Contract No: EP-W-09-002
WA #: 029-SION-0200

Region 2 RAC2
Remedial Action Contract

Final Phase II Environmental Site Assessment

Former Duofold
Targeted Brownfields Assessment
Ilion, New York.

June 15, 2017

CDM Smith

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PROJECT:	EPA Region 2, RAC 2 Contract No.: EP-W-09-002 Work Assignments: 029-SION-0200
DOCUMENT NO.:	3323-029-03252
SUBJECT:	Final Phase II Environmental Site Assessment Former Duofold Targeted Brownfields Assessment Ilion, New York

Dear Ms. Devine:

CDM Federal Programs Corporation (CDM Smith) is pleased to submit this Final Phase II Environmental Site Assessment (ESA) for the Targeted Brownfields Assessment (TBA) at the Former Duofold subject property located in Ilion, New York.

If you have any comments concerning this submittal, please contact me at (212) 377-4527.

Very truly yours,

CDM FEDERAL PROGRAMS CORPORATION

Brendan MacDonald, P.E., LEED ®AP
Project Manager

PSO: EG

Attachment
cc:
A. Devine, EPA Region 2 (CD)
F. Rosado, EPA Region 2 (letter only)
T. Leonard, Village of Ilion (Electronic Copy)
J. Blaum, CDM Smith (Electronic Copy)
L. Estrada, CDM Smith (Electronic Copy)
RAC 2 Region 2 Document Control

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Acronyms

AAI	All Appropriate Inquiries
ACM	asbestos containing material
AST	above ground storage tank
AWQS	ambient water quality standards
bgs	below ground surface
BVC	BAV1 vinyl chloride reductase
CDM Smith	CDM Federal Programs Corporation
CIH	Certified Industrial Hygienist
cis-1,2-DCE	cis-1,2-dichloroethene
CLP	Contract Laboratory Program
COCs	contaminants of concern
CRQL	Contract required quantitation limit
Delta	Delta Geophysics Inc.
DER	Division of Environmental Remediation
DMC	Deuterated Monitoring Compounds
DPT	direct push technology
EM	Electromagnetic
EPA	United States Environmental Protection Agency
ESA	Environmental Site Assessment
GC/MS	gas chromatography/mass spectrometry
GPR	ground penetrating radar
GPS	Global Positioning System
HASP	health and safety plan
ICP	inductive coupled plasma
ID	identification
IDW	Investigative derived waste
J	estimated value
J+	biased high estimated value
J-	biased low estimated value
mg/kg	milligram per kilogram
MS/MSD	matrix spike/matrix spike duplicate
No.	number
NYCRR	New York Codes Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
PAH	polyaromatic hydrocarbon
PAL	Project Action Limit
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
PID	photoionization detector
ppm	part per million
PVC	polyvinyl chloride
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
R	rejected
RSL	Regional Screening Levels

SCO	Soil Cleanup Objectives
SVOC	semi-volatile organic compound
TAL	Target Analyte List
TBA	Targeted Brownfields Assessment
TCE	trichloroethene
tceA	reductase
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TOGS	Technical & Operational Guidance Series
trans-1,2-DCE	trans-1,2-dichloroethene
µm	micron
µg/kg	microgram per kilogram
µg/L	microgram per Liter
U	undetected
UJ	undetected estimated
UST	underground storage tank
VOC	volatile organic compound
VC	vinyl chloride
VCR	vinyl chloride reductase
%	percent
%D	percent difference
%RSD	percent relative standard deviation

Executive Summary

This report presents the results of CDM Federal Programs Corporation's (CDM Smith) Phase II Environmental Site Assessment (ESA) for Former Duofold Corporation site (the "subject property") located in Ilion, New York (**Figure 1-1**). This Phase II ESA was conducted on behalf of the United States Environmental Protection Agency (EPA) as a result of a Targeted Brownfields Assessment (TBA) request from Herkimer County, Contract No.: EP-W-09-002, WA No.: 029-SION-0200.

The results of this Phase II ESA will assist the Village of Ilion in identifying any areas or contaminants of concern and identifying appropriate options for redevelopment and future use.

The subject property is currently owned by Ilion Properties, Inc. Company and is located at 7 Spruce Street in the Village of Ilion, Herkimer County, New York. The subject property is approximately 12.3 acres that is comprised of three Herkimer County tax parcels and located within the Village of Ilion. The majority of the subject property is comprised of tax parcel 120.29-1-63, on the south side of Spruce Street, and tax parcel 120.29-2-74.1, a contiguous parcel on the north side of River Street. The third parcel is located on the north side of Spruce Street with the tax parcel ID 120.29-1-26 (**Figure 2-1**).

The subject property was last used to cut and sew winter clothes and underwear from pre-dried and pre-treated materials. Manufacturing ceased around 2000, from which time the subject property has been vacant. Prior to use for clothing manufacturing, Sperry-Univac (formerly the Sperry-Rand Corporation) utilized the subject property to manufacture computers from the late 1940's until approximately 1968. The subject property was also used to manufacture naval shells during World War II. Remington-Rand Corporation utilized the subject property for manufacturing adding machines and typewriters in the 1930's. Through the early 1900's the subject property was owned by the Library Bureau and was used to manufacture wood and veneer.

The main building housed the former manufacturing and office operations of the facility and includes an approximately 106,000-square foot, 4-story brick structure. The middle portion of this structure has a basement with a 1,000,000-gallon underground fire protection water storage tank. The in-feed to this tank is unknown, but it is assumed to be from a municipal water source. The main building is vacant.

The powerhouse building is located adjacent to the west side of the main building. The powerhouse building contains boilers, a former coal silo and a 30,000-gallon aboveground Number (No.) 6 fuel oil tank that is located in a separate building. The volume of the product remaining in the tank, if any, is unknown. There is an approximately 5,600-square foot maintenance garage located to the west of the powerhouse building. The interior of the garage was not available for inspection and the contents of the garage are unknown. The remainder of tax parcel 120.29-1-63 consists of former building foundations and slabs to the east and a grassy area to the west. The area north of main building (tax parcel 120.29-1-26) is paved parking lot area, and the area south (tax parcel 120.29-2-74.1) is an open grassy area with a paved unnamed roadway that gives access to the main building.

The subject property is currently vacant and there are no known easements. There are no open permits issued by the New York State Department of Environmental Conservation (NYSDEC) or EPA related to the subject property (Barton and Loguidice 2012).

A site inspection and sampling investigation was conducted by NUS Corporation, Region 2 FIT, in 1990 for the EPA in which low levels of polyaromatic hydrocarbons (PAHs) and volatile organic compounds (VOCs) including chlorinated constituents (tetrachloroethene) were noted in the subject property soils. Elevated levels of metals (lead, arsenic, antimony, and copper) were also observed.

In 2014-2015 Nature's Way Environmental Consultants & Contractors, Inc. performed a subsurface investigation for NYSDEC that included sampling of surface soils, subsurface soils and groundwater quality. Low levels of polychlorinated biphenyls (PCBs), PAHs, and VOCs were seen in surface and subsurface soils. Elevated levels of metals (arsenic, barium, copper, lead, total mercury, nickel and selenium) were present in surface and subsurface soil. VOCs were seen at low levels in groundwater. Elevated levels of metals (arsenic, chromium, lead, manganese, nickel, and magnesium) were present in the installed monitoring wells. The 12 monitoring wells installed by Nature's way are still present at the subject property.

The 2016 Phase II ESA was performed by CDM Smith to investigate and confirm the previous investigation results conducted by Nature's Way and Barton and Loguidice. The Phase II ESA was conducted in accordance with the following guidance documents:

- Quality Assurance Guidance for Conducting Brownfields Site Assessments (EPA 1998)
- ASTM International E1527-13: Standard Practice for Environmental Site Assessments: Phase II Environmental Site Assessment Process (ASTM International 2013)
- New York State Department of Environmental Remediation (NYSDEC) Division of Environmental Remediation (DER)-10 Technical Guidance for Site Investigation and Remediation, May 2010 (DER-10);
- 6 NYCRR Part 375 Environmental Remediation Programs, December 2006

The following Phase II investigation tasks were completed by CDM Smith and their subcontractors in 2016 at the subject property:

- *Site Reconnaissance*: A site reconnaissance was performed by CDM Smith. The main building, the powerhouse building (containing boilers, a former coal silo and a separate building containing a 30,000-gallon #6 oil aboveground storage tank (AST)) and other site features of the property were visually inspected. There is an approximately 5,600-square foot maintenance garage located to the west of the powerhouse building, which was not available for inspection and the contents of the garage are unknown. Surface conditions at the time of the reconnaissance included maintained lawn areas, asphalt, and overgrown brushy areas. There was no snow on the ground at the time of the subject property visit.

- *Passive Gas Survey*: Beacon Environmental Services, Inc. performed a passive gas survey across the subject property except for within the buildings. A total of 81 sorbent tubes were deployed in an approximate 100 x 100-foot grid pattern to determine if VOCs were present in subsurface soils across the subject property and to aid in the placement of soil borings and temporary well points.

- *Electromagnetic (EM) 31 and Ground-Penetrating Radar (GPR): Survey:* An EM and GPR survey was performed by Delta Geophysics to identify any subsurface anomalies including underground storage tanks (USTs), septic tanks, buried drums, and utilities. The survey was conducted using electromagnetic conductivity, GPR and utility detection equipment. Findings from the survey include:

    - Utilities including water, gas, sanitary sewer, storm sewer and unknown utilities were located and marked with appropriate colors.

    - A potential building foundation was detected; however, in previous environmental report this feature was identified as a backfilled fire pond. No other subsurface features were identified via EM/GPR.

- *Soil Borings*: Twenty Geoprobe soil borings were advanced by Talon Drilling Company to a maximum depth of 15 feet and 20 subsurface soil samples were collected from depths ranging from 2 to 8 feet below ground surface (bgs). The locations selected for soil sampling was based on passive soil gas sampling, proximity to onsite features, and previous environmental sampling results. The soil was collected from the interval above the groundwater table. Lithologic logging, visual and olfactory observations, and photoionization (PID) field screening of subsurface soil samples, which were collected via direct push technology (DPT), were used to characterize environmental media and to screen for potential impacts.

- *Monitoring Well Sampling:* Ten temporary groundwater wells were installed and sampled, in addition to the 12 existing groundwater wells at the subject property, for a total of 22 groundwater wells sampled. The temporary monitoring wells ranged in depths from 11 to 15 feet bgs, while the existing wells had depths from 13 to 15 feet bgs. Groundwater samples were collected via low flow sample methodology.

- *Surface Soil Samples:* Ten surface soil samples were collected from 0 to 0.5 feet bgs via disposable trowel. Lithologic logging and PID screening was also performed for surface soil samples to characterize environmental media and screened for potential impacts to the ground surface.

- *Shallow Soil Borings:* Four shallow soil boring samples were collected across the subject property from a depth of 0 to 2 feet bgs. These locations were only analyzed for Toxicity Characteristic Leaching Procedure (TCLP) metals. The locations of these borings were advanced as close as possible to areas previously identified as having significantly high levels of lead. Analyzing for TCLP metals may determine if lead and other metals are leaching to groundwater in these areas. All sampling locations are presented on **Figure 3-1**.

All samples were analyzed via off-site EPA Contract Laboratory Program (CLP) laboratory. Surface soil samples were analyzed for pesticides, Target Analyte List (TAL) metals and TCLP metals. Shallow soil borings were analyzed for TCLP metals. Subsurface soil was analyzed for Target Compound List (TCL) VOCs, semi-volatile organic compounds (SVOCs), PCBs, TCLP Metals, and TAL Metals. The groundwater samples were analyzed for TCL VOCs, SVOCs, and TAL metals.

Phase II ESA Conclusions

CDM Smith's conclusions, based on analytical results, historic information, and visual observations are summarized below. Analytical results for soil were compared to NYSDEC Unrestricted Use Soil Cleanup Objectives (SCOs) and analytical results for groundwater were compared to NYSDEC Ambient Water Quality Standards (AWQS) and Guidance Values. EPA Regional Screening Levels (RSLs) are provided for reference in the analytical result tables (provided as an attachment to this report) however, these RSLs are generally less stringent than NYSDEC guidance thus the project action levels (PALs) will be consistent with NYSDEC guidance.

Within the surface soil and subsurface soil, metal concentrations were observed above the Unrestricted Use SCOs. Subsurface soil had detections for VOCs, SVOCs and TCLP Metals but no exceedances. PCBs were not detected in subsurface soil. Surface soil had no detections for pesticides but did have detections for TCLP metals below EPA Regulatory Levels. The four shallow subsurface soil samples from 0 to 2 feet bgs that were only analyzed for TCLP metals did have detections for TCLP metals but not above the EPA Regulatory Levels. Groundwater had VOC and metals exceedances but had no detections for SVOCs. A more detailed summary of the analytical results associated with the various matrices are below:

- *Surface Soil:* Pesticides were not detected in surface soil; however, several metals (copper, lead, nickel, silver and zinc) were detected at concentrations exceeding Unrestricted Use SCOs. Copper was observed from 61.9 milligrams per kilogram (mg/kg) to 193 mg/kg above the SCO of 50 mg/kg. Lead was observed from 112 mg/kg to 381 mg/kg above the SCO of 63 mg/kg. Nickel (65.9 mg/kg) and silver (3.9 mg/kg) were only observed above the SCOs of 30 mg/kg and 2 mg/kg, respectively in one location, DF-SS-06. Zinc was observed from 136 mg/kg to 629 mg/kg above the SCO of 109 mg/kg. All surface soil locations and their metal exceedances are shown on **Figure 4-1**. Surface soil was also analyzed for TCLP metals. There were detections for TCLP metals (barium, cadmium, chromium, lead and selenium) but there were no exceedances of the EPA Regulatory Levels.

- *Shallow Subsurface Soil:* Four shallow subsurface soil samples were collected from 0 to 2 feet bgs and analyzed for TCLP metals. As mentioned, these sample locations were placed in areas previously identified as having high concentrations of lead. Lead was only detected at DF-SSB-01(located near former soil boring SB-24 from the Nature's Way investigation) at a level of 0.1 J mg/L below the EPA Regulatory Level of 5 mg/L. Barium, cadmium, chromium, lead and selenium were all detected but did not exceed EPA Regulatory Levels, this indicates that leaching of metals is not a concern in these areas.

- *Subsurface Soil:* The passive soil gas samplers were deployed in a 100x100-foot grid pattern to screen for the presence of VOCs across the subject property and aid in the determination of soil boring and temporary well point locations. Subsurface soil samples ranged from 2 to 8 feet bgs. Several VOCs and SVOCs were detected in subsurface soil samples but did not exceed Unrestricted Use SCOs. Several metal concentrations (arsenic, barium, cadmium, chromium, copper, lead, nickel, selenium, and zinc) were detected above SCOs throughout the subject property. Copper, nickel, selenium and zinc were generally seen at similar levels (with the exception of DF-SB-11) throughout the subject property and may be associated with background concentrations rather than activities at the subject property. Arsenic, barium, cadmium, chromium, and lead appear to be the primary contaminations of concern (COCs) within the subsurface soil. DF-SB-11 had the most exceedances of metals above Unrestricted Use SCOs and a majority of the concentrations were the highest levels observed within the subsurface soil. The concentration ranges of metals that exceeded the Unrestricted Use SCOs in subsurface soil are listed in the table below. All subsurface soil sample locations and metal exceedances are shown on **Figure 4-2**.

Metal Compound	Concentration Range Seen in Subsurface Soil (mg/kg)	NYSDEC Unrestricted Use SCO (mg/kg)
Arsenic	13.9 to 41.3	13
Barium	1730 (only seen at DF-SB-11)	350
Cadmium	5.7 (only seen at DF-SB-11)	2.5
Chromium	49.4 to 2,090	30
Copper	54 to 251	50
Lead	97.9 to 84,200	63
Nickel	32.9 to 442	30
Selenium	6.5 (only seen at DF-SB-10)	3.9
Zinc	112 to 10,500	109

Subsurface soil was also analyzed for TCLP metals. There were detections for TCLP metals (arsenic, barium, cadmium, chromium, lead, mercury, and selenium) but there were no exceedances of the EPA Regulatory Levels.

- *Groundwater:* A network of 12 existing monitoring wells are located at the subject property. Ten temporary well points were installed during the Phase II ESA. Depth to water was identified at approximately 6 to 9 feet bgs and flows toward the north/northeast towards the Mohawk River. A complete round of groundwater was collected from the 12 existing wells as well as the ten temporary wells. No SVOCs were detected in groundwater samples. VOCs, cis-1,2-dichlorethene (cis-1,2-DCE), trans-1,2-dichlorethene (trans-1,2-DCE), trichloroethene (TCE), and vinyl chloride (VC) were detected at concentrations exceeding AWQS at 6 well locations (DF-MW-02, DF-MW-08, DF-MW-10, DF-TWP-14, DF-TWP-15 and DF-TWP-16). Cis-1,2-DCE was observed from 26 micrograms per liter (µg/L) to 340 µg/L above the AWQS of 5 µg/L. Trans-1,2-DCE was observed from 8.1 µg/L to 17 µg/L above the AWQS of 5 µg/L. TCE was observed from 5.8 µg/L to 34 µg/L above the AWQS of 5 µg/L. VC was observed from 2.4 µg/L to 33 µg/L above the AWQS of 2 µg/L. All groundwater sample locations and associated VOC exceedances are shown in **Figure 4-3.**

Iron, manganese, selenium, and sodium were detected above AWQS in a majority of the well locations sampled at the subject property. It is likely that these metals compounds are associated with background concentrations rather the site activities. All groundwater sample locations and associated metal exceedances are shown in **Figure 4-4.**

Based on the data generated during the Phase II ESA, CDM Smith concludes that contamination detected at the subject property is fairly wide-spread in the surface soil and more concentrated near the main building in the subsurface soil. Contamination in the surface and subsurface soil mainly consists of metals.

Groundwater contamination consists of both VOCs and metals. However, the metal exceedance levels seen are for iron, manganese, selenium, and sodium which are not typically associated with adverse health effects but rather adverse effects to supply well and conveyance infrastructure. As mentioned, it is likely the levels seen are associated with subject property background concentrations.

VOC exceedances in groundwater were concentrated on the eastern portion of the subject property. This area is located downgradient from an area previously identified as having VOC impacted soil and is likely to have been the source area. Based on these groundwater concentrations, the contamination is likely from random discharge of wash or rinse waters to the ground surface and not the results of any major TCE/PCE release.

The onsite buildings were determined to be unsuitable for internal access, therefore, no sampling was conducting within the buildings. Due to the subject property's history, there is a possibility for asbestos containing materials (ACMs). During the future demolition or rehabilitation of the onsite buildings, proper identification and removal of any ACMs should be performed. It is unlikely that contamination exist below the main building since this building has a basement and below that is a one-million-gallon water storage tank.

Recommendations

Based on the results of the Phase II Site Investigation activities and an evaluation of subject property information based on previous environmental investigations, the following recommendations are made:

- VOC-impacted groundwater may be easily managed at these relatively low levels via natural attenuation if the proper site conditions exist and no significant source was identified. TCE, cis-1,2-DCE, trans-1,2-DCE, and VC are all present in groundwater samples indicating that PCE is breaking down. A sample for Dehalococcoides, the dechlorinating bacteria, in addition to, their catalyzing enzymes BAV1 vinyl chloride reductase (BVC), tceA reductase (tceA), and vinyl chloride reductase (VCR) are recommended to confirm bacteria are present. The presence of these bacteria would indicate that there is a potential for reductive dechlorination. If the bacteria and specific site conditions are not present other remedial options may be considered.

- It is recommended that the contaminated subsurface soil adjacent to the main building be excavated and disposed of off-site at an appropriate state or federally regulated landfill. At DF-SB-11 the lead concentration exceeds the Industrial Use SCO of 3,900 mg/kg by more than 20 times at 84,200 mg/kg at depth of 4 to 5 feet bgs. This area should be sampled for TCLP metals again to confirm soil is not hazardous and to determine the proper handling and disposal of the material. Additional subsurface soil samples should be taken to delineate the extent of subsurface contamination.

- Surface soil (0-6 inches) throughout the subject property exhibited metal contamination at levels exceeding Unrestricted Use SCOs but below Residential Use SCOs. Depending on future site use, these levels are manageable at the residential level. However, it is recommended that continuous subsurface soil sampling is performed at 1-foot intervals down to approximately 4-feetto determine if contamination exists beneath surface soil. Subsurface soil samples were collected from 1 foot discrete intervals above the top of the water table or the 1-foot interval where the highest PID reading was observed at each sample location. Metal exceedances were observed in subsurface soil; however, it is unknown if exceedances exist between the discrete sample depth and surface soil. It would be recommended that either a surface scrape be conducted in some areas removing 6 to 12 inches if no further contamination exists beneath the surface soil or a cap be placed over these areas to reduce exposure to the general public. Capping of surface soil would require periodic cap inspections, development of an operations and maintenance plan and placement of deed restriction or environmental easement on the subject property. If contamination does exist further below surface soil, a deeper excavation may be required. All areas would be backfilled with clean fill. A deed restriction or environmental easement may also be required.

- A comprehensive inventory of all contents of the on-site structures should be performed prior to removal. Development of a recycling/waste disposal recycling plan can assist with sustainable disposal of discarded and abandoned materials. All waste removal should be conducted in accordance with state and federal regulations and guidance documents.

In general, the contamination detected at the subject property appears to be manageable so long as direct contact is prevented. Remediation by subsurface soil removal and backfill or isolation by capping of surface soils of areas where concentrations are above applicable standards would be recommended depending on future use. Based on the Phase II ESA sampling results, soil removal would be targeted to areas where subsurface contamination was identified such as the areas identified adjacent to the main building. Groundwater impacted by VOCs addressed using other remedial methods such as bioaugmentation to promote biological, chemical, and/or biochemical processes that result in the transformation of contaminants, if natural attenuation is not viable. A deed restriction or environmental easement may be required for any contamination that is left in place.

When undertaking subject property development, it is recommended that the developer enlist a professional engineer or scientist to prepare a health and safety plan, construction contingency plans, and a soils management plan, in order to safely and appropriately remove (and control) impacted materials. It is recommended that any work performed at the subject property be performed by an environmental professional (or if necessary a professional engineer) following approved plans and a site-specific health and safety plan approved by a certified industrial hygienist (CIH).

In the absence of excavation, engineering controls should be implemented. These controls would require (1) the installation of pavement or topsoil/vegetative cover or installation and maintenance of a perimeter fence; and (2) that any construction involving the disturbance of soils, fill materials, or demolition of uncharacterized structures located within the subject property (including non-emergency excavation, which may be part of utility repair or maintenance, or construction) should not be performed without the involvement of a professional engineer, and must be conducted in accordance with local state and federal rules and regulations and provide adequate engineering controls and worker protection. In the absence of remediation, the values of adjacent and surrounding properties may be (and currently be) negatively impacted. The loss of property value may represent some risk to public welfare, yet this risk may not be considered significant risk.

Section 1

Introduction

This report presents the results of CDM Federal Programs Corporation's (CDM Smith) Phase II Environmental Site Assessment (ESA) for the Targeted Brownfield Assessment (TBA) at the Former Duofold Corporation (the "subject property") located in Ilion, New York (**Figure 1-1** Site Location Map). This Phase II ESA was conducted on behalf of the United States Environmental Protection Agency (EPA) as a result of a TBA request from the Village of Ilion.

1.1 Purpose

This Phase II ESA was conducted on behalf of the EPA, as part of a TBA performed for Village of Ilion, to investigate the potential for contamination associated with the areas of concern identified during the previous investigations and the site reconnaissance. The objective of this Phase II ESA was to:

- confirm the presence/absence of previously identified underground storage tanks (USTs) and identify additional potential anomalies on the subject property
- determine if onsite soil and groundwater contamination exists above applicable criteria in areas not previously investigated and confirm previous sample data
- collect hydrogeological information

The subject property is zoned for Manufacturing (M-1). There is no current remedial goal, however all sampling results were compared to New York State Department of Environmental Conservation (NYSDEC) Unrestricted Use to allow for the Village of Ilion to weigh all alternatives before determining the fate of the subject property.

1.2 Special Terms and Conditions

Special terms and conditions in relation to this project have been addressed throughout various sections of this assessment.

1.3 Limitations, Methodology and Exceptions of Investigation

The Phase II investigation conducted by CDM Smith in May of 2016 was executed in accordance with the following documents:

- *"U.S. EPA Region 2 Brownfields Project Planning Guidance" (EPA 2000)*
- *"Generic Brownfields Quality Assurance Project Plan" (CDM Smith 2008)*
- *Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites, May 2014 (EPA)*

- *NYSDEC Division Environmental Remediation (DER)-10 Technical Guidance for Site Investigations and Remediation, May 2010 (DER-10)*
- *6 New York Codes Rules and Regulations (NYCRR) Part 375 Environmental Remediation Programs*
- *NYSDEC Technical & Operational Guidance Series (TOGS), Section 1.1.1 Ambient Water Quality Standards & Guidance Values and Groundwater Effluent*
- *6 NYCRR Part 703 – Water Quality Standards*
- *"Final Site-Specific Quality Assurance Project Plan (QAPP), Former Duofold Corporation, Targeted Brownfields Assessment, Ilion, New York" (CDM Smith 2016)*
- *"Site-Specific Health and Safety Plan (HASP), Former Duofold Corporation, Targeted Brownfields Assessment, Ilion, New York" (CDM Smith 2016)*
- *"Final Work Plan, Targeted Brownfields Assessments for Selected Region 2 Brownfields Initiative Sites" (CDM Smith 2010)*
- *"Standard Guide for Environmental Site Assessments: Phase II Environmental Site Assessment Process, Designation: E 1903-11" (ASTM International 2000) (Reapproved 2002)*
- *"Quality Assurance Guidance for Conducting Brownfields Site Assessments" (EPA 1998)*

Site assessment activities, including reporting of findings and conclusions, were conducted in accordance with ASTM International site assessment guidance to the extent practicable with respect to the information gathered.

The results for this TBA Phase II ESA are based on a review of available information obtained through a review of historic records and previous environmental investigations, an on-site reconnaissance, a geophysical survey, and field sampling analytical data. The Phase II ESA was completed to identify, locate, and characterize contamination present at the subject property. To meet this objective, sample locations were chosen based on the subject property history obtained by CDM Smith. The results of the Phase II ESA only characterize the nature of contamination at the subject property; the ESA has not fully characterized the extent of contamination.

This assessment has been prepared and conducted under the guidance of a qualified environmental professional as defined in NYSDEC's DER-10, 40 CFR Part 312, Standards and Practices for All Appropriate Inquiries (AAI) and ASTM E1903-11. The conclusions represent CDM Smith's professional opinions based on these aforementioned sources of information. A Phase II investigation is not a comprehensive site characterization or regulatory compliance audit, and should not be construed as such. CDM Smith cannot represent that the subject property contains no hazardous or toxic materials, products, or other latent conditions beyond those observed during the ESA. Further, the services herein shall not be construed, designed or intended to be relied upon as legal interpretation or advice. This report was prepared for the exclusive use by EPA, and is not intended for use by any other parties. Use of this report by any other party is at their sole risk without liability to CDM Smith.

Section 2

Site Description

2.1 Site Description

The subject property is currently owned by Ilion Properties and is located at 7 Spruce Street in the Village of Ilion, Herkimer County, New York. The subject property is 12.30 acres with the north side of the parcel bordered by Spruce Street and the south side by West River Street. The subject property is comprised of three Herkimer County tax parcels 120.29-1-63; 120.29-2-74.1; and 120.29-1-26. Refer to **Figure 2-1**, Overall Site Plan and Herkimer County Tax Map.

2.2 Physical Setting, Site History and Land Use

The subject property is located in an area with mixed residential and commercial development. The main building housed the former manufacturing and office operations of the facility and includes an approximately 106,000-square foot, 4-story brick structure. The middle portion of the structure has a basement with a 1,000,000-gallon underground fire protection water storage tank beneath the floor. The in-feed to this tank is unknown, but it is assumed to be from a municipal water source. The main building is vacant. The powerhouse building complex is located adjacent to the west side of the main building. The powerhouse building complex contains boilers, a former coal silo and a 30,000-gallon aboveground No. 6 fuel oil tank located in a separate building. The volume of product remaining in the tank, if any, is unknown. There is an approximately 5,600-square foot maintenance garage located to the west of the powerhouse building. The interior of the garage was not available for inspection and the contents of the garage are unknown. The remainder of tax parcel 120.29-1-63 consists of former building foundations/slabs to the east and a grassed area to the west. The area north of main building (parcel 120.29-1-26) is a paved parking lot area, and the area south (parcel 120.29.2-74.1) is an open grassy area with a paved unnamed roadway that gives access to the main building (Figure 2-1).

