1	1	0	
Equivalent pipe length per tee (ft)	33.15	33.15	17.30		33.15	17.30	17.30	9.15	
Length (ft)	0	33.15	17.3		33.15	17.3	17.3	0	
No of thru tees	0	0	1		0	1	1	1	
Equivalent pipe length per tee (ft)	11.05	11.05	5.77		11.05	5.77	5.77	3.05	
Length (ft)	0	0	5.77		0	5.77	5.77	3.05	
Number of Ball Valves (fully open)	0	1	0		1	0	0	1	
Equivalent pipe length per valve (ft)	1.66	1.66	0.87		1.66	0.87	0.87	0.46	
Length (ft)	0	1.6575	0		1.6575	0	0	0.4575	
Number of 45 degree elbows	0	0	0		0	0	1	0	
Equivalent pipe length per elbow (ft)	6.63	6.63	3.46		6.63	3.46	3.46	1.83	
Length (ft)	0	0	0		0	0	3.46	0	
Number of 90 degree elbows	0	0	1		0	1	0	0	
Equivalent pipe length per elbow	13.26	13.26	6.92		13.26	6.92	6.92	3.66	
Length (ft)	0	0	6.92		0	6.92	0	0	
Total Equivalent Length (ft)	70	65	86		66	85	79	9	
Friction loss (psi)	0.0071	0.0013	0.0111		0.0027	0.0376	0.0101	0.0	Total
Friction Loss (in H2O)	**0.20**	**0.04**	**0.31**		**0.07**	**1.04**	**0.28**	**0.64**	**2.23**

Zone 4 - IDDA2 Wells in Waste (HDPE Piping)	Pump to elbow	elbow to T	T to SVE22	SVE22 to SVE21	SVE21 to SVE20		T to SVE23	SVE23 to SVE24	SVE24 to SVE25	Wellhead	
Air Flow Rate (cfm)	240.0	240.0	120.0	80.0	40.0		120.0	80.0	40.0	40.0	
Pipe Diameter (in)	8	8	8	6	4		8	6	4	2	
Friction loss/ft pipe (psi)	0.0001	0.0001	0.0000	0.0001	0.0001		0.0000	0.0001	0.0001	0.0027	
Conservative Pipe Length (ft)	71	165	30	56	55		25	55	51	5	
No of branch tees	0	0	1	1	1		1	1	1	0	
Equivalent pipe length per tee (ft)	33.15	33.15	33.15	25.45	17.30		33.15	25.45	17.30	9.15	
Length (ft)	0	0	33.15	25.45	17.3		33.15	25.45	17.3	0	
No of thru tees	0	0	1	1	1		0	1	1	1	
Equivalent pipe length per tee (ft)	11.05	11.05	11.05	8.48	5.77		11.05	8.48	5.77	3.05	
Length (ft)	0	0	11.05	8.48	5.77		0.00	8.48	5.77	3.05	
Number of Ball Valves (fully open)	0	0	1	0	0		1	0	0	1	
Equivalent pipe length per valve (ft)	1.66	1.66	1.66	1.27	0.87		1.66	1.27	0.87	0.46	
Length (ft)	0	0	1.6575	0	0		1.6575	0	0	0.4575	
Number of 45 degree elbows	0	0	0	0	1		0	0	1	0	
Equivalent pipe length per elbow (ft)	6.63	6.63	6.63	5.09	3.46		6.63	5.09	3.46	1.83	
Length (ft)	0	0	0	0	3.46		0	0	3.46	0	
Number of 90 degree elbows	1	0	0	1	0		0	1	0	0	
Equivalent pipe length per elbow	13.26	13.26	13.26	10.18	6.92		13.26	10.18	6.92	3.66	
Length (ft)	13.26	0	0	10.18	0		0	10.18	0	0	
Total Equivalent Length (ft)	84	165	76	100	82		60	99	78	9	
Friction loss (psi)	0.0118	0.0231	0.0031	0.0070	0.0105		0.0024	0.0069	0.0100	0.0	Total
Friction Loss (in H2O)	**0.33**	**0.64**	**0.09**	**0.19**	**0.29**		**0.07**	**0.19**	**0.28**	**0.64**	**2.17**

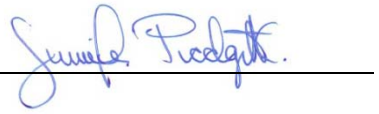
	Zone 1	Zone 2	Zone 3	Zone 4
Piping Frictional Loss (in H2O)	7.47	5.58	2.23	2.17
Total Pressure with 10% degradation factor (in H2O)	8.22	6.13	2.45	2.39
Pressure at SVE Wellhead (psia)	12.71	14.37	14.45	14.45
Allowable Loss (in H20) (10% of pressure at SVE Wellhead)	35.19	39.79	39.99	39.99
Total Per Blower (in H2O)	8.22	6.13	2.45	

Geosyntec consultants

COMPUTATION COVER SHEET

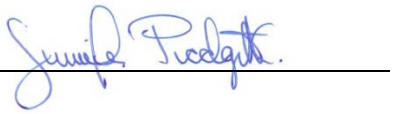
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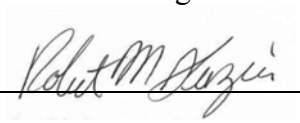
TITLE OF COMPUTATIONS PAVEMENT DESIGN

COMPUTATIONS BY:
Signature  DATE
Printed Name and Title: Jennifer M. Padgett, Staff Engineer

ASSUMPTIONS AND PROCEDURES CHECKED BY: (Peer Reviewer)
Signature  DATE
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Signature  DATE
Printed Name and Title: Robert Glazier, Associate

APPROVAL NOTES:

REVISIONS (Number and initial all revisions)

NO.	SHEET	DATE	BY	CHECKED BY	APPROVAL

PAVEMENT DESIGN

FLEXIBLE PAVEMENT

Pavement design for flexible pavements was performed following the procedures presented in the NYSDOT *Comprehensive Pavement Design Manual (CPDM)*, 2000.

Determine the pavement thickness:

Table 4-5 HMA Thickness Table

M_r = 28 MPa		
80 kN ESALs over Design Life	Total HMA Thickness	Select Granular Subgrade Thickness
millions	mm	mm
ESALs ≤ 2	165	0
2 < ESALs ≤ 4	175	0
4 < ESALs ≤ 8	200	0
8 < ESALs ≤ 13	225	0
13 < ESALs ≤ 23	250	0
23 < ESALs ≤ 45	250	150
45 < ESALs ≤ 80	250	300
80 < ESALs ≤ 140	250	450
140 < ESALs ≤ 300	250	600

M_r = 34 MPa		
80 kN ESALs over Design Life	Total HMA Thickness	Select Granular Subgrade Thickness
millions	mm	mm
ESALs ≤ 4	165	0
4 < ESALs ≤ 7	175	0
7 < ESALs ≤ 13	200	0
13 < ESALs ≤ 23	225	0
23 < ESALs ≤ 40	250	0
40 < ESALs ≤ 70	250	150
70 < ESALs ≤ 130	250	300
130 < ESALs ≤ 235	250	450
235 < ESALs ≤ 300	250	600

M_r = 41 MPa		
80 kN ESALs over Design Life	Total HMA Thickness	Select Granular Subgrade Thickness
millions	mm	mm
ESALs ≤ 6	165	0
6 < ESALs ≤ 11	175	0
11 < ESALs ≤ 20	200	0
20 < ESALs ≤ 35	225	0
35 < ESALs ≤ 60	250	0
60 < ESALs ≤ 110	250	150
110 < ESALs ≤ 200	250	300
200 < ESALs ≤ 300	250	450

M_r = 48 MPa		
80 kN ESALs over Design Life	Total HMA Thickness	Select Granular Subgrade Thickness
millions	mm	mm
ESALs ≤ 8	165	0
8 < ESALs ≤ 16	175	0
16 < ESALs ≤ 30	200	0
30 < ESALs ≤ 50	225	0
50 < ESALs ≤ 85	250	0
85 < ESALs ≤ 160	250	150
160 < ESALs ≤ 300	250	300

M_r = 55 MPa		
80 kN ESALs over Design Life	Total HMA Thickness	Select Granular Subgrade Thickness
millions	mm	mm
ESALs ≤ 12	165	0
12 < ESALs ≤ 20	175	0
20 < ESALs ≤ 40	200	0
40 < ESALs ≤ 65	225	0
65 < ESALs ≤ 115	250	0
115 < ESALs ≤ 215	250	150
215 < ESALs ≤ 300	250	300

M_r = 62 MPa		
80 kN ESALs over Design Life	Total HMA Thickness	Select Granular Subgrade Thickness
millions	mm	mm
ESALs ≤ 15	165	0
15 < ESALs ≤ 30	175	0
30 < ESALs ≤ 50	200	0
50 < ESALs ≤ 90	225	0
90 < ESALs ≤ 150	250	0
150 < ESALs ≤ 300	250	150

Table 4-1 Conventional Pavement Thickness Guide

Annual Average Daily Traffic AADT[1]	Percent Trucks	Subbase Course (all Pavements)	Portland Cement Concrete Pavement	Hot Mix Asphalt Pavement	
				Base Course	Top & Binder Courses Combined[2]
Over 10,000 Vehicles	10 % or more	300 mm	250 mm	150 mm	90 mm
	less than 10 %			125 mm	
6,000 to 10,000	10 % or more	300 mm	225 mm	125 mm	90 mm
	less than 10 %			100 mm	
4,000 to 5,999	All	300 mm	Not Applicable	75 mm	90 mm
Under 4,000 Vehicles	All	300 mm	Not Applicable	75 mm	80 mm

[1] See Section 4.5.1.1.B for AADT definition.
[2] This is for SUPERPAVE HMA - see Chapter 6 of this manual for individual course thicknesses.

The geomembrane cover on the landfill consists, of 1.5 feet of cover soil under 6 inches of top soil. The cover soil is composed of red-brown, silty sand, which may be used as subgrade, as long as the top 6 inches of top soil is removed. Therefore the cross section of the pavement will consist, from top to bottom of:

- Top = 30 mm
- Binder = 50 mm
- Base = 75 mm
- Subbase = 300 mm
- Geotextile
- Subbgrade = 155 mm

Materials:

The recommended SUPERPAVE Item Numbers are:

Top: 402.125301 M
Binder: 402.195901 M
Base: 402.255901 M

The recommended materials for the remaining layers are:

Subbase: Gravel
Geotextile: 8 oz/yd^2
Subgrade: Existing Cover Soil

REFERENCES

NYSDOT, 2000. *Comprehensive Pavement Design Manual.* New York State Department of Transportation. June 30, 2000.

Geosyntec consultants

COMPUTATION COVER SHEET

Client: Cortese LF PRP Group **Project:** Cortese Landfill **Project #:** MR0562B **Task #:** 3

TITLE OF COMPUTATIONS Settlement Evaluation of Concrete Mat for Trailers and Tanks

COMPUTATIONS BY:
Signature _____ DATE _____
Printed Name and Title: Jennifer M. Padgett, Staff Engineer

ASSUMPTIONS AND PROCEDURES CHECKED BY: (Peer Reviewer)
Signature _____ DATE _____
Printed Name and Title: Lucas deMelo, Project Engineer

COMPUTATIONS CHECKED BY:
Signature _____ DATE _____
Printed Name and Title: Chunling Li, Engineer

COMPUTATIONS BACKCHECKED BY: (Originator)
Signature _____ DATE _____
Printed Name and Title: Jennifer M. Padgett, Staff Engineer

APPROVED BY: (PM or Designate)
Signature _____ DATE _____
Printed Name and Title: Robert Glazier, Associate

APPROVAL NOTES: _____

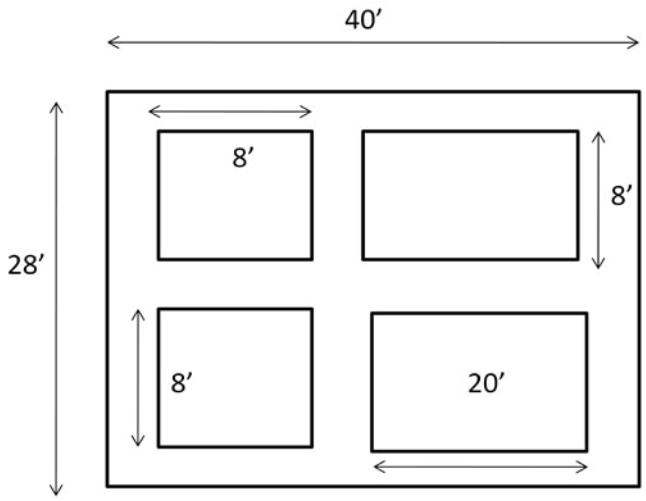
REVISIONS (Number and initial all revisions)

NO.	SHEET	DATE	BY	CHECKED BY	APPROVAL

SETTLEMENT EVALUATION OF CONCRETE MAT FOR TRAILERS AND TANKS

1. Footing Size Selection:

The footing dimensions were chosen to fit two 8 ft x 20 ft trailers and two 8 ft x 8 ft GAC vessel, as shown in the figure below.



The concrete mat will be placed over the landfill. The landfill currently has a geosynthetic cap with two feet of cover soil. The depth of the footing was chosen to be 1 ft, as to not interfere with the cap. Therefore, the dimensions of the footing are:

40 ft x 28 ft x 1 ft

2. Load Calculation:

The load used for settlement calculation was based on the weight of the concrete mat, trailers and GAC vessels.

Mat foundation (assume unit weight of concrete) = 150 psf

Trailers (assume) = 350 psf

GAC vessels (from manufacturer) = 12,900 lbs / (40'x 28') = 11.5 psf

Total Weight = 150 psf +350 psf + 2 x (11.5psf) = 523 psf

Net average pressure at the base of footing:

523 psf – 120 pcf × 1 ft = 403 psf

3. Ultimate Bearing Capacity Calculation:

The ultimate bearing capacity can be determined using the general bearing capacity equation from "Bearing Capacity of Soils" by the US Army Corps Manual:

$$q_u = cN_c\zeta_c + \frac{1}{2}B'\gamma'_H N_\gamma \zeta_\gamma + \sigma'_D N_q \zeta_q$$

- The first term, the cohesion term, is assumed to be zero for conservative purposes.
- The third term, the effective soil or surcharge pressure term, is also assumed to be zero. By assuming the depth of the foundation is zero the calculation is assumed to be on grade, with no excavation, making the calculation also more conservative.

Therefore the equation is reduced to:

$$q_u = \frac{1}{2}B'\gamma'_H N_\gamma \zeta_\gamma$$

where:

B' = minimum effective width of foundation B – $2e_B$, ft
e_B = eccentricity parallel with foundation width B, ft
γ'_H = effective unit weight beneath foundation base within the failure zone, pcf
N_γ = dimensionless bearing capacity factors of soil weight in the failure wedge
ζ_γ = dimensionless correction factors of soil weight in the failure wedge.

The eccentricity in this case is 0, as a result B' is the width of the foundation, 28 ft. The effective unit weight of underlying material is conservatively assumed to be 60 pcf, and the dimensionless factors are chosen from the Tables "Bearing Capacity of Soils" by the US Army Corps Manual presented below.

TABLE 4-1

Terzaghi Dimensionless Bearing Capacity Factors (after Bowles 1988)

ϕ'	N_q	N_c	N_γ
28	17.81	31.61	15.7
30	22.46	37.16	19.7
32	28.52	44.04	27.9
34	36.50	52.64	36.0
35	41.44	57.75	42.4
36	47.16	63.53	52.0
38	61.55	77.50	80.0
40	81.27	95.66	100.4
42	108.75	119.67	180.0
44	147.74	151.95	257.0
45	173.29	172.29	297.5
46	204.19	196.22	420.0
48	287.85	258.29	780.1
50	415.15	347.51	1153.2

ϕ'	N_q	N_c	N_γ
0	1.00	5.70	0.0
2	1.22	6.30	0.2
4	1.49	6.97	0.4
6	1.81	7.73	0.6
8	2.21	8.60	0.9
10	2.69	9.60	1.2
12	3.29	10.76	1.7
14	4.02	12.11	2.3
16	4.92	13.68	3.0
18	6.04	15.52	3.9
20	7.44	17.69	4.9
22	9.19	20.27	5.8
24	11.40	23.36	7.8
26	14.21	27.09	11.7

TABLE 4-2

Terzaghi Correction Factors ζ_c and ζ_γ

Factor	Strip	Square	Circular
ζ_c	1.0	1.3	1.3
ζ_γ	1.0	0.8	0.6

$$q_u = \frac{1}{2} \times 28 \times 60 \times 15.7 \times 0.8$$

The ultimate bearing capacity is therefore 10,550 psf

4. Correction for Mats:

When the widths of the footing is greater than six (B > 6 ft), the bearing capacity may be corrected by multiplying the surcharge term by a reduction factor:

$$r_\gamma = 1 - 0.25 \log_{10} \frac{B}{6}$$

$$r_\gamma = 0.83$$

0.83 x 10,550 psf = 8,756.5 psf

5. Factor of Safety:

$$F = \frac{8766}{403} = 21.75$$

6. Settlement Evaluation:

The primary and secondary settlement is calculated using the following equations.

$$S_p = C_c' H_0 \log\left(\frac{\sigma_{z0} + \Delta\sigma_z}{\sigma_{z0}}\right) \quad (6)$$

$$S_s = C_\alpha' H_0 \log\left(\frac{t_2}{t_1}\right) \quad (7)$$

where: C_c' = modified compression index (= C_c/ (1+e_0), where C_c= compression index and e_0 = initial void ratio); H_0 = soil layer thickness; σ_{z0} = initial vertical stress; $\Delta\sigma_z$ = increment of vertical stress; C'_α = modified secondary compression index; t_2 = future time of interest; t_1= age of waste.

Gabr and Valero [1995] provided values of the modified primary compression index in the range of 0.1 to 0.45. The modified secondary compression index ($C_{\alpha\varepsilon}$) for waste for typical municipal landfills is estimated to be 0.01 to 0.03 [Fasset et al., 1994]. At the Cortese Landfill, the filling of waste started in 1971 and the landfill was closed in 1981. The age of waste (t_1) varies from about 40 years at the bottom of landfill to 30 years at the top. The compressibility of waste should have decreased significantly over the years. Therefore, the lower bound value was assumed for the modified compression index and secondary compression index (i.e., C_c' = 0.10, C'□ = 0.01). The youngest age of waste was conservatively assumed for all depths. The future time of interest selected for secondary settlement consideration is 100 years from now (i.e., $t_2 = t_1+100$).

The settlement is calculated using an excel spreadsheet. Entire thickness of waste underlying the footing is considered for primary and secondary settlement calculations. Based on the calculation shown in Table 1, the estimated primary settlement and secondary settlement of the footing are estimated to be 0.31 ft and 0.07 ft, respectively.

7. Summary:

The preliminary footing size is selected to be 40 ft by 28 ft, the concrete mat is able to safely support the applied holds, and the total settlement is estimated to be approximately 0.4 inches.

References:

1. Fasset, J.B., Leonards, G.A. and Repetto, P.C., "*Geotechnical Properties of Municipal Solid Wastes and their Use Landfill Design*", Wastetech 94, Technical Proceeding 1994.

2. Gabr, M.A., and Valero, S.N., "*Geotechnical Properties of Municipal Solid Waste*," Geotechnical Testing Journal, GTJODJ, Vol. 18, No.2, June 1995, pp. 241-251.

3. U.S. Army Corps of Engineers (1992). *Bearing Capacity of Soils*. Engineer Manual No. 110-1-1905, Department of the Army, Washington DC 20314-1000.

Table 1 Footing Settlement Calculation

Cortese Landfill

C_c'= 0.1 **Net Pressure at Base of Footing (psf)= 403**

C_α'= 0.01 **B= 28** **L= 40**

Depth below Footing, Z ft	Depth below Cover, Z' ft	0.5B/Z	0.5L/Z	Influence Factor, I_f	Initial Stress psf	Average Initial Stress psf	Stress Increment psf	Average Stress Increment psf	Average Waste Age yrs	Settlement (primary compression) ft	Settlement (secondary compression) ft
0.00	1.00	-	-	1.00	65.00		403.00				
2.00	3.00	7.00	10.00	0.99	195.00	130.00	400.74	401.87	30.00	0.12	0.01
4.00	5.00	3.50	5.00	0.98	325.00	260.00	394.94	397.84	30.00	0.08	0.01
6.00	7.00	2.33	3.33	0.95	455.00	390.00	382.85	388.90	30.00	0.06	0.01
8.00	9.00	1.75	2.50	0.92	585.00	520.00	370.76	376.81	40.00	0.05	0.01
10.00	11.00	1.40	2.00	0.88	715.00	650.00	354.64	362.70	40.00	0.04	0.01
11.00	12.00	1.27	1.82	0.82	780.00	747.50	330.46	342.55	40.00	0.02	0.01
									Sum:	0.31	0.07

Settlement (primary compression) (ft): 0.31
Settlement (secondary compression) (ft): 0.07
Total Settlement (ft): 0.38

Geosyntec consultants

COMPUTATION COVER SHEET

Client: Cortese LF PRP Group **Project:** Cortese Landfill **Project #:** MR0562B **Task #:** 3

TITLE OF COMPUTATIONS Stormwater Management

COMPUTATIONS BY:
Signature _____ DATE _____
Printed Name and Title: Jennifer M. Padgett, Staff Engineer

ASSUMPTIONS AND PROCEDURES CHECKED BY: (Peer Reviewer)
Signature _____ DATE _____
Printed Name and Title: Jeff Wheeler, Designer

COMPUTATIONS CHECKED BY:
Signature _____ DATE _____
Printed Name and Title: Chunling Li, Engineer

COMPUTATIONS BACKCHECKED BY: (Originator)
Signature _____ DATE _____
Printed Name and Title: Jennifer M. Padgett, Staff Engineer

APPROVED BY: (PM or Designate)
Signature _____ DATE _____
Printed Name and Title: Robert Glazier, Associate

APPROVAL NOTES: _____

REVISIONS (Number and initial all revisions)

NO.	SHEET	DATE	BY	CHECKED BY	APPROVAL

Stormwater Management

1. Culvert Design for New Road:

A new road is being proposed to direct traffic from the existing pavement road, onto the landfill. The proposed road crosses a ditch; therefore a culvert needs to be designed to safely convey water under the proposed road. The location of the culvert is shown in Figure 1. The area draining into the ditch consists of a section of the main road. The drainage area and ditch were modeled to size the culvert using HydroCAD. The results are attached. An eight-inch reinforced concrete pipe is recommended to safely convey the 24-hr, 25-yr storm.

2. Erosion and Sediment Control for New Road:

Currently, the landfill area sheet flows into a riprap lined channel on the west side of the site. With the addition of the pavement road, the velocity of water flow during a storm is expected to increase due to the pavement. Therefore, it is important to ensure that the apron outlet for the riprap lined channel is adequately sized to handle the new peak discharge for the 24-hour, 25-yr storm. The drainage area, pavement road and channel were modeled to size the culvert using HydroCAD. The results from HydroCAD are attached.

To determine the size of the apron, the trapezoidal riprap channel is assumed to be a circular pipe, using the depth as the diameter.

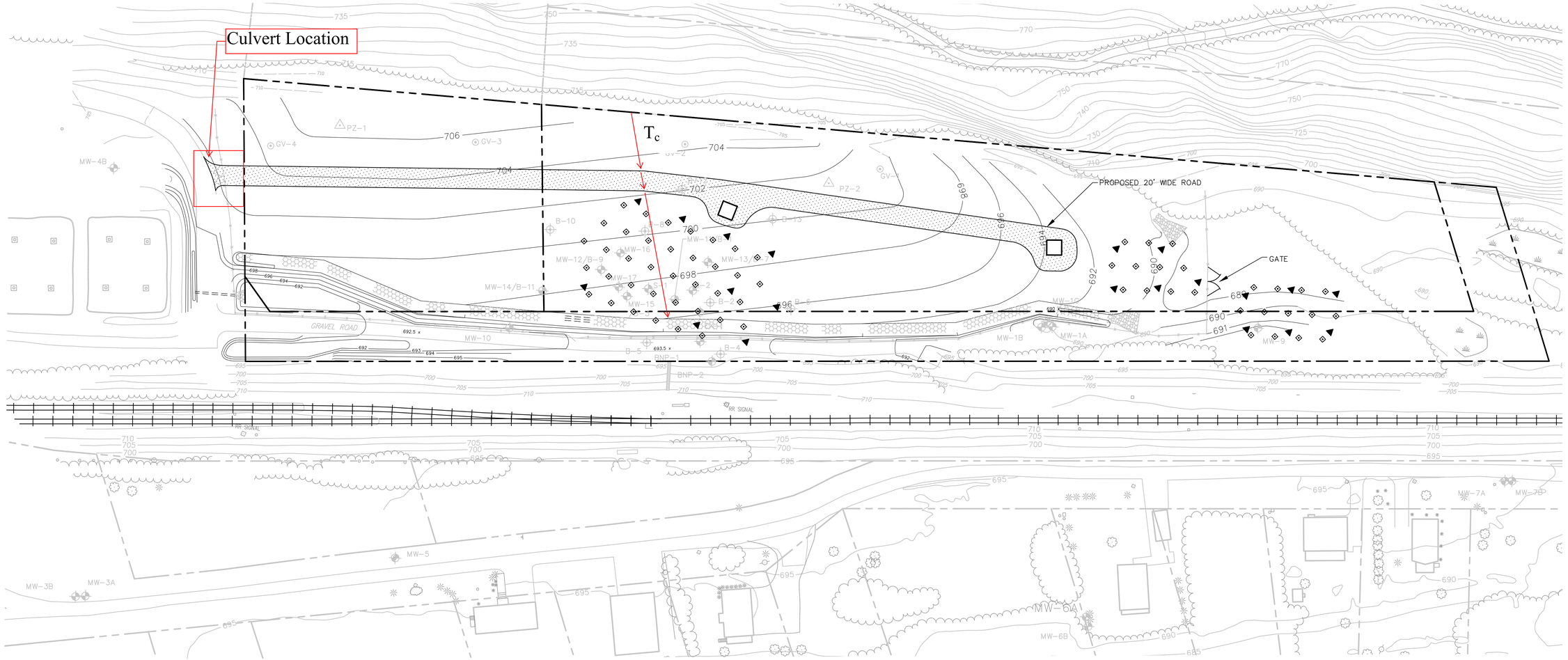
From HydroCAD: v = 2.4 fps
D = 2 ft

$$Q = A \times v = \left(\frac{\pi d^2}{4}\right) \times v$$

$$Q = \left(\frac{\pi \times 2^2}{4}\right) \times 2.4 = 4.8\ cfs$$

From Figure 5B.12 from the New York Standards and Specifications, we find that for a d = 24 in and Q = 5 cfs, stone diameter, d_{50}=0.2 ft and the apron length, L_a = 10 ft.

Therefore, the required apron dimensions are L_a = 10 ft and width, W = bottom width of channel +L_a = 2 ft + 10 ft = 12 ft. The existing apron (L_a = 10 ft and W = 13 ft) is therefore of adequate size to handle the 24-hr, 25-yr storm.



LEGEND

- LANDFILL PROPERTY BOUNDARY
- APPROXIMATE EDGE OF DELAWARE RIVER
- FENCE
- LANDFILL COVER ELEVATION CONTOUR
- PRE-EXISTING TOPOGRAPHY ELEVATION CONTOUR
- PASSIVE GAS VENT
- MONITORING WELL
- SURFACE WATER SAMPLE POINT
- PIEZOMETER
- SOIL VAPOR EXTRACTION WELL
- SOIL VAPOR EXTRACTION WELL IN WASTE
- AIR SPARGING WELL

50 25 0 50 100
SCALE IN FEET

Cortese Landfill – NPL Site Remedy Design

Narrowsburg, New York

Geosyntec consultants

COLUMBIA, MARYLAND

MAY 2011

FIGURE 1

P:\cadd\0562--cortese\0562_s00\0562-d01.dwg, 2, 6/3/2011 2:21:16 PM, geosyntec consultants, inc. - tj

APPENDIX C

Construction Specifications and Drawings

ENGINEERING SPECIFICATIONS

FOR THE CONSTRUCTION OF

OU 4 REMEDIAL DESIGN
CORTESE LANDFILL SITE
NARROWSBURG, NEW YORK

PREPARED FOR

CORTESE LANDFILL PRP GROUP

PRE-FINAL DESIGN REPORT
AUGUST 2011

PREPARED BY:

Geosyntec consultants

engineers | scientists | innovators

10220 Old Columbia Road, Suite A
Columbia, Maryland 21046
PROJECT NUMBER: MR0562B
AUGUST 2011

DIVISION 01 – GENERAL REQUIREMENTS

SECTION	TITLE	REVISION	DATE
01 00 00	**GENERAL REQUIREMENTS**		
01 10 00	**SUMMARY**		
01 11 00	Summary of Work		
01 11 13	Work Covered by Contract Documents		
01 14 16	Coordination with Occupants		
01 14 19	Use of Site		
01 30 00	**ADMINISTRATIVE REQUIREMENTS**		
01 32 16	Construction Progress Schedule		
01 32 19	Submittals Schedule		
01 32 33	Photographic Documentation		
01 33 00	Submittal Procedures		
01 33 23	Shop Drawings, Product Data, and Samples		
01 35 00	**SPECIAL PROCEDURES**		
01 35 29	Health, Safety, and Emergency Response Procedures		
01 35 29.13	Health, Safety, and Emergency Response Procedures for Contaminated Sites		
01 40 00	**QUALITY REQUIREMENTS**		
01 42 19	Reference Standards		
01 45 16	Field Quality Control Procedures		
01 45 16.13	Contractor Quality Control		
01 50 00	**TEMPORARY FACILITIES AND CONTROLS**		
01 60 00	**PRODUCT REQUIREMENTS**		
01 66 00	Product Storage and Handling Requirements		
01 70 00	**EXECUTION AND CLOSEOUT REQUIREMENTS**		
01 71 23.16	Construction Surveying		
01 75 13	Checkout Procedures		
01 77 00	Closeout Procedures		
01 78 23	Operation and Maintenance Data		
01 78 39	Project Record Documents		

DIVISION 02 – EXISTING CONDITIONS

SECTION	TITLE	REVISION	DATE
02 00 00	**EXISTING CONDITIONS**		
02 05 00	Common Work Results for Existing Conditions		
02 05 19	Geosynthetics for Existing Conditions		
02 20 00	**ASSESSMENT**		
02 22 00	Existing Conditions Assessment		
02 24 00	Environmental Assessment		
02 61 00	**CONTAMINATED SITE MATERIAL REMOVAL**		
02 62 00	**Light Non-Aqueous Phase Liquid Recovery Processes**		
02 62 16	Soil Vapor Extraction		

DIVISION 03 – CONCRETE

SECTION	TITLE	REVISION	DATE
03 00 00	**CONCRETE**		
03 05 00	Common Work Results for Concrete		
03 30 00	**CAST-IN-PLACE CONCRETE**		
03 30 53	Miscellaneous Cast-in Place Concrete		
03 35 00	Concrete Finishing		
03 39 00	Concrete Curing		

DIVISION 22 – PLUMBING

SECTION	TITLE	REVISION	DATE
22 00 00	**PLUMBING**		
22 05 00	Common Work Results for Plumbing		
22 06 15	Schedules for General Service Compressed-Air Equipment		
22 15 00	**GENERAL SERVICE COMPRESSED-AIR SYSTEMS**		
22 15 19.19	General Service Packaged Rotary-Screw Air Compressors		

DIVISION 26 – ELECTRICAL

SECTION	TITLE	REVISION	DATE
26 00 00	**ELECTRICAL**		
26 05 00	Common Work Results for Electrical		
26 05 12	Tracer Wire and Marking Tape for Underground Conduit		
26 05 19	Low-Voltage Electrical Power Conductors and Cables		
26 05 26	Grounding and Bonding for Electrical Systems		
26 05 30	Wiring Devices		
26 05 33	Raceways and Boxes for Electrical Systems		
26 05 53	Identification for Electrical Systems		
26 50 00	**LIGHTING**		
26 51 00	Interior Lighting		
26 51 13	Interior Lighting Fixtures, Lamps, and Ballasts		
26 52 00	Emergency Lighting		

DIVISION 31 – EARTHWORK

SECTION	TITLE	REVISION	DATE
31 00 00	**EARTHWORK**		
31 05 00	Common Work Results For Earthwork		
31 10 00	**SITE CLEARING**		
31 11 00	Clearing and Grubbing		
31 20 00	**EARTH MOVING**		
31 23 00	Excavation and Fill		
31 23 33	Trenching and Backfilling		
31 25 00	Erosion and Sedimentation Controls		

DIVISION 32 – EXTERIOR IMPROVEMENTS

SECTION	TITLE	REVISION	DATE
32 00 00	**EXTERIOR IMPROVEMENTS**		
32 05 00	Common Work Results for Exterior Improvements		
32 10 00	**BASES, BALLASTS, AND PAVING**		
32 12 16	Asphalt Paving		
32 30 00	**SITE IMPROVEMENTS**		
32 31 13	Chain Link Fences and Gates		
32 90 00	**PLANTING**		
32 92 19	Seeding		

DIVISION 33 – UTILITIES

SECTION	TITLE	REVISION	DATE
33 05 00	Common Work Results for Utilities		
33 05 23	Trenchless Utility Installation		
33 20 00	**WELLS**		
33 40 00	**STORM DRAINAGE UTILITIES**		
33 42 16	Concrete Culverts		
33 70 00	**ELECTRICAL UTILITIES**		
33 71 73	Electirical Utility Servicies		

DIVISION 40 - PROCESS INTEGRATION

SECTION	TITLE	REVISION	DATE
40 00 00	**PROCESS INTEGRATION**		
40 05 00	Common Work Results for Process Integration		
40 05 13.11	Leak Testing of Piping		
40 05 13.12	Tracer Wire and Marking Tape for Buried Piping		
40 05 13.73	Plastic Process Piping (Sch. 80 PVC Piping)		
40 05 13.74	Plastic Process Piping (CPVC Piping)		
40 05 13.75	HDPE Process Piping		
40 05 23	Common Work Results for Process Valves		
40 05 23.19	Stainless Steel Process Valves		
40 05 23.33	Brass and Iron Process Valves		
40 05 29	Hangers and Supports for Process Piping Systems		
40 90 00	**INSTRUMENTATION AND CONTROLS**		

DIVISION 42 – PROCESS HEATING, COOLING, AND DRYING EQUIPMENT

SECTION	TITLE	REVISION	DATE
42 00 00	**PROCESS HEATING, COOLING, AND DRYING EQUIPMENT**		
42 05 00	Common Work Results for Heating, Cooling, & Drying Equipment		
42 06 20	Schedules for Process Heating, Cooling, and Drying Equipment		

DIVISION 43 PROCESS GAS & LIQUID HANDLING EQUIPMENT

SECTION	TITLE	REVISION	DATE
43 00 00	**PROCESS GAS & LIQUID HANDLING EQUIPMENT**		
43 05 00	Common Work Results for Gas & Liquid Handling Equipment		
43 06 00	Schedules For Process Gas And Liquid Handling, Purification, and Storage Equipment		
43 06 10	Schedules for Gas Handling Equipment		
43 10 00	**GAS HANDLING EQUIPMENT**		
43 11 34	Regenerative Rotary Blowers		
43 30 00	**GAS AND LIQUID PURIFICATION EQUIPMENT**		
43 31 13.13	Vapor Phase Activated Carbon Adsorption Units		

Attachment 1 – Instrument List

CORTESE LANDFILL SITE

NARROWSBURG, NEW YORK

OU 4 REMEDIAL DESIGN

ENGINEERING SPECIFICATIONS

DIVISION 01

GENERAL REQUIREMENTS

PROJECT:	**OU 4 REMEDIAL DESIGN**
LOCATION:	**CORTESE LANDFILL NARROWSBURG, NEW YORK**
PROJECT NO.:	**MR0562B**
COMPANEW YORK:	**CORTESE LANDFILL PRP GROUP**
PREPARED BY:	Geosyntec consultants engineers | scientists | innovators

SECTION 01 00 00 – GENERAL REQUIREMENTS

Part 1 General

1.01 General Conditions

A. The General Conditions apply to all divisions and sections of this Engineering Specification, which shall be used to perform work as shown on the plans and as specified herein, and shall be properly coordinated with work as described in the related Specifications.

B. The Drawings and these Specifications are complementary to each other; what is called for by one shall be as binding as if called for by both. If there is any conflict between what is shown on the drawings and what is written in the Specifications, the details described on the drawings shall take precedence and the CONTRACTOR shall communicate the conflicts to the OWNER's REPRESENTATIVE in a timely manner.

1.02 Referenced Sections – None

1.03 Cited Standards

A. Standards listed as "Cited Standards" in the various sections of these contract documents are hereby incorporated into these Specifications by reference.

B. Referenced documents shall include all revisions, amendments, supplements, or addenda issued on or before the date of advertising for bids.

1.04 Safety

A. The CONTRACTOR shall be familiar with, and shall at all times conform to the regulations of the *"OSHA General Industry Occupational Safety and Health Standards," "OSHA Safety and Health Regulations for Construction," OSHA Hazardous Waste Operation and Emergency Response (HAZWOPER) regulations*, and other applicable state and municipal standards and regulations.

1.05 Quality Control

A. The CONTRACTOR shall be licensed by the State of New York, maintain workers' compensation insurance, and general liability insurance.

B. They must provide the Licensing Division with their Federal Employer I.D. # and or their Social Security Number.

C. Best Management Practices (BMPs) related to the work of this project are found in the following sections and their sub-sections:

1. SECTION 01 40 00 - QUALITY REQUIREMENTS
2. SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS
3. SECTION 01 60 00 - PRODUCT REQUIREMENTS

D. Additional BMPs may also be included throughout specific sections of each Division of these specifications in order for the CONTRACTOR to conduct work in an environmentally responsible manner.

1.06 Cultural Resources

A. The CONTRACTOR's attention is directed to the National Historic Preservation Act of 1966 (16 U.S.C. 470) and 36 CFR 800 which provides for the preservation of potential historical architectural, archeological or cultural resources (hereinafter called "cultural resources"). If potential cultural resources are discovered during subsurface excavations at the Site of construction, the following procedures shall be instituted:

1. The CONTRACTOR shall immediately notify the ENGINEER.

2. The ENGINEER will issue a Field Order directing the CONTRACTOR to cease all construction operations at the location of such potential cultural resources find.

3. Such Field Order shall be effective until such time as a qualified archeologist can be called to assess the value of these potential cultural resources and make recommendations to the State Historical Society Archeologist.

B. If the archeologist determines that the potential find is a bona fide cultural resource, at the direction of the State Historical Society Archeologist, the CONTRACTOR shall suspend work at the location of the find under the provisions for changes contained in Articles 13, 14 and 15 of the General Conditions.

Part 2 Products – Not Used

Part 3 Execution – Not Used

END OF SECTION

SECTION 01 10 00 - SUMMARY

01 11 00 Summary of Work

Part 1 General

1.01 Section Includes

A. Description of Project.

B. Location.

C. Access to the Site.

D. Scope of work.

E. Description of work.

F. Sequence of work.

1.02 Description of Project

A. The Remedial Action to be constructed by the CONTRACTOR is two (2) air sparging (AS)/soil vapor extraction (SVE) systems being constructed in the vicinity of former Intact Drum Disposal Area (IDDA) 1b and the vicinity of former IDDA 2 and the former septage lagoons at the Cortese Landfill Site in Narrowsburg, New York. Each AS/SVE system will include AS and SVE wells, trailers housing the AS/SVE process equipment, off-gas treatment equipment, access road to each area and staging pads for equipment, header piping/valves, and required utilities. Additional infrastructure will be installed for the future addition of amendments to the AS/SVE systems. Profiling and off-site disposal of existing investigation-derived waste, and recovery of light non-aqueous phase liquids, is also required.

1.03 Location

A. The Site is located in Narrowsburg, New York.

1.04 ACCESS TO THE SITE

A. Access to the Site is available from Engleman Avenue.

B. CONTRACTOR shall make all necessary arrangements with the authorities having jurisdiction for the movement of CONTRACTOR material and equipment to and from the Site over public roadways.

1.05 Scope of Work

A. The Work to be performed under the Contract consists of the construction, installation and associated work including start-up testing for the Remedial Action

1.06 Description of Work

1. Project startup including mobilization to the Site.

2. Development, implementation, and maintenance of a Remedial Action Work Plan (RAWP) including a Site-specific Health and Safety Plan, and a Remedial Action Management Plan including project team members/organization, project schedule, method for implementing CQA Plan, decon plan, permit plan, operations plan (work sequencing and coordination site prep/security/decon) equipment storage, site maintenance, traffic plan, erosion and dust control, submittals protocol, and reports;

3. Provision and maintenance of temporary facilities and controls;

4. Waste profiling and removal of investigation derived wastes;

5. Collection of free product from existing monitoring wells MW-13, S-1 and S-2 throughout construction.

6. AS and SVE well installation in two separate treatment areas;

7. Repair of landfill cap geosynthetics that were cut to access the underlying subsurface during boring and well installations;

8. Upgrade of the Site entrance from Engleman Lane with a stormwater culvert.

9. Construction of a temporary access road to the treatment areas and concrete footings to support the AS/SVE and off-gas treatment process equipment.

10. Assembly and delivery of the AS/SVE trailers to house the AS and SVE process equipment;

11. Delivery and connection of the off-gas treatment equipment to the AS/SVE trailers;

12. Installation of exterior AS and SVE piping and associated valves and fittings to connect the AS and SVE wells, respectively, to the AS/SVE trailers;

13. Paving of the permanent access road to the treatment areas.

14. Extension of the chain-linked fence to include the septage lagoon treatment area and installation of a gate.

15. Installation of electrical and data communication service connections to the AS/SVE trailers;

16. Start-up of the AS and SVE systems;

17. Site restoration; and

18. Site demobilization.

1.07 Noted Restrictions

A. No work on the Site shall be conducted until the RAWP has been approved by OWNER and the regulating agencies.

Part 2 Products – Not Used

Part 3 Execution – Not Used

END OF SECTION

01 11 13 Work Covered by Contract Documents

Part 1 General

1.01 Section Includes

A. This section provides a description of the Work Covered by the Contract Documents.

1.02 Referenced Sections

A. Related Sections are listed below:

1. SECTION 00 20 00 - INSTRUCTIONS FOR PROCUREMENT

2. SECTION 00 70 00 - CONDITIONS OF THE CONTRACT

1.03 Cited Standards – none

1.04 Noted Restrictions

A. For the purposes of this project, all work to be performed shall be as described in the Bid Forms of the associated **CONSTRUCTION CONTRACT**, and will not be included in this section.

1.05 Quality Control

A. Work Covered by Contract Documents requires purchase, furnishing of all material and equipment, and labor to perform installation and operation of all equipment and material.

B. The CONTRACTOR shall be responsible for obtaining, at a minimum, the following permits:

1. Building Permit for the Town of Tusten

2. Sign Permit for the Town of Tusten

C. The CONTRACTOR shall include anticipated costs for obtaining the necessary permits for the Work to be performed.

Part 2 Products – Not Used

Part 3 Execution – Not Used

END OF SECTION

01 14 16 Coordination with Occupants

Part 1 General

1.01 Section Includes

A. This section provides a description of how the CONTRACTOR shall coordinate construction activities with the OWNER and surrounding occupants.

1.02 Referenced Sections – None

1.03 Cited Standards – None

1.04 Noted Restrictions

A. The CONTRACTOR shall conduct its operations so as not to interfere unnecessarily with the authorized work of utility companies, other agencies, or facility operators or general city personnel. No street or access shall be closed without first obtaining permission of the OWNER's REPRESENTATIVE and proper governmental authority.

B. Care must be exercised not to damage the existing landfill closure systems. Penetration of the existing landfill closure system will be conducted as indicated on the Construction Drawings, or as directed by the OWNER'S REPRESENTATIVE. All penetrations will be repaired prior to completion of the Work.

1.05 Quality Control

A. The CONTRACTOR shall comply with all applicable federal, state and local standards, codes, permitting, and other restrictions in effect for construction activities within the City limits.

1. The CONTRACTOR shall develop and implement a plan to minimize the effect of construction activities on surrounding areas and shall be responsible for providing prior notice to the OWNERS of all business and residential properties where access to the properties may be restricted.

2. The CONTRACTOR shall restrict access to businesses within the affected area during normal business hours.

3. The CONTRACTOR shall minimize restriction of access to residential properties to the extent practicable.

Part 2 Products – Not Used

Part 3 Execution – Not Used

END OF SECTION

01 14 19 Use of Site

Part 1 General

1.01 Section Includes

A. This section provides a description of how the CONTRACTOR shall use the designated Site area.

1.02 Referenced Sections – None

1.03 Cited Standards – None

1.04 Noted Restrictions

A. "Use of the Site" will be in accordance with the access agreements agreed to for each specific Site/property owner that the project is worked on.

B. The CONTRACTOR shall limit work activities to the construction Site and shall restrict storage of construction materials, equipment, etc. to a Site (or Sites) designated by the OWNER.

C. Holes and/or trenches shall not be left in any locations unguarded. If it is necessary to do so, the CONTRACTOR shall provide suitable protection and warning signs to prevent injury.

D. The use or storage of explosives on the work or Site will not be permitted.

1.05 Quality Control

A. The CONTRACTOR shall assume full responsibility for protection and safekeeping of all equipment and products needed for construction.

B. The CONTRACTOR shall determine if there are underground wires, cables, pipelines, or other apparatus in the work area prior to excavation as the CONTRACTOR shall be liable for any damage to underground utilities caused by excavation.

1.06 CONTRACTOR's Work and Storage Area

A. The OWNER's REPRESENTATIVE will designate and arrange for the CONTRACTOR's use of a portion of the property adjacent to the Work for its exclusive use during the term of the Contract as an office and storage and shop area for its construction operations relative to this Contract.

B. The CONTRACTOR shall be solely responsible for the security of its tools, supplies and equipment at the Site.

Part 2 Products – Not Used

Part 3 Execution – Not Used

END OF SECTION

SECTION 01 30 00 – ADMINISTRATIVE REQUIREMENTS

01 32 00 Construction Progress Documentation

01 32 16 Construction Progress Schedule

Part 1 General

1.01 Section Includes

A. This section provides a description of the construction progress documentation.

1.02 Referenced Sections

A. Related Sections are listed below:

1. SECTION 00 70 00 - CONDITIONS OF THE CONTRACT

1.03 Progress Schedules

A. Progress schedules shall represent a practical plan to complete the Work within the Contract time(s) of completion indicated, and shall convey the CONTRACTOR's intent in the manner of execution and progress of the Work.

B. The scheduling and execution of construction in accordance with the Contract Documents are the responsibility of the CONTRACTOR. The CONTRACTOR shall involve and coordinate all Subcontractors and material suppliers in the development and updating of progress schedules.

C. The submittal of progress schedules shall be understood to be the CONTRACTOR's representation that the progress schedule meets the requirements of the Contract Documents and that the Work will be executed in the sequence and duration indicated in the progress schedule.

D. Scheduling Format

1. The Project Schedule shall be computer produced by utilizing project scheduling software such as Primavera, Microsoft Project, SureTrak, Timeline or other equivalent software as approved by the OWNER's REPRESENTATIVE.

2. The Project Schedule shall be updated monthly and shall show Contract tasks, the percent complete, progress bars, baseline schedules, milestones, start and finish dates, and other breakdowns as required by the OWNER's REPRESENTATIVE. The schedules shall show clearly the sequence of activities and shall list specifically the following activities:

a. Interim milestone completion dates. Phasing and staging of the Work as specified shall be prominently identified.

b. Submittals and the OWNER's review of submittals.

c. Any long lead time (over 60 days) orders for material and equipment.

d. Work to be performed by other contractors or agencies.

3. Descriptions of scheduled activities shall include sufficient detail to identify the work that is to be accomplished.

a. The schedule shall contain sufficient activities to clearly show the sequence and interdependencies of the Work. The schedule shall be prepared in such a way that an activity or group of activities will correspond directly with the bid item breakdown and/or the breakdown of lump sum bid items. The OWNER's REPRESENTATIVE may request that additional activities be added.

b. Activity durations shall be expressed in whole days. Work that is to be performed by Subcontract shall be clearly defined.

c. Float suppression techniques, such as preferential sequencing (crew movement, equipment use, and form reuse), extended duration, imposed dates, scheduling of work not required for the Contract, and others, shall not be used to affect or limit float in the schedule. The use of constraint dates should be minimized, and must be approved by the OWNER.

4. A schedule showing that Work that is completed in less than the completion time specified, that is found to be practical by the OWNER's REPRESENTATIVE, shall be considered to have float. The float shall be the time between the scheduled completion of the Work and the Contract completion date. Float time shall not be for the exclusive benefit of the CONTRACTOR.

5. A schedule found to be impractical for the preceding reasons or any other reasons shall be revised by the CONTRACTOR and resubmitted.

Part 2 Products – Not Used

Part 3 Execution – Not Used

END OF SECTION

01 32 19 Submittals Schedule

Part 1 General

1.01 Section Includes

A. This section includes information regarding submittals schedules.

1.02 Referenced Sections

A. Related Sections are listed below:

1. SECTION 01 32 16 - CONSTRUCTION PROGRESS SCHEDULES

1.03 Cited Standards – None

1.04 Noted Restrictions

1.05 Quality Control (Submittal Requirements)

A. The CONTRACTOR shall submit a completed submittal schedule and list of products for all items requiring the OWNER's review and approval within ten (10) calendar days after the effective date of Notice to Proceed. The following shall be included in the submittal:

1. Submittals, including description of the item and name of manufacturer, trade name and model number.

2. Specification reference.

3. Intended submission/resubmission date(s).

4. Order release date.

5. Lead time to delivery/anticipated delivery date(s).

6. Highlight any items that require expedited review to meet the project schedule.

B. Schedules shall be presented in a form acceptable to the OWNER in both electronic and hard copy versions and shall be updated and sent to the OWNER on a monthly basis. The CONTRACTOR shall identify all submittals that are required by the Contract Documents and determine the date on which each submittal will be submitted in conformance with the schedules specified in **Section 01 32 16 - Construction Progress Schedules**.

C. Submittals involving engineering design services, such as shoring and underpinning, excavation support structures, falsework for concrete, and load and design calculations, shall be sealed and signed by a Professional Engineer, currently registered in the State of New York for the discipline involved.

1. Other submittals involving engineering design services, when specified or required by governing codes and regulations, shall be

sealed and signed by a professional engineer, currently registered in the State of New York, for the discipline involved.

D. Review Period

1. The CONTRACTOR shall prepare submittals sufficiently in advance so that approval may be given before commencement of the related work.

2. Fifteen (15) calendar days shall be allowed after receipt by the OWNER for review of each submittal, including re-submittals.

3. The CONTRACTOR shall be responsible for determining whether or not certain governmental entities and utility districts require longer review periods. When longer review periods are required, the CONTRACTOR shall schedule the Work accordingly, so that the Work and project progress schedules are not adversely impacted.

E. Submittal Delivery

1. The CONTRACTOR shall deliver submittals by shipping them prepaid to OWNER'S REPRESENTATIVE, or by delivering them to the OWNER'S REPRESENTATIVE directly by hand.

F. Transmittal forms shall accompany submittals and include the following information:

1. The CONTRACTOR's name, address, and telephone number;

2. Submittal number and date;

3. Contract title and number;

4. Supplier's, manufacturer's, or Subcontractor's name, address, and telephone number; and

5. Subject identification including Contract Drawing and Specification reference.

G. Changes in approved submittals will not be allowed unless those approved submittals with changes have been resubmitted and approved, in the same manner as the original submittal.

H. Supplemental submittals initiated by the CONTRACTOR for consideration of corrective procedures shall contain sufficient data for review. Make supplemental submittals in the same manner as initial submittals.

Part 2 Products – Not Used

Part 3 Execution – Not Used

END OF SECTION

01 32 33 Photographic Documentation

Part 1 General

1.01 This section describes the specifications for photographic documentation to document the progress of remedial construction including:

A. Preconstruction photographs.

B. Periodic construction photographs

1. On-Site construction photographs

2. Off-Site construction photographs

C. Final Completion construction photographs

1.02 Quality Control

A. Digital Photographs

1. Each photograph shall contain at least one person or other easily identifiable object properly located to effectively illustrate dimensional scale of work being photographed.

2. Take photographs that are in focus. Photographs with blurry or out-of-focus areas will not be accepted.

3. Submit digital images exactly as recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.

4. All photographs, with the exception of Final Completion construction photographs, will include the date stamp of the date the photograph was taken.

B. Photographic Index

1. Each photograph will be identified by digital file name, date, time, orientation and description of the subject.

1.03 Usage Rights

A. Permission for CONTRACTOR to use construction photographs will be subject to approval of OWNER.

1.04 Submittals

A. Digital Images: Submit a complete set of digital image electronic files and photographic index as Project Record Document on CD-ROM.

Part 2 Products

2.01 Photographic Media

A. Digital Images

1. Provide images in uncompressed JPEG format, produced by a digital camera producing a high-resolution image.

2. Include date and time in filename of each image.

Part 3 Execution

3.01 Construction Photographs

A. General: Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work.

B. Preconstruction Photographs: Before starting construction, take color digital photographs of Site and surroundings including access routes, including existing items to remain during construction, from different vantage points

1. Flag construction limits before taking any construction photographs.

2. Take a minimum of eight (8) photographs to show existing conditions adjacent to Site before starting the Work.

3. Take a minimum of twelve (12) photographs of existing conditions of the Site to accurately record physical conditions at start of construction.

C. Periodic Construction Photographs

1. On-Site Construction Photographs: Take twenty (20) color digital photographs weekly to show status of construction at the Site and progress since last photographs were taken.

a. Select vantage points to show status of construction from differing directions.

2. Off-Site Construction Photographs: Take twelve (12) color digital photographs weekly to show status of off-Site construction of the AS/SVE trailers and progress since last photographs were taken.

a. Take eight (8) photographs of the trailer interior.

b. Take four (4) photographs of the trailer exterior.

D. Final Completion Construction Photographs: Take a minimum of sixteen (16) color photographs after date of satisfactory completion for submission as Project Record Documents.

E. OWNER'S REPRESENTATIVE-Directed Construction Photographs: OWNER'S REPRESENTATIVE may direct CONTRACTOR about number

and frequency of color digital photographs and general directions or vantage points. Select actual vantage points and take photographs to show the status of construction and progress since last photographs were taken.

END OF SECTION

01 33 00 Submittal Procedures

Part 1 General

1.01 Section Includes

A. This section specifies the general methods and requirements of submissions applicable to shop drawings, product data and samples, and operations and maintenance manuals. Detailed submittal requirements are specified in the technical Specifications sections.

B. The term “submittal” as used herein shall be understood to include working drawings, detail design calculations, shop drawings, fabrication and installation drawings, erection drawings, lists, graphs, operating instructions, catalog sheets, data sheets, samples, and similar items.

1.02 Referenced Sections

A. Related Sections are listed below:

1. SECTION 01 32 16 – CONSTRUCTION PROGRESS SCHEDULES

2. SECTION 01 33 23 – SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

3. SECTION 01 45 00 – QUALITY CONTROL

4. SECTION 01 77 00 – CLOSE OUT PROCEDURES

1.03 Cited Standards - None

1.04 Noted Restrictions

A. All submittals shall be complete, clearly typed, and legible. Incomplete submittals will be returned without review comments and no time extensions will be granted.

B. The CONTRACTOR is responsible for reviewing submittals made by his Suppliers and Subcontractors before transmitting them to the OWNER’S REPRESENTATIVE to assure proper coordination of the work and to determine that each submittal is in accordance with the Contract Documents. Incomplete or inadequate submittals will be returned for revisions without review.

1.05 Quality Control

A. CONTRACTOR's Responsibilities

1. The CONTRACTOR shall stamp and sign each submittal as having been reviewed and approved prior to submission, and shall be responsible for the following:

a. The correctness of the drawings, for shop fits and field connections, and for the results obtained by the use of such drawings.

b. Verification of catalog numbers, and similar data.

c. Determination and verification of field measurements and field construction criteria.

d. Checking and coordinating information in the submittal with requirements of the Work and of the Contract Documents.

e. Determination of accuracy and completeness of dimensions, quantities, and field conditions at the Site.

f. Safety precautions.

g. Errors or omissions on submittals.

h. Coordination and performance of work of all trades.

i. Identification and subsequent notification to the OWNER'S REPRESENTATIVE if there are deviation(s) from Contract requirements and Conformance with the Specifications.

2. A submittal cover sheet shall accompany each submittal and shall clearly indicate the names of the Project, OWNER, ENGINEER, CONTRACTOR, and Subcontractor or supplier (if appropriate), as well as the date, submittal number and contract number. Each item included in the submittals shall be listed on the cover sheet with a description, applicable project specification section, drawing number (if appropriate), location in the WORK, quantity required, and whether the item is being submitted as a product listed in the Contract Documents or as an equivalent substitution.

3. The CONTRACTOR shall coordinate each submittal with the requirements of the Work, placing particular emphasis upon assuring that each submittal of one trade is compatible with other submittals of related work.

4. All submittals shall bear the stamp of approval and signature of CONTRACTOR as evidence that CONTRACTOR has reviewed them. CONTRACTOR's stamp shall contain the following (minimum):

PROJECT NAME _____

CONTRACTOR'S NAME _____

Date: _____

Submittal No.: _____

Approved By: _____

5. The CONTRACTOR stamp and signature certify the following:

   a. The dimensional compatibility of the product with the space in which it is intended to be used.

   b. The review of submittals for compliance with Contract requirements.

6. A number shall be assigned to each submittal by the CONTRACTOR starting with No. 1 and thence numbered consecutively. Re-submittals shall be identified by the original submittal number followed by the suffix "A" for the first resubmittal, the suffix "B" for the second resubmittal, etc.

7. No portion of the work requiring a shop drawing, sample, or product data shall be started nor shall any materials be fabricated or installed prior to the approval or qualified approval of such item. Fabrication performed, materials purchased or on-Site construction accomplished which does not conform to approved shop drawings and data shall be at the CONTRACTOR's risk. The OWNER'S REPRESENTATIVE will not be liable for any expense or delay due to corrections or remedies required to accomplish conformity.

8. Approval of drawings and associated calculations by the OWNER'S REPRESENTATIVE shall not relieve the CONTRACTOR from the responsibility for errors or omissions in the drawings and associated calculations, or from deviations from the Contract Documents, unless submittals containing such deviations were submitted to the OWNER'S REPRESENTATIVE and the deviations were specifically called to the attention of the OWNER'S REPRESENTATIVE in the letter of transmittal and within the submittal, and approved specifically by the OWNER'S REPRESENTATIVE as a Contract change.

9. Approval of the CONTRACTOR's submittal by the OWNER'S REPRESENTATIVE shall not relieve the CONTRACTOR of any responsibility, including responsibility for accuracy and agreement of dimensions and details.

10. The OWNER'S REPRESENTATIVE will not be liable for any expense or delay due to corrections or remedies required to accomplish conformity.

11. For submittal Quantities, refer to **Section 01 33 23 - Shop Drawings, Product Data, and Samples**. After review by the OWNER'S REPRESENTATIVE, one marked up reproducible set of drawings, one copy of product data, and one sample will be returned to the CONTRACTOR.

12. After review, the CONTRACTOR shall distribute prints or copies of approved submittals, bearing the OWNER's or designated approval authority's stamp and signature, to the CONTRACTOR's field office, the OWNER's REPRESENTATIVE's field office, and any affected and

concerned subcontractors, suppliers, fabricators, or members of the CONTRACTOR's workforce.

B. Review by OWNER/OWNER's REPRESENTATIVE

1. Submittals will be reviewed for conformance with requirements of the Contract Documents. Review of a separate item will not constitute review of an assembly in which the item functions. Review will not relieve the CONTRACTOR from CONTRACTOR's responsibility for accuracy of submittals, for conformity of submittals to requirements of Contract Documents, for compatibility of described product with other provided products and the rest of the system, or for prosecution and completion of the Contract in accordance with the Contract Documents.

2. The review of shop drawings, data, and samples will be general. The review shall not be construed:

   a. As permitting any departure from the Contract requirements;

   b. As relieving the CONTRACTOR of responsibility for any errors, including details, dimensions, and materials;

   c. As approving departures from details furnished by the ENGINEER, except as otherwise provided herein.

3. The OWNER'S REPRESENTATIVE will indicate its reviews of submittals and the action taken by means of its review stamp. The review stamp will be affixed by the OWNER'S REPRESENTATIVE, the action block will be marked, and the stamp will be signed and dated.

4. The review-stamp action-block marks will have the following meanings:

   a. The mark REVIEWED (or "NO EXCEPTIONS TAKEN") means that the submittal appears to conform to the respective requirements of the Contract Documents; that fabrication, assembly, manufacture, installation, application, and erection of the illustrated and described product may proceed; and that the submittal need not be resubmitted.

   b. The mark FURNISH AS CORRECTED (or "MAKE CORRECTIONS NOTED") means there are minor clarifications or changes required on the submittal, but the submittal appears to conform to the respective requirements of the Contract Documents upon incorporation of the reviewer's corrections, and that fabrication, assembly, manufacture, installation, application, and erection of the illustrated and described product may proceed contingent upon CONTRACTOR's acceptance of the clarification/corrections. Submittals so marked need not be

resubmitted unless the CONTRACTOR challenges the reviewer's exception.

c. The mark REVISE AND RESUBMIT (or "AMEND AND RESUBMIT") means that the submittal is in noncompliance with the Contract Documents and must be corrected and the entire package resubmitted. Fabrication, assembly, manufacture, installation, application, and erection of the illustrated and described product may proceed after incorporation of the reviewer's corrections and verification by the OWNER's REPRESENTATIVE that the reviewer's corrections have been properly incorporated in the submittal. Resubmission within the time period specified is also required if the CONTRACTOR challenges the reviewer's corrections.

d. The mark "REJECTED" (or "REJECTED-SEE REMARKS") means that the submittal is deficient to the degree that the reviewer cannot correct the submittal with a reasonable degree of effort, and the submittal does not meet the intent of the Contract Documents. The CONTRACTOR has not made a thorough review of the submittal, and that the entire submittal package needs revision to bring the submittal into conformance. It may be necessary to resubmit using a different manufacturer/vendor to meet the Contract Documents.

5. Resubmittals will be handled in the same manner as first submittals. On resubmittals the CONTRACTOR shall direct specific attention, in writing, on the letter of transmittal and on resubmitted shop drawings by use of revision triangles or other similar methods, to revisions other than the corrections requested by the OWNER'S REPRESENTATIVE, on previous submissions. Any such revisions that are not clearly identified shall be made at the risk of the CONTRACTOR. The CONTRACTOR shall make corrections to any work done because of this type revision that is not in accordance to the Contract Documents as may be required by the OWNER'S REPRESENTATIVE.

6. Partial submittals will not be reviewed. The OWNER'S REPRESENTATIVE will be the only judge as to the completeness of a submittal. Submittals not complete will be returned to the CONTRACTOR, and will be considered "rejected" until resubmitted. The OWNER'S REPRESENTATIVE may at his option provide a list or mark the submittal directing the CONTRACTOR to the areas that are incomplete.

Part 2 Products – Not Used

Part 3 Execution – Not Used

END OF SECTION

01 33 23 Shop Drawings, Product Data, and Samples

Part 1 General

1.01 Section Includes

A. This section includes information regarding shop drawings, product data, and samples.

B. Definitions of components described are below:

1. Shop Drawings

a. Shop drawings, also known as record drawings, include fabrication, erection and installation, application, layout, and setting drawings, lists or schedules of materials and equipment, manufacturer's standard drawings, wiring and control diagrams, and all other drawings that may be required to show that the materials, equipment, and systems, and the positions of these items, comply with Contract requirements.

2. Product Data

a. The term "product data" includes manufacturer-prepared descriptive literature, catalog sheets, brochures, performance data, test data, printed diagrams, schedules, illustrations, and other information furnished by the CONTRACTOR or the various product and materials suppliers to illustrate and describe a product, material, system, or assembly for some portion of the work.

3. Samples

a. Samples are physical examples which illustrate materials, equipment, colors, textures, finishes, functions, configuration, and work quality, and establish the standards of quality and utility by which the Work will be judged for acceptance.

1.02 Referenced Sections

A. Related Sections are listed below:

1. SECTION 00 70 00 – CONDITIONS OF THE CONTRACT

2. SECTION 01 33 00 – SUBMITTAL PROCEDURES

3. SECTION 01 60 00 – PRODUCT REQUIREMENTS

4. SECTION 01 77 00 – CLOSEOUT PROCEDURES

1.03 Cited Standards – None

1.04 Noted Restrictions – None

1.05 Quality Control

A. Shop Drawings

1. The OWNER, or its REPRESENTATIVE, shall review shop drawings, product data, and samples and return the submittals within 15 days.

2. Drawings shall be prepared in accordance with ANSI Y14, Drafting Standards Manual, and the following requirements (unless recommended otherwise by the OWNER's REPRESENTATIVE):

a. Drawings shall be limited to the following standard sizes in inches:

Width	Length
8 1/2 inches (215.9mm)	11.0 inches (279.4mm)
11.0 inches (279.4mm)	17.0 inches (431.8mm)
17.0 inches (431.8mm)	22.0 inches (558.8mm)
22.0 inches (558.8mm)	34.0 inches (863.6mm)
24.0 inches (609.6mm)	36.0 inches (914.4mm)

b. Each drawing shall have the following information in the title block.

1. Drawing number, date, title, revision number, and sheet number

2. Contract number, Contract sheet number, Contract page number.

3. Contractor's name.

4. Subcontractor/manufacturer name (if applicable)

5. Name of installation location.

c. Each drawing shall use symbols from one standard reference source. The CONTRACTOR shall furnish a complete symbol list that includes non-standard symbols used on the drawing.

d. Each drawing shall include details necessary for the procurement, installation, maintenance, and repair of all components or facilities equipment provided. Change Order notices that are attached to drawings shall not constitute revised drawings. Each drawing shall include all changes and be upgraded to reflect the latest configuration.

e. When specified, shop drawings shall be prepared and submitted electronically. Such drawings shall be created using AutoCAD or Microstation if approved by the OWNER's REPRESENTATIVE. Shop drawings to be prepared and

submitted electronically include shop drawings which will be utilized as illustrations and drawings in Operation and Maintenance Manuals.

B. Product Data

1. The CONTRACTOR shall modify manufacturers' standard diagrams, charts, illustrations, brochures, calculations, schematics, catalog cuts, and other descriptive data to delete information which is not applicable to the Contract. The CONTRACTOR shall supplement standard information with additional information applicable to this Contract, and indicate dimensions, clearances, performance characteristics, capacities, wiring and other diagrams, and controls.

2. If the CONTRACTOR utilizes drawings prepared by others, such drawings may include the standards and symbols of others if the drawings are a mix of existing product drawings and drawings prepared specifically for this Contract. In the event others provide drawings prepared specifically for this Contract, such drawings shall conform in symbols, media and standards to the CONTRACTOR's drawings.

3. The CONTRACTOR shall modify the manufacturer's printed installation, erection, application, and placing instructions to delete information which is not applicable to the Contract.

4. Product Data shall include the following:

   a. Dates and revision dates.

   b. Contract title and number.

   c. Reference Contract Drawing numbers.

   d. Applicable Contract Specification Section numbers.

   e. Identification of product by description, model number, style number, serial number, or lot number.

   f. The names of the CONTRACTOR, Subcontractors, Suppliers, and manufacturers as applicable.

   g. Applicable standards, such as ASTM or Federal specification numbers.

5. Certificates of Compliance:

   a. The OWNER's REPRESENTATIVE may permit the use of certain materials prior to sampling and testing if accompanied by a certificate of compliance stating that the materials involved comply in all respects with the requirements of the Contract Documents. The certificate shall be signed by the manufacturer of the material. A certificate of compliance shall

be furnished with each lot of material delivered to the Work, and the lot so certified shall be clearly identified in the certificate.

b. All materials used on the basis of a certificate of compliance may be sampled and tested at any time. The fact that material is used on the basis of a certificate of compliance shall not relieve the CONTRACTOR of responsibility for incorporating material in the Work which conforms to the requirements of the Contract Documents. Any such material not conforming to such requirements shall be subject to rejection whether in place or not.

c. The OWNER's REPRESENTATIVE reserves the right to refuse the use of material submitted for approval solely on the basis of a certificate of compliance.

d. The form of the certificate of compliance and its disposition shall be as approved by the OWNER's REPRESENTATIVE.

C. Samples

1. The CONTRACTOR shall furnish to the OWNER's REPRESENTATIVE samples required by the Contract Documents. Samples shall be submitted without charge, with shipping charges prepaid. Materials for which samples are required shall not be used in the Work until approved in writing by the OWNER's REPRESENTATIVE.

2. Each sample shall be labeled with the following data:

a. Name, number, and location on project;

b. Name of CONTRACTOR;

c. Material or equipment represented, and location in the project;

d. Name of producer, brand, trade name if applicable, and place of origin; and

e. Date of submittal.

3. The CONTRACTOR shall forward a letter to the OWNER's REPRESENTATIVE submitting each shipment of samples and containing the information listed on the Sample Label specified herein. Approval of a sample shall be only for the characteristics and use named in the submittal and approval, and shall not be construed to change or modify any Contract requirement. Before submitting samples, the CONTRACTOR shall assure itself that the materials or equipment will be available in the quantities required in the Contract, as no change or substitution shall be permitted after a sample has

been approved unless such change or substitution is approved by the OWNER's REPRESENTATIVE in writing.

4. Samples of material from local sources shall be taken by or in the presence of the OWNER's REPRESENTATIVE. Samples taken otherwise shall not be considered for testing.

5. Inspection and tests will be made, but it is understood that such inspections and tests, if made at any point other than the point of incorporation in the work, in no way shall be considered as a guaranty of acceptance of any material which may be delivered later for incorporation in the work.

6. Approved samples not damaged in testing may be incorporated in the finished work if marked for identification and approved by the OWNER's REPRESENTATIVE. Materials incorporated in the Work shall match the approved samples.

7. Failure of any material to pass the specified tests shall be sufficient cause for refusal to consider, under the Contract, any further samples of the same brand, make, or source of that material. The OWNER's REPRESENTATIVE reserves the right to disapprove any material which has previously proven unsatisfactory in service.

8. Samples of material delivered to the Site or installed in place may be taken by the OWNER's REPRESENTATIVE for testing. Failure of samples to meet Contract requirements shall annul previous approvals of the item tested.

1.06 Submittals

A. Submittal Procedures are described in **Section 01 33 00**.

B. Unless notified otherwise by the OWNER or OWNER's REPRESENTATIVE, the quantities for the applicable submittals shall be as specified below:

1. The original and five (5) copies of the drawings.

2. Six (6) copies of manufacturers' standard schematic drawings.

3. Four (4) copies of CONTRACTOR's or manufacturers' calculations and six copies of manufacturers' standard data.

4. Six (6) copies of manufacturers' printed installation, assembly, erection, application, and placement instructions.

5. Three (3) copies of each sample item specified in the various Specification Sections (where applicable), unless otherwise specified by the OWNER's REPRESENTATIVE.

6. Six (6) copies of inspection reports, test reports, and certificates of compliance.

7. Where submittals are submitted to the OWNER's REPRESENTATIVE for information or record purposes, submit two copies.

8. The original and one copy of permits and licenses and other such documents obtained.

C. Other Submittals

1. Other submittals shall be furnished upon request for the OWNER's REPRESENTATIVE's approval to verify compliance of all equipment and materials with the Contract Documents. These submittals shall include in addition to drawings: catalog cuts, certifications of compliance, or any other substantiating information or samples of material items as necessary.

D. Distribution

1. The CONTRACTOR shall duplicate and distribute reproductions of shop drawings, copies of product data, and samples, which bear company stamp of approval, to job Site file, record documents file, subcontractors, suppliers, and any other entities requiring information.

Part 2 Products – Not Used

Part 3 Execution – Not Used

END OF SECTION

SECTION 01 35 00 Special Procedures

01 35 29 Health, Safety, and Emergency Response Procedures

01 35 29.13 Health, Safety, and Emergency Response Procedures for Contaminated Sites

Part 1 General

1.01 Section Includes

A. This section describes Health and Safety Specifications (HSS) to establish minimum health and safety requirements for the CONTRACTOR. The CONTRACTOR shall employ monitoring and procedures as necessary to protect the health and safety of workers and the surrounding community during work.

1.02 Applicability

A. These requirements shall be used by the CONTRACTOR'S Health and Safety Officer to assist in preparation of the CONTRACTOR'S Health and Safety Contingency Plan (HSCP). There requirements shall not relieve any party from compliance with any applicable State, Federal, or other health and/or safety requirements and safe construction practices which are not identified in these requirements.

B. During construction, it is anticipated that Site workers may come in contact with a number of potential hazards, including, but not limited to, (i) exposure to heavily impacted soil and groundwater media and associated breathing hazards; (ii) truck and heavy equipment traversing the Site; (iii) drilling equipment used to advance borings; (iv) fall and trip hazards; and (v) electrocution hazards.

1.03 Cited Standards

A. United States Federal Government - Code of Federal Regulations:

1. 29 CFR 1910.120 – Subpart H Hazardous Materials - Hazardous Waste Operations and Emergency Response.

2. 29 CFR 1910.134 – Subpart I – Personal Protective Equipment-Respiratory Protection.

3. 29 CFR 1910.146 – Subpart J – General Environmental Controls - Permit-required Confined Spaces.

4. 29 CFR 1910.1200 - Subpart Z- Toxic and Hazardous Substances – Hazard Communication.

5. 29 CFR 1926.65 - Subpart D – Occupational Health and Environmental Controls - Hazardous Waste Operations and Emergency Response.

6. 29 CFR 1910 Subpart I - Personal Protective Equipment.

7. 29 CFR 1910 Subpart Z - Toxic and Hazardous Substances.

8. 29 CFR 1926 Subpart P - Excavations.

1.04 Quality Control

A. The CONTRACTOR will ensure that all Site activities are performed in such a manner as to ensure the safety and health of all personnel and the surrounding community. All Site activities shall be conducted in accordance with all pertinent general industry (29 CFR 1910) and construction (29 CFR 1926) Occupational Health and Safety Administration (OSHA) standards, and the United States Environmental Protection Agency's (USEPA) *Standard Operating Safety Guides* (OSWER, 1988), as well as any other applicable New York State and municipal codes or ordinances. The CONTRACTOR is also responsible for ensuring that all Site activities comply with those requirements set forth in OSHA's final rule entitled *Hazardous Waste Operation and Emergency Response* (HAZWOPER), 29 CFR 1910.120, Subpart H.

B. To ensure that all Site activities are in compliance, the CONTRACTOR shall prepare a Project HSCP in accordance with the aforementioned regulations. The HSCP shall conform to the requirements of 29 CFR 1910.120 and all applicable state, federal, local, and other health and safety requirements and safe construction practices not specifically identified in these requirements. The CONTRACTOR's HSCP will be submitted to and reviewed by the ENGINEER and the regulating agencies. ENGINEER's review of CONTRACTOR's HSCP shall be limited to verification that the various components of the Project are adequately addressed. CONTRACTOR shall also submit to ENGINEER, HSCPs for all subcontractors or submit written documentation that said subcontractors shall follow CONTRACTOR's HSCP. In any case, all HSCPs or the written documentation shall be submitted at least 14 days prior to the CONTRACTOR's or subcontractor's mobilization to the Site. All HSCPs, at a minimum, will include the following:

1. Plans showing the location and layout of any temporary and permanent facilities to be constructed on or near the Site;

2. Description of the known hazards and evaluation of the risks associated with the Site and the potential health impacts related to Site activities;

3. List of key personnel and alternates responsible for Site safety, response operations, and protection of the public;

4. Description of levels of protection (based on specific standards) to be utilized by all personnel;

5. Delineation of Work, decontamination, and safe zones, and definitions of the movement of zones;

6. Description of decontamination procedures for personnel and equipment, and handling and removal of disposable clothing or equipment;

7. Incidental emergency procedures that address emergency care for personnel injuries and exposure problems, and containment measures. These procedures shall include evacuation routes, internal and external communication procedures for response to fire, explosion, or other emergencies, the name of the nearest hospital and the route to that hospital. Local agencies with the capability to respond to emergencies shall be identified and their capabilities shall be described. A description of the procedures for informing the community of these measures shall be outlined.

8. A description of the personnel medical surveillance program in effect;

9. A description of monitoring for personnel safety;

10. A description of routine and special personnel training programs; and

11. A description of an air monitoring program to determine concentrations of airborne contaminants to which worker on-Site and persons near the Site boundary may be exposed. The results of work-zone air monitoring may be used as a trigger for implementing Site-boundary air monitoring, additional control measures, and/or cessation of work.

1.05 Submittals

A. HSCP

1. The Contractor shall prepare and submit a HSCP for review by ENGINEER and then the regulating agencies. As part of the Health and Safety Program to be implemented by the CONTRACTOR and as specified herein, submittals are also required for the documentation of normal Health and Safety procedures during the duration of the project.

2. Proof of training (40 hr., 8-hr. refresher, respirator test fit 8-hr. mgr, 10-hr OSHA construction safety)

1.06 Site Background

A. The Cortese Landfill Site (Site) is located in Narrowsburg, Sullivan County, New York on the floodplain of the Delaware River. The Site is bounded to the northeast by a steep bedrock escarpment and to the southwest by a railroad embankment. The northern edge of the landfill lies approximately 70 feet south of the Narrowsburg Waste Water Treatment Plant. The Delaware River is approximately 400 feet southwest of the landfill, separated from the Site by the railroad embankment. Seven residences are located along the river across the railroad embankment from the Site. Other features of interest in the immediate area include a small borrow pit (White's Pond) and a small backwater area (the embayment) along the eastern shoreline of the Delaware River located approximately 800 feet southwest of the landfill. The Site property boundary encompasses approximately 3.75 acres of land owned by Mr. John Cortese and another 1.53 acre parcel along the northern margin of the Cortese property owned by the Town of Tusten, which purchased the

property from Mr. Cortese in 1973.

B. The Site received municipal solid waste (MSW) from approximately July 1970 to July 1981 at an estimated rate of approximately 3,000 cubic yards per year. Disposal practices were poorly documented, such that records about the types and volume of wastes received are essentially non-existent. The extent of MSW has been assessed based upon geophysical surveys and test pits. For a six-month period in 1973, the Site received industrial wastes including paint thinners, sludge, solvents, dyes, waste oil, and other petroleum products. Disposal of these wastes included the burial of drums in trenches. According to depositional testimony of the former landfill owner/operator and landfill employees, drums were disposed in three areas in the landfill. Initially, drums were emptied and/or crushed or mixed with MSW in a trench located in the northwest corner of the landfill. Subsequently, drums were segregated from MSW and were disposed intact in the main drum disposal area located in the center of the landfill, referred to as Intact Drum Disposal Area 1 (IDDA 1). Drums were also disposed intact in another area just beyond the southern end of the landfill referred to as IDDA 2. Two septage lagoons, which also received industrial wastes, were located outside of the southern end of the landfill adjacent to IDDA 2.

C. Various remedial investigations, removal actions, and other remedial activities have been implemented at the Site. These remedial activities have shown that soil and groundwater impacts associated with Volatile Organic Compounds (VOCs), Semi-Volatile Organic Compounds (SVOCs), and Metals still exist in the vicinity of the former IDDA1b, IDDA2 and the septage lagoons. The major Site Constituents of Concern are:

Constituent[1]	*Medium*	*Maximum Concentration*[2]	*Medium*	*Maximum Concentration*[2]
1,1,1-trichloroethane	soil	15	water	7,300
1,1-dichloroethane	soil	5	water	98,000
1,2,4-trichlorobenzene	soil	1,200	water	8,000
1,2-dichloroethane	soil	-	water	3,600
1,4-dichlorobenzene	soil	120	water	31,000
2-butanone (MEK)	soil	24	water	69,000
benzene	soil	12	water	11,000
carbon disulfide	soil	-	water	21
carbon tetrachloride	soil	57	water	120
chlorobenzene	soil	12	water	27,000
chloroethane	soil	-	water	43,000
chloroform	soil	7.6	water	3,900
ethylbenzene	soil	140	water	50,000
methyl isobutylene ketone (MIBK)	soil	16	water	3,000
methylene chloride	soil	0.5	water	12,000
naphthalene	soil	150	water	17,0000
tetrachloroethene	soil	36	water	10,000
toluene	soil	490	water	550,000
total xylenes	soil	610	water	130,000
trichloroethene	soil	360	water	67,000
vinyl chloride	soil	1	water	22,000

Footnotes:

1 Constituents that are included on this list have been detected at the Site at concentrations that may cause potential dermal, ingestion, or inhalation hazards, or the constituent is suspected to potentially be present at elevated concentrations but no analytical data are available.

2 Maximum concentration previously detected for the constituent based on historic data (if available). Liquid concentrations are presented in micrograms of constituent per liter of solution (µg/L). Solids concentrations are presented in milligrams of constituent per kilogram of soil (mg/kg).

Part 2 PRODUCTS – Not used

Part 3 EXECUTION

3.01 GENERAL

A. The CONTRACTOR will be responsible for ensuring that all Site activities are completed in a safe manner that is protective of human health and the environment. To help facilitate the Site health and safety procedures and comply with the quality control requirements above, additional CONTRACTOR requirements and responsibilities are summarized below.

3.02 HAZARD ANALYSIS AND MITIGATION

A. Several potential health and safety hazards will be encountered during construction of the Remedial Design. These hazards can be grouped into three categories that include chemical, physical, and biological hazards.

Each Site activity completed by the CONTRACTOR and/or subcontractors will be evaluated for potential chemical, physical, and biological hazards and appropriate safety procedures will be developed to protect workers.

B. Chemical hazards will be evaluated for each Site activity. Potential exposure pathways will be considered and include inhalation, dermal exposure, and/or ingestion. To effectively manage risk to exposure, a list of constituents of concern (COCs) and maximum detected concentrations that have been documented and/or are suspected to be present based on previous operation/activities are tabulated in Section 1.06. Based on this list, the CONTRACTOR will develop a plan to monitor workers chemical exposure and methods to mitigate any potential exposures.

C. Physical hazards will be considered for all Site activities. Potential physical hazards include, but are not limited to: cold and heat stress; hand/foot injuries; eye injuries; falling objects; slips, trips, and falls; loud noise; electrocution; heavy equipment; etc. The CONTRACTOR will implement appropriate safety measures to limit exposure to physical hazards.

D. Potential biological hazards (e.g. allergic reactions to poisonous plant or insects indigenous to area, etc) associated with tasks to be performed will be considered by the CONTRACTOR. Bear and rattlesnakes have been observed at the Site in the past. Safety procedures will be developed for each biological hazard identified.

3.03 HEALTH AND SAFETY PERSONNEL

A. The CONTRACTOR will provide a list of key project personnel responsible for Site Health and Safety. At a minimum, the CONTRATOR will provide and designate a competent and authorized individual to serve as the Site Health and Safety Officer (SHSO) during the execution of all work. The SHSO should have work experience related to construction activities at hazardous waste Sites and be familiar with the potential hazards associated with each work activity. The SHSO will be responsible, at a minimum, for the following:

1. Hold daily health and safety meetings prior to the start of each work shift. Each health and safety meeting will be documented on log which will include, at a minimum, all personnel present and safety topics reviewed during the meeting.

2. Implementing and daily enforcing of monitoring activities associated with the Site-specific HSCP;

3. Be on-Site during execution of all work;

4. Verify that all on-Site personnel are made aware of provisions in the HSCP and have been informed of the nature of any physical and/or chemical hazards associated with Site activities;

5. Maintain a daily log of all significant health and safety activities and incidents;

6. Suspend work if health and/or safety-related concerns arise;

7. Conduct Site safety orientation training;

8. Coordinate emergency procedures and notify appropriate authorities in the event of an emergency;

9. Establish actual levels of protection for each work area based on planned activity and location of each activity;

10. Evaluate Site health and safety as environmental or work conditions change; and

11. Maintain required health and safety documents and records on-Site;

3.04 LEVELS OF PERSONAL PROTECTION

A. All work completed at the Site will at a minimum, be completed in modified Level-D Personal Protective Equipment (PPE) that will include safety glasses/goggles, steel toe boots, long pants, outer gloves and protective clothing when handling potentially impacted media, and a hard-hat when overhead hazards are present. Drilling operations will also require tyvek coveralls and chemical protective gloves. Some of the Work at the Site may need to be conducted in Level B or C PPE depending on COC concentrations in the breathing zone measured during air monitoring activities described in Section 3.08. The CONTRACTOR will be responsible for providing all necessary PPE to its workers, including air purifying respirators or pressurized breathable air supply as necessary to support Level C and B work, respectively. The CONTRACTOR is responsible for providing employees with all necessary training requirements to complete work in Level C or B PPE.

3.05 DECONTAMINATION

A. The CONTRACTOR will be responsible for delineation of work, safe, and decontamination zones as well as determining the type and level of decontamination procedures for both personnel and equipment based on the evaluation of specific work activities in the controlled work zones. In an emergency, the primary concern is to prevent the loss of life or serious injury to personnel. Medical treatment will take precedence over decontamination in the event of a life threatening and/or serious injury/illness. Personnel will perform decontamination in designated and identified areas within or outside the Work Zone.

B. Wash solutions and PPE may require disposal at a licensed waste facility. Equipment that is contacted by potentially impacted media will be decontaminated as needed by washing in decontamination basins with appropriate solutions, or, if possible, by dry decontamination.

3.06 EMERGENCY PREPAREDNESS AND RESPONSE

A. The CONTRACTOR's HSCP will need to include an emergency response and action plan. This plan is intended to provide guidance for immediate response to a serious Site occurrence such as a life threatening or serious personnel injury, explosion, fire, or migration of significant quantities of a toxic

or hazardous material from the Site, which could endanger the public or adjacent public or private properties. This plan should at a minimum include internal and external communication procedures to inform others of the emergency, list of contacts and telephone numbers for applicable off-Site emergency responders (i.e., fire department, hospital, police department, etc.), evacuation routes, procedures for handling personnel injuries and/or exposures, and the name and directions to the nearest hospital or emergency care center.

3.07 PERSONNEL MEDICAL SURVEILLANCE, MONITORING, AND TRAINING

A. The CONTRACTOR will be required to provide personnel that meet all local, state, and federal eligibility requirements to work on Hazardous Material and Waste Sites. These monitoring and training requirements include, but are not limited to those set forth in 29 CFR 1910.120 and 29 CFR 1926.65.

3.08 AIR MONITORING

A. During drilling, well installation, and well head installation, at a minimum, the Work environment and workers' breathing zones, at a minimum, shall be monitored on a regular basis using a Photoionization Detector (PID) and a combustible gas indicator. Air monitoring equipment will be operated and calibrated according to manufacturer's operating procedures. Instruments shall be serviced to ensure their readiness for use and shall be removed from service and replaced by another similar unit when not operating properly.

B. CONTRACTOR shall observe the following Action Levels in workers' breathing zones:

Instrument	Action Level	Specific Action
PID	Peak reading greater than 5 ppm or any reading above background for 5 continuous minutes in breathing zone.	CONTRACTOR shall wear a VOC air purifying respirator or supplied air respirators, or perform constituent specific personal air monitoring to evaluate the need for respiratory protection.
Combustible Gas Indicator	Reading greater than 10% and less than 25% LEL	Secure ignition sources, continue monitoring, and continue Work.
	Reading greater than 25% LEL	Temporarily cease Work and contact CONTRACTOR SHSO.

C. The upwind and downwind perimeters of the Work area shall be monitored for VOCs with a PID during drilling and start-up testing. The following action levels/actions will be taken:

1. If total VOC levels exceed 5 ppm above background at the downwind perimeter, the CONTRACTOR shall install and monitor a wind sock at the Site to determine wind direction. Work activities must be halted and monitoring continued.

2. If, after halting Work, the VOC levels decrease below 5 ppm above background, Work activities with monitoring can resume.

3. If, after halting Work the VOC levels are greater than 5 ppm but less than 25 ppm over background at the perimeter of the Work area, VOC levels at 200 feet downwind of the work area perimeter (or half the distance to the nearest residential or commercial structure, whichever is less) will be measured. If the VOC levels are below 5 ppm over background at this location, Work activities can resume with monitoring.

4. If the VOC levels are above 25 ppm at the perimeter of the Work area, Work activities must be shut down. When Work activities are shut down, downwind air monitoring, as directed by the SHSO, will be conducted to ensure that the nearest residential or commercial structure is not impacted at levels exceeding background.

3.09 DOCUMENTATION

A. Generally, the CONTRACTOR via the SHSO will document all pertinent health and safety operations. Specific activities that will be documented, at a minimum, shall include the following:

1. Daily health and safety meeting sheets documenting workers in attendance and covered safety topics;

2. Daily PID and combustible gas meter calibration records;

3. PID and combustible gas meter readings;

4. Maintain a daily log of all health and safety activities and incidences and report deficiencies to the ENGINEER; and

5. Report and document “near-miss” situations where personnel injury or damage to property was narrowly avoided, so that corrective actions can be implemented to help prevent future incidences.