From the subsurface investigations, soil types at the subject property were generally consistent. The top 0 to 4 feet consisted of a brown, fine to medium sand, with trace gravel. Wet, very stiff, gray-brown silt and clayey silt was encountered below 4 feet below ground surface (bgs) to a maximum depth of 10 feet bgs. Groundwater is relatively shallow across the subject property at approximately 6 to 8 feet bgs. No intrusive analysis below the overburden was performed to determine the lithology and physical characteristics of the underlying bedrock.

The subject property was last used to cut and sew wither clothes and underwear from pre-dyed and pretreated materials. Manufacturing ceased around 2000, from which time the subject property has been vacant. Prior to use for clothing manufacturing, Sperry-Univac (formerly the Sperry-Rand Corporation) utilized the subject property to manufacture computers from the late 1940's until approximately 1968. The subject property was used to manufacture naval shells during World War II. Remington-Rand Corporation utilized the subject property for manufacturing adding machines and typewriters in the 1930's. Through the early 1900's the subject property was owned by the Library Bureau and was used to manufacture wood and veneer.

2.3 Adjacent Property Land Use

The subject property is primarily surrounded by mixed use residential and some commercial parcels. The adjacent parcel located along the southeast corner of the subject property was split between two companies; a former restaurant operation and a plumbing supply company. Parcels located further east across Central Avenue consists of a FastTrack Markets, an office building, Young's General Store and ACE, and an Aldi's Supermarket. The parcel located west of the subject property across Pleasant Avenue is a Bernie Bus Operations Facility.

2.4 Summary of Previous Assessment

A site inspection and sampling investigation was conducted by NUS Corporation, Region 2 FIT, in 1990 for the EPA in which low levels of polyaromatic hydrocarbons (PAHs) and volatile organic compounds (VOCs) including chlorinated constituents (tetrachloroethene (PCE)) were noted in subject property soils. Elevated levels of metals (lead, arsenic, antimony and copper) were also present.

In 2014-2015 Nature's Way Environmental Consultants & Contractors, Inc. performed a subsurface investigation for NYSDEC that included sampling of surface soils, subsurface soils and groundwater quality. Low levels of polychlorinated biphenyls (PCBs), PAHs, and VOCs were seen in surface and subsurface soils. Elevated levels of metals (arsenic, barium, copper, lead, total mercury, nickel, and magnesium) were present in the installed monitoring wells. The 12 monitoring wells installed by Nature's Way are still present at the subject property.

Section 3

Phase II Activities

3.1 Scope

CDM Smith performed a Phase II ESA at the subject property from October 2016 through November 2016 to investigate the contaminants of concern identified during a previous Phase I ESA and subsurface investigation. The activities performed as part of this Phase II ESA included:

- Preparation of a Site-Specific QAPP
- Preparation of a Site-Specific HASP
- Conducting a field planning meeting on May 9, 2016
- Site Reconnaissance
- Site Investigation:
    - *Geophysical Survey*: An Electromagnetic (EM) 31 and Ground Penetrating Radar (GPR) survey was performed by Delta Geophysics Inc. (Delta) of the property to identify any subsurface anomalies including USTs, septic tanks, buried drums, utilities and automotive parts. The survey was conducted using electromagnetic conductivity, GPR and utility detection equipment.
    - *Passive Soil Gas Sampling*: Beacon Environmental Services, Inc. performed a passive soil gas survey across the subject property with the exception of within the onsite buildings. A total of 81 sorbent tubes were deployed in a 100-foot grid pattern to determine VOC concentration gradients across the subject property to assist in the placement of soil borings and temporary well points.
    - *Soil Borings*: Twenty Geoprobe soil borings were advanced by Talon Drilling Company and sampled by CDM Smith.
    - *Temporary Groundwater Monitoring Wells*: The installation of 10 temporary groundwater wells were also advanced/installed by Talon Drilling Company while CDM Smith provided oversight.
    - *Existing Groundwater Monitoring Wells*: Gauging and sampling of the 12 existing monitoring wells.
    - *Surface Soil Sampling:* Ten surface soil samples were collected from 0 to 0.5 feet bgs via disposable trowel.
    - *Surface Soil Borings*: Four shallow soil boring samples were collected across the subject property from a depth of 0 to 2 feet bgs. These locations were only analyzed for Toxicity

Characteristic Leaching Procedure (TCLP) metals. All sample locations are indicated on **Figure 3-1** Sample Location Plan.

All samples were analyzed via EPA Contract Laboratory Program (CLP) laboratory. Surface soil samples were analyzed for pesticides, target analyte list (TAL) metals and TCLP metals. Surface soil borings were only analyzed for TCLP metals. Subsurface soil was analyzed for target compounds list (TCL) VOCs, semi-volatile organic compounds (SVOCs), PCBs, TCLP Metals, and TAL Metals. The groundwater samples were analyzed for TCL VOCs, SVOCs, TCLP metals, TAL metals and field filtered TAL metals.

3.2 Site Access and Reconnaissance

A site reconnaissance was performed by CDM Smith on January 26, 2016. During the reconnaissance, the subject property was observed to be vacant, unsecured, and covered in mowed grassy areas and overgrown vegetation. With the exception of the maintenance shop, all the onsite buildings were visually inspected.

3.3 Geophysical Survey

A complete geophysical survey was performed by Delta to identify any subsurface anomalies including USTs and utilities. The survey was completed from October 3 through October 6, 2016, the geophysical survey included the following:

- A GPR survey using a Geophysical Survey System Inc. SIR-3000 cart-mounted GPR unit with a 400-megahertz antenna System 2. The GPR unit was configured to transmit to a depth of approximately 10 feet bgs, but actual signal penetration was approximately 3 feet bgs. The limiting factor was signal attenuation near surface soils.

- A utility locator survey using a Radiodetection RD7000 precision utility detector and Fisher M- Scope TW-6 magnetic locator. The TW-6 and RD7000, used in conjunction, are designed to find subsurface pipes, cables and other metallic objects such as USTs. The TW-6 operates by generating a magnetic field at the transmitter which causes metallic objects in the subsurface to generate a secondary magnetic field. The induced secondary field is detected by the RD7000, which generates an audible tone when the instrument passes over an underground metallic object causing a change in balance between the primary and secondary electromagnetic fields.

- A Genomics EM-61 Mark II time-domain metal detector was used to complete an EM conductivity survey. The EM method uses the principle of electromagnetic induction to measure the variability of electrical conductivity of subsurface materials. The EM-61 was used to detect both ferrous and non-ferrous metals buried up to 8 feet bgs.

- Coordinate mapping using a Trimble Global Positioning System (GPS) Pathfinder Pro XRS.

- All accessible areas within the survey areas were examined during this investigation. Based on the data gathered, the following utilities were detected: water, gas, sanitary sewer and storm sewer. Additionally, a potential building foundations was detected. All detected utilities were marked onsite with appropriate colors. Anomalous features and unknown utilities were marked onsite in pink. The complete report can be found in **Appendix A**.

3.4 Sampling Activities and Sample Analysis

Field log book notes and sampling information recorded during investigation activities, including sampling equipment calibration forms, are provided in **Appendix B**. Sample locations are shown on **Figure 3-1** and a summary of the samples collected and sample parameters are presented in **Table 2-1**. Sampling locations were selected based on contamination impacted areas identified during the passive soil gas sampling, previous environmental sample locations, and evidence of staining. Analytical results are discussed in Section 4.

3.4.1 Passive Soil Gas Survey

Beacon Environmental Services, Inc. performed a passive gas survey across the subject property with the exception of inside the onsite buildings. A total of 81 sorbent tubes were deployed in a 100x100-foot grid pattern to screen for VOCs across the subject property to assist in the placement of soil borings and temporary well points. Passive soil gas survey results are given in **Appendix C**.

3.4.2 Soil Borings and Subsurface Soil Samples

Twenty Geoprobe soil borings were advanced from November 8 to 9, 2016 by Talon Drilling Company via direct push technology (DPT), to characterize environmental media and to screen for potential impacts. **Appendix D** presents Soil Boring and Temporary Well Construction Logs. The soil borings were advanced to a maximum depth of 15 feet bgs. The locations of the soil borings that were sampled are shown in **Figure 3-1**. The first few feet of soil encountered at the subject property was generally fill material. Just above the water table, moderately dense, brown fine to medium moist sand was observed at approximately 4 to 5 feet. Wet, moderately dense, gray-tan, silt and clay was then observed from 5 to 10 feet. A total of 20 subsurface samples were collected from the 20 soil borings based on the location of the borings, historical data and visual and olfactory observations. Subsurface soil samples were collected from the interval above the groundwater table. Lithologic logging and PID field screening was performed at all 20 locations. With the exemption of SB-11 and SB-12 located in the northeast corner of the building, PID readings across the subject property were non-detect for all samples. Elevated PID readings were recorded at 834 parts per million (ppm) from 4 to 5 feet bgs at SB-11 and 65.3 ppm in the sample collected from 6 to 7 feet bgs at SB-12. Subsurface soil samples were analyzed by a CLP laboratory (Chemtech Consulting Group) for the following organic compound analyses: TCL VOCs, SVOCs, PCBs, TAL metals and TCLP metals. Subsurface soil samples, analytical parameters, and associated QC samples are presented in **Table 3-1A** through **Table 3-1F**.

3.4.3 Shallow Soil Borings

Four shallow soil borings were advanced by Talon Drilling Company on November 8 and 9, 2016. The borings were advanced to a depth of 2 feet bgs and one sample was collected from a depth of 1 to 2 feet bgs. The lithology of the sample was recorded and field screened with a photoionization detector (PID). The samples were homogenized in a disposable aluminum pan then collected using a sample-dedicated hand trowel. The locations where these borings were advanced was as close as possible to previous sample locations in 2014 (MW-09, SB-12, SB-23 and SB-24) that were identified as having significantly high levels of lead. By analyzing for TCLP metals, it could be determined if lead was leaching.

Shallow soil borings were analyzed by a CLP laboratory (Chemtech Consulting Group) for TCLP metals. Shallow soil boring samples, analytical parameters, and associated QC samples are presented in **Table 3-1F**.

3.4.4 Surface Soil Samples

A total of 10 surface samples were collected from a depth of 0 to 0.5 feet bgs using a sample-dedicated disposable trowel. The lithology of the samples was recorded and field screened with a PID. Soil was homogenized in disposable aluminum pans and filled into appropriate sample bottleware. The sample-dedicated hand trowel was used to collect additional quality assurance/quality control (QA/QC) soil volume if needed.

Surface soil samples were analyzed by a CLP laboratory (Chemtech Consulting Group) for the following analyses: pesticides, TAL metals and TCLP metals. Surface soil samples, analytical parameters, and associated QC samples are presented in **Table 3-1D** through **Table 3-1F**.

3.4.5 Existing and Temporary Monitoring Well Installation and Sampling

Groundwater samples were collected from temporary monitoring wells installed via DPT drilling methods at 10 of the subsurface borings. Locations were determined based on the Phase II ESA field observations, passive soil gas sampling results and previous environmental sampling. The temporary wells were comprised of one-inch diameter polyvinyl chloride (PVC) with 5 foot screens with 0.010 inch slots. The total depth of the temporary wells ranged from 11 to 14 feet bgs. Each temporary well was screened from approximately one foot above to four feet below the water table.

Groundwater samples were collected from the 12 existing monitoring wells and 10 installed temporary well points. A synoptic round of water levels from all well locations was recorded prior to sampling. **Figure 3-1** shows the existing well locations and the temporary well point locations. The direction of groundwater flow is to the north and northeast as indicated by previous reports. A groundwater contour map is presented in **Figure 3-2** for the existing monitoring wells. Temporary well points were not surveyed therefore, water level readings for those locations were not included in the creation of the contour map.

Groundwater samples were collected using ¼-inch inner diameter Teflon™-lined polyethylene tubing and a peristaltic pump. Prior to low-flow sampling, each temporary well was developed for a minimum of 30 minutes or until water quality parameters (pH, specific conductivity, and temperature) recorded at five-minute intervals stabilized. The time between development and well purging ranged from 3 to 24 hours. Prior to sample collection, water quality parameters (pH, specific conductivity, turbidity, dissolved oxygen, temperature and redox potential) were again collected at five minute intervals. Groundwater samples were collected once water quality parameters stabilized. Final groundwater parameters are summarized in **Table 2-2** and the groundwater sampling logs can be found in **Appendix E**.

The groundwater samples were submitted to a CLP laboratory (Chemtech Consulting Group) for the following analyses: TCL VOCs, SVOCs, TAL metals, filtered TAL metals and TCLP metals. The

TAL metal samples were filtered using a disposable inline 0.45-micron (µm) field filters that were attached to the end of the well dedicated tubing after all other samples for analysis were collected. Groundwater samples, analytical parameters, and associated QC samples are presented in **Table 3-2A** through **Table 3-2C**.

3.4.6 Investigative Derived Waste Sampling and Disposal

All soil cuttings and purge water were collected and containerized in 55 gallon drums and stored on site. Capital Environmental collected investigative derived waste (IDW) soil and groundwater samples on November 14, 2016 and the drums were later removed for off-site disposal on December 14, 2016. Waste manifests are provided in **Appendix F**.

3.5 Deviations from the QAPP

No deviations from the QAPP were made.

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Section 4

Summary and Evaluation of Data

This section describes the selection of evaluation criteria and summarizes the analytical results of the Phase II ESA samples. The results of this Phase II ESA will assist the Village of Ilion in identifying areas and media of concern, determine if there is a need for additional delineation, and identify some appropriate options for remediation, if necessary, based on future use.

The Data Validation Reports for all data are included in **Appendix G**.

4.1 Selection of Evaluation Criteria

In accordance with the site-specific QAPP, analytical results are compared to both federal and state project action limits (PALs) presented in Worksheet #15 and listed below.

Soil Criteria

- EPA RSLs for Chemical Contaminants at Superfund Sites (May 2014) for residential soil, adjusted to a cancer risk of 1E-6 and hazard quotient of 1
- NYSDEC CP-51/Soil Cleanup Guidance

NYSDEC Subpart 375-6: Table 375-6.8(a): Unrestricted Use soil cleanup objectives (SCOs) VOC and SVOC soil results have been compared to Soil Cleanup Levels for Gasoline Contaminated Soils and for Fuel Oil Contaminated Soils, which are listed in Tables 2 and 3 of NYSDEC's CP-51 Soil Cleanup Guidance Documented issued October 21, 2010. The soil cleanup criteria presented in NYSDEC's CP-51 Tables 2 and 3 are comparable to NYSDEC's Unrestricted Use SCOs.

The subject property is currently zoned for manufacturing use however, soil results were compared to Unrestricted Use to assist the Village of Ilion with determining all alternative reuse scenarios for future development. Other NYSDEC use SCOs will be mentioned in this report to further provide insight to the Village. The proposed remedial goal is currently unknown. Soil analytical results are presented in **Tables 3-1A** through **Table 3-1F** for surface and subsurface soil samples.

Groundwater Criteria

- EPA National Primary Drinking Water Standards, EPA 816-F-09-0004, May 2009
- NYSDEC Part 703.5 Ambient Water Quality Standards (AWQS) for Class GA Groundwater (TOGS 1.1.1. Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations)

Although the PALs are based on federal and state groundwater guidance values (referenced as "evaluation criteria" in this report), the federal regulations are less stringent than the remediation goals established for the subject property; therefore, groundwater analytical results are compared to NYSDEC evaluation criteria. EPA guidance criteria will be included where applicable. The groundwater organic and inorganic PALs and analytical results are presented in **Table 3-2A** through **Table 3-2C**.

4.2 Soil Sample Results

4.2.1 Surface Soil Analytical Results

Tables 3-1A through 3-1F present the results of the subsurface soil samples collected during this Phase II ESA. **Figure 4-1** shows exceedances for metals in surface soil samples. Section 4.5 – Evaluation of Results provides a discussion on the relationship between the sample results and the environmental matrices that were sampled.

4.2.1.1 Pesticides

Pesticides were not detected in any surface soil samples.

4.2.1.2 Metals

Five metals were detected at concentrations exceeding the NYSDEC Unrestricted Use SCOs in surface soil samples. A summary of all metals results can be found in **Table 3-1E** and exceedances are presented below.

- *Copper* – Concentrations were observed at five surface soil locations, DF-SS-01(193 milligrams per kilogram (mg/kg)), DF-SS-02 (61.9 mg/kg), DF-SS-05 (83.8 mg/kg), DF-SS-06 (62 mg/kg) and DF-SS-08 (117 mg/kg), which exceeded the Unrestricted Use SCO of 50 mg/kg.

- *Lead* – Concentrations were observed at seven surface soil locations, DF-SS-01 (144 mg/kg), DF-SS-02 (183 mg/kg), DF-SS-03 (112 mg/kg), DF-SS-05 (175 mg/kg), DF-SS-06 (215 mg/kg), DF-SS-08 (334 mg/kg) and DF-SS-10 (381 mg/kg), which exceeded the Unrestricted Use SCO of 63 mg/kg.

- *Nickel* – Concentrations were observed at two surface soil locations, DF-SS-06 (65.9 mg/kg) and DF-SS-10 (90.5 mg/kg), which exceeded the Unrestricted Use SCO of 30 mg/kg.

- *Silver* – One sample location, DF-SS-06 indicated a concentration of 3.9 mg/kg, which exceeded the Unrestricted Use SCO of 2 mg/kg.

- *Zinc* – Concentrations were observed at six surface soil locations, DF-SS-01 (136 mg/kg), DF-SS-02 (194 mg/kg), DF-SS-05 (175 mg/kg), DF-SS-06 (212 mg/kg), DF-SS-08 (629 mg/kg) and DF-SS-10 (212 mg/kg), which exceeded the Unrestricted Use SCO of 109 mg/kg.

4.2.1.3 TCLP Metals

Several metals were detected in surface soil samples at low levels that did not exceed EPA Regulatory Levels for TCLP metals.

4.2.2 Subsurface Soil Analytical Results

Table 3-1A through **Table 3-1F** present the results of the organic and inorganic analytes detected in subsurface soil samples collected during this Phase II ESA. **Figure 4-2** shows exceedances of metals in subsurface soil samples. Section 4.5 provides a discussion on the relationship between the sample results and the environmental matrices that were sampled.

4.2.2.1 VOCs

Several VOCs were detected at low levels in subsurface soil samples at levels that did not exceed Unrestricted Use SCOs. Acetone was detected in three samples above Unrestricted Use SCOs.

4.2.2.2 SVOCs

Several SVOCs were detected at low levels in subsurface soil samples in levels that did not exceed Unrestricted Use SCOs.

4.2.2.3 PCBs

PCBs were not detected in any subsurface soil samples.

4.2.2.4 Metals

Eight metal compounds were detected at concentrations exceeding the NYSDEC Unrestricted Use SCOs in a majority of the subsurface soil samples. **Table 3-1E** details all detections and exceedances. Metal concentrations that exceed the SCOs are listed below for all subsurface soil locations.

- *Arsenic* – Concentrations above the NYSDEC Unrestricted Use SCO of 13 mg/kg was detected in DF-SB-02 from 4 to 5 feet bgs (25.5 mg/kg), DF-SB-06 from 4 to 5 feet bgs (41.3 mg/kg), DF-SB-07 from 7 to 8 feet bgs (13.6 mg/kg), DF-SB-10 from 5 to 6 feet bgs (18.3 mg/kg), SB-900-A (Duplicate at DF-SB-10) from 5 to 6 feet bgs (15.2 mg/kg), DF-SB-11 from 4 to 5 feet bgs (20.5 mg/kg), DF-SB-14 from 6 to 7 feet bgs (39.5 mg/kg), and DF-SB-16 from 5 to 6 feet bgs (13.9 mg/kg).

- *Barium* – Concentration above the NYSDEC Unrestricted Use SCO of 350 mg/kg was detected in Df-SB-11 from 4 to 5 feet bgs (1,730 mg/kg).

- *Cadmium* – Concentrations were detected above the NYSDEC Unrestricted Use SCO of 2.5 mg/kg in DF-SB-11 from 4 to 5 feet bgs (5.7 mg/kg).

- *Chromium* – Concentrations were detected above the NYSDEC Unrestricted Use SCO of 30 mg/kg in DF-SB-11 from 4 to 5 feet bgs (2,090 mg/kg) and DF-SB-13 from 4 to 5 feet bgs (49.4 mg/kg).

- *Copper* – Concentrations were detected above the NYSDEC Unrestricted Use SCO of 50 mg/kg in DF-SB-02 from 4 to 5 feet bgs (251 mg/kg), DF-SB-08 from 2 to 3 feet bgs (54 J mg/kg), DF-SB-11 from 4 to 5 feet bgs (219 mg/kg), DF-SB-13 from 4 to 5 feet bgs (235 J mg/kg), DF-SB-17 from 4 to 5 feet bgs (87 J mg/kg) and SB-900-B (Duplicate at DF-SB-17) from 4 to 5 feet bgs (94.4 J mg/kg).

- *Lead* – Concentrations above the NYSDEC Unrestricted Use SCO of 63 mg/kg were detected in DF-SB-02 from 4 to 5 feet bgs (397 mg/kg), DF-SB-05 from 5 to 6 feet bgs (130 mg/kg), DF-SB-07 from 7 to 8 feet bgs (97.9 mg/kg), DF-SB-11 from 4 to 5 feet bgs (84,200 mg/kg), DF-SB-13 from 6 to 7 feet bgs (674 mg/kg), DF-SB-17 from 4 to 5 feet bgs (553 J mg/kg), and SB-900-B (Duplicate at DF-SB-17) from 4 to 5 feet bgs (139 J mg/kg).

- *Nickel* – Concentrations were detected above the NYSDEC Unrestricted Use SCO of 30 mg/kg in DF-SB-02 from 4 to 5 feet bgs (32.6 mg/kg), DF-SB-08 from 2 to 3 feet bgs (76 mg/kg), DF-SB-10 from 5 to 6 feet bgs (36.9 mg/kg), and DF-SB-11 from 4 to 5 feet bgs (442 mg/kg).

- *Selenium* – Concentration above the NYSDEC Unrestricted SCO of 3.9 mg/kg was detected in DF-SB-10 from 5 to 6 feet bgs (6.5 J mg/kg).

- *Zinc* – Concentrations were detected above the NYSDEC Unrestricted Use SCO of 109 mg/kg in DF-SB-01 from 4 to 5 feet bgs (186 mg/kg), DF-SB-02 from 4 to 5 feet bgs (206 mg/kg), DF-SB-07 from 7 to 8 feet bgs (211 mg/kg), DF-SB-09 from 5 to 6 feet bgs (125 mg/kg), DF-SB-10 from 5 to 6 feet bgs (171 mg/kg), SB-900-A (Duplicate at DF-SB-10) from 5 to 6 feet bgs (143 mg/kg), DF-SB-11 from 4 to 5 feet bgs (10,500 mg/kg), DF-SB-12 from 6 to 7 feet bgs (142 mg/kg), DF-SB-13 from 4 to 5 feet bgs (339 mg/kg) and DF-SB-14 from 6 to 7 feet bgs (112 mg/kg).

4.2.2.5 TCLP Metals

Several metals were detected in subsurface soil samples at low levels that did not exceed EPA Regulatory Levels for TCLP metals.

4.3 Temporary Well Point and Existing Monitoring Well Sample Results

4.3.1 Monitoring Well Sample Analytical Results

Tables 3-2A through **3-2C** present the results of the analytes detected in the existing and temporary monitoring well samples collected during this Phase II ESA. **Figure 4-3** shows exceedances for VOCs detected in groundwater. Section 4.5 – Evaluation of Results provides a discussion on the relationship between the sample results and the environmental matrices that were sampled.

4.3.1.1 VOCs

Four VOCs were detected at concentrations above the NYSDEC AWQS in six of the 22 groundwater wells sampled. VOC concentrations that exceed the AWQS are listed below for all groundwater well locations and the complete summary of VOCs in groundwater can be found in Table 3A.

- *Cis-1,2-Dichloroethene (cis-1,2-DCE)* – Concentrations were detected above the NYSDEC AWQS of 5 µg/L in DF-MW-02 (26 µg/L), DF-MW-08 (240 J- µg/L), DF-MW-10 (64 µg/L), DF-TWP-15 (340 J- µg/L) and DF-TWP-16 (110 J- µg/L).

- *Trans-1,2-Dichloroethene (trans-1,2-DCE)* – Concentrations were detected above the NYSDEC AWQS of 5 µg/L in DF-MW-02 (17 µg/L), DF-TWP-15 (14 J- µg/L) and DF-TWP-16 (8.1 J- µg/L).

- *Trichloroethene (TCE)* – Concentrations were detected above the NYSDEC AWQS of 5 µg/L in DF-MW-02 (10 µg/L), DF-MW-10 (20 µg/L), DF-TWP-14 (34 µg/L) and DF-TWP-16 (5.8 µg/L).

- *Vinyl Chloride (VC)* – Concentrations were detected above the NYSDEC AWQS of 2 µg/L in DF-MW-02 (5.4 µg/L), DF-MW-08 (11 µg/L), DF-MW-10 (5.8 µg/L), DF-TWP-15 (2.4 µg/L) and DF-TWP-16 (33 µg/L).

4.3.1.2 SVOCs

No SVOCs were detected in groundwater samples and Table 3-2B presents a complete summary of SVOC results.

4.3.1.3 Metals

Iron, manganese, selenium, and sodium were detected at concentrations exceeding the NYSDEC AWQS exceedances in a majority both unfiltered and filtered groundwater samples. Filtered samples indicate the dissolved component of each metal analyte. Sample identification (ID) numbers with the suffix "-F" indicate the filtered sample. **Table 3-3C** details all exceedances.

- *Iron* – Concentrations were detected above the NYSDEC AWQS of 300 µg/L in samples DF-MW-01-1 (484 µg/L), DF-MW-02-1 (953 µg/L), DF-MW-02-1-F (393 µg/L), DF-MW-03-1 (6,170 µg/L), DF-MW-03-1-F (4,240 µg/L), DF-TWP-02-1 (8,870 µg/L), DF-TWP-02-1-F (8,540 µg/L), DF-TWP-18-1 (7,190 µg/L), DF-TWP-18-1-F (6,580 µg/L), DF-TWP-19-1 (476 µg/L), and DF-TWP-19-1-F (423 µg/L).

- *Manganese* – Concentrations were detected above the NYSDEC AWQS of 300 µg/L in samples DF-MW-02-1 (944 µg/L), DF-MW-02-1-F (894 µg/L), DF-MW-03-1 (5,320 µg/L), DF-MW-03-1-F (5,280 µg/L), DF-MW-08-1 (343 µg/L), DF-MW-08-1-F (341 µg/L), DF-MW-09-1 (1,010 µg/L), DF-MW-09-1-F (984 µg/L), DF-MW-10-1 (1,280 µg/L), DF-MW-10-1-F (1,220 µg/L), DF-TWP-02-1 (553 µg/L), DF-TWP-02-1-F (544 µg/L), DF-TWP-18-1 (1,140 µg/L), DF-TWP-18-1-F (1,100 µg/L), DF-TWP-19-1 (1,350 µg/L), and DF-TWP-19-1-F (1,340 µg/L).

- *Selenium* – Concentrations were detected above the NYSDEC AWQS of 10 µg/L in two samples, DF-TWP-02-1 (21.1 J µg/L) and DF-TWP-02-1-F (18.7 J µg/L).

- *Sodium* – Concentrations were detected above the NYSDEC AWQS of 20,000 µg/L in samples DF-MW-01-1 (32,200 µg/L), DF-MW-01-1-F (32,000 µg/L), DF-MW-02-1 (27,600 µg/L), DF-MW-02-1-F (28,600 µg/L), DF-MW-04-1 (42,100 µg/L), DF-MW-04-1-F (41,600 µg/L), DF-MW-06-1 (45,300 µg/L), DF-MW-06-1-F (45,600 µg/L), DF-MW-07-1 (44,600 µg/L), DF-MW-07-1-F (44,300 µg/L), DF-MW-08-1 (39,200 µg/L), DF-MW-08-1-F (38,600 µg/L), DF-MW-10-1 (28,300 µg/L), DF-MW-10-1-F (28,800 µg/L), DF-MW-11-1 (47,800 µg/L), DF-MW-11-1-F (48,200 µg/L), DF-MW-12-1 (49,700 µg/L), DF-MW-12-1-F (49,500 µg/L), DF-TWP-03-1 (35,300 µg/L), GW-900-2 (35,900 µg/L, duplicate of DF-TWP-03-1), DF-TWP-03-1-F (35,300 µg/L), GW-900-2-F (35,200 µg/L, duplicate of DF-TWP-03-1-F), DF-TWP-07-1 (44,500 µg/L), and DF-TWP-07-1-F (45,200 µg/L).