END OF SECTION

SECTION 01 40 00 – QUALITY REQUIREMENTS

Part 1 General

1.01 Section Includes

A. This section includes a brief description of general quality control, workmanship in relation to industry standards, and compliance with manufacturer's instructions.

1.02 Referenced Sections

A. Related Sections are listed below:

1. SECTION 00 70 00 – CONDITIONS OF THE CONTRACT

2. SECTION 01 33 23 – SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

3. SECTION 02 05 19 – GEOSYNTHETICS FOR EXISTING CONDITIONS

1.03 Cited Standards – None

1.04 Noted Restrictions – None

1.05 Quality Control

A. Verification of Dimensions

1. The CONTRACTOR shall lay out all work and shall be responsible for all lines, levels, grades, elevations and measurements of structures, and other work required under this contract.

2. The CONTRACTOR shall verify all Site dimensions, project layout dimensions, setbacks, etc., shown on the drawings before laying out the work.

3. The CONTRACTOR shall notify the OWNER's REPRESENTATIVE in writing of any error or discrepancy found and shall not proceed until the error or discrepancy is resolved.

4. The CONTRACTOR shall be responsible for correction of any work, which is done in error because of failure to verify dimensions.

B. Tests

1. The CONTRACTOR shall comply with any tests required by law, ordinance, rule, regulation, or order of any public authority having jurisdiction.

2. Special tests may be ordered by the OWNER's REPRESENTATIVE in accordance with the contract documents or as agreed between the OWNER's REPRESENTATIVE and CONTRACTOR in writing.

3. If the Specifications require testing by an independent testing laboratory, the CONTRACTOR shall select the testing laboratory and receive approval from the OWNER's REPRESENTATIVE. After approval, the CONTRACTOR shall schedule all tests and shall deliver all test reports to the OWNER's REPRESENTATIVE.

4. The CONTRACTOR is responsible for all costs involving testing with the exception of the following:

   a. Special tests required by the OWNER's REPRESENTATIVE. Special tests are to be paid for as stipulated in the contract documents or as otherwise agreed between the OWNER's REPRESENTATIVE and CONTRACTOR in writing.

C. In order to produce work of the specified quality, the CONTRACTOR shall maintain quality control over supplies, manufacturers, products, services, Site conditions, and workmanship.

D. All sampling and analysis of soils in the IDDA 2 and septage lagoon area during system installation shall comply with the requirements of the Quality Assurance Project Plan (QAPP).

1.06 Workmanship

A. The CONTRACTOR and his/her workers shall comply with the prevailing industry standards in regard to work and safety.

B. The CONTRACTOR shall provide workers who are qualified to perform all work to the specified quality.

1.07 Manufacturer's Instructions

A. The CONTRACTOR shall comply with the manufacturer's instructions in full detail, including each step in sequence. If the manufacturer's instructions conflict with the Contract Documents, the CONTRACTOR shall request clarification from the OWNER's REPRESENTATIVE before proceeding.

1.08 Construction Quality Assurance Plan

A. All work shall be performed in accordance with, and shall comply with the testing and requirements in, the Construction Quality Assurance Plan.

Part 2 Products – Not Used

Part 3 Execution – Not Used

END OF SECTION

01 42 19 Reference Standards

Part 1 General

1.01 Section Includes

A. This section includes details pertaining to the referenced standards used in these Specifications and their abbreviations.

B. Whenever references are made to published specifications, codes, standards or other requirements, it shall be understood that only the latest published specifications, standards or requirements of the respective issuing agencies, as of the date that the work is advertised for bids, shall apply; except to the extent that said standards or requirements may be in conflict with applicable laws, ordinances, or governing codes.

1.02 Referenced Sections – None

1.03 Cited Standards

A. The Contract Documents contain references to various standard specifications, codes, practices, and requirements for materials, equipment, work quality, installation, inspections, and tests, which references are published and issued by the organizations, societies, and associations listed in 1.06 below by abbreviation and name. These references are hereby made a part of the Contract Documents.

1.04 Noted Restrictions

A. No requirements set forth herein or shown on the drawings shall be waived because of any provision of, or omission from, said standards or requirements.

B. Whenever a referenced standard contains administrative requirements, including measurement and payment provisions, such as the standard specifications of various government entities, utility districts, and other agencies, such administrative requirements shall not apply to the Work of this Contract. References to such standards shall be applicable to the pertinent technical provisions only.

1.05 Quality Control

A. In case of conflict between codes, reference standards, drawings and the other Contract Documents, the most stringent requirements shall govern. All conflicts shall be brought to the attention of the OWNER's REPRESENTATIVE for clarification and direction prior to ordering or providing any materials or labor. The CONTRACTOR shall bid the most stringent requirements.

B. References in the Specifications to "OSHA Regulations for Construction" shall mean Title 29, 926, Construction Safety and Health Regulations, Code of Federal Regulations (OSHA), including all changes and amendments.

C. References in the Specifications to "OSHA Standards" shall mean Title 29, I 910, Occupational Safety and Health Standards, Code of Federal Regulations (OSHA), including all changes and amendments.

D. References in the Contract Documents to "Standard Specifications" shall mean the Manual of Standard Specifications as Published by the American Public Works Association, including all current supplements, addenda and revisions thereof.

1.06 Abbreviations

A. When an organization's abbreviation or acronym is used in the Contract Documents and throughout the Specifications, it shall be understood to mean the full name of the respective organization as shown below:

1. AASHTO American Association of State Highway and Transportation Officials
2. ACI American Concrete Institute
3. AFPA American Forest and Paper Association
4. AISC American Institute of Steel Construction
5. AISI American Iron and Steel Institute
6. ANSI American National Standards Institute
7. APA American Plywood Association
8. ASME American Society of Mechanical Engineers
9. ASTM American Society for Testing and Materials
10. AWPA American Wood Preservers Association
11. AWPI American Wood Preservers Institute
12. AWS American Welding Society
13. AWWA American Water Works Association
14. CRSI Concrete Reinforcing Steel Institute
15. EJCDC Engineers Joint Contract Documents Committee
16. IBC International Building Code of the International Conference of Building Officials (ICBO)
17. NACE National Association of Corrosion Engineers
18. NCMA National Concrete and Masonry Association
19. NEC National Electrical Code

20. NEMA National Electrical Manufacturers Association
21. NFPA National Fire Protection Association
22. NSF National Sanitation Foundation
23. OSHA Occupational Safety and Health Administration
24. SSPC Steel Structures Painting Council
25. UBC Uniform Building Code
26. UL Underwriters Laboratories Inc.
27. USACE U.S. Army Corps of Engineers
28. WIC Woodwork Institute of California

Part 2 Products – Not Used

Part 3 Execution – Not Used

END OF SECTION

01 45 16 Field Quality Control Procedures

Part 1 General

1.01 Section Includes

A. This section describes field quality control procedures to be performed by the CONTRACTOR.

1.02 Referenced Sections – None

1.03 Cited Standards – None

1.04 Noted Restrictions

A. Explosives and Blasting

1. The use or storage of explosives on the work or Site will not be permitted.

1.05 Quality Control

A. Chemicals

1. All chemicals used during project construction or furnished for project operation, whether soil sterilant, herbicide, pesticide, disinfectant, polymer, reactant or of other classification, shall show approval for use by either the U. S. Environmental Protection Agency or the U. S. Department of Agriculture. Use of all such chemicals and disposal of residues shall be in strict accordance with the printed instructions of the manufacturer.

Part 2 Products – Not Used

Part 3 Execution

3.01 Dust Abatement and Rubbish Control:

A. The CONTRACTOR shall provide under the Contract all necessary measures to prevent its operation from producing dust in amounts damaging to property or causing a nuisance to persons living in or occupying buildings in the vicinity. The CONTRACTOR shall be responsible for damage resulting from any dust originating from its operations. The dust abatement measurers shall be continued throughout the length of the contract.

B. During the progress of the work the CONTRACTOR shall keep the Site of the work and other areas used by it in a neat and clean condition and free from any accumulation of rubbish.

C. The CONTRACTOR shall dispose of all rubbish and waste materials of any nature occurring at the work Site, and shall establish regular intervals of collection and disposal of such materials and waste. The CONTRACTOR shall also keep its haul roads free from dirt, rubbish and unnecessary obstructions resulting from its operations.

D. Disposal of all rubbish and surplus materials shall be off the Site of construction in accordance with local codes and ordinances governing locations and methods of disposal and in conformance with all applicable Safety Laws and Health Standards for Construction.

END OF SECTION

01 45 16.13 Contractor Quality Control

Part 1 GENERAL

1.01 Section Includes

A. This section describes CONTRACTOR Quality Control requirements.

B. CONTRACTOR shall assign one person as the Quality Control Manager for the Project. The Quality Control Manager shall be responsible for preparing and submitting quality control certifications and test results to the Construction Quality Assurance (CQA) Team, as applicable, in accordance with the Construction Quality Assurance Plan

C. CONTRACTOR shall maintain an appropriate frequency of contact with ENGINEER to ensure that work quality is being maintained.

D. CONTRACTOR shall perform Construction Quality Control (CQC) field and laboratory testing as required by the Drawings and Specifications, and as necessary to demonstrate compliance with the Specifications. If CONTRACTOR is unable to self-perform these tasks, CONTRACTOR shall retain a CQC Consultant to complete the required CQC field and laboratory testing.

1.02 Referenced Sections – None

1.03 Cited Standards – None

1.04 Noted Restrictions - None

1.05 Definitions

A. Construction Quality Control (CQC) are those actions that provide a means to measure and regulate the characteristics of an item or service to contractual and regulatory requirements.

B. CQC refers to those actions taken by the manufacturers, fabricators, installers, or CONTRACTOR to ensure that the materials and the workmanship meet the requirements of the Drawings and the Specifications.

1.06 Submittals

A. CONTRACTOR shall include a discussion of CQC plans in the Remedial Action Work Plan to be submitted to USEPA within sixty (60) days of award of the Contract. Plans for CQC shall: (i) identify the Quality Control Manager; (ii) identify CONTRACTOR's CQC Consultant and/or testing laboratories, if required; and (iii) describe the proposed means and method for quality control to be implemented by CONTRACTOR; (iv) describe the procedures for scheduling and managing submittals, including those of subcontractors, off-Site fabricators, suppliers, and purchasing agents; and (v) describe reporting procedures including frequency of reports and report formats.. The CQC Consultant and/or laboratories shall be acceptable to both OWNER and ENGINEER.

Part 2 PRODUCTS - Not used.

Part 3 EXECUTION

3.01 General

A. CONTRACTOR shall be responsible for obtaining quality control documentation, or performing quality control tests as described in the Specifications.

B. Quality control testing procedures and frequencies for individual products and material are described in the Specifications.

3.02 Sampling And Testing

A. CONTRACTOR shall perform CQC soils testing during construction and shall promptly provide all test results to ENGINEER as required.

B. CONTRACTOR shall be responsible for cooperating with ENGINEER during all CQC testing activities and in resolving all problems identified during testing. CONTRACTOR shall provide all equipment and labor required to access CQC and CQA testing locations. CONTRACTOR shall repair any damage to finished Work caused by the sampling or testing activities.

C. Material sampling and testing for geosynthetics, pipe, etc., is the responsibility of CONTRACTOR and shall be performed by the appropriate manufacturer. CONTRACTOR and its subcontractor(s) shall be responsible for cooperating with the CQA Consultant during all testing activities. CONTRACTOR and its subcontractor(s) shall provide equipment and labor required to access testing locations. CONTRACTOR and its subcontractor(s) shall repair any damage to finished Work caused by sampling or testing activities.

D. CONTRACTOR shall be responsible for geometric control of the Work. Any surveying that may be performed by OWNER or ENGINEER does not relieve CONTRACTOR of its responsibility to layout, control, and document its Work. Any additional surveying that is required, if the initial CQC survey shows that the Work has not yet been completed to the lines and grades shown on the Drawings, shall be performed at the expense of CONTRACTOR.

E. CONTRACTOR shall abide by all qualification requirements identified in these Specifications (for subcontractors, supplies, manufacturers, etc.).

F. The work shall, at all times, be subject to the observation of the OWNER and/or ENGINEER. Observation or non-observation by the OWNER and/or ENGINEER, shall not relieve CONTRACTOR from his contractual obligation to furnish work and material as required, and properly complete the work in accordance with these Contract Documents. If OWNER or the ENGINEER considers that the work is not being properly accomplished, he may condemn or reject all or any part or the work and any materials or equipment incorporated into it. If any material, equipment, or work is condemned or rejected by the OWNER or ENGINEER, the CONTRACTOR shall bear all expenses for removal and proper replacement of such material, equipment, or work required to be provided by Contract Documents. The expense of

replacing any work performed by Others that is adversely affected by removal and proper replacement of improper work performed by CONTRACTOR shall be borne by CONTRACTOR.

G. The OWNER or ENGINEER do not include supervise or direct the actual work by CONTRACTOR, his employees, or agents. Neither the presence of the OWNER or ENGINEER nor any observations and testing performed by either party shall excuse CONTRACTOR from defects discovered in his work.

H. The OWNER or ENGINEER have the right to perform quality assurance testing and to observe the work at any time. CONTRACTOR and its subcontractor(s) shall provide equipment and labor required to access testing locations. CONTRACTOR and its subcontractor(s) shall repair any damage to finished Work caused by sampling or testing activities by OWNER or ENGINEER.

3.03 Protection

A. CONTRACTOR shall use all means necessary to protect all prior Work, including all materials and completed Work of other Sections.

3.04 Substandard Work Or Materials

A. Any defective or substandard work or materials furnished by CONTRACTOR that is discovered before the final acceptance of the work, as established by the ENGINEER's Certificate of Substantial Completion, or during the subsequent guarantee period, shall be removed immediately by CONTRACTOR even if it had been initially overlooked by the ENGINEER and recommended for payment. Satisfactory work or materials shall be substituted by CONTRACTOR for that rejected.

B. The ENGINEER may order tests on substandard or damaged work, equipment, or materials to determine the required functional capability for possible acceptance, if there is no other reason for rejection. The cost of such tests shall be borne by CONTRACTOR, and the nature, extent, and supervision of the tests will be as determined by the ENGINEER. If the results of the tests indicate that the required functional capability of the work, equipment, or material is impaired, consistent with the final general appearance of same, the work, equipment, or materials may be deemed substandard and shall be replaced by CONTRACTOR. The CONTRACTOR may elect to replace the substandard work or material in lieu of performing the tests.

END OF SECTION

SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

Part 1 GENERAL

1.01 SUMMARY

A. This section includes descriptions of temporary facilities and controls necessary for the Work.

B. Temporary facilities and controls that are addressed in this section include:

1. field office and telephone;
2. temporary sanitary and first aid facilities;
3. noise control;
4. dust control;
5. fire prevention control;
6. pollution control;
7. roads, access and parking areas;
8. protection of personnel, Work, and property;
9. temporary signs;
10. trucking;
11. relocation or removals;
12. CONTRACTOR's use of premises
13. security; and
14. cleanup during construction.

1.02 Referenced Sections

A. Related Sections are listed below:

1. SECTION 00 11 00 – SUMMARY OF WORK
2. SECTION 01 77 00 – CLOSEOUT PROCEDURES

1.03 Cited Standards – None

1.04 Noted Restrictions

A. The CONTRACTOR shall not make connections to, or draw water from any fire hydrant or pipeline without first obtaining permission of the authority having jurisdiction over the use, and from the agency owning the electrical or water system.

B. For each of such connection made to a water system, the CONTRACTOR shall first attach to the fire hydrant or pipeline a valve, backflow preventer, and a meter, if required by the said authority, of a size and type acceptable to said authority and agency.

C. The adjacent Narrowsburg Water and Sewer District's toilet facilities shall not be used by the CONTRACTOR's work force.

1.05 Quality Control

A. FIELD OFFICE AND TELEPHONES

1. CONTRACTOR shall provide and maintain upon the premises one field office which shall be for its own use and for use by ENGINEER and USEPA.

2. CONTRACTOR shall provide all offices with adequate heating, air conditioning, and lighting for the full duration of the Project. The offices shall have continuous power not subject to voltage fluctuations capable of damaging electrical equipment. CONTRACTOR shall maintain the offices in a clean condition.

3. CONTRACTOR's field office shall be equipped with an automatic feed copy machine. CONTRACTOR shall provide ENGINEER access to the copy machine and shall pay the cost for the use of these machines. The copy machines shall be kept in operation for the full duration of the Project

4. Office space used by ENGINEER and USEPA shall be large enough to comfortably house four people with associated furniture (i.e. desks, chairs, and tables).

5. CONTRACTOR shall provide a meeting place capable of comfortably seating 12 people around a common table.

6. CONTRACTOR shall provide mobile telephone service to its superintendent for the purpose of contacting CONTRACTOR during the project.

B. TEMPORARY SANITARY AND FIRST AID FACILITIES

1. CONTRACTOR shall provide temporary toilet accommodations and first aid supplies for workers on the Project, including all workers employed by subcontractors. Toilets shall be located in an area approved by OWNER and shall be maintained in a sanitary condition. Sanitary and first aid requirements include:

a. Provide at least one unit for every 20 persons, or fraction thereof.

b. Where water and sewer connections are not available, provide approved chemical or electric toilets.

c. Provide first aid stations at Work areas and in CONTRACTOR's field office.

d. Post telephone numbers of emergency services and hospitals at conspicuous locations at the Site and inside the trailers.

e. Provide facilities and fixtures in compliance with OSHA regulations and all other applicable federal, state, and local laws and regulations.

f. Enforce proper use of sanitary facilities, including preventing the committing of nuisances in buildings on the site. Employees who violate this rule shall be discharged. Dispose of all wastes in conformance with applicable regulations.

C. NOISE CONTROL

1. CONTRACTOR's vehicles and equipment shall be configured in a manner that minimizes noise to the greatest degree practicable. Noise levels shall conform to the latest OSHA standards and in no case shall noise levels be permitted to interfere with the Work of OWNER or others.

D. DUST CONTROL

1. CONTRACTOR shall be responsible for controlling objectionable dust caused by operation of vehicles and equipment, by clearing or grubbing, or any other activities within the Work area. CONTRACTOR shall keep dust in the air to a minimum. CONTRACTOR shall control dust by spraying water as described in the "*New York State Standards and Specification for Erosion and Sediment Control*".

E. FIRE PREVENTION CONTROL

1. CONTRACTOR shall take all precautions necessary to prevent fires and explosions. CONTRACTOR is advised that flammable and explosive gases are naturally generated at landfills and may be present in and adjacent to the Work area.

2. Fuel for cutting and heating torches shall be contained in containers approved by the Underwriter's Laboratory.

3. CONTRACTOR shall furnish and maintain a 20-pound maximum capacity dry chemical type fire extinguisher in the immediate vicinity of the Work when welding tools or torches of any type are in use.

F. POLLUTION CONTROL

1. CONTRACTOR shall provide methods, means and facilities required to prevent contamination of soil, water, or atmosphere by discharges from construction operations.

2. CONTRACTOR shall provide the methods, means and facilities required to prevent contamination of soil, water, or atmosphere from discharges of waste, leachate resulting from damage to existing structures and/or equipment by CONTRACTOR.

3. CONTRACTOR's equipment used during construction shall conform to current federal, state, and local laws and regulations regarding pollution control.

G. ROADS, ACCESS AND PARKING AREAS

1. Use of existing site access roads will be permitted to CONTRACTOR's personnel who lawfully frequent the Project Site. CONTRACTOR's vehicles shall in all cases yield to other trucks or equipment when operating on Site access roads.

2. Existing roads shall be kept open by CONTRACTOR for the passage of vehicular traffic and pedestrians during the construction period unless otherwise approved by OWNER.

3. CONTRACTOR shall provide signs, signals, barricades, lights, and personnel to regulate all traffic and to warn vehicles and personnel of hazards. Routes of ingress and egress to the location of the Work shall be clearly marked by CONTRACTOR and approved by OWNER.

4. CONTRACTOR shall construct and maintain temporary roads required for construction.

5. CONTRACTOR's personnel shall only use those parking areas designated for the Work. Storage of materials or parking of vehicles or equipment in areas not approved by OWNER is prohibited.

6. CONTRACTOR shall maintain storage and Work areas free of debris and obstructions.

H. PROTECTION OF PERSONNEL, WORK, AND PROPERTY

1. CONTRACTOR shall follow the requirements of its Health and Safety Contingency Plan, developed as required by Specification Section 01 35 29.13.

2. CONTRACTOR shall protect all existing structures and utilities not marked for removal and shall make all necessary repairs at its own expense to same, where CONTRACTOR is required to disturbed existing structures or utilities or existing structures or utilities become damaged from activities associated with the new construction work.

3. CONTRACTOR shall provide equipment with proper safety devices as required by local, State, or Federal regulation.

4. CONTRACTOR shall provide all scaffolding, staging, platforms, temporary flooring, railing, stairs, shoring, bracing, sheet, and fall

protection, etc. for safe and proper execution of the Work as required by local, State, or Federal laws and regulations for the protection of personnel and the public. Temporary safety measures shall be removed when the Work is completed.

5. Any Work damaged by failure to provide the protection required shall be removed and replaced with new Work at CONTRACTOR's expense.

6. The location of any construction fencing, and areas for on-site storage of equipment and other facilities required by CONTRACTOR shall be subject to approval by OWNER and ENGINEER.

I. TEMPORARY SIGNS

1. Project Identification Sign: CONTRACTOR shall install a project identification sign acceptable to OWNER within 21 days after Preconstruction Meeting.

2. The sign shall be erected at a location acceptable to OWNER. Proposed dimensions and lettering, and logos shall be submitted to OWNER and ENGINEER for prior approval. Lettering on the sign shall be professionally executed, straight, uniform and evenly spaced. The sign shall be painted with at least two coats of exterior paint. The paint shall be of a type formulated for use on exterior surfaces. CONTRACTOR shall maintain the sign in a first-class condition until completion of the Project.

3. No sign or advertisement, except the project identification sign, shall be displayed without OWNER's approval. Should directional signs be required, such signs shall be of size, color, and lettering that meets ENGINEER's approval.

J. TRUCKING

1. All trucks bringing to or removing equipment, materials, earth, loose materials, or debris from the Project Site shall be loaded in a manner to prevent dropping of materials on streets and shall be covered by a tarp.

2. CONTRACTOR shall maintain a crew at all points where trucks leave the Project Site and enter adjacent paved streets, to prevent any mud from being carried onto such adjacent paved streets.

3. Earth, loose materials, or debris deposited on the streets due to trucking activities shall be removed daily, regardless of the source of the debris.

K. RELOCATION OR REMOVALS

1. Should a change in location of a temporary facility be necessary in order to continue progress of the Work, CONTRACTOR shall remove

and relocate such items as directed without additional cost to OWNER.

2. CONTRACTOR shall remove temporary facilities when they are no longer required. Restore permanent facilities to their original or better condition.

L. CONTRACTOR'S USE OF PREMISES

1. The limits of the area allocated for use by CONTRACTOR for storage and execution of the Work shall be determined prior to commencement of the Work. CONTRACTOR must obtain prior approval by OWNER for use of any other areas of the Site.

2. CONTRACTOR shall:

a. not unreasonably encumber the Site with materials or equipment;

b. not load or surcharge existing structures or other facilities with equipment or supplies having a weight that will endanger the integrity of the structures;

c. assume full responsibility for protection and safekeeping of CONTRACTOR's equipment, products or materials stored on the premises;

d. move any stored products or equipment that interferes with operations of OWNER or other contractors;

e. coordinate and cooperate with other contractors on Site;

f. not restrict access to the Site by others;

g. stockpile materials removed from excavations within the Work area as directed by OWNER.

M. SECURITY

1. CONTRACTOR shall protect completed Work, existing premises, and OWNER's operations against theft, vandalism, and unauthorized entry.

2. CONTRACTOR shall coordinate Project Site security with OWNER's existing security system.

3. CONTRACTOR shall restrict entrance of persons and vehicles into Project Site to only those working on the Project.

4. CONTRACTOR shall allow entrance only to authorized persons with proper identification.

N. CLEANUP DURING CONSTRUCTION

1. Cleanup shall be performed daily to prevent accidents to personnel, protect all Work in place, and to effect completion of the Work in an orderly manner. Trash containers or roll-off boxes shall be emptied promptly after becoming full. All construction debris must be placed on trash barrels or roll-off containers at the end of the working day.

2. Construction cleanup shall consist of the removal of all mud, oil, grease, sand, gravel, dirt, trash, scrap, debris, and excess materials, from any floor space, ground, or walking surface, that may cause the tripping or sliding of Workers, ladders, or equipment. Particular attention shall be given to the removal of water from areas where electrical power tools are to be used.

3. Burning of waste material is prohibited.

4. All wastes shall be properly disposed.

Part 2 Products – Not Used

Part 3 Execution

3.01 Cleanup

A. Before final acceptance of work, the CONTRACTOR shall remove all materials and equipment related to temporary facilities and controls. Affected improvements shall be restored to their original condition, or better, to the satisfaction of the OWNER's REPRESENTATIVE and to the agency owning the affected utility.

END OF SECTION

SECTION 01 60 00 – PRODUCT REQUIREMENTS

Part 1 General

1.01 Section Includes

A. This section includes details pertaining to products, the quality of materials to be used, and appurtenances and accessories.

1.02 Referenced Sections

A. Related Sections are listed below:

1. SECTION 01 40 00 – QUALITY REQUIREMENTS

1.03 Quality of Materials

A. Materials, equipment, appliances, fixtures, and fabricated assemblies to be incorporated in the work shall be new unless indicated or specified otherwise in the Contract Documents.

B. Additional quality assurance provisions for materials and equipment are specified in **Section 01 40 00 - Quality Requirements**.

1.04 Products

A. General

1. All products including but not limited to material, equipment, and systems, shall comply with the Specifications and referenced standards as minimum requirements.

2. Fifteen (15) days after the date established in notice to proceed, the CONTRACTOR shall submit a complete list of major products proposed for use including the name of the manufacturer and model number of each product.

B. Product Substitutions

1. The CONTRACTOR may submit a request for substitution for any products specified by only one manufacturer. Products specified by naming several manufacturers shall have NO substitutions allowed.

2. The OWNER shall only consider requests from the CONTRACTOR for substitution if the request is made within fifteen (15) after the date established in notice to proceed.

3. The CONTRACTOR shall document each request with complete data substantiating compliance of the proposed substitution with the Contract Documents.

4. Prior to requesting a product substitution the CONTRACTOR shall do the following:

a. Investigate the proposed product and determine that it meets or exceeds the specified product in all respects.

b. Make sure that the proposed product will provide the same warranty as the specified product.

c. Coordinate installation and make sure that changes do not require substantial additions to the work to be performed.

d. Waive claims for additional costs, which may subsequently become apparent.

C. Product substitutions will not be considered when they are indicated or implied on shop drawings or product data submittals without a separate written request, or when acceptance requires substantial revision of the Contract Documents.

D. The OWNER will determine acceptability of a proposed substitution, and will notify the CONTRACTOR of acceptance or rejection in writing within a reasonable time.

E. The CONTRACTOR shall make only one request for substitution for each product and if the proposed substitution is rejected, the CONTRACTOR shall provide the specified product.

1.05 Appurtenances and Accessories

A. Products to be incorporated in the Work shall be furnished as complete assemblies or systems with all appurtenances and installation anchors, fasteners, and accessories as required to provide a complete and finished product installation.

B. Installed products with moving parts shall be fully operable at proper settings and levels in accordance with the respective manufacturers' instructions and recommendations.

Part 2 Products – Not Used

Part 3 Execution – Not Used

END OF SECTION

01 66 00 Product Storage and Handling Requirements

Part 1 General

1.01 Section Includes

A. This section includes details pertaining to packaging and handling, transportation and delivery, and storage and protection of the products to be used at the Site.

1.02 Referenced Sections

A. Related Sections are listed below:

1. SECTION 01 32 16 – CONSTRUCTION PROGRESS SCHEDULE

1.03 Cited Standards – None

1.04 Noted Restrictions

A. Products, materials and equipment not stored in a manner that will insure the maintaining of a new condition will be rejected by the OWNER'S REPRESENTATIVE. Such rejected products, materials and equipment shall be immediately removed from the work Site.

1.05 Packaging and Handling

A. The CONTRACTOR shall avoid bending, scraping, or overstressing materials and equipment. Projecting parts shall be protected by blocking with wood, by providing bracing, or by other methods approved by the OWNER's REPRESENTATIVE.

B. Materials and equipment shall be protected from soiling and moisture by wrapping or by other methods approved by the OWNER's REPRESENTATIVE.

C. Small parts shall be packaged in containers such as boxes, crates, or barrels to avoid dispersal and loss. The CONTRACTOR shall firmly secure an itemized list and description of contents to such a container.

D. See Section 02 05 19 for special handling requirements for geosynthetics.

1.06 Transportation and Delivery

A. Arrange deliveries of materials and equipment in accordance with the Project Schedule specified in **Section 01 32 16 - Construction Progress Schedule**, and coordinate to avoid conflict with work and conditions at the Site.

B. Deliver materials in undamaged condition, in manufacturers' unopened containers or packaging (where applicable), dry, with identifying labels intact and legible.

C. The CONTRACTOR shall provide the equipment and personnel to handle products by methods to prevent soiling or damage.

D. Deliver cement, prepared dry mortar mixes, grouting material, plaster, and coloring material in original, unopened and sealed containers, bearing the brand and manufacturer's name.

E. Refer also to the individual Specifications Sections for detailed requirements as applicable.

1.07 Storage and Protection

A. The receiving, storage, quality, and inventory control of equipment and materials required for the work of this Contract shall be the sole responsibility of the CONTRACTOR. Storage shall be arranged to provide easy access for inspection and identification of each shipment.

B. Materials shall be stored in such a manner as to ensure the preservation of their quality and fitness for the work and to facilitate inspection.

C. Sheltered, weather tight, or heated weather tight storage shall be provided as required to protect materials and equipment from weather damage and corrosion.

D. The CONTRACTOR shall store manufactured materials in accordance with the various manufacturers' instructions. The temperature and humidity shall be maintained within the ranges required by the various manufacturers' instructions.

E. Blocking, platforms, pallets, or skids shall be provided for materials and equipment subject to damage by contact with earth or pavement. Clearances shall be provided from adjacent surfaces for stored materials requiring natural ventilation.

F. Packaged materials shall be stored in their original unbroken packages or containers. Protect materials and equipment from damage and corrosion during warehousing operations.

G. For exterior storage of fabricated products, the products shall be placed on sloped supports aboveground. Products subject to deteriorations shall be covered with impervious sheet covering and ventilation shall be provided to avoid condensation.

H. Loose granular materials shall be stored on solid surfaces in a well-drained area to prevent mixing with foreign matter.

I. Perform periodic inspections of stored materials to assure that materials are maintained under specified conditions, and are free from damage or deterioration.

J. Fabricated structural components shall be stored on supports above ground and in a manner to prevent accumulation of water and warping. Products subject to deterioration from atmospheric conditions shall be covered in a manner that will provide adequate ventilation to avoid condensation.

K. Continue protection of materials and equipment from damage and corrosion

after installation until final acceptance of the work. Refer also to the individual Specifications Sections for detailed requirements, as applicable.

Part 2 Products – Not Used

Part 3 Execution – Not Used

END OF SECTION

SECTION 01 70 00 – EXECUTION AND CLOSEOUT REQUIREMENTS

01 71 23.16 Construction Surveying

Part 1 GENERAL

1.01 CONTRACTOR shall retain the services of an independent registered Land Surveyor licensed in the State of New York to provide survey control for each stage of construction and to provide survey "as-built" documentation for various components of construction. The Surveyor shall furnish all labor, materials, tools, supervision, transportation, and equipment necessary to perform the project surveying work as specified herein for the Project, as shown on the Drawings, and in accordance with the Construction Quality Assurance (CQA) Plan.

A. The work of this Section shall include, but not necessarily be limited to:

1. establishing survey control points;

2. surveying existing conditions;

3. providing survey control during construction; and

4. providing final "as-built" documentation.

1.02 Referenced Sections – None

1.03 Cited Standards – None

1.04 Noted Restrictions – None

1.05 Quality Control

A. Surveyor

1. CONTRACTOR shall retain the services of a registered Land Surveyor licensed in the State of New Jersey and acceptable to CLIENT and ENGINEER.

2. The Surveyor, in the opinion of CLIENT and ENGINEER, shall have a proven record of successful performance on projects of similar magnitude, including detailed, accurate documentation.

3. Surveying will be performed under the direct supervision of a qualified Land Surveyor, who may also be the Senior Surveyor on site.

4. The survey crew will consist of the Senior Surveyor and as many Surveying Assistants as are required to satisfactorily undertake the work. Surveying personnel will be experienced in the provision of these services, including detailed, accurate documentation.

B. Survey Instruments

1. The survey instruments used shall be capable of reading to a precision of 0.01 ft and with a setting accuracy of 10 seconds.

C. Survey Control Points

1. CONTRACTOR or CONTRACTOR's Surveyor shall verify locations of survey control points prior to starting work.

2. CONTRACTOR shall promptly notify CLIENT and ENGINEER of any discrepancies discovered.

3. CONTRACTOR shall protect preexisting survey control and reference points.

4. The control datum for survey is that indicated on the Drawings.

5. The Surveyor shall establish at least three survey control monuments prior to starting site work at location convenient for daily tie-in.

6. ENGINEER shall be promptly notified in writing of any discrepancies discovered before or during construction. CONTRACTOR shall immediately report, in writing, to CLIENT and ENGINEER any permanent survey control point which is lost, destroyed, or requires relocation. CONTRACTOR shall replace each lost or destroyed permanent survey control point at no additional cost to CLIENT. Survey control points shall be shown on all "as-built" record drawings.

D. Project Record Drawings

1. CONTRACTOR shall keep and update red-line drawings of all work performed throughout the project. Red-line drawings shall consist of the Drawings with field changes marked in red ink. CONTRACTOR shall allow CLIENT and ENGINEER to routinely inspect the red-line drawings

E. As-Built Survey

1. The Surveyor shall locate and clearly mark in the field all property boundaries within 100 ft of the work area prior to starting the work. CONTRACTOR shall immediately notify CLIENT and ENGINEER of any discrepancy between the boundary location shown on the Drawings and the location indicated by the evidence and procedures used by the Surveyor.

2. The Surveyor shall locate and clearly mark in the field (flag) the locations of the existing sewer forcemain, the slurry wall alignment, and the limit of disturbance, as indicated on the Drawings, prior to starting the Work. CONTRACTOR shall immediately notify CLIENT and ENGINEER of any discrepancy or conflicts found.

3. The Surveyor shall establish a 50-foot by 50-foot grid for construction and "as-built" documentation.

4. The Surveyor shall provide, at a minimum, a detailed as-built survey for the following components.

a. Existing site topography, with elevations, 25-ft beyond the limits of disturbance prior to commencing construction;

b. Final topography, with elevations, of the final grade;

c. Location of air sparging wells, soil vapor extraction wells, and groundwater monitoring wells, including elevation of ground surface, inner casing and outer casing (if present);

d. Location of aboveground piping;

e. Location of installed utilities

f. Location, depth, width and slope of constructed storm water management features; and

g. All other items that CONTRACTOR requires to complete its work and establish pay quantities.

F. Survey For Quantity Estimates

1. CONTRACTOR's Surveyor shall provide survey data required to determine quantity estimates for all related bid items listed in the CONTRACTOR's Bid Schedule. This survey shall be used by ENGINEER to establish the quantities for payment under the various items of Work. The survey information shall be supplied in detail sufficient to substantiate applications for payment.

2. CLIENT shall have the right to retain a third-party Surveyor licensed in the State of New York to review field survey data and/or resurvey portions of the Work to check as-built quantity estimates. In the case of conflict between the two surveys, ENGINEER shall review the two surveys and determine the final pay quantity.

3. In the event that survey data provided by CONTRACTOR is not sufficient to determine actual pay quantity, and the status of Work prevents additional data from being obtained, ENGINEER shall attempt to reasonably estimate the pay quantity based upon available information. ENGINEER's estimate shall be final.

G. Construction Tolerances

1. All constructed products shall meet the survey tolerances specified in the appropriate sections of these Specifications. The tolerances listed below notwithstanding, all permit conditions, regulatory requirements, and thickness requirements must be adhered to. It is CONTRACTOR's sole responsibility to control the work so that all of the geometric requirements of the project are met.

2. In the case where survey tolerances are not specified within a particular Section, the following survey tolerances shall apply:

a. Length, thickness, or distance: ±0.1 ft

b. Length, thickness, or distance with a specified minimum: 0 to +0.2 ft

c. Vertical elevation: ±0.1 ft

d. Slope angles: ± 5 percent of specified slope (e.g. 3H:1V = 33.3 percent ±1.7 percent)

e. Slope angles with a specified minimum: 0 to + 10 percent of specified slope

f. Horizontal coordinates: ±0.1 ft

H. Survey Documents

1. All final survey documents shall be provided in both paper and electronic format. The electronic files shall be in AutoCAD® 2006 format or in a format fully compatible with AutoCAD® 2006. Electronic files shall be furnished on compact disk (CD) or flash drive for use in Windows® compatible PCs. Electronic files shall be clearly labeled.

1.06 Submittals

A. Surveyor's Qualifications

1. Submit to ENGINEER the name, address and telephone number of the Surveyor prior to the start of site work.

2. Submit to ENGINEER the Surveyor's qualifications at least 14 days prior to the start of survey work. Qualifications shall address the following information:

a. prior experience of the survey firm in similar environmental projects, including name of project, location, a brief summary of the work, and dates; and

b. identify the key personnel assigned to the Project, including the crew chief for field surveying.

B. Calibration Certificates

1. Upon request, submit to ENGINEER calibration certificates for survey instruments and log of control and survey work for verification of accuracy of survey work.

C. Project Record Drawings

1. At the end of the Project, CONTRACTOR shall submit a complete set of red-line drawings to ENGINEER for its use in preparing the final report of construction activities.

D. As--built Drawings

1. CONTRACTOR shall prepare an “as-built” set of survey drawings of the work.

1.07 Coordination

A. Contractor shall be responsible for coordination of all as-built surveying. Should as-built survey data not meet the requirements of this specification, contractor shall be solely responsible for all project delays and costs associated with uncovering completed work in order to obtain necessary as-built data.

Part 2 Products – Not Used

Part 3 Execution – Not Used

END OF SECTION

01 75 13 Checkout Procedures

Part 1 General

1.01 Section Includes

A. This section describes the Checkout Procedures to be performed by the CONTRACTOR. Equipment testing and startup are required for satisfactory completion of the contract and shall be scheduled and completed within the contract time.

1.02 Referenced Sections – None

1.03 Cited Standards – None

1.04 Noted Restrictions – None

1.05 Quality Control

A. Equipment Testing

1. The CONTRACTOR shall furnish to the ENGINEER a written report addressed to the OWNER certifying that each item of equipment indicated in the equipment schedules has been properly installed and lubricated, is in accurate alignment, is free from any undue stress imposed by connecting piping or anchor bolts and has been operated satisfactorily under full-load conditions.

2. The CONTRACTOR shall be responsible for scheduling all operations testing. The CONTRACTOR shall furnish all personnel, power, water, chemicals, fuel, oil, grease and all other necessary equipment, facilities and services required for conducting the tests.

3. The CONTRACTOR is advised that the ENGINEER and the OWNER's operating personnel will witness operations testing and that the manufacturer's representative shall be required to instruct the OWNER ‘S operating personnel in correct operation and maintenance procedures.

4. This instruction shall be scheduled with the ENGINEER and the OWNER at least ten (10) days in advance and shall be provided while the equipment is fully operational. The CONTRACTOR shall have previously furnished the technical manuals required under **Sections 01 33 00 - Submittal Procedures** and **01 78 23 - Operation and Maintenance Data**.

Part 2 Products – Not Used

Part 3 Execution – Not Used

END OF SECTION

01 77 00 Closeout Procedures

Part 1 General

1.01 Section Includes

A. This section includes requirements for closeout procedures, final cleaning, and project record documents.

1.02 Referenced Sections – None

A. Related Sections are listed below:

1. SECTION 01 78 23 - OPERATION AND MAINTENANCE DATA

2. SECTION 01 78 39 - PROJECT RECORD DOCUMENTS

1.03 Cited Standards – None

1.04 Noted Restrictions – None

1.05 Quality Control

A. Closeout Procedures

1. The CONTRACTOR shall make all repairs and replacements promptly upon receipt of written order from the OWNER. If the CONTRACTOR fails to make such repairs or replacements promptly the OWNER reserves the right to do the Work and the CONTRACTOR and his surety shall be liable to the OWNER for the cost thereof. Replacement of earth fill, backfill or resurfacing where it has settled below the required finish elevations shall be considered as part of such required repair work.

B. Final Cleaning

1. Final cleaning shall be executed prior to the final inspection.

2. The CONTRACTOR shall clean the Site, sweep paved area, and clean any other surfaces.

3. Waste and surplus materials, rubbish and construction facilities shall be removed from the project and from the Site.

C. Project Record Documents

1. Documents shall be stored separate from those used for construction.

2. The CONTRACTOR shall keep documents current and shall not conceal any work until required information has been recorded.

3. At Contract Closeout, the CONTRACTOR shall submit documents with a transmittal letter containing the date, project title,

CONTRACTOR's name and address, list of documents, and the signature of the CONTRACTOR.

1.06 Submittals

A. When the CONTRACTOR considers his/her work has reached final completion, the CONTRACTOR shall submit a certification that states that the Contract Documents have been reviewed, work has been inspected, and that the work is complete in accordance with the Contract Documents and is ready for the OWNER's inspection. The inspection shall include start-up and testing of all installed equipment. Inspections by regulatory agencies shall be considered to be part of OWNER's inspection.

B. The request shall be made in writing, addressed to the OWNER's REPRESENTATIVE, at least seven days in advance of the requested date of the final inspection.

C. In addition to submittals required by the Conditions of the Contract, the CONTRACTOR shall provide submittals required by governing authorities, and shall submit a final statement of accounting giving the total adjusted contract sum, previous payments, and the sum remaining due.

D. The OWNER will issue a final change order reflecting approved adjustments to the contract sum not previously made by change order.

Part 2 Products – Not Used

Part 3 Execution

A. Final Cleanup

1. The CONTRACTOR shall promptly remove, from the vicinity of the completed work, all rubbish, unused materials, concrete forms, construction equipment and temporary structures and facilities used during construction. Final acceptance of the Work by the OWNER will be withheld until the CONTRACTOR has satisfactorily complied with the requirements for final cleanup of the project Site.

B. Inspection

1. The CONTRACTOR shall attend Pre-Final Inspection by USEPA at least fourteen (14) days prior to completion.

2. If USEPA requires corrective measures following the Pre-Final Inspection, CONTRACTOR shall undertake the corrective measures according to a schedule prepared by CONTRACTOR and approved by OWNER, ENGINEER and USEPA.

3. Within fourteen (14) days after completion of the construction of the corrective measures, CONTRACTOR shall attend a Final Inspection by USEPA. CONTRACTROR shall correct any deficiencies identified by USEPA during Final Inspection according to a schedule prepared

by CONTRACTOR and approved by OWNER, ENGINEER and USEPA

4. CONTRACTOR shall submit to ENGINEER inspection and corrective action reports, if any, within seven (7) days of completion of field inspection/corrective action implementation.

END OF SECTION

01 78 23 Operation and Maintenance Data

Part 1 General

1.01 Section Includes

A. This section includes the CONTRACTOR's requirements in regard to the Work's Operation and Maintenance Data. The CONTRACTOR has overall responsibility to obtain the necessary data from and compile the data as set forth in this specification, including items or equipment purchased by the OWNER and delivered to the CONTRACTOR for installation.

B. The Operating and Maintenance (O&M) Manual is prepared to provide a ready reference to all important pieces of mechanical and electrical equipment installed on the project. It is also to provide the necessary operating and maintenance data for use by service personnel. It is also to provide information required for checking equipment performance or for planning of expansion or redesign.

1.02 Referenced Sections – None

1.03 Cited Standards – None

1.04 Noted Restrictions

A. The O&M Manuals will be submitted in three-ring binder with insert labels in the cover and spine identifying the project and device name. Stick-on, taped or pasted labels are not acceptable.

B. Equipment will not be accepted until approval and submittal of final O&M manuals.

1.05 Quality Control

A. Operation and Maintenance (O&M) Manual

1. For the O&M Manual, the CONTRACTOR shall provide, at a minimum, the following:

a. A comprehensive and applicable operating and maintenance manual.

b. Nameplate data including equipment identification number (as identified on the Drawings), model number, serial number, operating range, and power supply.

c. Manufacturer's instruction, description of system operation, start-up data, and troubleshooting lists.

d. Manufacturer's instructions, calibration schedule and instructions, lubrication schedule, and type and cleaning procedures.

e. Electrical wiring diagram and schematic.

f. Complete parts list identifying material of construction, and the manufacturer's recommended repair parts listing.

g. Name, address and phone number for manufacturer, sales representative and nearest parts warehouse.

B. All information included shall be legible and sufficiently marked to indicate the exact size, model, type, etc., of equipment furnished and installed.

C. The number of binders (or "volumes") required will depend on the amount of information to be catalogued.

1.06 Submittals

A. The CONTRACTOR shall submit all approved O&M technical manuals to the OWNER'S REPRESENTATIVE. The OWNER's REPRESENTATIVE will then prepare the O&M Manual.

B. Manuals from the CONTRACTOR shall contain descriptive drawings and data which identify equipment installed at the project and detail the procedures and parts required to maintain and repair the equipment. Copies of approved submittals shall be included for all equipment.

C. The OWNER'S REPRESENTATIVE submittals shall include the following:

1. Two sets of the draft O&M manual shall be submitted for review.

2. Four sets of the final O&M manual and an electronic copy on compact disc shall be submitted to the following:

a. Three sets and CD to the OWNER

b. One set for the OWNER's REPRESENTATIVE

3. The manuals will be submitted in a three-ring binder with insert labels in the cover and spine identifying the project and device name. Stick-on, taped or pasted labels are not acceptable.

4. The quantities of drawings, manufacturer's literature, or other data required for these manuals are in addition to those otherwise required for normal distribution for approval during the construction period.

D. Equipment will not be accepted until approval and submittal of final O&M manuals.

E. The Operating and Maintenance Manuals shall be submitted to OWNER's REPRESENTATIVE sixty (60) days prior to scheduled completion, revised and resubmitted within thirty (30) days of scheduled completion.

Part 2 Products

2.01 O&M Manual Components

A. Page Size

1. All pages shall be standard 8-1/2 x 11 inches size or approximate multiples (preferably 17 x 11 inches) folded to 8-1/2 x 11 inch manila pockets, which shall have standard three-ring side punching for insertion in the binders. The equipment name, drawing description and number shall be written on the face of each manila pocket.

B. Drawings

1. All drawings larger than 8-1/2" x 11" shall be folded and inserted in individual 8-1/2" x 11" manila pockets, which shall have standard three-ring side punching for insertion in the binders. The equipment name, drawing description and number shall be written on the face of each manila pocket.

C. Binders

1. Binders shall be Buckram binders with block lettering for sheet size 8-1/2 x 11 inches with 2" to 3-1/2" expandable metal capacity as required for the project. The number of binders, however, shall be based on not filling them beyond 4".

D. The following information shall appear on the front cover and backbone:

1. "Operation and Maintenance Manual"

2. Project Name (and volume number if more than one volume)

3. OWNER’s name

4. OWNER’S REPRESENTATIVE's name

5. General CONTRACTOR's name

E. Item 5 need not be printed on the backbone.

F. Contents and Indexing:

1. Manuals shall contain descriptions of the AS/SVE systems in sufficient detail to adequately indicate the type of systems installed and the basic details of their operation.

2. All purchased equipment data shall be used to designate the sections. Within each section additional indexing of component parts may be required.

3. Operation and Maintenance Manuals shall contain to the fullest extent all possible information pertinent to the equipment. The arrangement and type of information to be filed shall be as follows:

a. Copy of purchase order change (if any).

b. Outline drawings, special construction details, "as built" electrical wiring and control diagrams for all major and supplementary systems.

c. Manufacturer's test or calculated performance data and certified test curves.

d. Installation, operating, and maintenance instructions, including a complete parts list and sectional drawing with parts identification numbers. Mark with model, size and plan number.

e. Manufacturer's brochure marked to indicate exact equipment purchased. Brochures on component parts supplied by a manufacturer with his equipment, but not manufactured directly by him, shall also be included.

f. The serial numbers of each item of equipment installed are to be listed with the model numbers and plan symbols.

g. Written warranties.

h. Include a Table of Contents. The contents shall be divided with tabbed index dividers into the following suggested parts:

Part I System Descriptions

Part II Purchased Equipment Data

Part III Test Reports and Valve Charts

Part IV Start-Up and Operation

Part V Preventative Maintenance Recommendations

i. A copy of the approved submittals for each piece of equipment, and a copy of all testing, adjusting and balancing reports.

j. Wiring diagrams marked with model and size and plan symbol.

k. Operating and Maintenance Manual data for Part I shall be obtained directly from the mechanical and electrical consultants. (Allow consultant preparation cost.)

l. The index shall contain the name and address of the manufacturer and, if different, where replacement and repair parts may be obtained.

Part 3 Execution – Not Used

END OF SECTION

01 78 39 Project Record Documents

Part 1 General

1.01 Section Includes

A. This section includes the CONTRACTOR's requirements in regard to the project record documents.

1.02 Referenced Sections – None

1.03 Cited Standards – None

1.04 Noted Restrictions – None

1.05 Quality Control

A. Prior to requesting final payment, the CONTRACTOR shall obtain and submit the following items to the ENGINEER for transmittal to the OWNER:

1. Manufacturers' representatives' installation, testing and startup reports.

2. Keying.

3. Maintenance stock items, spare parts and special tools.

4. Completed record drawings.

5. Certificates of inspection and acceptance by Federal, State and local governing agencies having jurisdiction.

6. Releases from all parties who are entitled to claims against the subject project, property or improvement pursuant to the provisions of law.

B. Record Drawings

1. The Record drawings shall be kept current with the work and shall be subject to inspection by the OWNER's REPRESENTATIVE at any time.

2. Prior to acceptance of the work, the CONTRACTOR shall submit the record drawings to the OWNER's REPRESENTATIVE.

3. Record drawings shall be provided in both paper and electronic format. The electronic files shall be in AutoCAD® 2006 format or in a format fully compatible with AutoCAD® 2006. Electronic files shall be furnished on compact disk (CD) or flash drive for use in Windows® compatible PCs. Electronic files shall be clearly labeled.

Part 2 Products – Not Used

Part 3 Execution

3.01 General

A. CONTRACTOR shall submit project record documents specified in this Section to OWNER's REPRESENTATIVE within 21 calendar days after EPA notice of construction completion

END OF SECTION

CORTESE LANDFILL SITE

NARROWSBURG, NEW YORK

OU 4 REMEDIAL DESIGN

ENGINEERING SPECIFICATIONS

DIVISION 02

EXISTING CONDITIONS

PROJECT:	**OU 4 REMEDIAL DESIGN**
LOCATION:	**CORTESE LANDFILL NARROWSBURG, NEW YORK**
PROJECT NO.:	**MR0562B**
COMPANEW YORK:	**CORTESE LANDFILL PRP GROUP**
PREPARED BY:	Geosyntec consultants engineers | scientists | innovators

SECTION 02 00 00 - EXISTING CONDITIONS

02 05 00 Common Work Results for Existing Conditions

Part 1 General

1.01 General Conditions

A. The General Conditions apply to all sections of this specification, which shall be done as shown on the plans and as specified, and shall be properly coordinated with work in other Specifications.

B. The Drawings and these Specifications are complementary to each other; what is called for by one shall be as binding as if called for by both. If there is any conflict between what is shown on the Drawings and what is written in the Specifications, the more restrictive shall take precedence and the CONTRACTOR shall communicate the conflicts to the OWNER's REPRESENTATIVE prior to constructing the work.

C. Safety

1. The CONTRACTOR shall be familiar with, and shall at all times conform to, the regulations of the *"OSHA General Industry Occupational Safety and Health Standards," "OSHA Safety and Health Regulations for Construction,"* and other applicable state and municipal standards and regulations.

1.02 Referenced Sections – None

1.03 Cited Standards

A. Standards listed as "Reference Standards" in the various sections of these contract documents are hereby incorporated into these Specifications by reference.

B. Referenced documents shall include all revisions, amendments, supplements, or addenda issued on or before the date of advertising for bids.

1.04 Noted Restrictions

A. If damage to existing underground/aboveground utilities occurs, restoration of utility service shall be completed AS SOON AS POSSIBLE by the CONTRACTOR and shall be included as part of the project's costs at no additional cost to the OWNER.

1.05 Quality Control

A. The CONTRACTOR shall conduct all work in accordance with the applicable rules and regulations of specified governing agencies, and in accordance with the laws, rules, and/or regulations of all other authorities having jurisdiction over the required construction work. Any required permits shall be obtained and paid for by the CONTRACTOR (including all town permit fees and charges).

1.06 Submittals

A. Record Drawings

1. The CONTRACTOR shall keep one up-to-date copy of all drawings for all deviations or modifications in location or elevation of any underground installation from that shown on the Contract Drawings.

2. Record Drawings provided by the CONTRACTOR shall include (but not be limited to) location of all underground pipes, valves, stub-outs, plugs, service pipelines, final well locations, treatment pipeline routings and the lateral and vertical extent of trench excavation. All locations and elevations shall be identified by qualified survey crews and tied to the New York Coordinate System NAD 83 in feet. Survey shall be in accordance with the respective pipeline and well installation Specifications.

Part 2 Products – Not used

Part 3 Execution – Not used

END OF SECTION

02 05 19 Geosynthetics for Existing Conditions

Part 1 General

1.01 Section Includes

A. This section describes how the CONTRACTOR will address maintenance and repair of the existing geosynthetic components of the landfill cap during construction including the repair of previous borehole and monitoring well penetrations.

B. Existing geosynthetics include:

1. Geomembrane

2. Geotextiles

3. Geonet

C. The CONTRACTOR shall furnish all materials, labor, tools and appurtenances required to install the geomembrane cover repairs as required by the Construction Drawings or make repairs due to damage caused by construction activities as directed by the ENGINEER. CONTRACTOR shall provide a “Competent Person” to implement, supervise, and inspect all Work.

1. Installation of geomembrane must be completed by an experienced INSTALLER fully qualified to complete the Work described in this Section.

2. Comply with applicable codes, ordinances, rules, regulations, and laws of local, State or Federal authorities having jurisdiction.

3. The CONTRACTOR/INSTALLER shall be responsible for the manufacturing, transport, and installation of the geomembrane. The CONTRACTOR/INSTALLER shall provide Shop Drawings and a written description detailing the proposed methods to be employed for performing the Work. All materials, equipment and supplies to be incorporated in the Work shall be described, including seaming plans, installation procedures, quality control programs, and any other information needed to show his proposed method of conforming to the Construction Drawings and these Technical Specifications.

D. The CONTRACTOR shall furnish all labor, materials, equipment, tools and appurtenances required to install geotextile as shown on the Construction Drawings. CONTRACTOR shall provide a “Competent Person” to implement, supervise, and inspect all Work.

1. Installation of geotextile must be completed by and experienced INSTALLER fully qualified to complete the Work in this Section.

2. Comply with applicable codes, ordinances, rules, regulations and laws of local, State or Federal authorities having jurisdiction.

3. Non-woven geotextile shall be installed as part of the cover repairs. The following Specifications shall govern the manufacturing, transport, and installation of the geotextile component of the final cover.

4. The CONTRACTOR/INSTALLER shall be responsible for the manufacturing, transport, and installation of the geotextile. The CONTRACTOR/INSTALLER shall provide Shop Drawings and a written description detailing the proposed methods to be employed for performing the Work. All materials, equipment and supplies to be incorporated in the Work shall be described, including installation procedures, quality control programs, and any other information needed to show his proposed method of conforming to the Construction Drawings and these Technical Specifications.

E. The CONTRACTOR shall furnish all materials, labor, tools and appurtenances required to repair the geonet drainage layer of the closure cover system.

1. Installation of geonet must be completed by an experienced CONTRACTOR/INSTALLER fully qualified to complete the work in this Section.

2. Geonet shall be installed as part of the closure cover system repairs. The following Technical Specifications shall govern the manufacturing, transport, and installation of the geonet component of the closure cover system.

3. Comply with applicable codes, ordinances, rules, regulations and laws of local, municipal, State or Federal authorities having jurisdiction.

F. The CONTRACTOR shall furnish and install HDPE pipe boot/sleeves and skirts for use in areas where the geomembrane cap must be or has been penetrated by vertical riser pipes as shown on the Contract Drawings or as directed by the ENGINEER. In general, penetration through the geomembrane cap are required at gas collection vent riser pipes, piezometers, groundwater monitoring wells, soil gas probes, air sparging wells and soil vapor extraction wells.

1.02 Referenced Sections – None

1.03 Cited Standards

A. American Society for Testing and Materials (ASTM):

1. ASTM D1004-90 – Standard Test Method for Initial Tear Resistance of Plastic Film and Sheeting.

2. ASTM D1204-84 – Standard Test Method for Linear Dimensional Changes of Nonrigid Thermoplastic Sheeting or Film at Elevated Temperature.

3. ASTM D1238-90 – Standard Test Method for Density for Flow Rates of Thermoplastics by Extrusion Plastometer.

4. ASTM D1505-85 – Standard Test Method for Density of Plastics by Density-Gradient Technique.

5. ASTM D1603-76 – Standard Test Method for Carbon Black in Olefin Plastics.

6. ASTM D2663-89 – Standard Test Methods for Carbon Black-Dispersion in Rubber.

7. ASTM D3015-90 – Practice for Microscopical Examination of Pigment Dispersion in Plastic Compounds.

8. ASTM D3786-87 – Test Method for Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabric – Diaphragm Bursting Strength Tester Method.

9. ASTM D4437-84 – Standard Practice for Determining Integrity of Field Seams Used in Joining Flexible Polymeric Sheet Geomembranes.

10. ASTM D4533-91 – Test Method for Trapezoid Tearing Strength of Geotextiles.

11. ASTM D4632-91 – Test Method for Breaking Load and Elongation of Geotextiles (Grab Method).

12. ASTM D4833-88 – Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products.

13. ASTM D4833-88 – Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products.

14. ASTM D5199-91 – Test Method for Measuring Nominal Thichness of Geotextiles and Geomembranes.

15. ASTM D638-91 – Standard Test Method for Tensile Properties of Plastics.

16. ASTM D746-79 – Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact.

17. ASTM D751-89 – Standards Test Methods of Testing Coated Fabrics.

18. ASTM D792-91 – Standards Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement.

B. Geosynthetic Research Institute (GRI):

1. GRI Test GM-5 – Ductile/Brittle Transition Time for Notched Polyethylene Specimens Under Constant Stress.

   Test method modified as follows.

   a. Test five samples taken in cross-machine direction.

   b. Test specimens at 30 percent of room temperature yield stress.

   c. Test shall be discontinued upon failure of first specimen or when test duration exceeds specified value.

C. United States Environmental Protection Agency, "Lining of Waste Containment and Other Impoundment Facilities,: EPA/600/2-88/052.

1.04 Qualifications

A. The CONTRACTOR/INSTALLER shall have previous experience in the installation of polyethylene geomembrane and will be required to provide satisfactory evidence demonstrating the successful installation of a total of at least 1,000,000 square feet of polyethylene geomembrane on at least five similar projects.

B. At a minimum, the CONTRACTOR/INSTALLER shall designate a Superintendent and a Master Seamer for the project. The Superintendent shall have at least 50 acres of supervisory experience for polyethylene geomembrane installation on at least five previous projects. The Master Seamer shall have at least 500,000 square feet of polyethylene geomembrane seaming experience using the methods required for this project and shall have worked on at least two previous projects. The CONTRACTOR/INSTALLER shall provide satisfactory evidence demonstrating these requirements are met. The CONTRACTOR/INSTALLER shall provide resumes for all installation personnel.

1.05 Quality Control

A. Prior to installation of any geosynthetic components, the MANUFACTURER or CONTRACTOR shall provide the ENGINEER with the following documentation:

1. Geomembrane Sheet Documentation:

   a. Specifications for the geomembrane which includes all properties listed in Part 2.01 of this Section measured using the specified test methods.

   b. Written certification that the minimum values given in the specification are guaranteed by the MANUFACTURER.

   c. Quality control (QC) certificates, signed by a responsible party employed by the MANUFACTURER, indicating product designation, roll number identification, date of

MANUFACTURER, testing procedures, and the results of all quality control tests. At a minimum, the tests listed in Part 2.04.c shall be performed, as applicable.

2. Geotextile Sheet Documentation:

   a. The origin (supplier's name and production plant), identification (brand name and number), and production date of the geotextile supplied for the project.

   b. Specifications for the geotextile which include all properties listed in Part 2 of this Section measured using the specified test methods.

   c. Written certification that the minimum values given in the specifications are guaranteed by the MANUFACTURER.

   d. Quality control certificates, signed by a responsible party employed by the geotextile MANUFACTURER, indicating product designation, roll number identification, date of MANUFACTURER, testing procedures and the results of all quality control tests. At a minimum, the tests listed Part 2.03b shall be performed, as applicable.

3. Geonet

   a. The MANUFACTURER shall perform quality control tests on the geonet during the production process. Geonet QC testing shall be performed at a frequency of one sample for every 50,000 square feet of material produced. Geonet samples will be tested for the properties and to the requirements given in Section 2.03. The CONTRACTOR shall obtain from the MANUFACTURER certified copies of the test results for the rolls provided for use in the closure cover system.

B. The following quality control tests, at a minimum, shall be performed and test results reported by the MANUFACTURER:

1. Geomembrane

Test	Method	Min. Frequency
Density	ASTM D1505	1/100,000 ft^2
Carbon Black Content	ASTM D1603	1/100,000 ft^2
Thickness	ASTM D5199	1/100,000 ft^2
Tensile Properties	ASTM D638	1/100,000 ft^2
Multi-Axial Elongation	ASTM D5617	1/250,000 ft^2

A certification of environmental stress crack resistance (GRI GM-5b) shall be provided by the MANUFACTURER.

2. Non-woven Geotextile

Test	Method	Min. Frequency
Mass per Unit Area	ASTM D3776	1/100,000 ft^2
Trapezoidal Tearing Strength	ASTM D4533	1/100,000 ft^2
Grab Tensile Strength	ASTM D4632	1/100,000 ft^2
Grab Elongation	ASTM D4632	1/100,000 ft^2
Burst Strength	ASTM D3786	1/100,000 ft^2

3. Woven Geotextile

Test	Method	Min. Frequency
Tensile Strength	ASTM D4595	1/100,000 ft^2
	ASTM D4632	1/100,000 ft^2
Elongation	ASTM D4595	1/100,000 ft^2
	ASTM D4632	1/100,000 ft^2
Burst Strength	ASTM D3786	1/100,000 ft^2
Puncture Strength	ASTM D4833	1/100,000 ft^2

4. Geonet

Test	Test Method	Min. Frequency
Transmissivity at 1000 psf	ASTM D4716	1/50,000 ft2
Polyethylene - Density (range)	ASTM D1505	1/50,000 ft2
Carbon Black	ASTM D1603	1/50,000 ft2
Peak Tensile Strength	ASTM D1682 modified	1/50,000 ft2
Thickness (min)	ASTM D751	1/50,000 ft2

C. All quality control test results shall be reviewed by the ENGINEER for conformance with the minimum physical properties listed in Part 2 of this Section. Any nonconformance shall be reported the OWNER and shall be the basis of rejection of the non-conforming rolls.

D. Upon delivery of the material to the Site, the ENGINEER may obtain conformance test samples to verify conformance with the project specifications. Alternatively, samples may be obtained at the manufacturing facility prior to material delivery to the Site, if desired by the OWNER.

1. Geomembrane Rolls

a. Samples shall be three (3) feet long in the machine direction by the entire width of the selected geomembrane roll and shall be obtained after the first (3) feet (or more if material is damaged as determined by the ENGINEER) of the roll has been removed. Samples shall be marked with “machine direction” indicated prior to shipment to the laboratory.

b. Conformance testing shall be performed by a qualified geosynthetic materials testing laboratory, which is accredited by the Geosynthetics Accreditation Institute-Laboratory Accreditation Program (GAI-LAP) and approved by the OWNER and ENGINEER.

c. The following conformance tests shall be performed on the geomembrane:

Test	Method	Min. Frequency
Density	ASTM D1505	1/200,000 ft^2
Carbon Black Content	ASTM D1603	1/200,000 ft^2
Thickness	ASTM D5199	1/200,000 ft^2
Tensile Properties	ASTM D638	1/200,000 ft^2

2. Geotextile Rolls

a. Samples shall be three (3) feet in the machine direction by the entire width of the selected geotextile roll and shall be obtained after the first three (3) feet (or more if material is damaged as determined by the ENGINEER) of the roll has been removed. Samples shall be marked with “machine direction” indicated prior to shipment to the laboratory.

b. Conformance testing shall be performed by a qualified geosynthetic materials testing laboratory, which is accredited by the Geosynthetic Accreditation Institute Laboratory Accreditation Program (GAI-LAP) and approved by the OWNER and the ENGINEER.

c. Conformance samples shall be tested for the properties listed in Part 2.02 of this Section. Conformance tests shall be performed at the minimum frequency of one per lot, but not less than one test per 100,000 square feet of material delivered.

3. Geonet

a. Samples shall be three (3) feet long in the machine direction by the entire width of the roll and shall be obtained after the first three (3) feet (or more if material is damaged as determined by the ENGINEER) of the roll has been removed; Samples shall be marked with "machine direction" indicated prior to shipment to the laboratory.

b. Conformance testing shall be performed by a qualified geosynthetic materials testing laboratory, which is accredited by GAI-LAP and approved by the OWNER and the ENGINEER.

c.

E. All conformance test results shall be reviewed by the ENGINEER for conformance with the minimum physical properties listed in Part 2 of this Section. Any nonconformance shall be reported to the OWNER and shall be the basis of rejection of the non-conforming rolls.

F. If the MANUFACTURER has reason to believe that the failing test results are the result of incorrect laboratory test procedures, the MANUFACTURER may request that the samples in question be retested for the failing property by the laboratory with a technical representative of the MANUFACTURER present during testing. Alternatively, the MANUFACTURER may request that the sample be rested at two different laboratories approved by the OWNER and the ENGINEER. Additional testing shall be at the cost to the MANUFACTURER. If both laboratories produce passing results, the material shall be accepted. If one or both of these laboratories does not produce passing results, then the original laboratory test results shall be accepted. The use of these procedures for addressing failing test results is subject to the approval of the OWNER.

G. If a test result does not meet the project specifications, all material from the resin batch or manufacturing lot represented by the failing sample shall be considered out-of-specification and rejected. Alternatively, at the option of OWNER, additional conformance test samples may be taken to bracket the portion of the batch not meeting the specification. This procedure is valid only when all rolls in the batch are consecutively produced and numbered from one manufacturing line. To isolate out-of-specification material, additional samples shall be taken from rolls which have numbers immediately adjacent (or the next roll number present on-Site from the same batch or lot) to the roll that was initially sampled and failed. If both additional tests pass, the roll that represents the initial failed test and the roll manufactured immediately after that roll (next larger roll number), if present on-Site, shall be rejected. If one or both of the additional tests fail, then the entire batch shall be rejected or this procedure repeated with two additional tests that bracket a greater number of rolls within the batch. All additional testing shall be at the cost to the CONTRACTOR.

1.06 Submittals

A. The CONTRACTOR shall submit to the ENGINEER all items described in subsequent sections as outlined by the following schedule:

1. Prior to Delivery to the Project Site

a. MANUFACTURER's Product Specifications.

b. MANUFACTURER's quality control certificates for each geomembrane and geonet roll to be delivered to the Site.

c. Certification stating geonet roll numbers and base resin type and lot from which the internal geonet was produced.

2. Prior to Installation

a. Resumes of all CONTRACTOR/INSTALLER geomembrane installation personnel onsite indicating prior similar geomembrane installation experience, and identification of the Superintendent, Master Seamer, and Quality Control Technician. CONTRACTOR/INSTALLER personnel shall be subject to approval by the OWNER and the ENGINEER.

b. Shop drawings showing details of geosynthetics installation, and details of all work including fusion and extrusion welding processes, overlapping, sewing, repairs, and HDPE boot/skirt installation.

c. If the repair large areas of the existing geosynthetics require geomembrane panel installation, shop drawings, including geomembrane panel layout drawings and details of all work, including fusion and extrusion welding processes.

d. Schedule of operations, including means and methods of installation.

3. Daily During Installation

a. Daily construction progress reports clearly showing geomembrane panels placed by date and indicating quantities of geotextile installed and specific areas of installation..

b. Daily seam test records, including seamer trial seam testing.

c. Daily records of field seam testing (destructive and non-destructive) for the geomembrane.

d. Daily construction progress reports clearly showing geonet deployment areas by date.

4. Upon Completion

a. Record drawing of locations of cap repairs and HDPE boot/skirt installations (4 prints and 1 reproducible).

b. Record panel layout diagram, if applicable (4 prints and 1 reproducible).

c. Summary and log of all laboratory quality control testing completed by the CONTRACTOR/INSTALLER.

d. Summary and log of all field quality control testing completed by the CONTRACTOR/INSTALLER.

e. Certification that material installation is complete and in accordance with the Specifications.

f. Statement of material warranty from the MANUFACTURER.

g. Statement of workmanship warranty from the CONTRACTOR/INSTALLER.

1.07 Delivery, Storage and Handling

A. The CONTRACTOR/INSTALLER shall be responsible for the protection of the geosynthetic components against damage during transportation to the Site, during storage at the Site, and prior to placement of subsequent construction materials. Only undamaged component shall be included within the construction. Any damaged material, as determined by the ENGINEER, shall be replaced by the CONTRACTOR/INSTALLER at no cost to the OWNER.

B. Conform to the MANUFACTURER's requirements to prevent damage to geosynthetic components during deliver, storage, and handling.

C. Delivery

1. Deliver materials to the Site only after the ENGINEER approves required submittals.

2. Separate any damaged rolls from undamaged rolls and store at locations designated by the ENGINEER until damaged rolls are removed from Site.

3. The ENGINEER shall be the final authority regarding damage.

4. Separate rolls without proper documentation and store until ENGINEER approval is received.

D. On-Site Storage

1. Store all materials in an area designated by the ENGINEER.

2. Protect from puncture, dirt, grease, water, moisture, mud, mechanical abrasions, excessive heat, and other potential damage.

3. Stack rolls in accordance with the MANUFACTURER's recommendation but no more than three (3) rolls high.

4. Store on a level prepared surface (not on wooden pallets).

5. Stack geotextile rolls in accordance with the MANUFACTURER's recommendation but no more than seven (7) rolls high.

E. On-Site Handling

1. CONTRACTOR/INSTALLER shall use appropriate handling equipment to load, move and deploy geomembrane rolls. Appropriate handling equipment includes cloth chokers and spreader bar for loading, and spreader and roll bars for deployment. Dragging or rolling panels on the ground surface shall not be permitted.

2. Folding of the geomembrane sheet shall not be permitted and shall be a basis for rejection.

3. The CONTRACTOR/INSTALLER shall be responsible for off-loading, storage, and transporting material from the storage area to the area to be lined.

4. CONTRACTOR/INSTALLER shall use appropriate handling methods to load, move and deploy geotextile rolls, subject to approval by the ENGINEER.

5. The CONTRACTOR/INSTALLER shall be responsible for off-loading, storage, and transporting material from the storage area to the area to be covered.

Part 2 Products

2.01 Geomembrane

A. Geomembrane sheet shall be manufactured using clean polyethylene resin reclaimed during the manufacturing process. The resin shall have a density ranging between 0.92 to 0.94 grams per cubic centimeter (g/cm^3). The geomembrane sheet shall contain 2.0 to 3.5 percent carbon black. The carbon black is to be pre-blended according to specifications of the MANUFACTURER. The MANUFACTURER shall use appropriate cleanliness during manufacturing process.

B. Geomembrane sheet shall be formulated from the appropriate polymers and compounding ingredients to form a polyethylene sheet material that meets all requirements for the specified end use of the product. The sheet material shall be capable of being bonded to itself by thermal bonding in accordance with the MANUFACTURER's recommendations and instructions, and the seaming requirements of this section.

C. Extruded sheets shall be at least 15 feet in width. Each roll shall be identified by a number and date of manufacture. Labels or markers used for identification shall be of a type which will not degrade the liner material. The labels shall contain, at a minimum, the following information:

1. MANUFACTURER's name.

2. Product identification.

3. Nominal thickness.

4. Roll Number.

5. Roll Dimensions.

D. Physical Property Requirements

1. The delivered polyethylene geomembrane sheet shall conform to the following minimum average roll value (MARV) properties:

	Property	Test Method	Minimum Average Roll Value (MARV)	Units
1.	Thickness (min. average) Thickness (min. reading)	ASTM D5199 ASTM D5199	40 36	mils Mils
2.	Sheet Density (min./max.)	ASTM D1505	0.92 – 0.94	g/cm^3
3.	Minimum Tensile Properties (min. each direction) (rage of grip separation 3 inches per minute)	ASTM D638		
	a. Tensile Strength at Break		3,800	Psi
	b. Elongation at Break	2.0 inch gauge length 2.5 inch gauge length	150 600	% %
4.	Carbon Black Content (min./max. allowable range)	ASTM D1603	2.5 – 3.5	%
5.	Multi-Axial Elongation (min.)	ASTM D5617	40	%
6.	Bonded Seam Strength (min.)	ASTM D4437	82*	Ppi
7.	Peel Adhesion Fusion (min.) Extrusion (min.)	ASTM D4437	 FTB** FTB**	

* Sheet shall yield before failure of the seam.

** Film Tear Bond. Seam separation shall not extend more than 10 percent into the seam. Testing shall be discontinued when the sample had visually yielded. Sample shall conform to a passing configuration as outlined in Figures A-4 (fillet extrusion) and A-6 (double wedge fusion) of the United States Environmental Protection Agency, "Lining of Waste Continment and Other Impoundment Facilities," EPA/600/2-88/052.

2.02 Geotextile

A. Geotextile rolls shall be at least 12 feet in width. Each roll shall be identified by a number and date of manufacture. Labels or markers used for identification shall be of a type which will not degrade the material. The labels shall contain, at a minimum, the following information:

1. MANUFACTURER's name.

2. Product identification.

3. Lot number.

4. Roll number.

5. Roll dimensions.

B. Physical Property Requirements

1. Non-woven geotextile shall conform to the following minimum requirements:

	Property	Test Method	Minimum Requirement
1.	Mass per Unit Area	ASTM D3776	10 oz/sy
2.	Trapezoidal Tearing Strength	ASTM D4533	100 lbs
3.	Grab Tensile Strength	ASTM D4632	305 lbs
4.	Grab Elongation	ASTM D4632	60%
5.	Burst Strength	ASTM D3786	510 psi
6.	Puncture Strength	ASTM D4833	130 lbs

2. Woven geotextile shall meet the following minimum average roll values (MARV) properties:

Property	Test Method	Minimum Requirement
Tensile Strength	ASTM D4595	125 lb/in
	ASTM D4632	250 lb
Elongation	ASTM D4595	12%
	ASTM D4632	12%
Burst Strength	ASTM D3786	500 psi
Puncture Strength	ASTM D4833	115 lbs

2.03 Geonet

A. The geonet shall be manufactured from pure or recycled virgin polyethylene resin, having a density between 0.935 and 0.939 g/cm^3, or an approved equivalent. The resin shall be mixed with two (2) to three (3) percent carbon black. The carbon black is to be pre-blended according to specifications of the MANUFACTURER.

B. Prior to the delivery of the geonet material to the Site, the CONTRACTOR will be required to provide the ENGINEER with a written certification that the product to be delivered has been extruded from an approved resin. No material will be permitted to be stored on Site until this certification has been delivered to the ENGINEER.

C. The MANUFACTURER of the geonet must be approved by the OWNER and have satisfactory experience in extruding geonet, with a reputation for producing a high quality product. The CONTRACTOR shall submit the

manufacturing company, address, and employee contact to the OWNER. The geonet shall be formulated from the appropriate polymers and compounding ingredients to form a geonet that meets all requirements for the specified end use of the product.

D. Geonet rolls shall be a minimum of seven (7) feet in width. Each roll shall be identified by a number and date of manufacture.

E. Geonet shall be POLY-NET PN3000CN as manufactured by Fluid Systems, Inc., or an approved equivalent. The geonet shall possess the following typical properties:

Property	Test Method	Value	Units
Transmissivity at 1000 psf	ASTM D4716	1.6×10^{-3}	m^2/sec
Polyethylene - Density (range)	ASTM D1505	0.935-0.939	g/cm^3
Carbon Black	ASTM D1603	2.0-3.0	% Content
Peak Tensile Strength	ASTM D1682 modified	23	lb/in
Thickness (min)	ASTM D751	0.20	inches

2.04 HDPE Pipe Boots/Sleeves and Skirts

A. The pipe boot/sleeve and skirt shall be constructed from minimum 40-mil smooth geomembrane with the same material properties as the geomembrane in Paragraph 2.01 of this Section.

B. The geomembrane used for boots/sleeves and skirts shall be made by the same MANUFACTURER as the geomembrane for the landfill cap.

C. Non-woven geotextile cushion between geomembrane boot and band clamps shall be 10 ounces per square yard (oz/yd^2) minimum.

2.05 Equipment

A. Welding Equipment and Accessories

1. Welding devices shall be equipped with gauges showing temperatures both in the device and at the nozzle.

2. An adequate number of welding devices, including parts, shall be maintained on the Site to avoid delaying Work.

3. Power sources used for equipment shall be capable of providing constant voltage under combined-line load.

4. Portable electric generators used on the geomembrane shall be equipped with a splash pad to contain spilled fuel.

B. Field Tensiometer

1. The CONTRACTOR shall provide a calibrated field tensiometer capable of quantitatively measuring geomembrane seam strength. The CONTRACTOR shall submit to the ENGINEER a certificate of calibration indicating calibration within the 12 month period.

2. The tensiometer shall be equipped with a gauge accurate to within ± 2 pounds per inches of specimen width.

3. The CONTRACTOR shall maintain the required die cutters for preparation of test specimens.

Part 3 Execution

3.01 Preparation

A. The CONTRACTOR/INSTALLER shall present a schedule of operations to the ENGINEER and obtain the ENGINEER's approval in writing of the same. This schedule shall be submitted sufficiently in advance of the proposed Work as to afford a reasonable amount of time for the ENGINEER to review and approve the schedule. The CONTACTOR/INSTALLER shall attend a pre-construction meeting at the Site with representatives of the OWNER and the ENGINEER to discuss project procedures, schedule, sequence of installation, and personnel to be used.

B. The CONTRACTOR/INSTALLER shall comply with all required submittals listed in Part 1.05 of this Section prior to geomembrane installation, including all material quality control documentation and a geomembrane panel layout drawing(s). All submittals require the review and written approval by the ENGINEER prior to installation.

C. Prior to geosynthetics installation, the CONTRACTOR/INSTALLER shall provide the ENGINEER a drawing indicating the proposed patching and HDPE boot/skirt installation. This drawing shall be in sufficient detail to provide an accurate representation of the field seaming that will be performed. Any revisions to the panel drawing shall be approved by the ENGINEER prior to future installation operations.

D. In the case that large areas of the geosynthetic cap require repair, the CONTRACTOR/INSTALLER shall provide the ENGINEER a panel drawing indicating the proposed geomembrane panel layout. This drawing shall be in sufficient detail to provide an accurate representation of the field seaming that will be performed. Any revisions to the panel drawing shall be approved by the ENGINEER prior to future installation operations.

E. The CONTRACTOR/INSTALLER shall prepare daily reports summarizing the day's activities and a copy shall be provided to the ENGINEER by 12:00 noon the following work day. The CONTRACTOR/INSTALLER shall prepare a standard daily report form for approval by the ENGINEER prior to commencement of geomembrane installation. These reports will contain, at a minimum, the following items:

1. Weather conditions.

2. Areas worked.

3. Daily production (quantities installed and seam lengths).

4. Personnel on Site.

5. Equipment used.

6. Type and results of quality control testing completed by the CONTRACTOR/INSTALLER, including results of all non-destructive seam strength tests.

7. Results of all destructive seam tests received from the ENGINEER.

8. Documentation of tracking, repair, and testing of all seams reconstructed as a result of failed non-destructive or destructive testing.

9. Problems encountered during construction.

10. Resolution of problems.

F. The ENGINEER shall provide at least one representative to observe installation of the geomembrane on a full-time basis.

G. The CONTRACTOR/INSTALLER shall inform the ENGINEER of the planned construction activities at the commencement of each work day. If the CONTRACTOR/INSTALLER wishes to concurrently perform two or more activities which require observation by the ENGINEER (i.e., pre-seaming preparation, seaming, non-destructive seam testing, and repairs), the CONTRACTOR/INSTALLER must submit in writing to the ENGINEER, a request for additional representatives no less than 48 hours in advance of any such construction activities.

H. The CONTRACTOR/INSTALLER shall appoint an experienced individual as the Quality Control Technician who will be responsible for supervising and/or conducting the field quality control program. The Quality Control Technician shall be on-site at all times during geomembrane installation. This appointment shall be subject to approval by the OWNER and the ENGINEER.

I. Before installation begins, and at least weekly thereafter, more often if determined necessary by the OWNER, project coordination meetings shall be held with designated representatives of the OWNER, the CONTRACTOR/INSTALLER, and the ENGINEER, to review the following information. This information shall be submitted to the OWNER and the ENGINEER by the CONTRACTOR in writing, during or before this meeting:

1. Progress of the Work.

2. Adherence to the Specifications.

3. Adherence to the quality control program, including the timely submission of the pertinent forms.

4. Planned Work and methods for the ensuing week, including estimate of time remaining until completion of the Work.

J. All submittals shall be made in a timely fashion.

K. Any changes in the proposed method of Work, SUBCONTRACTORs to be utilized, geomembrane resin or manufacturing must be approved in advance by the ENGINEER. The CONTRACTOR/INSTALLER assumes all responsibility relevant to providing an acceptable product.

L. CONTRACTOR shall expose area to be repaired using hand tools and shall clean all soil, bentonite grout, or other foreign materials from the area to be patched.

3.02 Installation

A. Field Seaming

1. Geomembrane field seams shall be one of the following types:

a. Double Hot Wedge (Fusion) – This seam is produced by melting to two intimate surfaces by running a hot metal wedge between the surface followed immediately by pressure to form a homogeneous bond. This seam has an integral air channel for non-destructive testing of the seam. All areas which are to become seam interfaces shall be free of dust, dirt and moisture.

b. Extrusion Weld – This seam is produced by extruding molten parent polyethylene resin between or at the edge of two overlapped geomembrane panels. A bonded seam is completed when extruded hot resins melt adjacent sheet resins to form a homogeneous weld. All areas which are to become seam interfaces shall be properly ground and free of dust, dirt, and moisture.

2. Double fusion welding shall be the primary method of seaming between adjacent panels. Extrusion welding shall be a secondary method for seaming between adjacent is areas where fusion seaming is difficult or impractical, and shall be the primary method for detail work and small repair work.

3. At least one spare operable seaming apparatus shall be maintained for every three seaming crews.

4. The Master Seamer shall be present during all geomembrane seaming and shall provide direct supervision over the seamers.

5. No seaming device or seamer (operator) shall be permitted to commence seaming of geomembrane until a field trial seam test has been performed by the seamer using the seaming device and has passed the required trial seam test in accordance with Part 4.03 of this Section.

6. The ENGINEER shall visually observe all field seams and sheets as installed. Any questionable areas or observed changes in physical installation characteristics will be immediately called to the attention of the CONTRACTOR/INSTALLER's Superintendent or designated representative and reinspected with the representative. With regard to the geomembrane seams, if the area is questionable in any manner after the initial field inspection, a field sample may be required and laboratory peel and tensile tests conducted in accordance with Part 4 of this Section. While destructive sampling will be minimized, random samples of seams representing different conditions shall be taken for testing at a minimum frequency of one (1) per 300 linear feet of weld for each welding device, to examine the weld and its effect, if any, on the adjacent material.

7. The seam numbering system shall be consistent with the panel numbering system.

8. Adjacent geomembrane panels shall have a nominal overlap of 3 inches for extrusion seams and 5 inches for fusion seams and shall be sufficient to allow for peel adhesion testing.

9. The overlap area shall be cleaned with a soft cloth or paper towel to remove any dirt, dust, moisture, grease, or other material prior to seaming.

10. Provide a firm, dry substrate under the seam overlap during seaming of the geomembrane. If required, use a geomembrane rub sheet, or similar hard surface, directly under the seam overlap to provide proper support of the seaming device. Use plywood or other firm material under the seam overlap when seaming over the anchor trench.

11. For fusion seaming, a moveable protective layer, such as a geomembrane rub sheet, may be required directly below the seam overlap to prevent build-up of moisture between the sheets and to prevent debris from collecting around the pressure rollers.

12. A smooth insulating plate or fabric shall be placed beneath the hot seaming device after usage to protect the underlying geomembrane.

13. For extrusion seaming, clean and dry welding rod or pellets shall be used. Extrudate shall be from the same parent material as the geomembrane. All heat degraded extrudate shall be purged from the extruder prior to beginning a seam and shall be disposed of outside of the geomembrane lined area.

14. Each extruder shoe shall be inspected by the CONTRACTOR/INSTALLER daily to check for wear to ensure that the offset is the same as the linear thickness. Worn shoes, damaged or misaligned armature brushes, nozzle contamination, pre-heat device, or worn or damaged parts shall be repaired prior to further use.

15. For extrusion welded seams, the following additional steps shall be performed:

    a. Clean oxidation from surface area of seam using disc grinder with number 80 grit sandpaper within one hour of seaming.

    b. Bevel the edge of the upper geomembrane sheet.

    c. Minimize exposed grinding marks outside of extrusion weld. The roughened surface shall extend to more than ¼-inch outside the seam area and the thickness of the sheet after grinding shall be at least 95 percent of the original thickness.

    d. Use a soft bristle brush after grinding to remove loose particles. Use of wire brushes shall not be permitted.

    e. Recleaning and/or rebrushing of the roughened surface may be required prior to seaming.

    f. Patch area where excessive grinding has reduced sheet thickness to less than 95 percent of the original sheet thickness.

16. Start/stop extrusion welding shall be avoided.

17. The end of an existing extrusion weld shall be ground 2 inches back from the point of stoppage or 2 inches from either side of a vacuum test leak before welding. Restart extrusion welding 2 inches back from the point of stoppage or 2 inches from either side of a vacuum test leak.

18. Temporary bonding for extrusion seams shall be used and shall consist of a hot air device (Leister). Care shall be taken to avoid damaging the geomembrane. Apply a nominal amount of heat to lightly tack the geomembrane panels together. Control temperature at the nozzle of the hot air device to prevent excessive heating or damage to the geomembrane.

19. Solvents or adhesives shall not be permitted.

20. If a wrinkle or “fishmouth” is present along and area to be seamed, the following repair procedure shall be followed:

    a. Cut the wrinkle along the ridge to achieve a flat overlap.

    b. Overlap the geomembrane along the cut.

    c. Extrusion weld along the overlap where the overlap exceed 3 inches.

    d. Patch the cut area where the geomembrane overlap of less than 3 inches. Use an oval-shaped patch of the same

geomembrane extending at least 6 inches beyond the cut area in all directions.

21. Provide adequate supplemental lighting if seaming operations are to be performed at night.

22. All cross seam tees shall be extrusion welded to a minimum distance of 4 inches on each side of the tee. For fusion seam intersections, the flap shall be cut and the edge of the air channel shall be exposed at the end of the seam to seal the seam at the intersection.

23. The CONTRACTOR shall perform quality control tests and procedures as required and indicated in Part 4 of this Section.

24. All seams shall be non-destructively tested using the appropriate method described in Part 3.03 of this Section. The testing method utilized by the CONTRACTOR/INSTALLER does not exclude the ENGINEER or the OWNER from performing their own tests. The CONTRACTOR/INSTALLER shall work closely with the ENGINEER in assisting them to perform independent rests or observe the testing performed by the CONTRACTOR/INSTALLER. The CONTRACTOR/INSTALLER is cautioned that field seaming will be thoroughly inspected. No consideration will be given for extra costs that may be incurred due to delays in the independent testing being performed by the ENGINEER or by the OWNER observing and reviewing the testing being performed by the CONTRATOR/INSTALLER.

25. All seams that cannot be subject to quality control testing must be overcapped.

B. Panel Deployment (for large area repairs, if required)

1. Geomembrane panels shall be installed to the configuration shown on the approved panel layout diagram. The proposed layout of panels shall be approved by the ENGINEER, assuring efficiency of material and minimization and proper placement of seams. Any variation from the panel diagram must be approved by the ENGINEER prior to installation of such panels. Should a variance be obtained, the CONTRACTOR/INSTALLER shall modify the panel diagram to show the record configuration following installation. The prime considerations in seaming shall be to minimize the number of seams made under unfavorable conditions. All overlaps for field seams shall be shingled in a downslope direction to the maximum extent practical.

2. Panels shall be placed unrolled from the anchor trench down the slope in a manner which does not cause scratches or crimps in the geomembrane and which does not damage the prepared subbase. Panels shall be placed to conform to the subbase. All panels shall be anchored properly at the top of slope and pulled taut to minimize

wrinkles. Any wrinkles between panels shall be removed prior to seaming.

3. Panels shall be held down temporarily along exposed edges until seamed to prevent uplift from wind. Acceptable methods of holding down the geomembrane include sand bags, tires, or other suitable weights which will not damage the geomembrane, subject to approval by the ENGINEER. Geomembrane which becomes damaged during installation due to wind or weather prior to covering shall be replaced by the CONTRACTOR/INSTALLER at no additional cost to the OWNER.

4. Panels shall be staggered such that cross seams between panels are not continuous throughout the cover area. Panels shall be installed such that no horizontal seams are constructed on slopes steeper than ten (10) percent.

5. All panel overlaps within an area of slope steeper than ten (10) percent shall be made parallel to the direction of maximum slope. Horizontal seams on slopes less than 10 percent shall be at least five (5) feet away from the toe and crest of any slopes steeper than 10 percent.

6. Each geomembrane panel shall be marked with a unique panel number. The numbering system shall be simple and logical and panels shall be consecutively numbered based on the order of installation.

7. The number of panels deployed in one day shall be limited by the number of panels which can be seamed on the same day.

8. Installation of individual geomembrane panels shall result in a good fit (thermal expansion or contraction shall be considered), without bridging in all corners and grade changes. Excessive slack shall be avoided to minimize wrinkles during the placement of the geonet, geotextile, and the protective cover soil.

9. Geomembrane shall not be installed when ambient air temperatures measured six (6) inches above the geomembrane, are below 32°F or above 104°F, during precipitation, or when winds exceed 20 mph, unless the CONTRACTOR/INSTALLER submits acceptable evidence to the ENGINEER that his performance standards can be maintained under these conditions. Trial seam and destructive testing frequencies may be increased at the discretion of the ENGINEER if installation is permitted under these circumstances.

10. The CONTACTOR/INSTALLER shall use appropriate methods, to be approved by the ENGINEER, necessary to prevent water or wind from getting under the installed geomembrane. Should excessive moisture become trapped below the geomembrane or wind damage occur, the CONTRACTOR/INSTALLER, at no additional cost to the OWNER, shall be required to repair all Work, including removing and

replacing as much of the installed geomembrane as the ENGINEER directs, to assure that the integrity of the geomembrane and the underlying subbase has not been compromised.

11. To avoid confusion, the CONTRACTOR/INSTALLER and ENGINEER shall each used different colored markers that are readily visible for writing on the geomembrane. The markers used shall be semi-permanent and compatible with the geomembrane. The CONTRACTOR/INSTALLER shall use white markers while the ENGINEER shall use yellow markers. No other parties shall be permitted to write on the geomembrane.

12. Pedestrian activity over the geomembrane shall be kept to a minimum and restricted to that which is necessary for installation. Installation personnel shall take precautions not to damage the geomembrane surface. All personnel working on the geomembrane shall wear smooth-soled shoes. Construction and other Site personnel shall be informed of the restriced access to areas of geomembrane placement. Barriers and signs shall not be permitted on the geomembrane prior to placement of soil cover.

13. No tracked equipment or other equipment which may pose a risk of puncturing, tearing or otherwise damaging the geomembrane or geocomposite shall be permitted for use in installation of the geomembrane or during placement of geonet or geotextile directly over the exposed geomembrane.

14. Use of glass bottles and smoking in the geomembrane installation area shall not be permitted. Care shall be taken to avoid dragging tools across the geomembrane surface; all large tools shall have smooth base plates or shoes. Use of clamps and other tools shall be restricted and used with care to avoid damaging the geomembrane.

C. Geotextile Installation

1. The geotextile, as described in Part of this section, shall be placed directly on the soil subgrade surface as a gas venting layer, and over the geonet drainage layer as a filler separation layer.

2. The CONTRACTOR/INSTALLER shall be responsible for the protection of the underlying geosynthetics during the installation of the geotextile layer. No equipment shall be permitted to operate on the geotextile or geonet at any time. In no way shall any tracked equipment or any other equipment which may pose a risk of puncturing, tearing, or otherwise damaging the geotextile or geonet be permitted for use during this phase of construction.

3. Geotextile shall be laid smooth and free of tension, stress, folds, wrinkles, or creases.

4. Geotextile seams shall be overlapped a minimum of six (6) inches prior to seaming.

5. Cutting and trimming of the geotextile shall be performed using hook blades to minimize the potential for cutting the underlying geonet. Underlying and adjacent installed materials shall be protected as required during geotextile installation.

6. During deployment, care shall be exercised so as not to entrap stones, excessive dust or mud, moisture, or other foreign materials which could potentially damage the geosynthetic layers or hamper subsequent seaming operations.

7. Geotextile that becomes dirty during installation which, in the judgment of the ENGINEER, may potentially lead to a clogging or otherwise reduced performance of the material, shall be cleaned or replaced, if necessary, by the CONTRACTOR/INSTALLER, at no additional cost to the OWNER.

8. The surface of the geotextile shall be examined thoroughly by the CONTRACTOR/INSTALLER to ensure that no potentially harmful objects, such as needles, are present. Such objects shall be removed or areas of the geotextile containing such objects shall be removed and replaced with acceptable material at no additional cost to the OWNER.

9. In the presence of wind, all installed geotextile panels shall be weighted with sandbags, tires, or other suitable weights which will not damage the geotextile materials, subject to approval by the ENGINEER. Such weights shall be installed during geotextile installation and shall remain until the first lift of the protective cover soil is placed.

D. Seaming Procedures

1. All geotextiles seams shall be joined by continuous sewing using a lock type stitch. Thread shall be polymeric with chemical and ultraviolet resistance properties equal to or greater than those of the geotextile. Spot sewing or heat bonding is not permitted.

2. All geotextile seams shall be examined and approved by the ENGINEER prior to covering the geotextile. The ENGINEER shall reject any seams not meeting the requirements of this Section. Unacceptable seams shall be repaired by the CONTRACTOR/INSTALLER at no additional cost to the OWNER.

E. Geomembrane Protection

1. The completed geomembrane shall be adequately protected by the CONTRACTOR/INSTALLER until the installation is accepted by the ENGINEER and the OWNER.

2. No vehicles shall be permitted on exposed geomembrane, nonwoven geotextile, or geonet prior to placement of a minimum 12-inch thick lift of the protective cover. A minimum 12-inch thick layer shall be

maintained between the geomembrane/geocomposite and low ground pressure equipment (less than or equal to 5 psi). A minimum 36-inch thick layer shall be maintained between equipment with a ground pressure greater than 5 psi.

F. Geotextile Protection

1. The completed geotextile shall be adequately protected by the CONTRACTOR/INSTALLER until the installation is accepted by the ENGINEER and the GROUP.

2. Protective cover soil shall be spread in the direction of geotextile overlap. Riprap shall not be dropped from a height exceeding one (1) foot.

3. No vehicles shall be permitted on exposed geotextile prior to placement of a minimum 12-inch thick lift of the protective cover. A minimum 12-inch thick layer shall be maintained between the geotextile and low ground pressure equipment (less than or equal to 5 psi). A minimum 36-inch thick layer shall be maintained between the geotextile and equipment with a ground pressure greater than 5 psi.

G. Geonet Installation

1. A geonet layer, as described in Article 2.03 of this Section, will be installed as a drainage layer over the geomembrane component of the closure cover system. The CONTRACTOR shall install the geonet layer in accordance with the MANUFACTURER's recommendations.

2. The CONTRACTOR shall be responsible for the protection of the geomembrane during the installation of the geonet layer. No equipment shall be permitted to operate on the geosynthetics at any time. Care shall be taken to keep the geonet clean during installation. Drainage net that is not clean shall be washed prior to installation. In the presence of wind, all deployed geonet shall be weighted with sandbags or the equivalent. Such sandbags shall be installed during placement and shall remain until replaced with cover material.

3. Adjacent edges of panels shall be overlapped a minimum 4-inches and adjacent ends of panels shall be overlapped a minimum 12-inches. Adjacent panels shall be secured with plastic ties spaced every 5 feet along the sides of the roll, and every 6 inches along the ends. Use of metallic ties shall not be permitted.

4. The geonet shall not be welded to the geomembrane.

5. All connections shall be inspected and approved by the ENGINEER. The ENGINEER shall reject any connections he deems insufficient and require those joints to be redone at no additional cost to the OWNER.

6. Repairs shall be made in accordance with the MANUFACTURER's procedures and recommendation at no additional cost the GROUP. The CONTRACTOR shall submit proposed report procedures for the approval of the ENGINEER.

H. HDPE Boot and Skirt Installation

1. The HDPE pipe boot and sleeve shall be installed in areas where the geomembrane cap must be penetrated by manholes and riser pipes, as shown on the Contract Drawings or as directed by the ENGINEER.

2. Prior to constructing the boot or sleeve, the CONTRACTOR shall assure that the material in the area of the penetration is properly compacted and that the area is clean. Take care to assure the geomembrane is not damaged.

3. Pipe boots/sleeves shall be fabricated to fit tightly the outside diameter of the penetrating feature. If boots/sleeves are prefabricated, the shop drawings shall show dimensions or callouts indicating the fit. If the boots/sleeves are field constructed, the fit shall be made to the satisfaction of the ENGINEER.

4. The size of the skirt which flares away from the base of the penetrating feature shall be adequate to provide twelve (12) inch minimum overlap over the geomembrane or as satisfactory to the ENGINEER.

5. Extrusion welding shall be as shown on the Contract Drawings and performed in accordance with Part 3.02B of this Section.

6. Neoprene cushion underneath band clamps shall extend two (2) inches beyond each band's edges.

7. Do not allow neoprene cushion to gather or wrinkle around boot when clamp is tightened.

I. Defects and Repairs

1. All seam and non-seam areas of the geomembrane shall be examined by the CONTRACTOR/INSTALLER and the ENGINEER for identification of defects, holes, blisters, undispersed raw material, large wrinkles, and any sign of contamination by foreign matter. The geomembrane surface shall be cleaned by the CONTRACTOR/INSTALLER prior to this examination if the ENGINEER determines that the amount of dust and mud inhibits proper examination.

2. Defects identified shall be marked, repaired, and non-destructively tested in accordance with this Section. Repair procedures include the following:

a. Patching, used to repair holes, tears, undispersed raw materials, and contamination by foreign matter.

b. Spot welding used to repair dimples and other small, localized flaws. "Topping" of extrusion welds shall not be permitted.

c. Capping, used to repair large lengths of failed seams.

d. Extrusion welding the flap, used to repair areas of inadequate fusion seams which have an exposed edge. Repairs of this type shall be approved in advance by the ENGINEER and shall not exceed 100 feet in length unless otherwise approved by the ENGINEER and the OWNER.

e. Removing the defective seam, sliding the panels together to provide the required overlap, and reconstructing the seam.

f. Removing the defective seam and replacing with a strip of new material welded into place.

3. For any repair method, the following provisions shall be satisfied:

a. Surfaces of the geomembrane which are to be repaired by extrusion welding shall be prepared in accordance with the requirements of Part 3.02B.o of this Section.

b. All surfaces shall be clean and dry at the time of the repair.

c. All seaming equipment used to make the repairs shall meet the requirements of this Section.

d. Patches or caps shall extend at least six (6) inches beyond the edge of the defect, and all corners shall be rounded with a radius of approximately 3 inches. Hook blades shall be used for cutting patches to the maximum extent practical to avoid inadvertently cutting the underlying geomembrane.

4. All repairs shall be non-destructively tested in accordance with applicable requirements of Part 4.04 of this Section. Repairs which fail non-destructive testing shall be repaired and subsequently retested until project specifications are satisfied.

5. When seaming of the geomembrane is completed and prior to placement of overlying materials, the ENGINEER and CONTRACTOR/INSTALLER shall examine the geomembrane for wrinkles and areas of "bridging" or "trampolining" (i.e. where the geomembrane is not in direct contact with the subbase such as at the toe of slope of other abrupt change in grade). The ENGINEER shall indicate if such areas require repair. Areas of repair shall be kept to an absolute minimum. A wrinkle is considered unacceptable when it can be folded over onto itself. Bridging is considered unacceptable if more than a 12-inch width of the geomembrane is not in contact with

the subbase. The CONTRACTOR/INSTALLER may elect to allow the geomembrane to contract (for wrinkles) or expand (for bridging) prior to placement of overlying materials. Otherwise, unacceptable wrinkles or areas of bridging shall be repaired and tested in accordance with the requirements of this Section. In no case shall overlying components be placed over unacceptable wrinkles or areas of bridging which could result in overstressing of the geomembrane as determined by the ENGINEER.

6. Repairs shall be documented by the CONTRACTOR/INSTALLER as follows:

   a. Number and log each repair.

   b. Perform appropriate non-destructive testing and provide results to the ENGINEER on a daily basis. The documentation shall identify seams or repairs that initially failed testing criteria and include evidence that these seams or repairs have been repaired and retested successfully.

   c. All repairs and associated test results shall be logged and submitted to the OWNER following completion of the Work

   d. All defects observed during installation shall be repaired by the CONTRACTOR/INSTALLER at no additional cost to the OWNER.

   e. Defective areas of the geotextile shall be removed and repaired by placing a patch of new geotextile with a minimum overlap of twelve (12) inches beyond the damaged area. The patch shall be continuously sewn to the surrounding geotextile or may be continuously heat bonded, subject to approval by the ENGINEER.

   f. Large defects to the geotextile (generally larger than half the width of the panel) shall be repaired by removing the affected panel(s) and replacing with new material.

J. Geomembrane Acceptance

1. No geomembrane shall be covered by the CONTRACTOR until such time as the ENGINEER has reviewed the test results required by these Specifications. As a minimum, the required quality control and conformance testing, the daily log of trial seam test results, non-destructive seam test results, laboratory destructive seam test results, and record drawing of the completed installation will be reviewed.

2. A final examination of the geomembrane surface shall be performed by the ENGINEER to verify that all seams have been completed and all defects have been repaired. The CONTRACTOR/INSTALLER

shall clean the geomembrane surface, as required, to allow for proper examination.

3. The CONTRACTOR shall be held responsible for protection of the installed geomembrane until the geomembrane installation is accepted by the ENGINEER and the OWNER and the overlying components are placed.

4. The geomembrane shall be considered acceptable after:

5. All required non-destructive seam testing has been performed and has passed the criteria listed in Part 4.04 of this Section.

6. All required destructive seam testing has been performed and has passed the criteria listed in Part 4.05 of this Section.

7. All defects have been repaired and tested in accordance with Part 4.06 of this Section.

8. All submittals required by Part 1.04 of this Section have been received and accepted by the OWNER.

9. Record drawings have been submitted to the OWNER.

10. The construction area has been cleaned and all waste has been removed and disposed of properly.

11. The final examination of the geomembrane has been made and all required documentation has been reviewed and accepted by the ENGINEER.

12. The required material and workmanship warranties have been submitted to and accepted by the OWNER.

K. Geotextile Acceptance

1. No geotextile shall be covered by the CONTRACTOR until such time as the ENGINEER has performed a final examination of the geotextile to verify that all seams have been completed and all defects have been repaired. The CONTRACTOR/INSTALLER shall clean the geotextile surface, as required, to allow for proper examination.

2. The CONTRACTOR shall be held responsible for protection of the installed geotextile until the installation is accepted by the ENGINEER and the GROUP and the overlying components are placed.

3. The geotextile shall be considered acceptable after:

   a. All required seaming has been performed in accordance with the specifications outlined in Part 3 of this Section.

   b. All submittals required by Part 1.04 of this Section have been received and accepted by the GROUP.

c. The construction area has been cleaned and all waste has been removed and disposed of properly.

d. The final examination of the geotextile has been made and all required documentation has been reviewed and accepted by the ENGINEER.

e. The required material and workmanship warranties have been submitted to and accepted by the GROUP.

L. Warranties

1. The MANUFACTURER shall warranty that all materials are free from manufacturing defects in material and workmanship for a period of ten (10) years following shipment to the Site.

2. The CONTRACTOR/INSTALLER shall warranty all Work, including the material and all workmanship for a period of two (2) years following acceptance by the OWNER.

3.03 Testing

A. General

1. The OWNER will engage the ENGINEER to conduct destructive testing and oversee non-destructive testing by the CONTRACTOR/INSTALLER during the geomembrane installation as part of the quality control program.

2. The ENGINEER and the CONTRACTOR/INSTALLER shall visually check all material to be included in the Work for transport damage and uniformity and compare sheet identification numbers with those on the quality control certificates provided by the MANUFACTURER to assure delivery of the appropriate material.

3. The ENGINEER and CONTRACTOR/INSTALLER shall also visually check the geomembrane material for any signs of damage which has occurred as a result of manufacturing, transport, unloading, storage, or installation. All observed damage shall be repaired in accordance with Part 4.06 of this Section.

4. All seams shall be observed for signs of deformation to the panels. Any seams which, in the opinion of the ENGINEER have caused excessive deformation of the geomembrane or show visual signs of overheating of the panels, shall be repaired at no additional cost to the OWNER regardless of the results of any non-destructive or destructive testing on the seam. The deficient seam shall be cut out, the panels again overlapped and welded, or the seam overcapped.

B. Trail Seam Testing

1. At the start of each work day on which seaming is to be performed, every five hours thereafter after each break in seaming of one-hour or

more, or after an equipment shutdown, a start-up field test of the seaming equipment and seamer (operator) shall be performed on a trial seam at or near the Work location to verify that acceptable geomembrane seams can be produced under existing ambient conditions. The trial seam shall be a minimum of five (5) feet in length as measured along the seam for self-propelled (fusion) seaming devices, and a minimum of three (3) feet for hand-held (extrusion) seaming devices. Seam overlap shall be as specified in Part 3.04.h of this Section. The material for the trial seams and the field testing equipment shall be provided by the CONTRACTOR/INSTALLERS at no additional cost to the OWNER.

2. Two (2) specimens shall be cut from the trial seam using a 1-inch wide die cutter, with the seam centered parallel to the specimen width. Specimen locations shall be selected at random along the test seam. Both specimens shall be tested for peel adhesion (peel) in accordance with ASTM D 4437. For double fusion seams, both tracks of the seam shall be tested. Testing shall be conducted in the field by the CONTRACTOR/INSTALLER using a calibrated tensiometer and observed and documented by the ENGINEER. Testing shall be performed at a constant jaw separation rate of 20 inches per minute (ipm). Pass criteria are specified in Part 2.01 of the Section for geomembrane. In addition to not meeting these specified criteria, a trial seam shall be considered a failure if, upon visual inspection, the weld shows:

   a. Excessive deformation; stepping of the bottom sheet when viewed in cross section.

   b. Discoloration of the sheet.

   c. Inadequate or excessively narrow or flat weld bead.

   d. Water blisters in weld bead.

   e. Misaligned weld bead, i.e. seam not reasonable centered with respect to overlap.

   f. Thinning of the sheet adjacent to the weld.

3. If a trial seam fails as described in Part 4.03.b above, the entire trial seam operation shall be repeated. If the second attempt fails, the seaming apparatus and seamer shall not be accepted and shall not be used for seaming until the deficiencies which caused the failures are corrected and two consecutive successful trial seams are completed.

4. The CONTRACTOR/INSTALLER shall provide a calibrated tensiometer for making the specified tests in the field in accordance with Part 2.06.b of this Section.

C. Non-Destructive Seam Testing

1. The ENGINEER and CONTRACTOR/INSTALLER shall visually inspect all geomembrane seams. In addition, the CONTRACTOR/INSTALLER shall test all seams along the entire length, in the manner approved prior to installation.

2. For non-destructive seam testing of extrusion seams, the vacuum box method shall be used. The vacuum test shall be performed concurrently with seaming as Work progresses, not at the completing of all seaming. The vacuum box assemble consists of the following:

    a. Rigid pen vacuum valve.

    b. Ensure that a leak tight seal is created.

    c. For a period of not less than ten (10) seconds, examine length of weld through viewing window for presence of soap bubbles.

    d. If no bubbles appear after ten (10) seconds, close vacuum valve and open bleed valve, move box over next adjoining area with minimum three (3) inches overlap and repeat process.

    e. Areas where soap bubbles appear shall be marked and repaired in accordance with Parts 3.04.q and 4.06 of this Section, and retested until all leaks are satisfactorily repaired as indicated by passing non-destructive testing.

3. The procedure at locations where seams cannot be non-destructively tested by a vacuum box is:

    a. Where possible, cap-strip seams with same geomembrane.

    b. If seam is accessible to testing equipment prior to final installation, non-destructively test seam prior to final installation.

    c. Seaming and cap-stripping operations shall be observed by ENGINEER for uniformity and completeness.

    d. Spark testing.

4. For double hot wedge (fusion) seams, air pressure testing shall be conducted. Air pressure testing shall be performed concurrently with seaming as Work progresses, not at the completing of all seaming. The equipment is comprised of the following:

    a. Air pumps equipped with pressure gauge capable of generating and sustaining a pressure between 25 to 30 psi and mounted on a cushion to protect the geomembrane.

    b. Rubber hose with fittings and connections.

c. Sharp hollow needle or other pressure feed device approved by the Operator.

d. A pressure gauge with an accuracy of 1 psi.

5. The procedure for air pressure is as follows:

a. Seal both ends of the seam to be tested.

b. Insert a needle or other approved pressure feed device into air channeled created by the double hot wedge fusion seam.

c. Insert a protective cushion between the air pump and the geomembrane.

d. Pressurize the air channel to 25 to 30 psi, close valve, and sustain the pressure for a minimum of five minutes.

e. Maximum allowable pressure loss after five (5) minutes is 4 psi.

f. If the maximum allowable pressure loss specified above is exceeded or the pressure does not stabilize, locate and repair in accordance with Parts 3.04.q and 4.06 of this Section, and retest until all leaks are satisfactorily repaired as indicated by passing non-destructive testing.

g. Cut opposite end of tested seam once testing is completed to verify continuity of the air channel. An audible rush of air shall serve as an indicator that the test represents the entire length of seam. If air does not escape, locate blockage and retest unpressurized area. Repair the cut end of the air channel with a patch and perform non-destructive testing in accordance with Part 1.04.c of this Section.

h. Remove needle or other approved pressure feed device and seal penetration holes by extrusion welding and perform non-destructive testing in accordance with Part 4.04.c of this Section.

D. Destructive Seam Testing

1. Destructive testing of geomembrane seams shall be conducted at the request of the ENGINEER to verify that seam strength requirements listed in Parts 2.01.D(6) and (7) of this Section have been satisfied. Destructive seam testing shall be performed as the Work progresses, not at the end of geomembrane installation.

2. Destructive seam tests shall be conducted at a minimum frequency of one test every 500 linear feet of field seam of geomembrane. This frequency requirement shall be considered an average for the entire installation. Individual samples may be obtained at a greater or lesser frequency as determined by the ENGINEER.

3. Test sample locations shall be selected by the ENGINEER and the sample shall be cut-put by the CONTRACTOR/INSTALLER. However, special consideration may be given to locations where the potential for defective seaming exists due to overheating, weld contamination, improper overlap, or adverse weather conditions. The CONTRACTOR/INSTALLER shall not be informed of the locations of destructive seam test samples in advance of seaming.

4. The ENGINEER may increase the frequency of destructive seam testing under the following circumstances:

   a. A high incidence of previous failures (greater than 10 percent).

   b. The seaming device is suspect.

   c. Seaming was performed under adverse weather conditions.

   d. The seam area contained excessive wrinkles.

   e. The seam area was not cleaned properly or dust was present at the time of seaming.

5. The ENGINEER shall assign a unique number to each destructive seam test and shall observe the cut-out of each sample by the CONTRACTOR/INSTALLER. The locations of all destructive seam test samples shall be recorded on the final record panel layout drawings. The ENGINEER shall record the reason for taking each sample at the particular location (i.e. statistical routine, suspicious seam area, etc.).

6. The CONTRACTOR/INSTALLER shall repair and non-destructively test all destructive seam test sample locations in accordance with Section 3.02 Iof this Section. Repair of these sample locations shall be considered part of the installation and shall be performed at no additional cost to the OWNER.

E. Field Testing

1. At each destructive seam test sample location, field and laboratory samples shall be obtained by the CONTRACTOR/INSTALLER. Field samples shall be obtained and tested as follows:

   a. Two specimens shall be cut from the field seam at the location indicated by the ENGINEER using a 1-inch wide die cutter, with the seam centered parallel to the specimen width. The distance between these two specimens shall be 42 inches measured along the seam.

   b. Both specimens shall be tested for peel adhesion (peel) in accordance with ASTM D4437. For double fusion seams, both tracks of the seam shall be tested. Testing shall be conducted in the field by the CONTRACTOR/INSTALLER

using a calibrated tensiometer and observed and documented by the ENGINEER. Testing shall be performed at a constant jaw separation rate of 20 inches per minute (ipm).

c. Pass criteria are specified in Part 2.01 of this Section for geomembrane.

d. If both specimens pass, a full laboratory destructive seam test sample shall be cut out and tested as specified in Part 4.05.h of this Section.

e. If one of both of these specimens failed, the entire destructive seam test sample shall be considered a failure and the seam segment(s) associated with this failure shall be tracked and repaired in accordance with Part 4.05.i of this Section.

F. Laboratory Testing

1. Destructive seam test samples which pass field testing as outlined in Part 4.05.g of this Section shall be tested at a laboratory approved by the OWNER and the ENGINEER. Laboratory samples shall be obtained and tested as followed:

a. The samples shall be 12 inches wide by 42 inches long with the seam centered lengthwise and shall be located between the two field specimens obtained in accordance with Part 3.03 E of this Section. The sample shall be cut out by the CONTRACTOR/INSTALLER under the observation of the ENGINEER. The sample shall be cut into three parts and distributed as followed:

1) One 12-inch wide by 18-inch long portion to the ENGINEER for laboratory testing.

2) One 12-inch wide by 12-inch long portion to the CONTRACTOR/INSTALLER for optional laboratory testing.

3) One 12-inch wide by 12-inch long portion to the OWNER for archive storage.

b. The laboratory sample shall be shipped by the ENGINEER to the approved laboratory as soon as possible after cut-out by the CONTRACTOR/INSTALLER.

c. The laboratory shall be cut into 10 specimens using a 1-inch wide die cutter with the seam centered widthwise. Five specimens shall be tested for bonded seam strength (shear) and five for peel adhesion (peel) in accordance with ASTM D4437. Specimens shall be selected alternately by type (peel, shear, peel, shear, etc.). For peel testing of double fusion seams, both tracks of the seam shall be tested.

Testing shall be performed at a constant jaw separating rate of 20 inches per minute (ipm).

d. Pass criteria are specified in Parts 2.01.D(6) of this Section for geomembrane.

e. The entire laboratory sample shall be considered passing if at least four out of five specimens in both peel and shear meet the applicable pass criteria.

f. If the laboratory sample fails, the seam segment(s) associated with this failure shall be tracked and repaired in accordance with Part 3.02 I of this Section.

g. The results of testing will be provided to the ENGINEER within 24 hours of receipt of the sample by the laboratory.

G. Tracking and Repair of Failed Destructive Test Samples

1. When a sample fails a destructive test, whether a field or laboratory test, the CONTRACTOR/INSTALLER shall follow the procedure outlined below:

a. The CONTRACTOR/INSTALLER can repair the seam segment(s) between any two passing destructive test locations.

b. Alternatively, the CONTRACTOR/INSTALLER can trace the seaming path to an intermediate location 10 feet (minimum) from the location of the original failed test in each direction and cut out a specimen with a 1-inch wide die cutter for an additional field test at each intermediate location. Each sample shall be tested in peel as in Part 4.05.g of this Section. If these additional specimens pass field testing, then a laboratory sample is obtained at each location and tested in accordance with Part 4.05.h. If these samples pass, then the seam segment(s) between these laboratory samples shall be repaired in accordance with Part 4.06 of this Section. If either sample fails, then the procedure is repeated until the limit of the failed seam segment(s) is(are) bound by passing tests in both directions.

c. All acceptable repaired seams must be bound by two locations from which passing laboratory destructive seam test samples have been obtained. Repairs between passing tests shall be made in accordance with Part 4.06 of this Section.

d. At the discretion of the ENGINEER, a laboratory destructive test of a trial seam test sample obtained in accordance with Part 4.03 of this Section may be performed in an attempt to bound a failed destructive test. This may be done in cases of extrusion welding of a series of small repairs; if ambient

conditions have changed significantly and/or the seaming device has been adjusted and corrected, or the seamer (operator) has changed since seaming of the failed seam segment(s); or if the seaming device has not been used for a significant period of time (more than 24 hours). If a laboratory test of a trail seam sample passes, this test may be used to bound the failed seam. In such a case, the entire seam length welded by the seaming device in question from the last passing destructive test up to the trial seam test on which the passing laboratory destructive test result was obtained shall be repaired in accordance with Part 4.06 of this Section.

H. Field Documentation

1. The CONTRACTOR/INSTALLER shall maintain a log of all quality control testing performed during installation. This log shall be submitted to the OWNER at the completion of the project.

2. The CONTRACTOR/INSTALLER shall prepare a record panel drawing locating and identifying geomembrane panels and seams as they have been installed. The drawing shall also indicate the locations of all patches and repairs, and destructive seam test samples. This drawing shall be submitted to the OWNER at the completion of the project.

END OF SECTION

SECTION 02 20 00 - ASSESSMENT

02 22 00 Existing Conditions Assessment

Part 1 General

1.01 Section Includes

A. This section includes a description of how the CONTRACTOR shall address existing materials at the site at the commencement of work.

1.02 Referenced Sections – None

1.03 Cited Standards – None

1.04 Noted Restrictions – none

1.05 Quality Control

A. Existing Utility Lines

1. The CONTRACTOR is responsible for locating any possible existing underground utilities in order to properly complete site work. The CONTRACTOR shall contact the OWNER'S REPRESENTATIVE immediately upon discovery of additional utilities in the area prior to starting and during the performance of the work.

2. Water, sewer, gas, power and telephone service to existing facilities shall be maintained with a minimum of interruption throughout the construction of the work. No such service shall be intentionally interrupted without the approval of the respective utility company concerned, and without first giving due warning to the occupants of said dwelling or business establishment.

3. The CONTRACTOR shall avoid disturbance and/or displacement of existing utilities and shall provide all temporary and permanent supports and other required protection.

B. Existing Power Lines

1. If the proposed work is in close proximity to overhead and underground power lines which could be hazardous to construction personnel and/or other persons, the CONTRACTOR shall properly protect the wires, pole supports, or other power line appurtenances to avoid disturbances to those facilities.

2. The CONTRACTOR shall also operate all machinery and conduct all other construction activities in a manner, which will assure protection of all construction personnel and other persons against the described hazard.

C. Existing Gas Lines

1. The CONTRACTOR shall avoid disturbance and/or displacement of underground gas lines and their associated facilities and shall provide all temporary and permanent supports required to protect and prevent exposure to construction personnel and/or other persons.

2. If gas lines are exposed during construction and leakage is detected, the CONTRACTOR shall suspend all construction work in those areas immediately. The owner of the pipeline and the ENGINEER and local emergency response personnel shall be immediately advised of the condition, and construction shall not resume until all repairs have been properly completed.

D. Existing Sewer Lines

1. The CONTRACTOR will not be permitted to use existing sewer systems (if any) as drain lines for the construction work. The CONTRACTOR shall be responsible for all surface water runoff and/or groundwater tributary to the pipeline and/or trenches constructed and shall supply the necessary dewatering and pumping equipment and storage facilities for handling those flows during construction.

Part 2 Products – Not Used

Part 3 Execution

3.01 Preparation

A. Where utilities are parallel to or cross the pipeline trench but do not conflict with the permanent work to be constructed, follow the procedures given below and as indicated on the Drawings. Notify the utility owner 48 hours in advance of the crossing construction and coordinate the construction schedule with the utility owner's requirements.

B. Determine the true location and depth of utilities and service connections which may be affected by or affect the work. Determine the type, material, and condition of these utilities. The CONTRACTOR shall pothole all utilities, except those listed in the contract documents as already being potholed, prior to submitting pipe laying drawings. The CONTRACTOR shall submit a set of potholing plans to the OWNER'S REPRESENTATIVE prior to submitting laying diagrams. In addition for pipeline work, the CONTRACTOR shall expose all utilities at least 500 lineal feet in advance of the start of pipeline excavation.

3.02 Procedures

A. Protect utilities in place, unless abandoned, and maintain the utility in service, unless otherwise specified on the Drawings or in the Specifications.

B. Adjacent Existing Underground Utilities

1. Whenever possible, environmental piping should be laid at least 10 feet, horizontally, from any existing or proposed water mains. If local conditions prevent a lateral separation of 10 feet, environmental piping may be laid closer than 10 feet to a water main as long as one of the following are performed:

   a. it is laid in a separate trench

   b. it is laid in the same trench with the water main located at one side of a bench of undisturbed earth

   c. In either case (a or b) the elevation of the top (crown) of the environmental pipe line is at least 18" below the bottom (invert) of the water main.

2. Whenever environmental piping must cross under existing water mains, the pipeline shall be laid at such an elevation that the top of the pipeline is at least 18" below the bottom of the water main.

3. Where significant utility conflicts are to be encountered, each pipeline shall be installed with a steel casing pipe at all such locations.

4. CONTRACTOR shall provide temporary support for all pipelines crossing the proposed trench. All pipelines 18" in diameter or larger crossing over the proposed environmental pipeline with less than 4 feet of clearance shall have a temporary support. The CONTRACTOR shall submit drawings of his method of temporary support to the OWNER for review. All pipelines less than 18 in. in diameter and crossing over the proposed environmental pipeline with less than 2 feet of clearance shall be protected by pouring one (1) sack of sand/cement slurry from the top of the environmental pipeline to the bottom of the crossing pipeline.

C. Lines and Grades for Water Lines and Underground Electrical Conduit

1. The CONTRACTOR shall employ a competent survey crew under the direction of a licensed New York Land Surveyor, approved by the OWNER'S REPRESENTATIVE, to lay out the work from the initial points of instruction as given by the OWNER'S REPRESENTATIVE. They shall set all offset stakes, set, test, and check all elevations and levels and other parts of the construction as the work progresses.

2. The CONTRACTOR shall furnish all flagging, nails, spikes, stakes, paint, and marking devices required for the survey and layout work. The CONTRACTOR shall also furnish personnel to assist the OWNER'S REPRESENTATIVE in checking the survey and layout work if required throughout the entire Contract period.

3. The OWNER'S REPRESENTATIVE will not provide surveying services to the CONTRACTOR. The CONTRACTOR shall retain the services of a qualified instrument man to perform the required survey work.

4. The CONTRACTOR shall furnish personnel to assist the OWNER'S REPRESENTATIVE for checking grades and locating existing facilities if requested.

5. The CONTRACTOR shall be responsible for protecting and safeguarding all benchmarks established by the OWNER'S REPRESENTATIVE and all existing property stakes, pins, monuments, etc. Any benchmarks, property stakes, pins, or monuments disturbed during construction activities shall be re-established and replaced by the CONTRACTOR's survey crew at no additional cost to the OWNER.

6. Property corner markers, boundary monuments, etc., disturbed or moved shall be restored, in conformance with the property deed description by a licensed land surveyor. Restoration of the markers or monuments shall be certified by said surveyor on a map prepared and stamped by him which shows the work accomplished. One copy of the map will be given to the property owner and one copy given to the OWNER'S REPRESENTATIVE.

D. Abandoned Utilities (Cut and Plug Ends)

1. The CONTRACTOR shall cut abandoned utility lines (conduits) and plug the ends with brick and mortar or a concrete plug. Plug utility lines with a wall of brick and mortar or a concrete plug from the cut end of the pipe. Remove and dispose of abandoned utilities within the trench excavation.

E. Temporary Relocations

1. The CONTRACTOR, with the approval of the OWNER'S REPRESENTATIVE, shall remove items, which would interfere with the pipe installation operations, and shall re-install these items after construction is complete.

2. The CONTRACTOR shall disassemble the items carefully and store them in a safe location, and in a manner to prevent damage. Any damage to the items, as a result of the CONTRACTOR's neglect during removal, disassembly, storage, and/or reinstallation shall be replaced or repaired to the satisfaction of the OWNER'S REPRESENTATIVE at the CONTRACTOR's expense.

3.03 Testing – None

3.04 Cleanup

A. Immediately after all construction operations have been completed, the CONTRACTOR shall thoroughly clean the area of all excess materials, debris, plant and equipment for which he or she is responsible. The CONTRACTOR shall also restore grounds, lawns, driveways, streets, roadways, pipes, drain lines, banks, ditches, and all other areas to their original condition, to the satisfaction of the OWNER and OWNER'S

REPRESENTATIVE, and shall leave the premises in a neat and operable condition.

B. Cleanup and restoration operations must be completed within a reasonable time following installation of any particular section of pipeline.

END OF SECTION

02 24 00 Environmental Assessment

Part 1 General

1.01 Section Includes

A. This section includes a description of how the CONTRACTOR shall address existing environmental conditions at the site at the commencement of work.

1.02 Referenced Sections – None

1.03 Cited Standards – None

1.04 Noted Restrictions – None

1.05 Quality Control

A. The CONTRACTOR shall evaluate the existing site environmental conditions and adjacent areas prior to commencement of work.

B. Landscaping, Existing Trees, and Vegetation

1. Existing trees, shrubbery, and other vegetation that is to remain in place shall be protected against unnecessary cutting, breaking or skinning of roots, skinning and bruising of bark, smothering of trees by stockpiling construction materials or excavated materials, excess foot or vehicular traffic, or improper parking of vehicles on vegetation. Temporary fences, barricades or guards are to be provided as required to protect trees and vegetation to be left standing.

2. Trees and other vegetation to remain within limits of contract work shall be watered as required to maintain their health during course of construction operations.

3. Protection shall be provided for roots over 1 ½" diameter cut during construction operations. Coat cut faces with a wound paint formulated for use on damaged plant tissues. Temporarily cover exposed roots with wet burlap to prevent roots from drying out; cover with earth as soon as possible.

4. The CONTRACTOR shall repair or replace trees and vegetation that will remain, which are damaged by construction operations, in a manner acceptable to the OWNER's REPRESENTATIVE and property owner if work is performed on private property. The OWNER's REPRESENTATIVE may employ an Arborist to repair damages to trees and shrubs at the CONTRACTOR's expense when deemed necessary.

C. Property Restoration

1. All landscaping and/or irrigation systems affected by work shall be restored to original condition.

2. The CONTRACTOR shall assume all responsibility and liability for property damages, bodily injury, or financial losses and interruptions of service that may result from his/her construction activities which affect structures, facilities, water lines, gas lines, power lines, electric conduits, sewer lines, telephone lines, cable TV lines, and all service facilities connected thereto.

3. The CONTRACTOR shall be responsible for the relocation, repairing, reconstruction, and re-installation of damaged or disturbed items due to his/her construction activities.

4. Damaged or disturbed items shall be re-installed or restored to their original condition as soon as possible and prior to completion of work. Restoration shall be approved by the authority having jurisdiction over the disturbed items. There shall be no extra cost to the OWNER.

5. Items not specifically stated in the Specifications that are removed, damaged, destroyed, or defaced due to neglect or carelessness on the part of the CONTRACTOR shall be repaired or replaced by the CONTRACTOR if determined so by the OWNER'S REPRESENTATIVE.

Part 2 Products - None

Part 3 Execution - None

END OF SECTION

SECTION 02 60 00 - CONTAMINATED SITE MATERIAL REMOVAL

02 61 00 Removal and Disposal of Contaminated Material

Part 1 General

1.01 Section Includes

A. This section includes a description of how the CONTRACTOR shall remove and dispose of investigation-derived waste (IDW).

B. IDW includes but is not limited to:

1. The constructed wetland in the vicinity of former IDDA 1b.

2. Roll-offs of in the vicinity of former IDDA 1b.

3. 55-gallon drums of spent vapor-phase granular activated carbon in the vicinity of former IDDA 1b.

4. Empty overpacks located to the south of the former septage lagoons.

5. Existing 55 gallon drums of soil cuttings and well development water from previous drilling and CONTRACTOR's drilling operations.

1.02 Referenced Sections

A. Section 013300 - Submittals

B. Section 013529 - Health, Safety, and Emergency Response Procedures

C. Section 312500 – Erosion, Sediment and Dust Control Measures

D. Section 311100 – Clearing and Grubbing

1.03 References

A. Code of Federal Regulations (CFR)

1. 40 CFR 260 Hazardous Waste Management System: General

2. 40 CFR 261 Identification of Hazardous Waste

3. 40 CFR 262 Standards Applicable to Generators of Hazardous Waste

4. 40 CFR 263 Standards Applicable to Transporters of Hazardous Waste

5. 40 CFR 264 Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

6. 40 CFR 265 Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities

7. 40 CFR 300.440 Procedures for planning and implementing off-site response actions

8. 49 CFR 171 General Information, Regulations and Definitions

9. 49 CFR 172 Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements

10. 49 CFR 173 Shippers – general requirements for shipments and packaging

11. 49 CFR 177 Carriage by public highway

B. McMahon & Mann Consulting Engineers, P.C.

1. Ex-Situ Groundwater Treatability Study, Cortese Landfill, Narrowsburg, New York. File 03-018. March 2004.

1.04 Definitions

A. MSDS – Material Safety Data Sheet

B. RCRA – Resource Conservation and Recovery Act (40 CFR)

C. TSA – Transportation and Safety Act (49 CFR)

1.05 Noted Restrictions – none

1.06 Quality Control

1.07 Submittals

A. CONTRACTOR shall submit with Bid a plan for materials handling including waste sampling, profiling, waste segregation, manifesting, removal and offsite disposal of IDM. The materials handling plan will indicate opportunities for recycling or reuse of non-hazardous IDM.

Part 2 PRODUCTS

2.01 Transport Containers

A. End Dump Trucks

1. End dump tractor-trailers shall have a minimum capacity of 45 cubic yards.

2. End dump tractor-trailers shall be DOT-compliant. The vehicle shall be clean, and free of holes, leaks, labels and excessive rust. All end dump tractor-trailers shall be lined and covered.

B. Roll-off Containers (Roll-offs)

1. Roll-offs shall have a minimum capacity of 20 cubic yards.

2. Roll-offs shall be DOT-compliant and clean. The container shall be free of holes, leaks, labels and excessive rust. All roll-offs shall be lined and covered.

3. Sealed roll-offs shall be used when required by the specific waste type and/or disposal facility.

C. Triaxle Dump Trucks

1. Triaxle dump trucks shall have a minimum capacity of 24 cubic yards.

2. Triaxle dump trucks shall be DOT-compliant and clean. The vehicle shall be free of holes, leaks, labels and excessive rust. All triaxle dump trucks shall be lined and covered.

3. Vehicle liners shall be a minimum of 6 mil polyethylene.

Part 3 EXECUTION

3.01 General

A. The CONTRACTOR is responsible for conducting all work activities in accordance with applicable local, state and federal regulations.

B. Emergency response shall be conducted in accordance with the CONTRACTOR's Site Specific Health and Safety Contingency Plan, prepared in accordance with Section 013529.

3.02 Waste Profiling

A. CONTRACTOR shall collect samples of IDW for waste characterization in order to develop a waste profile for each type of IDW in accordance with material handling plan. CONTRACTOR shall coordinate waste profiling with the ENGINEER and planned off-site treatment and disposal facilities.

B. Identification of hazardous waste shall be in accordance with 40 CFR 261.

3.03 Waste Classification

A. IDW shall be classified into the following categories based on the waste profile

1. Materials Requiring Off-Site Disposal

a. Solid and Liquid Hazardous Waste (environmental media)

b. Solid and Liquid Non-hazardous Waste (environmental media)

c. Wastes generated during work activities:

1) Spent PPE (Tyvek, gloves, rubber boots, respirator cartridges)

2) Building construction debris

3) Ordinary trash

2. Materials to be recycled or reused

a. Scrap Metal

b. Other materials identified by CONTRACTOR for recycling and approved by OWNER

3.04 Clearing and Waste Segregation

A. Clear IDW from current location as shown on the Construction Drawings in accordance with Section 311100.

B. IDW shall be segregated into the following categories based on the waste profile prior to loading for off-site transport

1. Materials Requiring Off-Site Disposal

a. Hazardous Waste

b. Non-hazardous Waste

c. Wastes generated during work activities:

1) Spent PPE (Tyvek, gloves, rubber boots, respirator cartridges)

2) Building construction debris

3) Ordinary trash

2. Materials to be potentially recycled or reused

a. Scrap Metal

b. Other materials identified by CONTRACTOR for recycling and approved by OWNER

C. If segregated IDW cannot be loaded for off-site transport after clearing, it will be stored in an area designated by OWNER until off-site transport can be arranged.

3.05 Manifesting

A. All hazardous wastes shall be documented by a hazardous waste manifest per 40 CFR Section 262. All non-hazardous wastes shall be documented by a non-hazardous bill of lading per 49 CFR Sections 171 and 172.

B. The OWNER EPA ID Number is NYD980528475. The Site Shipping Origin Address is 52 Engleman Lane, Narrowsburg, NY 12764.

C. Manifests and bills of lading shall be completed by the CONTRACTOR and signed by OWNER.

D. A copy of the manifest or bill of lading shall accompany the appropriate load. The transporter shall ensure that the manifest or shipping paper is readily available and recognizable by the authorities in the case of an accident or inspection. The transporter shall present the manifest to the disposal facility's representative upon arrival at the disposal facility.

E. Copies of completed manifests and bills of lading shall be maintained on file at the Site by the CONTRACTOR along with the associated inspection form and checklists. Copies will be provided to the ENGINEER and OWNER upon completion of transportation and disposal activities, or at any time upon request.

3.06 Labeling and Placarding

A. Each container shall be labeled per 49 CFR 172 Subpart E.

B. Each container shall be marked per 49 CFR Part 172.304, including OWNER's name and address and Manifest Document Number.

C. Each vehicle or container shall be placarded per 49 CFR Part 172, Subpart F.

D. The CONTRACTOR shall be responsible for determining the appropriate DOT hazard class based upon waste identification and classification during field activities and subsequent placarding.

3.07 Off-site Waste Transport

A. Transportation Vehicles

1. Off-site transport of bulk waste shall be conducted using the following vehicles:

   a. Roll-off containers

   b. End dump tractor-trailers

   c. Triaxle dump trucks

   d. Tanker trucks

2. The CONTRACTOR shall coordinate the delivery of empty vehicles with the selected transporter(s), and the loading, staging and shipment of all wastes to the facilities selected by OWNER.

3. The CONTRACTOR is responsible for any delays in receipt of empty vehicles or shipment of loaded vehicles and the impact on work

activities. The ENGINEER and OWNER are not responsible for coordination or communication with transporters or disposal facilities.

4. The CONTRACTOR shall prepare draft notifications to regulatory agencies regarding waste shipments for review. After addressing any comments CONTRACTOR shall send notifications required by federal, state, an local regulations and those required by the Consent Decree.

5. The CONTRACTOR will prepare and make available to the ENGINEER a file of the available MSDSs for hazardous materials to be shipped off-site. The CONTRACTOR shall submit to the ENGINEER MSDSs for any hazardous materials to be received during the Work.

6. Sealed roll-offs shall be used for transportation of bulk waste if required.

7. All vehicles shall be compliant with DOT regulations.

8. All waste transporters shall be licensed and permitted in all states and Canadian provinces through which they travel, including New York licenses and decals appropriate to the waste.

9. Progress of shipments according to the transporter and disposal facility shall be checked weekly by the CONTRACTOR, at a minimum. A weekly progress report shall be submitted to the ENGINEER. The progress report shall identify traveling vehicles, vehicles that have arrived at the disposal facility, loads which have been disposed and procedures to correct vehicles which are behind schedule. Vehicles shall be cross-referenced to their unique manifest or bill of lading number.

10. Temporary storage while in-transit shall not be permitted, except when necessary for transportation safety.

B. Vehicle Inspection prior to Shipment

1. All loads of waste shall be reviewed and approved in writing by the CONTRACTOR prior to shipment for off-site disposal.

2. All transport vehicles shall be in good operating condition and DOT-compliant.

3. A visual inspection of the tires, windshield, back-up alarms, cleanliness, and general condition shall be made by the CONTRACTOR prior to loading. All previous labels shall be removed completely. Vehicles with deficiencies shall be corrected prior to loading.

4. Vehicle liners shall be placed in the bed of the vehicle by the driver. The driver shall have appropriate PPE for the waste handled. The

excess liner shall be wrapped over the top of the waste material by the CONTRACTOR.

5. Each vehicle shall be fitted with a tarp to cover the entire load and prevent infiltration by rain and release of dust. Prior to tarping, the CONTRACTOR shall inspect the loaded vehicle to ensure that waste has not spilled onto the sides the vehicle. Waste spillage will be cleaned and removed by the CONTRACTOR prior to the shipment leaving the loading area.

6. The CONTRACTOR shall inspect the loaded vehicle to ensure that it has been loaded, tarped, and placarded properly and that it is ready for inspection by the Construction Manager.

7. The QC Manager will document that loaded vehicles were inspected and met the requirements of this Specification and all applicable State, Local, and Federal regulations.

C. Vehicle Weight

1. Each load shall be weighed at certified scales at the appropriate disposal facility to determine actual net load weight. The QC Manager should compare actual net load weights to the number of equipment buckets of material placed into trucks in order to maximize the net weight of material in each shipment without exceeding the 80,000 lb maximum gross vehicle weight requirement.

3.08 Disposal and Recycling Facilities

A. The CONTRACTOR will identify disposal facilities for hazardous and non-hazardous waste disposal based on the waste profiles and recycling facilities for recycled matter. USEPA will certify that the facilities identified are acceptable for the treatment, storage, or disposal of CERCLA waste. If no identified facility is acceptable to USEPA, CONTRACTOR shall identify additional disposal facilities for USEPA review until an acceptable facility is identified.

B. OWNER shall approve selection of USEPA-accepted receiving facilities prior to shipment. USEPA and the receiving state shall be notified of out-of-state waste shipments per Paragraph VI.15 of the Consent Decree.

3.09 Recordkeeping

A. Recordkeeping for shipping and waste tracking logs shall be conducted by the CONTRACTOR in accordance with 40 CFR Part 262, Subpart D.

B. All test results, waste analyses, and copies of inspection logs, checklists, manifests, bills of lading, and notifications of out-of state waste shipment shall also be retained by the CONTRACTOR for the duration of the project. At the completion of work, the CONTRACTOR shall release all electronic and paper records to OWNER.

C. All records shall be neat and orderly. All electronic files shall be printed to

generate a hard-copy backup. The CONTRACTOR shall maintain a file index with his records for easy location of documents. The file index shall be updated weekly at a minimum.

D. The CONTRACTOR shall provide OWNER with the information necessary to prepare and submit biennial reports.

E. The CONTRACTOR shall notify OWNER if a properly signed copy of a manifest is not received from the disposal facility within 35 days of the date the waste was accepted for transport. The CONTRACTOR shall assist OWNER in contacting the disposal facility to resolve the status of the hazardous waste and associated manifest.

F. The CONTRACTOR shall assist OWNER in completion of an Exception Report (40 CFR 262.42) if completed manifests are not received within 45 days.

G. The CONTRACTOR shall maintain a log of all hazardous and non-hazardous waste shipments from the Site. The log shall contain the following information at a minimum:

1. Shipment date
2. Truck number/license plate number
3. Weight (gross and tare)
4. Manifest/bill of lading number
5. Disposal facility
6. Corresponding sample identification and results
7. Waste classification
8. Waste profile
9. Date received at the facility
10. Date of treatment/disposal.

H. The CONTRACTOR shall maintain a log of material recycled from the Site. The type and amount of material recycled will be included on progress reports to the agencies in accordance with the Green Remediation Plan. The log shall contain the following information at a minimum:

1. Shipment date
2. Weight
3. Manifest/bill of lading number
4. Recycling facility

5. Description of material

6. Date received at the facility

3.010 Transport Routes

A. Proposed traffic patterns shall be submitted by the CONTRACTOR for ENGINEER and OWNER approval.

B. Transport vehicles shall not congest or back-up off-site roadways at entry or exit.

C. Directions to each disposal facility shall be submitted to OWNER and ENGINEER for approval.

END OF SECTION

02 62 00 Light Non-Aqueous Phase Liquid (LNAPL) Recovery Processes

Part 1 General

1.01 Section Includes

A. This section describes the recovery of LNAPL from existing groundwater monitoring wells MW-13, S-1 and S-2 during construction.

B. Measureable thicknesses of light non-aqueous phase liquid (LNAPL) have been identified during regular environmental monitoring at groundwater monitoring wells MW-13, S-1 and S-2. Thicknesses have been measured up to 0.74 feet but more often thicknesses are less than 0.2 feet.

C. LNAPL collected from groundwater monitoring well S-2 in 2007 was reported to have a density of 0.977 grams per cubic centimeter (g/cm^3)and a kinematic viscosity of 241 centistokes(cSt)

1.02 Referenced Sections

A. Section 026100 – Removal and Disposal of Contaminated Material

B. Section 013529 - Health, Safety, and Emergency Response Procedures

1.03 References

1.04 Noted Restrictions – none

1.05 Quality Control

A. CONTRACTOR shall install a LNAPL recovery system that is appropriately sized for the diameter of the groundwater monitoring well screen and riser.

1. MW-13: 2-inch diameter

2. S-1: 4-inch diameter

3. S-2: 4-inch diameter

B. CONTRACTOR will shall operate a LNAPL recovery system that is capable of recovering the LNAPL with the density and kinematic viscosity listed above.

C. CONTRACTOR shall conduct routine inspection of the LNAPL recovery system to ensure that there is no leakage and to record the volume of product recovered.

D. CONTRACTOR shall store recovered product in dedicated 55-gallon drums for characterization and off-site disposal.

1.06 Submittals

A. CONTRACTOR shall submit with Bid a plan for LNAPL recovery during construction. The plan will include means and methods for LNAPL recovery, storage, characterization and disposal.

B. CONTRACTOR shall provide ENGINEER with a weekly log of volume of product recovered from each well.

Part 2 Products

2.01 Skimmer Assembly (2", 4")

A. Skimmer assembly with coiled tubing and 24" travel

B. Variable inlet and connection for high water shut off (HWSO)

C. Skimmer assembly shall be SPG skimmers by QED Environmental Systems, or equal approved by the OWNER's REPRESENTATIVE.

1. 2-inch: SPG2

2. 4-inch: SPG4

2.02 Bladder Product Pump

A. Pump(s) shall be all pneumatic and intrinsically explosion-proof. All at-well equipment shall operate on compressed air. No electricity shall be required at the well head.

B. Pump system shall operate with a surface controlled controller. The controller specification is described later in this document. Pumps which have internal timers are not allowed.

C. Pump(s) shall be designed and constructed to fit in a standard 2" or 4" well casing well casing.

D. Pump(s) shall be completely constructed of materials resistant to attack by hydrocarbons, to meet the following specifications:

1. Pump body shall be electro-polished stainless steel for maximum resistance to chemical attack, swelling, cracking, abrasion, or other wear and tear. No plastic bodies shall be allowed.

2. Pump body shall not be unfinished standard pipe stock. Ends shall be machined to assure precise fit of end cap O-rings for proper seal and easy disassembly and re-assembly without O-ring damage.

E. Pumps(s) shall be Part No. 301310, by QED Environmental Systems, or equal approved by the OWNER's REPRESENTATIVE.

2.03 Programmable Controller

A. Solar powered or by 110 volt AC source

B. Intrinsically safe in solar powered mode

C. Environmentally sealed case, suitable for outdoor use

D. Includes filter/regulator

E. Regulates air flow and pump operation for any pneumatic pump(s)

F. Programmable controller shall be C100M by QED Environmental Systems, or equal approved by the OWNER's REPRESENTATIVE.

2.04 Compressed Air Supply

A. Air compressor

2.05 Optional Accessories

A. Automatic Tank Full Shutoff

Part 3 Execution

3.01 Preparation

A. Prior to implementing any of the Work described in this Section, CONTRACTOR shall become thoroughly familiar with all portions of the Work falling within this Section.

B. Prior to skimmer installation, gauge the depth to water and LNAPL thickness in the monitoring well in order to determine the depth of installation in accordance with the Manufacturer's instructions.

3.02 Installation

A. Install the bladder pump and float in the monitoring well in accordance with Manufacturer's instructions.

3.03 Operation

A. CONTRACTOR will operate LNAPL recovery system in accordance with submitted LNAPL recovery plan, as approved by OWNER and ENGINEER.

B. CONTRACTOR will minimize recovery of groundwater during operations.

C. CONTRACTOR may operate the LNAPL recovery system manually or develop automated operations approved by the ENGINEER.

D. CONTRACTOR will operate LNAPL recovery system until measurable LNAPL is no longer detectable, or to the satisfaction of the ENGINER.

3.04 Storage

A. CONTRACTOR will store recovered LNAPL at the Site at location designated by OWNER.

3.05 Characterization

A. CONTRACTOR shall develop a profile of the recovered product for off-site treatment, disposal or recycling.

3.06 Disposal

A. CONTRACTOR shall arrange for off-site disposal (or recycling) of the recovered product based on the waste profile using the procedures in Section 026100.

3.07 Removal

A. CONTRACTOR shall remove LNAPL recovery system from the monitoring wells during extended periods with no construction activity at the Site and at the completion of the Work.

END OF SECTION

02 62 16 Soil Vapor Extraction

Part 1 General

1.01 Section includes:

A. This section describes the components of the soil vapor extraction (SVE) systems to be installed at the Site to collect soil vapors coming off of the water table due to air sparging. It also describes components to treat the collected soil vapors, if necessary, prior to discharge to the atmosphere.

B. The SVE systems will consist of SVE wells, aboveground piping, mechanical equipment and appurtenances as shown in the Construction Drawings, as described herein.

1.02 Related Sections

A. 33 20 00 Wells

B. 40 05 13.74 Plastic Process Piping (CPVC Piping)

C. 40 05 13.75 HDPE Process Piping

D. 42 06 20 Schedules for Process Cooling Equipment

E. 43 06 10 Schedules for Gas Handling Equipment

F. 43 11 34 Regenerative Rotary Blowers

G. 43 31 13.13 Vapor Phase Activated Carbon Adsorption Units

1.03 Cited Standards – none

1.04 Submittals

A. CONTRACTOR shall submit Shop drawings showing the components of the SVE systems described in the Construction Drawings and product data as indicated herein and in the related Sections.

1.05 Quality Control

A. CONTRACTOR shall perform all work in accordance with any and all pertinent federal, State, and local codes.

B. Construction of the SVE systems shall be monitored by ENGINEER in accordance with the Construction Quality Assurance Plan.

Part 2 Products

2.01 SVE Wells

A. SVE wells shall be installed as shown on the Construction Drawings and as specified in **Section 33 20 00**.

2.02 Aboveground piping

A. Aboveground piping will consist of HDPE piping for SVE distribution piping headers and CPVC piping for connection to individual SVE wellheads as shown on the Construction Drawings.

B. See **Sections 40 05 13.74 and 40 05 13.75** for product specifications.

2.03 SVE Vacuum Blowers

A. SVE Vacuum Blowers shall be installed as shown on the Construction Drawings to provide the required vacuum at the SVE wellheads and sufficient pressure for discharge to the atmosphere.

B. The schedule for SVE blowers is presented in **Section 43 06 10** with additional specifications in **Section 43 11 34**.

2.04 SVE Moisture Separator

A. CONTRACTOR shall install a moisture separator tank upstream of each SVE blower in order to remove entrained moisture from the extracted soil gas prior to entry into the SVE blower.

B. Capacity; 60 gallons

C. Material of Construction: Steel

D. Ports:

1. Inlet
2. Outlet
3. Drain
4. Sight Glass (2)
5. Level Switch or Transmitter (up to 3)

E. Moisture separator shall be Model GX-60 by J.E. Gasho & Assoc., Inc. or equal approved by OWNER's REPRESENTATIVE.

2.05 Air-cooled Heat Exchanger

A. CONSTRACTOR shall install an air-cooled heat exchanger downstream of the SVE blower in order to cool the SVE blower discharge prior to entry into the vapor phase activated carbon units

B. The schedule for Air-cooled Heat Exchangers is presented in **Section 42 06 20**.

2.06 Off-gas Treatment

A. CONTRACTOR shall install off-gas treatment equipment necessary to treat

SVE discharge in accordance with applicable federal, State and local codes and regulations.

B. Off-gas treatment equipment shall be vapor phase activated carbon as specified in **Section 43 31 13.13** or equal approved by OWNER'S REPRESENTATIVE.

Part 3 Execution – Not Used

CORTESE LANDFILL SITE

NARROWSBURG, NEW YORK

OU 4 REMEDIAL DESIGN

ENGINEERING SPECIFICATIONS

DIVISION 03

CONCRETE

PROJECT:	**OU 4 REMEDIAL DESIGN**
LOCATION:	**CORTESE LANDFILL NARROWSBURG, NEW YORK**
PROJECT NO.:	**MR0562B**
COMPANEW YORK:	**CORTESE LANDFILL PRP GROUP**
PREPARED BY:	Geosyntec consultants engineers | scientists | innovators

SECTION 03 00 00 - CONCRETE

03 05 00 Common Work Results for Concrete

Part 1 General

1.01 General Conditions

A. The General Conditions apply to all work of this specification, which shall be done as shown on the plans, and as specified, and shall be properly coordinated with work in other Specifications.

B. The Drawings and these Specifications are complementary to each other; what is called for by one shall be as binding as if called for by both. If there is any conflict between what is shown on the Drawings and what is written in the Specifications, the more restrictive shall take precedence and the CONTRACTOR shall communicate the conflicts to the OWNER's REPRESENTATIVE prior to constructing the work.

C. Safety

1. The CONTRACTOR shall be familiar with, and shall at all times conform to, the regulations of the *"OSHA General Industry Occupational Safety and Health Standards," "OSHA Safety and Health Regulations for Construction,"* and other applicable state and municipal standards and regulations.

1.02 Referenced Sections - none

1.03 Cited Standards

A. All concrete work shall conform to the requirements of the following standard specifications, of the latest revisions, as applicable:

1. ASTM C31 / C31M - 09 Standard Practice for Making and Curing Concrete Test Specimens in the Field

2. ASTM C39 / C39M - 05e2 Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens

3. ASTM C172 - 08 Standard Practice for Sampling Freshly Mixed Concrete

1.04 Noted Restrictions - none

1.05 Quality Control

A. The CONTRACTOR shall furnish all material, equipment, labor, services, etc., to complete and install all concrete work as specified on the drawings.

1.06 Submittals

A. For all concrete work, the CONTRACTOR shall submit (at a minimum) shop drawings, manufacturer's catalog data and descriptive literature for form ties,

spreaders, corner formers, form coatings and curing compound, bond breakers, joint sealant, backing rod, joint filler, epoxy bonding compound, and color additive to the OWNER's REPRESENTATIVE.

1.07 Delivery, Storage, and Handling

A. All concrete related materials shall be delivered, stored, and handled as to prevent damage to the materials and the inclusion of foreign substances. Packaged materials shall be delivered and stored in original containers until ready for use. Material containers or materials showing evidence of water or other damage will not be accepted.

Part 2 Products

2.01 Concrete (General)

A. All concrete used for work shall be composed of Portland cement, fine aggregate, coarse aggregate, and water so proportioned and mixed as to produce a plastic, workable mixture in accordance with the applicable specifications and suitable to the specific conditions of placement.

Part 3 Execution

3.01 Preparation - none

3.02 Installation

A. Concrete work throughout shall be constructed as a monolith as feasible. Every part of the work concrete and grout of homogeneous structure, when hardened, shall have the required strength, watertightness, and resistance to weathering.

3.03 Testing of Concrete

A. During the progress of construction, the OWNER's REPRESENTATIVE will have tests made to determine whether the concrete, as being produced, complies with the requirements specified herein. These tests shall be made in accordance with ASTM C 31, ASTM C 39, and ASTM C 172.

B. The CONTRACTOR shall test the slump of concrete using a slump cone in accordance with the requirements of ASTM C 143. The CONTRACTOR shall test the slump at the beginning of each placement.

END OF SECTION

SECTION 03 20 00 – CONCRETE REINFORCING

03 21 00 Reinforcing Steel

Part 1 General

1.01 Section Includes

A. This section includes a description of how the CONTRACTOR shall proceed to furnish all material, equipment, labor, services, etc., to provide steel reinforcing bars for concrete reinforcement.

1.02 Referenced Sections - none

1.03 Cited Standards

A. All reinforcing steel shall conform to the requirements of the following standard specifications, of the latest revisions, as applicable:

1. ACI 315 – Details and Detailing of Concrete Reinforcement
2. ACI 318 – Building Code Requirements for Structural Concrete
3. ASTM A82 / A82M - 07 Standard Specification for Steel Wire, Plain, for Concrete Reinforcement
4. ASTM A185 / A185M - 07 Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete
5. ASTM A370 - Test Methods and Definitions for Mechanical Testing of Steel Products

1.04 Noted Restrictions – none

1.05 Quality Control

A. The CONTRACTOR shall receive approval from the OWNER's REPRESENTATIVE prior to movement or rearrangement of reinforcement bars if any adjustments need to be made in order to avoid interference with other embedded items.

1.06 Submittals

A. Shop drawings for reinforcing steel and accessories shall be prepared in accordance with "Details and Detailing of Concrete Reinforcement," ACI 315. Calculated weights of the bars shall be as specified in ACI 318.

B. The CONTRACTOR shall also submit a certificate of compliance stating that the grades and properties of the reinforcing steel are in conformance with ASTM A370, and any other applicable ASTM Standards.

1.07 Delivery and Storage

A. Reinforcing bars shall be delivered in bundles limited to one size and length of

bar, securely tied and indentified with plastic tags including the mill, heat number, and grade and size of the bars. The bars shall be placed in storage shall be stored off the ground and protected from moisture, dirt, and other contaminants that could cause an impaired bond with concrete.

Part 2 Products

2.01 Reinforcement Bars

A. Reinforcing bars shall conform to the requirements of the "Standard Specifications for Deformed Billet Steel Bars for Concrete Reinforcement" (ANSI/ ASTM A6l5). Reinforcing bars shall be Grade 60.

2.02 Welded Wire Fabric

A. Welded wire fabric for concrete reinforcement shall be electrically-welded wire fabric of cold-drawn wire conforming to "Specification for Welded Steel Wire Fabric for Concrete Reinforcement", (ANSI/ASTM A185).

2.03 Fabrication

A. Reinforcement shall be accurately formed to the dimensions indicated on the Drawings. All bars shall be bent cold. Diameter of bend measured on inside of bar, other than for stirrups and ties in sizes No. 3 through No. 5, shall not be less than specified in Table 3E-1. Inside diameter of bends for stirrups and ties shall not be less than 4 bar diameters for No. 5 bar and smaller. For bars larger than No. 5, diameter of bend shall comply with Table 3E-1 shown below.

Table 3E-1 – Min. Diameters Of Bend

Bar Size	Min. Diameter
No. 14 and 18	10 Bar Diameters

B. Metal reinforcement shall not be straightened or re-bent in a manner that will injure the material. Bars with kinks, or bends not shown on the Drawings, shall not be used. Heating of the reinforcement or welding to the reinforcement shall not be permitted.

2.04 Bar Supports

A. Bar supports shall be hot-dip galvanized steel, shall conform to ACI 315, and shall be furnished in sufficient number to prevent sagging and to support loads during construction.

Part 3 Execution

3.01 Preparation – none

3.02 Placing Reinforcement

A. Metal reinforcement shall be placed in accordance with ANSI/ACI 318, except

as otherwise noted herein and accurately positioned in accordance with the information on the drawings. Protective concrete cover shall be as required in ANSI/ACI 318. Reinforcement shall be secured against displacement by using annealed iron wire-ties or suitable clips at intersections, and shall be supported by concrete or metal supports, spacers, or metal hangers.

B. Metal reinforcement before being positioned, shall be free from loose mill and rust scale, and from coatings including ice that destroy or reduce the bond. Where there is delay in depositing concrete, reinforcement shall be re-inspected and cleaned when necessary.

C. When it is necessary to splice reinforcement at points other than shown on the drawings, the character of the splice shall be determined by the Owner's Representative.

D. All laps of wire mesh shall be one width of wire spacing, and adjoining sheets shall be securely tied together with No. 14 tie-wire, one tie for each 2 running feet. At laps, wires shall be staggered and tied in such a manner that they cannot slip.

3.03 Testing – None

END OF SECTION

SECTION 03 30 00 – CAST-IN-PLACE CONCRETE

03 30 53 Miscellaneous Cast-in Place Concrete

Part 1 General

1.01 Section Includes

A. The General Construction CONTRACTOR shall furnish all material, equipment, labor, services, etc., to complete and install all cast-in-place concrete work as specified in this section.

1.02 Referenced Sections - none

1.03 Cited Standards

A. All cast-in-place concrete shall conform to the requirements of the following standard specifications, of the latest revisions, as applicable:

1. ACI 301 - Specifications for Structural Concrete for Buildings
2. ACI 318 - Building Code Requirements for Reinforced Concrete
3. ACI 350R - Environmental Engineering Concrete Structures
4. ACI SP-15 - Field Reference Manual. A copy of this publication must be kept in the field office at all times during concrete construction.
5. ASTM C94 / C94M - 09a Standard Specification for Ready-Mixed Concrete
6. CRSI - Manual of Standard Practice

1.04 Noted Restrictions - None

1.05 Quality Control

A. The concrete to be used in this project shall be ready-mixed concrete in conformity with ANSI/ASTM C94 except as revised or amended hereinafter or with approval of the OWNER's REPRESENTATIVE.

B. Production Facility Requirements

1. Where the concrete production facility can establish the uniformity of its production for concrete of similar strength and materials based on recent test data, the average strength used as a basis for determining mix design proportions shall exceed the specified design strength by the requirements of ACI 318, Section 4.3 or ACI 301, Section 3.9.
2. When a concrete production facility does not have field test records for calculation of standard deviation, the required average strength shall be at least 1200 psi greater than the specified design strength.

1.06 Submittals

A. Shop drawings for cast-in-place concrete structures shall be submitted in accordance with **Section 01 33 00 Submittal Procedures**.

1.07 Storage of Materials

A. Cement and aggregates shall be stored in such a manner as to prevent deterioration of or contamination with foreign matter.

B. Fine and coarse aggregate shall be stored separately and in such a manner as to avoid segregation. Cement, which has become caked, partially set, or otherwise deteriorated, or any material, which has become damaged or contaminated, shall be rejected for use.

Part 2 Products

2.01 Cement

A. Portland cement shall conform to the Standard Specifications for Portland Cement of ANSI/ASTM C150, Type I or Type II. All cement shall be obtained from one source. Different brands of cement shall not be permitted, except as previously specified.

B. All cement shall be stored in a suitable way to protect the cement from dampness in a way to be easily inspected and to permit easy identification of each shipment. Facilities shall be provided for inspection and sampling of stored cement being used. The cement shall be rejected if it fails to meet any of the requirements of these specifications.

C. Fly ash (alternate, if used)

1. Fly ash may be used in the mix design. When fly ash is used as a partial replacement for cement, the minimum cement content shall be met by considering Portland cement plus fly ash as the total cementitious material. The replacement rate shall be determined from laboratory trial mixes, but shall not exceed 20 percent by weight of the total cementitious material.

2. Fly ash shall meet the requirements of ASTM C618, Class C, F or N with the exception of loss of ignition, where the maximum shall be less than 6% for Class F or N.

2.02 Fine Aggregates

A. Fine aggregate shall conform to the "Specifications for Concrete Aggregate", ANSI/ASTM C33.

B. For fine aggregates, only clean, natural sand shall be used. Artificial or manufactured sand will not be acceptable. The grading of the fine aggregate shall be as shown in the table below:

Sieve Designations	Percent Passing
3/8 in.	100
No. 4	95-100
No. 8	80-90
No. 16	50-75
No. 30	30-50
No. 50	10-20
No. 100	2-5

2.03 Coarse Aggregate

A. Course aggregate shall conform to "Specifications for Concrete Aggregate", ANSI/ASTM C33.

B. Coarse aggregate shall consist of crushed stone or crushed gravel conforming to the following limits:

1. Sodium sulfate test - 10% max loss

2. L. A. abrasion test - 35% max loss

3. Crushed particles (gravel) - 45% min loss

C. The sizes of coarse aggregate for the type of concrete being used in this work shall be Class B, ASTM Size 67.

D. The gradations required for the coarse aggregate are 8 to 18 percent for the top size aggregates and 8 to 22 percent for smaller top size aggregates retained on each sieve.

2.04 Water

A. Water used in mixing and curing concrete shall be from public water system and shall be clean and free from injurious amounts of sewage, oil, acid, alkali, organic matter or other deleterious substances.

2.05 Admixtures

A. All admixtures shall be approved by the OWNER's REPRESENTATIVE and shall be added to the concrete in strict accordance with the recommendation of the manufacturer.

B. The admixture shall conform to ASTM C494, Type A, and not contain more chloride ions than are present in municipal drinking water.

C. Calcium chloride, thiocyanates or admixtures containing more than 0.05 percent chloride ions are <u>not</u> permitted. Written conformance to the above-mentioned requirements and the chloride ion content of the admixture will be required from the admixture manufacturer prior to mix design review by the OWNER or the OWNER's REPRESENTATIVE.

Part 3 Execution

3.01 Preparation

A. The CONTRACTOR shall submit the ready-mix design from the batchplant used accompanied by complete standard deviation analysis or trial mixture test data.

B. All mixes shall be approved by the OWNER's REPRESENTATIVE prior to use on the job. No deviations from the approved mixes shall be permitted without approval from the OWNER's REPRESENTATIVE.

C. Structural concrete shall have a minimum compressive strength of 3,000 psi for slabs and trenches.

D. All concrete shall contain a minimum of 4% +/- 1% entrained air.

E. The concrete shall arrive at the job site at a slump of 2" to 3". The CONTRACTOR shall perform slump test to be witnessed by the OWNER or OWNER's REPRESENTATIVE for verification. All concrete shall have a maximum slump of 3" (slabs) or 4" for other applications.

F. The time elapsing from the time water is added to the mix until the concrete is deposited in place at the site of the work shall not exceed 30 minutes if concrete is hauled in non-agitating trucks, nor shall it exceed 60 minutes when hauled in transit-mix trucks or truck agitators.

G. The addition of water after the completion of the initial mixing operation will not be permitted, except when concrete is delivered in transit mix trucks. In this case water may be added to the batch materials and additional mixing (at minimum 20rpm) may be performed to modify the consistency to meet specified requirements, provided that all of these operations are performed within 45 minutes after the initial mixing operation and the mixing speed of 20 rpm is not exceeded. Concrete that is not within specified consistency limits at the time of placement shall not be used.

3.02 Mixing Concrete

A. The concrete shall be mixed in a batch mixer until there is uniform cement and aggregate proportioned by weight distribution of the materials, and shall be discharged completely before the mixer is recharged. For job-mixed concrete, the mixer shall be rotated at the speed recommended by the manufacturer and mixing shall be continued as follows for various sizes of mixers:

1. ½ yd^3 mixer or smaller at 1-¼ minutes
2. 3/4 to 1-¼ yd^3 mixer at 1-½ minutes
3. Larger than 1-¼ yd^3 mixer at 2 minutes
4. For each additional yd^3 over $2yd^3$ add ¼ minute

B. The ready-mixed concrete shall be mixed and delivered in accordance with the requirements of "Standard Specifications For Ready-Mixed Concrete" ANSI/ASTM C-94. During a continuous pour, the interval between loads shall not be greater than 20 minutes, or in any case be so great as to allow the concrete in place to become partially hardened. Water used to flush the mixer or agitator between loads shall not be allowed to become a part of any concrete in the work.

C. When the temperature is below 40°F, adequate equipment shall be provided for heating the component materials of the concrete so that the concrete being deposited can be maintained at a temperature of 50°F minimum to 90°F maximum. When the air temperature is above 90°F, the temperature of the concrete being deposited shall not exceed 90°F, and adequate means of cooling the concrete mix shall be provided.

D. Truck mixers shall be revolving-drum type and shall be equipped with a mixing water tank capable of introducing the appropriate amount mixing water for the work.

E. Delivery tickets shall be prepared for each load of ready-mixed concrete delivered. In the event a laboratory representative is designated to inspect the batching operation, he shall prepare the ticket. In the event no laboratory representative is required for the project, the batch plant operator shall prepare the ticket. The drivers of the trucks shall deliver the tickets to the Owner's Representative at the site at the time of delivery. The tickets shall contain the following information:

1. Number of yards delivered on this truck.
2. Quantities of materials in the batch.
3. The time at which the truck left the batching plant.
4. The time at which the cement was added.
5. The outdoor temperature in the shade.
6. The numerical sequence of the delivery.
7. The Date.

3.03 Placing Concrete

A. Placing of the concrete shall be done in accordance with ANSI/ACI 304, "Recommended Practice For Measuring, Mixing, and Placing Concrete".

B. Before depositing concrete, all debris shall be removed from the space to be occupied by the concrete. Forms, if constructed of lumber, shall be thoroughly wetted. Reinforcement, pipe sleeves and other materials to be embedded in the concrete shall be thoroughly secured in position. Water shall be removed from the space to be occupied by the concrete before concrete is deposited.

C. Concrete shall be handled from the transporting vehicle in a manner to prevent the separation or loss of the ingredients. Under no circumstances shall concrete that has partially hardened be deposited in the work. Concrete

shall be deposited in the forms as nearly as practicable in its final position to avoid re-handling. It shall be so deposited as to maintain, until the completion of the unit, a plastic surface approximately horizontal

D. Where concrete is conveyed to chutes, the equipment shall be of such size and design as to insure a continuous flow in the chute. The chutes shall be of metal, or metal-lined, and if two or more lengths are used, they shall have approximately the same slope. The slope shall not be less than 2H:1V and shall be such as to prevent the segregation of the ingredients. The discharge end of the chute shall be provided with a baffle plate to prevent segregation. If the distance of the discharge end of the chute above the surface of the concrete is more than 3 times the thickness of the layer being deposited, or more than 4 ft above the surface of the concrete, a spout or "elephant trunk" shall be used and the lower end maintained as near to the surface of deposit as practicable. When the operation is intermittent, the chute shall discharge into a hopper. The chute shall be thoroughly cleaned before and after each run and the debris from any water used shall be discharged outside the forms.

E. Before depositing new concrete on or against concrete which has hardened and to which it is to bond, the forms shall be re-tightened. The surface of the hardened concrete shall be roughened in a manner not to leave loosened particles of aggregate or damaged concrete at the surface. It shall be thoroughly cleaned of foreign matter and laitance, and saturated with water.

F. Concrete during and immediately after depositing shall be thoroughly compacted by means of vibration. The number of vibrators used shall be subject to the approval of the OWNER's REPRESENTATIVE. The concrete shall be thoroughly worked around the reinforcement and around embedded fixtures and into the corners of the forms. Note that manhole bottoms, pipe cradle and encasement, and similar concrete work are also required to be thoroughly vibrated.

G. The accumulation of water on the surface of the concrete due to water gain, segregation, or other causes, during placement and compacting, shall be prevented as far as possible by adjustments in the mixture. Provision shall be made for the removal of such accumulated water so that under no circumstance will concrete be placed in such accumulation.

H. To minimize the formation of laitance, great care shall be exercised to disturb the concrete as little as possible while it is being deposited. Upon completion of a section of concrete, all laitance shall be entirely removed before work is resumed. Prior to start of work, the CONTRACTOR shall submit the details of procedures he proposes to minimize and control the development of shrinkage cracks.

3.04 Placing Concrete in Hot Weather

A. Concrete shall be placed in hot weather in accordance with "Hot Weather Concreting" (ACI 305) latest revision.

B. If after stripping of forms any concrete is found to be not formed as shown on the drawings, out of alignment or not level, or shows a defective surface, it

shall be removed and replaced by the CONTRACTOR at his expense unless the granted permission by the OWNER's REPRESENTATIVE to patch the defective area, in which case patching shall be done as hereinafter described.

C. Defects that require replacement or repair are those that consist of honeycomb, damage due to stripping forms, loose pieces of concrete, surface holes caused by bolts and ties, excessive ridges at form joints and bulges due to movement of the forms. Ridges and bulges shall be removed by chipping, tooling or grinding on finished surfaces. Honeycomb and other defective concrete shall be chipped out, and the chipped openings having sharp edges shaped so that the mortar filling will be keyed in place. All holes shall be kept thoroughly moistened for several hours before mortar filling is placed. The area to be patched shall be filled with the specified repair material.

D. Imperfections, bolt and tie-rod holes, and chipped-out honeycomb areas to be repaired shall be filled with dry-patching mortar composed of 1 part of Portland cement to 2 parts of regular concrete sand (volume measurement) and just enough water so that after the ingredients are mixed thoroughly the mortar will stick together on being molded into a ball by slight pressure of the hands, and will not exude free water. Mortar repairs shall be placed in thin layers and thoroughly compacted by suitable tools.

E. The CONTRACTOR shall take care in filling rod and bolt-holes so that the entire depth of the hole is completely filled with compacted mortar. "EMBECO", Five Star, or equal, shall be added to all patching mortar in an amount as recommended by the manufacturer for the mix to be used except for unpainted, exposed surfaces, or surfaces which are specified to be waterproofed or damp-proofed with a chemical-type protective coating. For surfaces on which the chemical-type protective coatings are specified, only materials recommended by the coating manufacturer shall be used for repairs.

F. Materials for exposed surfaces not requiring painting or waterproofing shall not cause discoloration of the proposed patch or the surrounding concrete surfaces. All honeycomb areas, bolt-holes and other imperfections shall be repaired with Master Builders, Cleveland, OH, "Set 45" or U.S. Grout Corporation, Old Greenwich, CT, Five Star structural concrete, or an approved equal which shall be installed according to the manufacturer's recommendations.

END OF SECTION

03 35 00 Concrete Finishing

Part 1 General

1.01 Section Includes

A. This section shall describe how the CONTRACTOR shall perform work in regard to concrete finishing.

1.02 Referenced Sections – None

1.03 Cited Standards – None

1.04 Noted Restrictions – None

1.05 Quality Control

A. All concrete surfaces shall be finished by experienced finishers, as specified, as soon after placing the concrete as conditions will permit. The placing of concrete and the removal of forms shall be scheduled so that finishing the surfaces can be completed before the concrete reaches a final hard set. No cement plaster or cement brush-coats will be acceptable.

Part 2 Products

2.01 Sealer (where necessary)

A. Where specified, the sealer shall be Conspec #1, or Thomson's Water Seal 201 applied at a rate of 300 sq ft. / gallon for each coat.

Part 3 Execution

3.01 Preparation - none

3.02 Installation

A. Concrete surfaces which are specified or indicated to be painted, and all concrete surfaces, interior or exterior, exposed to view shall have fins removed and joints ground smooth, and shall be "sacked" with cement mortar so that all pits and holes are filled. All form ties shall be removed from all surfaces, and holes shall be filled after being cleaned and roughened by heavy sandblasting.

B. Unformed concrete surfaces shall be struck off to established grade and floated with a wood float until all irregularities are removed. Where required the surface shall then be troweled either with a wood trowel or a steel trowel, depending on the finish requirement of the area to be troweled, until a smooth dense finish is obtained. Troweling of the floated surface shall not be done until all excess water has evaporated.

END OF SECTION

03 39 00 Concrete Curing

Part 1 General

1.01 Section Includes

A. This section shall describe how the CONTRACTOR shall perform work in regard to concrete curing.

1.02 Referenced Sections – None

1.03 Cited Standards

A. Along concrete curing shall conform to the following or latest revisions of as applicable:

1. ASTM C171 - 07 Standard Specification for Sheet Materials for Curing Concrete

2. ASTM C309 - 07 Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete

1.04 Noted Restrictions – None

1.05 Quality Control

A. The CONTRACTOR shall protection against loss of moisture from the surface of the concrete by performing the following:

1. Keeping the surface cured for a minimum period of 7 days.

2. Keeping the surface in contact with the form.

3. Covering with burlap or cotton mats kept continuously wet and covered with polyethylene plastic.

4. Continuously sprinkling the exposed surfaces.

5. Applying a curing and sealing compound as specified herein.

Part 2 Products

2.01 Curing and Sealing Compound

A. Compound shall be "Super Aqua Cure VOX" or "Super Diamond Clear VOX" by The Euclid Chemical Co. or an equal approved by the OWNER's REPRESENTATIVE.

B. Clear Curing and Sealing Compound (VOC compliant) shall comply with ASTM C309, Type 1D and shall have 30% solids content minimum.

C. No curing compounds shall be used on any surfaces to which pneumatic mortar is to be applied, or on which any other type of concrete mortar or chemical waterproofing coating is to be used. They may be used in other

places, however, upon the approval of the compound and its location by the OWNER.

Part 3 Execution

3.01 Preparation – None

3.02 Curing and Placing

A. Curing shall be by application of the specified curing and sealing compound, or by application of water proof sheet materials conforming to ASTM C 171. Liquid membrane forming curing and sealing compounds shall be applied in accordance with the manufacturer's recommendations. The curing process must begin immediately after final finishing.

B. When concrete slab placements are subject to high temperatures, wind and/or low humidity, the OWNER'S REPRESENTATIVE may require the use of the evaporation retarder to minimize plastic cracking. The compound may be required to be applied one or more times during the finishing operation.

C. At air temperatures of 90°F or above, concrete shall be kept below 90°F during placing and curing. Concrete surfaces shall be kept continuously moist by wet-curing for at least 24 hours after the concrete has been placed, and water shall be applied to formed surfaces while forms are still in place.

D. After the period of wet-curing, a suitable heat-reflecting plastic membrane or white-pigmented curing compound or immediate membrane curing shall be used.

3.03 Testing – None

END OF SECTION

CORTESE LANDFILL SITE

NARROWSBURG, NEW YORK

OU 4 REMEDIAL DESIGN

ENGINEERING SPECIFICATIONS

DIVISION 22

PLUMBING

PROJECT:	**OU 4 REMEDIAL DESIGN**
LOCATION:	**CORTESE LANDFILL NARROWSBURG, NEW YORK**
PROJECT NO.:	**MR0562B**
COMPANEW YORK:	**CORTESE LANDFILL PRP GROUP**
PREPARED BY:	Geosyntec consultants engineers | scientists | innovators

SECTION 22 00 00 - PLUMBING

22 05 00 Common Work Results for Plumbing

Part 1 General

1.01 General Conditions

A. The General Conditions apply to all work of this specification, which shall be done as shown on the plans, and as specified, and shall be properly coordinated with work in other Specifications.

B. The Drawings and these Specifications are complementary to each other; what is called for by one shall be as binding as if called for by both. If there is any conflict between what is shown on the Drawings and what is written in the Specifications, the more restrictive shall take precedence, and the CONTRACTOR shall communicate the conflicts to the OWNER's REPRESENTATIVE prior to initiating construction.

C. Safety

1. The CONTRACTOR shall be familiar with, and shall at all times conform to, the regulations of the *"OSHA General Industry Occupational Safety and Health Standards," "OSHA Safety and Health Regulations for Construction,"* and other applicable state and municipal standards and regulations.

1.02 Referenced Sections - none

1.03 Cited Standards – none

1.04 Noted Restrictions – none

1.05 Quality Control – not used

Part 2 Products – Not Used

Part 3 Execution – Not Used

END OF SECTION

22 06 15 Schedules for General Service Compressed-Air Equipment

Part 1 General

1.01 This section describes the schedule for compressed-air equipment

A. Rotary-Screw Air Compressor

Equipment ID	Referenced Dwg No.	Manufacturer & Model #	Flow rate (SCFM)	HP	Pressure
C-201	M03A	Kaeser CSD 75 or Equal	345	75	125 psi
C-202	M03B	Kaeser BSD 50 or Equal	237	50	125 psi

B. Integral Air Dryer

Equipment ID	Referenced Dwg No.	Manufacturer & Model #	Flow rate (SCFM)	Pressure
H-501	M03A	see C-201	345 minimum	125 psi minimum
H-502	M03B	see C-202	237 minimum	125 psi minimum

C. Air Receiver Tank

Equipment ID	Referenced Dwg No.	Manufacturer & Model #	Capacity (Gallons)	Pressure
T-701	M03A	Kaeser A10129or equal	500 minimum	165 psi maximum
T-702	M03B	Kaeser A10131or equal	660 minimum	150 psi maximum

D. Coalescing Filter

Equipment ID	Referenced Dwg No.	Manufacturer & Model #	Flow rate (SCFM)	Pressure
F-401	M03A	Kaeser KOR 485.2 or equal	345 minimum	250 psi maximum
F-403	M03B	Kaeser KOR 375 or equal	237 minimum	250 psi maximum

E. Carbon Filter

Equipment ID	Referenced Dwg No.	Manufacturer & Model #	Flow rate (SCFM)	Pressure
F-402	M03A	Kaeser KVF 485.2 or equal	345 minimum	250 psi maximum
F-404	M03B	Kaeser KVF 375 or equal	237 minimum	250 psi maximum

1.02 Referenced Sections

A. 22 15 19.19 General Service Packaged Rotary-Screw Air Compressors

1.03 Cited Standards – none

1.04 Noted Restrictions – none

1.05 Quality Control

A. The air compressor with integral air dryer shall pressurize air and supply it with sufficient flow and pressure for the air sparging system(s) shown on the drawings.