4.4 Quality Assurance/Quality Control

Three field rinsate blanks were collected, one by pouring deionized water over dedicated soil sampling equipment, and the other two by pouring deionized water over dedicated groundwater sampling equipment. Field rinsate blanks were submitted with the environmental samples and analyzed for the same parameters (VOCs, SVOC, pesticides, PCBs, metals and mercury, and TCLP metals). The field rinsate blank associated with soil collection had detections of VOCs (acetone and methylene chloride), SVOCs (4-chloro-3-methypenol and benzaldehyde), one metal (barium), and TCLP metals (calcium and zinc). All results were below the contract required quantitation limit (CRQL), except the VOC acetone, which was above the CRQL. Five trip blanks were collected and shipped with the aqueous field samples for VOC analysis. Analytical results for field rinsate and trip blank samples are provided in **Table 3-3A** through **Table 3-3F**

All data were validated by EPA and have been reviewed to assess whether data quality is sufficient to support the project objectives. Some QC parameters were outside criteria; associated sample results were qualified accordingly. Data qualified as estimated J, J+, J-, U, or UJ are usable for project decisions; rejected data (R) are not considered usable for project purposes. Data validation reports are included in **Appendix G**. QC outliers noted within the EPA validation reports are described below.

- *Analytical Blanks* - Laboratory method blanks had detections of VOCs and metals. Associated sample results were appropriately qualified as estimated non-detect (U).
- *Field Rinsate Blanks* – Field rinsate blanks had VOC detections. Associated sample results were appropriately qualified as estimated non-detect (U).
- *Trip Blanks* – Trip blanks had detections of VOCs, acetone, and methylene chloride. Associated sample results were appropriately qualified as estimated non-detect (U).
- *Deuterated Monitoring Compounds (DMCs)* and Surrogate Recoveries – Several DMCs and surrogates exceeded QC criteria. This affected sample results for VOCs, SVOCs, pesticides and PCBs which were estimated by the data validator. In addition, two compounds (1,1,2,2-tetrachloroethane and 1,2-dibromo-3-chloropropane) in one VOC sample (DF-SB-11-A) were rejected due to DMC criteria.
- *Percent Relative Standard Deviation (% RSD) and Percent Difference (% D)* – These %RSD and %D were calculated from the initial calibrations and the continuing calibration checks to indicate the stability of specific compound response factors over increasing concentration, and the instrument's daily performance. A value outside these limits indicates potential detection and quantitation errors. Some % RSD and % D recoveries were outside control limits for VOC results; associated results required estimation.
- *Matrix Spike/Matrix Spike Duplicate (MS/MSD)* – These QC data were generated to determine the long-term precision and accuracy of the analytical method in various

matrices. Several MS/MSDs did not meet QC criteria. The affected PCB and arsenic sample results were qualified as estimated by the data validator.

- *Field Duplicate* – Several metals were above the validation criteria in the field duplicate sample pairs. These metal results were qualified estimated by the data validator.
- *Internal Standards* - Internal standards performance criteria ensure that gas chromatography (GC)/ mass spectrometry (MS) sensitivity and response are stable during every analytical run. Some VOC and SVOC internal standards results were outside criteria and were estimated. Additionally, seven VOC compounds (1,2,3-trichlorobenzene, 1,2,4-trichlorobenzene, 1,2-dibromo-3-chloropropane, 1,2-dichlorobenzene,1,3-dichlorobenzene, 1,4-dichlorobenzene, bromoform) in one sample (DF-SB-02-A) were rejected due to poor internal standards recovery.
- *Inductively Coupled Plasma (ICP) Serial Dilution (Inorganics)* - Several ICP serial dilutions did not yield acceptable percent difference. The affected detected metal result was estimated.
- *Spike Sample Analysis (Inorganics)* – Several iron spike sample analysis results did not meet QC criteria. The spike sample analysis results affected metals sample results, which were qualified as *estimated by the data validator.*

The final percentages of valid data are 99.9 percent (%) for soil and 100% for groundwater. The rejected data should not be used for project decisions. The ninety percent completeness goal for usable data has been met.

Data failing QC criteria were appropriately qualified as estimated, non-detected, or rejected during data validation. Almost all data reported herein are usable with the data validation qualifiers. The data generated during this Phase II are considered definitive level data and, except for the rejected data, are usable for the intended purpose which is to determine the extent of VOC, PAH and metal contamination and to allow for the grantee to best determine the appropriate future use of the Site based on the nature of the contamination.

4.5 Evaluation of Results

4.5.1 VOCs

VOC exceedances in subsurface soil samples were limited to DF-SB-10 (5 to 6 feet bgs) and DF-SB-11 (4 to 5 feet bgs) in the area closest to the main building. Acetone exceeded the NYSDEC Unrestricted SCO at these locations. The highest PID measurements were observed at DF-SB-11 but PID readings were non-detect at DF-SB-10. Neither location exhibited any soil staining. Subsurface soil had low detections of several VOCs but no exceedances of the Unrestricted Use SCOs. Groundwater also had several detections of VOCs, in addition to exceedances of cis-1,2-DCE, trans-1,2-DCE, TCE and VC in the area of the wooden foundation to the east of the main building.

4.5.2 SVOCs

Low PAH detections were seen throughout the subsurface soil. No exceedances were observed in either soil or groundwater.

4.5.3 PCBs and Pesticides

No pesticides were detected in surface soil and no PCBs were detected in subsurface soil.

4.5.4 Metals

Metals were detected across the subject property in subsurface soil, surface soil, and groundwater. Arsenic, cadmium, chromium, copper, lead, nickel, selenium, silver, and zinc exceeded Unrestricted Use SCOs in the subsurface and surface soil. The significant metal exceedances are concentrated directly adjacent to the main building.

In groundwater, iron, manganese and sodium were detected above AWQS in a vast majority of samples located across the subject property. Selenium exceeded the AWQS in one temporary well location in the far northeast corner of the subject property.

4.5.5 TCLP Metals

TCLP metals including arsenic, barium, cadmium, chromium, lead, mercury, and selenium were detected in surface, shallow subsurface soil, and subsurface soil at fairly low levels and they did not exceed EPA Regulatory Levels. This indicates that those metals listed are not leaching into the groundwater at the locations sampled.

4.5.6 Evaluation of Sampled Environmental Matrices

Within the surface soil and subsurface soil metal concentrations were observed above the Unrestricted Use SCOs. Subsurface soil had detections for VOCs, SVOCs and TCLP Metals but no exceedances. PCBs were not detected subsurface soil. Surface soil had no detections for pesticides but did have detections for TCLP metals below EPA Regulatory Levels. The four shallow subsurface soil samples from 0 to 2 feet bgs that were only analyzed TCLP metals did have detections for TCLP metals but not above the EPA Regulatory Levels. Groundwater had VOC and metals exceedances but had no detections for SVOCs. A summary of the analytical results associated with the various matrices are below:

- *Surface Soil***:** Pesticides were not detected in surface soil; however, several metals (copper, lead, nickel, silver and zinc) were detected at concentrations exceeding Unrestricted Use SCOs. Copper was observed from 61.9 mg/kg to 193 mg/kg above the SCO of 50 mg/kg. Lead was observed from 112 mg/kg to 381 mg/kg above the SCO of 63 mg/kg. Nickel (65.9 mg/kg) and silver (3.9 mg/kg) were only observed above the SCOs of 30 mg/kg and 2 mg/kg, respectively in one location, DF-SS-06. Zinc was observed from 136 mg/kg to 629 mg/kg above the SCO of 109 mg/kg. DF-SS-06 had exceedances for all 5 of the metals listed above and DF-SS-10 had the highest exceedance of lead in surface soil at 381 mg/kg. Both of these locations were in close proximity to the main building and former coal silo. DF-SS-08 also had a significant exceedance of lead (334 mg/kg), in addition, to the maximum concentration seen in surface soil for zinc (629 mg/kg). DF-SS-08 was located in the far northeast corner of the subject property. It should be noted that when comparing the levels of these metals to Residential Use SCOs, there are no metal exceedances. Surface soil was also analyzed for TCLP metals. There were detections for TCLP metals (barium, cadmium, chromium, lead and selenium) but there were no exceedances of the EPA Regulatory Levels. No exceedances of EPA Regulatory Levels for TCLP Metals indicates that metals are not leaching.

- *Shallow Subsurface Soil*: Four shallow subsurface soil samples were collected from 0 to 2 feet bgs and analyzed for TCLP metals. As mentioned, these sample locations were placed in areas previously identified as having high concentrations of lead. Lead was only detected at DF-SSB-01(located near former soil boring SB-24 from the Nature's Way investigation) at a level of 0.1 J mg/L below the EPA Regulatory Level of 5 mg/L. Barium, cadmium, chromium, lead and selenium were all detected but did not exceed Regulatory Levels, this indicates that leaching of metals is not a concern in these areas.

- *Subsurface Soil*: Subsurface soil samples ranged from 2 to 8 feet bgs. VOC and SVOC detections in the subsurface soil did not exceed Unrestricted Use SCOs during the Phase II ESA and were consistent with previous environmental investigation reports. Benzene and toluene were detected well below Unrestricted Use SCOs in DF-SB-11, a location near the former coal silo and smoke stack. Chlorinated solvents (cis-1,2-DCE, trans-1,2-DCE, PCE, TCE and VC) were detected primarily at borings located in the eastern portion of the subject property at levels below 10 micrograms per kilogram (µg/kg) (with the exception of cis-1,2-DCE which had detections as high as 72 µg/kg in DF-SB-15 from 5 to 6 feet bgs). Twenty SVOCs were detected at levels below their respective Unrestricted Use SCOs in subsurface soil samples across the subject property. While most concentrations were orders of magnitude below their respective Unrestricted Use SCOs, phenol was detected at 280 µg/kg just shy of its Unrestricted SCO of 330 µg/kg. Phenol was also detected at all but two subsurface soil locations (DF-SB-11 and DF-SB-12). Unrestricted Use SCOs are often more stringent than EPA RSLs however, for various PAHs, EPA RSLs are more stringent. The EPA RSLs for benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene at 160 µg/kg, 16 µg/kg, and 160 µg/kg, respectively were exceeded in DF-SB-04, DF-SB-05, DF-SB-06, DF-SB-07, DF-SB-11, DF-SB-12, and DF-SB-13. No PCBs were detected. Several metal concentrations (arsenic, barium, cadmium, chromium, copper, lead, nickel, selenium, and zinc) were detected above SCOs throughout the subject property. Copper, nickel, selenium and zinc were generally seen at similar levels (with the exception of DF-SB-11) throughout the subject property and may be associated with background concentrations rather than activities at the subject property. Arsenic, barium, cadmium, chromium, and lead can be seen as the primary COCs within subsurface soil. DF-SB-11 had most exceedances of metals above Unrestricted Use SCOs and a majority of the concentrations were the maximum levels seen within the subsurface soil. The concentrations of the metal exceedances in DF-SB-11 are listed in the table below.

Metal Compound	Concentration in Subsurface Soil at DF-SB-11 (mg/kg)	NYSDEC Unrestricted Use SCO (mg/kg)
Arsenic	20.5	13
Barium	1,730	350
Cadmium	5.7	2.5
Chromium	2,090	30

Metal Compound	Concentration in Subsurface Soil at DF-SB-11 (mg/kg)	NYSDEC Unrestricted Use SCO (mg/kg)
Copper	219	50
Lead	84,200	63
Nickel	442	30
Zinc	10,500	109

Unlike surface soil, four soil borings located immediately adjacent to the main building, DF-SB-06, DF-SB-10, DF-SB-11, and DF-SB-13 has samples all collected from 4 to 5 feet bgs with concentrations of metals that exceeded Restricted Use SCOs. Subsurface soil was also analyzed for TCLP metals. There were detections for TCLP metals (arsenic, barium, cadmium, chromium, lead, mercury, and selenium) but there were no exceedances of the EPA Regulatory Levels. No exceedances of EPA Regulatory Levels for TCLP Metals indicate that metals are not leaching. Exceedances of metals in surface soil and presented in **Figure 4-2**.

- *Groundwater:* All 22 groundwater wells sampled were analyzed for VOCs, SVOCs, and TAL metals. No SVOCs were detected in groundwater samples. VOCs, cis-1,2-DCE, trans-1,2-DCE, TCE, and VC were detected at concentrations exceeding AWQS at 6 well locations (DF-MW-02, DF-MW-08, DF-MW-10, DF-TWP-14, DF-TWP-15 and DF-TWP-16). Cis-1,2-DCE was observed from 26 µg/L to 340 µg/L above the AWQS for 5 µg/L. Trans-1,2-DCE was observed from 8.1 µg/L to 17 µg/L above the AWQS for 5 µg/L. TCE was observed from 5.8 µg/L to 34 µg/L above the AWQS for 5 µg/L. VC was observed from 2.4 µg/L to 33 µg/L above the AWQS of 2 µg/L. The VOC exceedances are mainly in the vicinity of the wooden foundation on the eastern portion of the subject property directly downgradient of the loading dock area, with the exception of MW-02. It is common to see any contamination in an area where utilities are present to follow the utility bedding paths. MW-02 is located at the end of a pipe chase that is connected to the eastern portion of the subject property (see GPR utility mark out figure included in **Appendix A**). It is likely that VOC impacted groundwater followed the utility path to MW-02

Section 5

Conclusions and Recommendations

CDM Smith's conclusions are based on analytical results, historic information, and visual observations summarized in Section 5.1.

5.1 Conclusions

Based on the data generated during the Phase II ESA, CDM Smith concludes that contamination detected at the subject property is fairly wide spread in the surface soil and more concentrated near the main building in the subsurface soil. Contamination in the surface and subsurface soil mainly consists of metals.

Groundwater contamination consists of both VOCs and metals. However, the metal exceedance levels seen are for iron, manganese, selenium, and sodium which are not typically associated with adverse health effects but rather adverse effects to supply well and conveyance infrastructure. As mentioned, it is likely the levels seen are associated with subject property background concentrations.

VOC exceedances in groundwater were concentrated on the eastern portion of the subject property. This area is located downgradient from an area previously identified as having VOC impacted soil and is likely to have been the source area. Based on these groundwater concentrations, the contamination is likely from random discharge of wash or rinse waters to the ground surface and not the results of any major TCE/PCE release.

The onsite buildings were determined to be unsuitable for internal access, therefore, no sampling was conducting within the buildings. Due to the subject property's history, there is a possibility for asbestos containing materials (ACMs). During the future demolition or rehabilitation of the onsite buildings, proper identification and removal of any ACMs should be performed. It is unlikely that contamination exist below the main building since this building has a basement and below that is a one-million-gallon water storage tank.

5.2 Recommendations

Based on the results of the Phase II Site Investigation activities and an evaluation of subject property information based on previous environmental investigations, the following recommendations are made:

- VOC-impacted groundwater may be easily managed at these relatively low levels via natural attenuation if the proper site conditions exist and no significant source was identified. TCE, cis-1,2-DCE, trans-1,2-DCE, and VC are all present in groundwater samples indicating that PCE is breaking down. A sample for Dehalococcoides, the dechlorinating bacteria, in addition to, their catalyzing enzymes BAV1 vinyl chloride reductase (BVC), tceA reductase (tceA), and vinyl chloride reductase (VCR) are recommended to confirm bacteria are present. The presence of these bacteria would indicate that there is a potential for reductive dechlorination. If the bacteria and specific site conditions are not present other remedial options may be considered.

- It is recommended that the contaminated subsurface soil adjacent to the main building is excavated and disposed of off-site at an appropriate state or federally regulated landfill. At DF-SB-11 the lead concentration exceeds the Industrial Use SCO of 3,900 mg/kg by more than 20 times at 84,200 mg/kg at depth of 4 to 5 feet bgs. This area should be sampled for TCLP metals again to confirm soil is not hazardous and to determine the proper handling and disposal of the material. Additional subsurface soil samples should be taken to delineate the extent of subsurface contamination.

- Surface soil (0-6 inches) throughout the subject property exhibited metal contamination at levels exceeding Unrestricted Use SCOs but below Residential Use SCOs. Depending on future site use, these levels are manageable at the residential level. However, it is recommended that continuous subsurface soil sampling is performed at 1-foot intervals down to approximately 4-feetto determine if contamination exists beneath surface soil. Subsurface soil samples were collected from 1 foot discrete intervals at the water table or the 1-foot interval where the highest PID reading was observed at each sample location. Metal exceedances were observed in subsurface soil; however, it is unknown if exceedances exist between the discrete sample depth and surface soil. It would be recommended that either a surface scrape be conducted in some areas removing 6 to 12 inches if no further contamination exists beneath the surface soil or a cap be placed over these areas to reduce exposure to the public. Capping of surface soil would require periodic cap inspections, development of an operations and maintenance plan and placement of deed restriction or environmental easement on the subject property. If contamination does exist further below surface soil, a deeper excavation should be considered and backfill with clean fill.

- A comprehensive inventory of all contents of the on-site structures should be performed prior to removal. Development of a recycling/waste disposal recycling plan can assist with sustainable disposal of discarded and abandoned materials. All waste removal should be conducted in accordance with state and federal regulations and guidance documents.

In general, the contamination detected at the subject property appears to be manageable so long as direct contact is prevented. Remediation by subsurface soil removal and removal or isolation by capping of surface soils of areas where concentrations are above applicable standards would be recommended depending on future use. Based on the Phase II ESA sampling results, soil removal would be targeted to areas where subsurface contamination was identified such as the areas identified adjacent to the main building. Groundwater impacted by VOCs addressed using other remedial methods such as bioaugmentation to promote biological, chemical, and/or biochemical processes that result in the transformation of contaminants, if natural attenuation is not viable.

In the absence of excavation, engineering controls should be implemented. These controls would require (1) the installation of pavement or topsoil/vegetative cover or installation and maintenance of a perimeter fence; and (2) that any construction involving the disturbance of soils, fill materials, or demolition of uncharacterized structures located within the subject property (including non-emergency excavation, which may be part of utility repair or maintenance, or construction) should not be performed without the involvement of a professional engineer, and must be conducted in accordance with local state and federal rules and regulations and provide adequate engineering controls and worker protection. In the absence of remediation, the values of adjacent and surrounding properties may be (and currently be) negatively impacted. The loss of property value may represent some risk to public welfare, yet this risk may not be considered significant risk.

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Section 6

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Tables

Table 1-1
Sampling Scope and Rationale Summary Table
Former Duofold Corporation
Ilion, New York

Field Event	Site Conditions	Investigation Objective	Media	Proposed Scope	Sample Method	Number of Locations	Number of Samples	Surface and Subsurface Soil						Groundwater				Air
								TCL VOCs	TCL SVOCs	PCBs	Pesticides	TAL Metals	TCLP Metals	TCL VOCs	TCL SVOCs	TAL Total Metals	TAL Dissolved Metals	VOCs
1	Former manufacturing facility, approximately 10.7-acres. Subsurface features unknown. Twelve existing monitoring wells installed to depths of 14 to 16 feet bgs. Elevated CVOCs detected in soil and groundwater onsite during prior investigations.	Identify subsurface anomolies, preferential pathways, potential sources, subsurface utilities, etc. in advance of intrusive work.	Surface	Surface Geophysical Survey.	GPR	No samples will be collected during GPR Survey												
		Confirm viability of existing monitoring wells for sampling.	Groundwater	Inspect 12 existing monitoring wells, including noting ovservations regarding surface construction, riser, depth to water, depth to product (if any), and depth to bottom.	Interface Probe	12	No samples will be collected during well inspection.											
		Identify potential source/release areas related to VOC impacts at the site. Aid in placement of DPT soil borings and evaluation of the potential for vapor intrusion.	Soil Gas	Sorbent tubes will be deployed (to ~3 ft bgs) with a hammer drill in a 100-foot grid pattern to determine VOC concentration gradients across the site. Tubes will be retrieved 14 days following deployment.	Sorbent Tubes	137	137											137
		Collect coordinate data on each passive soil gas sample location for use in mapping.	Surface	Collect GPS data for each passive soil gas location	GPS	137	No samples will be collected during GPS survey.											
2	Prior use of the facility includes: clothing manufacturing, computer manufacturing, naval shell manufacturing, adding machine and typewriter manufacturing, wood and veneer manufacturing. Existing above ground features include: 30,000-gallon No. 6 fuel oil above ground storage tank, main building with three segments, powerhouse building, silo, smoke stack, metal building, maintenance garage, former spray booth foundation, and wood and concrete foundation. Elevated VOCs, SVOCs, and metals detected in soil onsite during prior investigations.	Determine impacts to soil due to former site operations.	Subsurface Soil	Soil borings will be advanced using 5-foot macrocore samplers at up to 16 locations (to be refined based on the geophysical survey and passive soil gas survey results) via DPT to 15 feet bgs or the groundwater table, whichever is first. Continuous 5-foot soil cores will be collected at each location for soil logging and headspace screening. Samples will be collected from each boring with the sample exhibiting the highest PID reading submitted for laboratory analysis. If no visual, olfactory, or headspace values are identified in a boring, samples will be submitted from the interval above the water table for laboratory analysis. Surface samples for metals is covered below and will be the 0-6 inches at each location for TAL metals only. In addition, 4 borings will be advanced to 2 feet bgs at or as close as possible to MW-09, SB-12 (SF), SB-23, and SB-24. These are labeled as SSB on the Figure 2. Samples will be collected and analyzed for TCLP Metals analysis only.	DPT	16	16	16	16	16		16	16					
					DPT (advanced only to 2 feet bgs)	4	4						4					
		Evaluate lead concentrations at locations previously sampled that contain total lead greater than 20x the TCLP limit of 5 mg/L (i.e. total lead greater than 100 ppm)	Surface Soil	Collect a surface soil sample in 0-6 inches in unpaved areas during the 16 Geoprobe installations and submit for metals analysis. It is estimated that about 10 of the soil borings will be in unpaved areas and all will be analyzed for TAL Metals, TCLP Metals, and Pesticides.	hand	16	10				10	10	10					
		Install monitoring points to determine impacts to groundwater due to former site operations.	Groundwater	Install five 1-inch temporary monitoring wells into geoprobe locations previously advanced. At least one well will be installed within the wood and concrete foundation area, one well will be installed in parking lot area near 2014 soil boring SB-29, and one well will be installed at the upgradient end of the site near 2014 soil boring SB-25. Other two monitoring well locations will be determined based on the passive soil gas survey and soil boring screening. Depth/length of screen to be determined based on subsurface conditions identified during drilling; estimated at 5 feet of screen and 10 feet of riser.	DPT	5	No samples to be collected during installation of monitoring wells.											
				Develop newly installed wells by surge and purge.	Surge and Purge	5	No samples to be collected during well development.											
		Collect coordinate data on each soil boring and monitoring well location for use in mapping.	Surface	Collect GPS data for each soil boring and monitoring well location.	GPS	17	No samples will be collected during GPS survey.											

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Sampling Scope and Rationale Summary Table
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Field Event	Site Conditions	Investigation Objective	Media	Proposed Scope	Sample Method	Number of Locations	Number of Samples	Surface and Subsurface Soil						Groundwater				Air
								TCL VOCs	TCL SVOCs	PCBs	Pesticides	TAL Metals	TCLP Metals	TCL VOCs	TCL SVOCs	TAL Total Metals	TAL Dissolved Metals	VOCs
3	Existing network of 12 monitoring wells onsite from prior investigation. Groundwater flow toward the north-northeast. Depth to water approximately 6 to 8 feet bgs. Elevated VOCs, SVOCs, and metals detected in groundwater onsite during prior investigation.	Understand groundwater flow direction.	Groundwater	Conduct synoptic round of groundwater gauging at all existing permanent and newly installed temporary monitoring wells.	Interface Probe	17	No samples will be collected during gauging.											
		Determine impacts to groundwater due to former site operations.	Groundwater	Collect one round of low flow groundwater samples. Metals will be collected for both total and dissolved (field filtered) analysis.	Low Flow	17	17							17	17	17	17	
								Surface and Subsurface Soil						Groundwater				Air
								TCL VOCs	TCL SVOCs	PCBs	Pesticides	TAL Metals	TCLP Metals	TCL VOCs	TCL SVOCs	TAL Total Metals	TAL Dissolved Metals	VOCs
								16	16	16	10	26	26	17	17	17	17	137

The information above represents the proposed field events for the Phase II Environmental Site Assessment for the Former Duofold Corporation subject property. All field events have been completed as of November 2016.