1.06 Submittals

A. The CONTRACTOR shall submit product data for selected model(s), including rated output capacity, electrical specifications, and warranty coverage.

Part 2 Products – Not Used

Part 3 Execution – Not Used

END OF SECTION

22 15 00 General Service Compressed-Air Systems

22 15 19.19 General Service Packaged Rotary-Screw Air Compressors

Part 1 General

1.01 Section Includes

A. This section describes the rotary-screw air compressors to be used for the project.

1.02 Referenced Sections

A. Related Sections are shown below:

1. 22 15 16 General Service Compressed-Air Valves

1.03 Cited Standards

A. All rotary-screw air compressors shall comply with the following, or latest revisions of, as applicable

1. ASME B.16.22 - Wrought Copper and Bronze Solder Joint Pressure Fittings.

2. ASME B.16.3 - Malleable Iron Threaded Fittings.

3. ASTM A53 - Specification for pipe, steel, black and hot-dipped zinc coated, welded and seamless.

4. ASTM A234/A34M - Pipe fitting, flange fittings, and flanges, steel and malleable iron (threaded and butt welding), class 150.

5. Compressed Air & Gas Institute (CAGI) Standards

6. MSS SP-80 - Bronze Gate, Globe, Angle and Check Valve.

7. MSS SP-110 - Ball Valves threaded, socket welded, solder joint, groove and flared ends.

1.04 Noted Restrictions – none

1.05 Quality Control

A. The Contractor shall ensure that manufacturer of air compressors and associated hardware is a firm that has been regularly engaged in the manufacture of compressors of similar type and size, and has a history of at least five successful similar installations in operation for at least three years.

B. The Contractor shall ensure that the air compressors electrical equipment and materials quality assurance shall be in accordance with the Specifications.

Part 2 Products

2.01 Rotary-Screw Air Compressors

A. Rotary-screw air compressors shall be sized to deliver air at the volume and pressure required for the application. The compressors shall be equipped with air-cooled after coolers, coalescing type oil filters, air intake filters, silencers and sound attenuating enclosures.

B. The air compressors shall be self-contained, packaged units complete with master controller, start/stop controls, and high temperature and low oil pressure shutdown controls. They shall also be equipped with external connections for electrical, supply air piping, and discharge air piping.

C. The air compressors shall be direct driven by an electric motor having a maximum speed of 3,600 rpm. They shall have a molded case circuit breaker with thermal and overload protection. The motor shall have TEFC enclosure. The motor shall be provided with a magnetic type across-the-line, Wye Delta reduced voltage starter, to ensure low starting current and reduce thrust bearing loads. The control panel shall be enclosed in an enclosure meeting the requirements of NEMA 12. Guards, meeting OSHA requirements, shall be provided for all exposed moving parts.

D. Safety shutdown devices including low oil pressure and high oil temperature devices shall be provided.

E. Pressure relief safety valves shall be installed on the compressor.

2.02 Air Dryer

A. Dryer shall be fully integrated to the compressor package and be capable of providing a 38°F pressure dew point.

B. Dryer shall be rated for 230 psig maximum working pressure with a pressure drop not to exceed 3.2 psid.

C. Refrigerant type shall be R134a or approved equivalent.

2.03 Receivers

A. Receiver shall be as indicated on the Drawings. The receiver shall be an ASME and National Board stamped pressure vessel. A base plate for mounting the compressor shall be welded to the receiver.

B. The following accessories shall be provided:

1. ASME certified pressure relief valve.
2. Gate valve for air discharge.
3. Pressure gage.
4. Manual drain valve.
5. Automatic moisture drain.

2.04 Coalescing Air Filters

A. Coalescing air filters shall be provided as specified or indicated. Filters shall be rated to trap all 0.3 micron sized particles and above. Filters shall be rated at minimum 200 psig.

B. An automatic moisture drain shall also be provided.

2.05 Carbon Air Filters

A. Activated carbon air filters shall be provided as specified or indicated. Filters shall be rated to remove oil vapors and odors from compressed. Filters shall be rated at minimum 200 psig.

B. An automatic moisture drain shall also be provided.

2.06 Compressor Motors

A. Motors shall be three phase, 460V, 60Hz and suitable for full voltage across-the-line starting. Motor enclosure shall be manufacturer standard drop-proof fully guarded type.

2.07 Motor Starters

A. Motor starters shall be across-the-line magnetic starters operable on 480V, three phase, 60Hz supply.

B. Motor starters enclosure shall be NEMA 12 indoor type. Enclosure shall be manufactured to fit single or dual starters with the necessary auxiliary relays, terminal blocks, and other associated electrical components. Enclosure door shall be cut out and wired to fit the Contactor provided compressor controls, indication lights, and local annunciator and the DFE air compressor-monitoring unit.

C. Motor starters shall be factory tested.

Part 3 Execution

3.01 Preparation

A. The CONTRACTOR shall inspect the conditions of the area where products are to be placed or installed in addition to evaluation of air compressor components prior to installation. Electrical products that serve the equipment shall also be installed, tested, and accepted before equipment is started and operated.

3.02 Installation of Air Compressor

A. The CONTRACTOR shall install, align, connect, and test the equipment in accordance with the manufacturer's installation instructions and recommendations.

B. Install conduits, power cables, and control wires in accordance with Division

26 Electrical Specifications. Motor starters shall be tested following installation.

C. The CONTRACTOR shall pipe drains to a disposal location, and shall make adjustments required to place system in proper operating condition in accordance with the manufacturer's instructions and recommendations.

D. Pressure switches shall be set as required.

3.03 Testing

A. The CONTRACTOR shall perform field test for each installation in the presence of the OWNER'S REPRESENTATIVE. The Contractor shall give 48 hours notice to the OWNER'S REPRESENTATIVE prior to the test. Provide all necessary instruments, test setup, connections, labor and tools for testing. Defective workmanship, materials and equipment shall be corrected or replaced in accordance with the manufacturer's recommendations and to the satisfaction of the OWNER'S REPRESENTATIVE at no additional cost to the OWNER. All corrected work shall be retested to ensure compliance with these specifications.

B. Each test attribute shall be completed to the satisfaction of the OWNER'S REPRESENTATIVE. The CONTRACTOR shall submit written documentation to the OWNER'S REPRESENTATIVE that the following tests have been completed:

1. Compressor starts below switch set point.

2. Compressor stops at switch set point.

3. Automatic moisture drain valve discharges at required frequency.

4. Pressure relief valves operate as designed.

C. Field testing of electrical equipment and devices shall also be performed.

D. The CONTRACTOR shall pneumatically test the compressed-air piping system, in sections, to a pressure of at least 150 psi for not less than 15 minutes per section in the presence of the OWNER'S REPRESENTATIVE. The CONTRACTOR shall locate and repair leaks and retest the system until the system is leak free, using testing instruments calibrated by a qualified laboratory. Test sequence shall be as follows:

1. Lines shall be fully blown out.

2. Lines shall be pneumatically tested.

3.04 Adjustments and Cleanup

3.05 The CONTRACTOR shall make adjustments required to place system in proper operating condition in accordance with manufacturer's instructions and recommendations.

END OF SECTION

CORTESE LANDFILL SITE

NARROWSBURG, NEW YORK

OU 4 REMEDIAL DESIGN

ENGINEERING SPECIFICATIONS

DIVISION 26

ELECTRICAL

PROJECT:	**OU 4 REMEDIAL DESIGN**
LOCATION:	**CORTESE LANDFILL NARROWSBURG, NEW YORK**
PROJECT NO.:	**MR0562B**
COMPANEW YORK:	**CORTESE LANDFILL PRP GROUP**
PREPARED BY:	Geosyntec consultants engineers | scientists | innovators

SECTION 26 00 00 - ELECTRICAL

26 05 00 Common Work Results for Electrical

Part 1 General

1.01 General Conditions

A. This section includes information pertaining to electrical work for this project which includes (but is not limited to) furnishing and installation of electrical power and controls wiring, conduit, and electrical pull boxes.

B. The General Conditions apply to all work of this specification, which shall be done as shown on the plans, and as specified, and shall be properly coordinated with work in other Specifications.

C. The Drawings and these Specifications are complementary to each other; what is called for by one shall be as binding as if called for by both. If there is any conflict between what is shown on the Drawings and what is written in the Specifications, the more restrictive shall take precedence, and the CONTRACTOR shall communicate the conflicts to the OWNER's REPRESENTATIVE prior to constructing the work.

D. Safety

1. The CONTRACTOR shall be familiar with, and shall at all times conform to, the regulations of the *"OSHA General Industry Occupational Safety and Health Standards," "OSHA Safety and Health Regulations for Construction,"* and other applicable state and municipal standards and regulations.

1.02 Referenced Sections

A. Related Sections are shown below.

1. Section 31 23 00 Excavation and Fill

2. Section 31 23 33 Trenching and Backfilling

B. Note: All trenching, excavation, and backfilling shall be done in accordance with the requirements set forth in the Earthwork section of these specifications

C. The CONTRACTOR shall furnish all labor, equipment and material for trenching, excavation and backfill, concrete, and reinforcing for electrical work as indicated on the drawings and specified herein.

1.03 Cited Standards

A. All electrical system(s) equipment and material shall be furnished and installed in accordance with applicable sections of the following Codes and Standards, the latest editions of each as applicable.

1. National Electrical Code (NEC)
2. National Electrical Safety Code
3. National Fire Protection Association (NFPA)
4. State Building Codes
5. Local Municipal Codes and Ordinances
6. Public Utility Regulations
7. National Electrical Manufacturers Association (NEMA)
8. American National Standards Institute (ANSI)
9. Institute of Electrical and Electronics Engineers (IEEE)
10. Underwriters' Laboratories, Inc. (UL)
11. Occupational Safety and Health Act (OSHA)

B. Where requirements contained in this specification are higher or more rigid than those in the Codes or Standards referred to above, this specification shall govern. In the case of conflict between mandatory Code requirements and specification or drawing requirements, the Code shall be followed in each case, but only after submitting such proposed changes to the OWNER'S REPRESENTATIVE for approval.

C. Before acceptance of the work, the CONTRACTOR shall deliver to the OWNER a Certificate of Compliance from the inspection bureaus having jurisdiction.

1.04 Noted Restrictions

A. All conduit penetrations shall be watertight. Underground conduits or raceways shall be sealed or plugged at both ends with a bushing or terminal fitting.

B. A bushing, or terminal fitting, with an integral bushed opening shall be used at the end of all conduit or other raceway that terminates underground. A seal incorporating the physical protection characteristics of a bushing shall be permitted to be used in lieu of a bushing. Terminations entering pull and equipment boxes shall be made with liquid tight strain relief fittings and/or a flexible conduit system for cable and wire.

C. All permits and inspections required shall be paid for by the CONTRACTOR.

D. The CONTRACTOR, at his own expense, shall repair, replace and maintain in service any utilities, facilities, or services (underground, overhead, exterior, or interior) damaged, broken or otherwise rendered inoperative during the course of construction.

1.05 Quality Control

A. The CONTRACTOR shall furnish all material, equipment, labor, services, etc., to complete and install all electrical work as specified on the drawings.

B. The CONTRACTOR shall cooperate with the OWNER and/or OWNER's REPRESENTATIVE and shall provide assistance at all times for the inspection of the electrical work performed. The CONTRACTOR shall remove covers, operate machinery, or perform any reasonable work which, in the opinion of the OWNER's REPRESENTATIVE will be necessary to determine the quality or adequacy of the work.

C. The CONTRACTOR shall check dimensions, examine drawings and coordinate his/her work with other project related work to prevent conflicts. If conflicts occur, the OWNER's REPRESENTATIVE shall elect to decide which installation shall have preference. No additional compensation shall be approved for modifying installations made prior to resolution of conflicts.

D. All deviations from the plans must be approved by the OWNER.

1.06 Submittals

A. Submittals shall be made to the OWNER'S REPRESENTATIVE. The CONTRACTOR shall submit for acceptance a list giving names of manufacturers, catalog numbers and model or type designations and application of all materials he propose to use on the project.

B. Items used which are below the standard of quality of the specified items shall be subject to rejection. Items rejected must be replaced by the CONTRACTOR at no additional cost to the OWNER. Any materials erected by the CONTRACTOR prior to acceptance of the same will be at his own risk, and materials not accepted must be removed immediately from the site.

C. Record Drawings and Instruction Manuals

1. The CONTRACTOR shall maintain a neatly marked set of record drawings showing the installed location of conduits and pull boxes.

2. Record drawings shall be kept current with the work and shall be subject to inspection by the OWNER's REPRESENTATIVE at any time. Prior to acceptance of the work, the CONTRACTOR shall submit the record prints to the OWNER's REPRESENTATIVE.

Part 2 Products

2.01 Materials

A. All equipment and materials supplied by the CONTRACTOR for the electrical work herein specified shall be free of defects and suited for the intended installation. All equipment shall comply with the requirements of the Underwriter's Laboratories and shall bear the label of approval. Where applicable, they shall comply with ANSI, IEEE, and NEMA standards.

B. Where particular types or brand names are specified, it is understood that there shall be no substitutions except with the approval of the OWNER in writing.

C. If such types or brand names are qualified in the specifications by the words "or approved equal", or similar wording and if the CONTRACTOR wants to substitute a material or article considered by him to be "equal", the proposed substitution shall be clearly spelled out in writing to the OWNER together with the difference in price, if any, which shall result from the acceptance of such substitution.

D. Any anticipated delay in completion of construction due to substitution of alternate material, equipment, or systems shall be grounds for disapproval of the substitution.

Part 3 Execution – Not Used

END OF SECTION

26 05 12 Tracer Wire and Marking Tape for Underground Conduit

Part 1 General

1.01 Section Includes

A. This section includes specifications applicable to non-metallic underground conduit. During installation of buried non-metallic conduit, the CONTRACTOR shall furnish and install tracer wire and detectable Mylar marking tape as per the Drawings and the following Specifications.

1.02 Referenced Sections – none

1.03 Cited Standards

A. NYSEG

1. SP-1099. Specifications for Customer Electrical Service, 2.4 kV to 34.5 kV

2. Specifications for Electric Installations: Requirements for the Installation of Electric Services & Meters

1.04 Noted Restrictions – none

1.05 Quality Control – not used

Part 2 Products

2.01 Tracer Wire

A. Tracer wire shall be No. 14 AWG bare copper wire THWN 19/W (600V with 0.15 PVC insulation).

2.02 Detectable Mylar Marking Tape

A. The marking tape shall be 6” wide foil x 4mils thick detectable Mylar marking tape. The detectable marking tape will bear the words "CAUTION - BURIED ELECTRIC LINE BELOW”, in Yellow. The printing will be under Mylar so as to be readable through the clear Mylar.

B. Maximum spacing between the continuous warning messages shall be 16". The tape shall be a highly visible color and the tape will be color coded in accordance with the American Public Works Association and Utility Location Coordination Council Standards for non-potable water.

C. The tape shall be specially designed for prolonged underground use and shall be easily detectable with an electronic locator.

D. The Detection tape shall be as manufactured by Pollard Co. Inc., Long Island, NY (Model Nos. 802, 803, 804); Reef Industries, Inc., Houston, TX; Seton Identification Products, Branford, CT; or an approved equal.

Part 3 Execution

3.01 Tracer Wire Installation

A. Buried non-metallic conduit shall have a tracer wire along the entire length of the conduit unless indicated otherwise. The tracer wire shall be installed in accordance with its corresponding drawing shown in the Standard Details.

B. The tracer wire shall be positively attached to the crown of non-metallic buried conduit by taping, use of plastic wire, ties, or another similar type of attachment approved by the utility owner at a maximum of 10 ft. intervals for straight utility runs and at all changes of direction.

C. The ends of the tracer wire shall be exposed above the finished grade. Concrete valve boxes shall be installed at the locations where the ends of the tracer wire are exposed above the finished grade.

D. Tracer wire shall be exposed above finished grade in the precast concrete boxes at the transition where the non-metallic buried utility connects to the existing metallic utility. See drawings for locations of these instances

E. Tracer wire shall be continuous between boxes and shall be tested for continuity.

3.02 Detectable Mylar Marking Tape Installation

A. The CONTRACTOR shall install a six-inch wide foil detectable mylar marking tape over all non-metallic conduit. It shall be inductively locatable and conductively traceable using standard pipe and/or cable locating devices.

B. Care shall be taken to insure that the buried marking tape is Mylar encased aluminum foil.

C. Underground service conductors that are not encased in concrete and that are buried 18” or more below grade shall have their location identified by a warning ribbon that is place in the trench at least 12” above the underground installation.

D. The tape shall be laid directly above the conduit and directly on top of the compacted earth subgrade immediately before restoring the pavement.

E. The ends of the tape shall be lapped approximately six (6) inches.

3.03 Certification of Completion

A. Upon completion of the conduit system, the CONTRACTOR shall certify the following to the Company:

1. The conduit system has been constructed in accordance with the contract plans and Specifications.

2. The conduit system has been tested and has passed all of the required tests in the approved project plans and Specifications.

END OF SECTION

26 05 19 Low-Voltage Electrical Power Conductors and Cables

Part 1 General

1.01 Section Includes

A. This section identifies the minimum requirements for the selection and installation of low-voltage (less than 600 volts) electrical power conductors and cable wiring.

1.02 Referenced Sections

A. Related sections are shown below:

1. Section 26 05 26 - Grounding and Bonding for Electrical Systems

1.03 Cited Standards

All low-voltage electrical power conductors and cables shall conform to the following or latest revisions of, as applicable:

1. UL-44 Standard for Safety Rubber Insulated Wires and Cables

1.04 Noted Restrictions – none

1.05 Quality Control

A. Alternates

1. Alternate selection and installation requirements will be considered, provided they meet the intent of this specification and result in construction and performance that is equivalent to and otherwise in accordance with this specification.

2. All proposed alternates and deviations from this specification shall be described by the CONTRACTOR and may not be substituted until mutually agreed upon in writing by the CONTRACTOR and the OWNER'S REPRESENTATIVE.

1.06 Submittals

A. The CONTRACTOR shall submit complete catalog cuts of all raceways, fittings, boxes, supports, and mounting hardware, marked where applicable to show proposed materials and finishes.

Part 2 Products

2.01 General

A. All electrical equipment and material shall be new, unless otherwise noted or specified on the applicable design drawings; all new equipment and material shall be labeled or listed by Underwriters' Laboratories, Inc. (UL).

B. All conductors, including grounding conductors, shall be copper. Aluminum

conductor wire and cable will not be permitted. All conductors except flexible cords and cables, fixture wires, and conductors that form an integral part of equipment such as motors and controllers shall conform to the requirements of Article 310 of the National Electric Code (NEC), latest edition, for current carrying capacity. Flexible cords and cables shall conform to Article 400 and fixture wires shall conform to Article 402. All wiring shall have wire markers at each end.

2.02 Power and Lighting Conductors

A. All power and lighting conductors shall be soft drawn copper with the AWG sizes as shown on the drawings

B. All power and lighting conductor cables shall be one of the sizes above in accordance with the design drawings and rated at a minimum of 600 volts.

C. All wires shall with Type THWN insulation with a min. temperature rating of 75^{O}C.

D. Conductor size, insulation type, voltage, UL label, and the manufacturer's name shall be permanently marked on the conductor jacket at regular intervals.

E. All conductors shall be delivered to the job site in complete coils containing the manufacturer's name with an approval tag indicating conductor size and type of insulation.

F. Wire Manufacturers shall be:

1. Anaconda
2. General Cable
3. General Electric
4. Rome Cable
5. Phelps Dodge
6. Simplex
7. Hatfield
8. Capitol
9. OWNER'S REPRESENTATIVE-approved equal

G. All wire shall be brought to the job in unbroken packages and shall bear the date of manufacturing and shall not be older than 12 months.

2.03 Control Conductors

A. Controls wiring shall be No.2 Conductor AWG #18 / Stranded Shielded Gray PVC-Jacketed Wire in accordance with the design drawings, rated for a minimum 600 volts.

2.04 Instrumentation Conductors

A. Instrumentation cable shall be rated at 300 volts.

B. Individual conductors shall be No. 18 AWG stranded tinned copper. Insulation shall be 32 mils and shall be color-coded polyethylene: black-red for two conductor cables and black-red-white for three-conductor cable.

C. Instrumentation cables shall be composed of the individual conductors, an aluminum polyester foil shield, a No. 18 AWG stranded tinned copper drain wire, and a chrome PVC outer jacket with a thickness of 0.048 inch.

D. Single pair, No. 16 AWG, twisted, shielded cable shall be Belden Part No. 9342, or an approved equal.

E. Single triad, No. 16 AWG, twisted, shielded cable shall be Belden Part No. 1119A, or an approved equal.

2.05 Cable Terminations

A. Compression connectors shall be Burndy "Hi Lug", Thomas & Betts "Sta-Kon", or an approved equal. Threaded connectors shall be split bolt type of high strength copper alloy. Pressure type, twist-on connectors will not be acceptable.

B. Pre-insulated fork tongue lugs shall be Thomas & Betts, Burndy, or an approved equal.

C. General purpose electrical insulating tape shall be Scotch 33, Scotch Super 88, Plymouth "Slip-knot", or an approved equal. High temperature electrical insulating tape shall be polyvinyl as manufactured by Plymouth, 3M, or an approved equal.

D. Labels for coding all low voltage wiring shall be computer printable or pre-printed, self-laminating, self-sticking, as manufactured by W.H. Brady, 3M, or an approved equal.

E. Stress cone material for make-up of medium voltage shielded cable shall be as manufactured by Raychem, 3M, or an approved equal.

Part 3 Execution

3.01 General Preparation

A. Electrical systems shall be installed in accordance with the requirements of this specification, manufacturer's instructions, federal, state, and local regulations, and as specified on the applicable design drawings. Wire sizes shall be as shown on the plans.

3.02 Installation

A. All conductors shall be installed in accordance with the requirements of this specification and as specified on the applicable design drawings.

B. All conductors shall be continuous from outlet to outlet and/or terminal to terminal, and shall be identified as specified in Article 3.04.

C. Conductors shall not be pulled into any portion of the conduit until all construction work that might cause damage to the conductors has been completed. Mechanical means used to pull conductors shall be approved by the OWNER'S REPRESENTATIVE.

D. All conduits and wire ways shall be clean and dry before pulling any wires.

E. Carefully train all wires in panel boards, gutters, and wire ways in neat arrangement with termination located directly opposite terminals. Tape all frayed terminals and exposed wires.

F. Conductors shall not be spliced in conduits under any circumstances.

G. Where required, splices in conductors and cables shall be in suitable enclosures and made using properly sized solderless connectors. All splices shall be provided with insulation equal to or greater than the insulation of the conductor. A minimum of 12 inches of free length shall be provided for each conductor to be spliced. The number of taps and splices shall be held to a minimum.

H. All ground, neutral, and line connections to receptacle and wiring device terminals shall be made as recommended by the manufacturer. Ground jumper from outlet box to ground terminal or devices shall be provided when the device is not approved for grounding through the mounting screws.

I. All conductors and cables shall be installed in accordance with the manufacturer's instructions. Methods of gripping cables and tension limitations shall be coordinated before pulling all cables. In no case shall the pulling force in pounds exceed values set forth by the manufacturer.

J. Only commercially prepared conductor pulling compounds that are non-injurious to the conduit, cable jacket, or cable insulation and approved by the cable manufacturer shall be used. Using soaps, soap flakes, detergents, or similar preparations shall not be permitted.

K. Shield and/or shield drain conductors for electric instrument and thermocouple cables shall have continuity from the sensing element to the control panel. The shield shall be grounded only to the control panel ground at a single point.

L. For connections to devices with screw terminals, no more than two conductors shall be installed to one screw. All such connections shall be made using lugs.

M. Wire nuts shall be used only for connection of lighting and receptacle circuits. Wire nuts shall be taped.

N. Continuity and identification of all circuits shall be verified by the CONTRACTOR.

3.03 Connections

A. All connections to circuit breakers and switches shall be with:

1. #12 and smaller wire-approved insulated compression ring tongue lugs.

2. #10 and #8 wire--Buchanan "Termend" or approved equal locking tongue lug.

3. #6 and larger wire--Burndy "Quiklug" Type QDA or approved equal with solderless lug and clamp type connector.

B. All splices shall involve:

1. #8 and smaller wire--Scotchlock or approved equal pressure type solderless connectors with insulator.

2. #6 and larger wire--Burndy. Type QPR or approved equal solderless lugs and clamp type connector.

3. #1/0 wire and larger for ground conductors--cast by Cadweld or approved equal fusible metal process.

C. All tape used in making splices or protecting wires shall be 3M Scotch 33 or Super 88, or an approved equal.

D. Power and Wire Cable: Splices to motor leads in motor terminal boxes shall be wrapped with mastic material to form a mold and then taped with a minimum of two layers of varnished cambric tape then covered with a minimum of two layers of high temperature tape.

3.04 Identification

A. Wires shall be tagged as follows:

1. All branch circuits shall be left tagged in the panel boards for the purpose of distinguishing the various circuits. Tags shall be of linen, plainly marked (1, 2, 3) etc. with indelible ink and secured to the wires or such that they will adhere to the wires. (Utilize Brady PWM type or an approved equal.)

2. An indication of phasing shall be maintained throughout the project for all power circuits using color traced conductors or by applying permanent labels to the conductors. All wires shall be identified as to Phase using wire markers (L1, L2, L3, A, B, C,)

3. General purpose AC control cables shall be red. General purpose DC control cables shall be blue.

4. All spare cable shall be terminated on terminal screws and shall be identified with unique number as well as destination.

5. Terminal strips shall be identified by computer printable, cloth, self-sticking marker strips attached under terminal strip, or with permanent pen as determined by the OWNER'S REPRESENTATIVE.

B. A pull rope shall be installed in all empty conduits. Pull rope shall be nylon - ¼ inch. Both ends of all pull ropes shall be identified by means of labels or tags, reading "PULL ROPE" and shall be numbered to refer to the same pull rope.

END OF SECTION

26 05 26 Grounding and Bonding for Electrical Systems

Part 1 General

1.01 Section Includes

A. This section includes general CONTRACTOR responsibilities in order to install a fully functional grounding system.

1.02 Referenced Sections - none

1.03 Cited Standards - none

1.04 Noted Restrictions

A. Cold water or other utility piping systems shall not be used as grounding electrodes.

1.05 Quality Control

A. All metallic objects on the premises that enclose electrical conductors or that are likely to be energized by electrical currents shall be effectively grounded.

B. All metal equipment parts such as enclosures, raceways, and equipment grounding conductors and all earth grounding electrodes shall be solidly joined together into a continuous electrically conductive system.

C. All metallic systems shall be solidly interconnected to the electrical system as provided by the service entrance and for each grounded separately derived system that is installed.

D. A separately derived A.C. source shall be grounded to the equipment grounding conductor and to a separate made electrode.

E. Electrical continuity to ground metal raceways and enclosures, isolated from equipment ground by use of non-metallic conduit or fittings, shall be provided by a green insulated grounding conductor of approved size within each raceway connected to isolated metallic raceways, or enclosures at each end. Each flexible conduit over 6'-0" in length shall be provided with a green insulated grounding conductor of approved size.

F. Non-current-carrying metal parts of high voltage equipment enclosure, signal and power conduits, switchboard and panelboard enclosures, motor frames, equipment cabinets, and metal frames of buildings shall be permanently and effectively grounded.

G. Metallic or semi-conducting shields, and lead sheaths of cables operating at high voltage, shall be permanently and effectively grounded at each splice and termination.

H. Neutral of service conductors shall be grounded as follows:

1. Neutral shall be grounded at only one point within the site for that particular service. Preferable location of grounding point shall be at service switchboard, or main switch.

2. Equipment and conduit grounding conductors shall be bonded to that grounding point.

3. If other buildings on campus are served from a switchboard or panelboard in another building, power supply is classified as a feeder and not as a service.

4. Equipment grounding conductor is carried from switchboard to each individual building. At building, grounding conductor is bonded with power equipment enclosures, metal frames of building, etc., to "made electrode" for that building.

5. Neutral of feeder shall not be grounded.

I. If there is a distribution transformer at a building, secondary neutral conductor shall be grounded to "made electrode" serving building.

J. Within every building, main switchboard or panel, shall be bonded to a 1" or larger cold water line with a 1" conduit with one #6 wire. Metallic piping systems (gas, fire sprinkler, etc.) shall be bonded to cold water line with 3/4" conduit with one #8 wire.

Part 2 Products

2.01 Pull Boxes

A. Pull boxes shall be precast concrete and shall be approximately 14" wide, 19" long, and 12" deep (outside dimensions) or larger, if necessary, to obtain required clearances. Boxes shall be equipped with bolt-down, steel traffic covers - stamped per plans. Pull boxes shall be Brooks 36 or approved equal.

2.02 Electrodes

A. Electrodes shall be concrete enclosed made up of at least 20'-0" of #4 AWG, minimum size, copper conductor, encased by at least 2" of concrete, located within or near bottom of a concrete foundation, or footing, which is in direct contact with earth.

B. Footing rebar must be connected to copper wire using approved connections.

C. "Made" electrodes shall be approved copper-clad steel ground rods, minimum 3/4" diameter, 10'-0" long.

Part 3 Execution

3.01 Preparation - none

3.02 Installation

A. Grounding electrodes shall be located in nearest usable planting area, where not otherwise indicated on Drawings, and each electrode shall terminate within a concrete yard box installed flush with finish grade. In planting areas, concrete yard box shall be 2" above planting surfaces.

B. If concrete enclosed electrode is used, grounding wire shall terminate to a suitable copper plate with grounding lugs.

C. Grounding rods shall be driven to a depth of not less than 8'-0". Grounding electrodes shall have a resistance to ground of not more than 5 ohms.

D. When using grounding rods, if resistance to ground exceeds 5 ohms, 2 or more rods connected in parallel shall be provided to meet grounding resistance requirement.

E. Ground rods shall be separated from one another by not less than 10'-0".

F. Parallel grounding rods shall be connected together with approved fittings and approved grounding conductors in galvanized rigid steel conduit, buried not less than 12" below finish grade.

3.03 Testing

A. Electrical Contractor shall include in his bid, cost of services of an approved independent testing laboratory, to test grounding resistance of all made electrodes, ground rods, and bonding of building steel, water pipes, gas pipes and other utility piping. Tests to be performed are as follows:

1. Visually and mechanically examine ground system connections for completeness and adequacy.

2. Perform "fall of potential" tests on each ground rod or ground electrode where suitable locations are available per IEEE Standard No. 81, Section 8.2.1.2. Where suitable locations are not available, measurements will be referenced to a known dead earth or reference ground.

3. Perform the two point method test per IEEE No. 81, Section 8.2.1.1 to determine ground resistance between ground rod and building steel, and utility piping - such as water, gas and panelboard grounds. Metal railings at building entrances and at handicapped ramps shall also be tested.

4. Test shall be conducted in presence of the OWNER's REPRESENTATIVE.

5. Three copies of test results shall be submitted to the Engineer. Test results shall be submitted on an official form from the independent testing laboratory showing project location, test engineer, test conditions, test equipment data, ground system layout or diagram, and final test results.

END OF SECTION

26 05 30 Wiring Devices

Part 1 General

1.01 Section Includes

A. The CONTRACTOR shall furnish and install all wiring devices in accordance with these specifications and as indicated on the drawings.

B. These specifications include:

1. Receptacles.

2. Device plates and box covers

1.02 Referenced Sections – none

1.03 Cited Standards

A. FS W-C-596 - Electrical Power Connector, Plug, Receptacle, and Cable Outlet.

B. FS W-S-896 - Switch, Toggle.

C. NEMA WD 1 - General-Purpose Wiring Devices.

D. NEMA WD 5 - Specific-Purpose Wiring Devices.

1.04 Noted Restrictions

A. A bushing, or terminal fitting, with an integral bushed opening shall be used at the end of all conduit or other raceway that terminates underground. A seal incorporating the physical protection characteristics of a bushing shall be permitted to be used in lieu of a bushing. Terminations entering pull and equipment boxes shall be made with liquid tight strain relief fittings and/or a flexible conduit system for cable and wire.

1.05 Quality Control – Not Used

1.06 Submittals

A. Provide product data showing configurations, finishes, dimensions, and manufacturer's instructions.

1.07 Deliverables – Not Used

Part 2 Products

2.01 Wiring Devices

A. Wiring devices shall be listed for the current and voltage indicated. Receptacles shall have the NEMA configuration indicated and shall be of the grounding type.

B. Receptacles shall be manufactured by one of the following or an approved equal:

1. Hubbell
2. Sierra
3. Slater

C. Convenience and Straight-blade Receptacles: NEMA WD 1.

D. Locking-Blade Receptacles: NEMA WD 5.

E. Convenience Receptacle Configuration: NEMA WD 1; Type 515 20 R, ivory plastic face.

F. Specific-use Receptacle Configuration: NEMA WD 1 or WD 5; type as indicated on Drawings, black plastic face.

G. GFCI Receptacles: Duplex convenience receptacle with integral ground fault current interrupter, 20 amp rating.

2.02 Wall Plates

A. Wall plates shall be manufactured by one of the following or an approved equal:

1. Hubbell
2. Sierra
3. Slater

B. Weatherproof Cover Plates shall be gasketed cast metal with hinged gasketed device covers.

Part 3 Execution

3.01 Preparation – Not Used

3.02 Installation

A. Install convenience receptacles as per drawings.

B. Install galvanized steel plates on junction boxes.

3.03 Testing – Not Used

END OF SECTION

26 05 33 Raceways and Boxes for Electrical Systems

Part 1 General

1.01 Section Includes

A. This section includes the CONTRACTOR's responsibilities regarding the furnishing and installation complete of conduit, fittings, boxes, supports and all miscellaneous hardware for raceway and cable support, as specified herein and indicated on applicable drawings.

1.02 Referenced Sections

1.03 Related Sections are shown below.

A. 40 05 12 - Tracer Wire and Marking Tape for Underground Conduit

1.04 Cited Standards

A. All work for this section shall adhere to the following standards, or latest revisions of, as applicable:

1. ANSI/NEMA FB 1-2007 Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable

2. ANSI/SCTE 77 2007 - Specification for Underground Enclosure Integrity

3. ASTM D1784 - 08 Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds

4. ASTM D1785 Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120

5. ASTM D2466 - 06 Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40

6. ASTM D2665 Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings

7. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing.

1.05 Noted Restrictions

A. The use of Type A (thin wall) PVC conduit is not permitted.

B. All construction work is subject to inspection and testing. If raceways and/or pull boxes do not meet all requirements, they shall be rejected and replaced at the CONTRACTOR's expense.

1.06 Quality Control

A. The exact locations and routing of conduits shall be governed by structural conditions and physical interferences and by the location of electrical terminations on equipment. Where job conditions require reasonable changes in indicated locations and arrangements, the CONTRACTOR shall make such changes without extra cost to the OWNER.

Part 2 Products

2.01 PVC Conduit Raceways and Fittings (Underground, Non-metallic)

A. All underground conduit raceways shall be heavy duty NEMA TC 2 Sch. 40 PVC having the same inner and outer diameters as rigid steel conduit.

B. The conduit shall be UL listed for underground direct burial, concrete encasement, and exposed applications. The conduit shall be manufactured using high impact polyvinyl chloride. The use of Type A (thin wall) PVC conduit is not permitted.

C. Fittings

1. PVC fittings shall conform to the requirements of ASTM D-2466. The fittings shall be manufactured from a PVC compound that meets or exceeds the requirements for (Type I, Grade I) ASTM D-1784 and ASTM D-1785.

2. Product marking shall meet the requirements of ASTM D-1785 and ASTM D-2665 as applicable and shall include the following:

a. Manufacturer's name or trademark

b. Nominal size

c. Material designation code

d. ASTM designation

e. Date and time of manufacture

3. Fabricated fittings shall be manufactured from virgin materials. Elbows and tees shall be thermo-fused from Schedule 40 PVC materials and pressure tested.

4. Straight and reducer couplings shall be manufactured from Schedule 40 PVC material. Reducer couplings shall be formed in single piece construction. No welding or cementing shall be allowed in the manufacturing process.

5. Inside of vaults, connectors for liquid tight flexible conduit shall be hot-dipped galvanized malleable iron body and tightening nut. An O-ring gasket and grounding insert shall be part of the unit. 45^{o} and 90^{o} fittings shall be used where applicable.

D. Conduit Supports

1. Conduit Clamps, Straps, and Support shall be of steel or malleable iron.

Part 3 Execution

3.01 Preparation

A. Conduit Sizing, Arrangement, and Support

1. The CONTRACTOR shall make sure of the following prior to performing work:

a. Maintain min. 6” clearance between conduit and piping.

b. Maintain min. 12” clearance between conduit and heat sources such as flues, steam pipes, and heating appliances.

c. Also maintain min. 12” clearance between control and power conduits.

B. Note: it shall be the responsibility of the CONTRACTOR to protect all conduit terminations from mechanical injury and to prevent the entry of moisture and foreign matter into the conduit system by properly capping terminations.

3.02 Installation

A. Conduit

1. Conduit installation shall be in accordance with the best trade practices When installed under slabs on grade, conduit shall be separated by a minimum of 3" between identical systems and 12" between power and signal system.

2. Cut conduit square using a saw or pipe cutter; de-burr cut ends.

3. Bring conduit to the shoulder of fittings and couplings and fasten securely.

4. Use conduit hubs or sealing locknuts for fastening conduit to cast boxes, and for fastening conduit to sheet metal boxes in damp or wet locations.

5. Install no more than the equivalent of four 90^{o} bends between boxes.

6. Use conduit bodies to make sharp changes in direction, as around beams.

7. Use hydraulic one-shot conduit bender or factory elbows for bends in conduit larger than 2 inch size.

8. Avoid moisture traps where possible; where unavoidable, provide junction box with drain fitting as conduit low point.

9. Use suitable conduit caps to protect installed conduit against entrance of dirt and moisture.

10. Following testing, nylon pull rope shall be installed in all empty conduits.

11. Wipe plastic conduit clean and dry before joining. Apply full even coat of cement to entire area that will be inserted into fitting. Let joint cure for 20 minutes minimum.

12. Where required for ease of pulling and as necessary to meet code, the CONTRACTOR shall install junction or pull boxes even though not shown on the drawings.

13. Where conduit enters outlet boxes, pull boxes or other enclosures not specified elsewhere, a double locknut and bushing assembly shall be used. Bushings shall be plastic insulating type for conduit of 2 in. diameter and smaller, larger sizes to have insulated metallic bushings. Grounding bushings, where required, shall be insulated metallic type with set screw and large lug connecting screw.

14. Underground conduits or raceways shall be sealed or plugged at both ends with a bushing or terminal fitting.

15. PVC conduit shall be installed so each length shall have a bell and spigot connections. Bell ends shall be manufactured for the appropriate sizes at each end of conduit.

16. The CONTRACTOR shall exercise the necessary precautions to prevent the lodging of dirt, concrete, or trash in the conduit, fittings and boxes during the course of installation.

17. Each conduit shall be indentified at each end with a permanent brass or stainless steel marker, or other approved method. Designation shall be pressure stamped into tag.

3.03 Commissioning

A. Final Installation Check

1. Prior to operational testing, and after CONTRACTOR's check, final checking of raceways is required. Such checking will be done under the direction of the OWNER’s REPRESENTATIVE. The CONTRACTOR shall provide all necessary labor and, where requested, supervision to accompany, advise, and assist the OWNER’s personnel in making such checks and in recording the results. Improper or defective items discovered during the checking processes shall be listed and shall be corrected, as soon as possible.

2. The requirements for pre-operational checking include, but are not limited to, observing that conduits are properly installed in accordance with applicable documents and drawings.

3.04 Inspection

A. The following are mandatory hold points for which prior notification is required:

1. All underground duct lines, grounding systems, direct buried conduits, and other work which will be concealed in concrete or backfilled with earth shall be inspected and released by the OWNER's REPRESENTATIVE before concrete is poured or backfill is completed.

3.05 Testing

A. After conduit duct installation has been completed, mandrel cable shall be pulled through all new conduit ducts to verify its integrity and smooth interior surface free from obstruction that can cause damage to cable sheaths.

B. Mandrel cable shall be ¼" smaller than the inside conduit diameter and not less than 12 inches long.

C. Following mandrel pull-through cable testing, cylindrical wire brushes with stiff bristles shall be drawn through each conduit to clean the conduit and remove any obstructions.

END OF SECTION

26 05 53 Identification for Electrical Systems

Part 1 General

1.01 Section Includes

A. This section includes the CONTRACTOR's responsibilities regarding the following:

1. Nameplates and tape labels.
2. Wire and cable markers.
3. Conduit color coding.

1.02 Referenced Sections – none

1.03 Cited Standards – none

1.04 Noted Restrictions – none

1.05 Quality Control – Not Used

1.06 Submittals

A. The CONTRACTOR shall provide a schedule for nameplates and tape labels.

Part 2 Products

2.01 Nameplates

A. Nameplates shall be engraved three-layer laminated plastic with black letters on a white background.

2.02 Device Cover Plates

A. Device cover plates shall be engraved with 3/16" letters and fill with the following coloring:

1. Brown on Ivory background.
2. White on Brown background.
3. White on Red background.

2.03 Wire and Cable Markers

A. Wire and cable markers shall be cloth markers, split sleeve or tubing type.

Part 3 Execution

3.01 Preparation

A. The CONTRACTOR shall degrease and clean surfaces to receive

nameplates.

3.02 Installation

A. The CONTRACTOR shall install nameplates parallel to equipment lines and secure nameplates to equipment fronts using screws or rivets. Adhesive is not acceptable. Secure nameplate to inside face of recessed panelboard doors in finished locations.

B. The CONTRACTOR shall use engraved cover plates for identification of individual wall switches, receptacles, and control device stations.

C. Wire markers shall be provided on each conductor in panelboard gutters, pull boxes, and at load connection. Identify with branch circuit or feeder number for power and lighting circuits, and with control wire number as indicated on equipment manufacturer's shop drawings for control wiring.

D. Nameplate engraving shall be of minimum letter height in accordance with the following:

1. Panelboards

a. Pump Starter Panel and Local Control Panel: 1/4 inch (6 mm) to identify equipment designation. 3/16 inch (4.5 mm) to identify voltage rating and source.

2. Individual Circuit Breakers and Switches in Panelboards and Switchboards

a. 3/16 inch (4.5 mm) to identify circuit and load served, including location.

3. Individual Circuit Breakers and Enclosed Switches

a. 3/16 inch (4.5 mm) to identify load served.

4. Transformers

a. 1/4 inch (6 mm) to identify equipment designation. 3/16 inch (4.5 mm) to identify primary and secondary voltages, primary source, and secondary load and location.

3.03 Testing – none

END OF SECTION

SECTION 26 50 00 - LIGHTING

26 51 00 Interior Lighting

26 51 13 Interior Lighting Fixtures, Lamps, and Ballasts

Part 1 General

1.01 Section Includes

A. The CONTRACTOR shall furnish and install all interior lighting, lamps, and ballasts in accordance with these specifications and as indicated on the drawings.

Part 2 Products

2.01 Lighting Fixtures

A. Lighting fixtures shall be similar to the units specified on the plans. Information submittal required under the general requirements of this section shall include large scale polar plots providing candlepower vs. angle and footlamberts (brightness) vs. angle for longitudinal and transverse axis, and tabular information for calculation of illumination level by the zonal cavity method.

B. All fixtures shall be completely wired and shall meet the requirements of the NEC and shall bear the UL label. Lamps of the size specified shall be furnished for all fixtures. Lighting fixtures shall be complete assemblies with all necessary accessories such as globes, guards, lamps, ballasts, poles, bases, etc., unless specifically noted otherwise.

C. All fluorescent fixtures shall be Type HE as detailed in the drawings.

D. Fluorescent fixtures shall be 4 foot in length.

Part 3 Execution – not used

END OF SECTION

26 52 00 Emergency Lighting

Part 1 General

1.01 Section Includes

A. The CONTRACTOR shall furnish and install emergency lighting as specified herein and as indicated on the drawings.

Part 2 Products

2.01 Emergency Lighting

A. The emergency lighting shall consist of one Model NB-3-V-SX High-Lite unit, complete with two 6 volt high output incandescent lamps, charger, sealed lead calcium battery, voltmeter and sel-diagnostic circuit manufactured by High-Lites of Waterbury, CT, a Philips Company, or OWNER'S REPRESENTATIVE approved equal.

B. The unit shall be capable of a minimum of 90 minutes of illumination.

C. The unit shall have keyhole slots in the back of the unit for installation and a knockout for electrical connections.

Part 3 Execution

3.01 Preparation – none

3.02 Installation

A. The CONTRACTOR shall install emergency lighting units hard-wired to the 110 volt circuit over the doorway or alternative location approved by OWNER'S REPRESENTATIVE.

END OF SECTION

CORTESE LANDFILL SITE

NARROWSBURG, NEW YORK

OU 4 REMEDIAL DESIGN

ENGINEERING SPECIFICATIONS

DIVISION 31

EARTHWORK

PROJECT:	**OU 4 REMEDIAL DESIGN**
LOCATION:	**CORTESE LANDFILL NARROWSBURG, NEW YORK**
PROJECT NO.:	**MR0562B**
COMPANEW YORK:	**CORTESE LANDFILL PRP GROUP**
PREPARED BY:	Geosyntec consultants engineers | scientists | innovators

SECTION 31 00 00 - EARTHWORK

31 05 00 Common Work Results For Earthwork

Part 1 General

1.01 General Conditions

A. The General Conditions apply to all work of this specification, which shall be done as shown on the plans, and as specified, and shall be properly coordinated with work in other Specifications.

B. The Drawings and these specifications are complementary to each other; what is called for by one shall be as binding as if called for by both. If there is any conflict between what is shown on the Drawings and what is written in the specifications, the details described on the Drawings shall take precedence and the CONTRACTOR shall communicate the conflicts to the OWNER's REPRESENTATIVE in a timely manner.

C. Safety

1. The CONTRACTOR shall be familiar with, and shall at all times conform to, the regulations of the "OSHA General Industry Occupational Safety and Health Standards," "OSHA Safety and Health Regulations for Construction," , *OSHA Hazardous Waste Operation and Emergency Response (HAZWOPER) regulations*, and other applicable state and municipal standards and regulations.

2. The CONTRACTOR shall be familiar with, and shall at all times conform to New York Code of Regulations regarding Construction Safety Orders.

1.02 Referenced Sections

1. Section 01 35 29.13 Health, Safety, and Emergency Response Procedures for Contaminated Sites

1.03 Cited Standards

A. All earthwork specifications shall conform to the requirements of the following standard specifications, of the latest revisions, as applicable:

1. New York State Standard Specifications, Issued by: Department of Transportation, 2009.

1.04 Noted Restrictions – none

1.05 Quality Control

A. Quality Control: The CONTRACTOR shall provide proper quality control measures to assure compliance with specified requirements.

B. The CONTRACTOR shall engage the services of an approved independent

soils testing laboratory to perform tests as necessary to demonstrate compliance with these specifications.

C. Tolerances:

1. Construct finished surfaces to plus or minus 2 inches of the elevations indicated.

2. Complete embankment slopes to plus or minus 6 inches of the slope line indicated.

3. Maintain the moisture content of fill material as it is being placed within plus or minus three percent of the recommended moisture content of the material.

4. Maintain existing overall site drainage slope.

5. Maintain a minimum slope of 5” per 10 feet in the first 10 feet around structures.

1.06 Antipollution Measures

A. The CONTRACTOR shall conduct his activities and shall program his operations in such a manner as to minimize stream pollution from erosion of cleared soil surfaces and freshly excavated or backfilled material during periods of surface water runoff.

B. The CONTRACTOR shall reduce the area and duration of exposure of all erodible soils by the greatest extent practicable, and to that end hydro-mulching, reseeding and other specified surface restoration shall be required to closely follow backfilling and final grading operations.

C. Where the OWNER’s REPRESENTATIVE so directs in the field, sediment traps and other means to retard runoff rates shall be installed. Similar holding basins or other sediment traps arrangements shall also be required to be installed at the discharge of dewatering pumps.

D. The CONTRACTOR shall provide noise and dust abatement as necessary to minimize impact on surrounding areas.

END OF SECTION

SECTION 31 10 00 – SITE CLEARING

31 11 00 Clearing and Grubbing

Part 1 General

1.01 Section Includes

A. This sections describes how the General Construction CONTRACTOR shall furnish and complete all materials necessary to perform work related to all clearing, grubbing, scalping, removing of trees and stumps, and removing of all vegetation and construction debris from the limits shown on the Drawings.

B. The method of clearing, including the use of bulldozers, shall be at the option of the CONTRACTOR. However, he or she will not be permitted to cover up brush and similar debris with earth. All work under this heading shall be done sufficiently ahead of topsoil removal and excavation so as not to interfere with those operations. The CONTRACTOR shall remove stumps and large roots and refill the depression with suitable compacted earth fill where necessary to bring the grade back to its original elevation or final grade.

1.02 Referenced Sections

A. 31 25 00 Erosion and Sedimentation Controls

1.03 Cited Standards

A. All clearing and grubbing shall conform to federal, state and local codes and standards.

1.04 Noted Restrictions

A. The CONTRACTOR shall protect survey markers and monuments, existing improvements, and adjacent properties from removal and damage.

B. Protect existing utilities indicated or made known.

C. The CONTRACTOR shall notify all utilities of the intent to begin work at the site and shall locate all such utilities, including storm water drainage piping prior to commencing work.

D. The CONTRACTOR shall give written notices to utility companies and municipal departments requesting discontinuance of services to areas that will be affected by the site clearing and grubbing work.

E. Protection of persons and property:

1. Barricade open depressions and holes occurring as part of this work, and post warning lights on property adjacent to or within public access.

2. Operate warning lights during hours from dusk to dawn each day and as otherwise required.

3. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by operations under this section.

F. No burning or burying of brush, roots, stumps, etc. shall be permitted at the site. Such materials shall be disposed off-site in a safe, acceptable manner, in accordance with applicable laws and ordinances and as prescribed by authorities having jurisdiction.

G. All vegetation and objects not designated for removal shall be protected.

H. Protection of Existing Trees

1. The CONTRACTOR shall protect existing trees, shrubbery, and other vegetation that is to remain in place against unnecessary cutting, breaking or skinning of roots, skinning and bruising of bark, smothering of trees by stockpiling construction materials or excavated materials within drip line, excess foot or vehicular traffic, or parking of vehicles within drip line. Temporary fences, barricades or guards are to be provided as required to protect trees and vegetation to be left standing.

2. Trees and other vegetation to remain within limits of contract work shall be watered as required to maintain their health during course of construction operations.

3. Protection shall be provided for roots over 1 ½" diameter cut during construction operations. Coat cut faces with a wound paint formulated for use on damaged plant tissues. Temporarily cover exposed roots with wet burlap to prevent roots from drying out; cover with earth as soon as possible.

4. The CONTRACTOR shall repair or replace trees and vegetation that will remain, which are damaged by construction operations, in a manner acceptable to the OWNER's REPRESENTATIVE, and property owner if work is performed on private property. The OWNER's REPRESENTATIVE may employ an Arborist to repair damages to trees and shrubs at the CONTRACTOR's expense when deemed necessary.

I. Depressions caused by clearing and grubbing operations shall be filled with suitable soil material, unless further excavation or earthwork is indicated. Fill material shall be placed in horizontal layers not exceeding 6" loose depth, and thoroughly compacted to a 90% modified proctor density equal to or better than the adjacent original ground.

J. Use means necessary to prevent dust from becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.

K. Maintain access to the site at all times.

1.05 Quality Control

A. The CONTRACTOR shall use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

Part 2 Products

2.01 Materials And Equipment

A. The CONTRACTOR shall furnish all materials, tools, equipment, facilities, and services as required to complete the work described herein.

B. Fill material required for depressions created through clearing and grubbing shall be clean, dry earthen material common to the site. The material shall not contain rocks or lumps larger than 5 inches in greatest dimension, with no more than 15 percent by weight larger than 3 inches.

Part 3 Execution

3.01 Preparation

A. The CONTRACTOR shall notify all utilities of the intent to begin work at the site and shall locate and mark all underground utilities, including storm water drainage piping prior to commencing work.

B. The CONTRACTOR shall obtain all necessary permits prior to commencing work.

C. Protection of landscape features to be preserved shall be by fencing, barricades, or wrapping as required by the OWNER's REPRESENTATIVE.

D. Erosion and sediment controls measures specified in Section 31 25 00 shall be installed by the CONTRACTOR and approved by the ENGINEER prior to any clearing and grubbing activity.

3.02 Clearing and Grubbing

A. The CONTRACTOR shall remove trees, including stumps and roots, shrubs, grass, flowers and any other vegetation interfering with installation of new construction. The CONTRACTOR shall carefully and cleanly cut roots and branches of trees that will remain where such roots and branches obstruct new construction.

B. Grubbing shall consist of the removal and disposal of stumps, roots, root mats and other debris to a depth of not less than 18 inches below existing ground elevation.

C. The CONTRACTOR shall remove existing footers and foundations within the work site area that will interfere with excavation and construction activities. Such structures shall be removed to a minimum depth of 24". Such materials of construction shall not be used for backfill and shall be properly disposed offsite.

D. In locations to be seeded, the CONTRACTOR shall remove stumps at least 6 inches (150 mm) below ground surface. In unseeded areas to be rounded at the top of backslopes, stumps shall be cut flush with or below the surface of the final slope line.

E. If existing conduit/pipelines are constructed throughout the site to be cleared, a minimum of such areas shall be disturbed.

F. The CONTRACTOR shall remove low hanging, unsound, or unsightly branches on trees or shrubs designated to remain. The CONTRACTOR shall trim branches of trees extending over a roadbed to provide a clear height of 20 feet (6 m) above the roadbed surface. Cut off branches neatly and close to the tree boles. Remove other branches as necessary to present a balanced appearance. Treat scars resulting from tree branch removal with a heavy coat of an approved asphaltic tree paint.

3.03 Conservation of Topsoil and Existing Landscaping/Groundcover.

A. After the area has been cleared of vegetation, strip the existing topsoil to the depth necessary to provide at least 6-inch depth of topsoil in areas shown on the Drawings to be turfed or planted, without contamination with subsoils.

B. Stockpile in an area clear of new construction.

C. Maintain the stockpile in a manner which will not obstruct the natural flow of drainage.

1. Maintain stockpile free from debris and trash.

2. Keep the topsoil damp to prevent dust and drying out.

D. Disturbed vegetation shall be replaced in kind approved by the OWNER.

3.04 Cleanup

A. The CONTRACTOR shall dispose of debris contaminated with garbage, solid waste, or hazardous waste or material according to other contract items.

B. Salvageable Material

1. Any material, resulting from clearing operations on private property not desired by the property owner shall become property of the CONTRACTOR and shall be properly disposed of by the CONTRACTOR off site at no additional cost to the OWNER. Weather permitting, the CONTRACTOR shall remove and dispose of all waste material weekly.

END OF SECTION

SECTION 31 20 00 - EARTH MOVING

31 23 16 Excavation and Fill

Part 1 General

1.01 Section Includes

A. Under this section, the General Construction CONTRACTOR for this Contract shall furnish complete all materials, labor, and equipment necessary to perform work related to all excavation and backfill, as shown on the Drawings or specified herein.

1.02 Referenced Sections – None

1.03 Cited Standards – None

1.04 Noted Restrictions

A. The total length of excavated trench open at any one time should not be greater than the total length of pipeline/utility line that can be placed in the trench and backfilled in one working day. The CONTRACTOR shall use underground Service Alert (USA) notifications and shall utilize an underground utility locating service prior to performing work.

B. CONTRACTOR shall limit depth of excavation on the existing cover system to less than 18 inches except where noted on the Construction Drawings. Where excavations of 18 inches or greater on the existing cover system are required, excavation shall be competed using hand tools to avoid damage to to geosynthetic components.

1.05 Quality Control

A. The CONTRACTOR is responsible for the design, purchase and installation of all construction aids. None of the structures or materials indicated on the Drawings is intended for this use.

B. Limits of Work

1. All work to be done is located as shown on the contract Drawings. The CONTRACTOR shall confine his operations to designated areas of the sites shown on the Drawings.

2. The CONTRACTOR shall occupy and cross only those portions of the site on which the actual work is located.

C. Rights-of-Way

1. The OWNER will obtain all rights-of-way for areas deemed necessary for construction of conduit/pipelines and the CONTRACTOR shall confine all construction activities within the limitations of same. The CONTRACTOR, however, shall make his own arrangements for office space, materials storage yards, sanitary facilities, any utility

services which may be desired, and for ingress and egress over any private property or land which he desires to use for which the OWNER has obtained no right-of-way for construction, operation and/or maintenance.

2. The CONTRACTOR shall not use any vacant lot, or private land as a plant site, depository for materials, or spill site, or for any other purpose without the written authorization of the OWNER (or an authorized agent) of the land, a copy of which authorization shall be filed with the OWNER's REPRESENTATIVE.

D. Excavation for Conduit/ Pipelines

1. The depth of trench for conduit/pipelines shall be such that the conduit in its installed position shall comply with the line and grades as shown on the drawings.

2. No more than 50 lineal feet of open trench should exist when pipeline/utility line installation ceases at the end of the workday.

3. In excavation for pipelines/conduit made in open cut trenches where space permits, the sides of the trench from the ground surface to a depth not closer than 1 ft above the top of the conduit/pipe may be excavated to non-vertical and nonparallel planes. In no case shall the side walls of the trench in the conduit/pipe zone, defined as all that trench area below a point 12 inches above the top of the conduit/pipe in its installed position, be permitted to be other than vertical and parallel planes equidistant from the conduit/pipe centerline. The horizontal distance between the vertical planes shall be no greater than the outside diameter of the conduit/pipe plus 24 inches, nor less than the outside diameter of the conduit/pipe plus 12 inches.

4. Where the available space does not permit and where existing or proposed above ground or underground structures may be endangered, the sides of the trench above the conduit/pipe zone shall be excavated to vertical and parallel planes. The horizontal distance between the vertical planes shall be no greater than necessary to permit construction of the conduit/pipeline with all required sheeting, shoring and bracing in place.

Part 2 Products

Part 3 Execution

3.01 Preparation

A. Before beginning excavation or filling work, the topsoil (if any) from all areas to be affected shall be stripped to a depth of 6 inches and shall be properly stored and protected at a location approved by the OWNER's REPRESENTATIVE. After completion of the major construction work, the topsoil shall then be replaced as the upper layer of backfill to a depth of no

less than 6 inches so that the final grade shall be as required by the Drawings. If additional topsoil over and above that salvaged from the site is required in order to maintain the 6-in. depth specified, the CONTRACTOR shall furnish and install same at no additional cost to the OWNER.

B. The CONTRACTOR shall use Underground Service Alert (USA) notifications and shall utilize an underground utility locating service.

C. Concrete and/or other excavated surfacing materials shall be removed from the site and properly disposed at the CONTRACTOR's expense.

D. Backfill around all structures and in all trenches shall be carried to the grade existing before the installation of the improvement unless otherwise indicated on the Drawings or specified hereafter. Backfilling shall follow immediately after construction of the conduit/pipe and appurtenances and in no case shall there be a finished installed conduit/pipe left uncovered at the end of the work day.

E. Each CONTRACTOR shall make personal examination of the sites in which the improvements are to be installed and determine for themselves the extent and character of any work that may be encountered. All work on the basic contract will be performed on an unclassified basis. Unclassified excavation includes the removal and disposal of material of any kind, natural or man-made, without exception.

F. The CONTRACTOR shall provide adequate and suitable means of support to prevent failure of any excavation wall and to protect his personnel working in the excavation. The system of support shall be in accordance with current OSHA regulations.

3.02 Installation

A. All open excavation in the construction area shall be adequately barricaded and posted with battery operated warning lights, signs, etc., as required by any local, State, or Federal regulations, or by any published policy by the OWNER, or in the absence of any such regulation, to the satisfaction of the OWNER's REPRESENTATIVE.

B. Should the CONTRACTOR's operations encounter foundations of new or existing structures, the CONTRACTOR shall perform excavation and backfill as per the manufacturer's specifications for those structures.

C. No excessively wet material will be permitted to be used as backfill. Suitable or selected backfill material shall be kept separated from the unsuitable types. If the CONTRACTOR allows suitable backfill material from his excavation to become excessively wet or mixed with unsuitable material, he shall not be allowed to use it as backfill material and he will be required to bring in material from an outside source at no additional cost to the OWNER.

D. The OWNER's REPRESENTATIVE may require that sheeting, shoring or bracing installed for excavation be left in place in order to protect adjacent facilities or structures. Where such is not required in these specifications or

on the Drawings, the CONTRACTOR will be reimbursed as stipulated in the General Conditions section of these specifications. All other sheeting may be salvaged when the removal of same will not present a hazard to the adjacent facilities or to the safety of the CONTRACTOR's personnel. The CONTRACTOR shall be fully responsible and liable for any improper or premature removal of sheeting, shoring or bracing and any and all personal or property damages resulting there from.

E. All excavation materials not used in backfill or final grading operations shall be hauled to a specific site location as directed by the OWNER or OWNER's REPRESENTATIVE at the CONTRACTOR's expense. The CONTRACTOR shall not dispose of such material offsite or on the site of the work without the permission of the OWNER.

F. The CONTRACTOR shall prevent surface water and subsurface or groundwater from flowing into excavations and from flooding the project site. The CONTRACTOR shall not allow water to accumulate in excavations to prevent softening of foundation bottoms and undercutting of footings. The CONTRACTOR shall provide and maintain pumps, sumps, suction and discharge lines, and other dewater system components necessary to convey water away from excavations.

3.03 Testing - None

END OF SECTION

31 23 33 Trenching and Backfilling

Part 1 General

1.01 Section Includes

A. This section describes the general trenching and backfilling specifications for installation, and burial of conduit.

1.02 Referenced Sections – None

1.03 Cited Standards – None

1.04 Noted Restrictions

A. Trenching to depths greater than 18 inches shall not be permitted on the existing landfill cover system.

1.05 Quality Control

A. The CONTRACTOR shall verify all soil conditions and the trenches shall be dug according to the plan. The CONTRACTOR shall have all trenches dug and inspected prior to the arrival of the installation crew.

B. Unless otherwise indicated, excavation shall be open cut.

C. During excavation, material suitable for backfilling shall be stockpiled in an orderly manner, a distance back from the edges of the excavations specified by the governing safety agency. Materials unsuitable for backfilling shall be wasted as specified.

D. Caution shall be exercised in operating heavy equipment over conduit. Breaks caused by the CONTRACTOR's operations shall immediately be repaired at no additional expense to the OWNER and in a manner acceptable to the OWNER's REPRESENTATIVE.

E. The banks of excavated areas shall be controlled as is necessary to prevent movement of soil in areas supporting existing foundations, slabs, pole lines, underground power or telephone cables, trees, pipelines or other structures.

F. If, as a result of the excavation or through fault or neglect of the CONTRACTOR, the earth or ground under or around such foundations, slabs, pole lines, underground power or telephone cables, trees, pipelines or other structures, slips or is otherwise disturbed, corrective measures shall be taken as directed at no additional expense to the OWNER.

G. The bottom of the trench shall be excavated to the lines and grades shown with proper allowance for conduit/pipe thickness, and for foundation stabilization and special bedding when required. Material containing rocks or cobbles larger than 2 inches in maximum dimension shall not be permitted within 6 inches of the conduit/pipe. Material of this type shall be removed from the bottom of the trench and replaced with backfill material. Parts of the trench excavated below grade shall be corrected with backfill as specified.

The depth of trenches shall be as indicated on the Drawings.

H. Measurements for cover requirements shall be taken from the existing grade. (It is the responsibility of the CONTRACTOR to maintain these cover requirements with any future grade changes that may occur.)

I. Conduit Base

1. The conduit base shall be defined as a layer of material immediately below the bottom of the conduit and extending over the full trench width in which the conduit is bedded. Thickness of conduit base shall be 6 inches or unless shown otherwise on the Drawings.

J. Safety

1. All excavations shall be performed, protected, and supported as required for safety and in the manner set forth in the operation rules, orders, and regulations prescribed by the Division of Industrial Safety of the State of New York.

2. Barriers shall be placed at each end of all excavations and at such places as may be necessary along excavations to warn all pedestrians and vehicular traffic of such excavations. Lights shall also be placed along excavations from sunset each day to sunrise of the next day until such excavation is entirely refilled.

1.06 Submittals

A. Excavation drawings for worker protection shall be in accordance with **Section 01 33 00 Submittal Procedures**.

B. Submit six (6) copies of a report from a testing laboratory verifying that imported material conforms to the specifications.

Part 2 Products

2.01 Backfill and Bedding

A. Sand used for bedding and backfilling conduit shall have the following gradation:

Sieve Size	Percent Passing by weight
2 inch	-100
No. 4	70 - 100
No. 16	35 - 75
No. 50	10 - 40
No. 200	0 - 10

Minimum sand equivalent shall be 30 per ASTM D-2419.

2.02 Concrete for Conduit Encasement

A. Concrete for conduit encasement shall be 520C-2500 per the SSPWC.

2.03 Water for Compaction

A. Water used in compaction shall have a maximum chloride concentration of 500 mg/l, a maximum sulfate concentration of 500 mg/l, and shall have a pH of 7.0 to 9.0. Water shall be free of acid, alkali, or organic materials injurious to the conduit coatings.

Part 3 Execution

3.01 Preparation

A. The CONTRACTOR shall prepare the trench width one foot wider than the width of the conduit to be buried. Where more than one pipe is specified for a given trench, the trench shall be at least one foot wider than the width of the combined piping.

B. Trench width at the top of the trench will not be limited except where the width of the excavation would undercut adjacent structures, footings or slopes. In such cases, trench width shall be such that there is at least 18 inches between the top of edge of the trench and the structure, footing or slope.

C. Excavate the trench to the lines and grades shown on the Drawings with allowance for conduit thickness and for conduit base or special bedding. If the trench is inadvertently excavated below the required grade, refill any part of the trench excavated below the grade at no additional cost to the OWNER with sand slurry. Place the refilling material over the full width of trench in compacted layers not exceeding 6 inches deep to the established grade with allowance for the conduit base or special bedding.

D. The CONTRACTOR shall slope the sides of the trench at an angle above the highest point of the piping to assist in minimizing soil loads in loose soil conditions prior to compaction.

E. The CONTRACTOR shall have the trench inspected by the OWNER or the OWNER's REPRESENTATIVE.

F. Location of Excavated Material

1. During trench excavation, place the excavated material only within the working area. Do not obstruct any roadways or streets. Conform to federal, state, and local codes governing the safe loading of trenches with excavated material.

G. Length of Open Trench

1. Limit the length of open trench to 600 feet in advance of conduit-laying or amount of conduit installed and backfilled in one working day.

H. Foundation Stabilization

1. After the required excavation has been completed, the OWNER's REPRESENTATIVE will inspect the exposed conduit zone and trench subgrade to determine the need for any additional excavation. It is the intent that additional excavation be conducted in all areas within the influence of the conduit where unacceptable materials exist at the exposed subgrade.

2. Overexcavation shall include the removal of all such unacceptable material that exists directly beneath the conduit or within the conduit zone to the width and depth required. This may require excavating a wider trench.

3. Backfill the trench to subgrade of conduit base with refill material for foundation stabilization. Place the foundation stabilization in layers not exceeding 6 inches deep to the required grade.

I. Refill material used by the CONTRACTOR for his convenience will not receive any additional payment.

3.02 Installation

A. Conduit Bedding

1. Bedding of the conduit shall be done in the presence of the OWNER's REPRESENTATIVE. Bedding shall be done only after foundation preparation, laying of and jointing of the conduit.

2. As the conduit is installed it shall be bedded by hand. Care shall be taken to prevent any damage or shifting of the conduit. The conduit bedding material shall be compacted into place to the same density as specified for backfill above the conduit bedding material with materials as specified.

3. Thickness of conduit base shall be 6 inches or as otherwise shown on the Drawings or otherwise described in the specifications for the particular type of conduit installed.

4. Excavate coupling or bell holes at each joint to permit proper assembly and inspection of the entire joint.

B. After conduit has been bedded, place bedding material simultaneously on both sides of the conduit, keeping the level of bedding the same on each side. Carefully place the material around the conduit so that the conduit barrel is completely supported and that no voids or uncompacted areas are left beneath the conduit. Use particular care in placing material on the underside of the conduit to prevent lateral movement during subsequent backfilling.

C. The CONTRACTOR shall install a second layer of approved backfill material to a depth of approximately 12 inches unless specified otherwise in the Drawings. Place the backfill material carefully onto the bedding material previously placed. Do not permit free fall of the material until at least 2 feet of

cover is provided over the top of the conduit. Do not drop sharp, heavy pieces of material directly onto the conduit. This second layer of backfill material shall be graded to provide an even bed and compacted as per the compaction requirements in **Section 31 23 23.23 Compaction.**

D. The conduit installation crew will install the warning tape in the trench not more than one foot below finish grade. The CONTRACTOR will provide the warning tape.

E. Tracer wire shall be installed on HDPE piping in accordance with Division 43 specifications and as shown in the Detail Drawings.

F. Continue backfill to grade in accordance with compaction requirements in **Section 31 23 23.23 Compaction**.

G. Throughout the installation process, the CONTRACTOR shall not allow newly installed piping to be left uncovered overnight without prior approval from the OWNER or the OWNER's REPRESENTATIVE.

END OF SECTION

31 25 00 Erosion and Sedimentation Controls

Part 1 GENERAL

1.01 Description

A. This section includes but is not limited to furnishing, installing, and maintaining temporary erosion and sediment control features. The CONTRACTOR shall be responsible for all erosion and sediment control features necessary to direct surface drainage, maintain stable surface conditions and to prevent the release of sediment from the active work areas including the soil stockpiles and for all controls necessary to prevent generation of dust. The quantity and type of erosion control measures shown on the Drawings may be increased or decreased at the directive of the ENGINEER based upon actual conditions which occur during the construction of the project. Such variations in quantity shall not be considered as alterations in the details of construction or a change in the character of the work.

B. The installation and maintenance of all erosion and sediment control features shall be in accordance with local, state, and federal regulations and shall be satisfactory to the ENGINEER and OWNER, as well as regulatory representatives. Installation and maintenance of erosion and sediment control features shall also be conducted in accordance with permits or permit equivalencies obtained by OWNER.

1.02 Related Sections

A. Section 01 33 00 - Submittals

B. Section 31 10 00 - Site Clearing

C. Section 31 23 16 - Excavation and Fill

D. Section 31 23 33 – Trenching and Backfilling

1.03 Cited Standards

A. American Society for Testing and Materials (ASTM):

1. ASTM D 4354 - Practice for Sampling of Geotextiles for Testing

2. ASTM D 4355 - Test Method of Deterioration of Geotextiles and Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus)

3. ASTM D 4491 - Test Methods for Water Permeability of Geotextiles by Permittivity

4. ASTM D 4632 - Test Method for Breaking Load and Elongation of Geotextiles (Grab Method)

5. ASTM D 4751 - Test Method for Determining Apparent Opening Size for Geotextile

6. ASTM D 4759 - Practice for Determining Specification Conformance of Geosynthetics

B. New York State Department of Environmental Conservation (NYSDEC)

1. NYSDEC Standards and Specifications for Erosion and Sediment Control

2. NYSDEC Technical and Administrative Guidance Memorandum (TAGM) #4031

C. New York State Department of Health Generic Community Air Monitoring Plan

D. Sullivan County Soil and Water Conservation District requirements.

E. NYSDEC Soil Management Plan guidance.

1.04 Submittals

A. Prior to the installation of erosion and sedimentation control measures, the CONTRACTOR shall submit samples of the geotextile materials for silt fence, roadways, and entrances and physical property information proposed for the work to the ENGINEER and OWNER for approval. CONTRACTOR shall also submit proof that required permits and permit equivalencies, in addition to those retained by OWNER, relative to erosion and sediment control have been secured.

B. Material submittals shall also be submitted for stone and rip rap utilized within roadways, entrances, check dams, decontamination pads, and creek bank restoration. Submittals shall include the borrow source name, and location (address, street, town, lot and block, county and state), material gradation (ASTM D422), the prior use of the source, and a statement from the supplier that the material is not contaminated pursuant to NYSDEC Regulation Part 375-6.7 and Table 375-6.8(a). Analytical data for each borrow source and each material per borrow source for TCL VOCs, SVOCs, pesticides, and PCBs; TAL metals; and cyanide shall be submitted. Analytical data shall meet NYSDEC Unrestricted Use Soil Cleanup Objectives (Table 375-6.8(a)). Bills of lading for each load of imported material shall be submitted to the ENGINEER to document the borrow source.

1.05 Quality Control

A. CONTRACTOR is responsible for ensuring that all materials meet this specification. Any material not in conformance with these Specifications will be rejected and removed from the Site at the CONTRACTOR's expense.

Part 2 PRODUCTS

2.01 Silt Fence Geotextile

A. Silt fence geotextile shall be composed of strong, rot-proof synthetic fibers formed into a fabric of either the woven or non-woven type. The fabric shall

have a minimum height of 20 inches plus 6 inch burial depth and contain stabilizer and/or inhibitors to make the filaments resistant to deterioration resulting from exposure to sunlight or heat. The geotextile shall conform to the requirements shown in Table 1.

TABLE 1
Physical Requirements
For Temporary Silt Fence Geotextiles

Property	Test Method	Self Supported Requirements
Grab Tensile Strength Lbs.	ASTM D4632	90 minimum[1]
Elongation at 50% minimum grab tensile strength (45 lbs.)	ASTM D4632	50 maximum
Permittivity[2] (sec^{-1})	ASTM D4491	.01 minimum
Apparent Opening[2] Size (mm)	ASTM D4751	0.425 maximum
Ultraviolet[3] Degradation	ASTM D4355	Minimum 90% strength retained
Mullen Burst Strength (psi)	ASTM D3786	190 minimum
Puncture Strength (lbs)	ASTM D 751	40 minimum

NOTES:
1. Minimum - Use value in weaker principal direction. All numerical values represent minimum average roll value (i.e., test results from any sampled roll in a lot shall meet or exceed the minimum values in the table). Lot sampled according to ASTM D4354.
2. Permittivity & AOS indirectly relate to filtration performance of silt fence fabrics. Values presented reflect minimum criteria of products currently used.
3. Strength retained after 500 hours of ultraviolet exposure when tested according to ASTM D4355. This method specifies tensile testing by 2-inch strip (or ravelled strip) for both control and exposed samples.

B. Silt fence shall be reinforced with minimum 14 gage woven wire mesh with a maximum 6-inch mesh opening.

2.02 Silt Fence Posts

A. Posts shall be either wood, steel or synthetic having a minimum length of 36 inches (20 inches plus burial depth of 16 inches). Wood posts shall be of sound quality hardwood with a minimum cross sectional area of 3.0 square inches. Steel posts shall be standard T and U section weighing not less than 1.00 lb per linear foot.

2.03 Hay Bales

A. Hay bales shall be standard size and composed of securely tied clean grass hay and cereal straw. Bales shall be stored in a dry environment to prevent mold.

2.04 Construction Entrance and Decontamination Pad Coarse Aggregate

A. Coarse aggregate used for the construction entrance and decontamination pad shall be clean hard durable stone of 1 to 4 inch size (AASHTO #1). The stone shall be of such quality that it will not disintegrate on exposure to traffic, water, or weathering. The construction entrance and decontamination pad thicknesses shall not be less than 6 inches.

2.05 Access Road Dense-Graded Aggregate

A. Provide dense-graded aggregate meeting the gradation requirements of NYS DOT Type 1 Sub-base as listed below:

1.

Sieve Size	% Passing By Weight
75 mm	100
50 mm	90 - 100
6.3 mm	30 - 65
425 um	5 - 40
75 um	0 - 10

B. Aggregate shall be crushed rock having a minimum unit weight of 160 pounds per cubic foot.

2.06 Geotextile Filter Fabric

A. Construction entrances, decontamination pads, stone construction/haul roads, creek bank restoration, and check dams shall be underlain by a non-woven geotextile filter fabric material possessing a minimum grab tensile strength of 200 lbs/in (ASTM D4632), minimum puncture strength of 40 lbs (ASTM D4833), minimum elongation at failure of 50% (ASTM D4632), minimum Mullen Burst strength of 190 lbs (ASTM D3786), and maximum apparent opening size of 0.425 mm (40 U.S. sieve size, ASTM D4751).

Part 3 EXECUTION

3.01 Familiarization

A. Prior to implementing any erosion and sediment control measures, the CONTRACTOR shall become thoroughly familiar with the Site, the Site conditions, and all portions of the work pertaining to and/or related to this section. The CONTRACTOR shall carefully inspect the completed work of other sections and verify that all work is complete to the point where the work covered by this section may commence. Any conflicts or concerns with work which may impact the erosion, and sediment control work shall be brought to the attention of the ENGINEER in writing.

3.02 General

A. E&S measures shall be installed prior to any major soil disturbance and be maintained until permanent protection is established. The Site shall be graded so all stormwater is diverted to soil erosion and sediment control features. All necessary precautions shall be taken to minimize sediment transfer and not cause erosion of the downstream area. Soil washed, dropped, spilled or tracked outside the limit of disturbance or into a public right-of-way shall be removed immediately.

B. Sediment barriers shall not exceed a maximum drainage area of ¼ acre per 100 feet of sediment barrier. The 30 feet of slope adjacent to the sediment barrier shall be graded to a minimum slope of 5 percent. The maximum allowable slope lengths contributing run off to a sediment barrier (silt fence) placed on a slope are:

Slope Steepness	Maximum Length
2:1	25 ft
3:1	50 ft
4:1	75 ft
5:1 or flatter	100 ft

C. The barrier shall be installed to prevent water from flowing around the edges of the silt fence. The barrier shall be removed when the contributing drainage area has been stabilized so as not to block or impede storm flow or drainage.

3.03 Silt Fence Installation

A. A trench 6 inches in depth shall be excavated with equipment such as a trenching machine or motor grader; or, if equipment cannot be operated at that location, by hand.

B. Post installation shall start at the center or the low point (if applicable) with the remaining posts spaced a maximum of 8 feet apart. Posts shall be installed with 16 inches in the ground and a tolerance of one inch due to the presence of geosynthetics. Where a 16 inch burial depth is not able to be achieved, the posts should be adequately secured to prevent overturning of the fence due to sediment loading. This may require a decrease in post spacing.

C. Geotextile shall be securely attached to the post by wire, cord, staples, or other acceptable means. The geotextile shall be installed in such a manner that 6 inches of fabric is left at the bottom to be buried in the trench and a minimum overlap of 6 inches is provided at all splice joints. The geotextile shall be installed in the trench such that 6 inches is against the side of the trench. The trench shall be backfilled so that no flow can pass under the barrier. Backfill soil shall be properly compacted, as directed by the ENGINEER.

D. At the time of installation, geotextile shall be rejected if it has defects, rips, holes, flaws, deterioration, or damage incurred during manufacture, transportation, storage, or installation.

3.04 Hay Bale Installation

A. Hay bales shall be installed end to end in areas where silt fence installation is not feasible. A trench four inches in depth shall be excavated with equipment such as a trenching machine or motor grader; or, if equipment cannot be operated at that location, by hand. All bales shall be securely tied and staked. Bales shall be placed in a row with ends tightly abutting the adjacent bales. Bales shall be embedded a minimum of 4 inches. Bales shall be securely anchored in place by two stakes or re-bars driven through each bale. The first stake in each bale shall be driven toward the previously installed bale to force bales together. Stakes shall go to a depth of 16 inches and a tolerance of one inch due to the presence of geosynthetics.

3.05 Construction Entrance

A. The construction entrance shall be installed at the location(s) shown on the Drawings. The subgrade shall be prepared by grading as directed by the ENGINEER. Construction Entrances may be constructed on existing asphalt. The geotextile filter fabric shall be placed immediately after subgrade preparation with each section of fabric having a minimum overlap of 1 ft. Placement of the stone shall immediately follow installation of the geotextile in a method to prevent damage to fabric. A minimum of 1 foot of construction entrance coarse aggregate shall be placed over the geotextile prior to running over with mechanical equipment.

3.06 Access Roads

A. The access road shall be constructed on top of the landfill in accordance with the Drawings at locations necessary to facilitate the work. The access roads shall remain at the completion of work.

3.07 Stockpiles

A. Excavated soil stockpiles, if used, shall be located as shown on the Drawings and maintained within the identified stockpile limits. The maximum stockpile sideslope shall be 2H:1V unless steeper slopes are approved by the ENGINEER. Stockpiles shall be covered daily with secured 9-mil plastic sheeting. Waste stockpiles shall also be placed on 9-mil plastic sheeting. Silt fence or hay bales shall be installed completely around each stockpile at the end of each work day. Stockpiles shall be temporarily stabilized after all material has been placed with temporary seed as detailed in Section 3.11 or secured 9-mil plastic sheeting.

3.08 Temporary Seeding

A. Disturbed areas not subject to construction traffic to be left exposed more than 30 days should immediately be seeded with a temporary seed mix and fertilizer. Seed mix and application methods are specified in Section 02936. If the season prevents establishment of the temporary seed, mulch the exposed area with straw or equivalent at rate of 2 tons per acre. Mulch shall meet the requirements of Section 32 92 19.

B. Immediately following the initial disturbance of rough grading, all critical areas subject to erosion (i.e., steep slopes and berms) shall receive a temporary seeding in combination with straw mulch or equivalent at a rate of 2 tons per acre using the seed mix and mulch specified in Section 32 92 19. Slopes steeper than 3H:1V shall be graded and stabilized daily as installation occurs.

3.09 Maintenance and Removal of Temporary Measures

A. The CONTRACTOR shall maintain the integrity of silt fence, hay bales, check dams, decontamination stations and construction entrance as long as they are necessary to contain sediment associated with project activities. The CONTRACTOR and ENGINEER shall inspect all temporary silt fences, hay bales, and the construction entrance at least daily and after storm event. Any deficiencies shall be immediately corrected by the CONTRACTOR at the CONTRACTOR's expense.

B. In addition, the CONTRACTOR shall make a daily review of the location of silt fences in areas where construction activities have changed the natural contour and drainage runoff to ensure that the silt fences are properly located for effectiveness. Where deficiencies exist, additional silt fences shall be installed as directed by the ENGINEER or OWNER. Should the silt fence become damaged or otherwise ineffective while the barrier is still necessary, it shall be repaired promptly. Sediment deposits shall either be removed when the deposit reaches approximately one-half of the height of the silt fence or hay bale or a second silt fence shall be installed as directed by the ENGINEER or OWNER.

C. The temporary erosion control measures shall remain in place until the ENGINEER or OWNER directs that they be removed. Upon removal, the CONTRACTOR shall remove and dispose of any stone and excess silt accumulations, dress the area to give a positive aesthetic appearance, and vegetate all bare areas in accordance with the contract requirements. The silt fence or hay bale materials shall remain the property of the CONTRACTOR. All silt and sediment accumulations shall be removed and handled as waste in accordance with Section 02 61 00.

CORTESE LANDFILL SITE

NARROWSBURG, NEW YORK

OU 4 REMEDIAL DESIGN

ENGINEERING SPECIFICATIONS

DIVISION 32

EXTERIOR IMPROVEMENTS

PROJECT:	**OU 4 REMEDIAL DESIGN**
LOCATION:	**CORTESE LANDFILL NARROWSBURG, NEW YORK**
PROJECT NO.:	**MR0562B**
COMPANEW YORK:	**CORTESE LANDFILL PRP GROUP**
PREPARED BY:	Geosyntec consultants engineers | scientists | innovators

SECTION 32 00 00 - Exterior Improvements

32 05 00 Common Work Results for Exterior Improvements

Part 1 General

1.01 General Conditions

A. The General Conditions apply to all sections of this specification, which shall be completed as shown on the plans and as specified, and shall be properly coordinated with work in other Specifications.

B. The drawings and these specifications are complementary to each other; what is called for by one shall be as binding as if called for by both. If there is any conflict between what is shown on the drawings and what is written in the specifications, the more restrictive shall take precedence and the CONTRACTOR shall communicate the conflicts to the Design OWNER's REPRESENTATIVE in a timely manner.

C. Safety

1. The CONTRACTOR shall be familiar with, and shall at all times conform to, the regulations of the *"OSHA General Industry Occupational Safety and Health Standards," "OSHA Safety and Health Regulations for Construction,"* and other applicable state and municipal standards and regulations.

1.02 Referenced Sections – none

1.03 Cited Standards – none

1.04 Noted Restrictions - none

Part 2 Products – Not Used

Part 3 Execution – Not Used

END OF SECTION

SECTION 32 10 00 - BASES, BALLASTS, AND PAVING

32 12 16 Asphalt Paving

Part 1 General

1.01 Section Includes

A. This section describes the CONTRACTOR's responsibilities regarding asphalt paving for this project.

1.02 Referenced Sections – None

1.03 Cited Standards

A. All specifications for this section shall conform to the following, or latest revisions of, as applicable:

B. New York Department of Transportation (NYDOT) – Standard Specifications

1.04 Noted Restrictions – None

1.05 Quality Control

A. The contractor is responsible for all activities required to produce hot mix asphalt (HMA) that meets specification requirements. The COTNRACTOR shall incorporate a plan for all production of hot mix asphalt (HMA) and shall assume responsibilities for these activities.

1.06 Submittals

A. Submittals shall be in accordance with Section **01 33 00 Submittal Procedures**.

Part 2 Products

2.01 Pavement Construction Components

A. The pavement construction materials for this project shall conform to the following superpave item numbers:

1. Top Coat: 402.125301 M
2. Binder: 402.195901 M
3. Base: 402.255901 M

B. The asphalt road shall have a thickness of 18" prepared in the following manner:

1. 1 ¼" top asphalt coating
2. 2" of binder section

3. 3" of base material

4. 11 ¾" gravel subbase material

2.02 Fine Aggregate

A. Fine aggregate shall consist of natural sand or manufactured sand, that shall consist of hard, strong, durable particles which are free from a coating or any injurious material and injurious amounts of clay, loam, or other deleterious substances in accordance with NYDOT Standard Specification 703-01.

B. Fine aggregate shall not contain substances, which, when mixed in portland cement concrete, produce an unacceptable level of chloride ions in the final product. Substances that produce chloride ions shall be considered deleterious material. Any fine aggregate may be rejected if it is determined by the OWNER's REPRESENTATIVE to contain sufficient amounts of unsound or deleterious material to be harmful.

C. Fine aggregates from more than one source or of more than one type of material may be blended as approved by the OWNER's REPRESENTATIVE.

D. Fine aggregates shall meet the requirements of NYDOT Table 703-1 below.

NYDOT TABLE 703-1 FINE AGGREGATE REQUIREMENTS (TESTING)		
Test Method	**Portland Cement Concrete**	**Bituminous Concrete**
Magnesium Sulfates (NYSDOT 207) Max. percent loss by weight at 5 cycles	30	45
Organic Impurities (NYSDOT 202, AASHTO T-21) Organic Plate, Lighter Than	3	-
Gardner Color, Lighter Than	11	-

E. If fine aggregate is found unsatisfactory when examined for organic impurities, it shall be rejected unless it passes the mortar strength test for compression. Fine aggregates so tested shall achieve a compressive strength of at least one hundred percent when tested according to methods prescribed by the Material Bureau (NYSDOT 204).

2.03 Coarse Aggregate

A. Coarse aggregates shall consist of crushed stone, crushed gravel, screened gravel or crushed air-cooled blast furnace slag, conforming to the requirements outlined in Tables 703-2, Physical Requirements (Testing), 703-3, Physical Requirements (Deleterious Materials), and 703-4, Size of Stone, Gravel and Slag described in accordance with NYDOT Standard Specification 703-02.

TABLE 703-2 PHYSICAL REQUIREMENTS (TESTING)				
Material Designation	**Crushed Stone 703-0201**	**Crushed Gravel 703-0202 Concrete**	**Screened Gravel 703-0203**	**Crushed Slag 703-0204**
Magnesium Sulfate Test (703-07 P,G) Max. percent loss by weight at 10 cycles	18	18	18	6
Freezing and Thawing Test (703-08 P,G) Max. percent loss by weight at 25 cycles	20	20	20	-
Los Angeles Abrasion Test (703-11 P,G) Max. percent loss by weight (Grading A or B)	35	35	35	40
Flat Particles, Elongated Particles, or Flat and Elongated Particles (ASTM D4791) Maximum % by weight Flat and Elongated to the Degree of 5:1	10	10	-	-
Crushed Particles in any primary size(ASTM D5821) Minimum percent by weight Larger than 1/2 inch (1 fractured face)	-	75	-	-
Smaller than 1/2 inch (2 fractured faces)	-	85	-	-
Minimum unit weight (703-10 P,G) lbs/cu. ft.	-	-	-	70

B. Crushed Stone

1. Crushed stone shall be Material Designation 703-0201 and shall consist of clean, durable, sharp-angled fragments of rock of uniform quality. The crushed stone used as coarse aggregate for all items shall be obtained from sources conforming to the requirements of the NYDOT as to sampling, testing methods, Quarry Reports and any other required procedures.

C. Crushed Gravel

1. Crushed Gravel shall be Material Designation 703-0202 and shall consist of clean, durable, sharp-angled fragments of gravel free from coatings. A crushed particle shall be defined as one in which the total area of face fracture exceeds 25% of the maximum cross-sectional area of the particle. When two fractured faces are designated, the total area of each fractured face shall exceed 25% of the maximum cross-sectional area of the particle.

2. A naturally fractured face shall be acceptable providing that the sharp angular portion of the particle consists of sound material and is free from unsound or injurious coatings.

3. Crushed Gravel shall conform to the following:

TABLE 703-3 PHYSICAL REQUIREMENTS - DELETERIOUS MATERIALS				
Material Designation	Crushed Stone 703-0201	Crushed Gravel 703-0202 Concrete	Screened Gravel 703-0203	Crushed Slag 703-0204
Shale and shale-like materials	3.0	3.0	3.0	-
Coal/Lignite/Sulfides	1.0	1.0	1.0	-
Clay lumps or Wood	0.2	0.2	0.2	-
Metal Ore	3.0	3.0	3.0	3.0
Other Deleterious Materials	3.0	3.0	3.0	3.0
Total Deleterious Materials	5.0	5.0	5.0	5.0

TABLE 703-4 SIZES OF STONE, GRAVEL AND SLAG											
Size Designation	4 in	3 in	2 1/2 in	2 in	1 1/2 in	1 in	1/2 in	1/4 in	1/8 in	#80	#200
Screenings	-	-	-	-	-	-	100.0	90-100	-	-	0-1.0
1B	-	-	-	-	-	-	-	100.0	90-100	0-15	-
1A	-	-	-	-	-	-	100.0	90-100	0-15	-	-
1ST	-	-	-	-	-	-	100.0	0-15	-	-	-
1	-	-	-	-	-	100.0	90-100	0-15	-	-	-
2	-	-	-	-	100.0	90-100	0-15	-	-	-	-
3A	-	-	-	100.0	90-100	35-70	0-15	-	-	-	-
4A	-	-	100.0	90-100	-	0-20	-	-	-	-	-
4	-	100.0	90-100	-	0-15	-	-	-	-	-	-
5	90-100	0-15	-	-	-	-	-	-	-	-	-

Part 3 Execution

3.01 Preparation

A. The CONTRACTOR shall examine the areas and conditions under which work will be performed. The CONTRACTOR is responsible for correction of any conditions detrimental to road installation.

B. Final Preparation of Subgrades

1. Following preparation of subgrade, the CONTRACTOR shall prepare the entire area to be paved per NYDOT requirements for the application.

3.02 Installation

A. Placement of Base Courses

1. Subbase (when required):

a. The CONTRACTOR shall spread the specified subbase material to the appropriate thickness and shall compact to 95% minimum.

2. Base

a. The CONTRACTOR shall then spread the specified base material to appropriate thickness and shall compact to 95% minimum.

3. Moisture Content

a. The CONTRACTOR shall use only the amount of moisture needed to achieve the specified compaction.

B. Placement of Asphaltic Concrete Paving

1. The CONTRACTOR shall install the specified headers and stakes to achieve the arrangement of paving shown on the Drawings.

2. All loose materials from the compacted base shall be removed.

3. Spreading:

a. Asphalt shall be spread material in a manner which requires the least handling.

b. Where thickness of finished paving will be 3 inches or less, the CONTRACTOR shall spread in one layer.

4. Rolling:

a. After the material has been spread to the proper depth, the CONTRACTOR shall roll the pavement until the surface is hard, smooth, unyielding, and true to the thickness and elevations shown on the Drawings.

b. Pavement shall be rolled in at least two directions until no roller marks are visible.

3.03 Testing

A. Flood Test

1. Prior to application of a seal coat, a flood test shall be performed in the presence of the OWNER's REPRESENTATIVE.

2. The CONTRACTOR shall flood the entire asphalt concrete paved area with water by use of a tank truck or hoses.

3. If a depression is found where water ponds to a depth of more than 1/8-inch in 6 feet, the CONTRACTOR shall fill or otherwise correct the depression to provide proper drainage.

4. The CONTRACTOR shall feather and smooth the edges of fill so that the joint between fill and original surface is invisible.

B. Application of Seal Coat (if necessary)

1. If deemed so by the OWNER's REPRESENTATIVE, the CONTRACTOR shall prepare asphalt surfaces, mix seal coat material, and apply to asphalt in accordance with the manufacturer's recommendations.

2. The asphalt shall have a finished surface seal which, when dry and thoroughly set, is smooth, tough, resilient, of uniform black color, and free from coarse textured areas, lap marks, ridges, and other surface irregularities.

END OF SECTION

SECTION 32 30 00 – SITE IMPROVEMENTS

32 31 13 Chain Link Fences and Gates

Part 1 General

1.01 Scope

A. This sections describes how the General Construction CONTRACTOR shall furnish complete all fences and (or) gates necessary for the site as shown on the drawings.

1.02 Referenced Sections – none

1.03 Cited Standards

A. All chain link fences and gates shall conform to the requirements of the following standard specifications, of the latest revisions, as applicable:

1. ASTM A121 - Specification for Zinc-Coated (Galvanized) Steel Barbed Wire

2. ASTM A123 - Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

3. ASTM A153 - Specification for Zinc-Coating ((Hot-Dip) on Iron and Steel Hardware

4. ASTM A491 - Specification for Aluminum-Coated Steel Chain-Link Fence Fabric

5. ASTM A1011/A1011M-07 - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength

6. ASTM F567 - Practice for Installation of Chain-Link Fence

7. Chain Link Fence Manufacturers Institute (CLFMI): CLFMI Publication, "Standards for Chain Link Fence Installation"

1.04 Noted Restrictions

A. No used, re-rolled or open seam material will be permitted in posts or rails.

1.05 Quality Control

A. All dimensions and gages of material are subject to accepted steel producing industry tolerance standards. The jobsite shall be cleared of excess spillage of any concrete, cut wires, etc., and posthole excavation scattered uniformly away from posts.

B. Upon request of the OWNER's REPRESENTATIVE, samples of each component shall be submitted for approval prior to fabrication and shipment

of fencing for this project. Mill certificates shall confirm compliance with these specifications. Any material found not to be in compliance with the herein described specifications shall be removed and replaced at CONTRACTOR's expense.

Part 2 2 Products

2.01 Chain Link Fences

A. Fences shall be a minimum of 8 feet in height above grade when erected, including 7 feet of No. 9 gage wire woven in a 2 in. mesh, and 3 lines of No. 12-½ gage barbed wire mounted on 45 degree arms turned out.

B. The fence fabric shall be aluminum coated Class II chain link per ASTM A491 and shall have twisted and barbed selvages both on the top and on the bottom. The wire pickets of which this fabric is made shall be capable of withstanding a tensile strength test of 90,000 psi based on the cross-sectional area of the aluminum-coated wire.

C. Barbed wire shall be aluminum-coated steel with a coating of 0.30 oz / ft^2 of wire surface and 14 gage aluminum barbs in a 4-point pattern on approximately 5 in. centers. Tension wire shall be 7 gage aluminum coated wire attached to the bottom of fence fabric at intervals of 24 in. with hog rings.

2.02 Swing Gates

A. Swing gate frames shall have a minimum outer diameter (O.D.) of 1.90 in. and shall be hot-dip galvanized pipe, weighing 2.72 lb/ft.

B. Fabric shall be the same as in the fence. The gate shall be complete with malleable iron head and socket hinges, catches, and stops, and shall be so arranged to permit the gate to swing back against the fence 180 degrees.

C. The gate shall be furnished with a heavy-duty lock. Hardware shall be of adequate design and strength to provide satisfactory operation of the gate.

2.03 Slide Gates

A. Slide gates shall be mounted between 4 in. O.D. minimum gate posts, and the overhead track shall provide a minimum clearance of 14 ft. from the road surface.

B. The gate shall be similar and equal to U.S. Steel Company's "Safeguard" and all components shall be in accordance with design criteria set up by the manufacturer for gates of this size.

C. All posts, rails, and appurtenances shall be hot-dipped zinc-coated per ASTM A121, A123 and A153, whichever is applicable. Pipe posts shall have tops, which exclude moisture. The rail and guide system shall be so designed that one man can operate the gate with ease. A locking device shall be provided with the gate.

2.04 End, Corner, and Pull Posts

A. End, corner, and pull posts shall have a minimum outer diameter (O.D.) of 2-$^{7}/_{8}$ in. and shall be Standard Schedule 40 pipe with a 5.79 lb/ft or a 3.5" x 3.5" roll formed section with minimum theoretical bending strength of 486 lb under a 6 ft. cantilever load.

B. Attachment to roll-formed terminals shall be made by weaving fabric into integral lock loops formed in the post.

C. Line posts shall be hot-dip galvanized with a minimum 1.8 oz zinc coating and 2.375 in. O.D. Line posts shall be Standard Schedule 40 pipe with 3.65 lb/ft or a C-section roll formed from steel conforming to ASTM A1011/A1011M-07, Grade 45, 1.875" x 1.625" with a minimum theoretical bending strength of 247 lb under a 6 ft 0 in. cantilever load.

D. No used, re-rolled or open seam material will be permitted in posts or rails. Line posts shall be evenly spaced 10 ft 0 in. or less on centers and plumbed vertical unless otherwise specified.

E. Swing Gate Posts

1. Swing gate posts shall adhere to the following table.

Gate Frame Width	Standard Pipe	lb/ft
Up to 5 ft	2-7/8 in. O.D.	5.79
6 ft to 13 ft	4 in. O.D.	9.11
14 ft to 18 ft	6-5/8 in. O.D.	18.97
19 ft and over	8-5/8 in. O.D.	28.55

2.05 Top Railing

A. The top rail shall be hot-dip 1.66 in. O.D. Standard Schedule 40 pipe 2.27lb/ft or a roll-formed section of 1.625" x 1.25", 35,000 psi yield strength, channel-shaped rail with minimum theoretical bending strength of 192 lb on a 10-ft span midpoint load with couplings provided every 20 ft.

B. One coupling in every five shall have a heavy spring to permit expansion and contraction. The top rail shall be constructed so as to provide a continuous brace from end to end for each stretch of fence.

C. Brace material shall be furnished of similar construction. A bottom tension wire shall be supplied. The wire shall be No. 7 gage aluminum-coated steel, coil spring wire fastened to the chain link fabric at intervals of 24 in. with No. 11 gage galvanized steel hog rings.

2.06 Extension Arms

A. All 45 degree extension arms shall be hot-dip galvanized. Extension arms on line posts shall be pressed steel, and those on end and corner posts shall be malleable iron.

2.07 Concrete Footings

A. The CONTRACTOR shall provide concrete footings for fence posts under this Section. The concrete for posts shall have a minimum compressive strength at 28 days of 3,000 psi, using 1-inch maximum size aggregate and five sacks of cement minimum per cubic yard, with a maximum slump of 4 inches (unless specified otherwise by the OWNER's REPRESENTATIVE).

Part 3 Execution

3.01 Preparation

A. Installation of fencing shall not be started until final grading has been completed, and all fencing shall be located as indicated on the drawings.

B. Where posts are indicated or required to be embedded or set in concrete, the CONTRACTOR shall coordinate the installation of fencing closely with the installation of the concrete.

3.02 Installation

A. The CONTRACTOR shall install the fencing and gates in accordance with approved Shop Drawings, and applicable requirements of ASTM F567 and CLFMI Standards for Chain Link Fence Installation.

B. After installation by the CONTRACTOR, posts shall be plumb and rigid, rails shall be straight and tight, chain link fabric shall be smooth and uniformly stretched tight and straight, and tension wires and barbed wires shall be pulled taut.

C. Post Setting

1. All posts shall be set in holes of diameter and depth as indicated below. After post has been set and plumbed, the hole shall be filled with 3,000 psi concrete.

2. The exposed surface of the concrete shall be crowned to shed water, and the hole to set the line and terminal posts shall be 12 in. diameter. The hole depth shall be 38 in. and the post embedment shall be 36 in. The gate posthole shall be as a minimum 12 in. greater diameter than the post.

D. Gates shall be installed plumb, level, and secure for full opening without interference. The CONTRACTOR shall install ground-set items in concrete for anchorage if recommended by the fence manufacturer. The CONTRACTOR shall adjust hardware for smooth operation and lubricate. Sliding gates shall operate smoothly and easily under minimum pressure.

E. If safety and restriction signs are required, they shall be installed as indicated on the Contract Drawings

F. Concrete Placement

1. Concrete shall be placed around posts in a continuous pour. The CONTRACTOR shall check each post for plumb and vertical and top alignment, and hold in position during placement and finishing operations.

END OF SECTION

SECTION 32 90 00 PLANTING

32 92 19 Seeding

Part 1 GENERAL

1.01 Section includes

A. The CONTRACTOR shall furnish all labor, materials, equipment, tools, and appurtenances required to complete the seeding of all areas disturbed, regraded or receiving a cover during the course of construction. CONTRACTOR shall provide a "Competent Person" to implement, supervise, and inspect all work.

1.02 Referenced Sections

A. 31 25 00 Erosion and Sedimentation Controls

1.03 Cited Standards

A. New York Standards and Specifications for Erosion and Sediment Control. August 2005

1.04 Noted Restrictions –none

1.05 Quality Control

A. A satisfactory stand of grass, as determined by the ENGINEER, shall be required. To be acceptable, bare spots shall be scattered and there shall be no bare spots larger than one (1) square yard and a stand of grass shall consist of a uniform stand of at least 75 percent established permanent (i.e., perennial) grass species by the end of the first growing season.

B. Maintain erosion and sedimentation controls in accordance with Section 31 25 00.

1.06 Submittals

A. A manufacturer's Certificate of Compliance for the seed mixture shall be submitted by the manufacturer with each shipment of each type of seed. These certificates shall include the guaranteed percentages of purity, weed content and germination of the seed, and also the net weight and date of shipment. No seed may be sown until the CONTRACTOR has submitted the certificates.

1.07 Definitions

A. Weeds include, but are not limited to, Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, and Broome Grass.

Part 2 PRODUCTS

2.01 Seeding Mixture for Temporary Cover

A. Spring, Summer or Early Fall

1. Seeding mixture of 50% annual rye grass (annual or perennial) at 30 lbs./acre in accordance with local USDA Soil Conservation Service practices and specifications.

B. Late Fall or Early Winter

1. Seeding mixture of Certified 'Aroostook' winter rye (cereal rye) shall be applied at a rate of 100 lbs/acre in accordance with local USDA Soil Conservation Service practices and specifications.

2.02 Seed Mixture For Permanent Cover

A. General purpose erosion control mix for permanent critical area plantings per Section 3 of the " New York Standards and Specifications for Erosion and Sediment Control " dated August 2005:

Seed Mixture	Variety	Seeding Rates in lbs Per Acre	Recommended Seeding Dates
Creeping red fescue	Ensylva, Pennlawn, Boreal	20	In the spring by May 15 or between Aug. 15 and Oct. 1
Tall fescue	KY 31, Rebel	20	
Perennial Rye Grass	Pennfine, Linn	5	
Birdsfoot trefoil	Empire, Pardee	10	

2.03 Fertilizer

A. The soil should be tested to determine the amounts of amendments needed.

B. If soil must be fertilized before the results of a soil test can be obtained to determine fertilizer needs, 5-10-10 fertilizer or equivalent shall be applied at 600 lbs. per acre.ived from organic material.

C. Manure shall not be used on sites to be planted with birdsfoot trefoil or in the path of concentrated water flow.

2.04 Mulch

A. Straw mulch shall be oat or wheat straw, free from weeds, foreign matter detrimental to plant life, and dry. Hay or chopped cornstalks are not acceptable.

B. Wood fiber mulch for hydroseeding shall consist of wood fiber produced from clean, whole, uncooked wood, formed into resilient bundles having a high degree of internal friction and shall be dry when delivered to the site.

2.05 Water

A. Water shall be clean, fresh, potable and free of substances or matter which could inhibit vigorous growth of grass. Site process water shall not be used.

2.06 Lime

A. Agricultural grade lime shall be applied as required.

Part 3 Execution

3.01 Inspection

A. CONTRACTOR shall verify that prepared soil base is ready to receive the Work of this Section. If traffic has left the soil compacted, the area must be retilled.

3.02 Delivery, Storage, and Handling

A. Grass seed mixture shall be delivered by CONTRACTOR in sealed containers showing weight, seed mix, year of production, date of packaging, and location of packaging. Seed in damaged packaging is not acceptable.

B. Fertilizer shall be delivered by CONTRACTOR in waterproof bags showing weight, chemical analysis, and name of manufacturer. Fertilizer in damaged packaging is not acceptable.

3.03 Liming

A. When required, ground limestone which has been protected from moisture and is dry and free flowing shall be evenly spread over the area to be seeded at a rate that will produce a pH value of the soil of 6 in the upper 2 inches of soil.

3.04 Fertilizing

A. CONTRACTOR shall apply fertilizer in accordance with manufacturer's instructions.

B. Do not apply fertilizer at same time or with same machine as will be used to apply seed unless hydroseeding.

C. CONTRACTOR shall mix thoroughly into upper 2 inches of soil.

D. CONTRACTOR shall lightly water to aid the dissipation of fertilizer.

3.05 Seeding

A. A CONTRACTOR shall apply seed at rate shown in Part 2 of this Section or as recommended by local USDA Soil Conservation Service office. Seed evenly in two intersecting directions. Rake in lightly. Do not seed area in excess of that which can be mulched on same day.

B. Planting season shall be as indicated in Part 2 of this section or as

recommended by local USDA Soil Conservation Service.

C. CONTRACTOR shall not sow immediately following rain, when ground is dry, frozen, or during windy periods.

3.06 Hydroseeding

A. CONTRACTOR shall use this method for steep, inaccessible areas. When applying seeds, lime, fertilizer, or mulch materials with the hydroseeder, CONTRACTOR shall not use more than 100 to 150 pounds of solids per 100 gallons of water. If inoculate is in a seed, fertilizer, and lime slurry, it should be used within three to four hours, or a fresh supply of inoculate should be added. It is preferable to hydroseed when the soil is moist.

3.07 Mulching

A. Straw mulch shall be applied by CONTRACTOR at a minimum rate of 2 tons per acre.

B. Wood fiber mulch shall be applied by CONTRACTOR to seeded area at a rate of 2,000 pounds per acre. Immediately before spraying, the mulching material shall be mixed with water in the sprayer and kept uniformly suspended in the water by agitation during the spraying operation.

3.08 Reseeding

A. Where vegetative coverage is less the 75% after the first growing season, and where any bare spots greater than one (1) square yard, CONTRACTOR shall place additional seed in accordance with Section 3.05 or 3.06, at no additional cost to the OWNER.

END OF SECTION

CORTESE LANDFILL SITE

NARROWSBURG, NEW YORK

OU 4 REMEDIAL DESIGN

ENGINEERING SPECIFICATIONS

DIVISION 33

UTILITIES

PROJECT:	**OU 4 REMEDIAL DESIGN**
LOCATION:	**CORTESE LANDFILL NARROWSBURG, NEW YORK**
PROJECT NO.:	**MR0562B**
COMPANEW YORK:	**CORTESE LANDFILL PRP GROUP**
PREPARED BY:	Geosyntec consultants engineers | scientists | innovators

SECTION 33 05 00 Common Work Results for Utilities

33 05 23 Trenchless Utility Installation

Part 1 General

1.01 Section includes:

A. This section includes the requirements for trenchless utility installation under the railroad embankment between the Site and Delaware Drive

B. The railroad embankment and surrounding property shown on the Construction Drawings as owned by Pennsylvania Lines LLC is owned and operated by Norfolk Southern Corporation (NS).

C. Utility service connections traverse NS property, as shown on the Construction Drawings. The final location of the service connection shall be confirmed with the utility provider.

D. OWNER is responsible for the Application for Pipe or Wire Occupancy. CONTRACTOR shall provide all plans, specifications, and computations required to support the application.

1.02 Related Sections

A. 31 23 33 Trenching and Backfilling

1.03 References

A. Application for Pipe and Wire Occupancy, Norfolk Southern Corporation, 19 May 2011.

B. NSCE-8, Specifications for Pipeline Occupancy of Norfolk Southern Corporation Property, Norfolk Southern Corporation, 16 May 2001.

1.04 Quality Control

A. Trenchless utility installation shall be performed by a subcontractor acceptable to NS who has constructed at least (5) similar installations, which were constructed within one (1) year of each other and have in successful operation for not less than five (5) years.

B. Methods of installation shall be acceptable to NS in accordance with NSCE-8 and include:

1. Bore and Jack

2. Directional Bore/Horizontal Direction Drilling

C. All plans, specifications, and computations required to support the Application for Pipe and Wire Occupancy will be submitted to the ENGINEER for review

1.05 Submittals

A. Plan for geotechnical investigation to characterize the nature of the native materials to determine the feasibility of the installation. CONTRACTOR shall notify OWNER if entry to NS property is required for the purpose of conducting surveys, field inspections, obtaining soils, information or any other purposes associated with the design and construction for the proposed occupancy. CONTRACTOR shall be responsible for submittal of the application for Right of Entry to NS.

B. Two (2) copies of each submittal for review by ENGINEER. Include all applicable drawings, calculations, geotechnical reports, and a written work plan in each copy.

1. Identify in the work plan details of the construction, sequence of operations to be performed during construction, a detailed schedule of construction, and a traffic control plan.

2. Detail sufficiently the drawings, calculations, and descriptions in order to demonstrate to the ENGINEER whether the proposed materials and procedures will meet the requirements of this Section.

3. Sign and seal the structural designs and other engineered components by a registered Professional Engineer.

C. Three (3) copies of all design and construction plans and three (3) copies of all specifications and engineering computations for the proposed occupancy.

D. Plans

1. Plans are to be prepared in sizes as small as practical (8 ½" x 11", 8 ½" x 14" or 8 ½" x 17"). Larger size plans shall be folded, individually, by the applicant to an 8 ½ inch by 11 inch (216 x 279 mm) size prior to submission. Where more than one plan is involved, the folded plans shall be assembled into complete sets by the applicant before submission. Failure to comply with these requirements may be sufficient cause for rejection of the application by NS.

2. Plans shall be drawn to scale and shall include the following:

a. Plan view of proposed pipeline in relation to all NS facilities and facilities immediately adjacent to NS including, but not limited to, tracks, buildings, signals, pole lines, other utilities and all other facilities that may affect or influence the pipeline design and construction.

b. The location, in feet (meters), of the pipe crossing from the nearest NS Milepost and/or from the centerline of an NS bridge, giving the NS bridge number. If the above is not available, provide distance to the nearest highway grade crossing of the railroad and the DOT number posted at the highway grade crossing, if available.

c. In all cases, the name of the State and County in which the proposed facilities are located must be shown, in States

where Townships, Ranges and Sections are used. Show the distance in feet to the nearest Section line and identify the Section number, Township and Range.

d. The profile of the ground above the centerline of the pipe, from field survey, showing relationship of the pipeline and/or casing pipe to the ground levels, the tracks and other facilities. For longitudinal occupations, the top of rail profile of the adjacent track shall be shown on the pipeline profile.

e. All NS property lines indicated by dimensions, in feet (meters), to the centerline of adjacent track, as well as the overall width of the NS right-of-way. If the pipeline is in a public highway, the limits of the dedicated highway right-of-way, as well as the limits of any paving, sidewalks etc., shall be defined, by dimensions in feet (meters), from the centerline of the dedicated right-of-way.

f. The angle of the crossing in relation to the centerline of the tracks(s).

g. On pipelines having valves, the distance in feet (meters) along the pipeline from the crossing to the nearest valves and/or control stations.

h. A separate “Pipe Data Sheet” shall be submitted on an 8 ½” x 11” (216 x 279mm) sheet, for each crossing.

3. The plan shall be specific, on NS property and under tracks that are not on NS property, as to the:

a. Method of installation

b. Size and material of the casing pipe

c. Size and material of the carrier pipe

4. All plans and computations associated with the work under the agreement shall be prepared by, and bear the seal of, a Professional Engineer.

E. Specifications

1. Project specifications, for all work on and affecting the railroad right-of-way, shall be included with the submission. All pertinent requirements of this document shall be included.

F. Geotechnical Report:

1. Map showing field exploration locations

2. Summary of field exploration and laboratory testing procedures and results

3. Description of site surface and subsurface conditions encountered during field investigations

4. Soil boring Logs

G. Structural Data:

1. Casing and carrier material type

2. Casing and carrier wall thickness

3. Manufacturer's recommended maximum and minimum fill height limits for the identified casing and carrier

H. Traffic Control Plan

I. Installation Plan:

1. Location and dimensions of bore pit, if required.

2. Method of shoring, including details for all required ground support

3. Method of controlling line and grade

4. Method of spoil removal, including surface storage and disposal

5. Grouting techniques to be used for filling annular voids caused by over excavation, if any, including equipment, pumping and injection procedures, pressure grout types, and mixtures

6. Method of dewatering and disposal

7. Details of casing spacers and casing end seals

8. Emergency safety and repair plan for accidental damage caused to existing utilities, roadway surface, or other features resulting from construction operations

Part 2 Products

2.01 General Requirements

A. All products including casing pipe and carrier pipe shall meet the requirements of NSCE-8.

Part 3 Execution – Not Used

END OF SECTION

SECTION 33 20 00 – Wells

Part 1 General

1.01 Section Includes

A. This Section describes the labor, materials, tools, supervision, transportation, and installation equipment necessary for the installation of air sparging wells, and soil vapor extraction wells as specified herein and as shown on the Construction Drawings.

B. CONTRACTOR shall provide a qualified person to oversee boring installation and well construction.

C. CONTRACTOR shall retain the services of a qualified and experienced, licensed well drilling contractor (DRILLER) to install all wells.

D. CONTRACTOR shall retain the services of a qualified and experienced mobile analytical laboratory to provide on-site analysis of soil samples during the installation of the air sparging wells at the former IDDA 2 and septage lagoon source areas. Soil analytical results will be used to determine if step-out borings are necessary to complete the delineation of these source areas and if additional air sparging and soil vapor extraction wells in addition to those shown on the Construction Drawings will be required.

1.02 Referenced Sections

A. Related Sections are listed below:

1. Section 01 35 29.13 Health, Safety, and Emergency Response Procedures for Contaminated Sites

2. 02 05 19 Geosynthetics for Existing Conditions

1.03 Cited Standards

A. American Society for Testing and Materials (ASTM):

1. ASTM D 5784-95 – Guide for Use of Hollow-Stem Augers for Geoenvironmental Exploration and the Installation of Subsurface Water-Quality Monitoring Devices

2. ASTM D6914-04 - Standard Practice for Sonic Drilling for Site Characterization and the Installation of Subsurface Monitoring Devices

B. U.S Environmental Protection Agency (USEPA)

1. SW-846 - Test Methods for Evaluating Solid Waste Physical/Chemical Methods

2. OSWER Publication 9355.4-07FS - Estimating Potential for Occurrence of DNAPL at Superfund Sites

3.

1.04 Qualifications

A. Installation of the all wells shall be performed by person(s) holding valid license(s) in the State of New York. Selected DRILLER is expected to provide proof of licensure prior to beginning work.

1.05 Submittals

A. At least 14 days prior to installing any well, CONTRACTOR shall provide ENGINEER with the following information:

1. qualifications of the proposed DRILLER;

2. a copy of the DRILLER'S current valid license for the State of New York; and

3. qualifications of the mobile analytical laboratory including analytical chemists' NELAP certification, and laboratory Quality Assurance Plan.

B. After the completion of the well installation, CONTRACTOR shall provide ENGINEER with record drawing(s) of all wells showing:

1. surveyed location of each well;

2. surveyed elevation of the adjacent ground surface and top of standpipe for each well;

3. log of the soil boring and well construction information for each well, including start and completion dates and well development information;

4. copies of the soil analytical reports (IDDA 2 and septage lagoon areas only), if applicable; and

5. copies of the well DRILLERs logs.

C. DRILLER shall provide daily footage and material logs to ENGINEER for approval/agreement with field notebook. ENGINEER shall sign daily footage/materials logs. Copies of signed daily footage and material logs should be submitted to ENGINEER.

D. CONTRACTOR shall provide field analytical results for soil samples from air sparging well borings at IDDA 2 and septage lagoons in both paper and MS Excel compatible electronic format in accordance with the Quality Assurance Project Plan (QAPP).

1.06 CONSTRUCTION QUALITY ASSURANCE

A. The installation of wells shall be monitored by ENGINEER in accordance with the Construction Quality Assurance Plan.

Part 2 Products

2.01 WELL CONSTRUCTION

A. All air sparging wells and soil vapor extraction wells shall be constructed with all parts and materials as specified on the Construction Drawings. Certain deviations from specified materials may be acceptable providing DRILLER can offer evidence showing benefit over the specified materials. In any case, all deviations from specified materials must be approved by ENGINEER prior to use.

B. All wells will be constructed with the following specified annulus materials:

a. SILICA SAND - Morie #1 Sand, or equivalent;

b. BENTONITE PELLETS - 3/8-inch diameter, brand approved by ENGINEER;

c. 95% CEMENT/5% BENTONITE GROUT (Grout)- a mixture of 6.5 gallons of water per 94-pound bag of Portland Type I/II cement and 4 pounds of bentonite powder; and

d. CONCRETE - pre-mix concrete mixed to manufacturer's specifications with potable water.

C. Each well type will require a specified set of materials for construction. The specified materials that will be used to construct each type of well are summarized below:

1. Air Sparging Well

a. Sump Cap: 2-inch diameter, stainless steel

b. Screen: 2-inch diameter, 0.010-inch wire wrapped stainless steel, threaded joints

c. Riser (up to 6 inches below ground surface): 2-inch diameter Schedule 80 CPVC, threaded joints

d. Riser (from 6 inches below ground surface to 2 feet above ground surface): 2-inch diameter stainless steel, threaded joints

e. Top cap (temporary)

2. Soil Vapor Extraction Well

a. Sump Cap: 4-inch diameter, stainless steel

b. Screen: 4-inch diameter, 0.010-inch wire wrapped stainless steel, threaded joints

c. Riser (up to 3 feet above ground surface): 2-inch diameter Schedule 80 CPVC, threaded joints

Part 3 Execution

3.01 Preparation

A. Prior to implementing any of the Work described in this Section, CONTRACTOR shall become thoroughly familiar with all portions of the Work falling within this Section.

B. Prior to implementing any of the Work in this Section, CONTRACTOR shall carefully inspect the installed Work of all other Sections and verify that all Work is complete to the point where the installation of this Section may properly commence without adverse impact. If CONTRACTOR has any concerns regarding the installed Work of other Sections, then CONTRACTOR shall notify ENGINEER in writing within 48 hours of its site inspection. Failure to inform ENGINEER in writing or installation of the Work of this Section will be construed as CONTRACTOR's acceptance of the related Work of all other Sections.

C. Before boring installation, all borings shall be located and staked by a surveyor to ensure that they are installed at the appropriate location.

D. All borings will be cleared of underground utilities before boring advancement. CONTRACTOR will be responsible for damage to any subsurface utilities.

E. Prior to installation of any borehole located on the landfill cap, the geosynthetics must be accessed and cut by hand to prevent drill tooling from pushing down on and stretching or otherwise damaging these systems.

3.02 Installation

A. WELL BORING

1. All drilling and construction methods shall be considered safe and lawful in the State of New York and conducted in accordance with CONTRACTOR'S or DRILLER'S Health and Safety Contingency Plan prepared in accordance with Section 01 35 29.13. If DRILLER'S representative perceives specified method/material to be unsafe or unlawful, then the DRILLER shall notify CONTRACTOR and propose alternative method/material. If change to specified method or material is warranted, then ENGINEER shall review and approve said changes to DRILLER in writing.

2. Borings shall be completed using the best practical methods for the soils and materials encountered. Acceptable methods in the former IDDA 1b source area include hollow-stem auger, performed in accordance with ASTM D 5784 or Sonic drilling, performed in accordance with ASTM D6914 - 04. Sonic drilling, performed in

accordance with ASTM D6914-04 shall be used to install the air sparging wells at the former IDDA 2 and septage lagoon source areas in order to ensure adequate sample recovery and depth integrity for mobile laboratory analysis. However other methods may be acceptable if DRILLER can provide evidence showing benefit over these methods and ENGINEER concurs that sample integrity will not be adversely affected. Boreholes for SVE wells may be drilled by either drilling method. Borings will be installed with the following specified diameters:

a. AIR SPARGING WELL - minimum 6-inch diameter; and

b. SOIL VAPOR EXTRACTION WELL - minimum 8-inch diameter.

3. During boring installation for the air sparging wells in the former IDDA 1b source area, CONTRACTOR will observe and document the drill cuttings until it is determined that the water table has been reached. As the soil boring is advanced below the water table, the DRILLER will use split-spoons, continuous cores, or other appropriate sampling device to collect discrete samples from the soil boring. CONTRACTOR will observe and document the lithologic material in the sample and select the interval for installation of the well screen. Air sparging well screens will be installed at the interface of the Sand/Gravel aquifer and the underlying Silty Sand material with a minimum of ten feet of water column above the top of the well screen. CONTRACTOR will consult with ENGINEER if unsure of stratigraphic contacts or screen depths.

4. During boring installation for the air sparging wells in the former IDDA 2 and septage lagoon source areas, CONTRACTOR will observe and document the drill cuttings until it is determined that the water table has been reached. As the soil boring is advanced below the water table, DRILLER will use continuous cores, or other appropriate sampling device to collect discrete samples from the soil boring. CONTRACTOR will observe and document the lithologic material in the sample and collect three (3) soil samples from each boring for analysis by the on-site mobile laboratory. The CONTRACTOR will field screen recovered soil cores for VOCs using the head space method. Samples will be elected, based on VOC head space screening results, from the top, bottom, and intermediate portions of the total core run. CONTRACTOR will obtain concurrence from ENGINEER on selection of depth intervals to be sampled an submitted to the mobile laboratory. The CONTRACTOR will select the interval for installation of the well screen based on observations of the lithologic material in the soil core. Air sparging well screens will be installed at the interface of the Sand/Gravel aquifer and the underlying Silty Sand material with a minimum of ten feet of water column above the top of the well screen.

5. CONTRACTOR will submit soil samples to the mobile analytical laboratory for the following analyses in accordance with the QAPP:

a. Target Compound List (TCL) Volatile Organic Compounds (VOCs): SW-846 Method 8260B

b. Total Petroleum Hydrocarbons (Gasoline Range Organic): SW-846 8015C and/or ultraviolet fluorescence

c. Total Petroleum Hydrocarbons (Diesel Range Organic): SW-846 8015C and/or ultraviolet fluorescence

6. Alternative analytical methods proposed by CONTRACTOR and/or mobile laboratory shall be reviewed and approved by ENGINEER

7. CONTRACTOR will use soil analytical results to determine if step-out borings are required in the former IDDA 2 and septage lagoon source areas, in consultation with ENGINEER. Step-out borings will be indicated if:

a. Non-aqueous phase liquid (NAPL) is observed in any soil core.

b. The equilibrium pore water concentration of a VOC analyte (based on soil concentration and equilibrium partition coefficient) is greater than its effective solubility (based on pure compound solubility and mole fraction), indicating the presence of NAPL.

8. The location of any step-out boring will be approved by ENGINEER.

B. WELL CONSTRUCTION

1. Specified well construction details and materials are shown on the Construction Drawings. The CONTRACTOR is responsible for ensuring that all wells are constructed as specified in the Construction Drawings. Deviations from the Construction Drawings without the ENGINEER's approval will result in well decommissioning and replacement provided by CONTRACTOR at no cost to OWNER.

2. Upon completion of each boring, a well will be constructed in the borehole. At a minimum, the following procedures will be used to construct each well:

a. CONTRACTOR shall sound the borehole depth and record value.

b. An inert sand filter pack will be installed around the screen using the tremie method. At a minimum, the sand pack will extend 6-inches below the sump cap and 2 feet above the top of screen to ensure that the screen is not exposed directly to the geologic material. The sand pack will be built around the well screen slowly to minimize bridging and formation of voids. The DRILLER will sound the depth to top of installed sand pack and record value.

c. Prior to installation of the bentonite pellet seal in the groundwater monitoring and air sparging wells (i.e. not the soil vapor extraction vents), the sand pack will be "pre-developed" by placing a surge block down the interior of the well and surging several times. The pre-development serves to settle the sand pack and removes many of the voids and bridges that occur during construction of the filter pack.

d. After pre-development, gauge the depth to top of sand pack and if necessary adjust the thickness of the sand pack to a minimum of 2-feet above the top of the screen and record final depth to top of sand pack.

e. Install the bentonite pellet seal a minimum of 2 vertical feet above the sand pack. The seal should be built slowly to prevent bridging and formation of voids. Add sufficient potable water as necessary to ensure proper hydration of the bentonite pellet seal, measure, and record depth to top of bentonite.

f. The bentonite pellet seal will be allowed to hydrate for a minimum of 1-hour before grouting the remaining annulus. Proceeding with grouting before allowing at least 1-hour bentonite hydration time may cause grout contamination and plugging of the well screen. Failure to wait at least 1 hour and any resulting grout contamination that renders the well unusable will the responsibility of the CONTRACTOR and the CONTRACTOR will abandon the well and install replacement at no cost to OWNER.

g. If geosynthetics are present, fill the remainder of the borehole annulus with grout to within 6" of the landfill liner geosynthetics components. A tremie pipe will be used to place Grout from the bottom up to eliminate the potential for voids and bridging. Alternative grouting procedures may used if approved by the ENGINEER. The grout should be allowed to set for a minimum of 24-hours before proceeding with any other well construction activities. If geosynthetics are not present, grout to ground surface;

h. If geosynthetics are present, install a HDPE boot and skirt around the riser as specified in Section 02 05 19. The CONTRACTOR will coordinate the HDPE boot and skirt installation between the DRILLER and approved geosynthetics repair subcontractor to ensure efficient work-flow;

i. If geosynthetics are present, once the HDPE boot and skirt have been installed and approved by the ENGINEER, the remaining borehole annulus will be filled with grout to the ground surface as shown on the Construction Drawings.

j. Install a 12-inch diameter by 4-inch thick concrete pad around the riser as shown on the Construction Drawings

3. CONTRACTOR shall provide a compression cap and locking device for each well which shall have keyed-alike locks. CONTRACTOR will deliver all keys to ENGINEER following completion of well construction activities.

3.03 WELL DEVELOPMENT

A. Following completion of air sparging well construction, DRILLER shall develop the air sparging well using the following procedures:

1. Well development shall not occur until the well has been allowed to set for a minimum 24-hour period following grouting of annulus;

2. Well development will be completed using the “surge and purge” method to promote communication between the well screen, filter pack, and the surrounding aquifer;

3. The well will be surged with a decontaminated surge block (or the submersible pump if approved by ENGINEER) and purged using a decontaminated submersible pump. Alternate surging and purging will continue until all of the following criteria are met;

a. The well water is visually clear or measured turbidity is less than 50 NTUs;

b. The sediment thickness remaining in the well is less than one percent of the screen length as measured by vertical sounding with a weighted tape; and

c. The total volume of water removed from the well equals at least five times the standing water volume in the well (including the well screen and casing plus saturated annulus, assuming 30 percent porosity).

4. Should the recharge to the well be so slow that the required volume cannot be removed in 2 to 3 consecutive hours, if the water remains discolored, or excessive sediment remains after the five-volume removal, the CONTRACTOR shall inform the ENGINEER and other options for improving water quality will be discussed;

5. Development water will also be periodically evaluated for water chemical parameters that at a minimum include pH, specific conductance, and oxidation-reduction potential (ORP).

6. Disposable tubing shall be used for each well;

7. The surge block and pump shall be decontaminated prior to use in any subsequent wells (see Section 3.04); and

8. Development water shall be managed in accordance with Section 3.05 below.

9. A well development log will be maintained during development of each well and should at a minimum include:

   a. well designation;

   b. date of well installation;

   c. date of development;

   d. static water level before and after development;

   e. quantity of drilling fluid lost during drilling;

   f. quantity of standing water in well and annulus (30-percent porosity of saturated annulus assumed for calculation) prior to development;

   g. depth from top of well casing to bottom of well;

   h. screen length;

   i. depth from top of well casing to top of sediment inside well, before and after development;

   j. physical character of removed water, including changes during development in clarity, color, particulates, and odor;

   k. type and size/capacity of pump and/or bailer used;

   l. height of well casing above/below ground surface;

   m. typical pumping rate;

   n. estimate of recharge rate;

   o. water quality parameters time including turbidity, temperature, pH, dissolved oxygen, oxidation-reduction potential; and

   p. quantity of water removed and time for removal.

3.04 DECONTAMINATION

A. Decontamination of all equipment that will contact subsurface soil and/or groundwater will be performed prior to initial activities and between each individual location to prevent cross-contamination between locations.

B. All decontamination activities will occur at a designated decontamination area. CONTRACTOR will be responsible for building a decontamination pad that will collect all solids and liquids generated during decontamination.

C. Downhole drilling equipment such as augers, cutting bits, drill steel, and other associated equipment and tools that will contact potentially contaminated soil will be decontaminated by thoroughly cleaning with a high pressure wash and rinse to remove mud, soil, and other foreign material.

D. Other smaller equipment such as a water level indicator, surge block, or pump that will contact well water after well construction will be decontaminated as follows:

1. Wash equipment thoroughly with a detergent (Alconox or Liquinox) and a potable water solution to remove contamination from the equipment; and

2. Rinse twice with a potable water source to rinse away residual detergent solution.

E. All decontamination liquids and solids will be containerized in accordance with the waste handling procedures outlined in the following section.

3.05 WASTE HANDLING

A. All drill cuttings and other solids dislodged from drill tooling during decontamination will be collected in 55-gallon drums (or other appropriate container) and stored onsite in the drum storage area.

B. All well development and decontamination liquids will be collected in 55-gallon drums and stored onsite in the drum storage area or transferred to a larger bulk storage tank.

C. Personal protective equipment such as gloves or Tyvek and other disposable equipment such as plastic sheeting or tubing that is not thought to be grossly contaminated will be placed in the onsite dumpster for disposal as municipal solid waste. Materials that are thought to be grossly contaminated will containerized in 55-gallon drums and stored onsite in the drum storage area.

D. CONTRACTOR will be responsible for providing all drums or other containers used to store collected waste.

E. CONTRACTOR will be responsible for all drum handling, labeling, and management.

F. CONTRACTOR will be responsible for waste profile testing, coordination with off-sit treatment/disposal facilities, manifesting, load out, transportation, and disposal of all waste including cuttings, development water, PPE, and unused material.

END OF SECTION

SECTION 33 40 00 – Storm Drainage Utilities

33 42 16 Concrete Culverts

Part 1 General

1.01 Section Includes

A. This Section describes the labor, materials, equipment, tools, and appurtenances required to complete the Work of furnishing and installing reinforced concrete culvert pipe (RCP) at the location shown on the Construction Drawings.

1.02 Referenced Sections - None

1.03 Cited Standards

A. AASHTO-M170 for Standard Strength Reinforced Concrete Culvert Pipe for Class V Pipe

B. ASTM-C443

1.04 Noted Restrictions - None

1.05 Quality Control

A. Pipe installation shall be done by skilled workers. Each pipe laying crew shall have a pipe laying foreman.

B. Accurately install pipe as shown on the Contract Drawings, or as directed by the ENGINEER, so that inverts are smooth.

C. A full circle shall be visible at the far end, when looking through pipes, unless bends are specified or shown on the Construction Drawings.

D. Deflections at joints are not permitted without the prior consent of the ENGINEER.

E. Notify the ENGINEER in advance whenever an existing pipeline conflicts with the proposed locations of the Work.

F. Pipe and fittings of the same type shall be the products of a single manufacturer.

G. The manufacturer shall test and furnish certificates covering all pipe, fittings and accessories supplied under this Section demonstrating that the requirements of this Section have been met.

1.06 Submittals

A. Shop drawings, catalog cuts, and manufacturer's literature for all pipe and pipe fittings to include coatings and linings, material specifications, dimensions, tolerances, and all related data.

1.07 Delivery, Storage, And Handling

A. Carefully handle all pipes and fittings when loading and unloading. Avoid damaging the pipe, its coating, or its lining.

B. Store piping so that it does not interfere with Site operations.

Part 2 PRODUCTS

2.01 REINFORCED CONCRETE PIPE

A. Reinforced concrete pipe shall conform to the requirements of AASHTO-M170 for Standard Strength Reinforced Concrete Culvert Pipe for Class V Pipe unless otherwise designated on the plans. All pipe 12 inch in diameter or smaller shall be of the bell-and-spigot type. Pipes larger than 12 inch in diameter shall be tongue and groove or bell and spigot.

2.02 RUBBER RING GASKETS

A. Rubber ring gaskets shall conform to ASTM-C443 and shall be tough, flexible, chemical-resistant material, and of such size and shape as to ensure satisfactory pipe joints when incorporated in the Work.

Part 3 EXECUTION

3.01 EXCAVATION

A. Excavation for pipe and pipe bedding shall be dug by hand with caution due to proximity of geosynthetic cap system. Carefully cut the erosion control mat underlying the existing channel.

3.02 LAYING OF PIPE

A. The laying of pipe shall begin at the downstream end of the pipe line. The lower segment of the pipe shall be in firm contact with the bedding throughout its full length. Bell or groove ends of pipe shall be placed facing upstream.

B. The pipe bedding shall consist of coarse aggregate placed to conform to pipe shape. Pipe bedding shall extend a minimum of 6-inches below the pipe invert and shall extend a minimum of 2 feet above the top of the pipe for the full width and length of the trench.

3.03 INSPECTION

A. Carefully inspect each length of pipe and each fitting prior to lowering into place. Clearly mark and remove unsatisfactory materials from the job site.

B. Carefully inspect the trench subgrade and bedding.

C. Inspect each stretch of completed pipeline prior to backfilling, to ensure compliance with, the Contract Documents. Do not backfill prior to inspection by the ENGINEER.

3.04 PIPE INSTALLATION

A. Install pipe and fittings so that there will be no deviation at the joints and so that inverts present a smooth surface.

B. Install pipes in the locations and to the required lines and grades as shown, using a method of control approved by the ENGINEER.

C. Maintain cleanliness of installed pipe and fittings interiors throughout the Work. Plug ends when pipe installation is not in progress. Remove all plugs as required to place pipe into operation. Drainage of construction excavations through new pipes is prohibited.

D. All adjustments to the line and grade of pipe shall be performed by scraping away or filling in the bedding under the barrel of the pipe and not by blocking or wedging. Where additional bedding is required, it shall be provided at no additional cost to the OWNER. In all cases, the trench under the joint shall be excavated and suitably shaped to permit an even bearing for the barrel of the pipe.

E. When unsuitable materials or conditions are encountered, excavate below grade until a suitable foundation is encountered and backfilled with compacted coarse aggregate.

F. Approval by the ENGINEER is required prior to changing the location of any of the work due to field conditions. Changes in pipe sizes are prohibited without prior consent from the ENGINEER.

G. All installed piping shall form completely connected systems including connections to valves, equipment, structures, existing facilities, and appurtenances specified in other sections to result in a satisfactorily operating installation.

3.05 ADJUST AND CLEAN

A. All sections of piping found defective in material, alignment, grade, joints, or otherwise, shall be satisfactorily corrected.

B. Leave all the pipes and connections watertight.

C. Upon completion of construction of pipelines and appurtenances, all pipelines shall be thoroughly flushed out with water and all temporary plugs shall be removed. Flushing shall be executed in such manner that dirt or other material will not be discharged into existing sanitary sewers or water courses.

3.06 JOINING PIPE SECTIONS

A. Reinforced concrete pipe shall be joined using flexible water tight rubber gaskets conforming to ASTM-C443.

END OF SECTION

SECTION 33 70 00 Electrical Utilities

SECTION 33 71 73 Electrical Utility Services

Part 1 GENERAL

1.01 Section includes

A. Section includes arrangement with Utility Company for permanent electric service; payment of Utility Company charges for service; service provisions; and utility metering equipment.

B. System Description

1. Utility Company: New York State Electric and Gas Corp (NYSEG)

2. System Characteristics: 480Y/277 volts, three phase, four wire, 60 Hz.

a. IDDA 1b: 400 A Service

b. IDDA 2 and Septage Lagoons: 200 A Service

3. Service arrangement: Underground from NYSEG provided Pad-mounted Transformer.

4. Underground Service Provisions:

a. Underground primary cable conduits (three 4" C) from riser pole, bore through railroad Right of Way, and trench to Transformer pad.

b. Transformer Pad, grounding, etc. per Utility Standards.

c. Secondary service laterals from transformer pad to service-entrance equipment at each equipment pad. Through meter.

d. ¾" conduit from meter to telephone service backboard for Utility's use.

1.02 Related Sections:

A. Section 01 40 00 - Quality Requirements: Requirements for references.

B. Section 03 30 00 - Cast-in-Place Concrete: Concrete pads.

C. Section 31 23 33 – Trenching and Backfilling

D. Section 33 05 23 – Trenchless Utility Installation

1.03 References

A. NYSEG

1. SP-1099. Specifications for Customer Electrical Service, 2.4 kV to 34.5 kV

2. Specifications for Electric Installations: Requirements for the Installation of Electric Services & Meters

1.04 Quality Control

A. Perform work of this Section in accordance with Utility Company written requirements.

1.05 Existing Conditions

A. Verify field measurements are as shown on the Drawings.

1.06 Coordination

A. Contact Utility Company regarding charges related to service installation. Include utility charges in the Contract.

B. Provide information required for OWNER's application to Norfolk Southern for Wire or Pipeline Occupancy.

Part 2 PRODUCTS

2.01 Utility Meters

A. Furnished by Utility Company and installed by this Contractor at Transformer Pad.

B. Description: Self-contained watt-hour meter with demand attachment, rated 600 amperes at 480Y/277 volts, three phase.

2.02 Transformer Pad

A. Product Description: Cast-in-place concrete or Precast concrete transformer pad with cable pit, per NYSEG Standards..

Part 3 EXECUTION

3.01 Examination

A. Section 01 70 00 - Execution Requirements: Verification of existing conditions before starting work.

B. Verify service equipment is ready to be connected and energized.

3.02 Installation

A. Install service entrance conduits to each equipment pad service entrance equipment. Utility Company will terminate the secondary service lateral conductors at the pad-mounted transformer.

B. Install cast-in-place concrete pad for Utility Company transformer, in accordance with Section 03 30 00.

END OF SECTION

CORTESE LANDFILL SITE

NARROWSBURG, NEW YORK

OU 4 REMEDIAL DESIGN

ENGINEERING SPECIFICATIONS

DIVISION 40

PROCESS INTEGRATION

PROJECT:	**OU 4 REMEDIAL DESIGN**
LOCATION:	**CORTESE LANDFILL NARROWSBURG, NEW YORK**
PROJECT NO.:	**MR0562B**
COMPANEW YORK:	**CORTESE LANDFILL PRP GROUP**
PREPARED BY:	Geosyntec consultants engineers | scientists | innovators

SECTION 40 00 00 - PROCESS INTEGRATION

40 05 00 Common Work Results for Process Integration

Part 1 General

1.01 General Conditions

A. The General Conditions apply to all work of this Specification, which shall be done as shown on the plans, and as specified, and shall be properly coordinated with work in other Specifications.

B. The Drawings and these Specifications are complementary to each other; what is called for by one shall be as binding as if called for by both. If there is any conflict between what is shown on the Drawings and what is written in the Specifications, the more restrictive shall take precedence and the CONTRACTOR shall communicate the conflicts to the OWNER's REPRESENTATIVE prior to constructing the work.

C. Safety

1. The CONTRACTOR shall be familiar with, and shall at all times conform to, the regulations of the *"OSHA General Industry Occupational Safety and Health Standards," "OSHA Safety and Health Regulations for Construction,"* and other applicable state and municipal standards and regulations.

2. Protection of Work Area

a. The CONTRACTOR shall be familiar with possible/potential utilities that may impact construction work, and plan work accordingly.

b. The CONTRACTOR shall verify the possible locations for all underground utilities before beginning excavation work for pipe installation.

c. The CONTRACTOR shall protect existing site improvements from damage during construction of underground pipeline.

1.02 Referenced Sections - none

1.03 Cited Standards

A. All work performed shall comply with the following, or latest revisions of as applicable:

1. "GREENBOOK" Standard Specifications for Public Works Construction, 2006 Edition written by Public Works Standards, Inc. Vista, CA.

B. For welding operations (where necessary), welders and operators shall perform work in accordance with the following, as applicable for shop and

project site welding of piping work:

1. ASME B31.1 / B31.3 Power and Process Piping Package

2. ASME B31.9 - Working Pressure and Temperature Limits

C. For brazing procedures (if necessary), procedures, brazers, and operators shall be certified in accordance with the following, as applicable for shop and job-site brazing of piping work:

1. ASME Boiler and Pressure Vessel Code, Section IX,

1.04 Noted Restrictions

A. All mechanical equipment located within well vaults shall be constructed of stainless steel material unless indicated otherwise on the drawings.

B. SAE Grade 5 zinc coated bolts shall be used for above-ground flange joints. Threads shall be coated with an anti-seizing compound before nut installation.

C. Buried flange joints shall be 316 Stainless Steel per ASTM F593-95 with an 85,000 psi average tensile strength. Threads shall be coated with an anti-seizing compound before nut installation.

1.05 Quality Control

A. Manufacturers for piping shall be firms regularly engaged in manufacture of pipes and pipe fittings of types and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.

B. Installer's Qualifications:

1. Firm with at least 3 years history of successful experience on projects of similar nature.

2. Licensed as a firm in the contractor state of origin and in the state of California.

C. Welding Certification:

1. Each welder shall have passed a qualification test within the past six months.

2. The test shall be in accordance with the ASME Boiler and Pressure Vessel Code, Section IX, "Welding Qualifications", ASME Section VIII, and ANSI 313.

3. The test report shall certify that the welder is qualified to weld the material to be used at the job site.

4. The CONTRACTOR shall submit three copies of each welder's qualification test report to the Project Manager for approval prior to commencing the work. No welder shall be used on the project until so certified.

1.06 Submittals

A. Product Data: Submit manufacturer's technical product data, installation instructions, and dimensioned drawings for each type of pipe and pipe fitting. Submit piping schedule showing manufacturer, pipe or tube weight, fitting type, and joint type for each piping system.

B. Welding Certifications: Submit reports as required for piping work.

C. Brazing Certifications: Submit reports as required for piping work.

D. Maintenance Data: Submit maintenance data and parts lists for each type of mechanical fitting. Include this data, product data, and certifications in maintenance manual; in accordance with requirements of Division 1.

1.07 Deliverables

A. Except for concrete, corrugated metal, hub-and-spigot, clay, and similar units of pipe, provide factory-applied plastic end-caps on each length of pipe and tube. Maintain end-caps through shipping, storage and handling as required to prevent pipe-end damage and eliminate dirt and moisture from inside of pipe and tube.

B. Where possible, store pipe and tube inside and protected from weather. Where necessary to store outside, elevate above grade and enclose with durable, waterproof wrapping.

C. Protect flanges and fittings from moisture and dirt by inside storage and enclosure, or by packaging with durable, waterproof wrapping.

Part 2 Products – Not Used

Part 3 Execution – Not Used

END OF SECTION

40 05 13.11 Leak Testing of Piping

Part 1 General

1.01 Section Includes

A. This specification identifies the minimum requirements for leak testing of all piping performed by the CONTRACTOR.

1.02 Referenced Sections

A. Related Sections are below.

1. SECTION 40 05 13 - COMMON WORK RESULTS FOR PROCESS PIPING

1.03 Cited Standards – none

1.04 Noted Restrictions

A. Leak testing shall be limited to 1,000 foot intervals or between isolation valve locations, whichever is the shorter distance.

B. Changes in temperature will increase or decrease the apparent test pressure in any piping system. The effect depends on the rate of expansion of the pipe wall compared to the water in the pipe. When possible, testing should be done during periods of relatively stable atmospheric temperatures. Early mornings and late afternoons are good times to test the pipe when it has not been buried.

C. Under no circumstances shall the total time under the test exceed eight (8) hours at 1.5 times the pressure rating of the lowest rated component in the system. If the test is not completed due to leakage, equipment failure, etc., the test section shall be allowed to “relax” for eight (8) hours prior to the next test.

1.05 Quality Control

A. The CONTRACTOR shall perform hydrostatic testing of all single-walled piping and the inner pipe of double-walled piping.

B. The CONTRACTOR shall conduct pneumatic leak testing on the secondary containment piping of the environmental pipeline (double walled HDPE pipeline) and instruments, tubing and connections operating with an air or gaseous media.

C. The CONTRACTOR shall develop detailed procedures for leak testing based on the minimum requirements of this specification, and manufacturer's instructions. All leak testing procedures shall be submitted to the OWNER’s REPRESENTATIVE for review and approval.

D. All leak testing shall be witnessed by the OWNER or OWNER’s REPRESENTATIVE.

E. In general, service leak testing shall be conducted on the following systems:

1. All equipment, equipment connections and pipelines.

2. Instruments and instrument tubing connections to equipment, piping, or ducting.

3. Flanges or other connections temporarily blinded or capped for hydrostatic or pneumatic testing.

F. Requirements Prior to Testing

1. Before testing, the pipe trench shall be backfilled with a minimum of 2-1/2 feet of material, or center loaded to hold the pipe in place while testing.

1.06 Submittals

A. Two weeks prior to the start of leak testing, the CONTRACTOR shall submit detailed leak testing procedures for the OWNER's REPRESENTATIVE's review and approval as per **Section 40 05 13.09 Flushing and Testing**.

Part 2 Products

2.01 General

A. All temporary test gauges, fittings, hoses, valves, pumps, compressors, test media, relief devices, and leak inspection materials, including soap solutions, shall be specified and provided by the CONTRACTOR.

B. Any replacement piping components required to repair leaks, shall be provided by the CONTRACTOR at no additional cost to the OWNER.

C. Water

1. Make-up water for testing shall be potable water.

D. Test Bulkheads

1. Design and fabricate test bulkheads per Section VIII of the ASME Boiler and Pressure Vessel Code. Materials shall comply with Part UCS of said code. Design pressure shall be at least 2.0 times the specified test pressure for the section of pipe containing the bulkhead. Limit stresses to 70 percent of yield strength of the bulkhead material at the bulkhead design pressure. Include air-release and water drainage connections.

E. Vents and Drain for Aboveground Piping

1. Install vents on the high points of aboveground piping, whether shown on the Drawings or not. Install drains on low points of aboveground piping, whether shown on the Drawings or not. Provide a valve at each vent or drain point. Valves shall be 3/4-inch for piping 3 inches and larger and 1/2-inch for piping smaller than 3 inches.

F. Manual Air-Release Valves for Buried Piping

1. Provide temporary manual air-release valves for pipeline test. Construct the pipe outlet in the same manner as for a permanent air valve and after use, seal with a blind flange, pipe cap, or plug and coat equal to the adjacent pipe.

2.02 Testing Equipment

A. The CONTRACTOR shall provide all equipment required for hydrostatic and pneumatic testing, including, but not limited to:

1. All fittings bleed points, pumps, flanges, connections, etc., necessary to perform hydrostatic test.

2. Clean water, with sufficient quantity to fill pipeline section under test.

3. A strainer on the inlet side of pump to prevent foreign matter from entering the pipeline.

4. Flange connections and/or valves suitable to isolate the pipeline section being tested without leaking.

5. A relief valve capable of permitting pressure relief if pressure exceeds 20 to 25 percent above required test pressure to prevent pipeline failure.

6. Testing pressure gauge(s)

a. Sufficient number of pressure gauges capable of measuring 50 percent over the intended test pressure. Pressure gauges shall be accurate within 1.0 percent.

b. Pressure gauges and relief valves shall be checked for accuracy prior to use during actual testing of the pipeline.

7. A booster pump with sufficient capacity to boost the source water pressure to the required test pressure.

8. An air compressor with sufficient capacity to provide air pressure to the required test pressure for the leak tests.

Part 3 Execution

3.01 General Examination

A. The system or portion of the system to be tested shall be verified to determine that the system is mechanically completed and the following requirements have been met:

1. All solvent welded or bonded joints have cured for at least 8 hours unless the ambient temperature is less than 70 degrees Fahrenheit (°F). If the ambient temperature is less than 70°F, the cure time shall be in accordance with the manufacturer's instructions.

2. All welding has been completed, including the acceptance of all required nondestructive examinations on pressure retaining welds.

3. All fusion joints have been completed, including the acceptance of all required nondestructive examinations on pressure-retaining welds.

4. All flanged connections have been completed, including bolting and gaskets.

5. All expansion joints have been installed and suitably anchored or guided in accordance with the manufacturer's instructions.

6. All nipples and valves have been installed for vents, drains, and instrument connections as specified on the applicable design Drawings.

7. All anchors and supports have been placed as specified on the applicable design Drawings.

8. All joints, including welds, bonds, and piping joints have been left uninsulated and/or unburied and exposed for examination during testing.

B. Verification shall include a comparison of the system to be tested to the mechanical flow, piping, and other applicable design Drawings and the requirements of Section **40 05 13 Common Work Results for Process Piping,** as applicable.

3.02 General Preparation

A. The CONTRACTOR shall have a written plan, approved by the OWNER's REPRESENTATIVE, in place as required by **Section 40 05 13.09** and shall follow the requirements of the plan.

B. Equipment or piping that is not to be tested shall either be disconnected or isolated by blinds or other means. A valve may be used in place of a blind if the valve is rated to the test pressure.

C. Instrumentation shall not be installed prior to testing unless the instrument is vented.

D. If the OWNER's REPRESENTATIVE approves hydrostatic testing of vapor or gas lines, temporary supports shall be provided, if necessary, to support the weight of the test liquid.

E. Sufficient vents and drains shall be located and installed by the CONTRACTOR to allow the removal of air.

F. All temporary test connections shall be completed.

G. If impractical to test in place and if specifically approved by the OWNER or the OWNER's REPRESENTATIVE, short runs or spools of piping may be interconnected and tested together.

H. Check valve internals shall be disassembled if the direction of the check valve does not allow complete filling or depressurizing of the system.

I. Booster pump(s) shall provide sufficient capacity to boost the source water pressure to the required test pressure.

J. Prior to testing the pipeline shall be properly flushed as per the flushing Specifications in **Section 40 05 13.09 Flushing and Testing.**

3.03 Hydrostatic Leak Testing Requirements

A. Hydrostatic leak tests shall conform to the requirements of this specification and the manufacturer's instructions.

B. Test pressures for all piping systems shall not exceed 150% of the design pressure for the least-rated pipe, fitting, or valve installed in the system.

C. Air vents shall be provided by the CONTRACTOR at high points in the system to ensure that all air is purged from the system during filling. The number and location of all high point air bleeds shall also be approved by the OWNER's REPRESENTATIVE.

D. The CONTRACTOR shall conduct a leak test on all installed piping. The CONTRACTOR shall also furnish all necessary equipment and materials, and make all taps in the pipe as required. The OWNER shall be notified at least 72 hours in advance of testing.

E. Drain valves shall be provided to facilitate filling and draining of all test liquid from the system. Drain valves may be omitted if the system is to operate liquid filled.

F. Tests shall not be performed unless weather conditions ensure a dry surface on the system to be tested or suitable weather protection can be provided.

G. Testing shall not commence until all sections of the pipeline to be tested have been secured to prevent damage to adjacent piping and equipment in the event of a joint failure. Any appurtenant instruments or devices that could be damaged by the test shall be removed from the piping or suitably isolated prior to applying the test. The CONTRACTOR will be held responsible for any damage caused by the testing.

H. During hydrostatic leak testing, joints shall be exposed for visual inspection. It is advised to cover the pipeline in intervals, especially at curves to hold the pipe in place during pressure testing.

I. Expansion joints and/or expansion compensators shall be restrained, isolated, or removed during pressurized leak testing.

J. All leaks identified shall be repaired and retested at no additional expense to the OWNER, including labor and replacement of any material. After repair, the system shall be retested.

K. After testing, the CONTRACTOR shall remove all temporary blinds and remake all connections disassembled for the leak test.

L. The pipe shall not be backfilled until visual inspection has been completed. Joints shall not be backfilled until successful completion of the leak test.

3.04 Hydrostatic Leak Testing Procedure

A. The hydrostatic test procedure developed by the CONTRACTOR shall include the following provisions:

1. Air vents shall be opened to allow elimination of air from the system.

2. The tested pipeline shall be slowly filled (<1fps) with test fluid at the lowest point in the system. The CONTRACTOR shall provide means for increasing pressure to the required test pressures.

3. The test section shall be completely filled with the test medium, taking care to bleed off any trapped air.

4. When the tested pipeline is completely filled with the test fluid, the vents shall slowly be closed and line pressure shall slowly be brought up to the indicated test pressure.

5. Piping shall be tested up to 150% of the max. operating pressure (MAOP) of the lowest-rated component of each specified line segment.

B. The primary system shall be pressure tested hydrostatically in the phases as follows:

1. Initial Phase - Using clean water, the piping shall be tested up to 150% of the MAOP. Once the target is reached, allow 3 hours for diametric expansion.

2. Test Phase - After the pipeline has had time for equilibration, the test section shall be returned to 150% of the MAOP, the pump turned off, and a final test pressure held for 2 to 3 hours. If there is a leak observed, then the pipeline fails the test. Since double contained HDPE pipe is being tested, the DRISCO® test procedures shall be followed which includes allowable makeup. These conditions are described below.

3. DRISCO® HDPE Hydrostatic Leak Testing Procedures

a. Polyethylene pipe holds pressure by developing stress in its walls. This process continues throughout the test period and the pipe increases slightly in diameter. Pressure drop will occur due to continued expansion of the pipe during the second phase of the test. A drop in pressure during the test phase is common and does not prove with absolute certainty that a leak or failure is present in the system.

b. Polyethylene pipe is tested by measuring the "make up" water required to return the section to test pressure.

c. Allowable amounts of makeup water for expansion during the pressure test are shown in Table 16 from PPI Technical Report TR 31 shown below.

TABLE 16: HDPE ALLOWANCE FOR EXPANSION UNDER TEST PRESSURE*

Allowance for Expansion (U.S. Gallons / 100 Feet of Pipe)

Nominal Pipe Size (in)	1 Hour Test	2 Hour Test	3 Hour Test
3	0.10	0.15	0.25
4	0.13	0.25	0.40
6	0.30	0.60	0.90
8	0.50	1.0	1.5
10	0.75	1.3	2.1
11	1.0	2.0	3.0
12	1.1	2.3	3.4
14	1.4	2.8	3.2
16	1.7	3.3	5.0
18	2.2	4.3	6.5
20	2.8	5.5	8.0
22	3.5	7.0	10.5
24	4.5	8.8	13.3
28	5.5	11.1	16.8
32	7.0	14.3	215.0
36	9.0	18.0	27.0
40	11.0	22.0	33.0
48	15.0	27.0	43.0

Note: *These allowances only apply to the test period and not to the initial expansion phase.

d. If the test pressure is not returned within the allowable volume of water, the test fails.

e. If there are no visual leaks or significant pressure drops during the final test period, the pipeline passes the test.

C. Procedures Following Results

1. Examination for leakage shall be made of all welds, joints, and connections.

2. If a pressure test fails, the pipe shall be relieved, and the test section allowed to "relax" for a minimum of 8 hours before another test is attempted.

3. Upon satisfactory completion of the test, the system shall be slowly depressurized and completely drained. Air vents shall be opened as required to prevent inducing a vacuum on the system.

4. Provisions shall be made to divert draining test fluid from excavated and trenched areas and to maintain well formed and supported excavations throughout the testing procedure.

D. Test Records

1. Records shall be made of each piping system installation during the test. These records shall include:

a. Date of test.

b. Description and identification of piping tested including a marked up plan and profile.

c. Starting test pressure and end pressure.

d. Remarks, to include leaks (type, location) and repairs made on leaks

e. Certification by the CONTRACTOR and signed acknowledgement by the OWNER's REPRESENTATIVE.

3.05 Pneumatic Leak Test

A. General Requirements

1. The CONTRACTOR shall conduct pneumatic leak testing on the secondary containment piping of the environmental pipeline (double walled HDPE pipeline) and instruments, tubing and connections operating with an air or gaseous media.

2. The inner pipe of double walled HDPE piping shall remain full of water throughout the pneumatic testing of the outer pipe to prevent collapsing.

3. Pneumatic leak tests shall conform to the requirements of this specification and ANSI B31.3. Pneumatic leak testing of double-contained piping shall also conform to the manufacturer's instructions. Special precautions for pneumatic leak testing are identified in ANSI B31.3.

4. Test pressures shall not exceed 10 psig.

5. A pressure relief device shall be provided with a set pressure that does not exceed 110 percent of the test pressure. Sizing and selection of the pressure relief device shall be determined by the CONTRACTOR.

6. Tests shall not be performed unless weather conditions ensure a dry surface on the system to be tested or suitable weather protection can be provided.

7. All leaks shall be repaired at no additional expense to the OWNER, including labor and replacement of any material. After repair, the system shall be retested.

8. A "leak" shall be defined as a formation of bubbles observed when a soap solution is applied or as indicated by the criteria for double walled HDPE piping in Paragraph B. 5. below.

9. Upon satisfactory completion of the test, the pressure shall be slowly released.

B. Special Procedural Requirements for Doubled Walled HDPE Piping

1. Cap off the inner pipe and the containment annulus separately and provide pressure gauges on each end of the inner pipe and each end of the annulus. (Four gauges).

2. Using low-pressure compressed air, charge the annular space to the lesser of approximately one-half of the test pressure or 2.5 pounds per square inch gauge (psig) at which time a preliminary check of the system shall be conducted.

3. Thereafter, the pressure shall be gradually increased in increments of approximately one-tenth of the test pressure. The incremental pressure shall be held long enough to equalize the system, until the test pressure (10psig) is attained.

4. The test pressure shall be maintained for a minimum of 2 hours.

5. In a tight system, the containment gauge should read 10 psi (minus losses due to expansion), and the carrier gauge should be zero. If there is a leak in the containment piping, the containment gauge will begin to drop. If, however, there is a leak in the carrier piping, the inner piping will become pressurized.

6. If a leak is detected, the leak shall be located and the leaking section shall be replaced. The leak detection procedure shall be repeated until satisfactorily completed at no cost to the OWNER.

7. Upon satisfactory completion of the test, the system shall be slowly depressurized.

ATTACHMENT 1
HYDROSTATIC AND PNEUMATIC TEST DATA SHEET

Project Number: Project Name:

Piping System/Equipment:

Description of Piping System/Equipment Being Tested:

Reference Criteria:	
Type of Test:	Test Medium:
Operating Pressure:	Operating Temperature:
Test Pressure:	Test Temperature:
Examination Pressure:	Examination Temperature:
Minimum Holding Time at Test Pressure:	Minimum Holding Time at Examination Pressure:
Allowable Leakage:	

Pressure Test Gauge(s) Identification Number: _____
Calibration Due Date: _____

Test Relief Valve(s) Identification Number: _____
Calibration Due Date: _____

PRETEST RELEASE SIGN-OFF

Mechanical	Eng. _____	Date: _____	Supt: _____	Date: _____
Welded Joints	Eng. _____	Date: _____	Supt: _____	Date: _____
Instrumentation	Eng. _____	Date: _____	Supt: _____	Date: _____

Time Test Started:	Time Test Completed:

Comments:

Performed by Name: Date:	Witnessed by Client Name: Date:
Verified by Name: Date:	Witnessed by OWNER's REPRESENTATIVE Name: Date:

40 05 13.12 Tracer Wire and Marking Tape for Buried Piping

Part 1 General

1.01 Section Includes

A. This section includes Specifications applicable to non-metallic buried piping unless specified otherwise by the OWNER's REPRESENTATIVE.

B. During installation of buried non-metallic piping, the CONTRACTOR shall furnish and install tracer wire and detectable Mylar marking tape as per the Drawings and the following Specifications.

Part 2 Products

2.01 Tracer Wire

A. Tracer wire shall be No. 14 AWG bare copper wire with TW insulation.

2.02 Detectable Mylar Marking Tape

A. The marking tape shall be 6" wide foil detectable Mylar marking tape. The detectable marking tape will bear the words "CAUTION - BURIED PIPELINE BELOW", "CAUTION - BURIED WATER LINE BELOW" or "CAUTION - BURIED ENVIRONMENTAL LINE BELOW". The printing will be under Mylar so as to be readable through the clear Mylar.

B. Maximum spacing between the continuous warning messages shall be 16". The tape shall be a highly visible color and the tape will be color coded in accordance with the American Public Works Association and Utility Location Coordination Council Standards for non-potable water.

C. The tape shall be specially designed for prolonged underground use and shall be easily detectable with an electronic locator.

D. The Detection tape shall be as manufactured by Pollard Co. Inc., Long Island, NY (Model Nos. 802, 803, 804); Reef Industries, Inc., Houston, TX; Seton Identification Products, Branford, CT; or an approved equal.

Part 3 Execution

3.01 Tracer Wire

A. Buried non-metallic utilities (electrical, mechanical, and civil) shall have a tracer wire along the entire length of the pipeline unless indicated otherwise. The tracer wire shall be installed in accordance with its corresponding drawing shown in the Standard Details.

B. The tracer wire shall be positively attached to the crown of non-metallic buried utilities by taping, use of plastic wire, ties, or another similar type of attachment approved by the utility owner at a maximum of 10 ft. intervals for straight run of utility and at all changes of direction.

C. The ends of the tracer wire shall be exposed above the finished grade.

D. Concrete valve boxes shall be installed at the locations where the ends of the tracer wire are exposed above the finished grade.

E. Tracer wire shall be exposed above finished grade in precast concrete boxes at the transition where the non-metallic buried utility connects to the existing metallic utility (see drawings for locations).

F. Tracer wire shall be continuous between boxes and shall be tested for continuity.

3.02 Detectable Mylar Marking Tape

A. General

1. The CONTRACTOR shall install a six-inch wide foil detectable mylar marking tape over all nonmetallic water lines. It shall be inductively locatable and conductively traceable using standard pipe and/or cable locating devices.

2. Care shall be taken to insure that the buried marking tape is Mylar encased aluminum foil.

3. The detectable marking tape will be buried 8 in. below finish grade. The tape should be placed into backfill and allowed to settle into place in the backfill.

4. The marker tape shall be in accordance with its corresponding drawing shown in the Standard Details.

B. Installation Details:

1. The tape shall be laid directly above the piping or conduit and directly on top of the compacted earth subgrade immediately before restoring the pavement.

2. In open areas, the tape shall be laid during the backfilling operation on smooth, compacted backfill at a distance of 12” below the surface of the area.

3. The ends of the tape shall be lapped approximately six (6) inches.

3.03 Surface Restoration

A. All areas disturbed during construction, including, but not limited to, roads, curbs, sidewalks, open areas, and landscaped areas, shall be repaired in accordance with appropriate sections of the Standard Plans for Public Works Construction 1997 and The Standard Plans for Public Works Construction Supplement 1999.

3.04 Certification of Completion

A. Upon completion of the piping system, the CONTRACTOR shall certify the following to the Company:

1. The piping system has been constructed in accordance with the contract plans and Specifications.

2. The piping system has been field flushed and tested and has passed all of the required tests in the approved project plans and Specifications.

END OF SECTION

40 05 13.73 Plastic Process Piping (Sch 80 PVC Piping)

Part 1 General

1.01 Section Includes

A. This specification outlines the requirements for Polyvinyl Chloride (PVC) Schedule 80 pressure pipe. This pipe meets and or exceeds the industry standards and requirements as set forth by the American Society for Testing and Materials (ASTM) and the National Sanitation Foundation (NSF International).

1.02 Referenced Sections

A. Related Sections are shown below.

1. Section 40 05 13.11 - Leak Testing Of Piping

1.03 Cited Standards

A. All plastic process piping shall adhere to the following standards, or latest revisions of, as applicable:

1. ASTM D1784 – 08 Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds

2. ASTM D1785 – 06 Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120

3. ASTM D 3034 Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings

4. AWWA C900-07, AWWA Standard for Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 In. Through 12 In. (100 mm Through 300 mm), for Water Transmission and Distribution

5. ANSI/AWWA C905-08, AWWA Standard for Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14 In. Through 48 In. (350 mm Through 1,200 mm), for Water Transmission and Distribution

6. ASTM D 2321 Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications

7. National Sanitation Foundation (NSF International STD 61, STD 14)

1.04 Noted Restrictions

A. This pipe is intended for use in applications where the fluid conveyed does not exceed 140°F.

B. Threaded connections are not recommended for PVC pipe at temperatures above 110°F. The CONTRACTOR shall use flanged joints, unions, or roll grooved couplings where disassembly is necessary at elevated temperatures.

1.05 Quality Control

A. PVC Pipe Product Marking

1. For all PVC Piping, product marking shall meet the requirements of ASTM D1785 and shall include:

a. the manufacturer's name (or manufacturer's trademark when privately labeled)

b. the nominal pipe size

c. the material designation code

d. the pipe schedule and pressure rating in psi for water @ 73°F

e. the ASTM designation D1785

f. the independent laboratory's seal of approval for potable water usage

g. the date and time of manufacture.

B. The CONTRACTOR shall protect existing site improvements from damage during installation of above and underground pipeline.

1.06 Submittals

A. CONTRACTOR shall submit copies of the manufacturer's product specifications according to the requirements of **Section 01 33 00 Submittal Procedures**.

Part 2 Products

2.01 Schedule 80 PVC Pipe

A. All pipe shall be manufactured by one of the following, or an equal approved by the OWNER's REPRESENTATIVE.

1. Harvel® Plastics, Inc., Easton, PA

2. J-M Pipe, Livingston, NJ

3. Hunter Engineered Plastics, Lincoln, AL

4. National Pipe Co., Vestal, NY

B. The material used in the manufacture of the pipe shall be domestically produced rigid polyvinyl chloride (PVC) compound, Type I Grade I, with a Cell Classification of 12454 as defined in ASTM D1784.

C. The pipe shall be manufactured in the USA, using domestic materials, by an ISO 9001 certified manufacturer. This compound shall be gray in color as specified, and shall be approved by NSF International for use with potable

water (NSF Std 61).

D. Dimensions

1. PVC Schedule 80 pipe shall be manufactured in strict accordance to the requirements of ASTM D1785 for physical dimensions and tolerances. Each production run of pipe manufactured in compliance to this standard, shall also meet or exceed the test requirements for materials, workmanship, burst pressure, flattening, and extrusion quality defined in ASTM D1785.

2. All belled-end pipe shall have tapered sockets to create an interference-type fit, which meet or exceed the dimensional requirements and the minimum socket length for pressure-type sockets as defined in ASTM D2672.

3. All PVC Schedule 80 pipe must also meet the requirements of NSF Standard 14 and CSA Standard B137.3 rigid PVC pipe for pressure applications, and shall bear the mark of these Listing agencies.

4. This pipe shall have a flame spread rating of 0-25 when tested for surface burning characteristics in accordance with CAN/ULC-S102-2-M88 or equivalent.

5. Schedule 80 PVC Pipe Dimensions are shown in the table below (pipe sizes shown in strict compliance with ASTM D1785).

Schedule 80 Dimensions (1/8" – 4")

Nom. Pipe Size (in)	O.D.	Avg. I.D.	Min. Wall	Nom. Wt./Ft.	Max. Working Pressure (PSI)
1/8"	0.405	0.195	0.095	0.063	1230
1/4"	0.540	0.282	0.119	0.105	1130
3/8"	0.675	0.403	0.126	0.146	920
1/2"	0.840	0.526	0.147	0.213	850
3/4"	1.050	0.722	0.154	0.289	690
1"	1.315	0.936	0.179	0.424	630
1-1/4"	1.660	1.255	0.191	0.586	520
1-1/2"	1.900	1.476	0.200	0.711	470
2"	2.375	1.913	0.218	0.984	400
2-1/2"	2.875	2.290	0.276	1.500	420
3"	3.500	2.864	0.300	2.010	370
3-1/2"	4.000	3.326	0.318	2.452	350
4"	4.500	3.786	0.337	2.938	320

Schedule 80 Dimensions (5" – 24")

Nom. Pipe Size (in)	O.D.	Avg. I.D.	Min. Wall	Nom. Wt./Ft.	Max. Working Pressure (PSI)
5"	5.563	4.768	0.375	4.078	290
6"	6.625	5.709	0.432	5.610	280
8"	8.625	7.565	0.500	8.522	250
10"	10.750	9.493	0.593	12.635	230
12"	12.750	11.294	0.687	17.384	230
14"	14.000	12.410	0.750	20.852	220
16"	16.000	14.213	0.843	26.810	220
18"	18.000	16.014	0.937	33.544	220
20"	20.000	17.814	1.031	41.047	220
24"	24.000	21.418	1.218	58.233	210

E. Pressure Rating

1. The pressure ratings below are for water, non-shock, @ 73°F. The following temperature de-rating factors are to be applied to the working pressure ratings (WP) listed when operating at elevated temperatures.

Operating Temp (°F)	De-Rating Factor
73	1
80	0.88
90	0.75
100	0.62
110	0.51
120	0.4
130	0.31
140	0.22

2. Multiply the working pressure rating of the selected pipe at 73^{o}F, by the appropriate de-rating factor to determine the maximum working pressure rating of the pipe at the elevated temperature chosen.

   a. Example: To solve **10" PVC SCH 80 @ 120F**

   10" PVC SCH 80 @ 73^{o}F **=** 230psi

   De-Rating Factor @ 120^{o}F = 0.4

   Answer: 230 psi x 0.40 = **92 psi max. @ 120F**

F. Joints and Threads

1. Solvent-cemented joints should be utilized when working at or near maximum temperatures. Threaded connections are not recommended for PVC pipe at temperatures above 110F. The CONTRACTOR shall use flanged joints, unions, or roll grooved couplings where disassembly is necessary at elevated temperatures.

2. Thread only Schedule 80 or heavier PVC walls. ***Threading requires a 50% reduction in pressure rating stated for plain end pipe @73F.*** Threading of Schedule 40 PVC pipe is not a recommended practice due to insufficient wall thickness

Part 3 Execution

3.01 Preparation

A. The CONTRACTOR shall inspect each pipe and fitting prior to installation to ensure that there are no damaged portions of the pipe. Damaged pipe shall be replaced with new undamaged sections of pipe.

3.02 Installation

A. Before placement of the pipe in the trench, each pipe or fitting shall be thoroughly cleaned of any foreign substance which may have collected thereon and shall be kept clean at all times thereafter. For this purpose, the openings of all pipes and fittings in the trench shall be closed during any interruption to the Work. As pipe laying progresses, the CONTRACTOR shall keep the pipe interior free of all debris. The CONTRACTOR shall completely clean the interior of the pipe of all sand, dirt, rocks and any other debris following completion of pipe laying prior to testing, disinfecting and placing the completed pipeline in service.

B. Pipe shall be laid directly on the imported bedding material. No blocking will be permitted and the bedding shall be such that it forms a continuous, solid bearing for the full length of the pipe. Bell holes shall be formed at the ends of the pipe to prevent joint loading at the bells or couplings.

C. Where necessary to raise or lower the pipe grade due to unforeseen obstructions or other causes, the CONTRACTOR may change the alignment and/or the grades following approval from the OWNER's REPRESENTATIVE. Such change shall be made by the deflection of joints or by the use of additional fittings. However, in no case shall the deflection in the joint exceed the maximum deflection recommended by the pipe manufacturer.

D. No pipe shall be installed upon a foundation into which frost has penetrated or any time that there is a danger of the formation of ice or penetration of frost at the bottom of the excavation. No pipe shall be laid unless it can be established that the trench will be backfilled before the formation of ice and frost occurs.

E. Immediately before jointing bell and spigot pipe, both the bell and spigot end of the pipe shall be thoroughly cleaned and lubricated with an approved vegetable-based lubricant. The spigot end of the pipe section shall then be inserted into the bell of the previously laid joint and telescoped into its proper alignment. Tilting of the pipe to insert the spigot into the bell will not be permitted.

F. Solvent-welded and heat-fused joints shall be carefully and thoroughly cleaned immediately before joining the pipe. Particular care shall be taken in making solvent-welded joints to ensure a uniform, homogeneous and

complete bond.

3.03 Testing

A. Testing shall be performed per the Manufacturer's recommendations and in accordance with the requirements of Section **40 05 13.11 Leak Testing of Piping**.

END OF SECTION

40 05 13.74 Plastic Process Piping (CPVC Piping)

Part 1 General

1.01 Section Includes

A. This specification outlines minimum manufacturing requirements for Chlorinated Polyvinyl Chloride (CPVC) Schedule 40 and 80 iron pipe size (IPS) pressure pipe. This pipe meets and or exceeds the industry standards and requirements as set forth by the American Society for Testing and Materials (ASTM) and the National Sanitation Foundation (NSF International).

1.02 Referenced Sections

A. Related Sections are shown below.

1. 40 05 13.09 - Flushing And Testing

2. 40 05 13.11 - Leak Testing Of Piping

1.03 Cited Standards

A. All plastic process piping shall adhere to the following standards, or latest revisions of:

1. ASTM D1784 – 08 Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds

2. ASTM F441 / F441M - 09 Standard Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80

3. National Sanitation Foundation Requirements

1.04 Noted Restrictions

A. This pipe is intended for use in applications where the fluid conveyed does not exceed 200°F.

1.05 Quality Control

A. CPVC Pipe Product Marking

1. For all CPVC Piping, product marking shall meet the requirements of ASTM F 441 and shall include:

a. the manufacturer’s name (or manufacturer’s trademark when privately labeled)

b. the nominal pipe size

c. the material designation code

d. the pipe schedule and pressure rating in psi for water @ 73°F

e. the ASTM designation F 441

f. the independent laboratory's seal of approval for potable water usage

g. the flame spread rating and smoke development rating when tested and listed for surface burning characteristics per CAN/ULC S102.2 (Flame Spread (F.S.) of <25 and Smoke Development (S.D.) of <50).

B. Existing Utilities and Site Improvements

1. The CONTRACTOR shall be familiar with possible/potential utilities that may impact construction work, and plan work accordingly.

2. The CONTRACTOR shall protect existing site improvements from damage during construction of underground pipeline.

Part 2 Products

2.01 Schedule 40 and 80 CPVC Pipe

A. All pipe shall be manufactured by Harvel® Plastics, Inc., Easton, PA, or an equal approved by the OWNER's REPRESENTATIVE such as the following:

1. J-M Pipe, Livingston, NJ

2. Hunter Engineered Plastics, Lincoln, AL

B. The material used in the manufacture of the pipe shall be a rigid chlorinated polyvinyl chloride (CPVC) compound, Type IV Grade I, with a Cell Classification of 23447 as defined in ASTM D1784.

C. The compound shall be light gray in color, and shall be approved by NSF for use with potable water. Material used shall be domestically produced CPVC material as provided by Noveon, Inc. (formerly the BFGoodrich Company), or approved equal.

D. Dimensions

1. CPVC Schedule 40 and Schedule 80 pipe shall be manufactured in accordance to the requirements of ASTM F441 for physical dimensions and tolerances. Each production run of pipe manufactured in compliance to this standard, shall also meet the test requirements for materials, workmanship, burst pressure, flattening, and extrusion quality defined in ASTM F441.

2. All belled-end pipe shall have tapered sockets to create an interference-type fit, which meet or exceed the dimensional requirements, and the minimum socket length for pressure-type sockets, as defined in ASTM D2672.

3. The pipe shall be manufactured in strict compliance to ASTM F441, consistently meeting the Quality Assurance test requirements of this standard with regard to material, workmanship, burst pressure, flattening, and extrusion quality.

4. The pipe shall be produced in the USA using domestic materials, by an ISO 9001 certified manufacturer, and shall be stored indoors after production, at the manufacturing site, until shipped from factory. This pipe shall carry the National Sanitation Foundation (NSF) seal of approval for potable water applications.

5. The pipe shall have a Flame Spread rating < 25 and a Smoke Development rating < 50 when tested and listed for Surface Burning Characteristics in accordance with CAN/ULC-S102-2-M88 or equivalent.

6. Schedule 40 and Schedule 80 CPVC Pipe Dimensions are shown in the table below (pipe sizes shown in strict compliance with ASTM F441).