Notes:

TCL - Target Compound List
TAL - Target Analyte List
TCLP - toxicity characteristic leaching procedure
CVOC - chlorinated volatile organic compounds
bgs - below ground surface
VOCs - volatile organic compounds
SVOCs - semi-volatile organic compounds
ft - feet
GPR - ground penetrating radar
DPT - direct push technology
GPS - global positioning system
PCBs - polychlorinated biphenyls
mg/L - milligrams per liter
ppm - parts per million
No. - number

Table 2-1
Sample Parameters
Former Duofold Corporation
Ilion, New York

Location	Sample ID	Collection Date-Time	Depth Interval (feet)	PID Response (ppm)	QA/QC	Analyses
Subsurface Soil Samples						
DF-SB-01	DF-SB-01-A	11/8/2016 8:20	4 - 5	Non-Detect		VOCs, %Moisture, SVOCs, PCBs, TCLP Metals and Metals
DF-SB-02	DF-SB-02-A	11/8/2016 8:45	4 - 5	Non-Detect		
DF-SB-03	DF-SB-03-A	11/8/2016 9:10	4 - 5	Non-Detect		
DF-SB-04	DF-SB-04-A	11/8/2016 10:00	3 - 4	Non-Detect		
DF-SB-05	DF-SB-05-A	11/8/2016 9:35	5 - 6	Non-Detect		
DF-SB-06	DF-SB-06-A	11/8/2016 10:30	4 - 5	Non-Detect		
DF-SB-07	DF-SB-07-A	11/8/2016 10:45	7 - 8	Non-Detect		
DF-SB-08	DF-SB-08-A	11/9/2016 9:25	2 - 3	Non-Detect		
DF-SB-09	DF-SB-09-A	11/9/2016 9:40	5 - 6	Non-Detect		
DF-SB-10	DF-SB-10-A	11/9/2016 8:55	5 - 6	Non-Detect	Field Duplicate	
DF-SB-11	DF-SB-11-A	11/8/2016 12:15	4 - 5	834		
DF-SB-12	DF-SB-12-A	11/8/2016 11:55	6 - 7	65.3		
DF-SB-13	DF-SB-13-A	11/8/2016 11:20	4 - 5	Non-Detect		
DF-SB-14	DF-SB-14-A	11/8/2016 13:35	6 - 7	Non-Detect		
DF-SB-15	DF-SB-15-A	11/8/2016 13:10	4 - 5	Non-Detect		
DF-SB-16	DF-SB-16-A	11/8/2016 14:25	5 - 6	Non-Detect		
DF-SB-17	DF-SB-17-A	11/8/2016 13:50	4 - 5	Non-Detect	Field Duplicate	
DF-SB-18	DF-SB-18-A	11/9/2016 10:50	5 - 6	Non-Detect		
DF-SB-19	DF-SB-19-A	11/9/2016 10:15	4 - 5	Non-Detect		
DF-SB-20	DF-SB-20-A	11/9/2016 10:30	4- 5	Non-Detect		

Table 2-1
Sample Parameters
Former Duofold Corporation
Ilion, New York

Location	Sample ID	Collection Date-Time	Depth Interval (feet)	PID Response (ppm)	QA/QC	Analyses
DF-SSB-1	DF-SSB-1-A	11/8/2016 10:15	0 - 2			VOCs, %Moisture, SVOCs, PCBs, TCLP Metals and Metals
DF-SSB-2	DF-SSB-2-A	11/8/2016 9:20	0 - 2			
DF-SSB-3	DF-SSB-3-A	11/9/2016 13:30	0 - 2			
DF-SSB-4	DF-SSB-4-A	11/8/2016 14:45	0 - 2			
Surface Soil Samples						
DF-SS-01	DF-SS-01-A	10/10/2016 10:20	0 - 0.5	Non-Detect		Metals, Pesticides, TCLP Metals
DF-SS-02	DF-SS-02-A	10/10/2016 10:10	0 - 0.5	Non-Detect		
DF-SS-03	DF-SS-03-A	10/10/2016 10:00	0 - 0.5	Non-Detect		
DF-SS-04	DF-SS-04-A	10/10/2016 11:10	0 - 0.5	Non-Detect	Field Duplicate	
DF-SS-05	DF-SS-05-A	10/10/2016 12:00	0 - 0.5	Non-Detect		
DF-SS-06	DF-SS-06-A	10/10/2016 11:35	0 - 0.5	Non-Detect		
DF-SS-07	DF-SS-07-A	10/10/2016 12:40	0 - 0.5	Non-Detect	Field Duplicate	
DF-SS-08	DF-SS-08-A	10/10/2016 12:30	0 - 0.5	Non-Detect		
DF-SS-09	DF-SS-09-A	10/10/2016 12:20	0 - 0.5	Non-Detect		
DF-SS-10	DF-SS-10-A	10/19/2016 10:00	0 - 0.5	Non-Detect		
Groundwater Samples						
DF-MW-01	DF-MW-01-1	11/7/16 13:40	30 - 35	No Reading Taken		VOCs, SVOCs, and Metals
	DF-MW-01-1-F					
DF-MW-02	DF-MW-02-1	11/7/16 14:55	30 - 35			
	DF-MW-02-1-F					
DF-MW-03	DF-MW-03-1	11/8/16 9:00	5 - 10			
	DF-MW-03-1-F					

Table 2-1
Sample Parameters
Former Duofold Corporation
Ilion, New York

Location	Sample ID	Collection Date-Time	Depth Interval (feet)	PID Response (ppm)	QA/QC	Analyses
DF-MW-04	DF-MW-04-1	11/8/16 10:35	5 - 10	No Reading Taken		VOCs, SVOCs, and Metals
	DF-MW-04-1-F					
DF-MW-05	DF-MW-05-1	11/8/16 11:55	8 - 13		Field Duplicate	
	DF-MW-05-1-F				Field Duplicate	
DF-MW-06	DF-MW-06-1	11/8/16 13:40	5 - 10			
	DF-MW-06-1-F					
DF-MW-07	DF-MW-07-1	11/9/16 12:15	5 - 10			
	DF-MW-07-1-F					
DF-MW-08	DF-MW-08-1	11/7/16 14:55	15 - 20			
	DF-MW-08-1-F					
DF-MW-09	DF-MW-09-1	11/10/16 10:10	5 - 15			
	DF-MW-09-1-F					
DF-MW-10	DF-MW-10-1	11/9/16 13:40	4 - 14			
	DF-MW-10-1-F					
DF-MW-11	DF-MW-11-1	11/9/16 9:00	4 - 14			
	DF-MW-11-1-F					
DF-MW-12	DF-MW-12-1	11/9/16 10:45	3 - 13			
	DF-MW-12-1-F					
DF-TWP-02	DF-TWP-02-1	11/10/16 8:40	3 - 13			
	DF-TWP-02-1-F					
DF-TWP-03	DF-TWP-03-1	11/10/16 10:05	3 - 13		Field Duplicate	
	DF-TWP-03-1-F				Field Duplicate	
DF-TWP-07	DF-TWP-07-1	11/10/16 11:25	5 - 15			
	DF-TWP-07-1-F					

Table 2-1
Sample Parameters
Former Duofold Corporation
Ilion, New York

Location	Sample ID	Collection Date-Time	Depth Interval (feet)	PID Response (ppm)	QA/QC	Analyses
DF-TWP-09	DF-TWP-09-1	11/10/16 12:10	3 - 13	No Reading Taken		VOCs, SVOCs, and Metals
	DF-TWP-09-1-F					
DF-TWP-12	DF-TWP-12-1	11/11/16 10:15	4 - 14			
	DF-TWP-12-1-F					
DF-TWP-14	DF-TWP-14-1	11/11/16 9:00	4 - 11			
	DF-TWP-14-1-F					
DF-TWP-15	DF-TWP-15-1	11/11/16 9:45	4 - 14			
	DF-TWP-15-1-F					
DF-TWP-16	DF-TWP-16-1	11/11/16 8:45	5 - 11			
	DF-TWP-16-1-F					
DF-TWP-18	DF-TWP-18-1	11/10/16 13:10	4 - 14			
	DF-TWP-18-1-F					
DF-TWP-19	DF-TWP-19-1	11/10/16 12:10	4 - 14			
	DF-TWP-19-1-F					

Acronyms
PID - photoionization detector
ID - identification
QA/QC - quality assurance/quality control
ppm - parts per million
VOCs - volatile organic compounds
SVOCs - semi-volatile organic compounds
PCBs - polychlorinated biphenyls
TCLP - toxicity characteristic leaching procedure

Table 2-2
Groundwater Water Quality Parameters
Former Duofold Corporation
Ilion, New York

Location ID	MW-01	MW-02	MW-03	MW-04	MW-05	MW-06	MW-07	MW-08	MW-09	MW-10	MW-11	MW-12
Sample Date	11/7/2016	11/7/2016	11/8/22016	11/8/2016	11/8/2016	11/8/2016	11/9/2016	11/10/2016	11/10/2016	11/9/2016	11/9/2016	11/9/2016
Sample ID	DF-MW-01-1	DF-MW-02-1	DF-MW-03-1	DF-MW-04-1	DF-MW-05-1	DF-MW-06-1	DF-MW-07-1	DF-MW-08-1	DF-MW-09-1	DF-MW-10-1	DF-MW-11-1	DF-MW-12-1
Matrix	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG
Sample Type	N	N	N	N	N	N	N	N	N	N	N	N
Parent Sample Code												
CLP #	BD4Q3	BD4Q4	BD4Q5	BD4Q6	BD4Q7	BD4Q8	BD4Q9	BD4R0	BD4R1	BD4R2	BD4R3	BD4R4
Parameter	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
pH	6.97	6.74	6.62	7.07	6.78	7.11	7.08	7.38	6.58	7.12	7.14	7.27
Specific Conductivity (mS/cm	0.866	0.86	1.14	0.868	0.73	0.914	0.958	0.749	1.13	0.818	0.971	0.874
Dissolved Oxygen (mg/L)	0.01	0.01	0.01	0.01	0.82	1.28	1.26	0.01	0.01	0.01	0.01	0.67
Tempature (°C)	12.62	15.27	11.02	12.28	14.6	15.92	12.90	10.98	11.19	12.68	13.76	13.63
Redox Potential (mV)	115	10	-41	118	152	147	254	-91	173	184	255	248
Turbidity (NTUs)	17.4	30.3	152	20.9	24.9	50.2	31.4	21.8	0.1	2.5	21.8	10.4

Notes:

°C - degrees Celsius
CLP - Contract Laboratory Program
ID - identification
mg/L - milligram per liter
mS/cm^3 - millisiemens per cubic centimeter

mV - millivolts
N - normal field sample
NTUs - nephelometric turbidity units
WG - groundwater

Table 2-2
Groundwater Water Quality Parameters
Former Duofold Corporation
Ilion, New York

Location ID	TWP-02	TWP-03	TWP-07	TWP-09	TWP-12	TWP-14	TWP-15	TWP-16	TWP-18	TWP-19
Sample Date	11/10/2016	11/10/2016	11/10/2016	11/10/2016	11/11/2016	11/11/2016	11/11/2016	11/10/2016	11/10/2016	11/10/2016
Sample ID	DF-TWP-02-1	DF-TWP-03-1	DF-TWP-07-1	DF-TWP-09-1	DF-TWP-12-1	DF-TWP-14-1	DF-TWP-15-1	DF-TWP-16-1	DF-TWP-18-1	DF-TWP-19-1
Matrix	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG
Sample Type	N	N	N	N	N	N	N	N	N	N
Parent Sample Code										
CLP #	BD4R5	BD4R6	BD4R7	BD4R8	BD4R9	BDQN1	BDQN2	BDQN3	BDQN4	BDQN5
Parameter	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
pH	6.74	7.15	6.98	6.86	7.15	6.85	7.31	7.06	7.21	7.19
Specific Conductivity (mS/cm	0.686	0.686	0.757	0.753	0.686	0.633	0.671	0.731	0.626	0.907
Dissolved Oxygen (mg/L)	0.01	0.01	2.34	0.01	0.01	2.44	8.38	0.01	0.01	0.01
Tempature (°C)	8.61	11.37	12.12	14.39	10.73	12.01	12.92	15.49	17.59	16.93
Redox Potential (mV)	-59	-33	120	33	82	96	-67	-47	-108	-54
Turbidity (NTUs)	11.7	42.3	12.2	160	21.2	7.1	46.2	0.1	0.1	0.1

Notes:

ºC - degrees Celsius

CLP - Contract Laboratory Pro

ID - identification

mg/L - milligram per liter

mS/cm^3 - millisiemens per cub

Table 3-1A
Soil Sample Detections - VOCs
Former Duofold Corporation
Ilion, New York

				Sample ID	DF-SB-01-A		DF-SB-02-A		DF-SB-03-A		DF-SB-04-A		DF-SB-05-A		DF-SB-06-A		DF-SB-07-A		DF-SB-08-A		DF-SB-09-A		DF-SB-10-A		SB-900-A	
				Location ID	DF-SB-01		DF-SB-02		DF-SB-03		DF-SB-04		DF-SB-05		DF-SB-06		DF-SB-07		DF-SB-08		DF-SB-09		DF-SB-10		DF-SB-10	
				Sample Date	11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/9/2016		11/9/2016		11/9/2016		11/9/2016	
				Matrix	SO		SO		SO		SO		SO		SO		SO		SO		SO		SO		SO	
				Sample Depth	4 - 5 feet		4 - 5 feet		4 - 5 feet		3 - 4 feet		5 - 6 feet		4 - 5 feet		7 - 8 feet		2 - 3 feet		5 - 6 feet		5 - 6 feet		5 - 6 feet	
				Sample Type	N		N		N		N		N		N		N		N		N		N		FD	
				Parent Sample Code																					DF-SB-10-A	
				CLP #	BD4L5		BD4L6		BD4L7		BD4L8		BD4L9		BD4M0		BD4M1		BD4M2		BD4M3		BD4M4		BD4P9	
CAS No.	**Compound**	**EPA RSLs**	**NYSDEC Unrestricted Use**	**Unit**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**
71-55-6	1,1,1-Trichloroethane	810000	680	µg/kg	6.4	U	5.6	UJ	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6.7	UJ
79-34-5	1,1,2,2-Tetrachloroethane	600	NL	µg/kg	6.4	U	5.6	UJ	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6.7	UJ
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethan	4000000	NL	µg/kg	6.4	U	5.6	U	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6	U
79-00-5	1,1,2-Trichloroethane	150	NL	µg/kg	6.4	U	5.6	UJ	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6.7	UJ
75-34-3	1,1-Dichloroethane	3600	270	µg/kg	6.4	U	5.6	U	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6	U
75-35-4	1,1-Dichloroethene	23000	330	µg/kg	6.4	U	5.6	U	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6	U
87-61-6	1,2,3-Trichlorobenzene	6300	NL	µg/kg	6.4	UJ	5.6	R	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6.7	UJ
120-82-1	1,2,4-Trichlorobenzene	5800	NL	µg/kg	6.4	UJ	5.6	R	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6.7	UJ
96-12-8	1,2-Dibromo-3-chloropropane	5.3	NL	µg/kg	6.4	UJ	5.6	R	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6.7	UJ
106-93-4	1,2-Dibromoethane	36	NL	µg/kg	6.4	U	5.6	UJ	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6.7	UJ
95-50-1	1,2-Dichlorobenzene	180000	1100	µg/kg	6.4	UJ	5.6	R	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6.7	UJ
107-06-2	1,2-Dichloroethane	460	20	µg/kg	6.4	U	5.6	U	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6	U
78-87-5	1,2-Dichloropropane	1000	NL	µg/kg	6.4	U	5.6	UJ	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6.7	UJ
541-73-1	1,3-Dichlorobenzene	NL	2400	µg/kg	6.4	UJ	5.6	R	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6.7	UJ
106-46-7	1,4-Dichlorobenzene	2600	1800	µg/kg	6.4	UJ	5.6	R	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6.7	UJ
78-93-3	2-Butanone (MEK)	2700000	**NL**	µg/kg	13	U	11	U	9.6	U	9.4	U	11	U	9.2	U	14	U	13	U	**7.9**	J	**37**		**47**	J
591-78-6	2-Hexanone	20000	NL	µg/kg	13	U	11	UJ	9.6	U	9.4	U	11	U	9.2	U	14	U	13	U	12	U	15	U	13	UJ
108-10-1	4-Methyl-2-Pentanone (MIBK)	3300000	NL	µg/kg	13	U	11	UJ	9.6	U	9.4	U	11	U	9.2	U	14	U	13	U	12	U	15	U	13	UJ
67-64-1	Acetone	6100000	**50**	µg/kg	13	U	11	U	9.6	U	9.4	U	11	U	9.2	U	14	U	13	U	**30**		**130**		**170**	J
71-43-2	Benzene	1200	**60**	µg/kg	6.4	U	5.6	UJ	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6.7	UJ
74-97-5	Bromochloromethane	15000	NL	µg/kg	6.4	U	5.6	U	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6	U
75-27-4	Bromodichloromethane	290	NL	µg/kg	6.4	U	5.6	UJ	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6.7	UJ
75-25-2	Bromoform	19000	NL	µg/kg	6.4	UJ	5.6	R	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6.7	U
74-83-9	Bromomethane	680	NL	µg/kg	6.4	U	5.6	U	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6	U
75-15-0	Carbon Disulfide	77000	**NL**	µg/kg	6.4	U	5.6	U	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	**2.5**	J
56-23-5	Carbon Tetrachloride	650	760	µg/kg	6.4	U	5.6	UJ	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6.7	UJ
108-90-7	Chlorobenzene	28000	1100	µg/kg	6.4	U	5.6	UJ	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6.7	UJ
75-00-3	Chloroethane	1400000	NL	µg/kg	6.4	U	5.6	U	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6	U
67-66-3	Chloroform	320	370	µg/kg	6.4	U	5.6	U	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6	U
74-87-3	Chloromethane	11000	NL	µg/kg	6.4	U	5.6	U	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6	U
156-59-2	cis-1,2-Dichloroethene	16000	**250**	µg/kg	6.4	U	5.6	U	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6	U
10061-01-5	cis-1,3-Dichloropropene	NL	NL	µg/kg	6.4	U	5.6	UJ	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6.7	UJ
110-82-7	Cyclohexane	650000	NL	µg/kg	6.4	U	5.6	UJ	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6.7	UJ
124-48-1	Dibromochloromethane	8300	NL	µg/kg	6.4	U	5.6	UJ	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6.7	UJ
75-71-8	Dichlorodifluoromethane	8700	NL	µg/kg	6.4	U	5.6	U	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6	U
100-41-4	Ethylbenzene	5800	1000	µg/kg	6.4	U	5.6	UJ	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6.7	UJ
98-82-8	Isopropylbenzene	190000	NL	µg/kg	6.4	U	5.6	UJ	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6.7	UJ
179601-23-1	M,P-Xylene	58000	260	µg/kg	6.4	U	5.6	UJ	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6.7	U

Table 3-1A
Soil Sample Detections - VOCs
Former Duofold Corporation
Ilion, New York

				Sample ID	DF-SB-01-A		DF-SB-02-A		DF-SB-03-A		DF-SB-04-A		DF-SB-05-A		DF-SB-06-A		DF-SB-07-A		DF-SB-08-A		DF-SB-09-A		DF-SB-10-A		SB-900-A	
				Location ID	DF-SB-01		DF-SB-02		DF-SB-03		DF-SB-04		DF-SB-05		DF-SB-06		DF-SB-07		DF-SB-08		DF-SB-09		DF-SB-10		DF-SB-10	
				Sample Date	11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/9/2016		11/9/2016		11/9/2016		11/9/2016	
				Matrix	SO		SO		SO		SO		SO		SO		SO		SO		SO		SO		SO	
				Sample Depth	4 - 5 feet		4 - 5 feet		4 - 5 feet		3 - 4 feet		5 - 6 feet		4 - 5 feet		7 - 8 feet		2 - 3 feet		5 - 6 feet		5 - 6 feet		5 - 6 feet	
				Sample Type	N		N		N		N		N		N		N		N		N		N		FD	
				Parent Sample Code																					DF-SB-10-A	
				CLP #	BD4L5		BD4L6		BD4L7		BD4L8		BD4L9		BD4M0		BD4M1		BD4M2		BD4M3		BD4M4		BD4P9	
CAS No.	**Compound**	**EPA RSLs**	**NYSDEC Unrestricted Use**	**Unit**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**
79-20-9	Methyl Acetate	7800000	NL	µg/kg	6.4	U	5.6	U	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6	U
1634-04-4	Methyl tert-butyl ether	47000	930	µg/kg	6.4	U	5.6	U	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6	U
108-87-2	Methylcylohexane	NL	NL	µg/kg	6.4	U	**2.3**	J+	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6.7	UJ
75-09-2	Methylene Chloride	35000	**50**	µg/kg	**6.5**		**8.8**		4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	**8.8**		**8.2**		**11**		6	U
95-47-6	O-Xylene	65000	260	µg/kg	6.4	U	5.6	UJ	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6.7	UJ
100-42-5	Styrene	600000	NL	µg/kg	6.4	U	5.6	UJ	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6.7	UJ
127-18-4	Tetrachloroethene	8100	**1300**	µg/kg	6.4	U	**7.8**	J+	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6.7	UJ
108-88-3	Toluene	490000	**700**	µg/kg	6.4	U	5.6	UJ	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6.7	UJ
156-60-5	Trans-1,2-Dichloroethene	160000	**190**	µg/kg	6.4	U	5.6	U	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6	U
10061-02-6	Trans-1,3-Dichloropropene	NL	NL	µg/kg	6.4	U	5.6	UJ	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6.7	UJ
79-01-6	Trichloroethene	410	**470**	µg/kg	6.4	U	5.6	UJ	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6.7	UJ
75-69-4	Trichlorofluoromethane	2300000	NL	µg/kg	6.4	U	5.6	U	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6	U
75-01-4	Vinyl Chloride	59	**20**	µg/kg	6.4	U	5.6	U	4.8	U	4.7	U	5.6	U	4.6	U	6.9	U	6.3	U	6.2	U	7.3	U	6	U

🟧 > NYSDEC Unrestricted

Bolded > detection

Acronyms

µg/kg - microgram by kilograms	
CLP - Contract Laboratory Program	NL - not listed
EPA - Environmental Protection Agency	NYSDEC - New York State Department of Environmental Conservation
FD - field duplicate	Q - qualifier
ID - identification	RSLs - Regional Screening Levels
J - estimated result	SO - soil
J + - biased high estimated result	U - undetected
N - normal	UJ - esitmated undetected

Table 3-1A
Soil Sample Detections - VOCs
Former Duofold Corporation
Ilion, New York

				Sample ID	DF-SB-11-A		DF-SB-12-A		DF-SB-13-A		DF-SB-14-A		DF-SB-15-A		DF-SB-16-A		DF-SB-17-A		SB-900-B		DF-SB-18		DF-SB-19		DF-SB-20-A	
				Location ID	DF-SB-11		DF-SB-12		DF-SB-13-A		DF-SB-14		DF-SB-15-A		DF-SB-16		DF-SB-17		DF-SB-17		DF-SB-18		DF-SB-19		DF-SB-20	
				Sample Date	11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/9/2016		11/9/2016		11/9/2016	
				Matrix	SO		SO		SO		SO		SO		SO		SO		SO		SO		SO		SO	
				Sample Depth	4 - 5 feet		4 - 5 feet		6 - 7 feet		4 - 5 feet		5 - 6 feet		4 - 5 feet		4 - 5 feet		5 - 6 feet		4 - 5 feet		12 - 10 feet		4 - 5 feet	
				Sample Type	N		N		N		N		N		N		N		FD		N		N		N	
				Parent Sample Code															DF-SB-17-A							
				CLP #	BD4M5		BD4M6		BD4M7		BD4M8		BD4M9		BD4N0		BD4N1		BD4Q0		BD4N2		BD4N3		BD4N4	
CAS No.	**Compound**	**EPA RSLs**	**NYSDEC Unrestricted Use**	**Unit**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**
71-55-6	1,1,1-Trichloroethane	810000	680	µg/kg	6.2	UJ	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
79-34-5	1,1,2,2-Tetrachloroethane	600	NL	µg/kg	6.2	R	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethan	4000000	NL	µg/kg	6.2	UJ	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
79-00-5	1,1,2-Trichloroethane	150	NL	µg/kg	6.2	UJ	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
75-34-3	1,1-Dichloroethane	3600	270	µg/kg	6.2	UJ	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
75-35-4	1,1-Dichloroethene	23000	330	µg/kg	6.2	UJ	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
87-61-6	1,2,3-Trichlorobenzene	6300	NL	µg/kg	6.2	UJ	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
120-82-1	1,2,4-Trichlorobenzene	5800	NL	µg/kg	6.2	UJ	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
96-12-8	1,2-Dibromo-3-chloropropane	5.3	NL	µg/kg	6.2	R	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
106-93-4	1,2-Dibromoethane	36	NL	µg/kg	6.2	UJ	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
95-50-1	1,2-Dichlorobenzene	180000	1100	µg/kg	6.2	UJ	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
107-06-2	1,2-Dichloroethane	460	20	µg/kg	6.2	U	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
78-87-5	1,2-Dichloropropane	1000	NL	µg/kg	6.2	UJ	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
541-73-1	1,3-Dichlorobenzene	NL	2400	µg/kg	6.2	UJ	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
106-46-7	1,4-Dichlorobenzene	2600	1800	µg/kg	6.2	UJ	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
78-93-3	2-Butanone (MEK)	2700000	**NL**	µg/kg	12	UJ	**14**	J	9.5	U	12	U	**4.6**	J	**4.8**	J	10	U	12	U	7.3	U	14	U	**8.4**	J
591-78-6	2-Hexanone	20000	NL	µg/kg	12	UJ	15	U	9.5	U	12	U	10	U	12	U	10	U	12	U	7.3	U	14	U	12	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	3300000	NL	µg/kg	12	UJ	15	U	9.5	U	12	U	10	U	12	U	10	U	12	U	7.3	U	14	U	12	U
67-64-1	Acetone	6100000	**50**	µg/kg	**82**	J+	**33**		9.5	U	12	U	**16**		**17**		10	U	12	U	7.3	U	**29**		**33**	
71-43-2	Benzene	1200	**60**	µg/kg	**8.4**	J+	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
74-97-5	Bromochloromethane	15000	NL	µg/kg	6.2	UJ	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
75-27-4	Bromodichloromethane	290	NL	µg/kg	6.2	UJ	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
75-25-2	Bromoform	19000	NL	µg/kg	6.2	U	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
74-83-9	Bromomethane	680	NL	µg/kg	6.2	UJ	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
75-15-0	Carbon Disulfide	77000	**NL**	µg/kg	6.2	UJ	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
56-23-5	Carbon Tetrachloride	650	760	µg/kg	6.2	UJ	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
108-90-7	Chlorobenzene	28000	1100	µg/kg	6.2	UJ	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
75-00-3	Chloroethane	1400000	NL	µg/kg	6.2	UJ	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
67-66-3	Chloroform	320	370	µg/kg	6.2	UJ	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
74-87-3	Chloromethane	11000	NL	µg/kg	6.2	UJ	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
156-59-2	cis-1,2-Dichloroethene	16000	**250**	µg/kg	6.2	UJ	7.4	U	4.8	U	**4.2**	J	**72**		6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
10061-01-5	cis-1,3-Dichloropropene	NL	NL	µg/kg	6.2	UJ	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
110-82-7	Cyclohexane	650000	NL	µg/kg	6.2	UJ	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
124-48-1	Dibromochloromethane	8300	NL	µg/kg	6.2	UJ	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
75-71-8	Dichlorodifluoromethane	8700	NL	µg/kg	6.2	UJ	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
100-41-4	Ethylbenzene	5800	1000	µg/kg	6.2	UJ	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
98-82-8	Isopropylbenzene	190000	NL	µg/kg	6.2	UJ	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
179601-23-1	M,P-Xylene	58000	260	µg/kg	6.2	UJ	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U

Table 3-1A
Soil Sample Detections - VOCs
Former Duofold Corporation
Ilion, New York

				Sample ID	DF-SB-11-A		DF-SB-12-A		DF-SB-13-A		DF-SB-14-A		DF-SB-15-A		DF-SB-16-A		DF-SB-17-A		SB-900-B		DF-SB-18		DF-SB-19		DF-SB-20-A	
				Location ID	DF-SB-11		DF-SB-12		DF-SB-13-A		DF-SB-14		DF-SB-15-A		DF-SB-16		DF-SB-17		DF-SB-17		DF-SB-18		DF-SB-19		DF-SB-20	
				Sample Date	11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/9/2016		11/9/2016		11/9/2016	
				Matrix	SO		SO		SO		SO		SO		SO		SO		SO		SO		SO		SO	
				Sample Depth	4 - 5 feet		4 - 5 feet		6 - 7 feet		4 - 5 feet		5 - 6 feet		4 - 5 feet		4 - 5 feet		5 - 6 feet		4 - 5 feet		12 - 10 feet		4 - 5 feet	
				Sample Type	N		N		N		N		N		N		N		FD		N		N		N	
				Parent Sample Code															DF-SB-17-A							
				CLP #	BD4M5		BD4M6		BD4M7		BD4M8		BD4M9		BD4N0		BD4N1		BD4Q0		BD4N2		BD4N3		BD4N4	
CAS No.	**Compound**	**EPA RSLs**	**NYSDEC Unrestricted Use**	**Unit**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**
79-20-9	Methyl Acetate	7800000	NL	µg/kg	6.2	UJ	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
1634-04-4	Methyl tert-butyl ether	47000	930	µg/kg	6.2	UJ	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
108-87-2	Methylcylohexane	NL	NL	µg/kg	6.2	UJ	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
75-09-2	Methylene Chloride	35000	**50**	µg/kg	6.2	UJ	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
95-47-6	O-Xylene	65000	260	µg/kg	6.2	UJ	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
100-42-5	Styrene	600000	NL	µg/kg	6.2	UJ	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
127-18-4	Tetrachloroethene	8100	**1300**	µg/kg	6.2	UJ	7.4	U	**2.1**	J	5.9	U	5.2	U	6	U	**3**	J	**3**	J	3.7	U	6.8	U	5.9	U
108-88-3	Toluene	490000	**700**	µg/kg	**17**	J+	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
156-60-5	Trans-1,2-Dichloroethene	160000	**190**	µg/kg	6.2	UJ	7.4	U	4.8	U	5.9	U	**1.7**	J	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
10061-02-6	Trans-1,3-Dichloropropene	NL	NL	µg/kg	6.2	UJ	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
79-01-6	Trichloroethene	410	**470**	µg/kg	6.2	UJ	7.4	U	4.8	U	5.9	U	**4.1**	J	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
75-69-4	Trichlorofluoromethane	2300000	NL	µg/kg	6.2	UJ	7.4	U	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U
75-01-4	Vinyl Chloride	59	**20**	µg/kg	**2.4**	J+	**2.6**	J	4.8	U	5.9	U	5.2	U	6	U	5.1	U	5.9	U	3.7	U	6.8	U	5.9	U

🟧 > NYSDEC Unrestricted

Bolded > detection

Acronyms

µg/kg - microgram by kilograms

CLP - Contract Laboratory Program

EPA - Environmental Protection Agency

FD - field duplicate

ID - identification

J - estimated result

J + - biased high estimated result

N - normal

NL - not listed

NYSDEC - New York State Department of Environmental Conservation

Q - qualifier

RSLs - Regional Screening Levels

SO - soil

U - undetected

UJ - esitmated undetected

Table 3-1B
Soil Sample Detections - SVOCs
Former Duofold Corporation
Ilion, New York