Schedule 40 Dimensions

Nom. Pipe Size (in)	O.D.	Average I.D.	Min. Wall	Nom. Wt./Ft.	Max. Working Pressure (PSI)
1/4"	0.54	0.344	0.088	0.096	780
3/8"	0.68	0.473	0.091	0.128	620
1/2"	0.84	0.602	0.109	0.190	600
3/4"	1.05	0.804	0.113	0.253	480
1"	1.32	1.029	0.133	0.371	450
1-1/4"	1.66	1.360	0.140	0.502	370
1-1/2"	1.90	1.590	0.145	0.599	330
2"	2.38	2.047	0.154	0.803	280
2-1/2"	2.88	2.445	0.203	1.267	300
3"	3.50	3.042	0.216	1.660	260
3-1/2"	4.00	3.521	0.226	1.996	240
4"	4.50	3.998	0.237	2.363	220
6"	6.63	6.031	0.280	4.164	180
8"	8.63	7.942	0.322	6.268	160
10"	10.75	9.976	0.365	8.886	140
12"	12.75	11.889	0.406	11.751	130
14"	14.00	13.073	0.437	13.916	130
16"	16.00	14.940	0.500	18.167	130
18"	18.00	16.809	0.562	22.965	130
20"	20.00	18.743	0.593	29.976	120
24"	24.00	22.544	0.687	37.539	120

Schedule 80 Dimensions

Nom. Pipe Size (in)	O.D.	Average I.D.	Min. Wall	Nom. Wt./Ft.	Max. Working Pressure (PSI)
1/4"	0.54	0.282	0.119	0.117	1130
3/8"	0.68	0.403	0.126	0.162	920
1/2"	0.84	0.526	0.147	0.238	850
3/4"	1.05	0.722	0.154	0.322	690
1"	1.32	0.936	0.179	0.473	630
1-1/4"	1.66	1.255	0.191	0.654	520
1-1/2"	1.90	1.476	0.200	0.793	470
2"	2.38	1.913	0.218	1.097	400
2-1/2"	2.88	2.290	0.276	1.674	420
3"	3.50	2.864	0.300	2.242	370
3-1/2"	4.00	3.326	0.318	2.735	350
4"	4.50	3.786	0.337	3.277	320
6"	6.63	5.709	0.432	6.258	280
8"	8.63	7.565	0.500	9.506	250
10"	10.75	9.493	0.593	14.095	230
12"	12.75	11.294	0.687	19.392	230
14"	14.00	12.410	0.750	23.261	220
16"	16.00	14.213	0.843	29.891	220
18"	18.00	16.014	0.937	35.419	220
20"	20.00	17.814	1.031	45.879	220
24"	24.00	21.418	1.218	64.959	210

E. Pressure Rating

1. The pressure ratings below are for water, non-shock, @ 73°F. The following temperature de-rating factors are to be applied to the working pressure ratings (WP) listed when operating at elevated temperatures.

Operating Temp (°F)	De-Rating Factor
73-80	1
90	0.91
100	0.82
110	0.72
120	0.65
130	0.57
140	0.5
150	0.42
160	0.4
170	0.29
180	0.25
200	0.2

2. Multiply the working pressure rating of the selected pipe at 73°F, by the appropriate de-rating factor to determine the maximum working pressure rating of the pipe at the elevated temperature chosen.

   a. Example: To solve **10" CPVC SCH 80 @ 120F**

   10" CPVC SCH 80 @ 73°F **=** 230psi

   De-Rating Factor @ 120°F = 0.65

   Answer: 230 psi x 0.65 = **149.5 psi max. @ 120F**

F. Joints and Threads

1. Solvent-cemented joints should be utilized when working at or near maximum temperatures. Harvel Plastics does not recommend the use of CPVC for threaded connections at temperatures above 150°F; use flanged joints, unions, or roll grooved couplings where disassembly is necessary at elevated temperatures.

   Threading of Sch 40 CPVC pipe is not a recommended practice due to insufficient wall thickness. Thread only Sch 80 or heavier walls. ***Threading requires a 50% reduction in pressure rating stated for plain end pipe @73°F***.

Part 3 Execution

3.01 Preparation

A. The CONTRACTOR shall inspect each pipe and fitting prior to installation to ensure that there are no damaged portions of the pipe. Damaged pipe shall be replaced with new undamaged sections of pipe.

3.02 Installation

A. Before placement of the pipe in the trench, each pipe or fitting shall be thoroughly cleaned of any foreign substance which may have collected thereon and shall be kept clean at all times thereafter. For this purpose, the openings of all pipes and fittings in the trench shall be closed during any interruption to the Work. As pipe laying progresses, the CONTRACTOR shall keep the pipe interior free of all debris. The CONTRACTOR shall completely clean the interior of the pipe of all sand, dirt, rocks and any other debris following completion of pipe laying prior to testing and placing the completed pipeline in service.

B. Pipe shall be laid directly on the imported bedding material. No blocking will be permitted and the bedding shall be such that it forms a continuous, solid bearing for the full length of the pipe. Bell holes shall be formed at the ends of the pipe to prevent joint loading at the bells or couplings.

C. Where necessary to raise or lower the pipe grade due to unforeseen obstructions or other causes, the CONTRACTOR may change the alignment and/or the grades following approval from the OWNER's REPRESENTATIVE.

Such change shall be made by the deflection of joints or by the use of additional fittings. However, in no case shall the deflection in the joint exceed the maximum deflection recommended by the pipe manufacturer.

D. No pipe shall be installed upon a foundation into which frost has penetrated or any time that there is a danger of the formation of ice or penetration of frost at the bottom of the excavation. No pipe shall be laid unless it can be established that the trench will be backfilled before the formation of ice and frost occurs.

E. Immediately before jointing bell and spigot pipe, both the bell and spigot end of the pipe shall be thoroughly cleaned and lubricated with an approved vegetable-based lubricant. The spigot end of the pipe section shall then be inserted into the bell of the previously laid joint and telescoped into its proper alignment. Tilting of the pipe to insert the spigot into the bell will not be permitted.

F. Solvent-welded and heat-fused joints shall be carefully and thoroughly cleaned immediately before joining the pipe. Particular care shall be taken in making solvent-welded joints to ensure a uniform, homogeneous and complete bond.

3.03 Testing

A. Testing shall be performed per the Manufacturer's recommendations and in accordance with the requirements of Section **40 05 13.11 Leak Testing of Piping**.

END OF SECTION

40 05 13.75 HDPE Process Piping

Part 1 General:

1.01 Section Includes

A. This section includes a description of how the CONTRACTOR shall address the construction practices that relate to single-wall and double-walled high-density polyethylene (HDPE) environmental piping.

1.02 Referenced Sections

A. Related Sections are listed below:

1. Section 40 05 13.09 – Flushing and Testing
2. Section 40 05 13.11 – Leak Testing Of Piping
3. Section 40 05 13.12 – Tracer Wire and Marking Tape for Buried Piping

1.03 Cited Standards

A. All HDPE piping shall conform to the requirements of the following standard Specifications, of the latest revisions, as applicable:

1. ASTM F714 Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter
2. ASTM D 3350 Standard Specification for Polyethylene Plastics Pipe and Fittings Materials
3. ASTM D 3261 Standard Specification for Butt Heat Fusion of Polyethylene Plastic Fittings for Polyethylene Plastic Pipe and Tubing
4. ASTM D 2837 Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials
5. ASTM D 2657 Standard Practice for Heat Fusion Joining of Polyolefin Pipe and Fittings
6. ASTM D 2321 Standard Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe
7. ASME B16.5 Pipe Flanges and Flanged Fittings NPS 1/2 through NPS 24
8. ASME B16.21 Nonmetallic Flat Gaskets for Pipe Flanges
9. ASME B31.3 Process Piping
10. Occupational Safety and Health Administration - Code of Federal Regulations (CFR) Title 29 Part 1910

11. Occupational Safety and Health Administration - CFR Title 29 Part 1926

12. Standard Specifications for Public Works Construction (Green Book)

1.04 Noted Restrictions

A. Hot gas welding shall not be allowed for wetted components.

B. All installed piping shall flushed and tested as per the Specifications in **Section 40 05 13.09 and Section 40 05 13.11.**

C. All buried HDPE piping shall be installed as per the Specifications in **Section 40 05 13.12.**

1.05 Quality Control

A. Fusion machine heater plate surface temperatures and hydraulic cylinder interface pressures shall be recorded during the butt fusion joining operations. Measurements shall be permanently recorded utilizing a McElroy Datalogger or other OWNER-approved equal.

B. The CONTRACTOR shall ensure that the persons joining the HDPE have been trained in the pipe manufacturer's recommended procedures.

C. It is the sole responsibility of the CONTRACTOR to construct a pipeline capable of passing the leak tests. Failure of a pipeline segment to pass leak testing shall be repaired at no cost to the OWNER.

D. The Supplier shall submit, in writing, that the pipe furnished under this specification is in conformance with the material and mechanical requirements specified.

E. HDPE Pipe System

1. All material and fittings furnished under this specification shall be from a manufacturer who has been regularly engaged in the design and manufacture of HDPE piping for at least 5 years.

2. The HDPE piping system, including fittings and custom fabrications, shall be supplied by a single OWNER-approved manufacturer.

3. Pipe that has been tested by the manufacturer and falls outside the appropriate limits set forth in these Specifications shall be rejected for use on this project.

4. The HDPE pipe manufacturer shall submit Quality Assurance / Quality Control (QA/QC) records to the OWNER and maintain these records for a minimum of 3 years from the date of production.

1.06 Submittals

A. Pipe fabrication drawings shall be submitted to the OWNER's REPRESENTATIVE before beginning the fabrication of the pipe. Pipe

fabrication drawings shall include (but not be limited to) the following information:

1. Manufacturer/Supplier (Supplier).
2. Type, grade, and thickness of HDPE pipe.
3. Joint detail.
4. Method of joint assembly.
5. Details of flanges, dished heads, and outlets, including size and type to be utilized.
6. Complete material lists, which shall include all required hardware to assemble pipe.
7. Pipe fusion requirements.
8. Pipe bedding requirements and the Supplier's proposed method of construction.
9. Pipe closure pieces and jumper pipe assemblies.
10. Manufacturer's recommended pressure test procedure.

B. The CONTRACTOR shall submit all necessary shop drawings, vendor data, dimensional data, and inspection reports to the OWNER or the OWNER's REPRESENTATIVE.

C. The COTNRACTOR shall provide line drawings of each typical piping system to the scale shown on the drawings, locating each support or hanger, and shall also identify each type of hanger or support by the manufacturer's catalog number or figure.

D. Installation drawings and manufacturer's catalog information on each type of hanger and support used shall be provided to the OWNER's REPERESENTATIVE.

E. Fusion Joint Technician Certification

1. The certified fusion technician used for the work shall be certified and trained in the proper use of fusion equipment and manufacturer's recommended procedures.
2. The CONTRACTOR shall submit a written certification to the OWNER from the HDPE pipe suppliers that the proposed pipe fusion method(s) and equipment are appropriate for use on the project and on the supplied HDPE pipe.

F. Fusion bonding machine recorded parameters shall be submitted to the OWNER within 2 days following the completion of any joint. Failure to submit this information may result in the joint being rejected and replaced.

G. The CONTRACTOR shall provide a comprehensive project work plan and schedule 15 days before the start of HDPE pipe installation at the project site.

1.07 Protection of Work Area

A. The CONTRACTOR shall be familiar with possible/potential utilities that may impact construction work, shall verify the possible locations for all underground utilities before beginning excavation work for pipe installation, and shall protect existing site improvements from damage during construction of underground pipeline.

Part 2 Products:

2.01 Single-Wall High-Density Polyethylene Pipe (HDPE)

A. Polyethylene pipe shall be manufactured only from HDPE virgin compounds. All piping system components (i.e., pipe, fittings, reducers, etc.) shall be of the same material and shall be the product of one manufacturer such as ISCO Industries, LLC or an approved equal. All piping system components shall also be made in the USA.

B. The pipe and fittings shall be homogeneous throughout and free from visible cuts, cracks, holes, blisters, voids, foreign inclusions, or other defects that are visible to the naked eye and that may affect the wall integrity. Damaged sections of piping shall not be repaired. Damaged sections of piping shall be cut out and replaced per the manufacturer's procedures and recommendations..

C. Pipe shall be uniform in color, opacity, density, and other physical properties, and free from tacky or sticky material.

D. HDPE pipe shall be manufactured in accordance with the requirements of ASTM F714 and AWWA C906.

E. HDPE solid wall pipe shall be made from a plastic compound meeting the requirements of Standard PE Code Designation PE-3408 as defined by ASTM D2837 and ASTM D3350.

F. HDPE pipe shall be SDR 11 and have a pressure rating of 160 psig at 73.4 degrees Fahrenheit.

G. Exposed HDPE pipe shall be marked with a PURPLE LONGITUDINAL STRIPE extruded into the outer diameter of the pipe.

H. Flushing and hydrostatic testing shall be performed for the piping. Please refer to **Section 40 05 13.09-11.**

2.02 HDPE Fittings

A. Fittings shall be molded or fabricated from the same material as the pipe, and designed for butt fusion attachment to the pipe.

1. Molded fittings shall be manufactured in accordance with ASTM D3261 and shall be so marked. Each production lot of molded fittings shall be subjected to the tests required by ASTM D3261.

B. Polyethylene fabricated fittings for elbows, tees, crosses, wyes, etc., shall be molded or fabricated by the pipe manufacturer.

1. Butt fusion outlets shall be made to the same outside diameter or externally reinforced wall thickness, tolerances, and the internal pressure service equivalent to match the full service pressure as the mating pipe.

2. Pressure de-rated fabricated fittings shall not be permitted.

C. Molded fittings shall be manufactured in accordance with ASTM D3261, and so marked. Each production lot of molded fittings shall be subject to the test required under ASTM D3261.

D. Polyethylene flange adapters shall be made with sufficient through-bore length to be clamped in a butt fusion-joining machine without the use of a stub-end holder. The sealing surface of the flange adapter shall be machined with a series of small V-shaped grooves to provide gasket-less sealing, or to restrain the gasket against blowout.

2.03 Double Wall High-Density Polyethylene Pipe (HDPE)

A. General

1. The double-walled HDPE pipe shall be Asahi Fluid-Lok as manufactured by Asahi/America, Inc., Malden, MA or an OWNER's REPRESENTATIVE approved equal.

2. The CONTRACTOR shall be responsible for the overall operation of the complete system, and the CONTRACTOR shall be responsible for the acceptable condition of the containment piping. No deviation from this specification shall be allowed without express written consent of the OWNER's REPRESENTATIVE.

B. Materials

1. The pipe and fittings shall conform to ASTM D-3350 with minimum cell classification values of 345464C. The pipe and fittings shall be made from the same polyethylene resin base which meets this specification.

2. Pipe and Fittings

a. The pipe used to fabricate the piping system supplied under this specification shall be high density, extra high molecular weight polyethylene pipe.

b. The pipe and fittings shall conform to ASTM D-3350 with minimum cell classification values of 345464C. The pipe and fittings shall be made from the same polyethylene resin base which meets this specification.

C. Pipe Dimensions and SDR

1. Pipe supplied under this specification shall have IPS (Iron Pipe Size) OD and shall meet ASTM D 3035. The pipe sizes shall be as shown in the schedule or on the drawings.

2. Fittings shall be manufactured to the same IPS ID and OD as the pipe. This shall be verified by the CONTRACTOR to make sure that fittings do not de-rate the piping system.

3. All molded and fabricated fittings shall meet the pressure requirements of the system as specified and based on ASTM D2837 Hydrostatic Design Basis for Thermoplastic Pipes.

4. All molded fittings shall be manufactured per ASTM D3261. Pipe joints and fittings shall be supplied to the job site ready for simultaneous butt-fusion.

5. Carrier pipe support shall be with full round centralizers welded to the carrier pipe. Centralizer support spacing per Plastic Piping Institute standards and manufacturer's recommendations.

6. The centralizers shall be machined for accuracy from pipe grade resin ½" sheet stock HDPE. Centralizers have openings at 6 o'clock and 12 o'clock per the drawings. The opening at 6 o'clock will permit the flow of liquid between the carrier pipe and the containment pipe. Then minimum vertical opening shall be 0.75 inches or greater including allowance for internal beads. The minimum horizontal opening shall be 1.25 inches. The opening at 12 o'clock shall be the same dimensions.

7. The OD of the centralizer shall match the ID of the containment piping as closely as possible.

8. All pipe and fittings with a carrier pipe diameter of 8" or larger and all piping with a carrier pipe of 6" DR 11 or lower DR (thicker wall) shall have the centralizers extrusion welded to the carrier pipe based on the specified support spacing above. End centralizers shall be extrusion welded to the carrier pipe and the containment piping at the ends of all pipe and fittings.

9. The pipe and fitting manufacturer shall provide documentation that the fabricator/welders have a minimum of 2 years experience fabricating dual containment systems and shall show compliance with ASTM C 1147.

2.04 Double Wall HDPE Fittings (Dogbones™)

A. Force Transfer Dogbones™ shall be used to anchor the differential and the total forces from thermal expansion / contraction for DW HDPE pipe. The Force Transfer Dogbones™ shall be mass anchor machined from solid high density polyethylene pipe grade resin. The coupling shall anchor the inner carrier pipe and the outer containment pipe to an external anchor point. Force Transfer Dogbones™ shall be used to protect fittings from thermal

expansion as required by the manufacturer's thermal analysis of the system based on the standards outlined in this specification.

B. Force Transfer Dogbones™ shall simultaneously be fused into the system. Solid Force Transfer Dogbones™ shall be used to segment the annular space as required.

C. Force Transfer Dogbones™ shall be ported unless indicated on the Drawings. Ports shall provide a continuous annular space and match the openings in the centralizers. Ports must be positioned properly during installation.

D. End termination/Force Transfer Dogbones™ shall be used to seal the system at both ends. The coupling shall be simultaneously butt fused to the carrier and containment pipe to seal the annular space. No other closure or termination will be allowed. This fitting will also provide the transition to single wall piping.

E. Tie-ins to other piping systems and/or equipment where butt-fusion is not applicable shall be with HDPE flange adapters and coated metal back-up rings, unless otherwise specified by the OWNER's REPRESENTATIVE on the Drawings. Mechanical compression or clamp style fittings will not be allowed under this specification.

F. Additional Force Transfer Dogbones™ shall be used for transition between different pipeline sizes and DW HDPE piping systems. A machine adapter shall be used to butt fuse the walls of the different pipe.

2.05 Reducers

A. It is the CONTRACTOR's responsibility to provide reducers of a material similar to that of the connected system. The size of a reducer may not be shown because the equipment has not been specifically chosen at the time the Drawings were made. Therefore, in all cases, the CONTRACTOR must choose reducers of a size to suit the requirements.

2.06 Pipe Sleeves

A. The CONTRACTOR shall provide, size, and locate all sleeves such that they be set and/or installed prior to pouring of concrete.

2.07 Hanger and Support Systems

A. Pipe Supports (SVE Header 4" to 8"):

1. TOLCO Threaded Pipe Adjuster

a. Size Range: 2½" thru 36" pipe

b. Material: Carbon Steel

c. Function: Straight threaded shank that permits adjustment after installation

d. Approvals: WW-H-171E, Type 39 2½" thru 36" and Manufacturers Standardization Society SP-69, Type 38, when used with Pipe Saddle

e. Maximum Temperature: 650°F

2. TOLCO Pipe Saddle with U-Bold and Threaded Pipe Adjuster

a. Includes U-Bolt and Threaded Pipe Adjuster

b. Size Range: 4" thru 36" pipe

c. Material: Carbon Steel with cast iron reducer

d. Function: Supports horizontal pipe from floor stanchion using the U-bolt and Threaded Pipe Adjuster

e. Approvals: WW-H-171E, Type 38, 4" thru 36". And Manufacturers Standardization Society SP-69, Type 37

3. TOLCO Pipe Saddle and Threaded Pipe Adjuster

a. Size Range: 2½" thru 36" pipe

b. Material: Carbon Steel with cast iron reducer

c. Function: Supports horizontal pipe from floor stanchion where vertical adjustment is required

d. Approvals: WW-H-171E, Type 39, 4" thru 36", and Manufacturers Standardization Society SP-69, Type 38

4. TOLCO Adjustable Pipe Support with U-Bolt

a. Size Range: Size 2" thru 12" pipe

b. Material: Carbon Steel

c. Function: Supports horizontal pipe from floor stanchion where vertical adjustment is required

d. Maximum Temperature: 650°F

B. Pipe Supports (Air Sparging 1"):

1. UNISTRUT One Hole Pipe Clamp

a. Material: ASTM specifications A1008, A575, A576, A635, or A36. Fitting Steel is ASTM A1011 SS GR 33.

Part 3 Execution

3.01 Preparation

A. The CONTRACTOR shall carefully inspect the installed work of all other sections and verify that all work is complete to the point where the work of this Section may properly commence without adverse impact.

B. If the CONTRACTOR has any concerns regarding the installed work in other sections, the OWNER shall immediately be notified in writing prior to the start of work of this Section.

C. Installers shall be pre-qualified through sufficient training in butt fusion techniques according to ASTM D2657 Section 9.

D. The Manufacturer's Representative shall provide on-site training in the assembly, installation and operation of double-containment systems.

3.02 Installation

A. The double-containment piping shall be installed in accordance with the manufacturer's recommended procedures.

B. Handling

1. Pipe and accessories shall be handled in a manner suitable to ensure delivery in a sound, undamaged condition. Slings for handling the pipeline shall not be positioned at butt-fused pipe joints or fitting joints to prevent stressing the fused joints.

2. The interior of the pipe and accessories shall be thoroughly cleaned of foreign matter before being installed and shall be kept clean during the operations.

C. Placing

1. Pipe and accessories shall be assembled to avoid twisting or damage to the pipe. Under no circumstances shall any of the materials be dropped or dumped.

D. Joining Methods

1. Lengths of pipe shall be assembled into suitable installation lengths by the butt-fusion process. Thermal fusion shall be conducted only by persons who have received training and are certified in the use of the fusion equipment that is intended for use on this project. The selected fusion equipment shall conform to the equipment recommended by the pipe manufacturer.

E. Pipe Supports

1. Piping shall be continuously supported throughout the piping system.

2. Supports shall be examined to be free of defects prior to use by the CONTRACTOR.

3. If at all necessary, additional supports shall be provided at the following locations:

   a. where pipe changes direction

   b. adjacent to flanged valves and strainers

   c. equipment connections and heavy fittings.

4. Installation shall be performed per the manufacturer's recommendations.

5. Testing shall be performed per the manufacturer's recommendations.

3.03 Flushing and Testing

A. Installed piping shall be flushed and tested as per the manufacturer's specifications and the Specifications contained in **Sections 40 05 13.09-11**.

3.04 Clean-up

A. The interior and exterior of the pipelines shall be cleaned after assembly. Prior to pipe closure, the CONTRACTOR shall leave the pipe section full of depressurized water.

END OF SECTION

40 05 23 Common Work Results for Process Valves

Part 1 General

1.01 Section Includes

A. This section covers furnishing, installing, and testing (where required), of all valves which would be furnished by the manufacturer(s).

B. The CONTRACTOR shall provide all valves as specified herein and as shown on the Drawings. The CONTRACTOR shall submit for approval by the OWNER a schedule of all valves indicating the service, size, and connections, make, model number and any special features such as chain wheel operators, etc.

1.02 Referenced Sections

A. Related Sections are below.

1. SECTION – 40 06 90 SCHEDULE FOR PROCESS VALVES

1.03 Cited Standards

A. All valves shall comply to the following standards, or latest revisions of, as applicable:

1. ANSI B16.10 - Face-to-Face and End-to-End Dimensions of Ferrous Valves

2. MSS-25 - Standard Marking System for Valves, Fittings, Flanges and Unions

1.04 Noted Restrictions

A. No asbestos shall be used in the manufacture of any valve component.

1.05 Quality Control

A. The CONTRACTOR shall furnish and install the specified valves, complete in place, all in accordance with the standard Drawings and as described in these Specifications.

B. Manufacturer's Qualifications: Only firms, who are regularly engaged in manufacture of valves, of types and sizes required, whose products have been in satisfactory use in similar service, shall be used.

C. Valve Types: Provide valves of same type by same manufacturer.

D. Valve Identification: Provide valves with manufacturer's name (or trademark) and pressure rating clearly marked on valve body.

E. All valves shall be subject to inspection at the place of manufacture, in accordance with the provisions of the referenced standards, as supplemented by the requirements herein.

F. During the manufacture of the valves, the OWNER or OWNER's REPRESENTATIVE shall be given access to all areas where manufacturing and testing is in process and shall be permitted to make all inspections necessary to confirm compliance with the Specifications.

G. Except as modified herein, all materials used in the manufacture of the valves shall be tested in accordance with requirements as applicable.

1.06 Submittals

A. Submittals shall be made to the OWNER or to his designated REPRESENTATIVE in accordance with the General Conditions of the Contract. Submittals are often made under the general term of "Shop Drawings", but include all items listed in the General Conditions.

B. Some submittal requirements listed in the General Conditions or within the Specifications are not ordinarily termed as shop drawings, but still must be submitted as above.

C. Product Data: Submit manufacturer's technical product data, including installation instructions for each type of valve. Include pressure drop curve or chart for each type and size of valve.

D. Shop Drawings: Submit manufacturer's assembly-type (exploded view) shop drawings for each type of valve, indicating dimensions, weights, materials, and methods of assembly of components.

E. Maintenance Data: Submit maintenance data and spare parts list for each type of valve. Include this data, product data, and shop drawings in maintenance manual, in accordance with requirements of Division 1.

Part 2 Products

2.01 Valves

A. All valves shall be manufacturer's standard, of the design which the manufacturer recommends for the service intended. Each valve shall bear the maker's name or trademark or reference symbol to indicate the service conditions for which it is guaranteed.

B. All packing, gaskets, discs, seats, diaphragms, lubricants, etc., shall conform to recommendations of the valve manufacturer for the intended service.

C. Unless otherwise stated in the Specifications, the valve operating mechanisms shall be supplied by the valve manufacturer. This shall include handwheels, levers, gear boxes, and pneumatic and electric operators and positioners. The available torque shall be greater than twice the normal turning torque and shall also be greater than the seating or unseating torque.

Part 3 Execution

3.01 Preparation – None

3.02 Installation

A. The CONTRACTOR shall install all valving as per the Drawings, the manufacturer's directions and the Specifications contained herein.

B. Valves shall be installed with the stems positioned in the horizontal or above the centerline of the pipe. Operators shall be positioned so that they do not interfere with pedestrian traffic. In passageways or above platforms the minimum clearance between the floor and the lowest protruding point on the valve or operator shall be 6 ft 8 in. All valves shall be accessible for operation, maintenance or removal. Valves shall be arranged to open counterclockwise by handwheel or lever operation unless otherwise indicated in these Specifications. Valve operators, which are 7 ft 0 in. or more above the operating floor or platform shall be chain wheel operated. Where necessary for operations as described above, valves shall be bevel or spur gear operated. Plug valve 6 in. and larger shall be gear operated.

C. If screw end valves are recommended by the OWNER's REPRESENTATIVE and are to be used, all screw end valves shall be threaded according to the American Standard for Pipe Threads No. B2.1.

D. Flange end valves shall have connecting end flanges in accordance with the Series of the American Standards Association for type valves covered in the Standard.

E. Positioners or actuators shall be given special support where they overhang from the valve or where the total valve, actuator and position weight is excessive for the size of pipeline.

F. The CONTRACTOR is responsible that instrument air supplied to each user is at the proper pressure. If the user requires air at a pressure equal to the instrument air supply, a regulator (air set) is not required. If the instrument air supply must be reduced, a regulator V-27 must be supplied for each user. Some air sets will be specified in the Instrumentation Section. These need not be duplicated.

G. The placement of valves, instruments and other components shall be located such that they can be easily serviced.

H. Associated buried valves with nut operators and access vaults shall installed per the manufacturer's recommendations.

3.03 Testing

A. Installed piping shall be flushed and tested as per the manufacturer's specifications and the Specifications contained in **Sections 40 05 13.09-11**.

END OF SECTION

40 05 23.19 Stainless Steel Process Valves

Part 1 General

1.01 Section Includes

A. This section lists the Stainless steel valves which shall be used for this project.

Part 2 Products

2.01 Check Valves

A. Stainless Steel Check Valves shall adhere to the following:

1. Check Valves 1”

a. Pipe Size: 1000 which corresponds to 1”

b. Material Code: 316 SS

c. Seal Material: Viton

d. Crack Pressure: 3 Psig

e. The valves shall be Generant Series CV or equal approved by OWNER’S REPRESENTATIVE.

2.02 Ball Valves

A. Stainless Steel Ball Valves shall adhere to the following::

1. Ball Valves ½” – 8”

a. Body: per ASTM A351-CF8M

b. Ball is 316SS, Stem is 316 SS

c. Seals: ME PTFE / Teflon

d. End Connection: 150 lb ANSI flanged (ANSI B16.5)

e. Working pressure sufficient to design requirements indicated in drawings.

f. The valves shall Valtorc Series 180 (150#), or equal approved by the OWNER’s REPRESENTATIVE.

2.03 Gate Valves

A. Stainless Steel Gate Valves shall adhere to the following::

1. Gate Valves ½” – 12” (non-rising stem)

a. Body and Disc: per ASTM A351-CF8M

b. Non-Rising Stem is 316 SS

c. End Connection: 150 lb ANSI flanged (ANSI B16.5)

d. Working pressure sufficient to design requirements indicated in drawings.

e. Pressure/ Temperature ratings shall be in accordance with ASME/ASTM B 16.34.

f. The valves shall Valtorc Series 403 flanged end gate valves (non-rising) or equal approved by the OWNER's REPRESENTATIVE.

Part 3 Execution

3.01 Preparation

A. Working pressure sufficient to design requirements indicated in drawings.

3.02 Installation

A. Installation should be performed per the manufacturer's recommendations.

3.03 Testing

A. Testing shall be performed per the manufacturer's recommendations.

END OF SECTION

40 05 23.33 Brass and Iron Process Valves

Part 1 General

1.01 Section Includes

A. This section lists the brass and cast iron valves which shall be used for this project (if selected instead of steel process valves).

Part 2 Products

2.01 Valves

A. The CONTRACTOR shall furnish and install the following valves:

1. Cast Iron Gate Valve 1”, 1.5”, 2”, 3”, 4” ,6”, 8”

a. Cast iron body, non rising stem, manual wheel operated, bronze trim with tapered wedge disc and renewable bronze seats.

b. Flanged inlet and outlet

c. The valves shall be a Figure 461 as manufactured by Crane, Joliet, IL or OWNER-approved equal.

Part 3 Execution – Not Used

END OF SECTION

40 05 29 Hangers and Supports for Process Piping Systems

Part 1 General

1.01 Section Includes

A. This section includes materials and installation of pipe hangers and supports including accessory items, such as anchor bolts and screws and neoprene isolation pads.

1.02 Referenced Sections – None

1.03 Cited Standards – None

1.04 Noted Restrictions – None

1.05 Quality Control – None

1.06 Submittals

A. Submit shop drawings in accordance with Section 01300.

B. Provide line drawings of each typical piping system to the scale shown on the drawings, locating each support or hanger. Identify each type of hanger or support by the manufacturer's catalog number or figure.

C. Provide installation drawings and manufacturer's catalog information on each type of hanger and support used.

Part 2 Products

2.01 Materials

A. Design Criteria

1. No attempt has been made to show or detail in the drawings every pipe support or hanger required. Provide pipe supports for every piping system installed.

2. Pipe support and hanger components shall withstand the dead loads imposed by the weight of the pipes filled with water and shall have a minimum safety factor of five based on material ultimate strength.

B. Hanger and Support Systems

1. Pipe hangers and supports shall comply with MSS SP-58 for the standard types referenced on the drawings. Construct special hangers and supports as detailed on the drawings. Type numbers for standard hangers and supports shall be in accordance with MSS SP-58 as listed below:

Type / No.	Description	Manufacturer and Model Recommended
1	Adjustable steel clevis	Grinnell Fig. 590 or 260, Kin-Line 455, or 12C
3	Steel double-bolt pipe	Kin-Line 473, Grinnell clamp Fig. 295A or 295H
5	Pipe hanger	Kin-Line 450
7	Adjustable steel band	Grinnell Fig. 269, hanger Atlanta Engineering Fig. 22
8	Extension pipe or riser	Grinnell Fig. 261, clamp Atlanta Engineering Fig. 39
9	Adjustable band hanger	Grinnell Fig. 97
10	Adjustable swivel ring	Grinnell Fig. 70 band hanger
13	Steel turnbuckle	Grinnel Fig. 230
14	Steel clevis	Grinnell Fig. 299
15	Swivel turnbuckle	Grinnell Fig. 114
18	Steel or malleable iron	Grinnell Fig. 281, concrete insert Superstrut 452
24	U-bolt	Grinnell Fig. 137, Kin-Line 437
26	Clip	Grinnell Fig. 262, Kin-Line 477
31	Light welded steel	Grinnell Fig. 194
32	Medium welded steel	Grinnell Fig. 195 bracket
33	Heavy welded steel	Grinnell Fig. 199 bracket
36	Pipe saddle support	Grinnell Fig. 258
37	Pipe stanchion saddle	Grinnell Fig. 259, Kin-Line 467
38	Adjustable pipe saddle	Grinnel Fig. 264, support Atlanta Engineering Fig. 308

2. Pipe hangers and supports shall be hot-dipped galvanized per ASTM A 153 carbon steel (ASTM A 36, A 575, or A 576). Bases, rollers, and anchors shall be steel as described above or may be cast iron (ASTM A 48). Pipe clamps shall be steel as described above or may be malleable iron (ASTM A 47).

3. Pipe hangers and supports shall be as manufactured by Grinnell, Kin-Line, Unistrut, Superstrut, or equal.

C. Offset Pipe Clamp

1. Grinnell Figure 103, or equal. Material shall be Type 316 stainless steel.

D. Anchor Bolts and Screws

1. Anchor bolts and screws for attaching pipe supports and hangers to walls, floors, ceilings, and roof beams shall be Type 316 stainless steel, ASTM A 276. Nuts shall be type 316 stainless steel, ASTM A 194, Grade 8M, or ASTM F 594, Type 316 stainless steel.

E. Neoprene Isolating Sleeves for Metal Pipe 2 Inches and Smaller

1. Unistrut P2600, Kin-Line 418 and 419, or equal.

Part 3 Execution

3.01 Preparation

A. Pipe Hanger and Wall Support Spacing

1. Install pipe hangers and wall supports on horizontal and vertical runs at the spacing shown or detailed on the drawings. Provide hanger rods (for horizontal runs) and wall supports of the sizes shown or detailed on the drawings. If no spacing or rod sizes are given in the drawings or in the specifications for a particular piping system, use the following:

2. Pipe Hanger and Wall Support Spacing for Steel Pipe:

Max. Support Pipe Size (in)	Min. Rod / Hanger Spacing (ft)	Size (in)
3/8 and smaller	4	3/8
1/2 through 1	6	3/8
1-1/4 through 2	8	3/8
2-1/2 and 3	10	1/2
3-1/2 and 4	10	5/8
6	12	3/4
8	12	7/8
10 and 12	14	7/8
14 and 16	16	1
18	15	1
20 through 24	9	1
30	6	1

3. Pipe Hanger or Wall Support Spacing for PVC Pipe:

Max. Support Pipe Size (in)	Min. Rod or Hanger Spacing (ft)	Size (in)
3/4	4	3/8
1	4	3/8
1 1/2	5	3/8
2	5	3/8
2 1/2	5	1/2
3 through 6	6	1/2

4. Provide sway bracing for hangers where detailed on the drawings. If no bracing is detailed, provide bracing at 10-foot-maximum center-to-center intervals.

B. Pipe Support Spacing for Supports on Top of Slabs or Grade

1. Install pipe supports on horizontal runs at the spacing shown or detailed on the drawings. Provide supports of the type shown or detailed on the drawings. If no spacing requirements are given on the drawings or in the specifications for a particular piping system, use the following:

2. Pipe Support Spacing for Steel Pipe:

Pipe Size (in)	Maximum Support Spacing (ft)
3/8 and smaller	4
1/2 through 1	6
1-1/4 through 2	8
2-1/2 and 3	10
3-1/2 and 4	10
6	12
8	12
10 and 12	14
14 and 16	16
18	16
20 through 24	18
30	18

3. Pipe support spacing for other pipe materials shall be the same as described above in Section A.

3.02 Installation

A. Installing Pipe Hangers and Supports

1. Provide separate hangers and supports at valves. Provide one hanger or support around each end of the valve body or on the adjacent connecting pipe within one pipe diameter of the valve end.

2. Provide separate hangers and supports at each pipe elbow, tee, or fitting. Provide separate hangers and supports on both sides of each non-rigid joint or flexible pipe coupling.

3. Install piping without springing, forcing, or stressing the pipe or any connecting valves, pumps, and other equipment to which the pipe is connected.

4. Use 1-5/8-inch-high channel frames unless 3-1/4-inch is needed to provide clearance from walls. Use multiple back-to-back channels if additional clearance is needed.

B. Installing Neoprene Isolating Sleeves

1. Install a sleeve around each metal pipe 2 inches and smaller at the point of bearing or contact with the pipe hanger or support.

C. Painting and Coating

1. Paint exposed non-galvanized pipe hangers and supports to match the color of the adjacent wall per Section 09900. Coat galvanized pipe supports per Section 09900. Color of finish coat shall match adjacent piping. If the adjacent wall is not painted, paint the hangers and supports to match color code of the largest pipe on the support.

3.03 Testing – None

END OF SECTION

SECTION 40 90 00 - INSTRUMENTATION AND CONTROLS FOR PROCESSS SYSTEMS

Part 1 General

1.01 Scope

A. This section describes how the Instrumentation and Controls Integrator (I&C Integrator) shall provide the labor, tools, equipment and materials necessary to implement general administrative and engineering requirements for a controls and instrumentation installation in accordance with the plans and Specifications.

B. Definitions

1. The following terms are utilized in this Section and shall mean CONTRACTOR with respect to the provisions of the Contract:

a. I&C Integrator

b. Mechanical Contractor

c. Electrical Contractor

d. General Piping Contractor

C. Work performed by the I&C Integrator under this contract shall be to furnish and install complete instrumentation and process controls systems as described and specified herein. The I&C Integrator shall provide all equipment and controls necessary to operate the system per the design and coordinate and interface with equipment from all other Divisions and Vendors. The I&C Integrator's responsibilities pertaining to this section 40 90 00 and its related sub-sections shall include:

1. Supply instrumentation equipment.

2. Supply UL-508A labeled Remote Control Panels.

3. Supply UL 0508A labeled Main Control Panel.

4. Supply wireless Ethernet radio equipment, including towers/masts, antennas, radio site surveys.

5. Supply Ethernet distribution equipment and cabling.

6. Supply fiber-optic distribution equipment and cabling.

7. Prepare Submittals.

8. PLC system design and programming.

9. HMI screen design and programming.

10. Provide calibration, programming and startup of field instruments.

11. Provide the final PLC, HMI programs and Operations Manuals on electronic media.

12. Provide On-sight Operator and Maintenance Training.

1.02 Referenced Sections - none

1.03 Cited Standards

A. The Instrumentation and Controls Integrator shall perform all work in accordance with the applicable requirements of governing agencies having jurisdiction and in accordance with the plans and Specifications herein. The work shall also comply with applicable provisions and recommendations of the following:

1. Instrument Society of America (ISA)
2. 2008 National Electrical Code (NEC)
3. National Electrical Manufacturers Association (NEMA)
4. Institute of Electrical and Electronic Engineers (IEEE)
5. American National Standards Institute (ANSI)
6. National Fire Protection Association (NFPA)
7. Scientific Apparatus Manufacturers Association (SAMA)
8. Underwriters Laboratories (UL)
9. Joint Industrial Council (JIC)
10. International Standards Organization (ISO)
11. American Society for Testing and Materials (ASTM)
12. International Electrotechnical Commission (IEC)

1.04 Noted Restrictions – None

1.05 Quality Control

A. Qualifications of the System Integrator

1. Must be a finically sound firm with at least (7) seven years of experience in design, implementation, supply and support of instrumentation and controls systems for the type of facility covered by these Specifications.

2. Must have documented record of successful projects in the instrumentation and controls field.

3. Must have an engineering and technical staff with knowledge of applicable processes and practices.

4. Must have a PLC and HMI/SCADA programming staff with knowledge of applicable processes and practices.

B. System Responsibility

1. The instrumentation and control systems shall be furnished by a single I&C integrator who shall have responsibility for the total I&C scope of this project. Responsibility cannot be split among individual integrators or subcontractors.

C. Materials

1. All materials and equipment supplied shall be new, latest model, equal in quality, appearance and performance to that specified herein and shall be subject to the approval of the OWNER's REPRESENTATIVE. Materials and equipment furnished shall also be standard products of the approved and acceptable manufacturers and shall be subject to the approval of the OWNER's REPRESENTATIVE.

2. The I&C Integrator may be supplied with materials and components by others for inclusion within control panels that they are fabricating. This shall include but not be limited to, VFD's, instruments, and controls specified to be provided with equipment or other systems.

D. Special Warranty

1. The I&C Integrator shall provide repair and replacement services for the instrumentation and controls systems for (1) one year, commencing with the time the system is completed and accepted by the OWNER, and including all repair and replacement parts needed during the warranty period.

E. Maintenance

1. Service Contract

a. The I&C Integrator shall prepare and submit a quotation for an extended warranty and service agreement. The purchase of this agreement shall be at the discretion of the OWNER.

2. Spare Parts

a. The I&C Integrator shall prepare and submit a quotation for an extended warranty and service agreement. The purchase of this agreement shall be at the discretion of the OWNER.

3. Consumables

a. Consumable items are used during normal system operation. These items include paper, ribbons, tapes, ink, toner, etc. The I&C Integrator shall supply consumables to operate the controls systems for (1) one year from date of acceptance by the OWNER.

b. Included will be a consumable parts list which shall include the consumable's name, part number and stocking distributor with address and phone number.

1.06 Submittals

A. Shop drawings shall be submitted in accordance with Section 01 33 00 Specifications and per the following:

1. All Drawings, data sheets, lists and forms shall clearly state the project name, OWNER, location, and date.

2. Provide complete panel layouts with attached component bill-of-materials referencing components on the panel.

3. Provide electrical schematics, including wire and cabling numbers, identifying control panel and field termination points.

4. Provide a master I/O, tag and wiring schedule showing all digital and analog I/O points.

5. Provide a master interconnection wiring diagram showing all panel mounted and field equipment.

6. Loop drawings shall follow the ISA-S5.4 format.

7. All materials shall be contained in one submittal, partial submittals submissions will note be accepted unless approved by the OWNER's REPRESENTATIVE.

8. The I&C Integrator will consult/meet with the OWNER's REPRESENTATIVE prior to submitting of the shop drawings to review all control and programming requirements.

B. Operation and Maintenance Manuals shall be submitted in accordance with Section 01 33 00 Specifications and per the following:

1. Assembly and installation instructions.
2. Startup and Power up procedures.
3. Troubleshooting procedures.
4. O&M instructions.
5. Explanation of fault diagnostics.
6. Shut down procedures.
7. Detailed parts list/bill-of-materials with product cut sheets.
8. HMI screen shots and detailed explanation of operator intervention procedures.
9. Procedures for obtaining historical data in both trending and report format.

10. Shop drawings, data sheets, I/O lists, wiring schedules, and symbol/ equipment designations.

C. Spare Parts List shall be submitted in accordance with Section 01 33 00 Specifications and per the following:

1. Include the current parts list indicating part name, equipment name or number, manufacturer's name, manufacturer's part number and stocking distributor with name, address and phone number.

2. Include recommended spare parts to stock and recommended stocking quantity.

D. Software Documentation shall be submitted in accordance with Section 01 33 00 Specifications and per the following:

1. Provide (4) four copies of the as-built PLC programs on electronic media such as CD's or USB memory devices. Provide the required programming software to view the logic programs.

2. Provide (4) four copies of the as-built HMI programs on electronic media such as CD's or USB memory devices. Provide the required programming software to view the HMI programs.

3. Provide (4) four copies of the VFD configuration data on electronic media such as CD's or USB memory devices. Provide the required software to view the VFD configuration.

4. Provide a system Ethernet configuration drawing showing all PLC, HMI, radio and VFD equipment with their designated Ethernet IP addresses.

E. Testing Procedures

1. Submit to the OWNER's REPRESENTATIVE for review, a detailed description of the field test procedures proposed to demonstrate performance of the completed systems.

F. Project Record Documents

1. The I&C Integrator shall maintain (2) two field working sets of shop drawings and submittals. The I&C Integrator shall furnish an identical set of drawings to the OWNER's REPRESENTATIVE when field wiring is to begin.

2. All changes made during the course of the project shall be made by the Integrator to the field and OWNER's REPRESENTATIVE's drawing sets on a weekly basis. Included in the updates will be clearly marked and dated "As-Built Changes". A final "As-Built" set of drawings will be delivered to the OWNER's REPRESENTATIVE and also included in all O&M Manuals as described in Item "B" above.

1.07 Delivery, Storage, and Handling

A. Deliver equipment properly packaged and mounted on pallets to facilitate handling of heavy items. Utilize fabricated containers or wrappings to protect equipment for damage during shipping and handling.

B. Coordinate equipment delivery schedules with the OWNER's REPRESENTATIVE both verbally and in writing. Include shipper documentation and expected on-site delivery dates and times.

C. Inspect equipment to ensure that no damage has occurred during shipment. Handle equipment carefully to prevent physical damage. Do not install damaged equipment, remove from site and replace with new equipment.

D. All items shipped to the job site shall be properly stored until they can be installed. Such storage shall meet the requirements of the OWNER's REPRESENTATIVE. Use all means necessary to protect the equipment during and after installation from both the environment and other trades.

Part 2 Products

2.01 General Control Standards

A. All equipment installed in wet locations shall be NEMA 4X and if available NEMA 6P.

B. Panel Wiring shall be the following:

1. Power Wiring: Stranded copper, Type MTW or Type THHN, minimum size 14 AWG, 600V insulation.

2. Control Wiring: Stranded cooper, Type MTW, minimum size 16 AWG, 600V insulation.

3. Discrete Signal Wiring: Type MTW, minimum size 18 AWG, 600V insulation.

4. Analog Signal Wiring: Belden 9154, 20 AWG, two-conductor stranded with 100% foil shielding, 300V insulation, or equal.

5. Insulation Color Code:

a. Black: 120VAC branch circuit distribution.

b. White 120VAV neutral conductor

c. Red: 120VAC control wiring

d. Blue: Low voltage DC circuits (positive source)

e. Blue/White Stripe: Low voltage DC circuits (negative source)

f. Yellow: Control circuits energize from an external source.

g. Green: Equipment ground.

6. Provide terminal blocks for all external wiring connections. Provide 20% spare terminal blocks for future external connections. Equipment grounding terminal blocks shall be the color green.

7. All control wiring terminations and cables will be labeled with machine printed wiring labels or sleeves. Numbering method will match the wiring schematic line numbers.

8. Provide plastic wiring duct for all control panels. Minimum size shall be 1.5”W x 2”T.

C. Name Plates

1. All devices and enclosures shall be identified with plastic laminated engraved plates or engraved stainless steel plates.

2. Engraved plates shall be attached with stainless steel screws, drive rivet or straps.

3. Panels and enclosures shall be identified with 3” x 6” engraved plates.

4. Identification of front mounted panel devices shall be engraved or plastic printed labels.

5. Identification of instrumentation and field devices shall be engraved laminated plastic or metal tags. Each device shall be labeled with the appropriate PID tag name.

D. Arc Flash and Panel Specifications

1. All control panels shall be constructed to meet UL508A standards and shall carry a UL508A certification marking.

2. Control panel designs shall obtain the highest possible 2008 NEC and UL508A short circuit current rating. Control panels shall be labeled with a SCCR label to meet the NEC 409.110 specifications.

2.02 Equipment Suppliers

A. Controls

1. PLC Devices shall be manufactured by Allen-Bradley.

2. Panel Devices shall be manufactured by one of the following:

a. Allen-Bradley

b. Square-D

c. Cutler Hammer

d. Siemens

e. Phoenix Contact

f. Sola

g. Panduit

h. or an OWNER's REPRESENTATIVE approved equal.

B. Communications Equipment Manufacturers

1. Ethernet Radios: Phoenix Contact

2. Ethernet Switches: Hart

3. Fiber to Ethernet Switches: Hart

4. or an OWNER's REPRESENTATIVE approved equal.

C. Auxiliary Support Equipment

1. Data Logging: Red Lion Data Station Plus

2. Web Server: Red Lion Data Station Plus

3. Alarm Phone Dialer: Sensaphone 400

4. UPS: APC 1500VA

5. or an OWNER's REPRESENTATIVE approved equal.

D. Variable Frequency Drives (VFDs) shall be Allen-Bradley Power Flex 400.

Part 3 Execution

3.01 Preparation

A. The I&C Integrator shall prepare and submit to the OWNER's REPRESENTATIVE for review a detailed description of the test procedures that they propose to demonstrate the performance of the completed system.

B. The I&C Integrator shall provide Instrument Calibration Sheets and a space for sign-off on individual items. A sample of the Instrument Calibration Sheet will be provided to the OWNER's REPRESENTATIVE for approval.

3.02 Installation

A. Please see installation procedures for each of the individual components in their respective sections.

3.03 Testing

A. During the on-site testing and startup, the OWNER's REPRESENTATIVE shall have unrestricted access to the system. All faults identified during this period shall be documented, corrected and retested prior to completion of the on-site test. All test data and generated reports shall be logged and certified copies provided to the OWNER's REPRESENTATIVE.

B. When possible “live” I/O points shall be used to properly test the systems. Whenever this is not possible, the I&C Integrator shall simulate I/O points to test the system.

END OF SECTION

CORTESE LANDFILL SITE

NARROWSBURG, NEW YORK

OU 4 REMEDIAL DESIGN

ENGINEERING SPECIFICATIONS

DIVISION 42

PROCESS HEATING, COOLING, AND DRYING EQUIPMENT

PROJECT:	**OU 4 REMEDIAL DESIGN**
LOCATION:	**CORTESE LANDFILL NARROWSBURG, NEW YORK**
PROJECT NO.:	**MR0562B**
COMPANEW YORK:	**CORTESE LANDFILL PRP GROUP**
PREPARED BY:	Geosyntec consultants engineers | scientists | innovators

SECTION 42 00 00 - PROCESS HEATING, COOLING, AND DRYING EQUIPMENT

42 05 00 Common Work Results for Process Heating, Cooling, and Drying Equipment

Part 1 General

1.01 General Conditions

A. The General Conditions apply to all work of this specification, which shall be done as shown on the plans, and as specified, and shall be properly coordinated with work in other Specifications.

B. The Drawings and these Specifications are complementary to each other; what is called for by one shall be as binding as if called for by both. If there is any conflict between what is shown on the Drawings and what is written in the Specifications, the more restrictive shall take precedence and the CONTRACTOR shall communicate the conflicts to the OWNER's REPRESENTATIVE prior to constructing the work.

C. Safety

1. The CONTRACTOR shall be familiar with, and shall at all times conform to, the regulations of the *"OSHA General Industry Occupational Safety and Health Standards," "OSHA Safety and Health Regulations for Construction,"* and other applicable state and municipal standards and regulations.

1.02 Referenced Sections - none

1.03 Cited Standards – none

1.04 Noted Restrictions – none

1.05 Quality Control – not used

Part 2 Products – Not Used

Part 3 Execution – Not Used

END OF SECTION

42 06 20 Schedules for Process Cooling Equipment

Part 1 General

1.01 This section describes the schedule for process cooling equipment.

A. Air-Cooled Heat Exchangers

Equipment ID	Referenced Dwg No.	Manufacturer & Model #	Flowrate (SCFM)	Temperature Approach (°F)	HP	Pressure Drop (psi)
H-503	M04A	Xchanger, Inc. AA-1000 or equal	700 minimum	10	2	0.5 psi maximum
H-504	M04A	Xchanger, Inc. AA-500 or equal	480 minimum	10	2	0.5 psi maximum

1.02 Related Sections

A. 43 06 10 Schedules for Gas Handling Equipment

B. 43 11 34 Regenerative Rotary Blowers

C. 43 31 13.13 Vapor Phase Activated Carbon Adsorption Units

1.03 Cited Standards – none

1.04 Noted Restrictions – none

1.05 Quality Control

A. The heat exchanger shall cool the discharge from the regenerative blower to a minimum temperature of 100°F prior to the inlet of the vapor phase activated carbon units for the soil vapor extraction system(s) shown on the drawings.

1.06 Submittals

A. The CONTRACTOR shall submit product data for selected model(s), including rated output capacity, electrical specifications, and warranty coverage.

Part 2 Products – Not Used

Part 3 Execution – Not Used

END OF SECTION

CORTESE LANDFILL SITE

NARROWSBURG, NEW YORK

OU 4 REMEDIAL DESIGN

ENGINEERING SPECIFICATIONS

DIVISION 43

PROCESS GAS & LIQUID HANDLING EQUIPMENT

PROJECT:	**OU 4 REMEDIAL DESIGN**
LOCATION:	**CORTESE LANDFILL NARROWSBURG, NEW YORK**
PROJECT NO.:	**MR0562B**
COMPANEW YORK:	**CORTESE LANDFILL PRP GROUP**
PREPARED BY:	Geosyntec consultants engineers | scientists | innovators

SECTION 43 00 00 – PROCESS GAS & LIQUID HANDLING EQUIPMENT

43 05 00 Common Work Results for Process Gas & Liquid Handling Equipment

Part 1 General

1.01 General Conditions

A. The General Conditions apply to all work of this specification, which shall be done as shown on the plans, and as specified, and shall be properly coordinated with work in other Specifications.

B. The Drawings and these Specifications are complementary to each other; what is called for by one shall be as binding as if called for by both. If there is any conflict between what is shown on the Drawings and what is written in the Specifications, the more restrictive shall take precedence and the CONTRACTOR shall communicate the conflicts to the OWNER's REPRESENTATIVE prior to constructing the work.

C. Safety

1. The CONTRACTOR shall be familiar with, and shall at all times conform to, the regulations of the *"OSHA General Industry Occupational Safety and Health Standards," "OSHA Safety and Health Regulations for Construction,"* and other applicable state and municipal standards and regulations.

1.02 Referenced Sections - none

1.03 Cited Standards – none

1.04 Noted Restrictions – none

1.05 Quality Control

A. The CONTRACTOR shall use an adequate number of skilled workers who are thoroughly trained and experienced in the necessary crafts to perform the work, and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Note, all equipment specified in this Division shall include a concrete pad of the appropriate strength and thickness for adequate support of equipment as applicable and in accordance with manufacturer's recommendations.

Part 2 Products – Not Used

Part 3 Execution – Not Used

END OF SECTION

43 06 00 - SCHEDULES FOR PROCESS GAS AND LIQUID HANDLING, PURIFICATION, AND STORAGE EQUIPMENT

43 06 10 Schedules for Gas Handling Equipment

Part 1 General

1.01 This section describes the schedule for gas handling equipment

Equipment ID	Referenced Dwg No.	Manufacturer & Model #	Flowrate (SCFM)	HP	Differential
C-203	M04A	Rotron EN 808 or Equal	190	7.5	170 IWC
C-204	M04A	Rotron EN 909 or Equal	480	15	100 IWC
C-205	M04B	Rotron EN 909 or Equal	480	15	100 IWC

1.02 Referenced Sections

A. 43 11 34 Regenerative Rotary Blowers

1.03 Cited Standards – none

1.04 Noted Restrictions – none

1.05 Quality Control

A. The blower impeller, driven by the direct-coupled motor, shall pressurize air and supply it with sufficient flow and pressure to meet the design requirements of the soil vapor extraction system as shown on the drawings.

1.06 Submittals

A. The CONTRACTOR shall submit product data for selected model(s), including rated output capacity, electrical specifications, and warranty coverage.

Part 2 Products – Not Used

Part 3 Execution – Not Used

END OF SECTION

SECTION 43 10 00 - GAS HANDLING EQUIPMENT

43 11 34 Regenerative Rotary Blowers

Part 1 General

1.01 Section Includes

A. This section describes the regenerative rotary blowers to be used for this project.

1.02 Referenced Sections – none

1.03 Cited Standards – none

1.04 Noted Restrictions – none

1.05 Quality Control

A. The blower impeller, driven by the direct-coupled motor, shall pressurize air and supply it with sufficient flow and pressure to meet the design requirements of the soil vapor extraction system as shown on the drawings.

1.06 Submittals

A. The CONTRACTOR shall submit product data for selected model, including rated output capacity, electrical specifications, and warranty coverage.

Part 2 Products

2.01 Regenerative Rotary Blower

A. Standard product design shall include regenerative blower with cast impeller (for ruggedness), housing and cover, meeting the following specifications:

1. Blower shall be an environmental model rated for continuous duty at the required workload.

2. Blower shall be factory balanced and motor-coupled. Blower shall be equipped with a Teflon lip seal, final assembly leak tested to less than 25 cc/min @ 3 psi.

3. Blower shall be equipped with an inlet filter and integral intake and exhaust mufflers, held in place with a screen (spring or wire hold-down is not acceptable), to minimize operating noise levels.

4. Inlet and outlet ports shall be of cast iron; soft metals, such as aluminum are not allowed.

B. Standard product design shall include one industrial quality UL and CSA approved electric motor, with the following specification:

1. Blower-motor unit shall be a maintenance-free, compact direct-drive arrangement.

2. Motor must meet the system's electrical voltage/phase and explosion-proof requirements (if applicable).

3. Motor must be rated for continuous duty and carry full rated load at temperatures below insulation limits; motor ball bearings shall be double sealed with a rated life of not less than 20,000 hours continuous duty at the maximum rated blower load.

C. Blower/motor unit shall be primed and painted.

Part 3 Execution

3.01 Preparation

A. Blowers shall be evaluated to be free of defects prior to installation

3.02 Installation

A. Installation should be performed per the manufacturer's recommendations.

3.03 Testing

A. Testing shall be performed per the manufacturer's recommendations.

END OF SECTION

SECTION 43 30 00 - GAS AND LIQUID PURIFICATION EQUIPMENT

43 31 13.13 Vapor Phase Activated Carbon Adsorption Units

Part 1 General

1.01 Section Includes

A. This section describes the Vapor Phase Activated Carbon units that are to be furnished and installed by the CONTRACTOR.

1.02 Related Sections

A. 02 62 16 Soil Vapor Extraction

1.03 Cited Standards - none

1.04 Noted Restrictions – None

1.05 Quality Control

A. Each unit shall have an abrasion and corrosion resistant baked epoxy lining; urethane exterior finish and shall include forklift channels for easy handling.

Part 2 Products

2.01 Activated Carbon Vessel System

A. The CONTRACTOR shall provide and install two (2) Vapor Phase Activated Carbon units for each soil vapor extraction system.

B. The system will be a duplex system. All two (2) adsorbers shall be of carbon steel material, skid-mounted, with piping, valves, gauges, and carbon adsorption material provided with each adsorber.

C. Vessels

1. Each vessel shall have a carbon capacity of a minimum of 5,000 lbs, and a carbon bed volume of 180 ft^3.

2. Each unit shall have 8” flanged inlet and outlet connections with a 16” top manway.

D. The units shall be PROTECT VS 6 canisters to be provided by Calgon Carbon Corp. of Pittsburgh, PA, or equivalent approved by the ENGINEER.

Part 3 Execution

3.01 Preparation

A. Prior to installing the activated carbon system, the CONTRACTOR shall check the equipment for defects.

3.02 Installation

A. Installation shall be performed per the manufacturer's specifications.

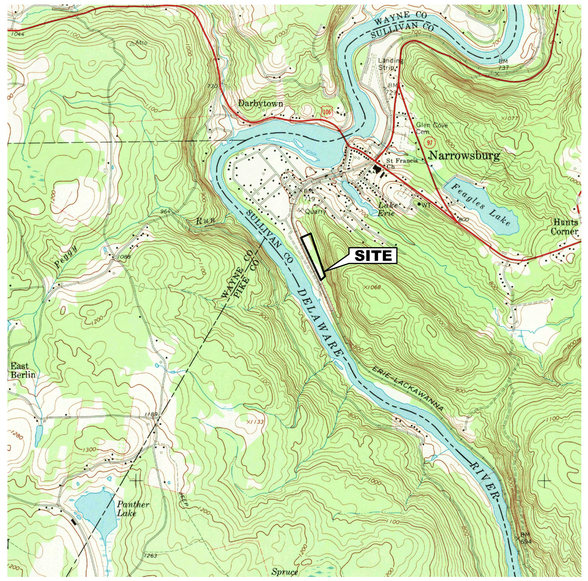
3.03 Testing

A. Testing shall be performed per the manufacturer's specifications.

END OF SECTION

OU 4 REMEDIAL DESIGN
DESIGN DRAWINGS
NOT FOR CONSTRUCTION

CORTESE LANDFILL
NARROWSBURG, NEW YORK
AUGUST 2011



REFERENCE: USGS 7.5' QUADRANGLE OF NARROWSBURG, NEW YORK (1968)

APPROXIMATE SCALE: 1" = 2,000'

VICINITY MAP

DRAWING NO.	DESCRIPTION
	GENERAL
G01	DRAWING LIST AND VICINITY MAP
G02	SITE PLAN
G03	PLAN VIEW OF TARGET TREATMENT AREA - FORMER IDDA 1b
G04	PLAN VIEW OF TARGET TREATMENT AREA - FORMER IDDA 2 AND SEPTAGE LAGOONS
	CIVIL
C01	SITE IMPROVEMENTS
C02	SITE IMPROVEMENT DETAILS
C03	AIR SPARGING DISTRIBUTION PIPING
C04	SOIL VAPOR EXTRACTION DISTRIBUTION PIPING
C05	CONSTRUCTION DETAILS

DRAWING NO.	DESCRIPTION
	MECHANICAL
M01A	PROCESS LEGEND - PIPING AND VALVES
M01B	PROCESS LEGEND - INSTRUMENTATION
M01C	PROCESS LEGEND - EQUIPMENT AND ELECTRICAL
M02A	PROCESS FLOW DIAGRAM - AIR SPARGING SYSTEM
M02B	PROCESS FLOW DIAGRAM - SOIL VAPOR EXTRACTION SYSTEM
M03A	PIPING AND INSTRUMENTATION DIAGRAM - FORMER IDDA 1b AIR INJECTION SYSTEM
M03B	PIPING AND INSTRUMENTATION DIAGRAM - FORMER IDDA 2 AND SEPTAGE LAGOONS AIR INJECTION SYSTEM
M04A	PIPING AND INSTRUMENTATION DIAGRAM - FORMER IDDA 1b SOIL VAPOR EXTRACTION SYSTEM
M04B	PIPING AND INSTRUMENTATION DIAGRAM - FORMER IDDA 2 AND SEPTAGE LAGOONS SOIL VAPOR EXTRACTION SYSTEM
M05	AS/SVE SYSTEMS LAYOUT CONSTRUCTION DETAIL
M06	WELL DETAILS
	ELECTRICAL
E01	ELECTRICAL SITE PLAN

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN	APP

Geosyntec consultants
10220 OLD COLUMBIA ROAD, SUITE A
COLUMBIA, MARYLAND 21046 USA
PHONE: 410.381.4333

CORTESE LANDFILL PRP GROUP
NARROWSBURG, NEW YORK

TITLE: DRAWING LIST AND VICINITY MAP

PROJECT: OU 4 REMEDIAL DESIGN

SITE: CORTESE LANDFILL
NARROWSBURG, NEW YORK

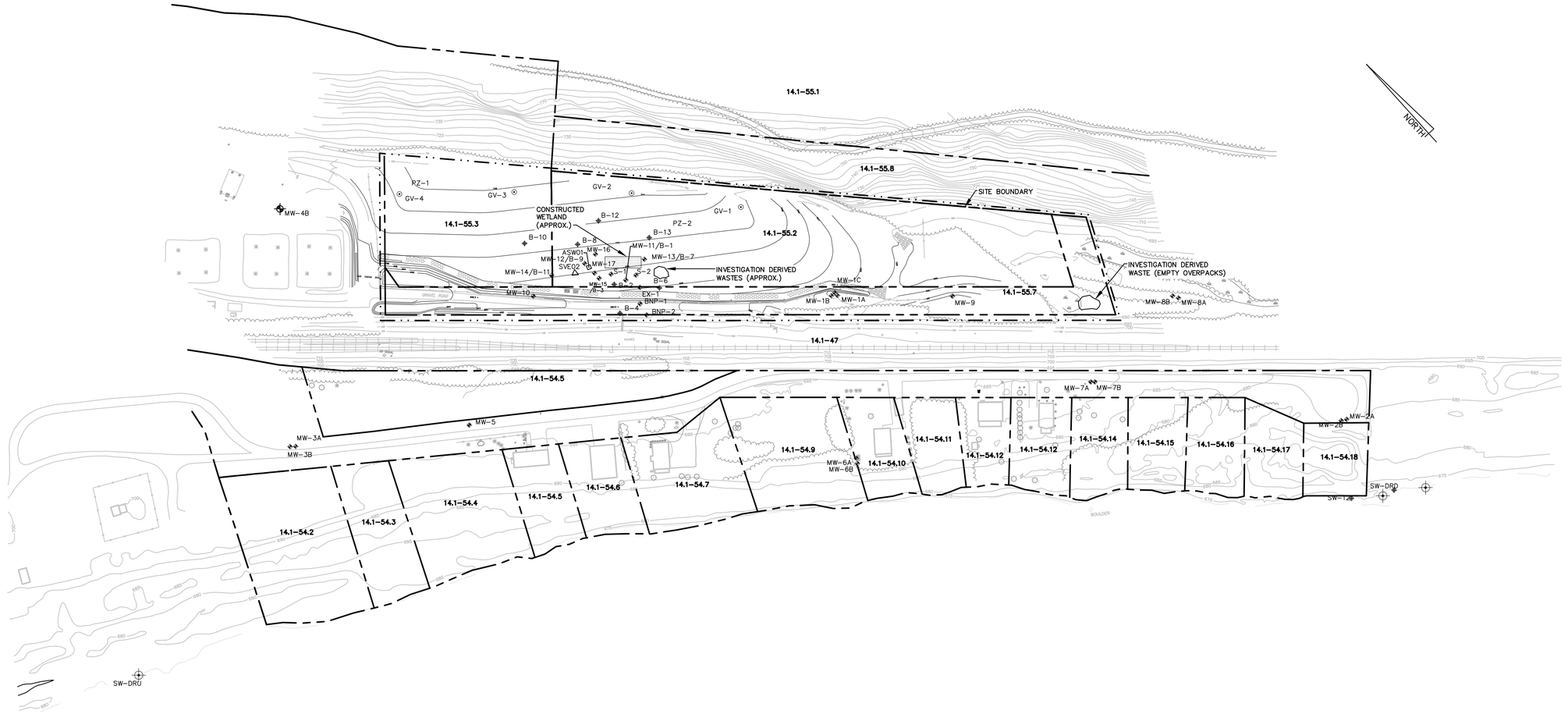
THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE

DATE

DESIGN BY:	AK	DATE:	AUGUST 2011
DRAWN BY:	TSJ	PROJECT NO.:	MR0562B
CHECKED BY:		FILE:	0562-G01
REVIEWED BY:		DRAWING NO.:	G01
APPROVED BY:			

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LEGEND

	PROPERTY BOUNDARY
	LANDFILL PROPERTY BOUNDARY
	FENCE
704	ELEVATION CONTOUR
B–12	EXISTING SOIL BORING REQUIRING GEOSYNTHETIC
GV–1	PASSIVE GAS VENT
MW–10	MONITORING WELL
SW–DRU	SURFACE WATER SAMPLE POINT
PZ–1	PIEZOMETER
14.1–54.3 **GERCENTER, LEAH**	TAX LOT AND BLOCK NUMBER/ OWNER OF THE PARCEL

NOTE:

1. ALL COORDINATES SHOWN ON THIS MAP REFLECT THE NORTH AMERICAN DATUM 1983 (NAD 83) AS DERIVED USING THE NATIONAL GEODETIC SURVEY SHIFT OF N 05°05'25" AND E A DISTANCE OF 426,246.03' AS APPLIED TO THE NATIONAL GEODETIC SURVEY DATUM OF 1927 (NAD 27). ALL ELEVATIONS SHOWN ON THIS MAP REFLECT THE NORTH AMERICAN VERTICAL DATUM OF 1988, AS DERIVED USING THE NATIONAL GEODETIC SURVEY SHIFT OF –0.5479' AS APPLIED TO THE NATIONAL GEODETIC VERTICAL DATUM OF 1929.
2. TOPOGRAPHY AND SURFACE FEATURES EAST OF DELAWARE DRIVE WERE ORIGINALLY PREPARED BY FIELD METHODS BY OM P. POPLI P.E., L.S. P.C. CONSULTING ENGINEERS & SURVEYORS, ROCHESTER, NEW YORK, MARCH 1995. TOPOGRAPHY CHANGES SINCE MARCH 1995 PREPARED BY ENVIRONMENTAL RESEARCH, INC. ON DECEMBER 12, 1996. TOPOGRAPHY AND SURFACE FEATURES WEST OF DELAWARE DRIVE WERE DIGITIZED FROM AN ELECTRONICALLY SCANNED FILE OF THE TOPOGRAPHIC BASE MAP PREPARED BY ROBINSON AERIAL SURVEYS, INC., BY PHOTOGRAMMETRIC METHODS FROM PHOTOGRAPH TAKEN APRIL 18, 1985.
3. PROPERTY LINES EAST OF DELAWARE DRIVE WERE DETERMINED FROM A SURVEY MAP ENTITLED "CORTESE LAND FILL SITE" DATED MAY 7, 1985, PREPARED BY GARY PACKER, P.L.S. AND "TAX MAP, TOWN OF TUSTEN, SULLIVAN COUNTY, NY," DATED 11/20/92 AND REVISED 12/18/08. PROPERTY OWNERSHIP DATA WERE DERIVED FROM THE SULLIVER COUNTY MAP VIEWER (HTTP://WEBAPPS.SCGNET.US/SCIMAP/MAIN.ASP). LANDFILL PROPERTY BOUNDARY TAKEN FROM BASELINE–PROPERTY BOUNDARY–CONTROL, CORTESE LANDFILL SITE, TOWN OF TUSTEN, SULLIVAN COUNTY, NY, MAY 7, 1985, BY GARY PARKER, P.L.S.
4. REFERENCE: DRAWING DEVELOPED FROM FIGURE 2, "SITE PLAN" OF THE SOURCE CHARACTERIZATION REPORT BY GOLDER ASSOCIATES, INC., DATED 24 JANUARY 2008.
5. CONSTRUCTED WETLAND AND INVESTIGATION DERIVED WASTES TO BE PROFILED AND PROPERLY DISPOSED. INVESTIGATION DERIVED WASTE INCLUDES PILOT TEST PROCESS RESIDUALS (SPENT IRON METALS, WETLANDS SOILS/INFRASTRUCTURE), PERSONAL PROTECTIVE EQUIPMENT, DRUMMED SOIL CUTTINGS, UNUSED OVERPACK DRUMS, MISCELLANEOUS SOIL PILES AND DEBRIS.
6. FREE PRODUCT TO BE RECOVERED FROM MONITORING WELLS, S–1, S–2, AND MW–13 THROUGHOUT CONSTRUCTION SCHEDULE.

100 50 0 100 200
SCALE IN FEET

REV	DATE	DESCRIPTION	DRN	APP
1	2/8/12	REMOVED PROPERTY IDENTIFIERS	JOC	AK

Geosyntec consultants
10220 OLD COLUMBIA ROAD, SUITE A
COLUMBIA, MARYLAND 21046 USA
PHONE: 410.381.4333

CORTESE LANDFILL PRP GROUP
NARROWSBURG, NEW YORK

TITLE: **EXISTING CONDITIONS**

PROJECT: **OU 4 REMEDIAL DESIGN**

SITE: **CORTESE LANDFILL NARROWSBURG, NEW YORK**

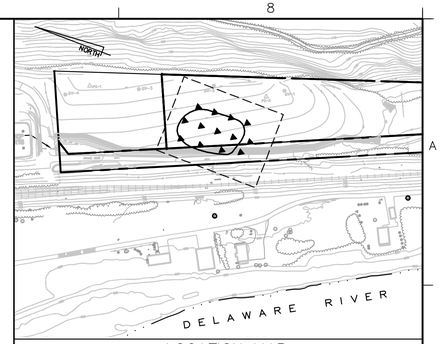
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SIGNATURE

DATE

DESIGN BY:	LW	DATE:	AUGUST 2011
DRAWN BY:	JOC	PROJECT NO.:	MR0562B
CHECKED BY:		FILE:	0562–5G02r1
REVIEWED BY:		DRAWING NO.:	G02
APPROVED BY:			

NOT FOR CONSTRUCTION



LOCATION MAP
SCALE: 1" = 200'

NORTH

FORMER IDDA 1b SOURCE AREA (DASHED WHERE INFERRED)

37.5' SVE ROI (TYP)

15' AS ROI (TYP)

SVE-5 SVE-6 SVE-7 SVE-8 SVE-9 SVE-10 SVE-11 SVE-12 SVE-13 SVE-14

ASW01 (AIW-1) (NOTES 2 AND 6) ASW02 ASW03 ASW04 ASW05 ASW06 ASW07 ASW08 ASW09 ASW10 ASW11 ASW12 ASW13 ASW14 ASW15 ASW16 ASW17 ASW18 ASW19 ASW20 ASW21 ASW22 ASW23 ASW24 ASW25 ASW26 ASW27 ASW28 ASW29 ASW30 ASW31 ASW32 ASW33 ASW34 ASW35 ASW36 ASW37

SVE-1 (NOTES 2 AND 6) SVE-2 (NOTE 6) SVE-3

MW-10 MW-11 (NOTE 6) MW-12 (NOTE 6) MW-13 (NOTES 5 AND 6) MW-14 (NOTE 6) MW-15 (NOTE 6) MW-16 (NOTE 6) MW-17 (NOTE 6)

S-1 (NOTES 5 AND 6) S-2 (NOTES 5 AND 6)

EX-1 (NOTE 6)

SGP-1A/B SGP-2A/B/C SGP-3A/B/C SGP-4A/B/C SGP-5A/B SGP-6A/B SGP-7 SGP-8

BNP-1 BNP-2

B-2 (NOTE 6) B-4 B-5 B-6 B-8 (NOTE 6) B-10 (NOTE 6) B-12 B-13

N 1008700 N 1008600 N 1008500 E 337600 E 337500

700 702 693.5 695 698 710

LEGEND

- LANDFILL PROPERTY BOUNDARY
- FENCE
- 704 ELEVATION CONTOUR
- MW-10 GROUNDWATER MONITORING WELL
- ASW-01 AIR SPARGING WELL
- SVE-2 SOIL VAPOR EXTRACTION WELL IN WASTE
- SINGLE SOIL GAS PROBE
- NESTED SOIL GAS PROBE
- B-6 SOIL BORING
- AIR SPARGING RADIUS OF INFLUENCE (AS ROI)
- SOIL VAPOR EXTRACTION RADIUS OF INFLUENCE (SVE ROI)

NOTES:

1. SEE DRAWING G02 FOR EXISTING SITE CONDITIONS DETAILS.
2. AIR SPARGING WELL ASW01 (AIW-1) AND SOIL VAPOR EXTRACTION WELLS SVE-1 AND SVE-2 WERE INSTALLED IN DECEMBER 2010 AS PART OF THE AS/SVE PILOT TEST. SVE-1 WILL NOT BE USED. ALL OTHER AIR SPARGING AND SOIL VAPOR EXTRACTION WELLS WILL BE INSTALLED DURING REMEDIAL CONSTRUCTION.
3. THE AS ROI AND SVE ROI ARE BASED ON THE RESULTS OF THE AS/SVE PILOT TEST CONDUCTED IN MARCH 2011 BY GEOSYNTEC CONSULTANTS, INC.
4. NO TREATMENT IS NECESSARY AT THE LOCATION OF FORMER IDDA 1a.
5. FREE PRODUCT WILL BE RECOVERED FROM MONITORING WELLS S-1, S-2, AND MW-13 THROUGHOUT CONSTRUCTION SCHEDULE.
6. GEOSYNTHETIC CAP WILL BE REPAIRED AT SOIL BORING AND EXISTING WELL LOCATIONS. CAP REPAIRS AT WELL LOCATIONS WILL INCLUDE INSTALLATION OF HDPE BOOT AND SKIRT. SEE CAP REPAIR SCHEDULE. ALL OTHER AIR SPARGING AND SOIL VAPOR EXTRACTION WELLS THAT PENETRATE THE GEOSYNTHETIC CAP WILL BE COMPLETED WITH A HDPE BOOT AND SKIRT.

Location	Description	Northing	Easting	Cap Repair
B-2	Soil Boring	1,008,563.2	337,595.2	Patch
B-6	Soil Boring	1,008,486.6	337,622.5	Patch
B-8	Soil Boring	1,008,652.1	337,634.1	Patch
B-10	Soil Boring	1,008,739.7	337,596.9	Patch
B-12	Soil Boring	1,008,635.2	337,687.9	Patch
B-13	Soil Boring	1,008,540.0	337,697.2	Patch
EX-1	Monitoring Well	1,008,559.6	337,570.6	HDPE Boot and Skirt
MW-11	Monitoring Well	1,008,588.0	337,572.1	HDPE Boot and Skirt
MW-12	Monitoring Well	1,008,667.5	337,569.3	HDPE Boot and Skirt
MW-13	Monitoring Well	1,008,572.7	337,619.9	HDPE Boot and Skirt
MW-14	Monitoring Well	1,008,712.9	337,526.1	HDPE Boot and Skirt
MW-15	Monitoring Well	1,008,633.1	337,555.6	HDPE Boot and Skirt
MW-16	Monitoring Well	1,008,656.6	337,592.4	HDPE Boot and Skirt
MW-17	Monitoring Well	1,008,644.4	337,560.7	HDPE Boot and Skirt
S-1	Monitoring Well	1,008,616.6	337,571.2	HDPE Boot and Skirt
S-2	Monitoring Well	1,008,575.0	337,587.6	HDPE Boot and Skirt
SGP-1A/B	Soil Gas Probe	1,008,661.7	337,558.6	HDPE Boot and Skirt
SGP-2A/B/C	Soil Gas Probe	1,008,655.2	337,566.9	HDPE Boot and Skirt
SGP-3A/B/C	Soil Gas Probe	1,008,649.3	337,562.3	HDPE Boot and Skirt
SGP-4A/B/C	Soil Gas Probe	1,008,639.9	337,558.8	HDPE Boot and Skirt
SGP-5A/B	Soil Gas Probe	1,008,665.5	337,555.3	HDPE Boot and Skirt
SGP-6A/B	Soil Gas Probe	1,008,670.0	337,552.7	HDPE Boot and Skirt
SGP-7	Soil Gas Probe	1,008,683.5	337,538.0	HDPE Boot and Skirt
SGP-8	Soil Gas Probe	1,008,695.2	337,531.6	HDPE Boot and Skirt
AIW-1	Air Sparging Well	1,008,657.8	337,566.3	HDPE Boot and Skirt
SVE-1	SVE Well	1,008,653.6	337,564.9	HDPE Boot and Skirt
SVE-2	SVE Well	1,008,676.2	337,546.8	HDPE Boot and Skirt

NOT FOR CONSTRUCTION

10 5 0 10 20
SCALE IN FEET

REV	DATE	DESCRIPTION	DRN	APP

Geosyntec consultants
10220 OLD COLUMBIA ROAD, SUITE A
COLUMBIA, MARYLAND 21046 USA
PHONE: 410.381.4333

CORTESE LANDFILL PRP GROUP
NARROWSBURG, NEW YORK

TITLE: PLAN VIEW OF TARGET TREATMENT AREA – FORMER IDDA 1b

PROJECT: OU 4 REMEDIAL DESIGN

SITE: CORTESE LANDFILL NARROWSBURG, NEW YORK

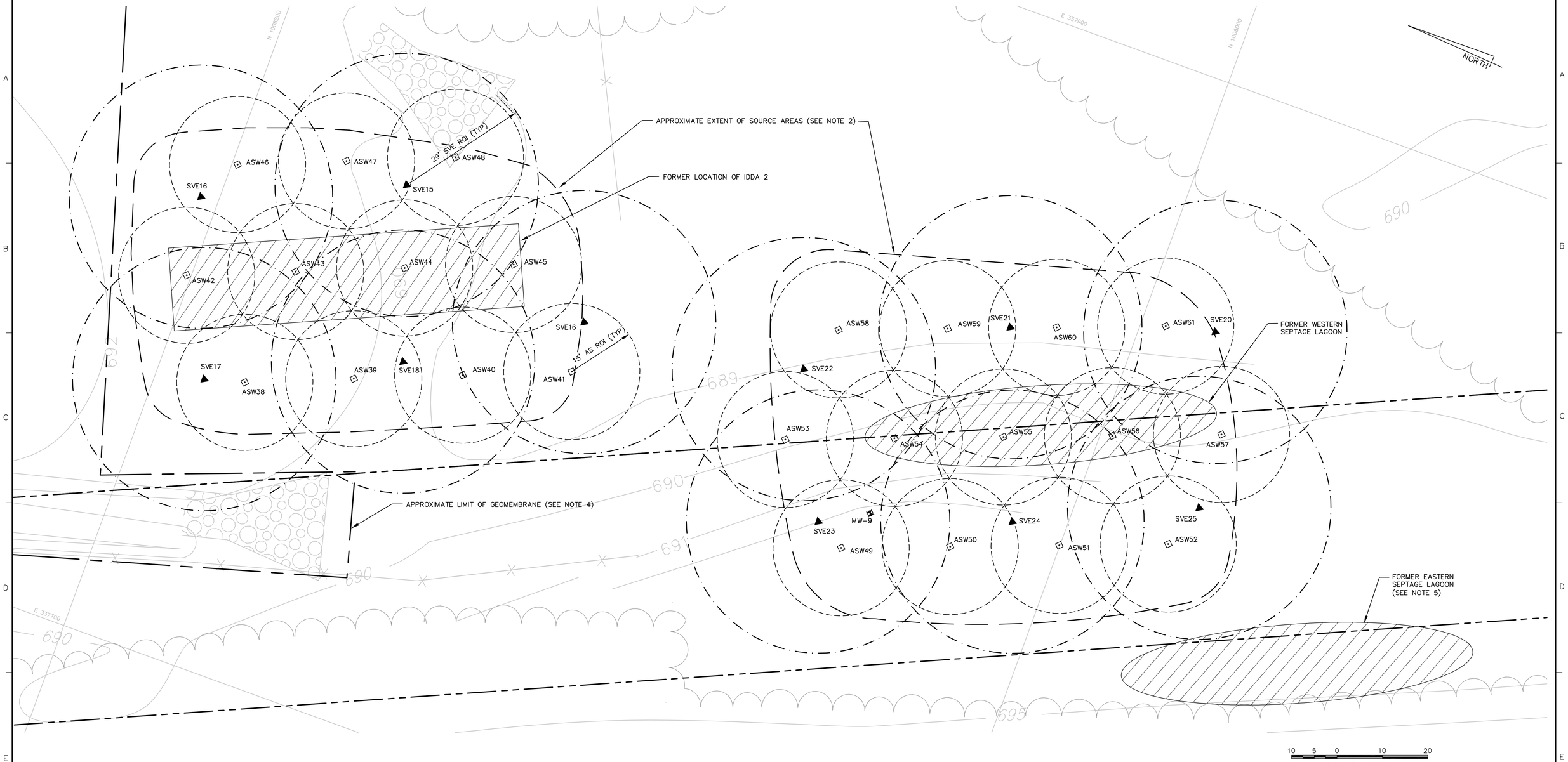
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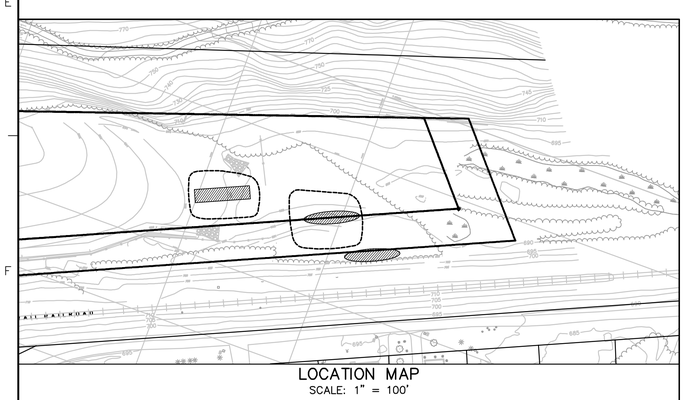
DATE

DESIGN BY:	LW	DATE:	AUGUST 2011
DRAWN BY:	JOC	PROJECT NO.:	MR0562B
CHECKED BY:		FILE:	0562-G03
REVIEWED BY:		DRAWING NO.:	G03
APPROVED BY:			

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10 5 0 10 20
SCALE IN FEET



LOCATION MAP
SCALE: 1" = 100'

NOTES:

1. SEE DRAWING G02 FOR EXISTING SITE CONDITIONS DETAILS.
2. THE EXTENT OF THE SOURCE AREAS TO BE TREATED WILL BE DETERMINED DURING WELL INSTALLATION.
3. THE AS ROI AND SVE ROI ARE BASED ON THE RESULTS OF THE AS/SVE PILOT TEST CONDUCTED IN MARCH 2011 BY GEOSYNTEC CONSULTANTS, INC.
4. LIMIT OF GEOMEMBRANE BASED ON FIGURE 3 "COVER SEAL PANEL LAYOUT", CORTESE LANDFILL IN REMEDIAL CONSTRUCTION REPORT, REMEDIAL WORK ELEMENT I, CONSTRUCTION MANAGEMENT AND CONSTRUCTION QUALITY SERVICES, CORTESE LANDFILL CLOSURE, NARROWSBURG, NEW YORK, GOLDER ASSOCIATES, INC. (SEPT. 1998)
5. NO TREATMENT IS NECESSARY AT THE FORMER EASTERN SEPTAGE LAGOON.

LEGEND

- LANDFILL PROPERTY BOUNDARY
- LIMIT OF GEOMEMBRANE
- FENCE
- 704 ELEVATION CONTOUR
- MW-10 GROUNDWATER MONITORING WELL
- AIW-1 AIR SPARGING WELL
- SOIL VAPOR EXTRACTION WELL IN WASTE
- AIR SPARGING RADIUS OF INFLUENCE (AS ROI)
- SOIL VAPOR EXTRACTION RADIUS OF INFLUENCE (SVE ROI)

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN	APP

Geosyntec consultants
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PHONE: 410.381.4333

CORTESE LANDFILL PRP GROUP
NARROWSBURG, NEW YORK

TITLE: PLAN VIEW OF TARGET TREATMENT AREA – FORMER IDDA 2 AND SEPTAGE LAGOONS

PROJECT: OU 4 REMEDIAL DESIGN

SITE: CORTESE LANDFILL NARROWSBURG, NEW YORK

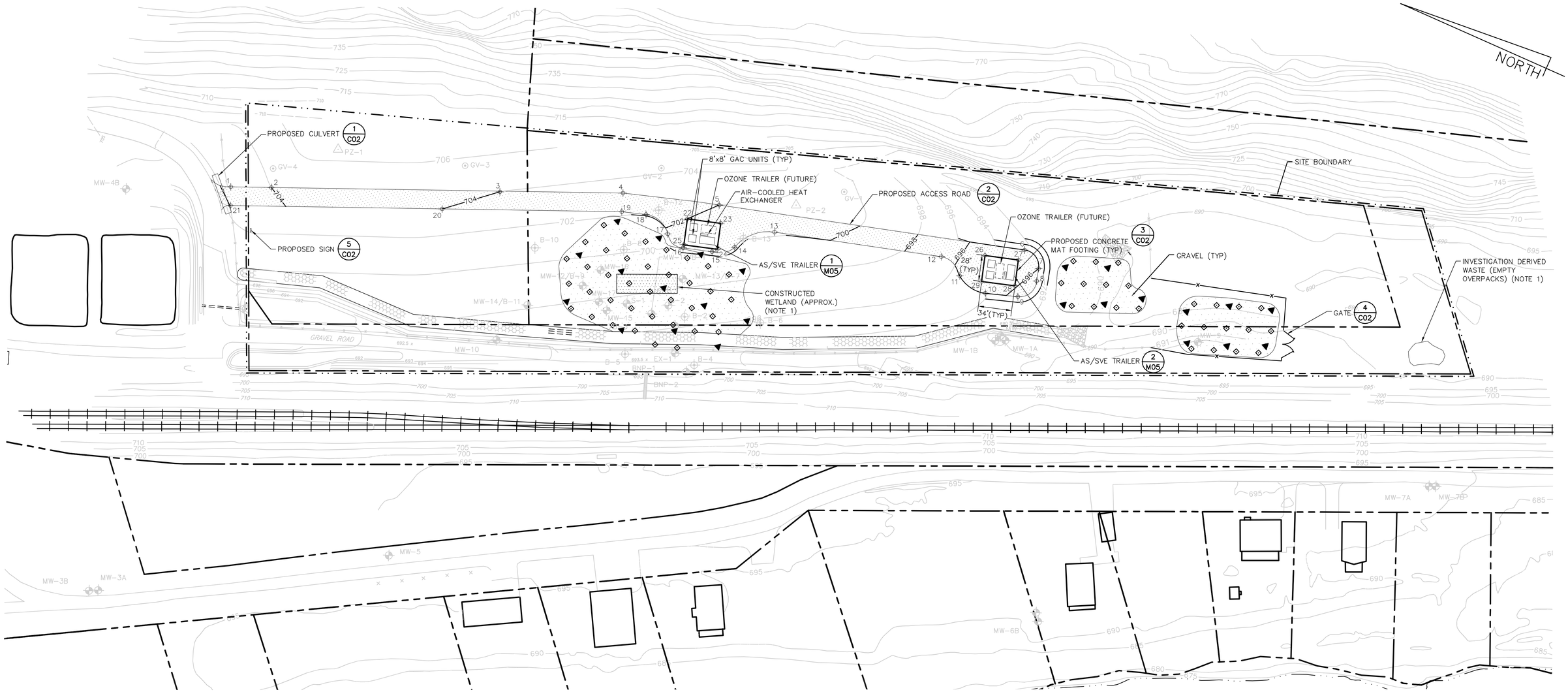
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DATE

DESIGN BY:	LW	DATE:	AUGUST 2011
DRAWN BY:	JOC	PROJECT NO.:	MR0562B
CHECKED BY:		FILE:	0562-G04
REVIEWED BY:		DRAWING NO.:	G04
APPROVED BY:			

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CONTROL POINT SCHEDULE				
ID	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	1009054.4	337511.5	702.2	EDGE OF ROAD
2	1009014.4	337528.6	704.0	EDGE OF ROAD
3	1008789.3	337624.6	704.0	EDGE OF ROAD
4	1008668.6	337677.4	703.0	EDGE OF ROAD
5	1008569.3	337707.9	702.0	EDGE OF ROAD
6	1008251.4	337797.9	694.0	EDGE OF ROAD
7	1008229.5	337785.8	694.0	EDGE OF ROAD
8	1008225.9	337772.9	694.0	EDGE OF ROAD
9	1008237.4	337749.2	694.0	EDGE OF ROAD
10	1008270.5	337738.4	694.0	EDGE OF ROAD
11	1008303.3	337744.1	694.0	EDGE OF ROAD
12	1008329.8	337754.8	696.2	EDGE OF ROAD
13	1008503.4	337705.7	701.3	EDGE OF ROAD
14	1008535.8	337673.4	702.0	EDGE OF ROAD
15	1008555.8	337659.1	702.0	EDGE OF ROAD

CONTROL POINT SCHEDULE				
ID	NORTHING	EASTING	ELEVATION	DESCRIPTION
16	1008585.9	337650.2	702.0	EDGE OF ROAD
17	1008607.0	337657.2	702.0	EDGE OF ROAD
18	1008636.6	337666.5	701.6	EDGE OF ROAD
19	1008661.6	337658.6	701.5	EDGE OF ROAD
20	1008838.3	337582.6	704.0	EDGE OF ROAD
21	1009046.5	337493.1	702.1	EDGE OF ROAD
22	1008594.4	337680.4	702.2	EDGE OF ROAD
23	1008559.9	337690.8	702.2	EDGE OF ROAD
24	1008551.9	337663.7	702.2	EDGE OF ROAD
25	1008586.4	337653.8	702.2	EDGE OF ROAD
26	1008287.6	337775.2	696.0	EDGE OF ROAD
27	1008253.1	337785.4	696.0	EDGE OF ROAD
28	1008245.2	337758.8	696.0	EDGE OF ROAD
29	1008279.5	337748.3	696.0	EDGE OF ROAD

LEGEND

- PROPERTY BOUNDARY
- SITE BOUNDARY
- FENCE
- ELEVATION CONTOUR
- GV-1 PASSIVE GAS VENT
- MW-10 MONITORING WELL
- PZ-1 PIEZOMETER
- SOIL VAPOR EXTRACTION WELL
- AIR SPARGING WELL

NOTES

1. CONSTRUCTED WETLAND AND INVESTIGATION DERIVED WASTES TO BE PROFILED AND PROPERLY DISPOSED. INVESTIGATION DERIVED WASTE INCLUDES PILOT TEST PROCESS RESIDUALS (SPENT IRON METALS, WETLANDS SOILS/INFRASTRUCTURE), PERSONAL PROTECTIVE EQUIPMENT, DRUMMED SOIL CUTTINGS, UNUSED OVERPACK DRUMS, MISCELLANEOUS SOIL PILES AND DEBRIS.

50 25 0 50 100
SCALE IN FEET

REV	DATE	DESCRIPTION	DRN	APP

Geosyntec consultants
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COLUMBIA, MARYLAND 21046 USA
PHONE: 410.381.4333

CORTESE LANDFILL PRP GROUP
NARROWSBURG, NEW YORK

TITLE: SITE IMPROVEMENTS

PROJECT: OU 4 REMEDIAL DESIGN

SITE: CORTESE LANDFILL
NARROWSBURG, NEW YORK

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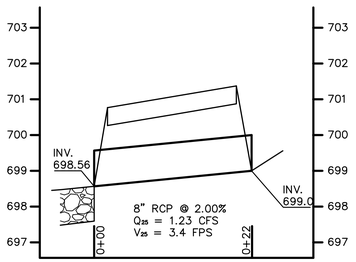
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DATE

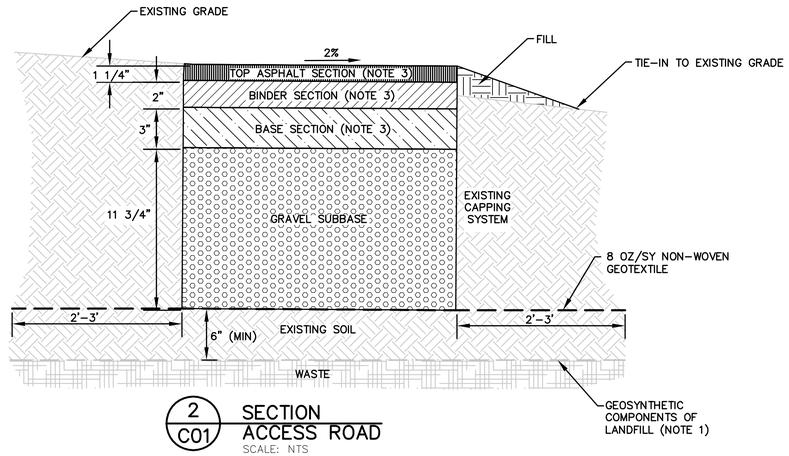
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DRAWN BY:	JOC	PROJECT NO.:	MR0562B
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REVIEWED BY:		DRAWING NO.:	C01
APPROVED BY:			

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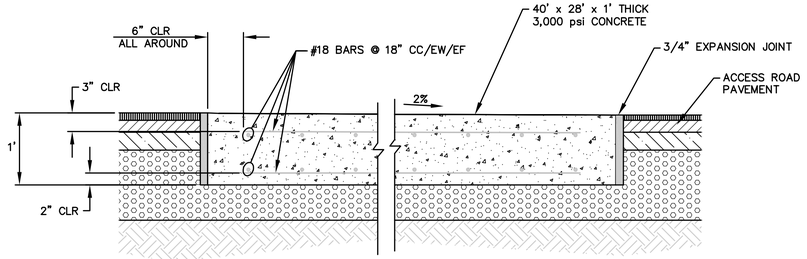
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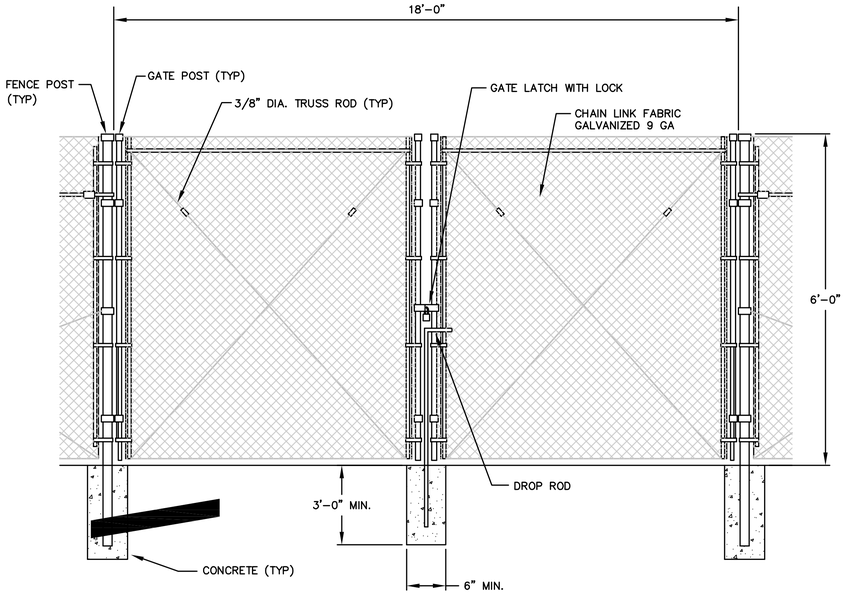
1 / C01 PROFILE
8" CULVERT
SCALE: HOR. 1" = 10'
VER. 1" = 2'



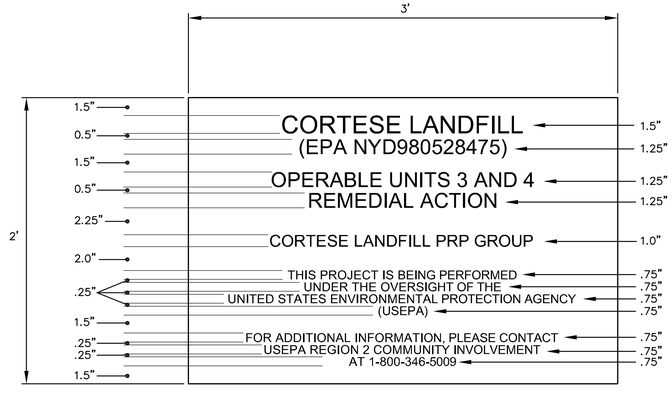
2 / C01 SECTION
ACCESS ROAD
SCALE: NTS
(NOTES 1, 2, AND 3)



3 / C01 SECTION
CONCRETE MAT FOOTING
SCALE: NTS
(NOTES 1 AND 4)



4 / C01 DETAIL
ACCESS GATE
SCALE: N.T.S.



5 / C01 DETAIL
SIGN
SCALE: N.T.S.
(NOTE 4)

NOTES:

1. CAPPING SYSTEM GEOSYNTHETICS SIT APPROXIMATELY 24 INCHES BELOW GROUND SURFACE.
2. CONTRACTOR SHALL TAKE ALL APPROPRIATE MEASURES TO PROTECT EXISTING CAPPING SYSTEM GEOSYNTHETICS. IF GEOSYNTHETICS ARE DAMAGED DURING ROAD SUBGRADE PREPARATION, CONTRACTOR SHALL REPAIR GEOSYNTHETICS IN ACCORDANCE WITH TECHNICAL SPECIFICATIONS.
3. MATERIALS IN THE PAVEMENT CONSTRUTION SHALL HAVE THE FOLLOWING SUPERPAVE ITEM NUMBERS:
   TOP: 402.125301 M
   BINDER: 402.195901 M
   BASE: 402.255901 M
4. THE SIGN SHALL BE MADE OF ALUMINUM AND ATTACHED TO THE FENCE AT THE ENTRANCE TO THE SITE.

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN	APP
1	2/8/12	REVISED SIGN TEXT	JOC	AK

Geosyntec consultants
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COLUMBIA, MARYLAND 21046 USA
PHONE: 410.381.4333

CORTESE LANDFILL PRP GROUP
NARROWSBURG, NEW YORK

TITLE: SITE IMPROVEMENT DETAILS

PROJECT: OU 4 REMEDIAL DESIGN

SITE: CORTESE LANDFILL
NARROWSBURG, NEW YORK

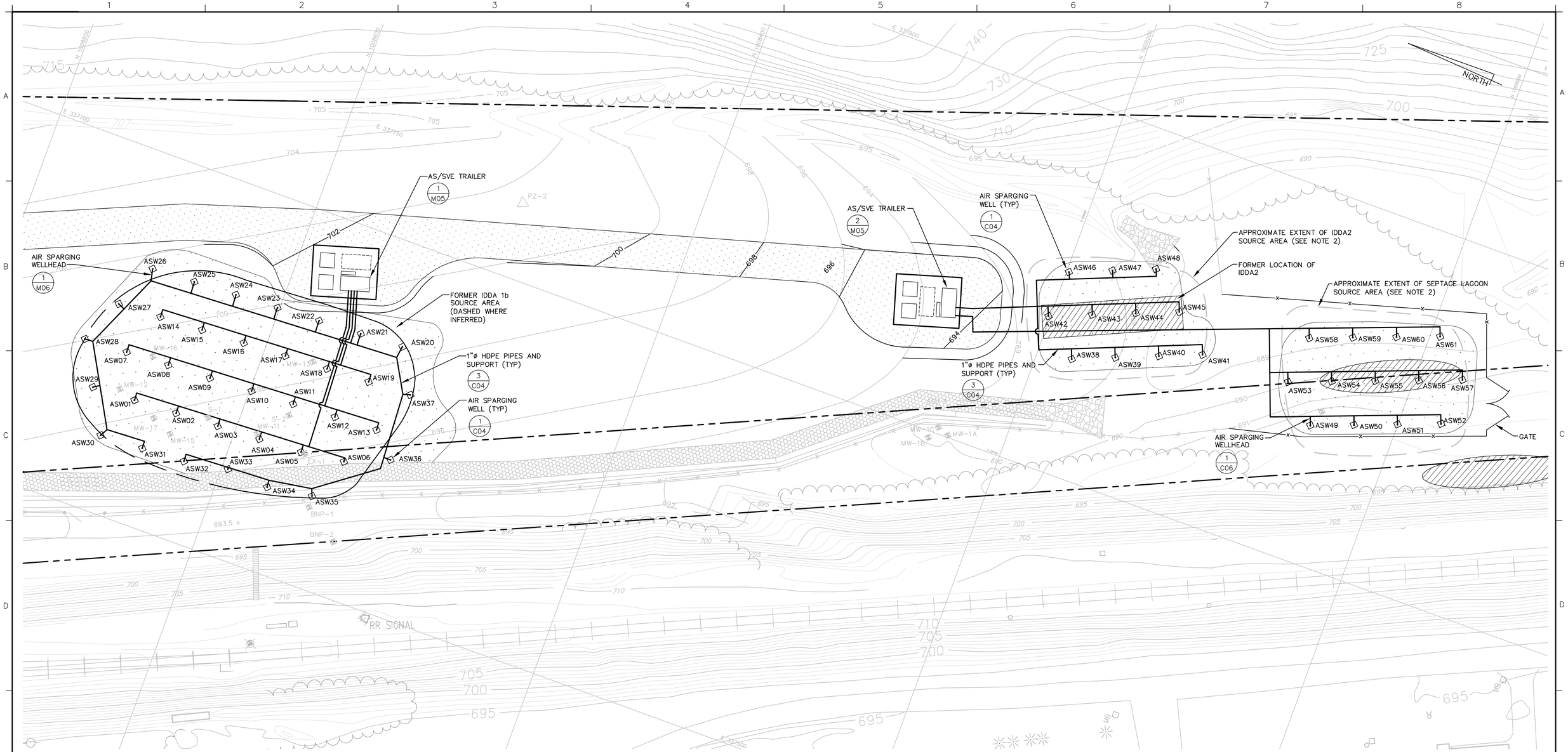
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DRAWN BY:	JOC	PROJECT NO.:	MR0562B
CHECKED BY:		FILE:	0562-5c02r1
REVIEWED BY:		DRAWING NO.:	C02
APPROVED BY:			

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NOTES:

1. EXISTING SITE CONDITIONS FROM FIGURE 2 "SITE PLAN, CORTESE LANDFILL CERCLA SITE, NARROWSBURG, NEW YORK" BY GOLDER ASSOCIATES, DATED 24 JANUARY 2008.
2. THE EXTENT OF THE SOURCE AREAS AT IDDA 2 AND SEPTAGE LAGOONS TO BE TREATED WILL BE DETERMINED DURING WELL INSTALLATION.
3. PIPE SUPPORTS TO BE SPACED A MAXIMUM OF 6 FEET APART.

LEGEND

- LANDFILL PROPERTY BOUNDARY
- FENCE
- 704 LANDFILL COVER ELEVATION CONTOUR
- 750 EXISTING GROUND ELEVATION CONTOUR
- AIR SPARGING WELL

25 12.5 0 25 50
SCALE IN FEET

NOT FOR CONSTRUCTION

REV.	DATE	DESCRIPTION	DRN	APP

Geosyntec consultants
10220 OLD COLUMBIA ROAD, SUITE A
COLUMBIA, MARYLAND 21046 USA
PHONE: 410.381.4333

CORTESE LANDFILL PRP GROUP
NARROWSBURG, NEW YORK

TITLE: AIR INJECTION DISTRIBUTION PIPING

PROJECT: OU 4 REMEDIAL DESIGN

SITE: CORTESE LANDFILL
NARROWSBURG, NEW YORK

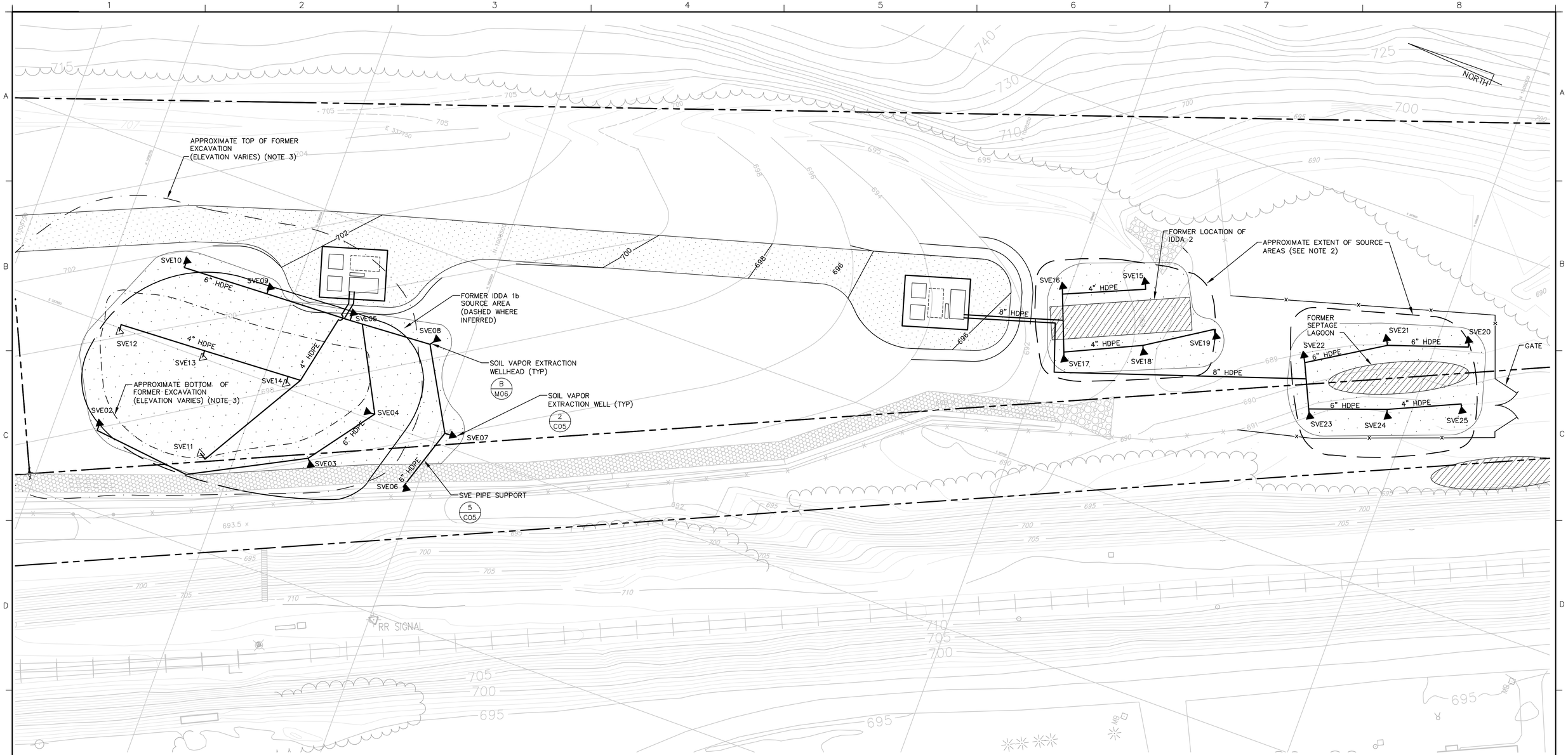
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DRAWN BY:	JOC	PROJECT NO.:	MR0562B
CHECKED BY:		FILE:	0562-c03
REVIEWED BY:		DRAWING NO.:	C03
APPROVED BY:			

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NOTES:

1. EXISTING SITE CONDITIONS FROM FIGURE 2 "SITE PLAN, CORTESE LANDFILL CERCLA SITE, NARROWSBURG, NEW YORK" BY GOLDER ASSOCIATES, DATED 24 JANUARY 2008.
2. THE EXTENT OF THE FORMER SOURCE AREA AT FORMER IDDA 2 AND SEPTAGE LAGOONS TO BE TREATED WILL BE DETERMINED DURING WELL INSTALLATION.
3. TOP AND BOTTOM OF FORMER EXCAVATION FROM FIGURE 2 "LOCATION PLAN OF B AND A–BDC TEST BORINGS AND PREVIOUS INVESTIGATIONS BY OTHERS", BY BARROW AND ASSOCIATES, P.C., DATED 11 DECEMBER 2009.

PIPING SUPPORT SCHEDULE	
NOM. PIPE SIZE (IN)	PIPE SUPPORT SPACING (FT)
2	8
4	12
6	14
8	16

LEGEND

- LANDFILL PROPERTY BOUNDARY
- FENCE
- 704 ELEVATION CONTOUR
- ▶ SOIL VAPOR EXTRACTION WELL
- ▷ SOIL VAPOR EXTRACTION WELL IN SAND/WASTE

25 12.5 0 25 50
SCALE IN FEET

REV	DATE	DESCRIPTION	DRN	APP

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CORTESE LANDFILL PRP GROUP
NARROWSBURG, NEW YORK

TITLE: SOIL VAPOR EXTRACTION DISTRIBUTION PIPING

PROJECT: OU 4 REMEDIAL DESIGN

SITE: CORTESE LANDFILL
NARROWSBURG, NEW YORK

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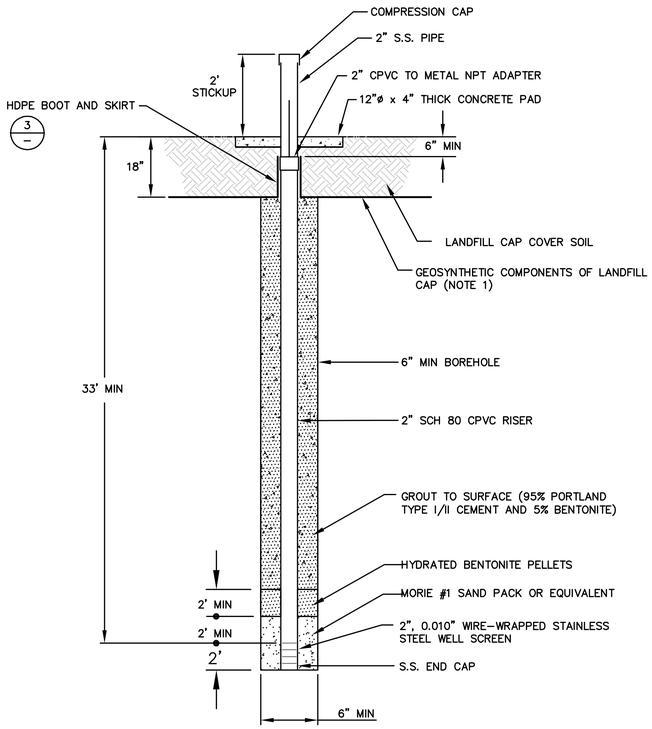
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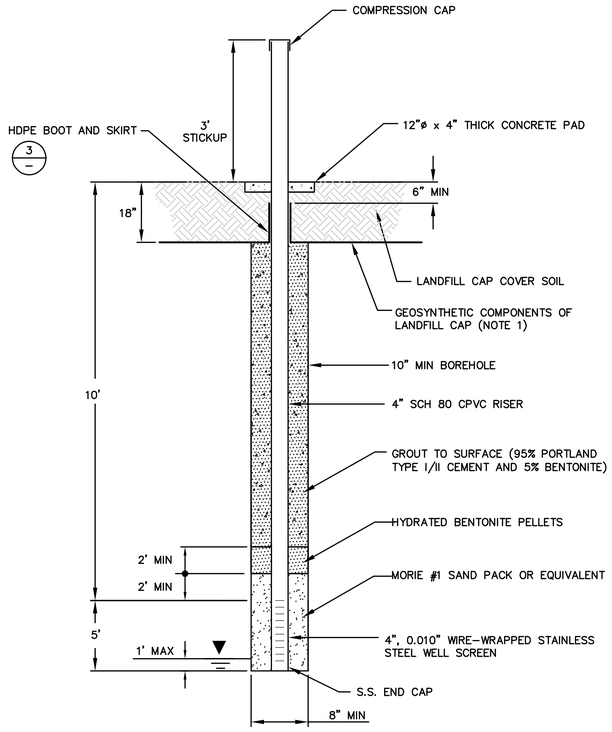
DESIGN BY:	LW	DATE:	AUGUST 2011
DRAWN BY:	JOC	PROJECT NO.:	MR0562B
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REVIEWED BY:		DRAWING NO.:	C04
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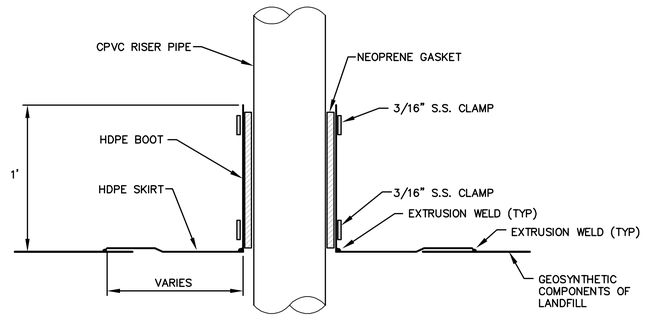
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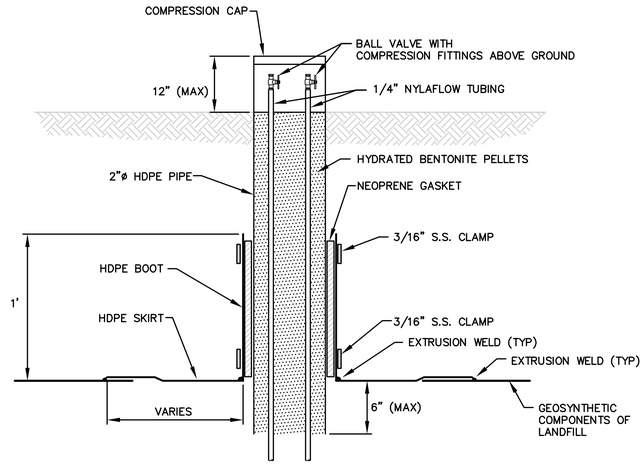
1 C03 DETAIL
AIR SPARGING WELL INSTALLATION
SCALE: NTS



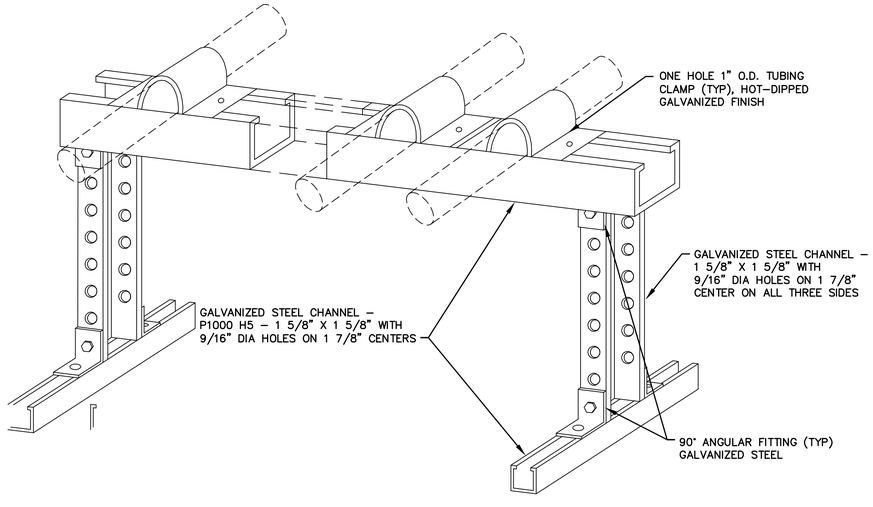
2 C04 DETAIL
SOIL VAPOR EXTRACTION VENT INSTALLATION
SCALE: NTS



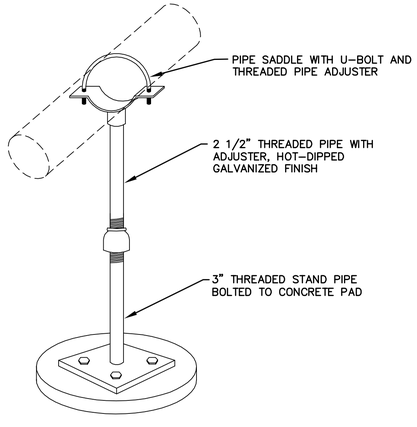
3 — DETAIL
HDPE BOOT AND SKIRT
SCALE: NTS



6 G03 DETAIL
SGP A/B HDPE BOOT AND SKIRT
SCALE: NTS



4 C03 DETAIL
AS PIPING PIPE SUPPORTS
SCALE: NTS



5 C04 DETAIL
SVE PIPING PIPE SUPPORT
SCALE: NTS

NOTES:

1. PROPOSED BORINGS WILL BE INSTALLED AFTER HAND DIGGING TO EXPOSE THE GEOSYNTHETIC COMPONENTS AND CUTTING A HOLE IN THE LINER LARGE ENOUGH TO ALLOW THE DRILL TOOLING TO PASS THROUGH.
2. INSTALLED IN VADOSE ZONE.

REV	DATE	DESCRIPTION	DRN	APP

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CORTESE LANDFILL PRP GROUP
NARROWSBURG, NEW YORK

TITLE: CONSTRUCTION DETAIL

PROJECT: OU 4 REMEDIAL DESIGN

SITE: CORTESE LANDFILL
NARROWSBURG, NEW YORK

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REVIEWED BY:		DRAWING NO.:	
APPROVED BY:			C05

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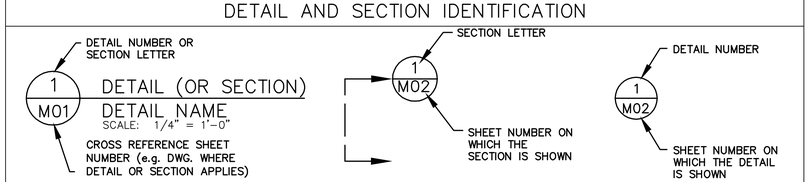
VALVE SYMBOLS

	GATE VALVE
	GLOBE VALVE
	BALL VALVE
	CONTROL VALVE
	PLUG VALVE
	NEEDLE VALVE
	BUTTERFLY VALVE
	DIAPHRAGM VALVE
	CHECK VALVE
	KNIFE GATE VALVE
	PINCH VALVE
	SQUEEZE VALVE
	3–WAY VALVE
	4–WAY VALVE
	ANGLE VALVE
	FLOAT OPERATED VALVE
	FOOT VALVE
	SLIDE GATE VALVE
	INJECTION/ANTI–SYPHON CHECK VALVE
	PRESSURE RELIEF VALVE
	AIR REGULATOR
	AIR VENT/VACUUM BRAKE
	STOP COCK
	SAMPLE PORT/DRAIN

PIPING SYMBOLS

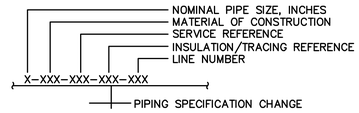
F	AIR FILTER		DIELECTRIC COUPLING
R	AIR REGULATOR		ROTAMETER
F R	COMB. AIR FILTER / REGULATOR W/ GUAGE		RAIN CAP
U	AIR LUBRICATOR		BUG SCREEN
	WYE STRAINER	P	PITOT TUBE
S	STRAINER, BASKET TYPE		EXPANSION JOINT–FLANGED TYPE
	UNION		FLEXIBLE CONNECTION
	FLANGE		SAFETY SHOWER
	DRESSER COUPLING		CONCENTRIC REDUCER
	FLEXIBLE HOSE		ECCENTRIC REDUCER
	HOSE CONNECTION		QUICK CONNECT COUPLER
	FLUME	ST	STEAM TRAP
M	MAGNETIC FLOWMETER		PLUG
	SONIC FLOWMETER		RUPTURE DISK (PRESSURE)
	TURBINE FLOWMETER		DIAPHRAGM OR CHEMICAL SEAL
	ORIFICE FLOWMETER		VENTURI INJECTOR
	FLOW METER ELEMENT		INSULATION
	SIGHT FLOW INDICATOR		PIPE INSULATION
PI	PRESSURE INDICATOR	E E	PIPE INSULATION w/ ELECTRICAL HEAT TRACE
TI	TEMPERATURE INDICATOR	S S	PIPE INSULATION w/ STEAM HEAT TRACE
	WEIR	TP	TIE POINT
	HOSE		

DETAIL AND SECTION IDENTIFICATION



PIPING DESIGNATIONS AND ABBREVIATIONS

PIPING IDENTIFICATION



PIPING MATERIAL ABBREVIATIONS

ABS	ACRYLONITRILE BUTADIENE STYRENE TRUSS PIPE
ALM	ALUMINUM PIPE OR TUBING
ARP	ALUMINUM REINFORCED PLASTIC PIPE
BPT	BRAIDED PLASTIC TUBING – PVC
CI	CAST IRON PIPE
CISP	CAST IRON SOIL PIPE
CMSP	CORRUGATED METAL CULVERT PIPE
CMH	CHEMICAL HOSE
CMP	CORRUGATED METAL PIPE
COP	COPPER PIPE
CPVC	CHLORINATED POLYVINYL CHLORIDE PIPE
DCHDPE	DOUBLE CONTAINED HIGH DENSITY POLYETHYLENE PIPE
DI	DUCTILE IRON PIPE
ERP	EPOXY RESIN PIPE
FRP	FIBERGLASS REINFORCED PLASTIC PIPE
GALV	GALVANIZED STEEL PIPE
HDPE	HIGH DENSITY POLYETHYLENE PIPE
HSI	HIGH SILICONE IRON PIPE
KLS	PVDF LINED STEEL PIPE – KYNAR LINED TYP.
KYN	PVDF PIPE – KYNAR TYP.
NEO	NEOPRENE HOSE
NLS	NEOPRENE LINES STEEL PIPE
NYL	NYLON TUBING
PEP	POLYETHYLENE PIPE
PERT	POLYETHYLENE REINFORCED TUBING
PLS	POLYPROPYLENE LINED STEEL PIPE
POP	POLYPROPYLENE PIPE
PVC	POLYVINYL CHLORIDE PIPE
PVDF	POLYVINYLIDENE FLUORIDE (KYNAR)
PRP	PHENOLIC RESIN PIPE
RBR	RUBBER HOSE
RCCP	REINFORCED CONCRETE CULVERT PIPE
RCP	REINFORCED CONCRETE PIPE
SAR	SARAN TUBING
SLH	SLUDGE HOSE
SLS	SARAN LINED STEEL PIPE
SST	STAINLESS STEEL PIPE OR TUBING
STL	CARBON STEEL PIPE
TEF	TEFLON TUBING
TLS	TEFLON LINED STEEL PIPE
TYB	TYGON TUBING – BRAIDED
TYG	TYGON TUBING – UNBRAIDED

PIPING SERVICE DESIGNATION

AA	AMBIENT AIR
BC	BIOFOULING CONTROL
BD	BLOW DOWN
BW	BACKWASH
CA	COMPRESSED AIR
CF	CHEMICAL FEED
CG	CHLORINE GAS
CTR	COOLING WATER RETURN
CTS	COOLING WATER SUPPLY
CW	CITY WATER
CWR	CHILLED WATER RETURN
CWS	CHILLED WATER SUPPLY
DF	DIESEL FUEL/FUEL OIL
DG	DRAINS – NON–CORROSIVE
DIW	DEIONIZED WATER
FO	FUEL OIL
FW	FIRE WATER
FLW	FILTERED WATER
GW	GROUND WATER
HC	HIGH PRESSURE STEAM CONDENSATE
HO	HYDRAULIC OIL
HS	HIGH PRESSURE STEAM
HV	HYDROCARBON VAPOR
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
IA	INSTRUMENT AIR
IG	INERT GAS
IW	INDUSTRIAL WATER
IWW	INDUSTRIAL WASTEWATER
LC	LOW PRESSURE STEAM CONDENSATE
LO	LUBE OIL
LS	LOW PRESSURE STEAM
MC	MEDIUM PRESSURE STEAM CONDENSATE
MS	MEDIUM PRESSURE STEAM
N	NITROGEN
NG	NATURAL GAS
OVF	OVERFLOW
PA	PLANT AIR
PO	POLYMER
POT	POTABLE WATER
PR	PRODUCT – SANITARY PIPING
PS	PRIMARY SLUDGE
PW	PROCESS WATER
PWW	PROCESS WASTEWATER
RCW	RECYCLED WATER
RW	RIVER WATER
SG	SOIL GAS
SL	SLUDGE
SS	SECONDARY SLUDGE
STW	STORM WATER
SW	SOFTENED WATER
SWW	SANITARY WASTEWATER
TW	TREATED WATER
V	PROCESS VENT
VA	PROCESS VAPOR
VTR	VENT THROUGH ROOF
VTW	VENT THROUGH WALL
WAW	WASH WATER
WO	WASTE OIL
WW	WASTEWATER

ACTUATOR SYMBOLS

S	SOLENOID
	DIAPHRAGM
	CYLINDER
M	MOTOR
	ELECTRO–PNEUMATIC
E/H	ELECTRO–HYDRAULIC

INSULATION/TRACING DESIGNATIONS

ET	ELECTRIC TRACING
FP	FREEZE PROTECTION INSULATION
FPET	FREEZE PROTECTION & ELECTRICAL TRACING
FPST	FREEZE PROTECTION & STEAM TRACING
IH	HOT INSULATION
IHET	HOT INSULATION & ELECTRICAL TRACING
IHST	HOT INSULATION & STEAM TRACING
IHXJ	HOT INSULATION & JACKETED
IC	COLD INSULATION
ICWT	COLD INSULATION & WATER TRACING
ICXJ	COLD INSULATION & JACKETED
IP	PERSONNEL PROTECTION INSULATION
ST	STEAM TRACING
WT	WATER TRACING
XJ	JACKETED, DENOTE TYPE

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CORTESE LANDFILL PRP GROUP
NARROWSBURG, NEW YORK

TITLE: PROCESS LEGEND – PIPING AND VALVES

PROJECT: OU 4 REMEDIAL DESIGN

SITE: CORTESE LANDFILL NARROWSBURG, NEW YORK

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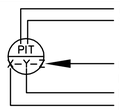
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APPROVED BY:			

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TYP. INSTRUMENTATION SYMBOLS



FE	LOCAL MOUNTED INSTRUMENT
FY	REAR OF PANEL MOUNTED INSTRUMENT
QA	PANEL MOUNTED INSTRUMENT
HS L/R	FUNCTION DESIGNATOR SEE ABBREVIATION LIST
FI 141	PLC CONTROL
I	HARDWIRED INTERLOCK
3	PLC INTERLOCK
———	INSTRUMENTATION CONNECTION TO PROCESS, OR MECHANICAL LINK, OR INSTRUMENT SUPPLY. FOLLOWING ABBREVIATIONS DENOTE TYPE OF LINE: PS PROCESS SAMPLE AS AIR SUPPLY GS GAS SUPPLY ES ELECTRICAL SUPPLY
//—//—//	PNEUMATIC SIGNAL OR UNDEFINED SIGNAL FOR PROCESS FLOW LINE
– – – – – – –	ELECTRIC SIGNAL
—x—x—x—	CAPILLARY TUBING (FILLED SYSTEM)
—L—L—L—	HYDRAULIC SIGNAL
—A—A—	ANALOG SIGNAL
—D—D—	DISCRETE SIGNAL
—XXXX	CONTROL SIGNAL CONTINUATION – REFERENCES CONTROL LOOP NUMBER CONTINUATION

INSTRUMENT SOCIETY OF AMERICA TABLE

LETTER	FIRST LETTER(S)		SUCCEEDING LETTERS		
	PROCESS OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS (+)		ALARM		
B	BURNER FLAME		USER'S CHOICE (+)	USER'S CHOICE (+)	USER'S CHOICE (+)
C	CONDUCTIVITY			CONTROL	
D	DENSITY (S.G.)	DIFFERENTIAL			
E	VOLTAGE/EMF		PRIMARY ELEMENT		
F	FLOW RATE	RATIO/BIAS			
G	GAUGE		GLASS	GATE	
H	HAND (MANUAL)				HIGH
I	CURRENT		INDICATE		
J	POWER	SCAN			
K	TIME OR SCHEDULE			CONTROL STATION	
L	LEVEL		LIGHT (PILOT)		LOW
M	MOTION				MIDDLE/INTERMEDIATE
N	USER'S CHOICE (+)		USER'S CHOICE (+)	USER'S CHOICE (+)	USER'S CHOICE (+)
O	USER'S CHOICE (+)		ORIFICE/RESTRICTION		
P	PRESSURE/VACUUM		POINT (TEST CONNECTION)		
Q	QUANTITY/EVENT (+)	INTEGRATE	INTEGRATE		
R	RADIOACTIVITY		RECORD/PRINT		
S	SPEED/FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTI-VARIABLE (+)		MULTIFUNCTION (+)	MULTIFUNCTION (+)	MULTIFUNCTION (+)
V	VISCOSITY			VALVE/DAMPER	
W	WEIGHT/FORCE		WELL		
X	UNCLASSIFIED (+)		UNCLASSIFIED (+)	UNCLASSIFIED (+)	UNCLASSIFIED (+)
Y	STATUS			RELAY/COMPUTE (+)	
Z	POSITION			DRIVE, ACTUATE, OR UNCLASSIFIED FINAL CONTROL ELEMENT	

(+) WHEN USED, EXPLANATION IS SHOWN ADJACENT TO INSTRUMENT SYMBOL. SEE ABBREVIATIONS LIST.

TYPICAL INSTRUMENTATION IDENTIFICATION

FLOW

FC	FLOW CONTROLLER
FCV	FLOW CONTROL VALVE
FE	FLOW ELEMENT
FI	FLOW INDICATOR
FIC	FLOW INDICATING CONTROLLER
FIT	FLOW INDICATING TRANSMITTER
FK	FLOW DIAL
FQ	FLOW TOTALIZER
FS	FLOW SWITCH
FT	FLOW TRANSMITTER

LEVEL

LA	LEVEL ALARM
LC	LEVEL CONTROLLER
LE	LEVEL ELEMENT
LI	LEVEL INDICATOR
LIC	LEVEL INDICATING CONTROLLER
LISL	LEVEL INDICATING SWITCH LOW
LISH	LEVEL INDICATING SWITCH HIGH
LLH	LEVEL LIGHT HIGH
LLL	LEVEL LIGHT LOW
LS	LEVEL SWITCH
LSL	LEVEL SWITCH LOW
LSH	LEVEL SWITCH HIGH
LSHH	LEVEL SWITCH HIGH HIGH
LT	LEVEL TRANSMITTER

PRESSURE

PC	PRESSURE CONTROLLER
PCV	PRESSURE CONTROL VALVE
PDE	PRESSURE DIFFERENTIAL ELEMENT
PDI	PRESSURE DIFFERENTIAL INDICATOR
PDT	PRESSURE DIFFERENTIAL TRANSMITTER
PE	PRESSURE ELEMENT
PI	PRESSURE INDICATOR
PIC	PRESSURE INDICATOR CONTROLLER
PIT	PRESSURE INDICATING TRANSMITTER
PLH	PRESSURE LIGHT HIGH
PRV	PRESSURE REGULATING VALVE
PSE	RUPTURE DISK
PSV	PRESSURE SAFETY VALVE
PSH	PRESSURE SWITCH HIGH
PT	PRESSURE TRANSMITTER

SPEED

SC	SPEED CONTROLLER
SI	SPEED INDICATOR
SIC	SPEED INDICATING CONTROLLER
ST	SPEED TRANSMITTER

TEMPERATURE

TC	TEMPERATURE CONTROLLER
TCV	TEMPERATURE CONTROL VALVE
TE	TEMPERATURE ELEMENT (RTD)
TI	TEMPERATURE INDICATOR
TIC	TEMPERATURE INDICATING CONTROL
TS	TEMPERATURE SWITCH
TT	TEMPERATURE TRANSMITTER

TIME

KI	CLOCK
KIC	TIME INDICATING CONTROLLER
KQI	RUN TIME TOTALIZER INDICATOR

MISCELLANEOUS

ASH	ALARM SWITCH HIGH
HS	HAND SWITCH
QI	STATUS INDICATOR
XCV	ACTUATED OPEN-CLOSE CONTROL VALVE
ZC	POSITION CONTROLLER
ZE	POSITION ELEMENT
ZI	POSITION INDICATOR
ZIT	POSITION INDICATOR TRANSMITTER

SUBSCRIPTS – USED WITH COMPLEX LOGIC SYMBOL

A	ANALOG
D	DIGITAL
E	VOLTAGE
H	HYDRAULIC
I	CURRENT (ELECTRICAL)
I/P	CURRENT TO PNEUMATIC SIGNAL CONVERSION
O	ELECTROMAGNETIC OR SONIC
P	PNEUMATIC

MISCELLANEOUS ABBREVIATIONS

AC	ALTERNATING CURRENT	FO	FAIL OPEN	MFR	MANUFACTURER	SP	SET POINT
ACK	ACKNOWLEDGE	FV	FULL VACUUM	MIN	MINIMUM	S/S	START/STOP
AFD	ADJUSTABLE FREQUENCY DRIVE	FWD	FORWARD ACTING	MP	MEDIUM PRESSURE	STS	STORM SEWER
AMB	AMBIENT	G	GRAVITY	NC	NORMALLY CLOSED	T	TRAP ASSEMBLY
A/M	AUTO/MANUAL	GAL	GALLONS	NLL	NORMAL LIQUID LEVEL	TC	THERMOCOUPLE
ATM	ATMOSPHERE	GPM	GALLONS PER MINUTE	NNF	NORMALLY NO FLOW	TAN	TANGENT
BL	BATTERY LIMIT	GR	GRADE	NO	NORMALLY OPEN	TORQ	TORQUE
BW	BACKWASH	GS	GAS SUPPLY	NPT	NATIONAL PIPE TAPER	TURB	TURBIDITY
CA	CORROSION ALLOWANCE	HC	HOSE CONNECTION	O/C	OPEN/CLOSE	TP	TIE POINT
CD	CONTINUOUS DRAINER	HH	HAND HOLE	O/C/A	OPEN/CLOSE/AUTO	TYP	TYPICAL
CO	CLEAN OUT	HLL	HIGH LIQUID LEVEL	O/C/R	OPEN/CLOSE/REMOTE	UPS	UNINTERRUPTIBLE POWER SUPPLY
COMP	COMPRESSOR	HOA	HAND-OFF-AUTO	O/O	ON/OFF	VAC	VACUUM
CONN	CONNECTION	HOR	HORIZONTAL	O/O/A	ON/OFF/AUTO	VC	VENT CONNECTION
CSC	CAR SEAL CLOSED	HP	HIGH PRESSURE	O/O/L	ON/OFF/LOCAL	VERT	VERTICAL
CSO	CAR SEAL OPEN	I/O	INPUT/OUTPUT	O/O/R	ON/OFF/REMOTE	VIB	VIBRATION
D	DRAIN	IN	INSTRUMENT NITROGEN	O/S/C	OPEN/STOP/CLOSE	WO	WASH OUT CONNECTION
DC	DIRECT CURRENT	LEL	LOWER EXPLOSIVE LIMIT	OS	OILY WATER SEWER	WWTF	WASTEWATER TREATMENT FACILITY
DRC	DRAIN CONNECTION	LF	LINEAL FEET	PC	PURGE CONNECTION	WWTP	WASTEWATER TREATMENT PLANT
DES	DESIGN	LG	LIGHT GLASS	pH	HYDROGEN ION CONCENTRATION	WX	ANALOG INPUT
DEV	DEVIATION	L/O/H	LOW/OFF/HIGH	PLC	PROGRAMMABLE LOGIC CONTROLLER	WY	ANALOG OUTPUT
DO	DISSOLVED OXYGEN	LP	LOW PRESSURE	POTW	PUBLICLY OWNED TREATMENT WORKS	X	DISCRETE INPUT
E	EXISTING	L/O/R	LOCAL/OFF/REMOTE	P/S	PRIMARY/SECONDARY	Y	DISCRETE OUTPUT
EF	EXHAUST FAN	L/R	LOCAL/REMOTE	PSV	PRESSURE SAFETY VALVE	Δ	DIFFERENCE
EFF	EFFLUENT	M	ELECTRIC MOTOR	REV	REVERSE ACTING	Σ	SUM
EL	ELEVATION	M/A	MANUAL/AUTO	RTD	RESISTANCE TEMPERATURE DETECTOR	X	MULTIPLY
EM	EMERGENCY	MAX	MAXIMUM	SAS	SANITARY SEWER	/	DIVIDE
ES	EMERGENCY STOP	MOA	MANUAL/OFF/AUTO	SEQ	SEQUENCE	$\surd$	SQUARE ROOT
FC	FAIL CLOSED	MCC	MOTOR CONTROL CENTER	SC	SAMPLE CONNECTION	<	SELECT HIGHEST SIGNAL
FD	FLOOR DRAIN	MCP	MAIN CONTROL PANEL	SO	STEAM OUT	>	SELECT LOWEST SIGNAL
FL	FAIL LAST POSITION					◇	STREAM NUMBER

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CORTESE LANDFILL PRP GROUP
NARROWSBURG, NEW YORK

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EQUIPMENT SYMBOLS

	CENTRIFUGAL PUMP		PROCESS VESSEL (PRESSURIZED)
	AIR DIAPHRAGM PUMP		DRUMS
	METERING PUMP		PRESSURIZED TANKS
	GEAR PUMP		ATMOSPHERIC TANK
	PROGRESSIVE CAVITY PUMP		CARBON VESSELS
	DOUBLE SUCTION PUMP	F	INLINE FILTER (F=FILTER, C=COALESCING, G=CARBON)
	VERTICAL TURBINE PUMP	F E T M	FLOWMETER [F = FLOWMETER, T = TOTALIZER] FLOWMETER [E = ELECTRICAL, M = MECHANICAL]
	PROPORTIONAL FEED PUMP		SPILL ALIGNMENT
	SUBMERSIBLE PUMP	M	MIXER (ELECTRIC)
	CENTRIFUGAL BLOWER		THERMOMETER
	ROTARY BLOWER		COMPRESSOR
	ROTARY POSITIVE DISPLACEMENT BLOWER		SCREW CONVEYOR
	ROTARY LOBE BLOWER		HOPPER
	DRYER		AIR-TO-AIR HEAT EXCHANGER

ELECTRICAL SYMBOLS

	LEVEL SWITCH
	TEMPERATURE SWITCH
H O A	HAND-OFF AUTO SWITCH
M	MOTOR CONTACTS
M	MOTOR STARTER COIL
CR	CONTROL RELAY CONTACTS
CR	CONTROL RELAY COIL
	OVERLOAD CONTACTS
	TRANSFORMER
	CIRCUIT BREAKER
	FUSED DISCONNECT
OL	OVERLOAD (MOTOR)
	INDICATOR LAMP
10	MOTOR WITH HP VALUE
	RECEPTACLE
	FUSE
	GROUND CONNECTION
	LIGHTING (SINGLE LAMP)
	LIGHTING (FOUR LAMPS)
HOA	HAND-OFF AUTO SWITCH
HA	HAND SWITCH

PRIMARY ELEMENTS

FE	MAGNETIC FLOW METER
FE	WEIR
LS	LEVEL SWITCH (FLOAT)
ZS	LIMIT SWITCH
TANK LE	LEVEL ELEMENT DPIT
PI LF	PRESSURE GAUGE WITH INLINE SLEEVE TYPE MOUNTED CHEMICAL SEAL ASSEMBLY, LF INDICATES LIQUID FILLED REQUIREMENTS.
TC	WELL TYPE INSTRUMENT

EQUIPMENT DESIGNATIONS

EQUIPMENT NUMBERS
100 AGITATORS, AERATORS
200 AIR HANDLING – BLOWERS, COMPRESSORS, DRYERS
300 CLARIFIERS, THICKENERS, SEPARATORS
400 FILTERS – VACUUM, PRESSURE, CENTRIFUGES
500 HVAC – EXHAUST FANS, HEAT PUMPS, ETC.
600 PUMPS
700 TANKS
800 ALL OTHER MECHANICAL EQUIPMENT

EQUIPMENT CODE LEGEND
X–abc
X = EQUIPMENT CODE
C = COMPRESSOR
F = FILTER
G = GENERAL
M = MIXER
P = PUMP
T = TANK
V = REGULATING VALVE
abc = EQUIPMENT I.D. NUMBER
(SEQUENTIALLY WITHIN EQUIPMENT NUMBERS)

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Geosyntec consultants
10220 OLD COLUMBIA ROAD, SUITE A
COLUMBIA, MARYLAND 21046 USA
PHONE: 410.381.4333

CORTESE LANDFILL PRP GROUP
NARROWSBURG, NEW YORK

TITLE: PROCESS LEGEND – EQUIPMENT AND ELECTRICAL

PROJECT: OU 4 REMEDIAL DESIGN

SITE: CORTESE LANDFILL
NARROWSBURG, NEW YORK

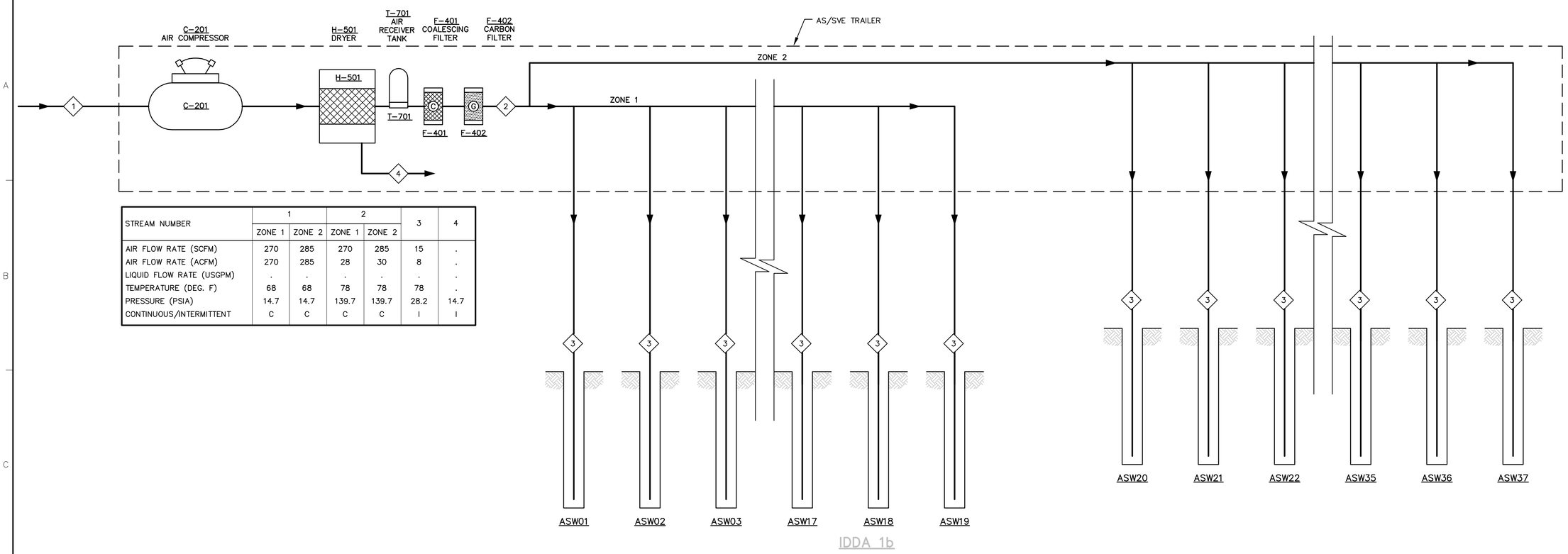
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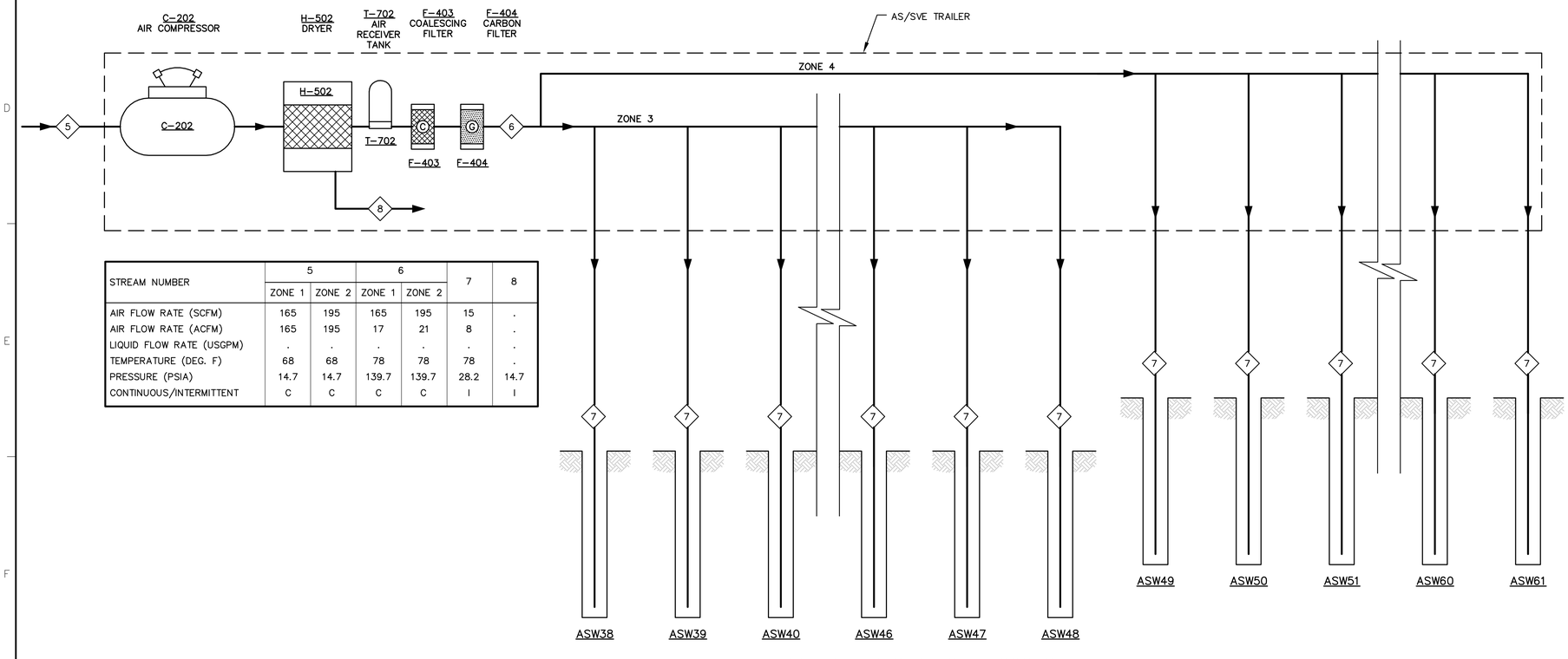
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REVIEWED BY:	DRAWING NO.: M01C
APPROVED BY:	

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STREAM NUMBER	1		2		3	4
	ZONE 1	ZONE 2	ZONE 1	ZONE 2		
AIR FLOW RATE (SCFM)	270	285	270	285	15	.
AIR FLOW RATE (ACFM)	270	285	28	30	8	.
LIQUID FLOW RATE (USGPM)	.	.	.	.	.	.
TEMPERATURE (DEG. F)	68	68	78	78	78	.
PRESSURE (PSIA)	14.7	14.7	139.7	139.7	28.2	14.7
CONTINUOUS/INTERMITTENT	C	C	C	C	I	I

IDDA 1b



STREAM NUMBER	5		6		7	8
	ZONE 1	ZONE 2	ZONE 1	ZONE 2		
AIR FLOW RATE (SCFM)	165	195	165	195	15	.
AIR FLOW RATE (ACFM)	165	195	17	21	8	.
LIQUID FLOW RATE (USGPM)	.	.	.	.	.	.
TEMPERATURE (DEG. F)	68	68	78	78	78	.
PRESSURE (PSIA)	14.7	14.7	139.7	139.7	28.2	14.7
CONTINUOUS/INTERMITTENT	C	C	C	C	I	I

IDDA 2 AND SEPTAGE LAGOONS

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PHONE: 410.381.4333

CORTESE LANDFILL PRP GROUP
NARROWSBURG, NEW YORK

TITLE: PROCESS FLOW DIAGRAM – AIR SPARGING SYSTEMS

PROJECT: OU 4 REMEDIAL DESIGN

SITE: CORTESE LANDFILL
NARROWSBURG, NEW YORK

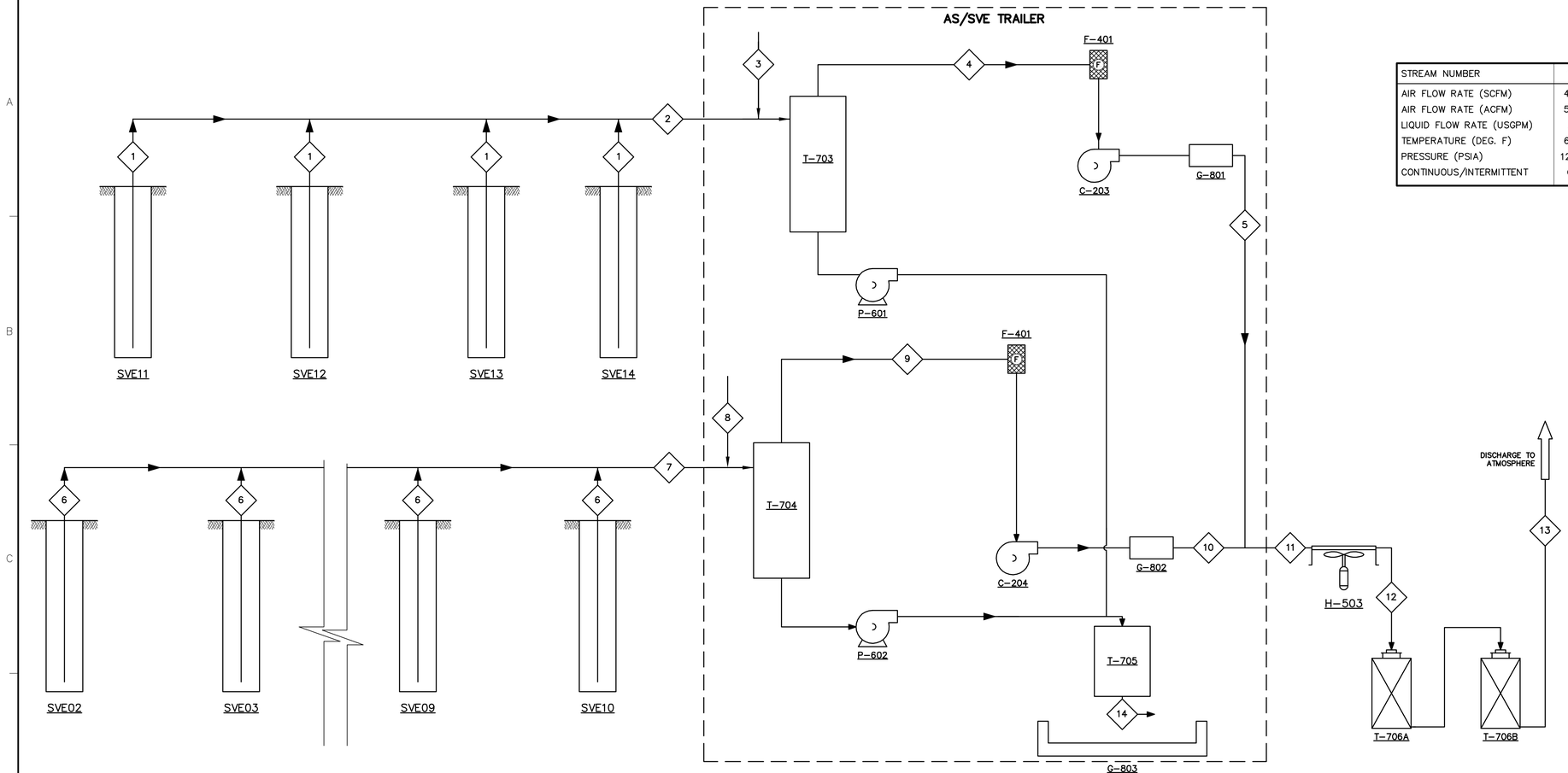
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REVIEWED BY:		DRAWING NO.:	M02A
APPROVED BY:			

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IDDA 1b

STREAM NUMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14
AIR FLOW RATE (SCFM)	43	169	21	190	190	49	433	47	480	480	670	670	670	.
AIR FLOW RATE (ACFM)	50	200	28	163	522	50	450	62	449	1221	1744	1185	1160	.
LIQUID FLOW RATE (USGPM)	.	.	.	.	.	.	.	.	.	.	.	.	.	TBD
TEMPERATURE (DEG. F)	68	68	90	70	150	68	68	90	70	150	150	105	105	.
PRESSURE (PSIA)	12.7	12.4	14.7	12.2	18.3	14.4	14.2	14.7	13.3	17.0	17.3	16.8	16.5	.
CONTINUOUS/INTERMITTENT	C	C	C	C	C	C	C	C	C	C	C	C	C	I

C-203
SVE BLOWER

C-204
SVE BLOWER

C-205
SVE BLOWER

F-401
SOIL GAS INLINE FILTER

F-405
SOIL GAS INLINE FILTER

G-801
SILENCER

G-802
SILENCER

G-803
SPILL CONTAINMENT

G-805
SPILL CONTAINMENT

H-503
AIR-COOLED HEAT EXCHANGER

H-504
AIR-COOLED HEAT EXCHANGER

P-601
LIQUID TRANSFER PUMP

P-602
LIQUID TRANSFER PUMP

P-603
LIQUID TRANSFER PUMP

T-703
MOISTURE SEPARATOR

T-704
MOISTURE SEPARATOR

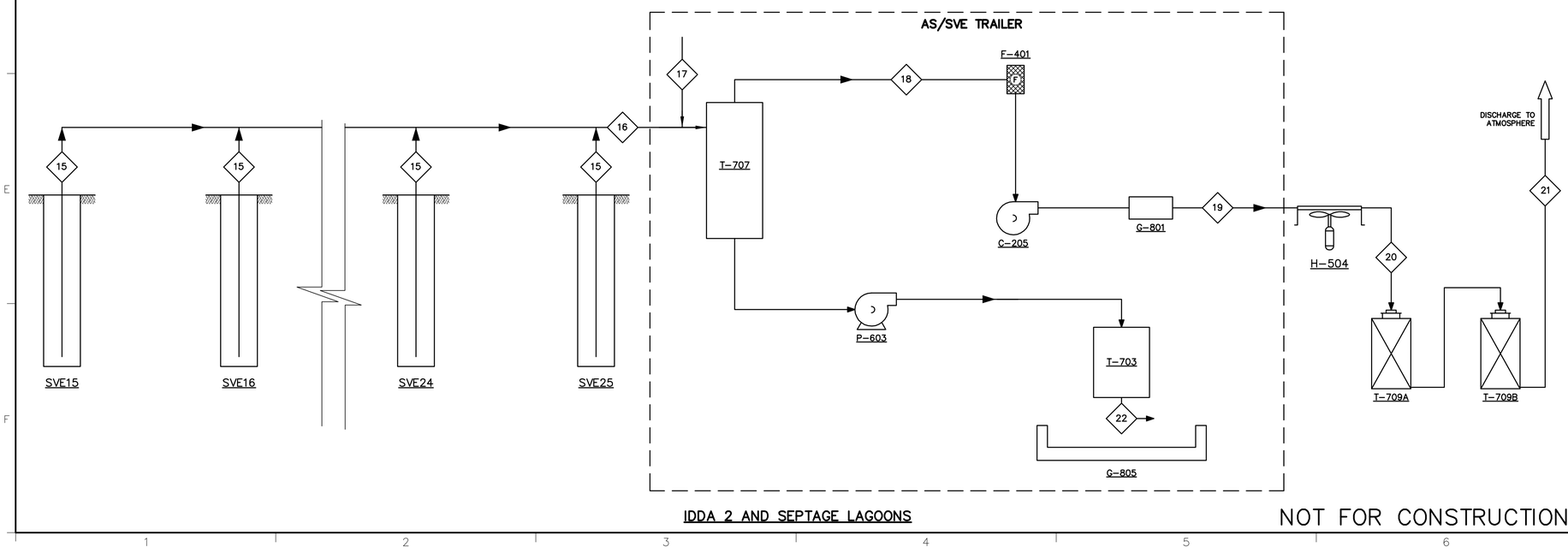
T-705
HOLDING TANK

T-706A/B
VAPOR PHASE CARBON VESSELS

T-707
MOISTURE SEPARATOR

T-708
HOLDING TANK

T-709A/B
VAPOR PHASE CARBON VESSELS



IDDA 2 AND SEPTAGE LAGOONS

STREAM NUMBER	15	16	17	18	19	20	21	22
AIR FLOW RATE (SCFM)	39	428	52	480	480	480	480	.
AIR FLOW RATE (ACFM)	40	440	52	436	554	537	526	.
LIQUID FLOW RATE (USGPM)	.	.	.	.	.	.	.	TBD
TEMPERATURE (DEG. F)	68	68	90	70	150	105	105	.
PRESSURE (PSIA)	14.4	14.3	14.7	13.3	17.0	16.5	16.1	.
CONTINUOUS/INTERMITTENT	C	C	C	C	C	C	C	I

REV	DATE	DESCRIPTION	DRN	APP

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PHONE: 410.381.4333

CORTESE LANDFILL PRP GROUP
NARROWSBURG, NEW YORK

TITLE:
PROCESS FLOW DIAGRAM – SOIL VAPOR EXTRACTION SYSTEMS

PROJECT:
OU 4 REMEDIAL DESIGN

SITE:
CORTESE LANDFILL
NARROWSBURG, NEW YORK

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APPROVED BY:			

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C-201
AIR COMPRESSOR
MOTOR: 75HP
FLOWRATE: 345 SCFM
PRESSURE: 125PSI
TYPE: ROTARY SCREW

H-501
DRYER
FLOWRATE: 345 SCFM
TYPE: REFRIDGERATED

T-701
RECEIVER TANK
660 GALLONS

F-401
COALESCING FILTER

F-402
CARBON FILTER

AS/SVE TRAILER

HOA
HS 201
HS 201
YC 201
O/O
KQI 201
OUTSIDE AIR
C-201
H-501
T-701
V-101
TI 501
TAH 501
TAH 501
2"-GALVANIZED-AIR-1000
F-401
F-402
PI 201
PIT 201
PSV 201
V-102
PAH 201
PAH 201
KC 201
1
DELAY
UC 201
PAL 201
PAL 201
TIT 001
TAH 001
TAH 001
TE 001
ROOM
TAL 001
TAL 001
PERMISSIVE
KC 201
TAH 501
PAH 201
PAL 201
TAH 001
TAL 001
YC 203
YC 204
DPIT 201
FY 201
UC 201
FAL 201
FAL 201
2
UY 201
DELAY
OR
V-901
V-920
V-103
V-104
V-801
V-802
PI 101
1/4
SP-101
NOTE 6
V-1501
V-1201
1"-HDPE-AIR-1101
V-1101
1"-SS-AIR/03-1201
V-2101
TP
FI 101
PIT 101
V-3101
V-4101
1"-GALV-AIR-1101
2"-CPVC-AIR/ 03-1201
2x1
ASW01
PI 100
V-4120
PIT 120
V-3120
FI 120
V-820
1"-GALV-AIR-1120
YC 820
O/C
KC 201
NOTE 6
V-1520
1"-HDPE-AIR-1120
V-1120
V-1220
V-2120
1"-SS-AIR/03-1220
PI 120
1/4
SP-120
2x1
2"-CPVC-AIR/ 03-1220
ASW20
V-902
V-921
UY 202
FAL 201
KC 202
YC 802
PI 102
1/4
SP-102
NOTE 6
V-1502
V-1202
1"-HDPE-AIR-1102
V-1102
1"-SS-AIR/03-1202
V-2102
2x1
TP
FI 102
PIT 102
V-3102
V-4102
V-802
1"-GALV-AIR-1102
PIT 121
V-4121
V-3121
FI 120
V-821
1"-GALV-AIR-1121
YC 821
KC 201
NOTE 6
V-1521
1"-HDPE-AIR-1121
V-1221
V-2121
1"-SS-AIR/03-1221
2x1
PI 121
1/4
SP-121
2"-CPVC-AIR/ 03-1221
ASW21
2"-CPVC-AIR/ 03-1202
ASW02
V-9MM
V-9NN
2"-GALV-AIR-1001
2"-GALV-AIR-1002
UY 201
FAL 201
KC 201
YC 8MM
PI 1MM
1/4
SP-1MM
NOTE 6
V-15MM
V-12MM
1"-HDPE-AIR-11MM
V-11MM
1"-SS-AIR/03-1218
V-21MM
2x1
TP
FI 1MM
PIT 1MM
V-31MM
V-41MM
V-8MM
1"-GALV-AIR-11MM
2"-CPVC-AIR/ 03-12MM
PIT 1NN
V-41NN
V-31NN
FI 1NN
V-8NN
1"-GALV-AIR-11NN
YC 8NN
KC 201
NOTE 6
V-15NN
1"-HDPE-AIR-11NN
V-11NN
V-12NN
V-21NN
1"-SS-AIR/03-12NN
2x1
PI 1NN
1/4
SP-1NN
2"-CPVC-AIR/ 03-12NN
ASWMM (TYP) SEE NOTE 3
ASWNN (TYP) SEE NOTE 4
V-918
V-936
UY 202
FAL 201
KC 202
YC 818
PI 118
1/4
SP-118
NOTE 6
V-1518
V-1218
1"-HDPE-AIR-1118
V-1118
1"-SS-AIR/03-1218
V-2118
2x1
TP
FI 118
PIT 118
V-3118
V-4118
V-818
1"-GALV-AIR-1118
PIT 136
V-4136
V-3136
FI 136
V-836
1"-GALV-AIR-1136
YC 836
KC 201
NOTE 6
V-1536
1"-HDPE-AIR-1136
V-1236
V-1136
V-2136
1"-SS-AIR/03-1236
2x1
PI 136
1/4
SP-136
2"-CPVC-AIR/ 03-1218
ASW18
2"-CPVC-AIR/ 03-1236
ASW36
V-919
V-937
UY 201
FAL 201
KC 201
YC 819
PI 119
1/4
SP-119
NOTE 6
V-1519
V-1219
1"-HDPE-AIR-1119
V-1119
1"-SS-AIR/03-1219
V-2119
2x1
TP
FI 119
PIT 119
V-3119
V-4119
V-819
1"-GALV-AIR-1119
PIT 137
V-4137
V-3137
FI 137
V-837
1"-GALV-AIR-1137
YC 837
KC 201
NOTE 6
V-1537
1"-HDPE-AIR-1137
V-1237
V-1137
V-2137
1"-SS-AIR/03-1237
2x1
PI 137
1/4
SP-137
2"-CPVC-AIR/ 03-1219
ASW19
2"-CPVC-AIR/ 03-1237
ASW37

NOTES

1. TIMER KC-201 STARTS C-201. AFTER DELAY UC-202 OF 5 MINUTES, LOW PRESSURE ALARM PAL-201 SHUTS DOWN C-201.
2. UY-202 INDICATES THAT ANY TIMER (KC-801 TO KC-837) HAS OPENED THE CORRESPONDING VALUE (V-838 TO V-861). AFTER DELAY UC-212 OF 10 MINUTES. LOW FLOW ALARM FAL-202 CLOSES ALL OPEN VALVES.
3. MM=03-17 FOR PROCESS LINES TO ASW03-ASW17 NOT SHOWN INDIVIDUALLY.
4. NN=22-35 FOR PROCESS LINES TO ASW22-ASW35 NOT SHOWN INDIVIDUALLY.
5. AIR COMPRESSOR PRESSURE RELIEF TO BE PROVIDED BY MANUFACTURER.
6. FUTURE OZONE (03) AMENDMENT PIPING WILL CONNECT AT AS WELLHEAD.

REV	DATE	DESCRIPTION	DRN	APP

Geosyntec consultants
10220 OLD COLUMBIA ROAD, SUITE A
COLUMBIA, MARYLAND 21046 USA
PHONE: 410.381.4333

CORTESE LANDFILL PRP GROUP
NARROWSBURG, NEW YORK

TITLE: PIPING AND INSTRUMENTATION DIAGRAM – FORMER IDDA1b AIR INJECTION SYSTEM

PROJECT: OU 4 REMEDIAL DESIGN

SITE: CORTESE LANDFILL NARROWSBURG, NEW YORK

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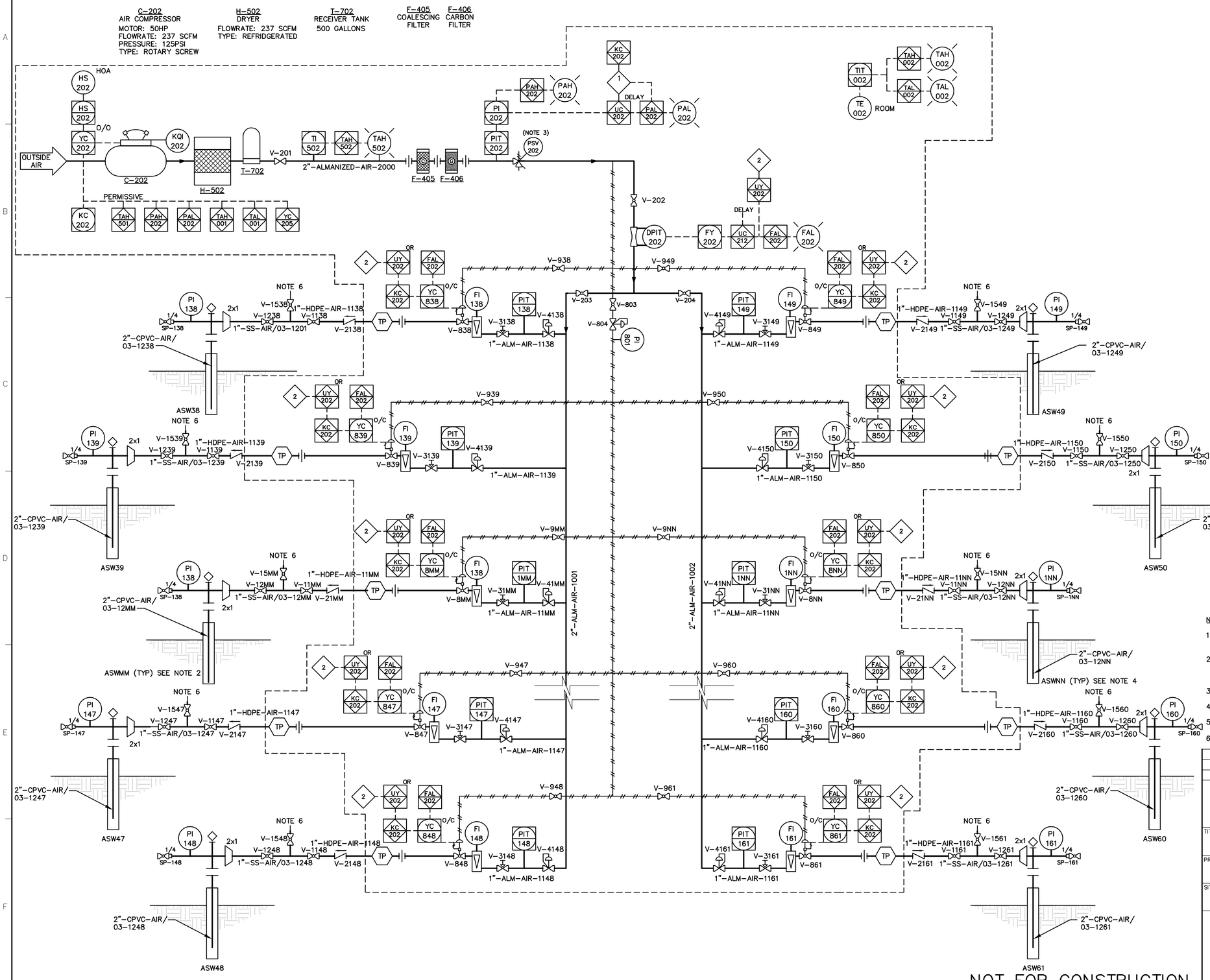
C-202
AIR COMPRESSOR
MOTOR: 50HP
FLOWRATE: 237 SCFM
PRESSURE: 125PSI
TYPE: ROTARY SCREW

H-502
DRYER
FLOWRATE: 237 SCFM
TYPE: REFRIDGERATED

T-702
RECEIVER TANK
500 GALLONS

F-405
COALESCING FILTER

F-406
CARBON FILTER



NOT FOR CONSTRUCTION

NOTES

1. TIMER KC-202 STARTS C-202. AFTER DELAY UC-202 OF 5 MINUTES, LOW PRESSURE ALARM PAL-202 SHUTS DOWN C-202.
2. UY-202 INDICATES THAT ANY TIMER (KC-838 TO KC-861) HAS OPENED THE CORRESPONDING VALUE (V-838 TO V-861). AFTER DELAY UC-212 OF 10 MINUTES. LOW FLOW ALARM FAL-202 CLOSES ALL OPEN VALVES.
3. MM=40-46 FOR PROCESS LINES TO ASW40-ASW46 NOT SHOWN INDIVIDUALLY.
4. NN=50-59 FOR PROCESS LINES TO ASW50-ASW59 NOT SHOWN INDIVIDUALLY.
5. AIR COMPRESSOR PRESSURE RELIEF TO BE PROVIDED BY MANUFACTURER.
6. FUTURE OZONE (03) AMENDMENT PIPING WILL CONNECT AT AS WELLHEAD.

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CORTESE LANDFILL PRP GROUP
NARROWSBURG, NEW YORK

TITLE: PIPING AND INSTRUMENTATION DIAGRAM – FORMER IDDA2 AND SEEPAGE LAGOONS AIR INJECTION SYSTEM

PROJECT: OU 4 REMEDIAL DESIGN

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APPROVED BY:			

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T-703
MOISTURE SEPARATOR
CAPACITY: 50 GAL (MIN) MAT'L OF CONST: STEEL

T-704
MOISTURE SEPARATOR
CAPACITY: 50 GAL (MIN) MAT'L OF CONST: STEEL

T-706A/B
VAPOR PHASE CARBON VESSELS
CAPACITY: 5000 LB MAT'L OF CONST: EPOXY-COATED STEEL

T-705
HOLDING TANK
CAPACITY: 250 GAL (MIN) MAT'L OF CONST: POLYETHYLENE

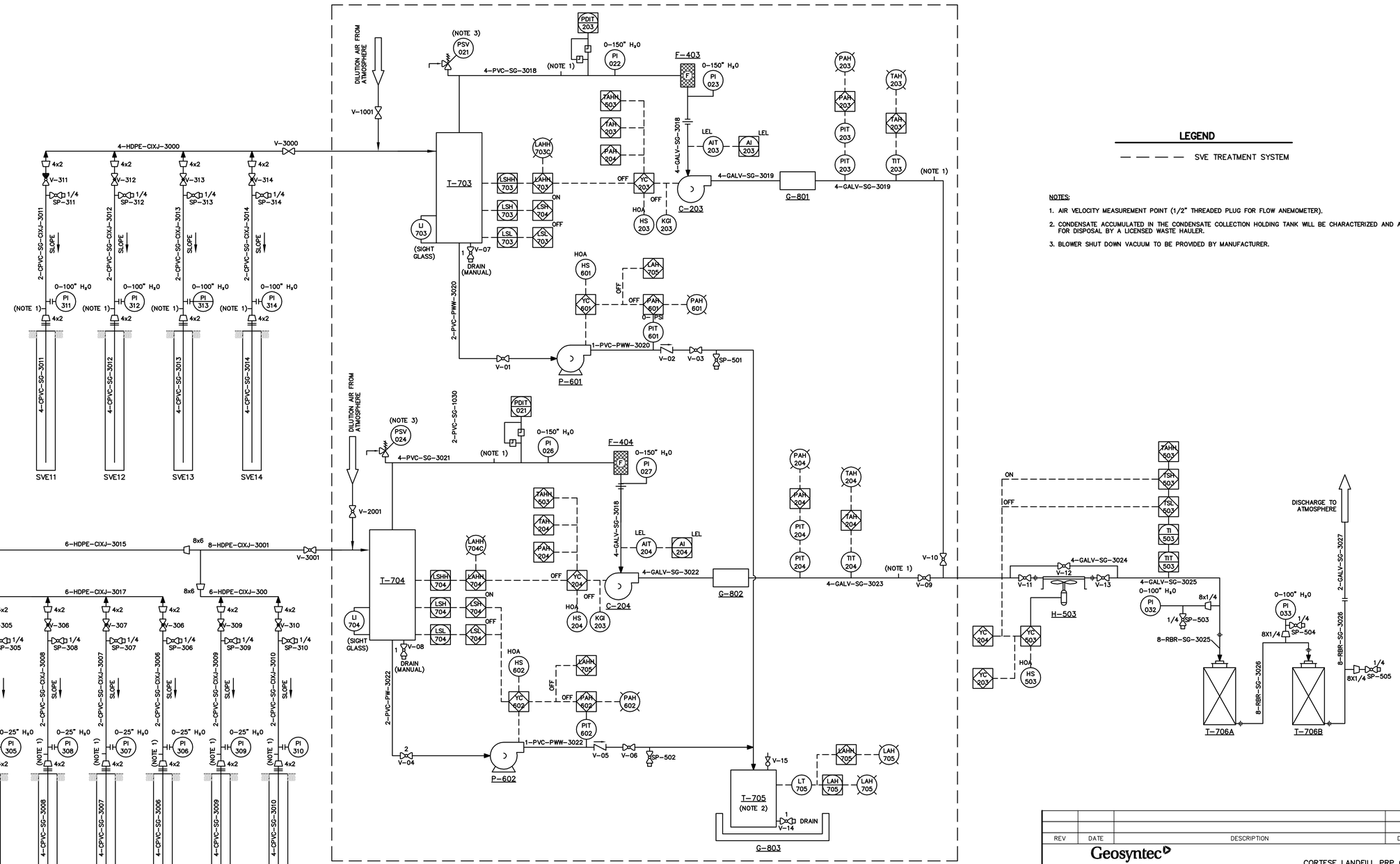
F-403
SOIL GAS INLINE FILTER
TYPE: INLINE PARTICULATE

F-404
SOIL GAS INLINE FILTER
TYPE: INLINE PARTICULATE

G-801
SILENCER

G-802
SILENCER

G-803
SPILL CONTAINMENT



LEGEND

— — — — SVE TREATMENT SYSTEM

NOTES:

1. AIR VELOCITY MEASUREMENT POINT (1/2" THREADED PLUG FOR FLOW ANEMOMETER).
2. CONDENSATE ACCUMULATED IN THE CONDENSATE COLLECTION HOLDING TANK WILL BE CHARACTERIZED AND ARRANGED FOR DISPOSAL BY A LICENSED WASTE HAULER.
3. BLOWER SHUT DOWN VACUUM TO BE PROVIDED BY MANUFACTURER.