				Sample ID	DF-SB-01-A		DF-SB-02-A		DF-SB-03-A		DF-SB-04-A		DF-SB-05-A		DF-SB-06-A		DF-SB-07-A		DF-SB-08-A	
				Location ID	DF-SB-01		DF-SB-02		DF-SB-03		DF-SB-04		DF-SB-05		DF-SB-06		DF-SB-07		DF-SB-08	
				Sample Date	11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/9/2016	
				Matrix	SO		SO		SO		SO		SO		SO		SO		SO	
				Sample Depth	4 - 5 feet		4 - 5 feet		4 - 5 feet		3 - 4 feet		5 - 6 feet		4 - 5 feet		7 - 8 feet		2 - 3 feet	
				Sample Type	N		N		N		N		N		N		N		N	
				Parent Sample Code																
				CLP #	BD4L5		BD4L6		BD4L7		BD4L8		BD4L9		BD4M0		BD4M1		BD4M2	
CAS No.	**Compound**	**EPA RSLs**	**NYSDEC Unrestricted Use**	**Unit**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**
92-52-4	1,1-Biphenyl	4700	**NL**	µg/kg	250	U	200	U	190	U	200	U	210	U	200	U	220	U	210	U
95-94-3	1,2,4,5-Tetrachlorobenzene	2300	NL	µg/kg	250	U	200	U	190	U	200	U	210	U	200	U	220	U	210	U
58-90-2	2,3,4,6-Tetrachlorophenol	190000	NL	µg/kg	250	U	200	U	190	U	200	U	210	U	200	U	220	U	210	U
95-95-4	2,4,5-Trichlorophenol	630000	NL	µg/kg	250	U	200	U	190	U	200	U	210	U	200	U	220	U	210	U
88-06-2	2,4,6-Trichlorophenol	6300	NL	µg/kg	250	U	200	U	190	U	200	U	210	U	200	U	220	U	210	U
120-83-2	2,4-Dichlorophenol	19000	NL	µg/kg	250	U	200	U	190	U	200	U	210	U	200	U	220	U	210	U
105-67-9	2,4-Dimethylphenol	130000	NL	µg/kg	250	U	200	U	190	U	200	U	210	U	200	U	220	U	210	U
51-28-5	2,4-Dinitrophenol	13000	NL	µg/kg	480	U	390	U	370	U	390	U	420	U	380	U	430	U	400	U
121-14-2	2,4-Dinitrotoluene	1700	NL	µg/kg	250	U	200	U	190	U	200	U	210	U	200	U	220	U	210	U
606-20-2	2,6-Dinitrotoluene	360	NL	µg/kg	250	U	200	U	190	U	200	U	210	U	200	U	220	U	210	U
91-58-7	2-Chloronaphthalene	480000	NL	µg/kg	250	U	200	U	190	U	200	U	210	U	200	U	220	U	210	U
95-57-8	2-Chlorophenol	39000	NL	µg/kg	250	U	200	U	190	U	200	U	210	U	200	U	220	U	210	U
91-57-6	2-Methylnaphthalene	24000	**NL**	µg/kg	250	U	**300**		190	U	200	U	210	U	200	U	220	U	**92**	J
95-48-7	2-Methylphenol	320000	330	µg/kg	480	U	390	U	370	U	390	U	420	U	380	U	430	U	400	U
88-74-4	2-Nitroaniline	63000	NL	µg/kg	250	U	200	U	190	U	200	U	210	U	200	U	220	U	210	U
88-75-5	2-Nitrophenol	NL	NL	µg/kg	250	U	200	U	190	U	200	U	210	U	200	U	220	U	210	U
91-94-1	3,3 -Dichlorobenzidine	1200	NL	µg/kg	480	U	390	U	370	U	390	U	420	U	380	U	430	U	400	U
99-09-2	3-Nitroaniline	NL	NL	µg/kg	480	U	390	U	370	U	390	U	420	U	380	U	430	U	400	U
534-52-1	4,6-Dinitro-2-methylphenol	510	NL	µg/kg	480	U	390	U	370	U	390	U	420	U	380	U	430	U	400	U
101-55-3	4-Bromophenyl phenyl ether	NL	NL	µg/kg	250	U	200	U	190	U	200	U	210	U	200	U	220	U	210	U
59-50-7	4-Chloro-3-methylphenol	630000	NL	µg/kg	250	U	200	U	190	U	200	U	210	U	200	U	220	U	210	U
106-47-8	P-Chloroaniline	2700	NL	µg/kg	480	U	390	U	370	U	390	U	420	U	380	U	430	U	400	U
7005-72-3	4-Chlorophenyl phenyl ether	NL	NL	µg/kg	250	U	200	U	190	U	200	U	210	U	200	U	220	U	210	U
106-44-5	4-Methylphenol	630000	330	µg/kg	480	U	390	U	370	U	390	U	420	U	380	U	430	U	400	U
100-02-7	4-Nitrophenol	NL	NL	µg/kg	480	U	390	U	370	U	390	U	420	U	380	U	430	U	400	U
83-32-9	Acenaphthene	360000	**20000**	µg/kg	250	U	200	U	190	U	200	U	210	U	200	U	220	U	210	U
208-96-8	Acenaphthylene	NL	100000	µg/kg	250	U	200	U	190	U	200	U	210	U	200	U	220	U	210	U
98-86-2	Acetophenone	780000	**NL**	µg/kg	480	U	**45**	J	370	U	390	U	420	U	380	U	430	U	400	U
120-12-7	Anthracene	1800000	**100000**	µg/kg	250	U	200	U	190	U	**60**	J	210	U	200	U	220	U	210	U
1912-24-9	Atrazine	2400	NL	µg/kg	480	U	390	U	370	U	390	U	420	U	380	U	430	U	400	U
100-52-7	Benzaldehyde	780000	NL	µg/kg	480	U	390	U	370	U	390	U	420	U	380	U	430	U	400	U
56-55-3	Benzo(a)anthracene	160	**1000**	µg/kg	250	U	**56**	J	190	U	**170**	J	**49**	J	**78**	J	**93**	J	210	U
50-32-8	Benzo(a)pyrene	16	**1000**	µg/kg	250	U	**46**	J	190	U	**140**	J	**50**	J	**62**	J	**82**	J	210	U
205-99-2	Benzo(b)fluoranthene	160	**1000**	µg/kg	250	U	**65**	J	190	U	**190**	J	**73**	J	**77**	J	**130**	J	210	U
191-24-2	Benzo(g,h,i)perylene	NL	**100000**	µg/kg	250	U	200	U	190	U	**81**	J	210	U	200	U	**46**	J	210	U
207-08-9	Benzo(k)fluoranthene	1600	**800**	µg/kg	250	U	200	U	190	U	**69**	J	210	U	200	U	220	U	210	U
111-91-1	Bis(2-Chloroethoxy)methane	19000	NL	µg/kg	250	U	200	U	190	U	200	U	210	U	200	U	220	U	210	U
111-44-4	Bis(2-Chloroethyl) ether	230	NL	µg/kg	480	U	390	U	370	U	390	U	420	U	380	U	430	U	400	U
117-81-7	Bis(2-Ethylhexyl)phthalate	39000	**NL**	µg/kg	250	U	200	U	190	U	200	U	210	U	200	U	220	U	210	U
108-60-1	Benzyl Butyl Phthalate	290000	NL	µg/kg	250	U	200	U	190	U	200	U	210	U	200	U	220	U	210	U

Table 3-1B
Soil Sample Detections - SVOCs
Former Duofold Corporation
Ilion, New York

				Sample ID	DF-SB-01-A		DF-SB-02-A		DF-SB-03-A		DF-SB-04-A		DF-SB-05-A		DF-SB-06-A		DF-SB-07-A		DF-SB-08-A	
				Location ID	DF-SB-01		DF-SB-02		DF-SB-03		DF-SB-04		DF-SB-05		DF-SB-06		DF-SB-07		DF-SB-08	
				Sample Date	11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/9/2016	
				Matrix	SO		SO		SO		SO		SO		SO		SO		SO	
				Sample Depth	4 - 5 feet		4 - 5 feet		4 - 5 feet		3 - 4 feet		5 - 6 feet		4 - 5 feet		7 - 8 feet		2 - 3 feet	
				Sample Type	N		N		N		N		N		N		N		N	
				Parent Sample Code																
				CLP #	BD4L5		BD4L6		BD4L7		BD4L8		BD4L9		BD4M0		BD4M1		BD4M2	
CAS No.	**Compound**	**EPA RSLs**	**NYSDEC Unrestricted Use**	**Unit**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**
105-60-2	Caprolactam	3100000	NL	µg/kg	480	U	390	U	370	U	390	U	420	U	380	U	430	U	400	U
86-74-8	Carbazole	NL	NL	µg/kg	480	U	390	U	370	U	390	U	420	U	380	U	430	U	400	U
53-70-3	Dibenzo(a,h)anthracene	16	330	µg/kg	250	U	200	U	190	U	200	U	210	U	200	U	220	U	210	U
132-64-9	Dibenzofuran	7300	**NL**	µg/kg	250	U	**69**	J	190	U	200	U	210	U	200	U	220	U	210	U
84-66-2	Diethyl phthalate	5100000	NL	µg/kg	250	U	200	U	190	U	200	U	210	U	200	U	220	U	210	U
131-11-3	Dimethyl phthalate	NL	**NL**	µg/kg	**1900**		**980**		**950**		**620**		**1400**		**800**		**1200**		**660**	
84-74-2	Di-n-butylphthalate	630000	NL	µg/kg	250	U	200	U	190	U	200	U	210	U	200	U	220	U	210	U
117-84-0	Di-n-octylphthalate	63000	NL	µg/kg	480	U	390	U	370	U	390	U	420	U	380	U	430	U	400	U
206-44-0	Fluoranthene	240000	**100000**	µg/kg	480	U	**88**	J	370	U	**410**		**150**	J	**160**	J	**190**	J	400	U
86-73-7	Fluorene	240000	**30000**	µg/kg	250	U	200	U	190	U	200	U	210	U	200	U	220	U	210	U
87-68-3	Hexachloro-1,3-butadiene	1200	NL	µg/kg	250	U	200	U	190	U	200	U	210	U	200	U	220	U	210	U
118-74-1	Hexachlorobenzene	210	NL	µg/kg	250	U	200	U	190	U	200	U	210	U	200	U	220	U	210	U
77-47-4	Hexachlorocyclopentadiene	180	NL	µg/kg	480	U	390	U	370	U	390	U	420	U	380	U	430	U	400	U
67-72-1	Hexachloroethane	1800	NL	µg/kg	250	U	200	U	190	U	200	U	210	U	200	U	220	U	210	U
193-39-5	Indeno(1,2,3-cd)pyrene	160	**500**	µg/kg	250	U	200	U	190	U	**79**	J	210	U	200	U	**53**	J	210	U
91-20-3	Naphthalene	3800	**12000**	µg/kg	250	U	**230**		190	U	200	U	210	U	200	U	220	U	**56**	J
98-95-3	Nitrobenzene	5100	NL	µg/kg	250	U	200	U	190	U	200	U	210	U	200	U	220	U	210	U
621-64-7	N-Nitroso-di-n-propylamine	78	NL	µg/kg	250	U	200	U	190	U	200	U	210	U	200	U	220	U	210	U
86-30-6	N-Nitrosodiphenylamine	110000	NL	µg/kg	250	U	200	U	190	U	200	U	210	U	200	U	220	U	210	U
87-86-5	Pentachlorophenol	1000	800	µg/kg	480	U	390	U	370	U	390	U	420	U	380	U	430	U	400	U
85-01-8	Phenanthrene	NL	**100000**	µg/kg	250	U	**130**	J	190	U	**280**		**150**	J	**96**	J	**64**	J	**53**	J
108-95-2	Phenol	1900000	**330**	µg/kg	**200**	J	**120**	J	**110**	J	**69**	J	**170**	J	**120**	J	**130**	J	**170**	J
129-00-0	Pyrene	180000	**100000**	µg/kg	250	U	**83**	J	190	U	**350**		**140**	J	**130**	J	**160**	J	210	U

Bolded > detection

🟨 > NYSDEC Unrestricted

Acronyms

µg/kg - microgram by kilograms

CLP - Contract Laboratory Program

EPA - Environmental Protection Agency

FD - field duplicate

ID - identification

J - estimated result

N - normal

NL - not listed

NYSDEC - New York State Department of Environmental Conservation

Q - qualifier

RSLs - Regional Screening Levels

SO - soil

U - undetected

Table 3-1B
Soil Sample Detections - SVOCs
Former Duofold Corporation
Ilion, New York

				Sample ID	DF-SB-09-A		DF-SB-10-A		SB-900-A		DF-SB-11-A		DF-SB-12-A		DF-SB-13-A		DF-SB-14-A		DF-SB-15-A	
				Location ID	DF-SB-09		DF-SB-10		DF-SB-10		DF-SB-11		DF-SB-12		DF-SB-13		DF-SB-14		DF-SB-15	
				Sample Date	11/9/2016		11/9/2016		11/9/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016	
				Matrix	SO		SO		SO		SO		SO		SO		SO		SO	
				Sample Depth	5 - 6 feet		5 - 6 feet		5 - 6 feet		4 - 5 feet		6 - 7 feet		4 - 5 feet		6 - 7 feet		4 - 5 feet	
				Sample Type	N		N		FD		N		N		N		N		N	
				Parent Sample Code					DF-SB-10-A											
				CLP #	BD4M3		BD4M4		BD4P9		BD4M5		BD4M6		BD4M7		BD4M8		BD4M9	
CAS No.	**Compound**	**EPA RSLs**	**NYSDEC Unrestricted Use**	**Unit**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**
92-52-4	1,1-Biphenyl	4700	**NL**	µg/kg	230	U	250	U	240	U	**370**		260	U	200	U	250	U	220	U
95-94-3	1,2,4,5-Tetrachlorobenzene	2300	NL	µg/kg	230	U	250	U	240	U	250	U	260	U	200	U	250	U	220	U
58-90-2	2,3,4,6-Tetrachlorophenol	190000	NL	µg/kg	230	U	250	U	240	U	250	U	260	U	200	U	250	U	220	U
95-95-4	2,4,5-Trichlorophenol	630000	NL	µg/kg	230	U	250	U	240	U	250	U	260	U	200	U	250	U	220	U
88-06-2	2,4,6-Trichlorophenol	6300	NL	µg/kg	230	U	250	U	240	U	250	U	260	U	200	U	250	U	220	U
120-83-2	2,4-Dichlorophenol	19000	NL	µg/kg	230	U	250	U	240	U	250	U	260	U	200	U	250	U	220	U
105-67-9	2,4-Dimethylphenol	130000	NL	µg/kg	230	U	250	U	240	U	250	U	260	U	200	U	250	U	220	U
51-28-5	2,4-Dinitrophenol	13000	NL	µg/kg	450	U	480	U	470	U	480	U	500	U	400	U	480	U	420	U
121-14-2	2,4-Dinitrotoluene	1700	NL	µg/kg	230	U	250	U	240	U	250	U	260	U	200	U	250	U	220	U
606-20-2	2,6-Dinitrotoluene	360	NL	µg/kg	230	U	250	U	240	U	250	U	260	U	200	U	250	U	220	U
91-58-7	2-Chloronaphthalene	480000	NL	µg/kg	230	U	250	U	240	U	250	U	260	U	200	U	250	U	220	U
95-57-8	2-Chlorophenol	39000	NL	µg/kg	230	U	250	U	240	U	250	U	260	U	200	U	250	U	220	U
91-57-6	2-Methylnaphthalene	24000	**NL**	µg/kg	230	U	250	U	240	U	**650**		260	U	200	U	250	U	220	U
95-48-7	2-Methylphenol	320000	330	µg/kg	450	U	480	U	470	U	480	U	500	U	400	U	480	U	420	U
88-74-4	2-Nitroaniline	63000	NL	µg/kg	230	U	250	U	240	U	250	U	260	U	200	U	250	U	220	U
88-75-5	2-Nitrophenol	NL	NL	µg/kg	230	U	250	U	240	U	250	U	260	U	200	U	250	U	220	U
91-94-1	3,3 -Dichlorobenzidine	1200	NL	µg/kg	450	U	480	U	470	U	480	U	500	U	400	U	480	U	420	U
99-09-2	3-Nitroaniline	NL	NL	µg/kg	450	U	480	U	470	U	480	U	500	U	400	U	480	U	420	U
534-52-1	4,6-Dinitro-2-methylphenol	510	NL	µg/kg	450	U	480	U	470	U	480	U	500	U	400	U	480	U	420	U
101-55-3	4-Bromophenyl phenyl ether	NL	NL	µg/kg	230	U	250	U	240	U	250	U	260	U	200	U	250	U	220	U
59-50-7	4-Chloro-3-methylphenol	630000	NL	µg/kg	230	U	250	U	240	U	250	U	260	U	200	U	250	U	220	U
106-47-8	P-Chloroaniline	2700	NL	µg/kg	450	U	480	U	470	U	480	U	500	U	400	U	480	U	420	U
7005-72-3	4-Chlorophenyl phenyl ether	NL	NL	µg/kg	230	U	250	U	240	U	250	U	260	U	200	U	250	U	220	U
106-44-5	4-Methylphenol	630000	330	µg/kg	450	U	480	U	470	U	480	U	500	U	400	U	480	U	420	U
100-02-7	4-Nitrophenol	NL	NL	µg/kg	450	U	480	U	470	U	480	U	500	U	400	U	480	U	420	U
83-32-9	Acenaphthene	360000	**20000**	µg/kg	230	U	250	U	240	U	**120**	J	260	U	200	U	250	U	220	U
208-96-8	Acenaphthylene	NL	100000	µg/kg	230	U	250	U	240	U	250	U	260	U	200	U	250	U	220	U
98-86-2	Acetophenone	780000	**NL**	µg/kg	450	U	**73**	J	470	U	480	U	500	U	**43**	J	480	U	420	U
120-12-7	Anthracene	1800000	**100000**	µg/kg	230	U	250	U	240	U	**150**	J	**68**	J	200	U	250	U	220	U
1912-24-9	Atrazine	2400	NL	µg/kg	450	U	480	U	470	U	480	U	500	U	400	U	480	U	420	U
100-52-7	Benzaldehyde	780000	NL	µg/kg	450	U	480	U	470	U	480	U	500	U	400	U	480	U	420	U
56-55-3	Benzo(a)anthracene	160	**1000**	µg/kg	230	U	250	U	240	U	**490**		**230**	J	**260**		250	U	220	U
50-32-8	Benzo(a)pyrene	16	**1000**	µg/kg	230	U	250	U	240	U	**160**	J	**130**	J	**270**		250	U	220	U
205-99-2	Benzo(b)fluoranthene	160	**1000**	µg/kg	230	U	250	U	240	U	**530**		**170**	J	**340**		250	U	220	U
191-24-2	Benzo(g,h,i)perylene	NL	**100000**	µg/kg	230	U	250	U	240	U	**150**	J	**56**	J	**150**	J	250	U	220	U
207-08-9	Benzo(k)fluoranthene	1600	**800**	µg/kg	230	U	250	U	240	U	**160**	J	**71**	J	**140**	J	250	U	220	U
111-91-1	Bis(2-Chloroethoxy)methane	19000	NL	µg/kg	230	U	250	U	240	U	250	U	260	U	200	U	250	U	220	U
111-44-4	Bis(2-Chloroethyl) ether	230	NL	µg/kg	450	U	480	U	470	U	480	U	500	U	400	U	480	U	420	U
117-81-7	Bis(2-Ethylhexyl)phthalate	39000	**NL**	µg/kg	230	U	250	U	240	U	250	U	260	U	200	U	250	U	220	U
108-60-1	Benzyl Butyl Phthalate	290000	NL	µg/kg	230	U	250	U	240	U	250	U	260	U	200	U	250	U	220	U

Table 3-1B
Soil Sample Detections - SVOCs
Former Duofold Corporation
Ilion, New York

				Sample ID	DF-SB-09-A		DF-SB-10-A		SB-900-A		DF-SB-11-A		DF-SB-12-A		DF-SB-13-A		DF-SB-14-A		DF-SB-15-A	
				Location ID	DF-SB-09		DF-SB-10		DF-SB-10		DF-SB-11		DF-SB-12		DF-SB-13		DF-SB-14		DF-SB-15	
				Sample Date	11/9/2016		11/9/2016		11/9/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016	
				Matrix	SO		SO		SO		SO		SO		SO		SO		SO	
				Sample Depth	5 - 6 feet		5 - 6 feet		5 - 6 feet		4 - 5 feet		6 - 7 feet		4 - 5 feet		6 - 7 feet		4 - 5 feet	
				Sample Type	N		N		FD		N		N		N		N		N	
				Parent Sample Code					DF-SB-10-A											
				CLP #	BD4M3		BD4M4		BD4P9		BD4M5		BD4M6		BD4M7		BD4M8		BD4M9	
CAS No.	**Compound**	**EPA RSLs**	**NYSDEC Unrestricted Use**	**Unit**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**
105-60-2	Caprolactam	3100000	NL	µg/kg	450	U	480	U	470	U	480	U	500	U	400	U	480	U	420	U
86-74-8	Carbazole	NL	NL	µg/kg	450	U	480	U	470	U	480	U	500	U	400	U	480	U	420	U
53-70-3	Dibenzo(a,h)anthracene	16	330	µg/kg	230	U	250	U	240	U	**50**	J	260	U	**50**	J	250	U	220	U
132-64-9	Dibenzofuran	7300	**NL**	µg/kg	230	U	250	U	240	U	**600**		260	U	200	U	250	U	220	U
84-66-2	Diethyl phthalate	5100000	NL	µg/kg	230	U	250	U	240	U	250	U	260	U	200	U	250	U	220	U
131-11-3	Dimethyl phthalate	NL	**NL**	µg/kg	**520**		**890**		**520**		**300**		**1800**		**1200**		**340**		**330**	
84-74-2	Di-n-butylphthalate	630000	NL	µg/kg	230	U	250	U	240	U	250	U	260	U	200	U	250	U	220	U
117-84-0	Di-n-octylphthalate	63000	NL	µg/kg	450	U	480	U	470	U	480	U	500	U	400	U	480	U	420	U
206-44-0	Fluoranthene	240000	**100000**	µg/kg	450	U	480	U	470	U	**2600**		**650**		**360**	J	480	U	420	U
86-73-7	Fluorene	240000	**30000**	µg/kg	230	U	250	U	240	U	**940**		260	U	200	U	250	U	220	U
87-68-3	Hexachloro-1,3-butadiene	1200	NL	µg/kg	230	U	250	U	240	U	250	U	260	U	200	U	250	U	220	U
118-74-1	Hexachlorobenzene	210	NL	µg/kg	230	U	250	U	240	U	250	U	260	U	200	U	250	U	220	U
77-47-4	Hexachlorocyclopentadiene	180	NL	µg/kg	450	U	480	U	470	U	480	U	500	U	400	U	480	U	420	U
67-72-1	Hexachloroethane	1800	NL	µg/kg	230	U	250	U	240	U	250	U	260	U	200	U	250	U	220	U
193-39-5	Indeno(1,2,3-cd)pyrene	160	**500**	µg/kg	230	U	250	U	240	U	**160**	J	**55**	J	**160**	J	250	U	220	U
91-20-3	Naphthalene	3800	**12000**	µg/kg	230	U	250	U	240	U	880		260	U	200	U	250	U	220	U
98-95-3	Nitrobenzene	5100	NL	µg/kg	230	U	250	U	240	U	250	U	260	U	200	U	250	U	220	U
621-64-7	N-Nitroso-di-n-propylamine	78	NL	µg/kg	230	U	250	U	240	U	250	U	260	U	200	U	250	U	220	U
86-30-6	N-Nitrosodiphenylamine	110000	NL	µg/kg	230	U	250	U	240	U	250	U	260	U	200	U	250	U	220	U
87-86-5	Pentachlorophenol	1000	800	µg/kg	450	U	480	U	470	U	480	U	500	U	400	U	480	U	420	U
85-01-8	Phenanthrene	NL	**100000**	µg/kg	230	U	250	U	240	U	**3000**		260	U	**97**	J	250	U	220	U
108-95-2	Phenol	1900000	**330**	µg/kg	**110**	J	**200**	J	**150**	J	480	U	500	U	**120**	J	**220**	J	**200**	J
129-00-0	Pyrene	180000	**100000**	µg/kg	230	U	250	U	240	U	**1900**		**640**		**320**		250	U	220	U

Bolded > detection

🟨 > NYSDEC Unrestricted

Acronyms

µg/kg - microgram by kilograms

CLP - Contract Laboratory Program

EPA - Environmental Protection Agency

FD - field duplicate

ID - identification

J - estimated result

N - normal

NL - not listed

NYSDEC - New York State Department of Environmental Conservation

Q - qualifier

RSLs - Regional Screening Levels

SO - soil

U - undetected

Table 3-1B
Soil Sample Detections - SVOCs
Former Duofold Corporation
Ilion, New York

				Sample ID	DF-SB-16-A		DF-SB-17-A		SB-900-B		DF-SB-18-A		DF-SB-19-A		DF-SB-20-A	
				Location ID	DF-SB-16		DF-SB-17		DF-SB-17		DF-SB-18		DF-SB-19		DF-SB-20	
				Sample Date	11/8/2016		11/8/2016		11/8/2016		11/9/2016		11/9/2016		11/9/2016	
				Matrix	SO		SO		SO		SO		SO		SO	
				Sample Depth	5 - 6 feet		4 - 5 feet		4 - 5 feet		5 - 6 feet		4 - 5 feet		4 - 5 feet	
				Sample Type	N		N		FD		N		N		N	
				Parent Sample Code					DF-SB-17-A							
				CLP #	BD4N0		BD4N1		BD4Q0		BD4N2		BD4N3		BD4N4	
CAS No.	**Compound**	**EPA RSLs**	**NYSDEC Unrestricted Use**	**Unit**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**
92-52-4	1,1-Biphenyl	4700	**NL**	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
95-94-3	1,2,4,5-Tetrachlorobenzene	2300	NL	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
58-90-2	2,3,4,6-Tetrachlorophenol	190000	NL	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
95-95-4	2,4,5-Trichlorophenol	630000	NL	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
88-06-2	2,4,6-Trichlorophenol	6300	NL	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
120-83-2	2,4-Dichlorophenol	19000	NL	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
105-67-9	2,4-Dimethylphenol	130000	NL	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
51-28-5	2,4-Dinitrophenol	13000	NL	µg/kg	550	U	380	U	400	U	500	U	480	U	450	U
121-14-2	2,4-Dinitrotoluene	1700	NL	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
606-20-2	2,6-Dinitrotoluene	360	NL	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
91-58-7	2-Chloronaphthalene	480000	NL	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
95-57-8	2-Chlorophenol	39000	NL	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
91-57-6	2-Methylnaphthalene	24000	**NL**	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
95-48-7	2-Methylphenol	320000	330	µg/kg	550	U	380	U	400	U	500	U	480	U	450	U
88-74-4	2-Nitroaniline	63000	NL	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
88-75-5	2-Nitrophenol	NL	NL	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
91-94-1	3,3 -Dichlorobenzidine	1200	NL	µg/kg	550	U	380	U	400	U	500	U	480	U	450	U
99-09-2	3-Nitroaniline	NL	NL	µg/kg	550	U	380	U	400	U	500	U	480	U	450	U
534-52-1	4,6-Dinitro-2-methylphenol	510	NL	µg/kg	550	U	380	U	400	U	500	U	480	U	450	U
101-55-3	4-Bromophenyl phenyl ether	NL	NL	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
59-50-7	4-Chloro-3-methylphenol	630000	NL	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
106-47-8	P-Chloroaniline	2700	NL	µg/kg	550	U	380	U	400	U	500	U	480	U	450	U
7005-72-3	4-Chlorophenyl phenyl ether	NL	NL	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
106-44-5	4-Methylphenol	630000	330	µg/kg	550	U	380	U	400	U	500	U	480	U	450	U
100-02-7	4-Nitrophenol	NL	NL	µg/kg	550	U	380	U	400	U	500	U	480	U	450	U
83-32-9	Acenaphthene	360000	**20000**	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
208-96-8	Acenaphthylene	NL	100000	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
98-86-2	Acetophenone	780000	**NL**	µg/kg	550	U	380	U	400	U	500	U	480	U	450	U
120-12-7	Anthracene	1800000	**100000**	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
1912-24-9	Atrazine	2400	NL	µg/kg	550	U	380	U	400	U	500	U	480	U	450	U
100-52-7	Benzaldehyde	780000	NL	µg/kg	550	U	380	U	400	U	500	U	480	U	450	U
56-55-3	Benzo(a)anthracene	160	**1000**	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
50-32-8	Benzo(a)pyrene	16	**1000**	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
205-99-2	Benzo(b)fluoranthene	160	**1000**	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
191-24-2	Benzo(g,h,i)perylene	NL	**100000**	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
207-08-9	Benzo(k)fluoranthene	1600	**800**	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
111-91-1	Bis(2-Chloroethoxy)methane	19000	NL	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
111-44-4	Bis(2-Chloroethyl) ether	230	NL	µg/kg	550	U	380	U	400	U	500	U	480	U	450	U
117-81-7	Bis(2-Ethylhexyl)phthalate	39000	**NL**	µg/kg	280	U	190	U	210	U	**76**	J	**65**	J	230	U
108-60-1	Benzyl Butyl Phthalate	290000	NL	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U

Table 3-1B
Soil Sample Detections - SVOCs
Former Duofold Corporation
Ilion, New York

				Sample ID	DF-SB-16-A		DF-SB-17-A		SB-900-B		DF-SB-18-A		DF-SB-19-A		DF-SB-20-A	
				Location ID	DF-SB-16		DF-SB-17		DF-SB-17		DF-SB-18		DF-SB-19		DF-SB-20	
				Sample Date	11/8/2016		11/8/2016		11/8/2016		11/9/2016		11/9/2016		11/9/2016	
				Matrix	SO		SO		SO		SO		SO		SO	
				Sample Depth	5 - 6 feet		4 - 5 feet		4 - 5 feet		5 - 6 feet		4 - 5 feet		4 - 5 feet	
				Sample Type	N		N		FD		N		N		N	
				Parent Sample Code					DF-SB-17-A							
				CLP #	BD4N0		BD4N1		BD4Q0		BD4N2		BD4N3		BD4N4	
CAS No.	**Compound**	**EPA RSLs**	**NYSDEC Unrestricted Use**	**Unit**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**
105-60-2	Caprolactam	3100000	NL	µg/kg	550	U	380	U	400	U	500	U	480	U	450	U
86-74-8	Carbazole	NL	NL	µg/kg	550	U	380	U	400	U	500	U	480	U	450	U
53-70-3	Dibenzo(a,h)anthracene	16	330	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
132-64-9	Dibenzofuran	7300	**NL**	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
84-66-2	Diethyl phthalate	5100000	NL	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
131-11-3	Dimethyl phthalate	NL	**NL**	µg/kg	**1400**		**1100**		**600**		**920**		**670**		**290**	
84-74-2	Di-n-butylphthalate	630000	NL	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
117-84-0	Di-n-octylphthalate	63000	NL	µg/kg	550	U	380	U	400	U	500	U	480	U	450	U
206-44-0	Fluoranthene	240000	**100000**	µg/kg	550	U	380	U	**54**	J	500	U	480	U	450	U
86-73-7	Fluorene	240000	**30000**	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
87-68-3	Hexachloro-1,3-butadiene	1200	NL	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
118-74-1	Hexachlorobenzene	210	NL	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
77-47-4	Hexachlorocyclopentadiene	180	NL	µg/kg	550	U	380	U	400	U	500	U	480	U	450	U
67-72-1	Hexachloroethane	1800	NL	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
193-39-5	Indeno(1,2,3-cd)pyrene	160	**500**	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
91-20-3	Naphthalene	3800	**12000**	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
98-95-3	Nitrobenzene	5100	NL	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
621-64-7	N-Nitroso-di-n-propylamine	78	NL	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
86-30-6	N-Nitrosodiphenylamine	110000	NL	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
87-86-5	Pentachlorophenol	1000	800	µg/kg	550	U	380	U	400	U	500	U	480	U	450	U
85-01-8	Phenanthrene	NL	**100000**	µg/kg	280	U	190	U	210	U	260	U	250	U	230	U
108-95-2	Phenol	1900000	**330**	µg/kg	**280**	J	**140**	J	**110**	J	**250**	J	**160**	J	**110**	J
129-00-0	Pyrene	180000	**100000**	µg/kg	280	U	190	U	**52**	J	260	U	250	U	230	U

Bolded > detection

🟧 > NYSDEC Unrestricted

Acronyms

µg/kg - microgram by kilograms	NL - not listed
CLP - Contract Laboratory Program	NYSDEC - New York State Department of Environmental Conservation
EPA - Environmental Protection Agency	Q - qualifier
FD - field duplicate	RSLs - Regional Screening Levels
ID - identification	SO - soil
J - estimated result	U - undetected
N - normal	

Table 3-1C
Soil Sample Detections - PCBs
Former Duofold Corporation
Ilion, New York

				Sample ID	DF-SB-01-A		DF-SB-02-A		DF-SB-03-A		DF-SB-04-A		DF-SB-05-A		DF-SB-06-A		DF-SB-07-A		DF-SB-08-A		DF-SB-09-A		DF-SB-10-A		SB-900-A		DF-SB-11-A		DF-SB-12-A	
				Location ID	DF-SB-01		DF-SB-02		DF-SB-03		DF-SB-04		DF-SB-05		DF-SB-06		DF-SB-07		DF-SB-08		DF-SB-09		DF-SB-10		DF-SB-10		DF-SB-11		DF-SB-12	
				Sample Date	11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/9/2016		11/9/2016		11/9/2016		11/9/2016		11/8/2016		11/8/2016	
				Matrix	SO		SO		SO		SO		SO		SO		SO		SO		SO		SO		SO		SO		SO	
				Sample Depth	4 - 5 feet		4 - 5 feet		4 - 5 feet		3 - 4 feet		5 - 6 feet		4 - 5 feet		7 - 8 feet		2 - 3 feet		5 - 6 feet		5 - 6 feet		5 - 6 feet		4 - 5 feet		6 - 7 feet	
				Sample Type	N		N		N		N		N		N		N		N		N		N		FD		N		N	
				Parent Sample Code																					DF-SB-10-A					
				CLP #	BD4L5		BD4L6		BD4L7		BD4L8		BD4L9		BD4M0		BD4M1		BD4M2		BD4M3		BD4M4		BD4P9		BD4M5		BD4M6	
CAS No.	**Compound**	**EPA RSLs**	**NYSDEC Restricted Residential Use**	**Unit**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**
11096-82-5	Aroclor 1260	240	1000	µg/kg	48	U	39	U	37	U	39	U	42	U	38	U	43	U	40	U	45	U	48	U	47	U	48	U	50	U
11097-69-1	Aroclor 1254	120	1000	µg/kg	48	U	39	U	37	U	39	U	42	U	38	U	43	U	10	J	45	U	48	U	47	U	48	U	50	U
11100-14-4	Aroclor 1268	NL	1000	µg/kg	48	U	39	U	37	U	39	U	42	U	38	U	43	U	40	U	45	U	48	U	47	U	48	U	50	U
11104-28-2	Aroclor 1221	200	1000	µg/kg	48	U	39	U	37	U	39	U	42	U	38	U	43	U	40	U	45	U	48	U	47	U	48	U	50	U
11141-16-5	Aroclor 1232	170	1000	µg/kg	48	U	39	U	37	U	39	U	42	U	38	U	43	U	40	U	45	U	48	U	47	U	48	U	50	U
12672-29-6	Aroclor 1248	230	1000	µg/kg	48	U	39	U	37	U	39	U	42	U	38	U	43	U	40	U	45	U	48	U	47	U	48	U	50	U
12674-11-2	Aroclor 1016	410	1000	µg/kg	48	U	39	U	37	U	39	U	42	U	38	U	43	U	40	U	45	U	48	U	47	U	48	U	50	U
37324-23-5	Aroclor 1262	NL	1000	µg/kg	48	U	39	U	37	U	39	U	42	U	38	U	43	U	40	U	45	U	48	U	47	U	48	U	50	U
53469-21-9	Aroclor 1242	230	1000	µg/kg	48	U	39	U	37	U	39	U	42	U	38	U	43	U	40	U	45	U	48	U	47	U	48	U	50	U

Acronyms

µg/kg - microgram by kilograms
CLP - Contract Laboratory Program
EPA - Environmental Protection Agency
FD - field duplicate
ID - identification
N - normal
NL - not listed
NYSDEC - New York State Department of Environmental Conservation
Q - qualifier
RSLs - Regional Screening Levels
SO - soil
U - undetected

Table 3-1C
Soil Sample Detections - PCBs
Former Duofold Corporation
Ilion, New York

				Sample ID	DF-SB-13-A		DF-SB-14-A		DF-SB-15-A		DF-SB-16-A		DF-SB-17-A		SB-900-B		DF-SB-18-A		DF-SB-19-A		DF-SB-20-A	
				Location ID	DF-SB-13		DF-SB-14		DF-SB-15		DF-SB-16		DF-SB-17		DF-SB-17		DF-SB-18		DF-SB-19		DF-SB-20	
				Sample Date	11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/9/2016		11/9/2016		11/9/2016	
				Matrix	SO		SO		SO		SO		SO		SO		SO		SO		SO	
				Sample Depth	4 - 5 feet		6 - 7 feet		4 - 5 feet		5 - 6 feet		4 - 5 feet		4 - 5 feet		5 - 6 feet		4 - 5 feet		4 - 5 feet	
				Sample Type	N		N		N		N		N		FD		N		N		N	
				Parent Sample Code											DF-SB-17-A							
				CLP #	BD4M7		BD4M8		BD4M9		BD4N0		BD4N1		BD4Q0		BD4N2		BD4N3		BD4N4	
CAS No.	**Compound**	**EPA RSLs**	**NYSDEC Restricted Residential Use**	**Unit**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**
11096-82-5	Aroclor 1260	240	1000	µg/kg	40	U	48	U	42	U	55	U	38	U	40	U	50	U	48	U	44	U
11097-69-1	Aroclor 1254	120	1000	µg/kg	40	U	48	U	42	U	55	U	13	J	40	U	50	U	48	U	44	U
11100-14-4	Aroclor 1268	NL	1000	µg/kg	40	U	48	U	42	U	55	U	38	U	40	U	50	U	48	U	44	U
11104-28-2	Aroclor 1221	200	1000	µg/kg	40	U	48	U	42	U	55	U	38	U	40	U	50	U	48	U	44	U
11141-16-5	Aroclor 1232	170	1000	µg/kg	40	U	48	U	42	U	55	U	38	U	40	U	50	U	48	U	44	U
12672-29-6	Aroclor 1248	230	1000	µg/kg	40	U	48	U	42	U	55	U	38	U	40	U	50	U	48	U	44	U
12674-11-2	Aroclor 1016	410	1000	µg/kg	40	U	48	U	42	U	55	U	38	U	40	U	50	U	48	U	44	U
37324-23-5	Aroclor 1262	NL	1000	µg/kg	40	U	48	U	42	U	55	U	38	U	40	U	50	U	48	U	44	U
53469-21-9	Aroclor 1242	230	1000	µg/kg	40	U	48	U	42	U	55	U	38	U	40	U	50	U	48	U	44	U

Acronyms
µg/kg - microgram by kilograms
CLP - Contract Laboratory Program
EPA - Environmental Protection Agency
FD - field duplicate
ID - identification
N - normal
NL - not listed
NYSDEC - New York State Department of Environmental Conservation
Q - qualifier
RSLs - Regional Screening Levels
SO - soil
U - undetected

Table 3-1D
Soil Sample Detections - Pesticides
Former Duofold Corporation
Ilion, New York

				Sample ID	DF-SS-01-A		DF-SS-02-A		DF-SS-03-A		DF-SS-04-A		DF-SS-05-A		DF-SS-06-A		DF-SS-07-A		SB-900-C		DF-SS-08-A		DF-SS-09-A		DF-SS-10-A	
				Location ID	DF-SS-01		DF-SS-02		DF-SS-03		DF-SS-04-A		DF-SS-05-A		DF-SS-06		DF-SS-07		DF-SS-07		DF-SS-08		DF-SS-09		DF-SS-10	
				Sample Date	11/7/2016		11/7/2016		11/7/2016		11/7/2016		11/7/2016		11/7/2016		11/7/2016		11/7/2016		11/7/2016		11/7/2016		11/7/2016	
				Matrix	SO		SO		SO		SO		SO		SO		SO		SO		SO		SO		SO	
				Sample Depth	0 - 0.5 feet		0 - 0.5 feet		0 - 0.5 feet		0 - 0.5 feet		0 - 0.5 feet		0 - 0.5 feet		0 - 0.5 feet		0 - 0.5 feet		0 - 0.5 feet		0 - 0.5 feet		0 - 0.5 feet	
				Sample Type	N		N		N		N		N		N		N		FD		N		N		N	
				Parent Sample Code															DF-SS-07-A							
				CLP #	BD4N9		BD4P0		BD4P1		BD4P2		BD4P3		BD4P4		BD4P5		BD4Q1		BD4P6		BD4P7		BD4P8	
CAS No.	**Compound**	**EPA RSLs**	**NYSDEC Restricted Residential**	**Unit**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**
72-54-8	4,4'-DDD	2300	13000	µg/kg	4	U	4.5	UJ	4.5	UJ	4.1	UJ	4.7	UJ	4	UJ	4.1	UJ	4.1	UJ	5.6	UJ	3.7	UJ	3.7	U
72-55-9	4,4'-DDE	200	8900	µg/kg	4	U	4.5	UJ	4.5	UJ	4.1	UJ	4.7	UJ	4	UJ	4.1	UJ	4.1	UJ	5.6	UJ	3.7	UJ	3.7	U
50-29-3	4,4'-DDT	1900	7900	µg/kg	4	U	4.5	UJ	4.5	UJ	4.1	UJ	4.7	UJ	4	UJ	4.1	UJ	4.1	UJ	5.6	UJ	3.7	UJ	3.7	U
309-00-2	Aldrin	39	97	µg/kg	2.1	U	2.3	UJ	2.3	UJ	2.1	UJ	2.4	UJ	2.1	UJ	2.1	UJ	2.1	UJ	2.9	UJ	1.9	UJ	1.9	U
319-84-6	alpha-BHC	86	480	µg/kg	2.1	U	2.3	UJ	2.3	UJ	2.1	UJ	2.4	UJ	2.1	UJ	2.1	UJ	2.1	UJ	2.9	UJ	1.9	UJ	1.9	U
319-85-7	beta-BHC	300	360	µg/kg	2.1	U	2.3	UJ	2.3	UJ	2.1	UJ	2.4	UJ	2.1	UJ	2.1	UJ	2.1	UJ	2.9	UJ	1.9	UJ	1.9	U
5103-71-9	cis-Chlordane	NL	4200	µg/kg	2.1	U	2.3	UJ	2.3	UJ	2.1	UJ	2.4	UJ	2.1	UJ	2.1	UJ	2.1	UJ	2.9	UJ	1.9	UJ	1.9	U
319-86-8	delta-BHC	NL	100000	µg/kg	2.1	U	2.3	UJ	2.3	UJ	2.1	UJ	2.4	UJ	2.1	UJ	2.1	UJ	2.1	UJ	2.9	UJ	1.9	UJ	1.9	U
60-57-1	Dieldrin	34	200	µg/kg	4	U	4.5	UJ	4.5	UJ	4.1	UJ	4.7	UJ	4	UJ	4.1	UJ	4.1	UJ	5.6	UJ	3.7	UJ	3.7	U
959-98-8	Endosulfan I	NL	24000	µg/kg	2.1	U	2.3	UJ	2.3	UJ	2.1	UJ	2.4	UJ	2.1	UJ	2.1	UJ	2.1	UJ	2.9	UJ	1.9	UJ	1.9	U
33213-65-9	Endosulfan II	NL	24000	µg/kg	4	U	4.5	UJ	4.5	UJ	4.1	UJ	4.7	UJ	4	UJ	4.1	UJ	4.1	UJ	5.6	UJ	3.7	UJ	3.7	U
1031-07-8	Endosulfan sulfate	NL	24000	µg/kg	4	U	4.5	UJ	4.5	UJ	4.1	UJ	4.7	UJ	4	UJ	4.1	UJ	4.1	UJ	5.6	UJ	3.7	UJ	3.7	U
72-20-8	Endrin	1900	11000	µg/kg	4	U	4.5	UJ	4.5	UJ	4.1	UJ	4.7	UJ	4	UJ	4.1	UJ	4.1	UJ	5.6	UJ	3.7	UJ	3.7	U
7421-93-4	Endrin aldehyde	NL	NL	µg/kg	4	U	4.5	UJ	4.5	UJ	4.1	UJ	4.7	UJ	4	UJ	4.1	UJ	4.1	UJ	5.6	UJ	3.7	UJ	3.7	U
53494-70-5	Endrin ketone	NL	NL	µg/kg	4	U	4.5	UJ	4.5	UJ	4.1	UJ	4.7	UJ	4	UJ	4.1	UJ	4.1	UJ	5.6	UJ	3.7	UJ	3.7	U
58-89-9	gamma-BHC (Lindane)	570	1300	µg/kg	2.1	U	2.3	UJ	2.3	UJ	2.1	UJ	2.4	UJ	2.1	UJ	2.1	UJ	2.1	UJ	2.9	UJ	1.9	UJ	1.9	U
76-44-8	Heptachlor	130	2100	µg/kg	2.1	U	2.3	UJ	2.3	UJ	2.1	UJ	2.4	UJ	2.1	UJ	2.1	UJ	2.1	UJ	2.9	UJ	1.9	UJ	1.9	U
1024-57-3	Heptachlor epoxide	70	NL	µg/kg	2.1	U	2.3	UJ	2.3	UJ	2.1	UJ	2.4	UJ	2.1	UJ	2.1	UJ	2.1	UJ	2.9	UJ	1.9	UJ	1.9	U
72-43-5	Methoxychlor	32000	NL	µg/kg	21	U	23	UJ	23	UJ	21	UJ	24	UJ	21	UJ	21	UJ	21	UJ	29	UJ	19	UJ	19	U
8001-35-2	Toxaphene	490	NL	µg/kg	210	U	230	UJ	230	UJ	210	UJ	240	UJ	210	UJ	210	UJ	210	UJ	290	UJ	190	UJ	190	U
5103-74-2	trans-Chlordane	NL	NL	µg/kg	2.1	U	2.3	UJ	2.3	UJ	2.1	UJ	2.4	UJ	2.1	UJ	2.1	UJ	2.1	UJ	2.9	UJ	1.9	UJ	1.9	U

Acronyms

µg/kg - microgram by kilograms
CLP - Contract Laboratory Program
EPA - Environmental Protection Agency
FD - field duplicate
ID - identification
N - normal
NL - not listed
NYSDEC - New York State Department of Environmental Conservation
Q - qualifier
RSLs - Regional Screening Levels
SO - soil
U - undetected
UJ - estimated undetected

Table 3-1E
Soil Sample Detections - Metals
Former Duofold Corporation
Ilion, New York

				Sample ID	DF-SB-01-A		DF-SB-02-A		DF-SB-03-A		DF-SB-04-A		DF-SB-05-A		DF-SB-06-A		DF-SB-07-A		DF-SB-08-A	
				Location ID	DF-SB-01		DF-SB-02		DF-SB-03		DF-SB-04		DF-SB-05		DF-SB-06		DF-SB-07		DF-SB-08	
				Sample Date	11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/9/2016	
				Matrix	SO		SO		SO		SO		SO		SO		SO		SO	
				Sample Depth	4 - 5 feet		4 - 5 feet		4 - 5 feet		3 - 4 feet		5 - 6 feet		4 - 5 feet		7 - 8 feet		2 - 3 feet	
				Sample Type	N		N		N		N		N		N		N		N	
				Parent Sample Code																
				CLP #	BD4L5		BD4L6		BD4L7		BD4L8		BD4L9		BD4M0		BD4M1		MBD4M2	
CAS No.	**Compound**	**EPA RSLs**	**NYSDEC Unrestricted**	**Unit**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**
7429-90-5	Aluminum	7700	NL	mg/kg	6070		4090		4220		7590		4800		9280		5490		6680	
7440-36-0	Antimony	3.1	NL	mg/kg	0.91		11		0.87	U	0.87	U	0.9	U	0.88	U	0.82	U	0.82	U
7440-38-2	Arsenic	0.68	13	mg/kg	4		25.5		3.7		5.2		8.8		41.3		13.6		7.8	
7440-39-3	Barium	1500	350	mg/kg	39.2		124		28		53.3		80.2		44.1		134		60.3	
7440-41-7	Beryllium	16	7.2	mg/kg	0.45	U	0.51		0.44	U	0.52		0.54		0.44	U	0.56		0.42	
7440-43-9	Cadmium	7.1	2.5	mg/kg	0.34	J	0.42	J	0.21	J	0.21	J	0.23	J	0.37	J	0.4	J	0.18	J
7440-70-2	Calcium	NL	NL	mg/kg	3880		26300		17300		40300		29700		23100		24300		27600	
7440-47-3	Chromium	NL	30	mg/kg	9.5		9.5		6.7		10.9		13.9		7.2		15.7		9.9	
7440-48-4	Cobalt	2.3	NL	mg/kg	10.3		7.9		5.1		9.1		10.4		6.5		8.4		7.9	
7440-50-8	Copper	310	50	mg/kg	19.2		251		15.3		28.1		29.1		25.5		43.3		54	J
7439-89-6	Iron	5500	NL	mg/kg	15600		33700		9760		19300	J	15500		23700		17400		17900	J
7439-92-1	Lead	400	63	mg/kg	8.9		397		22.5		11.6		130		8		97.9		42.2	
7439-95-4	Magnesium	NL	NL	mg/kg	3130		3650		3860		8340		7830		4550		8000		6580	
7439-96-5	Manganese	NL	1600	mg/kg	348		239		138		579		666		605		566		427	
7440-02-0	Nickel	150	30	mg/kg	24.6		32.6		13.5		20.2		24		12.9		20.9		76	
7440-09-7	Potassium	NL	NL	mg/kg	707		523		456		1080		621		954		694		938	
7782-49-2	Selenium	39	3.9	mg/kg	2.2	U	1.5	J	0.4	J	2.2	U	2.3	U	2.2	U	0.41	J	0.52	J
7440-22-4	Silver	39	2	mg/kg	0.058	J	0.13	J	0.052	J	0.065	J	0.094	J	0.1	J	0.14	J	0.41	UJ
7440-23-5	Sodium	NL	NL	mg/kg	441	U	457	U	430	U	430	U	415	U	406	U	558	U	110	J
7440-28-0	Thallium	0.078	NL	mg/kg	0.071	J	0.18	J	0.11	J	0.083	J	0.45	U	0.097	J	0.1	J	0.41	U
7440-62-2	Vanadium	39	NL	mg/kg	13.3		14		10.1		16.2		18		11.6		19.7		12.3	
7440-66-6	Zinc	2300	109	mg/kg	186		206		47.3		77.4		79.8		49.2		211		89.1	

Bolded > detection

🟧 > NYSDEC Unrestricted

Acronyms

mg/kg - microgram per kilogram	Q - qualifier
CLP - Contract Laboratory Program	RSLs - Regional Screening Levels
EPA - Environmental Protection Agency	SO - soil
FD - field duplicate	U - undetected
ID - identification	
J - estimated result	
N - normal	
NL - not listed	
NYSDEC - New York State Department of Environmental Conservation	

Table 3-1E
Soil Sample Detections - Metals
Former Duofold Corporation
Ilion, New York

				Sample ID	DF-SB-09-A		DF-SB-10-A		SB-900-A		DF-SB-11-A		DF-SB-12-A		DF-SB-13-A		DF-SB-14-A		DF-SB-15-A		DF-SB-16-A	
				Location ID	DF-SB-09		DF-SB-10		DF-SB-10		DF-SB-11		DF-SB-12		DF-SB-13		DF-SB-14		DF-SB-15		DF-SB-16	
				Sample Date	11/9/2016		11/9/2016		11/9/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016	
				Matrix	SO		SO		SO		SO		SO		SO		SO		SO		SO	
				Sample Depth	5 - 6 feet		5 - 6 feet		5 - 6 feet		4 - 5 feet		6 - 7 feet		4 - 5 feet		6 - 7 feet		4 - 5 feet		5 - 6 feet	
				Sample Type	N		N		FD		N		N		N		N		N		N	
				Parent Sample Code					DF-SB-10-A													
				CLP #	MBD4M3		MBD4M4		MBD4P9		MBD4M5		MBD4M6		MBD4M7		MBD4M8		MBD4M9		MBD4N0	
CAS No.	**Compound**	**EPA RSLs**	**NYSDEC Unrestricted**	**Unit**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**
7429-90-5	Aluminum	7700	NL	mg/kg	7720		14700		9770		5490		12300		7730		10800		4600		9380	
7440-36-0	Antimony	3.1	NL	mg/kg	1	U	2.2		1	U	3.6		1	U	8.3		1.2	U	0.79	U	1.2	U
7440-38-2	Arsenic	0.68	13	mg/kg	4.3		18.3		15.2		20.5		4.9		12.9	J	39.5		4.4		13.9	
7440-39-3	Barium	1500	350	mg/kg	49		131		80.8		1730		82.1		66.8		36.1		19.5		62	
7440-41-7	Beryllium	16	7.2	mg/kg	0.51		2.2	J	0.72	J	0.54	U	0.85		0.45	U	0.64		0.4	U	0.64	
7440-43-9	Cadmium	7.1	2.5	mg/kg	0.12	J	1.8	J	0.27	J	5.7		0.18	J	0.41	J	0.36	J	0.079	J	0.29	J
7440-70-2	Calcium	NL	NL	mg/kg	94100		6830		8210		24300		3500		15000		31100		1360		18300	
7440-47-3	Chromium	NL	30	mg/kg	14.5		25.4		17.4		2090		19.3		49.4		15.2		6.4		13.7	
7440-48-4	Cobalt	2.3	NL	mg/kg	10.1		21.9		14.9		9.8		10.2		7.3		10.9		4.4		12.3	
7440-50-8	Copper	310	50	mg/kg	20.2	J	46.4	J	29	J	219		29.9	J	235	J	30	J	26.1	J	32.3	J
7439-89-6	Iron	5500	NL	mg/kg	18800	J	33100	J	26900	J	17400		23500	J	21900	J	32800	J	13100	J	26300	J
7439-92-1	Lead	400	63	mg/kg	13.9		54.1	J	22.1	J	84200		20.8		674		17		12.5		16.4	
7439-95-4	Magnesium	NL	NL	mg/kg	5960		5440		4740		8000		4730		5180		10600		1670		6700	
7439-96-5	Manganese	NL	1600	mg/kg	219		496		516		552		186		528		184		375		306	
7440-02-0	Nickel	150	30	mg/kg	22.7		36.9		27.9		442		24.8		17.5		26		15.2		27.5	
7440-09-7	Potassium	NL	NL	mg/kg	1060		1330		920		964		1190		944		1380		686		1110	
7782-49-2	Selenium	39	3.9	mg/kg	2.5	U	6.5	J	1.1	J	2.7	U	0.79	J	0.68	J	0.61	J	2	U	0.93	J
7440-22-4	Silver	39	2	mg/kg	0.5	UJ	0.61	UJ	0.5	UJ	0.18	J	0.14	J	0.23	J	0.13	J	0.04	J	0.094	J
7440-23-5	Sodium	NL	NL	mg/kg	88.7	J	105	J	87.3	J	558	U	88.1	J	99.3	J	132	J	54.2	J	110	J
7440-28-0	Thallium	0.078	NL	mg/kg	0.5	U	1.4		0.5	U	1		0.5	U	0.45	U	0.57	U	0.4	U	0.59	U
7440-62-2	Vanadium	39	NL	mg/kg	15.7		32.7		20.1		13		18.7		14.7		19.6		7.9		19.8	
7440-66-6	Zinc	2300	109	mg/kg	125		171		143		10500		142		339		112		36.6		70.4	

Bolded	> detection
🟧	> NYSDEC Unrestricted

Acronyms

mg/kg - microgram per kilogram

CLP - Contract Laboratory Program

EPA - Environmental Protection Agency

FD - field duplicate

ID - identification

J - estimated result

N - normal

NL - not listed

NYSDEC - New York State Department of Environmental Conservation

Q - qualifier

RSLs - Regional Screening Levels

SO - soil

U - undetected

Table 3-1E
Soil Sample Detections - Metals
Former Duofold Corporation
Ilion, New York