C-203
SVE BLOWER
FLOW RATE: 190 SCFM DIFF: 170" H_2O
TYPE: REGENERATIVE MAT'L OF CONST: ALUMINUM

C-204
SVE BLOWER
FLOW RATE: 480 SCFM DIFF: 100" H_2O
TYPE: REGENERATIVE MAT'L OF CONST: ALUMINUM

P-601
LIQUID TRANSFER PUMP
FLOW RATE: 1 GPM TDH: 25'
TYPE: CENTRIFUGAL MAT'L OF CONST: STEEL

P-602
LIQUID TRANSFER PUMP
FLOW RATE: 1 GPM TDH: 25'
TYPE: CENTRIFUGAL MAT'L OF CONST: STEEL

H-503
AIR-COOLED HEAT EXCHANGER
TYPE: FAN FORCED AIR
FLOW RATE: 700 CFM

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN	APP

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COLUMBIA, MARYLAND 21046 USA
PHONE: 410.381.4333

CORTESE LANDFILL PRP GROUP
NARROWSBURG, NEW YORK

TITLE: PIPING AND INSTRUMENTATION DIAGRAM– FORMER IDDA1b SVE TREATMENT SYSTEM

PROJECT: OU 4 REMEDIAL DESIGN

SITE: CORTESE LANDFILL NARROWSBURG, NEW YORK

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APPROVED BY:			

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T-707
MOISTURE SEPARATOR
CAPACITY: 50 GAL (MIN) MAT'L OF CONST: STEEL

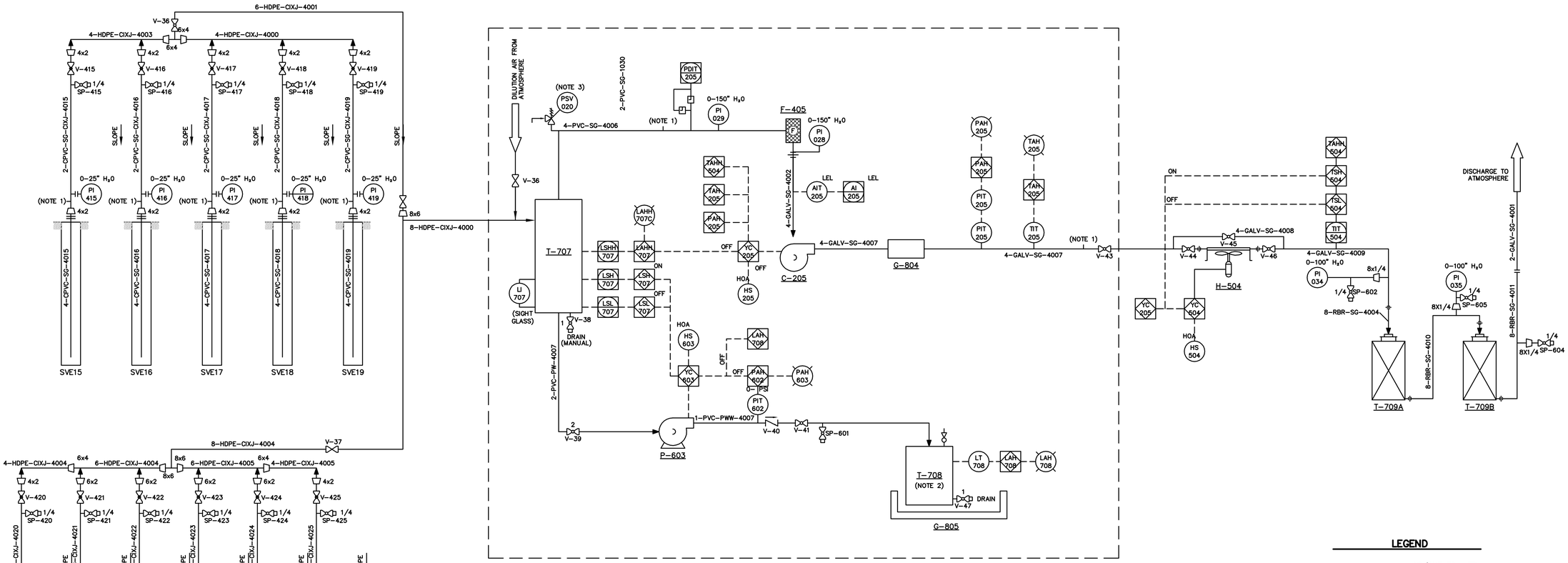
T-709A/B
VAPOR PHASE CARBON VESSELS
CAPACITY: 5000 LB MAT'L OF CONST: EPOXY-COATED STEEL

T-708
HOLDING TANK
CAPACITY: 250 GAL (MIN) MAT'L OF CONST: POLYETHYLENE

F-405
SOIL GAS INLINE FILTER
TYPE: INLINE PARTICULATE

G-804
SILENCER

G-805
SPILL CONTAINMENT



LEGEND

— — — — AS/SVE TRAILER

NOTES:

1. AIR VELOCITY MEASUREMENT POINT (1/2" THREADED PLUG FOR FLOW ANEMOMETER).
2. CONDENSATE ACCUMULATED IN THE CONDENSATE COLLECTION HOLDING TANK WILL BE CHARACTERIZED AND ARRANGED FOR DISPOSAL BY A LICENSED WASTE HAULER.
3. BLOWER SHUT DOWN VACUUM TO BE PROVIDED BY MANUFACTURER.

C-205
SVE BLOWER
FLOW RATE: 480 CFM DIFF: 100" H_2O
TYPE: REGENERATIVE MAT'L OF CONST: ALUMINUM

P-603
LIQUID TRANSFER PUMP
FLOW RATE: 1 GPM TDH: 25'
TYPE: CENTRIFUGAL MAT'L OF CONST: STEEL

H-504
AIR-COOLED HEAT EXCHANGER
TYPE: FAN FORCED AIR
FLOW RATE: 480 CFM

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN	APP

Geosyntec consultants
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PHONE: 410.381.4333

CORTESE LANDFILL PRP GROUP
NARROWSBURG, NEW YORK

TITLE: PIPING AND INSTRUMENTATION DIAGRAM– FORMER IDDA2 AND SEEPAGE LAGOONS SVE TREATMENT SYSTEM

PROJECT: OU 4 REMEDIAL DESIGN

SITE: CORTESE LANDFILL NARROWSBURG, NEW YORK

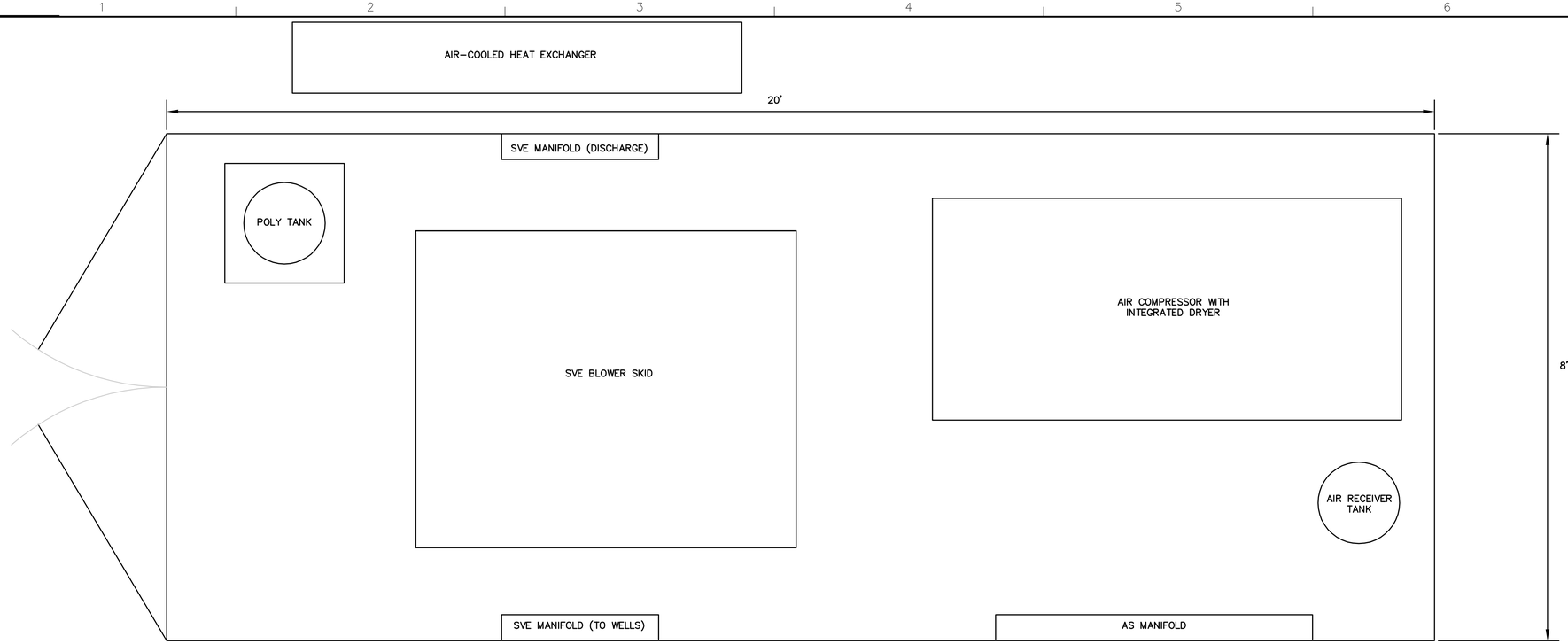
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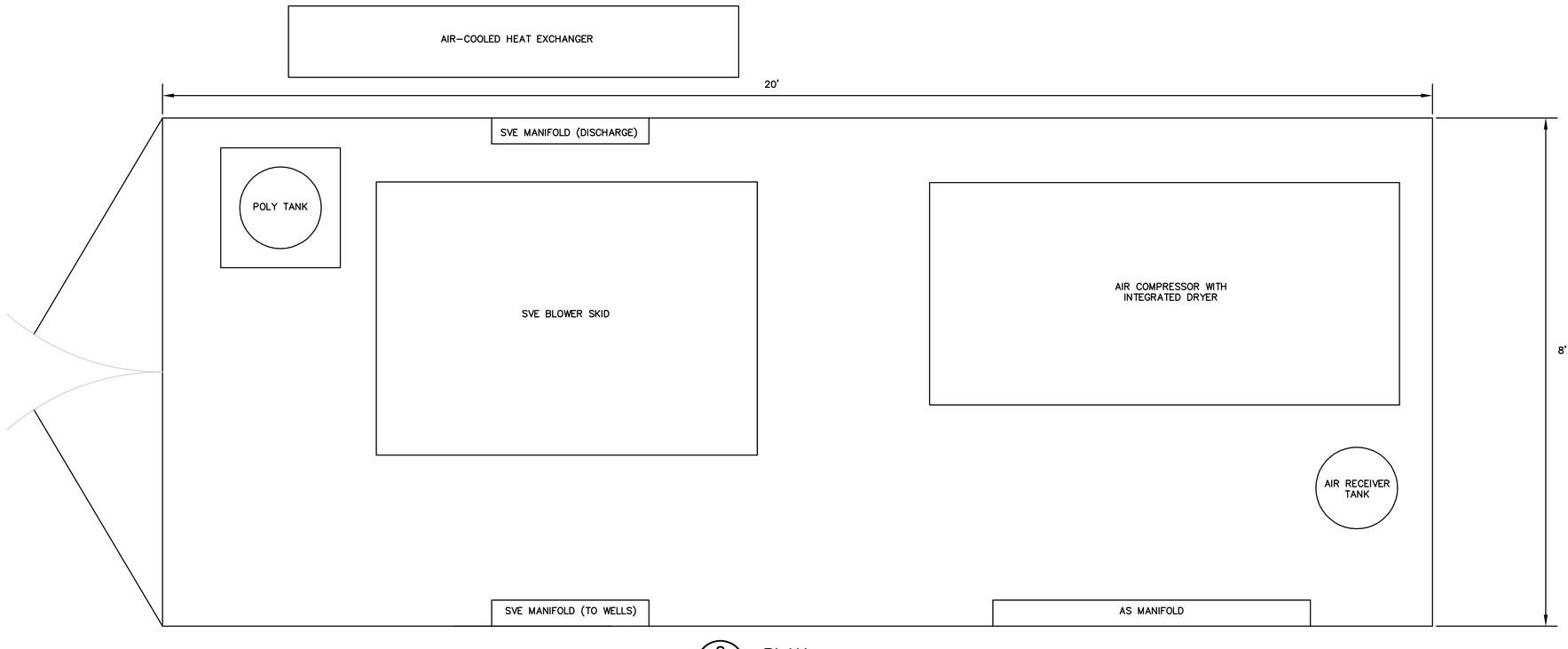
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REVIEWED BY:		DRAWING NO.:	M04B
APPROVED BY:			

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1/C03 PLAN
IDDA 1B AS/SVE SYSTEM
SCALE: N.T.S.



2/C03 PLAN
IDDA 2 AS/SVE SYSTEM
SCALE: N.T.S.

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN	APP

Geosyntec consultants
10220 OLD COLUMBIA ROAD, SUITE A
COLUMBIA, MARYLAND 21046 USA
PHONE: 410.381.4333

CORTESE LANDFILL PRP GROUP
NARROWSBURG, NEW YORK

TITLE: AS/SVE SYSTEMS LAYOUT CONSTRUCTION DETAIL

PROJECT: OU 4 REMEDIAL DESIGN

SITE: CORTESE LANDFILL
NARROWSBURG, NEW YORK

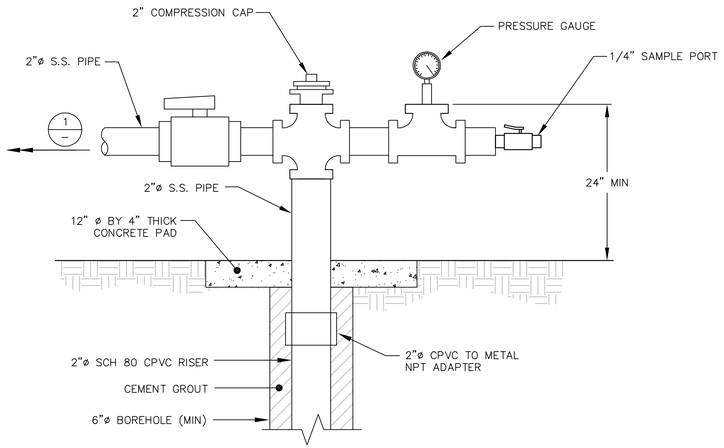
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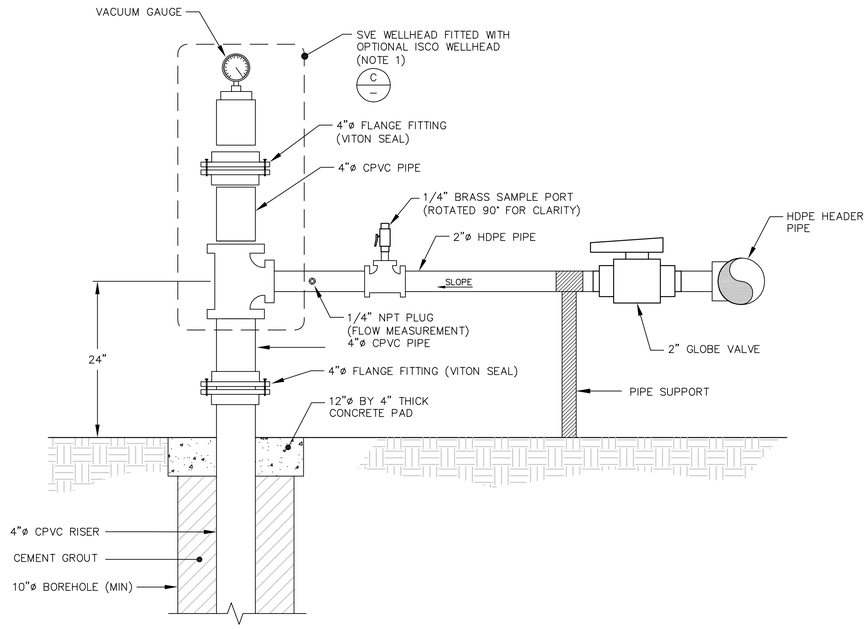
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APPROVED BY:			M05

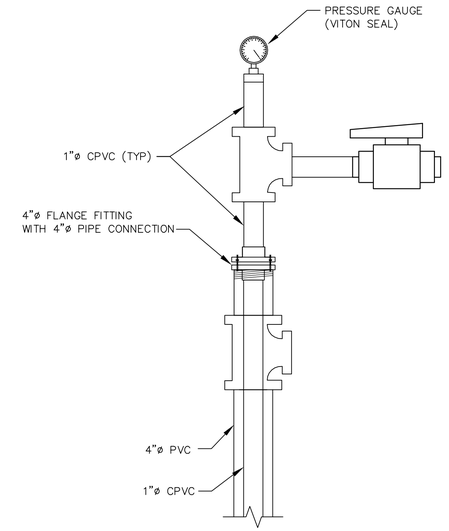
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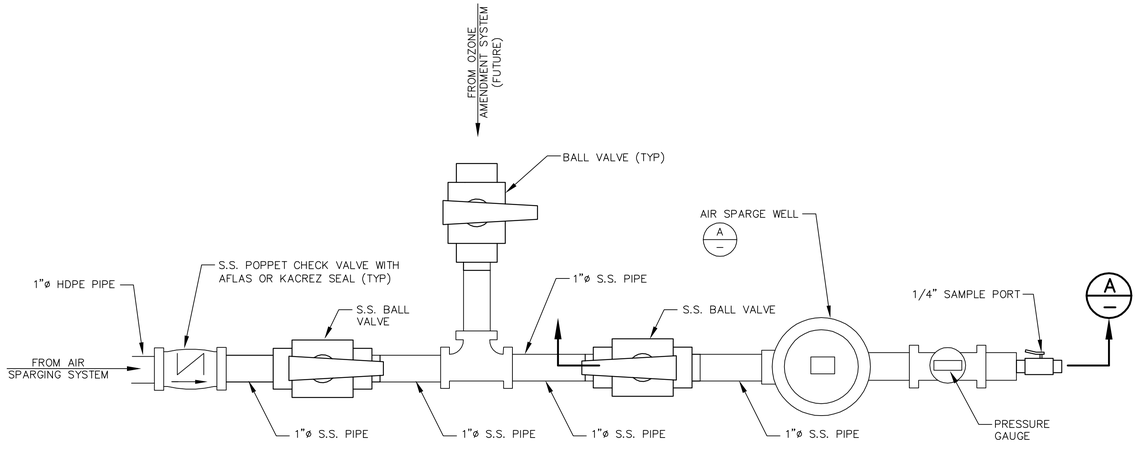
A / C03 SECTION
AIR SPARGE WELLHEAD
SCALE: NTS



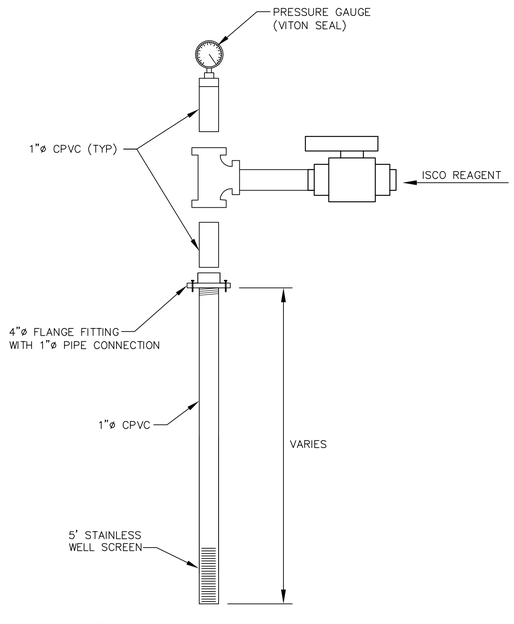
B / C04 SECTION
SOIL VAPOR EXTRACTION (SVE) WELLHEAD
SCALE: NTS



C / – DETAIL
SVE WELLHEAD FITTED WITH
OPTIONAL ISCO WELLHEAD
SCALE: NTS



1 / C03 PLAN
AIR SPARGING WELLHEAD
SCALE: NTS



D / – DETAIL
ISCO WELLHEAD (OPTIONAL)
SCALE: NTS

NOTES:

1. ISCO WELLHEAD WILL BE INSTALLED ON SVE WELLHEAD IF OPTIONAL ISCO APPLICATION IS CONDUCTED. WELLHEADS ARE SHOWN FOR REFERENCE.

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DRN	APP

Geosyntec consultants
10220 OLD COLUMBIA ROAD, SUITE A
COLUMBIA, MARYLAND 21046 USA
PHONE: 410.381.4333

CORTESE LANDFILL PRP GROUP
NARROWSBURG, NEW YORK

TITLE: AIR SPARGE WELL DETAILS

PROJECT: OU 4 REMEDIAL DESIGN

SITE: CORTESE LANDFILL
NARROWSBURG, NEW YORK

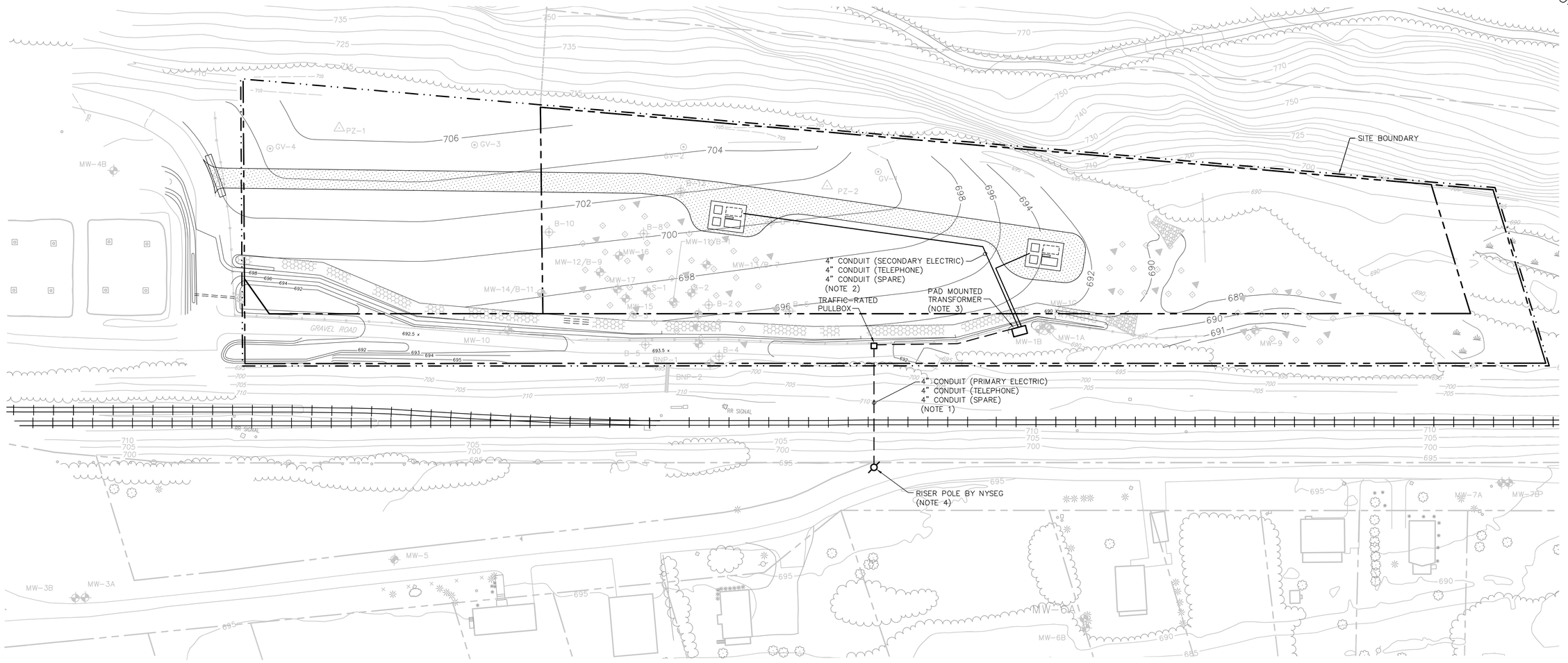
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REVIEWED BY:		DRAWING NO.:	M06
APPROVED BY:			

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NOTES:

1. FOR INSTALLAION OF UTILITIES UNDER THE RAILROAD EMBANKMENT, AN APPLICATION FOR PIPE OR WIRE OCCUPANCY MUST BE SUBMITTED TO NORFOLK SOUTHERN CORPORATION.
2. UNDERGROUND INSTALLATION OF UTILITIES WITHIN THE LIMITS OF THE LANDFILL COVER SYSTEM SHALL NOT PENETRATE THE INSTALLED GEOSYNTHETICS.
3. TRANSFORMER AND METER TO BE INSTALLED BY NYSEG. CONTRACTOR SHALL PROVIDE CONCRETE PAD THAT MEETS NYSEC SPECIFICATIONS.
4. NYSEG WILL DETERMINE RISER POLE LOCATION AND NEED FOR ACCESS TO PRIVATE PROPERTY.

LEGEND

- PROPERTY BOUNDARY
- SITE BOUNDARY
- FENCE
- 704 — ELEVATION CONTOUR
- GV-1 — PASSIVE GAS VENT
- MW-10 — MONITORING WELL
- SW-DRU — SURFACE WATER SAMPLE POINT
- PZ-1 — PIEZOMETER
- SOIL VAPOR EXTRACTION WELL
- AIR SPARGING WELL
- PRIMARY (15kV)
- SECONDARY (480V, 3ø, UNDERGROUND)

NOT FOR CONSTRUCTION

50 25 0 50 100
SCALE IN FEET

REV	DATE	DESCRIPTION	DRN	APP

Geosyntec consultants
10220 OLD COLUMBIA ROAD, SUITE A
COLUMBIA, MARYLAND 21046 USA
PHONE: 410.381.4333

CORTESE LANDFILL PRP GROUP
NARROWSBURG, NEW YORK

TITLE: ELECTRICAL SITE PLAN

PROJECT: OU 4 REMEDIAL DESIGN

SITE: CORTESE LANDFILL
NARROWSBURG, NEW YORK

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DESIGN BY:	LW	DATE:	AUGUST 2011
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REVIEWED BY:		DRAWING NO.:	E01
APPROVED BY:			

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APPENDIX D

Construction Quality Assurance Plan

Prepared for

Cortese Landfill Technical Committee
c/o SCA Services, Inc.
425 Perinton Parkway
Fairport, NY 14450

CONSTRUCTION QUALITY ASSURANCE PROJECT PLAN

Operable Unit 4, Source Areas
CORTESE LANDFILL SITE
NARROWSBURG, NEW YORK

Prepared by

Geosyntec consultants

10220 Old Columbia Road, Suite A
Columbia, Maryland 21046

Project Number MR0562B
Document Number MD11297

AUGUST 2011

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Appendix A CQA Forms

1. INTRODUCTION

This CQA Project Plan (CQAP) has been prepared for the construction of the Remedial Action (RA) for the Cortese Landfill Site (Site) in Narrowsburg, New York as presented in the *Pre-Final Remedial Design Report* (Remedial Design) (Geosyntec, 2011). Management of the quality of construction is an integral part of a remedial action project. For this project, quality management will be accomplished through both oversight of the constructed components of the in situ source treatment system and testing normally performed by a party independent of the RA Contractor (Construction Quality Assurance [CQA]) and by the RA Contractor (Construction Quality Control [CQC]). As used in this document, CQA and CQC are defined as follows:

- CQA refers to a planned series of observations, reviews, and testing, if required, conducted by qualified CQA personnel, to ensure the approved remedial action complies with the approved drawings and specifications, and other applicable contract documents; and
- CQC refers to those actions taken by the construction contractor, including many of their subcontractors, manufacturers, and/or suppliers, through a planned system of inspections and tests used to directly monitor, control and document the quality of the materials used in and construction of the remedy in compliance with the approved drawings and specifications, and other applicable construction documents.

The CQAP is organized as follows:

- Section 1.0 presents the purpose and organization of the report and project description;
- Section 2.0 outlines the project organization and responsibilities;
- Section 3.0 describes the inspection and testing activities required to evaluate whether construction and materials comply with design specifications and plans;
- Section 4.0 presents the project meeting requirements; and
- Section 5.0 describes documentation requirements of CQA activities.

1.1 Purpose and Scope

This CQAP addresses construction of the Remedial Action selected for the Site in the Record of Decision (ROD) and ROD amendment issued by the United States Environmental Protection Agency (USEPA) on October 5, 2010 (hereinafter, "2010 ROD/ROD Amendment"). The CQAP establishes the quality assurance monitoring and documentation procedures that will be used by CQA personnel during oversight and testing of the construction of the Remedial Action. Further, this plan provides an outline of the role of each party during construction and structure for

project meetings and documentation. The Plan is intended to supplement the Construction Documents and to provide a reference for the CQA personnel.

1.2 Project Description

As specified in the 2010 ROD/ROD Amendment, the selected remedy for groundwater and the source areas at the Site includes in situ source treatment in source areas and natural attenuation of downgradient groundwater. In situ source treatment will conducted using a sequence of remedial technologies, including:

- Air sparging (AS) of the source areas for approximately seven years to remove a significant quantity of the petroleum hydrocarbons and other volatile organic compounds;
- Collection and discharge to the atmosphere after aboveground treatment, if necessary, of the extracted vapors from the AS wells using soil vapor extraction (SVE) wells;
- Amendment additions, such as ozone, to the AS/SVE system for the final phase of the AS/SVE period;
- Subsurface-stabilization period for up to five years after the air-sparging program has been completed; and
- Subsequent application of in-situ chemical oxidation (ISCO), if necessary, potentially including a surfactant enhancement, to address the remaining, more recalcitrant source materials.

The initial construction activities for the Remedial Action will be the construction of the AS and SVE systems, which will include:

- Site preparation;
- AS and SVE well installation in two separate treatment areas;
- Repair of landfill cap geosynthetics that were cut to access the underlying subsurface during boring and well installations;
- Assembly and delivery of the AS/SVE trailers to house the AS and SVE process equipment;
- Delivery and connection of the off-gas treatment equipment to the AS/SVE trailers;
- Installation of exterior AS and SVE piping and associated valves and fittings to connect the AS and SVE wells, respectively, to the AS/SVE trailers;
- Installation of electrical and data communication service connections to the AS/SVE trailers;

- Final pavement of the asphalt access road to the treatment areas;
- Start-up of the AS and SVE systems; and
- Site demobilization.

It is assumed that ozone will be used as the amendment during AS/SVE operations. Construction of the ozone amendment systems will be conducted prior to the final phase AS/SVE period and will include the following activities:

- Assembly and delivery of the ozone amendment trailers to house the ozone amendment process equipment;
- Installation of ozone piping and associated valves and fittings to connect the ozone amendment systems to the AS wells;
- Installation of electrical and data communication service connections to the ozone amendment trailers; and
- Start-up of the ozone amendment systems.

The optional ISCO application may be necessary following the stabilization period. ISCO wellheads will be constructed to be installed on the SVE wells during the optional ISCO application. Quality Assurance measures to be implemented during ISCO application, if necessary, will be specified in the Operation, Maintenance and Monitoring Plan.

2. PROJECT PARTICIPANT RESPONSIBILITIES AND QUALIFICATIONS

The following section summarizes the roles and responsibilities of key project members and their function during Remedial Construction. An organizational chart is presented in Figure 1.

2.1 Cortese Landfill Respondents

The Cortese Landfill Respondents (Respondents) is the overall responsible party and will be responsible for implementing the RA. They will retain contractors, engineers, and specialist as necessary to perform the RA and will be the primary point of contact with USEPA. Mr. Mark Snyder of SCA Services will serve as the Project Coordinator. The Respondents will participate in key negotiations with USEPA and review monthly progress reports to USEPA. The Respondents is responsible for retaining a RA Contractor for the Remedial Construction.

2.2 Design Engineer

The Design Engineer is responsible for preparing the Drawings, the CQA plan, and the Specifications for the Remedial Design. The Design Engineer must be a qualified engineer, licensed as a Professional Engineer in the State of New York. The Design Engineer should have a history which demonstrates familiarity with the components of the prescribed remedial design. The Respondents retained Geosyntec Consultants, Inc. (Geosyntec) as the Design Engineer for the Remedial Design.

During the construction phase, Geosyntec will:

- Review design and specification change and modification requests, as necessary; and
- Provide clarification to the Drawings and Specifications, as necessary.

Design and specification change requests will be transmitted through the Engineer of Record to Geosyntec and the Respondents for review and approval. Geosyntec will appoint an individual approved by the Respondents to act as the point of contact for issues related to construction.

2.3 RA Contractor

The RA Contractor is responsible for constructing the prescribed Remedial Action in accordance with the Drawings and Specifications. The RA Contactor must fulfill all appropriate CQC measures and implement corrective action when a deficiency is noted. The Contractor will retain the services of specialty subcontractors (e.g., geosynthetic installer, electrical utility, etc.) when needed to complete project tasks. The RA Contractor will be responsible for management and performance of all subcontractors. The RA Contractor should have experience in general earthwork, well installation, construction of treatment systems, and shall have current state and federal licenses as appropriate.

2.4 Engineer of Record

The Engineer of Record will be retained by the Respondents, independent of the RA Contractor, to implement the CQAP, including monitoring, testing, and documentation of all aspects of construction. The Engineer of Record will be a qualified New York State licensed engineer. The Engineer of Record will assign a Resident Engineer who shall be responsible for field implementation of the construction and will remain on-site throughout construction. Additional quality assurance (QA) Monitors will be assigned to assist the Resident Engineer as required by the number and type of construction activities in progress. The Engineer of Record will:

- Review the Drawings and Specifications, and related work plans;
- Review schedule of construction activities with the RA Contractor;
- Coordinate CQA testing activities;
- Review corrective measures to be employed in the event of deviation from the approved drawings and specifications, and other applicable construction documents;
- Be consulted and formally reject defective work;
- Review and respond to the RA Contractor's requests for clarification raised through the Resident Engineer;
- Approve scope changes in accordance with the Change Order process defined in the Contract Documents;
- Transmit, as necessary, design and specification change requests to the Design Engineer and the Group for approval; and
- Prepare and certify, through P.E. stamp and signature, the remedial construction report, including as-built drawings.

2.5 Resident Engineer and Quality Assurance Monitors

The Resident Engineer will be the on-site representative of the Engineer of Record during construction. The Resident Engineer will have sufficient experience to oversee and execute the CQA activities associated with the various aspects of the construction sequence. The Resident Engineer is required to be familiar with the plans and the type of construction activities that will be performed at the Site. The Resident Engineer will be assisted by additional QA Monitor(s) in performance of the CQA tasks required by the CQAP The Resident Engineer is responsible for monitoring and documenting the construction project so that the project outcome complies with the intent of the remedial design and is responsible for monitoring the technical aspects of construction at the Site. The Resident Engineer will be in contact with the Respondents, the RA Contractor, and the Engineer of Record to facilitate project quality assurance and quality control. The Resident Engineer will be responsible for verifying that: (i) the quality assurance and quality

control tasks are performed as required; (ii) the general project construction tasks are appropriately staffed and the necessary resources are available to complete the required work; and (iii) the project design and schedule are achieved. The Resident Engineer will:

- Prepare an agenda for, preside at, and record project meeting minutes;
- Document that required CQC testing has been performed in accordance with the Specifications;
- Review shop drawings and other material submittals provided by the RA Contractor to verify that materials are in conformance with the Specifications;
- Schedule and coordinate CQA activities;
- Direct and oversee the QA Monitor(s)
- Review CQA field data and daily field reports of the QA Monitor(s);
- Prepare daily written reports describing construction progress, testing performed, and results of testing;
- Coordinate requests for design/specification clarifications and modifications with the Engineer of Record;
- Maintain on-site CQA records; and
- Assist in the preparation of the remedial construction report.

The QA Monitor(s) will:

- Monitor and document CQC activities performed by the RA Contractor and Subcontractors;
- Monitor and document CQA activities as required by this CQAP and the approved drawings and specifications, and other applicable construction documents;
- Assist in the performance of CQA activities as directed by the Resident Engineer; and
- Prepare written daily reports describing the construction progress, testing performed, and results of testing.

3. PROJECT CONSTRUCTION QUALITY ASSURANCE

Project CQA will be implemented by the Resident Engineer under the supervision of the Engineer of Record with the support of QA Monitor(s), as needed. The Resident Engineer will provide the appropriate CQA personnel needed to properly monitor and document each construction activity. Collectively, the Resident Engineer and the QA Monitor(s) will form the CQA Team. Depending upon an individual's qualifications and experience, one individual may serve in multiple roles. In general, the CQA Team will:

- Become familiar with project documents, Drawings, and Specifications;
- Review site-specific documentation, including bid documents and proposed layouts;
- Attend the pre-construction and any resolution meeting when requested;
- Prepare and review the remedial construction report, including a review of the record drawings;
- Become familiar with the CQA requirements for the project and ensure they are being implemented;
- Attend CQA-related meetings;
- Review the ongoing preparation of the record drawing(s);
- Verify the calibration and condition of on-site CQC equipment in accordance with manufacturer's instructions;
- Prepare daily and weekly report logs;
- Identify the need for additional test requirements;
- Review supplier, manufacturer, and installer certifications and documentation and make appropriate recommendations; and
- Evaluate any non-conformance with the Specifications and recommend appropriate changes in procedures or Specifications.

3.1 Specific CQA Requirements

3.1.1 Site Preparation

Several site preparation activities will need to be completed before implementing Remedial Design Construction. These activities include removal and offsite disposal of the existing constructed wetland and investigation-derived waste (IDW), installation of erosion control measures, set up of a field office and other construction support infrastructure and utilities, construction of a stabilized entrance and access road to the treatment system areas, installing

gates along the perimeter fence, and recovery of free product from select wells. These preparation activities will allow for efficient and proper construction of the Remedial Design. The CQA Team will monitor and document the site preparation activities for the remedial design. Specific monitoring activities include, but are not limited to:

- Monitor and document that gates are installed and updated as outlined in the Specification;
- Inspect final completion of gates to verify that they are off the ground to prevent dragging and entry is secured by chain and locks so that all interested parties have access;
- Monitor the construction of stabilized access road leading to the treatment areas and document that location and materials are in compliance with Drawings and Specifications;
- Monitor the construction of concrete pads to support process equipment in the treatment areas and document that location and materials are in compliance with Drawings and Specifications;
- Monitor free product recovery to ensure that aqueous phase recovery is kept to a minimum and that recovered fluids are properly stored;
- Report on suspect materials used in construction and notifying the Contractor of non-complying results;
- Monitor progress during waste profiling, manifesting, removal and offsite disposal of existing constructed wetland, collected free product, and IDW stored onsite and ensure operations comply with the Specifications; and
- Monitor each construction activity to assess whether damage has been caused to underlying geosynthetics.

3.1.2 Well Installation

Well installation includes the installation of all AS, SVE, and groundwater monitoring wells. The AS and SVE wells are the points that deliver air and recover soil gas from the treatment area. Groundwater monitoring wells will be used to monitor the performance of the remedy and compliance with the remedial objectives. The CQA Team will monitor and document advancement of borings and construction of each well and ensure each is installed as outlined in the Drawings and Specifications. Each AS and groundwater monitoring well will be developed using the "purge and surge" method presented in the Specifications. Specific monitoring activities include, but are not limited to:

- Review the Contractor's proposal submittals to verify that the proposed materials and construction methods conform to the requirements of the Specifications;

- Confirm with GPS technology, field measurements, or other surveying techniques that boring and well installation horizontal locations are accurate;
- Monitor and document that geosynthetics have been exposed and penetrated as defined in the Specifications;
- Observe boring installation and document geologic materials as outlined in the Specifications;
- Monitor and document selection of screen interval with respect to stratigraphic contact;
- Monitor and document well construction materials and installation depths related to the well casing, screen, and annulus materials and that materials and installation methods conform to the Specifications;
- Report on suspect materials used in construction and notifying the Contractor of non-complying results; and
- Monitor and document well development activities and compliance with the Specifications.

3.1.3 Geosynthetic Repair

Penetrations through the geosynthetics of the landfill cap during previous site investigations and during installation of the air sparging and soil vapor extraction wells will be repaired as part of the remedial action. It is anticipated that a specialty subcontractor that has appropriate geosynthetic credentials will be procured to complete this task. The geosynthetics installer, in particular, must be approved and/or licensed for installation of the manufacturer(s) geosynthetic material. Further, the geosynthetics installer must be pre-qualified and approved by the Respondents and the Engineer of Record. The geosynthetic installer must certify that each penetration has been repaired. The CQA Team will monitor geosynthetic repair activities including, but are not limited to:

- Review of the required proposal submittal to verify the resin and geosynthetic that will be used comply with the Specifications;
- Monitor and document geosynthetic placement and seaming operations at each repair location and that operations conform to the Specifications; and
- Observation and documentation of destructive and non-destructive field seam testing.

Example repair and trial seam logs are included in Appendix A.

3.1.4 AS/SVE Trailer Assembly

It is anticipated that the AS and SVE process equipment will be assembled off-site in AS/SVE trailers and transported to the Site when manufacturing is complete. Each AS/SVE trailer will

house the air sparging compressor, SVE Blower(s), and other associated components identified on the Drawings and in the Specifications. The RA Contractor may choose to construct the AS/SVE trailers with support from subcontractors or to procure the AS/SVE trailers from a specialty subcontractor that has demonstrated experience in construction of similar AS/SVE trailer systems. An assembly contractor will be responsible for providing its own CQC and will be accountable for delivering a product that conforms to the Drawings and Specifications and is free of defect.

Submittals required by the Specifications prior to construction will be approved by the Resident Engineer in consultation with the Engineer of Record. Once the units are assembled, the CQA Team will inspect them for completeness at the assembly location and make sure all installed components meet the required Specifications and will observe and document the leak test of the system. The CQA Team will also test the operation of key system components (e.g. air compressor, SVE blower, programmable logic controls, process equipment, process control valves, and emergency shut-down switches) to document that all are operating efficiently and correctly. If no defects are found by the CQA team, the AS/SVE trailers will be considered complete and the units will be approved for shipment to the Site. However, if defects are identified they must be addressed before the units arrive at the Site.

3.1.5 AS/SVE Trailer and Off-gas Treatment Equipment Installation

Upon completion, the AS/SVE trailers as well as the off-gas treatment process units will be delivered to the Site for installation. When the units arrive at the Site, the CQA team will at a minimum:

- Inspect and document the condition of each unit paying special attention to damage that might have occurred during shipment;
- If damage is noticed, notify the Engineer of Record and appropriate measures will be implemented to correct the issue; and
- Observe the placement of each unit at the correct location and orientation as identified in the Drawings including tie-down installation.

3.1.6 Electrical and Communication Service

Electric and communication services (i.e. telephone) will be connected to each treatment areas shown on the Drawings and in accordance with the Specifications. The CQA Team will monitor the installation of the electric and communication services. Specific monitoring activities include, but are not limited to:

- Review the required submittals to verify the proposed voltage and amperage of the electric service are sufficient to power the AS/SVE and ozone amendment trailers as

identified in the Drawings and Specifications and confirmed by inspection of the AS/SVE trailers as delivered;

- Review the required submittals to verify that the proposed communication line is adequate as detailed in the Specifications;
- Observe and document placement of electrical and communication components and connection to the AS/SVE trailers as outlined in the Specifications; and
- Confirm operation of electric and communication service at each AS/SVE trailer.

3.1.7 Exterior Piping, Fittings and Valves

Exterior piping, fittings, and valves will connect each AS/SVE trailer to the various well heads as detailed in the Drawings and Specifications. The CQA Team will monitor pipe, fitting, and valve placement by the Supervisor Contractor or Subcontractor(s). The CQA team will, at a minimum:

- Review the required proposal submittal to verify that all proposed pipe, fittings, and valves meet acceptance criteria in the Specifications;
- Inspect and document the pipe, fittings, and valves once they are onsite to ensure that proper materials were provided; and
- Monitor and document the progress during piping installation; and
- Observe and document pressure testing by the RA Contactor in accordance with the Specifications.

Once installation of piping, fittings, and valves is complete, it will be inspected and approved for pressure testing by the Resident Engineer. Pressure testing will be performed by the RA Contractor and documented by the CQA Team. Any defects in construction identified during pressure testing will be corrected.

3.1.8 Asphalt Access Road

The access road to the treatment areas will be paved with asphalt following construction activities that will require the use of heavy equipment (e.g. well installation, AS/SVE trailer delivery). To document that the components of the asphalt access road are produced and installed to conform to the requirements of the Drawings and Specifications, the CQA Team will:

- Monitor preparation and installation of the subgrade and asphalt in accordance with the Specifications;
- Review submittals to ensure that materials meet the Specifications; and

- Document that the completed asphalt access road conforms to the Drawings and Specifications.

3.1.9 AS/SVE Systems Start-up and Shakedown

Upon completion of the mechanical and electrical connections to the AS/SVE trailers and the approval of the Resident Engineer, the RA Contractor will demonstrate the operation of the AS/SVE systems in accordance with the Drawings and Specifications. The CQA team will observe and document the AS/SVE system start-up. If defects in construction and/or operations are identified, start-up will be stopped and the defects corrected. Upon correction, start-up will resume with the approval of the Resident Engineer. Quality Assurance measures to be implemented during initial start-up and operation will be specified in the draft Operation, Maintenance and Monitoring Plan.

3.1.10 Ozone Amendment Trailer Assembly

It is anticipated that the ozone amendment process equipment will be assembled off-site in trailers and transported to the Site when manufacturing is complete. Each ozone amendment trailer will house the air compressor, ozone generator, and other associated components identified on the Drawings and in the Specifications. It is anticipated that the RA Contractor will procure the ozone amendment trailers from a specialty subcontractor that has shown experience in construction of similar ozone amendment systems. An assembly contractor will be responsible for providing its own CQC and will be accountable for delivering a product that conforms to the Drawings and Specifications and is free of defect.

Submittals required by the Specifications prior to construction will be approved by the Resident Engineer in consultation with the Engineer of Record. Once the units are assembled, the CQA Team will inspect them for completeness at the point of assembly and make sure all installed components meet the required Specifications and will observe and document the leak test of the system. The CQA team should also observe the operation of key system components (e.g. air compressor, programmable logic controls, process equipment, process control valves, and emergency shut-down switches) to ensure that all are operating efficiently and correctly. If no defects are found by the CQA team, the ozone amendment trailers will be considered complete and the units will be approved for shipment to the Site. However, if defects are identified they must be addressed before the units arrive at the Site.

3.1.11 Ozone Amendment Trailer Installation

Following completion, the ozone amendment trailers will be delivered to the Site for installation. When the units arrive at the Site, the CQA team will at a minimum do the following:

- Inspect and document the condition of each unit paying special attention to damage that might have occurred during shipment;

- If damage is noticed, the Engineer of Record will be notified and appropriate measures will be implemented to correct the issue; and
- Observe the placement of each unit at the correct location and orientation as identified in the Drawings including tie-down installation.

3.1.12 Ozone Amendment Systems Start-up and Shakedown

Following completion of the mechanical and electrical connections to the ozone amendment trailers and the approval of the Resident Engineer, the RA Contractor will demonstrate the operation of the ozone amendment systems in accordance with the Drawings and Specifications. The CQA team will observe and document the ozone amendment system start-up. If defects in construction and/or operations are identified, start-up will be stopped and the defects corrected. Upon correction, start-up will resume with the approval of the Resident Engineer. Quality Assurance measures to be implemented during initial start-up and operation will be specified in the Operation, Maintenance and Monitoring Plan as a revision or addendum at the time of ozone amendment. Note that the ozone amendment systems will be installed after operation of the AS/SVE systems have begun and will be part of a separate procurement at a later date.

3.1.13 Final Inspection and Site Demobilization

During each phase of construction, a thorough pre-final Site inspection will be completed by the Resident Engineer and representatives of the regulatory agencies once all components of the Remedial Action for that phase have been constructed. Final inspection will be documented and should include operational tests of all systems and components, confirmation that significant ruts or other disturbance on the landfill cap have been smoothed and reseeded, and all IDW generated during construction have been removed and disposed off-Site. If there are any issues that need to be resolved, a punch list will be provided to the RA Contractor that also includes any regulatory agency concerns. Once these have been addressed to the satisfaction of the Resident Engineer, a final inspection will be performed. If no other issues are identified and all systems and components have been determined to operating properly, the inspection and Remedial Construction will be considered complete for that phase and the RA Contractor will be given permission to demobilize from the Site.

3.2 Deficiencies, Problems, and Repairs

The Resident Engineer will document noncompliance with the requirements of the construction drawings, technical specifications, and the Standards and report them to the Engineer of Record and the Contractor.

The Contractor will correct the deficiency to the satisfaction of the Resident Engineer. If a project specification criterion cannot be met, then the Resident Engineer will suggest alternate solutions and present them to the Engineer of Record and the regulatory agencies for review and

approval. With approval, the corrective action will be presented to the Contractor for implementation. The Resident Engineer will verify that the deficiency has been corrected by the Contractor in accordance with the approved corrective action.

4. PROJECT MEETINGS

Meetings with key project personnel are necessary to assure a high degree of quality during construction, and promote clear, open channels of communication. Project meetings presented herein will be held before, during and after Remedial Construction to ensure that all tasks are accomplished according the schedule, plans, and specifications. As appropriate, these meetings may occur onsite, offsite, or via teleconference and should include all relevant parties. Although meetings are outlined below, open communication should be maintained between relevant parties throughout project implementation to assure that the expectations of the Respondents, Engineer of Record, and RA Contractor are achieved.

4.1 Pre-Construction Meetings

After award of the contract to the successful bidder, a general pre-construction meeting will be held. This meeting will be attended by representatives of the Respondents, the Engineer of Record, the Resident Engineer, the RA Contractor, regulatory agencies, and other relevant parties. Pre-construction meetings for the major portions of the remedial construction are essential for the success of the project. Pre-construction meetings will be held prior to the beginning of each construction activity, including but not limited to: (i) mobilization, (ii) well installation, and (iii) AS/SVE trailer and off-gas treatment equipment delivery and installation, (iv) exterior piping installation, (v) electrical and communication service installation, and (vi) ozone amendment trailer delivery and installation.

The purpose of pre-construction meetings is to review Site health and safety requirements, coordinate construction tasks, anticipate design or installation problems that might cause difficulties and delays in construction, review the Drawings, Specifications, and CQA Plan with all of the parties involved, and identify the approvals that will be required before proceeding further with construction. During each meeting, the Resident Engineer will record the discussions and decisions of the meeting. A record of the meeting will be documented by the appointee in the form of meeting minutes, which will be subsequently distributed to the attendees.

Topics to be included in each pre-construction meeting should include at a minimum the following:

- Introduce each organization and Site personnel;
- Review general scope of work, drawings, specifications, and requirements;
- Present CQA Plan, Review Site-specific Health and Safety Procedures, and other relevant documents;
- Review activities to be conducted during construction;

- Review roles of each organization relative to the design criteria, plans, and specifications within the CQA Plan;
- Review lines of authority and communication;
- Discuss location for storing equipment and materials;
- Review work area security and safety protocol and traffic plan
- Discuss established procedures or protocol for observations and tests;
- Discuss the established procedures or protocols for handling construction deficiencies, repairs, and retesting;
- Review methods for documenting and reporting inspection data;
- Discuss proposed modifications the Remedial Design, CQA Plan, or Health and Safety Plan to address Site-specific considerations or changed conditions;
- Discuss the protection of uncompleted work during inclement weather;
- Verify that design criteria, plans, and specifications are clearly understood;
- Review of emergency and contingency plans; and
- Review of endpoint activities and procedures for project completion

4.2 Progress Meetings

Regularly scheduled progress meetings will be held during construction between the appropriate CQA Team members and the RA Contractor. The Engineer of Record may participate when appropriate and/or requested. This meeting will be used to discuss site safety, the current progress of the project, upcoming planned activities, contractor submittal status, design clarifications and/or modifications, work problems, potential solutions, and any new business. Any matter requiring action raised in this meeting will be reported to the appropriate parties. Minutes of the progress meetings will be recorded by a member of the CQA Team and will be distributed to all members of the CQA organization.

Informal daily progress meetings will be held between the Resident Engineer and the Contractor prior to the start of work or following the completion of work. The purpose of these meetings will be to review the previous day's activities, review the upcoming day's activities, and identify any needs or potential construction problems.

4.3 Periodic Meetings

Periodic meetings should occur at intervals as required to review work schedule progress and if a problem or deficiency is present or likely to occur. These meetings are intended to be informal and held on as-needed basis.

4.4 Problem or Work Deficiency Meetings/Calls

Special meetings/calls will be scheduled when and if problems or deficiencies are present or judged likely to occur. At a minimum, the Resident Engineer, RA Contractor, and a representative of the Respondents shall participate in these meetings/calls. The purpose of the meetings/calls is to define and resolve an identified problem or work deficiency. Items discussed during these meetings/calls will be documented by a member of the CQA Team and will be distributed to the attendees and affected parties.

5. DOCUMENTATION

5.1 Daily Record Keeping

The Resident Engineer shall be responsible for documenting on-site CQA activities. The documentation will support the Engineer of Record's certification of the remedial action in compliance with the design documents.

Standard reporting procedures will include preparation of a daily CQA report which, at a minimum, will consist of: (i) date, project name, location, and weather; (ii) field notes describing the work activities undertaken, including any meetings and observations, that occurred during the day; (iii) CQA monitoring logs and testing data sheets; and (iv) signature of the CQA personnel who authored the report. Example field forms are included in Appendix A. This information will be maintained on site.

The Resident Engineer will document, in a daily field log, discussions held with the Contractor(s). At a minimum, the documentation will include the following information:

- Date, project name, location, and other identification;
- Name of parties to discussion;
- Relevant subject matter or issues; and
- Suggested resolutions.

Monitoring logs and test data sheets will be prepared daily. At a minimum, these logs and data sheets will include the following information:

- An identifying sheet number for cross referencing and document control;
- Date, project name, location;
- Observed weather conditions;
- Descriptions and specific locations of areas, or units, of work being tested and/or observed and documented;
- A summary of test results;
- Calibrations or recalibrations of test equipment, and actions taken as a result of recalibration;
- Delivery schedule of off-site materials received, including quality control documentation; and

- Decisions made regarding acceptance of units of work, and/or corrective actions to be taken in instances of substandard quality.

5.2 Photographic Documentation

Photographs will be taken on a daily basis in order to serve as a pictorial record of work progress, problems, and mitigation activities in accordance with the Specifications. Key photographs of daily activities will be included in the daily field report. The Resident Engineer will upload the photographs daily, keeping a digital file of the pictures with dates, descriptions, and in chronological order. Selected photographs will be reproduced as part of the remedial construction report.

5.3 Submittals

Submittals, including shop drawings and other material submittals, will be required during construction. Submittals will be documented on submittal logs and submittal approval forms. Example forms are included in Appendix A.

5.4 Design and/or Specification Changes

Design and/or Specifications changes may be required during construction. Design and/or Specifications changes will be made only with the written agreement of the Respondents, the Design Engineer and the regulatory agencies, if necessary, and will take the form of a Clarification to the Specifications. Clarifications will be provided in writing to all involved and affected parties. Example forms are included in Appendix A.

5.5 Remedial Construction Report

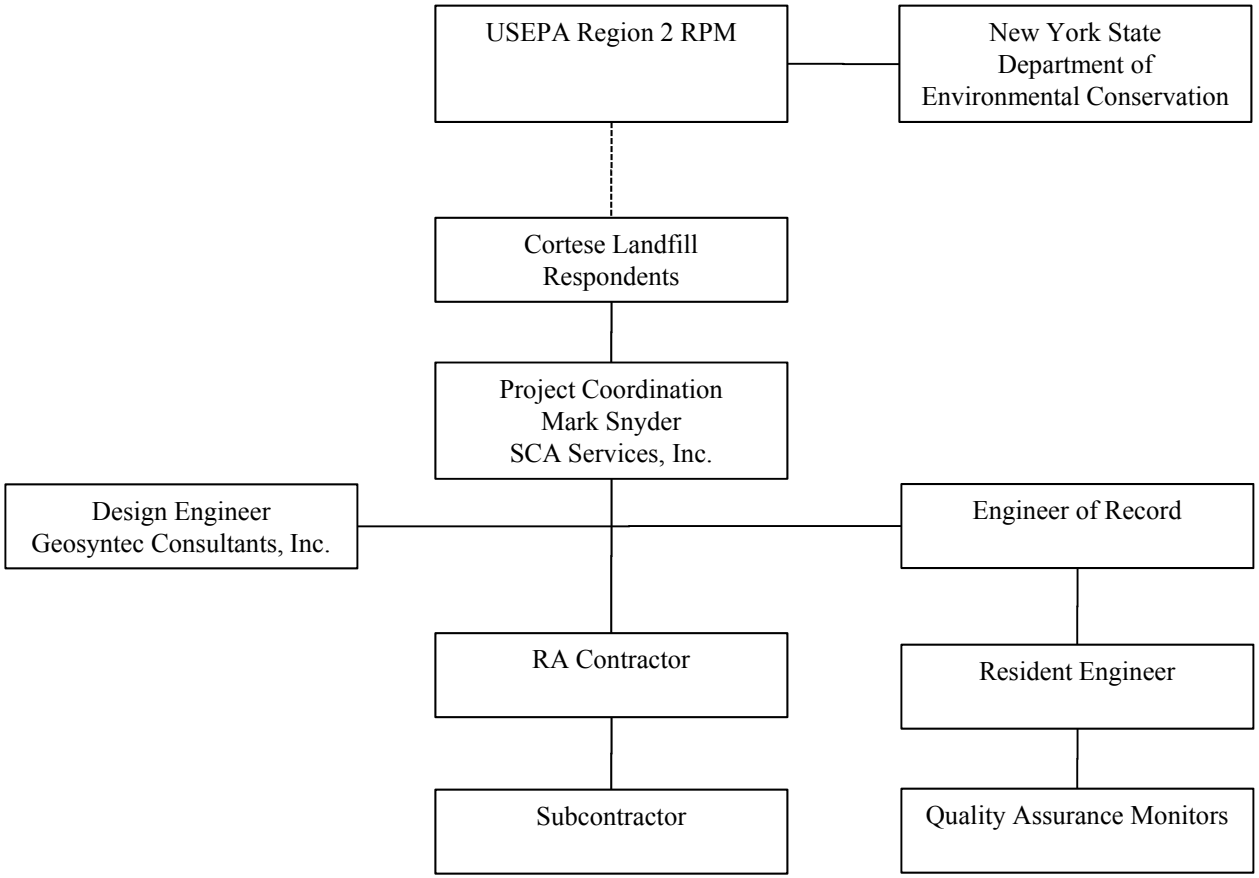
At the completion of the work, a remedial construction report will be prepared by the CQA Team. This report will document that: (i) the work has been performed in compliance with the Drawings and Specifications; and (ii) physical sampling and testing, except as properly authorized, have been performed at the appropriate frequencies and that the result of such testing met the minimum requirements set forth in the approved drawings and specifications, and other applicable construction documents, and this CQAP.

At a minimum, this report will include: (i) pertinent information collected and recorded during the CQA activities; (ii) documentation of changes from the approved Drawings and Specifications; (iii) record drawings; (iv) photographic documentation; (v) manifests documenting IDW disposition; and (vi) a summary statement sealed and signed by the Engineer of Record.

The record drawings will be prepared and assembled by the CQA Team based on as-built drawings to be provided by the RA Contractor. They will include scale drawings depicting the

location of the construction and details pertaining to the extent of construction. The record drawings will be certified by the Engineer of Record and included as part of the Remedial Construction Report.

FIGURE



Project Organizational Chart

Cortese Landfill Site

Narrowsburg, New York

Geosyntec consultants

Columbia, Maryland | August 2011

Figure **1**

MR0562/Figure 1 (Org Chart).pptx

APPENDIX A

CQA FORMS

CERTIFICATE OF ACCEPTANCE
SUBGRADE SURFACE

INSTALLER	PROJECT
NAME:	NAME:
ADDRESS:	LOCATION:
INSTALLER AUTHORIZED REPRESENTATIVE:	OWNER:

I, The undersigned, duly authorized representative of _____ do hereby accept the surface on which the geosynthetics will be installed and shall be responsible for maintaining the suitability of this surface, in accordance with the project specifications. (i.e., The contractor shall not install the geosynthetics until the subgrade surface is acceptable. Installation of the geosynthetics will be considered acceptance of the subgrade.)

PRIMARY: ☐ SECONDARY: ☐ OTHER: _____

DATE	PANEL NOS.	SIGNATURE

Geosyntec consultants

CHANGE ORDER/CLARIFICATION LOG

PROJECT: _____ PROJECT NO. _____ TASK NO.: _____

LOCATION: _____ YEAR: _____

DESCRIPTION: _____

CONTRACTOR: _____

REFERENCE NO.	TITLE	DATE SUBMITTED (day/mo)	STATUS		DATE APPROVED/ REJECTED (day/mo)	COMMENTS
			ACCEPTED	REJECTED		

Geosyntec consultants

CHANGE ORDER (CO) **REFERENCE NO.:** _____

PROJECT: _____

LOCATION _____ PROJECT NO.: _____ TASK NO.: _____

DESCRIPTION: _____ DATE: _____ day _____ month _____ year

FINANCIAL IMPACT:

☐ NOT APPLICABLE ☐ COST $ _____ ☐ SAVINGS $ _____

SCHEDULE IMPACT:

☐ NOT APPLICABLE ☐ DELAY EST. DAYS _____ ☐ SAVINGS EST. DAYS _____

REFERENCES: _____

_____

SPECIFICATION SECTION: _____

CQA PLAN SECTION: _____

MATERIAL TYPE: _____

ITEM BEING CHANGED OR ADDED: _____

_____

_____

_____

REASON FOR CHANGE: _____

_____

_____

_____

_____

EFFECTIVE DATE OF CHANGE _____ day _____ month _____ year

FINANCIAL AND SCHEDULE CONSIDERATIONS: _____

_____

_____

_____

_____

_____

DECISION: ☐ APPROVED ☐ DENIED

_____ _____

OWNERS REPRESENTATIVE DATE CQA REPRESENTATIVE DATE

_____

PROJECT MANAGER DATE

COPY TO: _____

Geosyntec consultants

CLARIFICATION FORM **REFERENCE NO.:** _____

PROJECT: _____

LOCATION: _____ PROJECT NO.: _____ TASK NO.: _____

DESCRIPTION: _____ DATE: _____ day _____ month _____ year

REFERENCES: _____

SPECIFICATION SECTION: _____

CQA PLAN SECTION: _____

CLARIFICATION: _____

REQUESTED BY: _____

(SIGNATURE AND TITLE) (DATE)

RESPONSE: _____

RESPONDED BY: _____

(SIGNATURE AND TITLE) (DATE)

COPY TO: _____

Geosyntec consultants

DAILY FIELD REPORT

PROJECT: _____

LOCATION: _____ PROJECT NO.: _____ TASK NO.: _____

DESCRIPTION: _____ Date: _____

COPY TO: _____ PER: _____

Geosyntec consultants

DAILY FIELD REPORT

PROJECT: _____

LOCATION: _____ PROJECT NO.: _____ TASK NO.: _____

DESCRIPTION: _____ Date: _____

COPY TO: _____ PER: _____

Geosyntec consultants

MATERIAL INVENTORY

PROJECT: _____

LOCATION _____ PROJECT NO.: _____ TASK NO.: _____

DESCRIPTION: _____ YEAR: _____

MATERIAL TYPE: _____ MANUFACTURER: _____

INVENTORY			Q.A. CONFORMANCE					Q.C. DOCUMENTS				
DATE	BATCH / ROLL NUMBER	QA ID	DATE SAMPLED	SAMPLE NO.	PASS	FAIL	QA ID	DATE REC'VED	DATE CHECKED	PASS	FAIL	QA ID

AVERAGE ROLL WIDTH: _____ (ft) AVERAGE ROLL LENGTH: _____ (ft)

NUMBER OF ROLLS ABOVE: _____ CUMULATIVE NUMBER OF ROLLS: _____

CUMULATIVE AREA: _____ (ft^2) NO. OF CONFORMANCE TESTS (page/total): _____/_____

COMMENTS: _____

_____

Geosyntec consultants

REPAIR SUMMARY LOG

PROJECT: _____

LOCATION _____ PROJECT NO.: _____ TASK NO.: _____

DESCRIPTION: _____ YEAR: _____

INSTALLER: _____ ☐ PRIMARY ☐ SECONDARY ☐ OTHER _____

REPAIR NO./ CODE[1]	REP. TYPE[3]	DATE	LOCATION[2]				SIZE[2]			WELDER ID		QA ID	NON-DESTRUCTIVE TESTING					
			SEAM	PANEL	DIST.	OFFSET	LENGTH	WIDTH	DIA.	MACH. NO.	OP. ID		DATE	OP. ID	PASS	FAIL	ACTION	QA ID

NOTES: (1) REPAIR NUMBERS SHALL BE NUMBERED SEQUENTIALLY, REPAIR CODES: P = PATCH C = CAP S = ANCHOR TRENCH EXTENSION (SKIRT) DS = DESTRUCTIVE SAMPLE G = GRIND & WELD T = TOPPING ALONG FUSION SEAM R = RECONSTRUCTION (2) LOCATION & SIZE SHALL BE INDICATED IN FEET (3) REAIR TYPES: E = EXTRUSION F = FUSION

Geosyntec consultants

SUBMITTAL LOG

PROJECT: _____ PROJECT NO. _____ TASK NO.: _____

LOCATION: _____ YEAR: _____

DESCRIPTION: _____

CONTRACTOR: _____

REFERENCE NO.	SUBMITTAL TITLE	REVISION	DATE SUBMITTED (day/mo)	DATE REVIEWED (day/mo)	RE-SUBMIT		DATE APPROVED (day/mo)	COMMENTS
					YES	NO		

Geosyntec consultants

1255 Roberts Blvd NW • Suite 200
Kennesaw, GA 30144
(678) 202-9500 • Fax (678) 202-9501

SUBMITTAL COVER SHEET

TO:	Mr.	**Date:**	**Job No.:**
ADDRESS:			

Submittal I.D. No.:	Revision No.:	Contractor Submittal No.:
Specification Section(s):	Date of Submittal:	
Submittal Subject:		

Notations:

- ☐ No Exception Taken
- ☐ Corrected as Noted
- ☐ Rejected
- ☐ Revise and Resubmit
- ☐ Submit Specified Items

Remarks:

Review of this submittal does not relieve the Contractor from their responsibility for deviations from the Contract Documents nor from their responsibility for errors or omissions in the submittal. Contractor is, and Engineer is not, responsible for matters relating to fabrication, shipping, handling, storage, assembly, installation, construction (including safety), and coordination for performing the Work

Prepared by **Date**	**Engineer-of-Record** **Date**
Print Name: Mr.	Print Name:

Distribution:

- ☐ Person, Company
- ☐ Person, Company
- ☐ Person, Company
- ☐ Person, Company

Geosyntec consultants

WEEKLY FIELD REPORT

PROJECT: _____

LOCATION: _____ PROJECT NO.: _____ TASK NO.: _____

DESCRIPTION: _____ WEEK ENDING: _____

COPY TO: _____ PER: _____

Geosyntec consultants

TRIAL SEAM LOG - EXTRUSION

PROJECT: _____

LOCATION _____ PROJECT NO.: _____ TASK NO.: _____

DESCRIPTION: _____ YEAR: _____

SPECIFICATIONS: PEEL: _____ SHEAR: _____ ☐ ppi ☐ psi

TENSIOMETER DESCRIPTION: _____ SERIAL NO.: _____

TRIAL SEAM NO.	DATE (day/mo)	TIME	MACHINE NO.	OPER. ID	MAT. DESCR. (1)	PREHEAT TEMP. (°C / °F)	BARREL TEMP. (°C / °F)	PEEL	SHEAR	PASS	FAIL	RETEST NO.	QA ID

NOTE: (1) MATERIAL DESCRIPTION REFERS TO EITHER SMOOTH/SMOOTH (S/S); SMOOTH/TEXTURED (S/T); OR TEXTURED/TEXTURED (T/T).

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TRIAL SEAM LOG - FUSION

PROJECT: _____

LOCATION _____ PROJECT NO.: _____ TASK NO.: _____

DESCRIPTION: _____ YEAR: _____

SPECIFICATIONS: PEEL: _____ SHEAR: _____ ☐ ppi ☐ psi

TENSIOMETER DESCRIPTION: _____ SERIAL NO.: _____

TRIAL SEAM NO.	DATE (day/mo)	TIME	MACHINE NO.	OPER. ID	MAT. DESCR. (1)	WEDGE TEMP. (°C / °F)	MACHINE SPEED SETTING	PEEL	SHEAR	PASS	FAIL	RETEST NO.	QA ID

NOTE: (1) MATERIAL DESCRIPTION REFERS TO EITHER SMOOTH/SMOOTH (S/S); SMOOTH/TEXTURED (S/T); OR TEXTURED/TEXTURED (T/T).

APPENDIX E

Green Remediation Plan

Prepared for

Cortese Landfill Technical Committee
c/o SCA Services, Inc.
425 Perinton Parkway
Fairport, NY 14450

GREEN REMEDIATION PLAN

OPERABLE UNIT 4

CORTESE LANDFILL SITE
NARROWSBURG, NEW YORK

Prepared by

Geosyntec consultants

10220 Old Columbia Road, Suite A
Columbia, Maryland 21046

Project Number MR0562B
Document Number MD11310

AUGUST 2011

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Table 1: Sample Table for Reporting Green Remediation Practices

LIST OF ATTACHMENTS

Attachment 1: Estimation of Landfill Gas Production

1. INTRODUCTION

"Green Remediation" is the practice of considering environmental effects of the implementation of a remedy and incorporating options, where appropriate, to enhance the net environmental benefit of cleanup actions. This Green Remediation Plan (GRP) has been prepared in support of the implementation of the Remedial Design (RD) for Operable Unit (OU) 4 at the Cortese Landfill Site (Site) in Narrowsburg, New York. The GRP is required as part of the Remedial Design pursuant to the Remedial Design Administrative Order on Consent ("RD AOC") and Paragraph VIII.A.5 the attached Statement of Work (SOW) (USEPA, 2011a) entered into by USEPA Region 2 and the Cortese Landfill Respondents (the Respondents) as well as the July 7, 2011 Remedial Design Work Plan (RDWP; Geosyntec, 2011).

The GRP is organized as follows:

- Section 1.0 presents the purpose and organization of the report and project description;
- Section 2.0 presents the green remediation practices to be conducted during RD implementation;
- Section 3.0 describes the metrics to be used, including the purchase of renewable energy certificates (RECs); and
- Section 4.0 describes documentation requirements to maintain records of "green-related" activities, and report this information to USEPA.

1.1 Purpose and Scope

This GRP addresses implementation of the remedy selected for the Site in the Record of Decision (ROD) and ROD amendment issued by the USEPA on October 5, 2010 (USEPA, 2010b). The GRP describes the strategies, metrics, and documentation that will be used to demonstrate the sustainability of the Remedial Action during construction, operation and monitoring of in situ source treatment at OU 4.

1.2 Project Description

As specified in the 2010 ROD/ROD Amendment, the selected remedy for groundwater (OU 3) and the former source areas (OU 4) at the Site includes in situ source treatment in former source areas and natural attenuation of groundwater down gradient from the landfill. The remedy includes the following components:

- Air sparging (AS) of the source areas for approximately seven years to remove a significant quantity of the petroleum hydrocarbons and other volatile organic compounds;
- Collection and discharge to the atmosphere after aboveground treatment, if necessary, of the extracted vapors from the AS wells using soil vapor extraction (SVE) wells;
- Amendment additions, such as ozone, to the AS/SVE system for the final phase of the AS/SVE period;
- Subsurface-stabilization period for up to five years after the air-sparging program has been completed;
- Subsequent application of in-situ chemical oxidation (ISCO), if necessary, potentially including a surfactant enhancement, to address the remaining, more recalcitrant source materials;
- Monitored natural attenuation (MNA) of the groundwater down gradient from the landfill perimeter; and
- Long-term monitoring.

2. GREEN REMEDIATION PRACTICES

This GRP considers the following sustainability elements:

- Use of 100% of electricity from renewable sources;
- Use of clean diesel fuels and technologies;
- Methane capture at landfill sites; and
- Industrial material reuse or recycling within regulatory requirements.

It should be noted that the expected methane generation based on the mass and age of the waste is not expected to be sufficient to support a gas flare. The Site accepted waste for 10 years. It is estimated that approximately 65,000 tons of waste were placed at the Site over 30 years ago. Based on data from previous Superfund methane-to-energy projects (USEPA, 2010c), sites with less than 1 million tons of municipal waste are expected to have very low quantities of landfill gas generated regardless of age. The estimated landfill gas generation for Site is presented in Attachment 1. Based on this estimate, the Site is not a good candidate for methane capture. Therefore this GRP does not propose methane capture or metrics.

The GRP applies to administration, construction, operation, and monitoring of the active treatment remediation systems.

2.1 Administration

During RD implementation, the Respondents will incorporate green remediation practices into the contracting process, where appropriate, by including consideration of green remediation practices when evaluating construction contractor bids. The green remediation practices to be considered include use of clean diesel technology, clean fuels and equipment idling time controls. The Respondents will also consider purchase of previously-used process equipment and sale of process equipment and equipment trailers for re-use when active source treatment remedy components are complete.

2.2 Construction

Remedial Action (RA) construction will include the following activities:

- Recovery of free-phase light non-aqueous phase liquids (LNAPL) from existing monitoring wells in the source areas;
- Construction of a paved access road on top of the landfill;

- Construction of concrete pads to support aboveground process equipment;
- AS and SVE well installation in two separate treatment areas;
- Repair of landfill cap geosynthetics that were cut to access the underlying subsurface during boring and well installations;
- Assembly and delivery of the process equipment trailers to house the AS and SVE process equipment and the amendment process equipment at a later stage;
- Installation of exterior AS and SVE piping and associated valves and fittings to connect the AS and SVE wells, respectively, to the AS/SVE trailers;
- Installation of electrical and data communication service connections to the AS/SVE trailers;
- Installation of groundwater monitoring wells for monitoring the performance of the in situ source treatment and natural attenuation; and
- Site demobilization.

The RA Contractor will incorporate green remediation practices into the RA construction by:

- Recycling of materials rather than disposal where practicable;
- Delineating source areas during well installation in order to optimize well locations and screen depths in the treatment areas, thereby reducing O&M timeframes and increasing overall system energy and materials efficiency;
- Installing exterior process piping aboveground to facilitate decommissioning and possible recycling of piping equipment after active treatment; and
- Using process equipment trailers to avoid construction of permanent buildings with substantial foundations at the Site and to facilitate system re-use at other sites.

2.3 Operations

The selection of in situ source treatment as the remedy for OU 4 minimized depletion of groundwater resources at the Site. In contrast, groundwater extraction and ex-situ treatment would have permanently removed the groundwater resource. Termination of active source treatment is based on a reduction in contaminant mass discharge from the former source areas and natural attenuation processes to be relied upon to achieve the final groundwater performance standard. This approach will shorten the time required for active treatment system operation,

thereby reducing overall energy consumption and materials use while providing comparable environmental benefit. In situ source treatment will begin with AS/SVE to remove much of the contaminant mass that can be removed by AS alone and will only use amendment additions such as ozone, that require a greater amount of energy and materials, at a later time to remove the more recalcitrant contaminants. This approach reduces overall energy and material usage.

Additional green remediation practices to be performed during operation of the active treatment systems include:

- Cycled operation of air sparging which (1) enhances overall contact between the sparge air and the contaminant source material because the cycling creates new air migration pathways through the source, (2) optimizes mass transfer of molecular oxygen to the groundwater to promote aerobic biodegradation, and (3) reduces the size of compressor needed to operate the system thereby optimizing the electrical energy and off-gas treatment media use;

- Specification of maintenance programs for mechanical equipment to reduce component failure and associated generation of equipment waste;

- Purchase of Renewable Energy Certificates (RECs);

- Recycling/regeneration of spent vapor-phase carbon, if utilized in remedy. The need for continued off-gas treatment will be evaluated as the remedy progresses;

- Reduced energy use for heat exchanger fans, and reduced material and energy use to treat gas condensate residuals, when off-gas treatment is no longer necessary;

- Use of LNAPL recovery skimmers where necessary to reduce the operational timeframe for active sparging systems, thereby reducing energy and material use;

- Reduce air emissions via SVE off-gas treatment;

- Discontinuation of active treatment in areas that meet remediation goals earlier than other areas, thereby reducing energy use; and

- Repair of penetrations in previously installed low permeability cover resulting from prior and upcoming boreholes to limit atmospheric air intrusion during SVE operation and thereby reduced the overall number of wells and flow rate needed for containment of vapors.

2.4 Monitoring

Monitoring of the remedial components includes monitoring the operation of the active treatment systems (performance monitoring). The primary environmental effects of monitoring activities are due to travel to the site to conduct monitoring events and the consumption of materials during the event in the field and at the off-site laboratory. Travel to the site for performance monitoring was reduced through the use of remote monitoring where appropriate. The monitoring program was designed to optimize the frequency and types of analyses to those that are necessary, including use of indicator compounds and reduced monitoring location/frequency where appropriate.

Additional green remediation practices to be performed during monitoring events include use of dedicated sampling equipment to minimize waste such as equipment decontamination fluids, and cross-contamination.

3. ENVIRONMENTAL METRICS

The following sections present data that will be reported to USEPA during remedy implementation to demonstrate satisfaction of the GRP objectives.

3.1 Use of 100% renewable sources of energy

The Respondents have opted to purchase RECs equivalent to the electrical power usage at the Site in lieu of using 100% of electricity from renewable sources. The energy usage represented by the RECs purchased will offset the environmental effects of energy usage at the Site. Note that RECs will likely be purchased periodically whereas energy consumption will be continuous. Therefore, the overall "balance" of energy use and RECs purchased might be out of sync at a given point in time or for a given reporting period depending upon the timing of energy consumption and REC purchases. However, balance will be achieved for the timeframe of remedy construction and active treatment system operation.

Data Needed:

Kilowatt-hours (kWh) of electricity used during the reporting period and the zip code of site where energy is supplied for the reporting period; and

Number of RECs purchased during the reporting period.

3.2 Energy Conservation and Efficiency Approaches

Air sparging will be operated in cycles to enhance process efficiency and increase the efficiency of energy use. Energy used to run the air compressors during cycled injection into the air sparging wells will be less than if air sparging were run continuously in all wells, which would require a larger, more energy-intensive compressor.

Data Needed:

The zip code of site where energy is supplied;

Run time of the compressor motors over the reporting period;

Difference in power requirement (kilowatts) for the design compressor vs. a compressor that would have been needed for simultaneous continuous sparging in all wells; and

Kilowatt-hours of electricity that were saved (i.e. run time times difference in power requirement).

3.3 Use of Clean Diesel Fuels and Technologies

The Respondents will consider the use of clean diesel fuels and technology during construction of the remedy. During construction procurement, information on the bidder's diesel-powered fleet will be solicited and that information will be evaluated as part of the procurement decision process. If the selected RA contractor uses clean diesel fuels and technology, the RA contractor will provide information in their bid about the diesel vehicle fleet to be used during construction and the technology to be used. This item will not be considered for the O&M phase of the remedy because of the very limited use of diesel vehicles compared to the construction phase of the remedy.

Data Needed:

The following information is needed to determine the emission reductions achieved from clean construction practices and will be solicited from the construction bidders:

Diesel Fleet Information:

- Number of diesel vehicles in contractor's owned fleet;
- Diesel Vehicle/Equipment Type, Sector, Application, Horsepower Rating and Model Year;
- Diesel Fuel Type and Annual Fuel Usage; and
- Diesel Usage Rate (hours/vehicle/year).

Diesel Technology Information:

- Number of Diesel Vehicles in Contractor's Fleet to be Retrofitted; and
- Diesel Retrofit Technology Type and Model Year.

If this information cannot be obtained there are a set of default values that may be applied by USEPA staff.

3.4 Industrial Material Reuse or Recycling

Industrial material reuse or recycling may occur during construction through the purchase of products with recycled content and/or recycling/reuse of construction and demolition debris (e.g., spent granular zero-valent iron from treatability pilot test). During operations, materials may be reused (e.g., VGAC regeneration) or recycled (e.g., recycling of recovered LNAPL). At the time

of decommissioning of the remedial systems, materials may be recycled or sold for re-use within regulatory requirements.

Data Needed:

1. The amount (in tons) and type (steel, wood, glass, plastic, paper, etc.) of materials reduced through purchase of products with recycled content (e.g. tons of steel); and

2. The amount (in tons) and type (steel, wood, glass, concrete, construction and demolition debris, organic, VGAC, recovered LNAPL, etc.) of materials reused or recycled.; and

4. DOCUMENTATION

The Respondents will include a discussion of the green remediation practices and technologies implemented at the Site in semi-annual or annual progress reports during RA. The report will include a tabulation of the type of green remediation practice or technology, the usage data to be used to calculate the environmental metrics, and the percentage to be attributed to green remediation. A sample table is presented as **Table 1**. It is expected that these reports will be prepared during RA construction, and during active source treatment technology application at OU 4. Once the active source treatment at OU 4 has been completed and only MNA operations remain, no further documentation or reporting of green remediation practices are planned.

5. REFERENCES

Geosyntec, 2011. Remedial Design Work Plan (Rev. 1), Operable Units 3 and 4, Cortese Landfill Site, Narrowsburg, New York, July 8, 2011.

USEPA, See U.S. Environmental Protection Agency.

U.S. Environmental Protection Agency, 2009. Principles for Greener Cleanups. http://www.epa.gov/oswer/greencleanups/pdfs/oswer_greencleanup_principles.pdf. August.

U.S. Environmental Protection Agency, 2010a. Green Remediation Best Management Practices for Air Sparge/Soil Vapor Extraction. EPA 542-F-10-007. March.

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U.S. Environmental Protection Agency, 2011b. Greener Cleanups Contracting and Administrative Toolkit. http://www.clu-in.org/greenremediation/docs/Greener_Cleanups_Contracting_and_Administrative_Toolkit.pdf. January.

TABLES

TABLE 1
SAMPLE TABLE FOR REPORTING GREEN REMEDIATION PRACTICES

Green Technology and Practice Implemented	Date(s) Implemented	Total Green Usage	Percentage of Equipment Meeting Green Practice (If not 100%, Explain In Comment Field)	Comments

Source: USEPA, 2011b. Greener Cleanups Contracting and Administrative Toolkit.

ATTACHMENT 1

Estimation of Landfill Gas Production

Cortese Landfill Site

PURPOSE

The purpose of this calculation is to estimate the rate of landfill gas (methane) production at the Cortese Landfill Site (Site) in Narrowsburg, New York in order to determine the feasibility of landfill gas capture for Green Remediation practices during soil vapor extraction (SVE) at the Site as part of the Remedial Action. Landfill gas capture would most likely be implemented at former Intact Drum Disposal Area (IDDA) 1b.

PROCEDURE

Data from previous Superfund methane-to-energy projects (USEPA, 2010) were used to estimate methane gas generation at the Site. Nomographs present the total estimated landfill gas collection potential as function of the mass of waste in place based on the number of years of operation and time since landfill closure. The appropriate nomograph was used to estimate landfill gas collection potential at the site based on the input parameters presented below.

INPUT PARAMETERS

Mass of Waste in Place

Volume of landfill: 15 ft thick x 5 acre area x 43,560 sq ft/acre = 121,000 cubic yards of waste

Volume of drum removal excavation: 12,000 cubic yards (half acre)

Current volume of waste = 121,000 cubic yards - 12,000 cubic yards = 109,000 cubic yards waste

Density of waste: 0.6 tons/cubic yard (USEPA, 2010)

Mass of waste = 109,000 cubic yards x 0.6 tons/cubic yard = **65,340** tons = 0.065 M tons

Operating Duration of Landfill

The landfill operated from 1971 to 1981

Operating duration = 1981 – 1971 = **10** years

Time since Closure

The Site stopped accepting waste **30** years ago.

Former IDDA 1b SVE Flow Rate

The total SVE flow rate as presented in the Pre-Final Remedial Design Report at the former IDDA 1b is 750 cubic feet per minute (cfm).

RESULTS and CONCLUSION

The most appropriate nomograph was Figure 2 (USEPA, 2010) for landfills that operated for 20 years with landfill closure between 15 and 25 years ago and is presented as Figure 1. The nomograph assumes 60% landfill gas collection efficiency and 40% methane content (both are defaults in the attachment and the pilot test had 40% methane)

The correlation for landfill closure 25 years shown on Figure 1 was extrapolated to 0.065 M tons which is off the low end of the scale on the nomograph. The result is 7.3 cfm.

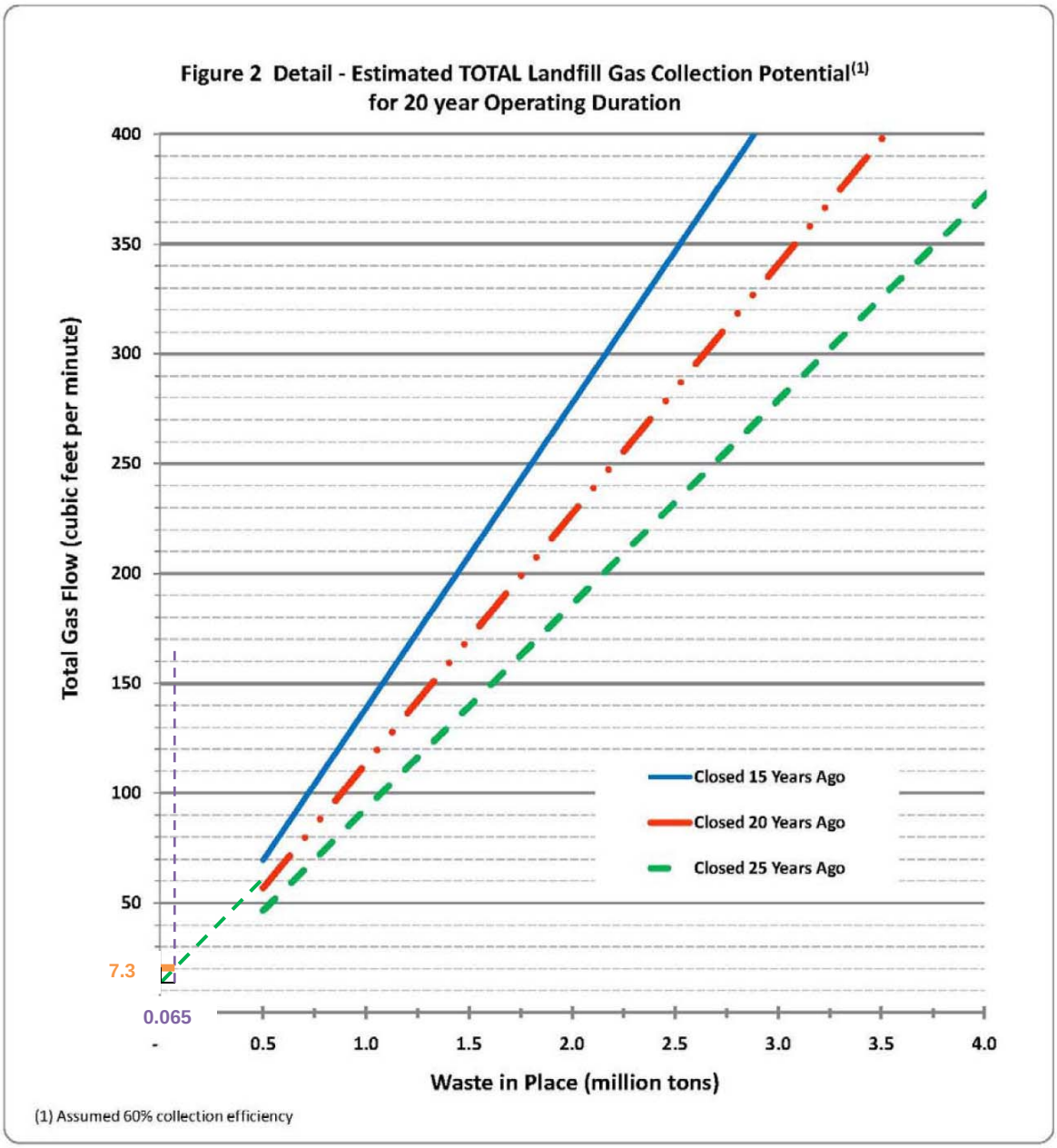
The methane concentration during SVE operation at IDDA 1b would be:

(7.2 cfm methane generation potential)/(750 cfm SVE flow rate) x (40% methane under static condition) = 0.4% methane in the SVE during operation.

This methane concentration will not sustain a flare. Therefore methane capture at the Site is not feasible.

REFERENCES

U.S. Environmental Protection Agency, 2010. Superfund Landfill Methane-To-Energy Pilot Project. OSWER number 9200.081. December.



Basis of Figures 2:

a) Graphs developed using LandGEM version 3.02, k=0.04, Lo=100

b) The graphs show total landfill gas assuming 60% collection efficiency and a methane content of 40%, older landfills may be lower.

c) Graphs assume greater than 25 inches of precipitation per year. Drier areas are estimated to have lower gas generation rates with steadier levels over time. See example graph in the Introduction. While wetter sites may see higher generation rates that decline faster.

Figure 1 Nomograph of Landfill Gas Collection Potential (from USEPA, 2010)