				Sample ID	DF-SB-17-A		SB-900-B		DF-SB-18-A		DF-SB-19-A		DF-SB-20-A		DF-SS-01-A		DF-SS-02-A		DF-SS-03-A		DF-SS-04-A	
				Location ID	DF-SB-17		DF-SB-17		DF-SB-18		DF-SB-19		DF-SB-20		DF-SS-01		DF-SS-02		DF-SS-03		DF-SS-04-A	
				Sample Date	11/8/2016		11/8/2016		11/9/2016		11/9/2016		11/9/2016		11/7/2016		11/7/2016		11/7/2016		11/7/2016	
				Matrix	SO		SO		SO		SO		SO		SO		SO		SO		SO	
				Sample Depth	4 - 5 feet		4 - 5 feet		5 - 6 feet		4 - 5 feet		4 - 5 feet		0 - 0.5 feet		0 - 0.5 feet		0 - 0.5 feet		0 - 0.5 feet	
				Sample Type	N		FD		N		N		N		N		N		N		N	
				Parent Sample Code			DF-SB-17-A															
				CLP #	MBD4N1		MBD4Q0		MBD4N2		MBD4N3		MBD4N4		MBD4N9		MBD4P0		MBD4P1		MBD4P2	
CAS No.	**Compound**	**EPA RSLs**	**NYSDEC Unrestricted**	**Unit**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**
7429-90-5	Aluminum	7700	NL	mg/kg	5230		4770		5810		10400		10700		2530		3020		2760		6490	
7440-36-0	Antimony	3.1	NL	mg/kg	12.8	J	3.1	J	0.89	U	0.89	U	0.84	U	1.1		2.1		1	U	0.88	U
7440-38-2	Arsenic	0.68	13	mg/kg	9.7		9.5		7.4		7.6		8.9		6.5		11.6		6.5		5.9	
7440-39-3	Barium	1500	350	mg/kg	51.4		63.2		48.3		56.6		52.6		163		67.4		56.6		42.2	
7440-41-7	Beryllium	16	7.2	mg/kg	0.42		0.48		0.48		0.57		0.51		0.42	U	0.5	U	0.51	U	0.45	
7440-43-9	Cadmium	7.1	2.5	mg/kg	0.38	J	0.31	J	0.27	J	0.13	J	0.2	J	0.39	J	0.62		0.48	J	0.23	J
7440-70-2	Calcium	NL	NL	mg/kg	19700		12500		44600		5070		61000		52200		94300	J	23400		22100	
7440-47-3	Chromium	NL	30	mg/kg	10.6		9.9		11.7		13.1		18.1		6.1		8.9		5.6		9.4	
7440-48-4	Cobalt	2.3	NL	mg/kg	6.3		7.9		10.2		9.7		9.9		2.5		4.5		2.7		8.3	
7440-50-8	Copper	310	50	mg/kg	87	J	94.4	J	30.2	J	20.9	J	40.1	J	193		61.9		26.4		24.7	
7439-89-6	Iron	5500	NL	mg/kg	17500	J	23400	J	15400	J	28600	J	32200	J	11300		14000		13500		16800	
7439-92-1	Lead	400	63	mg/kg	553	J	139	J	16.9		13.5		24.7		144		183		112		13.2	
7439-95-4	Magnesium	NL	NL	mg/kg	2680		2680		17900		4760		13100		26900		20700		10200		5130	
7439-96-5	Manganese	NL	1600	mg/kg	434		306		767		244		470		304		317		234		523	
7440-02-0	Nickel	150	30	mg/kg	22.5		20.6		23.9		23		23.8		12		15.5		22.9		19.5	
7440-09-7	Potassium	NL	NL	mg/kg	620		770		768		795		610		.		612		285	J	1110	
7782-49-2	Selenium	39	3.9	mg/kg	2	U	0.56	J	0.56	J	0.41	J	0.64	J	0.45	J	0.67	J	2.6	U	2.2	U
7440-22-4	Silver	39	2	mg/kg	0.23	J	0.31	J	0.45	UJ	0.45	UJ	0.42	UJ	0.16	J	0.24	J	0.16	J	0.079	J
7440-23-5	Sodium	NL	NL	mg/kg	96.8	J	94	J	82.3	J	85.5	J	117	J	447	U	468	U	491	U	452	U
7440-28-0	Thallium	0.078	NL	mg/kg	0.4	U	0.44	U	0.45	U	0.45	U	0.42	U	0.42	U	0.5	U	0.51	U	0.44	U
7440-62-2	Vanadium	39	NL	mg/kg	13.9		15.8		15.5		15.7		18		15.5		31.6		20.9		14.3	
7440-66-6	Zinc	2300	109	mg/kg	96		74.1		67.4		103		89.9		136		194		60.9		65.2	

Bolded > detection

🟧 > NYSDEC Unrestricted

Acronyms

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Table 3-1E
Soil Sample Detections - Metals
Former Duofold Corporation
Ilion, New York

				Sample ID	DF-SS-05-A		DF-SS-06-A		DF-SS-07-A		DF-SS-08-A		DF-SS-09-A		DF-SS-10-A	
				Location ID	DF-SS-05-A		DF-SS-06		DF-SS-07		DF-SS-08		DF-SS-09		DF-SS-10	
				Sample Date	11/7/2016		11/7/2016		11/7/2016		11/7/2016		11/7/2016		11/7/2016	
				Matrix	SO		SO		SO		SO		SO		SO	
				Sample Depth	0 - 0.5 feet		0 - 0.5 feet		0 - 0.5 feet		0 - 0.5 feet		0 - 0.5 feet		0 - 0.5 feet	
				Sample Type	N		N		N		N		N		N	
				Parent Sample Code												
				CLP #	MBD4P3		MBD4P4		MBD4P5		MBD4P6		MBD4P7		MBD4P8	
CAS No.	**Compound**	**EPA RSLs**	**NYSDEC Unrestricted**	**Unit**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**
7429-90-5	Aluminum	7700	NL	mg/kg	4960		5060		5150		4200		4170		2070	
7440-36-0	Antimony	3.1	NL	mg/kg	2.9		0.85	U	0.93	U	4		0.84	U	0.81	U
7440-38-2	Arsenic	0.68	13	mg/kg	11		9.4		6.4		5.7		5.1		3.4	
7440-39-3	Barium	1500	350	mg/kg	119		135		45.1		96.5		24		42.3	
7440-41-7	Beryllium	16	7.2	mg/kg	0.52	U	0.42	U	0.47	U	0.62	U	0.42	U	0.4	U
7440-43-9	Cadmium	7.1	2.5	mg/kg	0.58		1.1		0.23	J	2.4		0.28	J	0.62	
7440-70-2	Calcium	NL	NL	mg/kg	31500		42700		32600		52800		59000		14900	
7440-47-3	Chromium	NL	30	mg/kg	10.4		19.3		10.5		22.8		8.7		9	
7440-48-4	Cobalt	2.3	NL	mg/kg	6.7		6.3		6.7		5.5		3.4		4	
7440-50-8	Copper	310	50	mg/kg	83.8		62		23.2		117		25.2		41.3	
7439-89-6	Iron	5500	NL	mg/kg	20600		24500		13900		14000		11400		12200	
7439-92-1	Lead	400	63	mg/kg	175		215		18.8		334		33.4		381	
7439-95-4	Magnesium	NL	NL	mg/kg	7660		8220		5060		16000		9980		2240	
7439-96-5	Manganese	NL	1600	mg/kg	307		401		446		253		245		134	
7440-02-0	Nickel	150	30	mg/kg	27.3		65.9		16.9		27.8		9.9		90.5	
7440-09-7	Potassium	NL	NL	mg/kg	729		835		844		899		470		324	J
7782-49-2	Selenium	39	3.9	mg/kg	0.54	J	2.1	U	2.3	U	3.1	U	2.1	U	2	U
7440-22-4	Silver	39	2	mg/kg	0.21	J	3.9		0.079	J	1.1		0.2	J	0.3	J
7440-23-5	Sodium	NL	NL	mg/kg	531	U	454	U	436	U	619	U	406	U	398	U
7440-28-0	Thallium	0.078	NL	mg/kg	0.52	U	0.42	U	0.47	U	0.62	U	0.42	U	0.4	U
7440-62-2	Vanadium	39	NL	mg/kg	20.4		28.9		12.5		16		9.1		337	
7440-66-6	Zinc	2300	109	mg/kg	175		212		66.1		629		62.9		212	

Bolded > detection

🟧 > NYSDEC Unrestricted

Acronyms

mg/kg - microgram per kilogram

CLP - Contract Laboratory Program

EPA - Environmental Protection Agency

FD - field duplicate

ID - identification

J - estimated result

N - normal

NL - not listed

NYSDEC - New York State Department of Environmental Conservation

Q - qualifier

RSLs - Regional Screening Levels

SO - soil

U - undetected

Table 3-1F
Soil Sample Detections - TCLP Metals
Former Duofold Corporation
Ilion, New York

Sample ID				DF-SB-01-A		DF-SB-02-A		DF-SB-03-A		DF-SB-04-A		DF-SB-05-A		DF-SB-06-A		DF-SB-07-A		DF-SB-08-A		DF-SB-09-A		DF-SB-10-A		SB-900-A	
Location ID				DF-SB-01		DF-SB-02		DF-SB-03		DF-SB-04		DF-SB-05		DF-SB-06		DF-SB-07		DF-SB-08		DF-SB-09		DF-SB-10		DF-SB-10	
Sample Date				11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/9/2016		11/9/2016		11/9/2016		11/9/2016	
Matrix				SO		SO		SO		SO		SO		SO		SO		SO		SO		SO		SO	
Sample Depth				4 - 5 feet		4 - 5 feet		4 - 5 feet		3 - 4 feet		5 - 6 feet		4 - 5 feet		7 - 8 feet		2 - 3 feet		5 - 6 feet		5 - 6 feet		5 - 6 feet	
Sample Type				N		N		N		N		N		N		N		N		N		N		FD	
Parent Sample Code																								DF-SB-10-A	
CLP #				MBD4L5		MBD4L6		MBD4L7		MBD4L8		MBD4L9		MBD4M0		MBD4M1		MBD4M2		MBD4M3		MBD4M4		MBD4P9	
CAS No.	**Compound**	**EPA Regulated Level**	**Unit**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**
7440-38-2	Arsenic	**5**	mg/L	5	U	5	U	5	U	**5**	U	5	U	5	U	**5**	U	5	U	5	U	5	U	5	U
7440-39-3	Barium	**100**	mg/L	**0.52**	J	**0.36**	J	**0.33**	J	**0.6**	J	**0.54**	J	**0.54**	J	**0.57**	J	**0.34**	J	**0.74**	J	**0.16**	J	**0.23**	J
7440-43-9	Cadmium	**1**	mg/L	**0.0011**	J	**0.00046**	J	**0.0005**	J	**0.0011**	J	**0.00075**	J	**0.01**	J	**0.011**	J	0.00059	J	1	U	**0.00093**	J	**0.00025**	J
7440-47-3	Chromium	**5**	mg/L	**0.0016**	J	**0.0027**	J	**0.0018**	J	**0.0021**	J	**0.0029**	J	**0.0018**	J	**0.0018**	J	0.00085	J	5	UJ	**0.0017**	J	**0.0021**	J
7439-92-1	Lead	**5**	mg/L	5	U	**0.039**	J	**5**	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
7439-97-6	Mercury	**0.2**	mg/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
7782-49-2	Selenium	**1**	mg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	**0.013**	J	**0.0085**	J	**0.014**	J	**0.0076**	J
7440-22-4	Silver	5	mg/L	5	U	5	U	5	U	5	U	5	U	5	U	**5**	U	5	U	5	U	5	U	5	U

Bolded > detection

Acronyms

mg/L - milligram per liter
CLP - Contract Laboratory Program
EPA - Environmental Protection Agency
FD - field duplicate
ID - identification
J - estimated result
TCLP - toxicity characteristic leaching procedure
N - normal
Q - qualifier
SO - soil
U - undetected
UJ - estimated undetected

Table 3-1F
Soil Sample Detections - TCLP Metals
Former Duofold Corporation
Ilion, New York

			Sample ID	DF-SB-11-A		DF-SB-12-A		DF-SB-13-A		DF-SB-14-A		DF-SB-15-A		DF-SB-16-A		DF-SB-17-A		SB-900-B		DF-SB-18-A		DF-SB-19-A		DF-SB-20-A		DF-SSB-01-A	
			Location ID	DF-SB-11		DF-SB-12		DF-SB-13		DF-SB-14		DF-SB-15		DF-SB-16		DF-SB-17		DF-SB-17		DF-SB-18		DF-SB-19		DF-SB-20		DF-SSB-01	
			Sample Date	11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/9/2016		11/9/2016		11/9/2016		11/8/2016	
			Matrix	SO		SO		SO		SO		SO		SO		SO		SO		SO		SO		SO		SO	
			Sample Depth	4 - 5 feet		6 - 7 feet		4 - 5 feet		6 - 7 feet		4 - 5 feet		5 - 6 feet		4 - 5 feet		4 - 5 feet		5 - 6 feet		4 - 5 feet		4 - 5 feet		0 - 2 feet	
			Sample Type	N		N		N		N		N		N		N		FD		N		N		N			
			Parent Sample Code															DF-SB-17-A									
			CLP #	MBD4M5		MBD4M6		MBD4M7		MBD4M8		MBD4M9		MBD4N0		MBD4N1		MBD4Q0		MBD4N2		MBD4N3		MBD4N4		MBD4N5	
CAS No.	**Compound**	**EPA Regulated Level**	**Unit**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**
7440-38-2	Arsenic	**5**	mg/L	5	U	**0.045**	J	5	UJ	**0.015**	J	5	U	**0.035**	J	5	U	5	U	**0.011**	J	**0.012**	J	**0.054**	J	5	U
7440-39-3	Barium	**100**	mg/L	**0.54**	J	**0.85**	J	**0.4**	J	**0.31**	J	**0.62**	J	**1.6**	J	**0.79**	J	**1.2**	J	**1.8**	J	**2**	J	**1.1**	J	**0.75**	J
7440-43-9	Cadmium	**1**	mg/L	**0.0003**	J	**0.0013**	J	**0.00074**	J	1	U	**0.0075**	J	**0.0011**	J	**0.00043**	J	**0.00026**	J	**0.00059**	J	**0.00072**	J	**0.0019**	J	**0.001**	J
7440-47-3	Chromium	**5**	mg/L	**0.0019**	J	5	UJ	**0.0021**	J	**0.0027**	J	5	UJ	5	UJ	**0.0047**	J	**0.0039**	J	5	UJ	5	UJ	5	UJ	**0.0046**	J
7439-92-1	Lead	**5**	mg/L	5	U	5	U	5	U	5	U	**0.024**	J	5	U	5	U	5	U	5	U	5	U	5	U	**0.1**	J
7439-97-6	Mercury	**0.2**	mg/L	0.2	U	**0.0013**		0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.000087	
7782-49-2	Selenium	**1**	mg/L	1	U	**0.0076**	J	1	U	**0.0047**	J	1	U	**0.0094**	J	**0.01**	J	**0.018**	J	**0.0088**	J	**0.014**	J	**0.0074**	J	1	U
7440-22-4	Silver	5	mg/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U

Bolded > detection

Acronyms

mg/L - milligram per liter
CLP - Contract Laboratory Program
EPA - Environmental Protection Agency
FD - field duplicate
ID - identification
J - estimated result
TCLP - toxicity characteristic leaching procedure
N - normal
Q - qualifier
SO - soil
U - undetected
UJ - estimated undetected

Table 3-1F
Soil Sample Detections - TCLP Metals
Former Duofold Corporation
Ilion, New York

Sample ID				DF-SSB-02-A		DF-SSB-03-A		DF-SSB-04-A		DF-SS-01-A		DF-SS-02-A		DF-SS-03-A		DF-SS-04-A		DF-SS-05-A		DF-SS-06-A		DF-SS-07-A		DF-SS-08-A		DF-SS-09-A		DF-SS-10-A	
Location ID				DF-SSB-02		DF-SSB-03		DF-SSB-04		DF-SS-01		DF-SS-02		DF-SS-03		DF-SS-04-A		DF-SS-05-A		DF-SS-06		DF-SS-07		DF-SS-08		DF-SS-09		DF-SS-10	
Sample Date				11/9/2016		11/9/2016		11/9/2016		11/7/2016		11/7/2016		11/7/2016		11/7/2016		11/7/2016		11/7/2016		11/7/2016		11/7/2016		11/7/2016		11/7/2016	
Matrix				SO		SO		SO		SO		SO		SO		SO		SO		SO		SO		SO		SO		SO	
Sample Depth				0 - 2 feet		0 - 2 feet		0 - 2 feet		0 - 0.5 feet		0 - 0.5 feet		0 - 0.5 feet		0 - 0.5 feet		0 - 0.5 feet		0 - 0.5 feet		0 - 0.5 feet		0 - 0.5 feet		0 - 0.5 feet		0 - 0.5 feet	
Sample Type				N		N		N		N		N		N		N		N		N		N		N		N		N	
Parent Sample Code																													
CLP #				MBD4N6		MBD4N3		MBD4N4		MBD4N9		MBD4P0		MBD4P1		MBD4P2		MBD4P3		MBD4P4		MBD4P5		MBD4P6		MBD4P7		MBD4P8	
CAS No.	**Compound**	**EPA Regulated Level**	**Unit**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**	**Result**	**Q**
7440-38-2	Arsenic	**5**	mg/L	5	U	5	U	5	UJ	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
7440-39-3	Barium	**100**	mg/L	**0.12**	J	**0.99**	J	**0.8**	J	**0.92**	J	**0.46**	J	**0.36**	J	**0.34**	J	**0.94**	J	**1.4**	J	**0.45**	J	**0.56**	J	**0.3**	J	**0.95**	J
7440-43-9	Cadmium	**1**	mg/L	1	U	**0.00085**	J	**0.00062**	J	**0.00065**	J	**0.00092**	J	**0.001**	J	**0.00029**	J	**0.0013**	J	**0.0027**	J	1	U	**0.0042**	J	**0.0012**	J	**0.01**	J
7440-47-3	Chromium	**5**	mg/L	**0.0024**	J	**0.0023**	J	**0.0025**	J	**0.0037**	J	**0.003**	J	**0.002**	J	**0.0018**	J	**0.0023**	J	**0.0019**	J	**0.0019**	J	**0.0024**	J	**0.002**	J	**0.0016**	J
7439-92-1	Lead	**5**	mg/L	5	U	5	U	5	U	**0.01**	J	**0.0022**	J	**0.0052**	J	5	U	**0.0023**	J	**0.0032**	J	5	U	**0.013**	J	5	U	**0.027**	J
7439-97-6	Mercury	**0.2**	mg/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
7782-49-2	Selenium	**1**	mg/L	1	U	**0.016**	J	**0.0053**	J	1	U	**0.005**	J	1	U	1	U	**0.0065**	J	1	U	1	U	1	U	1	U	1	U
7440-22-4	Silver	5	mg/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U

Bolded > detection

Acronyms

mg/L - milligram per liter
CLP - Contract Laboratory Program
EPA - Environmental Protection Agency
FD - field duplicate
ID - identification
J - estimated result
TCLP - toxicity characteristic leaching procedure
N - normal
Q - qualifier
SO - soil
U - undetected
UJ - estimated undetected

Table 3-2A
Groundwater Sample Detections - VOCs
Former Duofold Corporation
Ilion, New York

Location ID					DF-MW-01		DF-MW-02		DF-MW-03		DF-MW-04		DF-MW-05		DF-MW-06		DF-MW-07		DF-MW-08		DF-MW-09		DF-MW-10		DF-MW-11		DF-MW-12		DF-MW-12		DF-TWP-02	
Sample Date					11/7/2016		11/7/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/9/2016		11/10/2016		11/10/2016		11/9/2016		11/9/2016		11/9/2016		11/8/2016		11/10/2016	
Sample ID					DF-MW-01-1		DF-MW-02-1		DF-MW-03-1		DF-MW-04-1		DF-MW-05-1		DF-MW-06-1		DF-MW-07		DF-MW-08-1		DF-MW-09-1		DF-MW-10-1		DF-MW-11-1		DF-MW-12-1		GW-900-1		DF-TWP-02-1	
Matrix					WG		WG		WG		WG		WG		WG		WG		WG		WG		WG		WG		WG		WG		WG	
Sample Type					N		N		N		N		N		N		N		N		N		N		N		N		FD		N	
Parent Sample Code																													DF-MW-12-1			
CLP #					BD4Q3		BD4Q4		BD4Q5		BD4Q6		BD4Q7		BD4Q8		BD4Q9		BD4R0		BD4R1		BD4R2		BD4R3		BD4R4		BDQN6		BD4R5	
CAS No.	Compound	EPA RSLs	NYSDEC AWQS	Unit	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
71-55-6	1,1,1-Trichloroethane	200	5	μg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
79-34-5	1,1,2,2-Tetrachloroethane	NL	5	μg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	NL	5	μg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	**0.67**		0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
79-00-5	1,1,2-Trichloroethane	5	1	μg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
75-34-3	1,1-Dichloroethane	NL	5	μg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
75-35-4	1,1-Dichloroethene	7	5	μg/L	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	**0.36**	J-	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	UJ
87-61-6	1,2,3-Trichlorobenzene	NL	5	μg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
120-82-1	1,2,4-Trichlorobenzene	70	5	μg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.2	0.04	μg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
106-93-4	1,2-Dibromoethane	0.05	0.0006	μg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
95-50-1	1,2-Dichlorobenzene	600	3	μg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
107-06-2	1,2-Dichloroethane	5	0.6	μg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
78-87-5	1,2-Dichloropropane	5	1	μg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
541-73-1	1,3-Dichlorobenzene	NL	3	μg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
106-46-7	1,4-Dichlorobenzene	75	3	μg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
78-93-3	2-Butanone (MEK)	NL	50	μg/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
591-78-6	2-Hexanone	NL	50	μg/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	NL	NL	μg/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
67-64-1	Acetone	NL	50	μg/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
71-43-2	Benzene	5	1	μg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	**0.15**	J	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
74-97-5	Bromochloromethane	NL	5	μg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
75-27-4	Bromodichloromethane	80	50	μg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
75-25-2	Bromoform	80	50	μg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
74-83-9	Bromomethane	NL	5	μg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
75-15-0	Carbon Disulfide	NL	60	μg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
56-23-5	Carbon Tetrachloride	5	5	μg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
108-90-7	Chlorobenzene	100	5	μg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
75-00-3	Chloroethane	NL	5	μg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
67-66-3	Chloroform	80	7	μg/L	**1.5**		0.5	U	0.5	U	**1.6**		0.5	U	**3.2**		**1.4**		**1.1**		0.5	U	0.5	U	**2.1**		0.5	U	0.5	U	0.5	U
74-87-3	Chloromethane	NL	5	μg/L	0.5	U	0.5	U	0.5	U	**0.33**	J	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
156-59-2	cis-1,2-Dichloroethene	70	5	μg/L	0.5	U	**26**		0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	**240**	J-	**0.38**	J	**64**		0.5	U	0.5	U	0.5	U	0.5	UJ
10061-01-5	cis-1,3-Dichloropropene	NL	0.4	μg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
110-82-7	Cyclohexane	NL	NL	μg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
124-48-1	Dibromochloromethane	80	50	μg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
75-71-8	Dichlorodifluoromethane	NL	5	μg/L	0.5	U	**0.5**	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
100-41-4	Ethylbenzene	700	5	μg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
98-82-8	Isopropylbenzene	NL	5	μg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
179601-23-1	M,P-Xylene	10000	19	μg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
79-20-9	Methyl Acetate	NL	NL	μg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1634-04-4	Methyl tert-butyl ether	NL	10	μg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
108-87-2	Methylcyclohexane	NL	NL	μg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
75-09-2	Methylene Chloride	5	5	μg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1.3	U	0.5	U	0.5	U
95-47-6	O-Xylene	10000	19	μg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
100-42-5	Styrene	100	5	μg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
127-18-4	Tetrachloroethene	5	5	μg/L	**1.6**		**3.3**		0.5	U	**0.55**		0.5	U	0.5	U	**3.2**		**1.1**		0.5	U	**3**		**0.22**	J	0.5	U	0.5	U	0.5	U
108-88-3	Toluene	1000	5	μg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U

Table 3-2A
Groundwater Sample Detections - VOCs
Former Duofold Corporation
Ilion, New York

				Location ID	DF-MW-01		DF-MW-02		DF-MW-03		DF-MW-04		DF-MW-05		DF-MW-06		DF-MW-07		DF-MW-08		DF-MW-09		DF-MW-10		DF-MW-11		DF-MW-12		DF-MW-12		DF-TWP-02	
				Sample Date	11/7/2016		11/7/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/9/2016		11/10/2016		11/10/2016		11/9/2016		11/9/2016		11/9/2016		11/8/2016		11/10/2016	
				Sample ID	DF-MW-01-1		DF-MW-02-1		DF-MW-03-1		DF-MW-04-1		DF-MW-05-1		DF-MW-06-1		DF-MW-07		DF-MW-08-1		DF-MW-09-1		DF-MW-10-1		DF-MW-11-1		DF-MW-12-1		GW-900-1		DF-TWP-02-1	
				Matrix	WG		WG		WG		WG		WG		WG		WG		WG		WG		WG		WG		WG		WG		WG	
				Sample Type	N		N		N		N		N		N		N		N		N		N		N		N		FD		N	
				Parent Sample Code																									DF-MW-12-1			
				CLP #	BD4Q3		BD4Q4		BD4Q5		BD4Q6		BD4Q7		BD4Q8		BD4Q9		BD4R0		BD4R1		BD4R2		BD4R3		BD4R4		BDQN6		BD4R5	
CAS No.	Compound	EPA RSLs	NYSDEC AWQS	Unit	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
156-60-5	Trans-1,2-Dichloroethene	100	5	µg/L	0.5	U	**17**		0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	**2**	J-	0.5	U	**4.6**		0.5	U	0.5	U	0.5	U	0.5	UJ
10061-02-6	Trans-1,3-Dichloropropene	NL	0.4	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
79-01-6	Trichloroethene	5	5	µg/L	**0.22**	J	**10**		0.5	U	**0.37**	J	0.5	U	0.5	U	**0.27**	J	**1.7**		**0.21**	J	**20**		**0.1**	J	0.5	U	0.5	U	0.5	U
75-69-4	Trichlorofluoromethane	NL	5	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
75-01-4	Vinyl Chloride	2	2	µg/L	0.5	U	**5.4**		0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	**11**		0.5	U	**5.8**		0.5	U	0.5	U	0.5	U	0.5	U

Bolded > detection

🟨 > NYSDEC AWQS

Acronyms

µg/L - microgram per liter

AWQS - Ambient Water Quality Standards

CLP - Contract Laboratory Program

EPA - Environmental Protection Agency

FD - Field Duplicate

ID - identification

J - estimated results

J- - biased low estimated result

N - normal

NL - not listed

NYSDEC - New York State Department of Environmental Conservation

Q - qualifier

RSLs - Regional Screening Levels

WG - groundwater

U - undetected

UJ - estimated undetected

Table 3-2A
Groundwater Sample Detections - VOCs
Former Duofold Corporation
Ilion, New York

				Location ID	DF-TWP-03		DF-TWP-03		DF-TWP-07		DF-TWP-09		DF-TWP-12		DF-TWP-14		DF-TWP-15		DF-TWP-16		DF-TWP-18		DF-TWP-19	
				Sample Date	11/10/2016		11/10/2016		11/10/2016		11/10/2016		11/11/2016		11/11/2016		11/11/2016		11/11/2016		11/10/2016		11/10/2016	
				Sample ID	DF-TWP-03-1		GW-900-2		DF-TWP-07-1		DF-TWP-09-1		DF-TWP-12-1		DF-TWP-14-1		DF-TWP-15-1		DF-TWP-16-1		DF-TWP-18-1		DF-TWP-19-1	
				Matrix	WG		WG		WG		WG		WG		WG		WG		WG		WG		WG	
				Sample Type	N		FD		N		N		N		N		N		N		N		N	
				Parent Sample Code			DF-TWP-03-1																	
				CLP #	BD4R6		BDQN7		BD4R7		BD4R8		BD4R9		BDQN1		BDQN2		BDQN3		BDQN4		BDQN5	
CAS No.	Compound	EPA RSLs	NYSDEC AWQS	Unit	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
71-55-6	1,1,1-Trichloroethane	200	5	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
79-34-5	1,1,2,2-Tetrachloroethane	NL	5	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	NL	5	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	**0.34**	J	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
79-00-5	1,1,2-Trichloroethane	5	1	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
75-34-3	1,1-Dichloroethane	NL	5	µg/L	0.5	U	0.5	U	0.5	U	**0.14**	J	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	**0.24**	J
75-35-4	1,1-Dichloroethene	7	5	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	UJ	0.5	UJ	**1.4**	J-	**0.3**	J-	0.5	U	0.5	U
87-61-6	1,2,3-Trichlorobenzene	NL	5	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
120-82-1	1,2,4-Trichlorobenzene	70	5	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.2	0.04	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
106-93-4	1,2-Dibromoethane	0.05	0.0006	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
95-50-1	1,2-Dichlorobenzene	600	3	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
107-06-2	1,2-Dichloroethane	5	0.6	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
78-87-5	1,2-Dichloropropane	5	1	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
541-73-1	1,3-Dichlorobenzene	NL	3	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
106-46-7	1,4-Dichlorobenzene	75	3	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
78-93-3	2-Butanone (MEK)	NL	50	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
591-78-6	2-Hexanone	NL	50	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	NL	NL	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
67-64-1	Acetone	NL	50	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
71-43-2	Benzene	5	1	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	**0.3**	J	0.5	U	0.5	U	0.5	U
74-97-5	Bromochloromethane	NL	5	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
75-27-4	Bromodichloromethane	80	50	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
75-25-2	Bromoform	80	50	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
74-83-9	Bromomethane	NL	5	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U
75-15-0	Carbon Disulfide	NL	60	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U
56-23-5	Carbon Tetrachloride	5	5	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
108-90-7	Chlorobenzene	100	5	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
75-00-3	Chloroethane	NL	5	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U
67-66-3	Chloroform	80	7	µg/L	0.5	U	0.5	U	**5.1**		0.5	U	**1.3**		0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
74-87-3	Chloromethane	NL	5	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U
156-59-2	cis-1,2-Dichloroethene	70	5	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	**0.33**	J-	**2.1**	J-	**340**	J-	**110**	J-	0.5	U	**1.7**	
10061-01-5	cis-1,3-Dichloropropene	NL	0.4	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
110-82-7	Cyclohexane	NL	NL	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
124-48-1	Dibromochloromethane	80	50	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
75-71-8	Dichlorodifluoromethane	NL	5	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U
100-41-4	Ethylbenzene	700	5	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
98-82-8	Isopropylbenzene	NL	5	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	UJ	0.5	UJ	0.5	U	0.5	UJ	0.5	U	0.5	U
179601-23-1	M,P-Xylene	10000	19	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
79-20-9	Methyl Acetate	NL	NL	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1634-04-4	Methyl tert-butyl ether	NL	10	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
108-87-2	Methylcylohexane	NL	NL	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
75-09-2	Methylene Chloride	5	5	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
95-47-6	O-Xylene	10000	19	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
100-42-5	Styrene	100	5	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
127-18-4	Tetrachloroethene	5	5	µg/L	0.5	U	0.5	U	0.5	U	**0.29**	J	**2.8**		**2.2**		0.5	U	**2**		0.5	U	**1.9**	
108-88-3	Toluene	1000	5	µg/L	**0.11**	J	**0.1**	J	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U

Table 3-2A
Groundwater Sample Detections - VOCs
Former Duofold Corporation
Ilion, New York

				Location ID	DF-TWP-03		DF-TWP-03		DF-TWP-07		DF-TWP-09		DF-TWP-12		DF-TWP-14		DF-TWP-15		DF-TWP-16		DF-TWP-18		DF-TWP-19	
				Sample Date	11/10/2016		11/10/2016		11/10/2016		11/10/2016		11/11/2016		11/11/2016		11/11/2016		11/11/2016		11/10/2016		11/10/2016	
				Sample ID	DF-TWP-03-1		GW-900-2		DF-TWP-07-1		DF-TWP-09-1		DF-TWP-12-1		DF-TWP-14-1		DF-TWP-15-1		DF-TWP-16-1		DF-TWP-18-1		DF-TWP-19-1	
				Matrix	WG		WG		WG		WG		WG		WG		WG		WG		WG		WG	
				Sample Type	N		FD		N		N		N		N		N		N		N		N	
				Parent Sample Code			DF-TWP-03-1																	
				CLP #	BD4R6		BDQN7		BD4R7		BD4R8		BD4R9		BDQN1		BDQN2		BDQN3		BDQN4		BDQN5	
CAS No.	Compound	EPA RSLs	NYSDEC AWQS	Unit	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
156-60-5	Trans-1,2-Dichloroethene	100	5	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	UJ	**0.23**	J-	**14**	J-	**8.1**	J-	0.5	U	0.5	U
10061-02-6	Trans-1,3-Dichloropropene	NL	0.4	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
79-01-6	Trichloroethene	5	5	µg/L	0.5	U	0.5	U	**0.16**	J	**0.54**		**1.8**		**34**		**0.77**		**5.8**		0.5	U	**2.2**	
75-69-4	Trichlorofluoromethane	NL	5	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
75-01-4	Vinyl Chloride	2	2	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	**0.44**	J	0.5	U	**2.4**		**33**		0.5	U	0.5	U

Bolded > detection

🟧 > NYSDEC AWQS

Acronyms

µg/L - microgram per liter

AWQS - Ambient Water Quality Standards

CLP - Contract Laboratory Program

EPA - Environmental Protection Agency

FD - Field Duplicate

ID - identification

J - estimated results

J- - biased low estimated result

N - normal

NL - not listed

NYSDEC - New York State Department of Environmental Conservation

Q - qualifier

RSLs - Regional Screening Levels

WG - groundwater

U - undetected

UJ - estimated undetected

Table 3-2B
Groundwater Sample Detections - SVOCs
Former Duofold Corporation
Ilion, New York

				Location ID	DF-MW-01		DF-MW-02		DF-MW-03		DF-MW-04		DF-MW-05		DF-MW-05		DF-MW-06		DF-MW-07		DF-MW-10		DF-MW-11		DF-MW-12		DF-MW-08	
				Sample Date	11/7/2016		11/7/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/9/2016		11/9/2016		11/9/2016		11/9/2016		11/10/2016	
				Sample ID	DF-MW-01-1		DF-MW-02-1		DF-MW-03-1		DF-MW-04-1		DF-MW-05-1		GW-900-1		DF-MW-06-1		DF-MW-07-1		DF-MW-10-1		DF-MW-11-1		DF-MW-12-1		DF-MW-08-1	
				Matrix	WG		WG		WG		WG		WG		WG		WG		WG		WG		WG		WG		WG	
				Sample Type	N		N		N		N		N		FD		N		N		N		N		N		N	
				Parent Sample Code											DF-MW-05-1													
				CLP #	BD4Q3		BD4Q4		BD4Q5		BD4Q6		BD4Q7		BDQN6		BD4Q8		BD4Q9		BD4R2		BD4R3		BD4R4		BD4R0	
CAS No.	Compound	EPA RSLs	NYSDEC AWQS	Unit	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
92-52-4	1,1'-Biphenyl	NL	5	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
95-94-3	1,2,4,5-Tetrachlorobenzene	NL	5	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
123-91-1	1,4-Dioxane	NL	NL	µg/L	2	U	2.1	UJ	2	UJ	2	UJ	2	UJ	2	UJ	2	UJ	2	UJ	2	UJ	2	UJ	2	UJ	2	UJ
108-60-1	2,2'-Oxybis(1-chloropropane)	NL	5	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
58-90-2	2,3,4,6-Tetrachlorophenol	NL	NL	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
95-95-4	2,4,5-Trichlorophenol	NL	NL	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
88-06-2	2,4,6-Trichlorophenol	NL	NL	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
120-83-2	2,4-Dichlorophenol	NL	5	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
105-67-9	2,4-Dimethylphenol	NL	50	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
51-28-5	2,4-Dinitrophenol	NL	10	µg/L	10	U	10	U	10	U	10	U	10	UJ	10	U	10	U	10	U	10	U	10	U	10	U	10	U
121-14-2	2,4-Dinitrotoluene	NL	5	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
606-20-2	2,6-Dinitrotoluene	NL	5	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
91-58-7	2-Chloronaphthalene	NL	NL	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
95-57-8	2-Chlorophenol	NL	NL	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
91-57-6	2-Methylnaphthalene	NL	NL	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
95-48-7	2-Methylphenol	NL	NL	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
88-74-4	2-Nitroaniline	NL	5	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	UJ	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
88-75-5	2-Nitrophenol	NL	NL	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
91-94-1	3,3'-Dichlorobenzidine	NL	5	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
99-09-2	3-Nitroaniline	NL	5	µg/L	10	U	10	U	10	U	10	U	10	UJ	10	U	10	U	10	U	10	U	10	U	10	U	10	U
534-52-1	4,6-Dinitro-2-methylphenol	NL	NL	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
101-55-3	4-Bromophenyl-phenylether	NL	NL	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
59-50-7	4-Chloro-3-methylphenol	NL	NL	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
7005-72-3	4-Chlorophenyl-phenylether	NL	NL	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
106-44-5	4-Methylphenol	NL	NL	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
100-01-6	4-Nitroaniline	NL	5	µg/L	10	U	10	U	10	U	10	U	10	UJ	10	U	10	U	10	U	10	U	10	U	10	U	10	U
100-02-7	4-Nitrophenol	NL	NL	µg/L	10	U	10	U	10	U	10	U	10	UJ	10	U	10	U	10	U	10	U	10	U	10	U	10	U
83-32-9	Acenaphthene	NL	NL	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
208-96-8	Acenaphthylene	NL	NL	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
98-86-2	Acetophenone	NL	NL	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
120-12-7	Anthracene	NL	50	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
1912-24-9	Atrazine	3	7.5	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
100-52-7	Benzaldehyde	NL	NL	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
56-55-3	Benzo(a)anthracene	NL	0.002	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
50-32-8	Benzo(a)pyrene	0.2	NL	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
205-99-2	Benzo(b)fluoranthene	NL	0.002	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
191-24-2	Benzo(g,h,i)perylene	NL	NL	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
207-08-9	Benzo(k)fluoranthene	NL	0.002	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
111-91-1	Bis(2-chloroethoxy)methane	NL	5	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
111-44-4	Bis(2-chloroethyl)ether	NL	1	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
117-81-7	Bis(2-ethylhexyl)phthalate	6	5	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
105-60-2	Caprolactam	NL	NL	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
86-74-8	Carbazole	NL	NL	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
53-70-3	Dibenzo(a,h)anthracene	NL	NL	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
132-64-9	Dibenzofuran	NL	NL	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
84-66-2	Diethylphthalate	NL	50	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U

Table 3-2B
Groundwater Sample Detections - SVOCs
Former Duofold Corporation
Ilion, New York

				Location ID	DF-MW-01		DF-MW-02		DF-MW-03		DF-MW-04		DF-MW-05		DF-MW-05		DF-MW-06		DF-MW-07		DF-MW-10		DF-MW-11		DF-MW-12		DF-MW-08	
				Sample Date	11/7/2016		11/7/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/9/2016		11/9/2016		11/9/2016		11/9/2016		11/10/2016	
				Sample ID	DF-MW-01-1		DF-MW-02-1		DF-MW-03-1		DF-MW-04-1		DF-MW-05-1		GW-900-1		DF-MW-06-1		DF-MW-07-1		DF-MW-10-1		DF-MW-11-1		DF-MW-12-1		DF-MW-08-1	
				Matrix	WG		WG		WG		WG		WG		WG		WG		WG		WG		WG		WG		WG	
				Sample Type	N		N		N		N		N		FD		N		N		N		N		N		N	
				Parent Sample Code											DF-MW-05-1													
				CLP #	BD4Q3		BD4Q4		BD4Q5		BD4Q6		BD4Q7		BDQN6		BD4Q8		BD4Q9		BD4R2		BD4R3		BD4R4		BD4R0	
CAS No.	Compound	EPA RSLs	NYSDEC AWQS	Unit	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
131-11-3	Dimethylphthalate	NL	50	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
84-74-2	Di-n-butylphthalate	NL	50	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
117-84-0	Di-n-octylphthalate	NL	50	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
206-44-0	Fluoranthene	NL	50	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
86-73-7	Fluorene	NL	50	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
118-74-1	Hexachlorobenzene	1	0.04	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
87-68-3	Hexachlorobutadiene	NL	0.5	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
77-47-4	Hexachlorocyclopentadiene	50	5	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
67-72-1	Hexachloroethane	NL	5	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
193-39-5	Indeno(1,2,3-cd)pyrene	NL	0.002	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
78-59-1	Isophorone	NL	50	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
91-20-3	Naphthalene	NL	NL	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
98-95-3	Nitrobenzene	NL	0.4	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
621-64-7	N-Nitroso-di-n-propylamine	NL	NL	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
86-30-6	N-Nitrosodiphenylamine 1	NL	50	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
87-86-5	Pentachlorophenol	1	2	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
85-01-8	Phenanthrene	NL	50	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U
108-95-2	Phenol	NL	2	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
129-00-0	Pyrene	NL	50	µg/L	5.1	U	5.2	U	5.1	U	5.1	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5	U	5	U	5.1	U

Acronyms

µg/L - microgram per liter
AWQS - Ambient Water Quality Standards
CLP - Contract Laboratory Program
EPA - Environmental Protection Agency
FD - Field Duplicate
ID - identification
N - normal
NL - not listed
NYSDEC - New York State Department of Environmental Conservation
Q - qualifier
RSLs - Regional Screening Levels
WG - groundwater
U - undetected
UJ - estimated undetected

Table 3-2B
Groundwater Sample Detections - SVOCs
Former Duofold Corporation
Ilion, New York

				Location ID	DF-MW-09		DF-TWP-02		DF-TWP-03		DF-TWP-03		DF-TWP-07		DF-TWP-09		DF-TWP-12		DF-TWP-14		DF-TWP-15		DF-TWP-16		DF-TWP-18		DF-TWP-19	
				Sample Date	11/10/2016		11/10/2016		11/10/2016		11/10/2016		11/10/2016		11/10/2016		11/11/2016		11/11/2016		11/11/2016		11/11/2016		11/10/2016		11/10/2016	
				Sample ID	DF-MW-09-1		DF-TWP-02-1		DF-TWP-03-1		GW-900-2		DF-TWP-07-1		DF-TWP-09-1		DF-TWP-12-1		DF-TWP-14-1		DF-TWP-15-1		DF-TWP-16-1		DF-TWP-18-1		DF-TWP-19-1	
				Matrix	WG		WG		WG		WG		WG		WG		WG		WG		WG		WG		WG		WG	
				Sample Type	N		N		N		N		N		N		N		N		N		N		N		N	
				Parent Sample Code							DF-TWP-03-1																	
				CLP #	BD4R1		BD4R5		BD4R6		BDQN7		BD4R7		BD4R8		BD4R9		BDQN1		BDQN2		BDQN3		BDQN4		BDQN5	
CAS No.	Compound	EPA RSLs	NYSDEC AWQS	Unit	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
92-52-4	1,1'-Biphenyl	NL	5	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
95-94-3	1,2,4,5-Tetrachlorobenzene	NL	5	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
123-91-1	1,4-Dioxane	NL	NL	µg/L	2	UJ	2	UJ	2	UJ	2	UJ	2	UJ	2	UJ	2	UJ	2	UJ	2	UJ	2	UJ	2	UJ	2	UJ
108-60-1	2,2'-Oxybis(1-chloropropane)	NL	5	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
58-90-2	2,3,4,6-Tetrachlorophenol	NL	NL	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
95-95-4	2,4,5-Trichlorophenol	NL	NL	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
88-06-2	2,4,6-Trichlorophenol	NL	NL	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
120-83-2	2,4-Dichlorophenol	NL	5	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
105-67-9	2,4-Dimethylphenol	NL	50	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
51-28-5	2,4-Dinitrophenol	NL	10	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
121-14-2	2,4-Dinitrotoluene	NL	5	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
606-20-2	2,6-Dinitrotoluene	NL	5	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
91-58-7	2-Chloronaphthalene	NL	NL	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
95-57-8	2-Chlorophenol	NL	NL	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
91-57-6	2-Methylnaphthalene	NL	NL	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
95-48-7	2-Methylphenol	NL	NL	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
88-74-4	2-Nitroaniline	NL	5	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
88-75-5	2-Nitrophenol	NL	NL	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
91-94-1	3,3'-Dichlorobenzidine	NL	5	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
99-09-2	3-Nitroaniline	NL	5	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
534-52-1	4,6-Dinitro-2-methylphenol	NL	NL	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
101-55-3	4-Bromophenyl-phenylether	NL	NL	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
59-50-7	4-Chloro-3-methylphenol	NL	NL	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
7005-72-3	4-Chlorophenyl-phenylether	NL	NL	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
106-44-5	4-Methylphenol	NL	NL	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
100-01-6	4-Nitroaniline	NL	5	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
100-02-7	4-Nitrophenol	NL	NL	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
83-32-9	Acenaphthene	NL	NL	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
208-96-8	Acenaphthylene	NL	NL	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
98-86-2	Acetophenone	NL	NL	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
120-12-7	Anthracene	NL	50	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
1912-24-9	Atrazine	3	7.5	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
100-52-7	Benzaldehyde	NL	NL	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
56-55-3	Benzo(a)anthracene	NL	0.002	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
50-32-8	Benzo(a)pyrene	0.2	NL	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
205-99-2	Benzo(b)fluoranthene	NL	0.002	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
191-24-2	Benzo(g,h,i)perylene	NL	NL	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
207-08-9	Benzo(k)fluoranthene	NL	0.002	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
111-91-1	Bis(2-chloroethoxy)methane	NL	5	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
111-44-4	Bis(2-chloroethyl)ether	NL	1	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
117-81-7	Bis(2-ethylhexyl)phthalate	6	5	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
105-60-2	Caprolactam	NL	NL	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
86-74-8	Carbazole	NL	NL	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
53-70-3	Dibenzo(a,h)anthracene	NL	NL	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
132-64-9	Dibenzofuran	NL	NL	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
84-66-2	Diethylphthalate	NL	50	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U

Table 3-2B
Groundwater Sample Detections - SVOCs
Former Duofold Corporation
Ilion, New York

				Location ID	DF-MW-09		DF-TWP-02		DF-TWP-03		DF-TWP-03		DF-TWP-07		DF-TWP-09		DF-TWP-12		DF-TWP-14		DF-TWP-15		DF-TWP-16		DF-TWP-18		DF-TWP-19	
				Sample Date	11/10/2016		11/10/2016		11/10/2016		11/10/2016		11/10/2016		11/10/2016		11/11/2016		11/11/2016		11/11/2016		11/11/2016		11/10/2016		11/10/2016	
				Sample ID	DF-MW-09-1		DF-TWP-02-1		DF-TWP-03-1		GW-900-2		DF-TWP-07-1		DF-TWP-09-1		DF-TWP-12-1		DF-TWP-14-1		DF-TWP-15-1		DF-TWP-16-1		DF-TWP-18-1		DF-TWP-19-1	
				Matrix	WG		WG		WG		WG		WG		WG		WG		WG		WG		WG		WG		WG	
				Sample Type	N		N		N		N		N		N		N		N		N		N		N		N	
				Parent Sample Code							DF-TWP-03-1																	
				CLP #	BD4R1		BD4R5		BD4R6		BDQN7		BD4R7		BD4R8		BD4R9		BDQN1		BDQN2		BDQN3		BDQN4		BDQN5	
CAS No.	Compound	EPA RSLs	NYSDEC AWQS	Unit	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
131-11-3	Dimethylphthalate	NL	50	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
84-74-2	Di-n-butylphthalate	NL	50	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
117-84-0	Di-n-octylphthalate	NL	50	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
206-44-0	Fluoranthene	NL	50	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
86-73-7	Fluorene	NL	50	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
118-74-1	Hexachlorobenzene	1	0.04	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
87-68-3	Hexachlorobutadiene	NL	0.5	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
77-47-4	Hexachlorocyclopentadiene	50	5	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
67-72-1	Hexachloroethane	NL	5	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
193-39-5	Indeno(1,2,3-cd)pyrene	NL	0.002	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
78-59-1	Isophorone	NL	50	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
91-20-3	Naphthalene	NL	NL	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
98-95-3	Nitrobenzene	NL	0.4	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
621-64-7	N-Nitroso-di-n-propylamine	NL	NL	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
86-30-6	N-Nitrosodiphenylamine 1	NL	50	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
87-86-5	Pentachlorophenol	1	2	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
85-01-8	Phenanthrene	NL	50	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
108-95-2	Phenol	NL	2	µg/L	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
129-00-0	Pyrene	NL	50	µg/L	5	U	5	U	5	U	5	U	5.1	U	5	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U

Acronyms

µg/L - microgram per liter
AWQS - Ambient Water Quality Standards
CLP - Contract Laboratory Program
EPA - Environmental Protection Agency
FD - Field Duplicate
ID - identification
N - normal
NL - not listed
NYSDEC - New York State Department of Environmental Conservation
Q - qualifier
RSLs - Regional Screening Levels
WG - groundwater
U - undetected
UJ - estimated undetected

Table 3-2C
Groundwater Sample Detections - Metals
Former Duofold Corporation
Ilion, New York

				Location ID	DF-MW-01				DF-MW-02				DF-MW-03				DF-MW-04			
				Sample Date	11/7/2016		11/7/2016		11/7/2016		11/7/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016	
				Sample ID	DF-MW-01-1		DF-MW-01-1-F		DF-MW-02-1		DF-MW-02-1-F		DF-MW-03-1		DF-MW-03-1-F		DF-MW-04-1		DF-MW-04-1-F	
				Matrix	WG		WG		WG		WG		WG		WG		WG		WG	
				Sample Type	N		N		N		N		N		N		N		N	
				Parent Sample Code																
				CLP #	MBD4Q3		MBDQP4		MBD4Q4		MBDQP5		MBD4Q5		MBDQP6		MBD4Q6		MBDQP7	
CAS No.	Compound	EPA RSLs	NYSDEC AWQS	Unit	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
7429-90-5	Aluminum	NL	NL	µg/L	**22.3**		20	U	**11.4**	J	**26.9**		**73.5**		**1.7**	J	**19.7**		20	U
7440-36-0	Antimony	6	3	µg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
7440-38-2	Arsenic	10	25	µg/L	**0.76**	J	**0.18**	J	**1.9**		**0.82**	J	**15.2**		**6.5**		**0.34**	J	**0.17**	J
7440-39-3	Barium	2000	1000	µg/L	**62.8**		**61**		**77.7**		**74.6**		**204**		**193**		**69.9**		**66.5**	
7440-41-7	Beryllium	4	3	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
7440-43-9	Cadmium	5	5	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
7440-70-2	Calcium Metal	NL	NL	µg/L	**138000**		**135000**		**146000**		**142000**		**217000**		**209000**		**125000**		**125000**	
7440-47-3	Chromium	100	50	µg/L	2	U	2	U	2	U	2	U	**0.07**	J	2	U	**38**		**38.5**	
7440-48-4	Cobalt	NL	NL	µg/L	1	U	1	U	**0.24**	J	**0.24**	J	**0.94**	J	**0.89**	J	1	U	1	U
7440-50-8	Copper	1300	200	µg/L	**0.3**	J	**0.95**	J	**0.42**	J	**1.3**	J	2		**0.14**	J	**0.72**	J	**0.73**	J
7439-89-6	Iron	NL	300	µg/L	**484**		**37**	J	**953**		**393**		**6170**		**4240**		**35.8**	J	**7.6**	J
7439-92-1	Lead	15	25	µg/L	**0.13**	J	1	U	**0.15**	J	**0.07**	J	**0.6**	J	1	U	**0.08**	J	1	U
7439-95-4	Magnesium	NL	35000	µg/L	**20600**		**20300**		**20600**		**21000**		**26000**		**26000**		**19200**		**19100**	
7439-96-5	Manganese	NL	300	µg/L	**83.2**		**70.5**		**944**		**894**		**5320**		**5280**		**194**		**24.7**	
7440-02-0	Nickel	NL	100	µg/L	**0.08**	J	**0.16**	J	**0.42**	J	**0.35**	J	1.1		1		**0.91**	J	**0.27**	J
7440-09-7	Potassium	NL	NL	µg/L	**3390**		**3350**		**1630**		**1710**		**1350**		**1350**		**3600**		**3570**	
7782-49-2	Selenium	50	10	µg/L	**4.3**	J	**4.8**	J	2.1	J	**2**	J	5	UJ	5	UJ	**2.2**	J	**2.4**	J
7440-22-4	Silver	NL	50	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
7440-23-5	Sodium	NL	20,000	µg/L	**32200**		**32000**		**27600**		**28600**		**14800**		**14900**		**42100**		**41600**	
7440-28-0	Thallium	2	0.5	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
7440-62-2	Vanadium	NL	NL	µg/L	**0.18**	J	**0.03**	J	**0.69**	J	**0.32**	J	**0.79**	J	**0.03**	J	**0.12**	J	**0.05**	J
7440-66-6	Zinc	NL	2000	µg/L	**0.82**	J	**2.1**		**1.8**	J	**3.8**		**2.2**		**1.8**	J	**1.4**	J	**3**	

Bolded >detection
🟧 > NYSDEC AWQS

Acronyms
µg/L - microgram per liter
AWQS - Ambient Water Quality Standards
CLP - Contract Laboratory Program
EPA - Environmental Protection Agency
FD - Field Duplicate
ID - identification
J - estimated results
N - normal
NL - not listed
NYSDEC - New York State Department of Environmental Conservation
Q - qualifier
RSLs - Regional Screening Levels
WG - groundwater
U - undetected

Table 3-2C
Groundwater Sample Detections - Metals
Former Duofold Corporation
Ilion, New York

Location ID					DF-MW-05								DF-MW-06				DF-MW-07				DF-MW-08			
Sample Date					11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/8/2016		11/9/2016		11/9/2016		11/10/2016		11/10/2016	
Sample ID					DF-MW-05-1		GW-900-1		DF-MW-05-1-F		GW-900-1-F		DF-MW-06-1		DF-MW-06-1-F		DF-MW-07-1		DF-MW-07-1-F		DF-MW-08-1		DF-MW-08-1-F	
Matrix					WG		WG		WG		WG		WG		WG		WG		WG		WG		WG	
Sample Type					N		FD		N		FD		N		N		N		N		N		N	
Parent Sample Code							DF-MW-05-1				DF-MW-05-1-F													
CLP #					MBD4Q7		MBDQN6		MBDQP8		MBDQR6		MBD4Q8		MBDQP9		MBD4Q9		MBDQQ0		MBD4R0		MBDQQ1	
CAS No.	Compound	EPA RSLs	NYSDEC AWQS	Unit	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
7429-90-5	Aluminum	NL	NL	µg/L	**6.4**	J	**3.8**	J	20	U	**3**	J	**16.9**	J	**2.4**	J	**46.4**		**1.8**	J	**21.4**		20	U
7440-36-0	Antimony	6	3	µg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
7440-38-2	Arsenic	10	25	µg/L	**0.12**	J	1	U	1	U	1	U	**0.17**	J	**0.12**	J	**0.14**	J	**0.11**	J	**3.1**		**2.3**	
7440-39-3	Barium	2000	1000	µg/L	**65.6**		**65.4**		**66.9**		**65.8**		**60.5**		**60**		**84.1**		**84.1**		**86.1**		**80.5**	
7440-41-7	Beryllium	4	3	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
7440-43-9	Cadmium	5	5	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
7440-70-2	Calcium Metal	NL	NL	µg/L	**142000**		**143000**		**144000**		**141000**		**132000**		**131000**		**152000**		**153000**		**113000**		**110000**	
7440-47-3	Chromium	100	50	µg/L	0.08	J	**0.07**	J	2	U	2	U	2	U	2	U	**0.21**	J	**0.18**	J	**7.4**		**6**	
7440-48-4	Cobalt	NL	NL	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
7440-50-8	Copper	1300	200	µg/L	**0.39**	J	**0.38**	J	**0.75**	J	**0.5**	J	**0.21**	J	**0.54**	J	**0.47**	J	**0.86**	J	**0.23**	J	**0.34**	J
7439-89-6	Iron	NL	300	µg/L	**17.4**	J	**16.7**	J	**9.6**	J	**10.9**	J	**33.3**	J	**9.3**	J	**42.8**	J	**10.5**	J	**2390**		**1860**	
7439-92-1	Lead	15	25	µg/L	1	U	1	U	1	U	1	U	**0.16**	J	1	U	**0.18**	J	1	U	**0.09**	J	1	U
7439-95-4	Magnesium	NL	35000	µg/L	**13600**		**13800**		**13500**		**13700**		**21800**		**21700**		**21700**		**21400**		**15700**		**15700**	
7439-96-5	Manganese	NL	300	µg/L	**0.78**	J	**0.64**	J	**0.86**	J	**1.2**		**5.2**		**0.85**	J	**10.9**		**0.6**	J	**343**		**341**	
7440-02-0	Nickel	NL	100	µg/L	1	U	1	U	**0.2**	J	1	U	1	U	1	U	**0.19**	J	**0.07**	J	**0.14**	J	**0.17**	J
7440-09-7	Potassium	NL	NL	µg/L	**2110**		**2130**		**2090**		**2110**		**3060**		**3110**		**2720**		**2690**		**2730**		**2730**	
7782-49-2	Selenium	50	10	µg/L	**2.4**	J	**2.9**	J	**2.2**	J	**1.9**	J	**2.7**	J	**2.8**	J	**2.2**	J	**2.8**	J	**1.4**	J	**2.5**	J
7440-22-4	Silver	NL	50	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
7440-23-5	Sodium	NL	20,000	µg/L	**7590**		**7730**		**7510**		**7650**		**45300**		**45600**		**44600**		**44300**		**39200**		**38600**	
7440-28-0	Thallium	2	0.5	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
7440-62-2	Vanadium	NL	NL	µg/L	**0.06**	J	**0.05**	J	**0.05**	J	**0.06**	J	**0.08**	J	**0.04**	J	**0.1**	J	**0.06**	J	**0.14**	J	**0.06**	J
7440-66-6	Zinc	NL	2000	µg/L	**0.43**	J	**0.35**	J	**1.3**	J	**0.41**	J	**0.53**	J	**1.1**	J	**0.82**	J	**2.3**		**0.83**	J	**0.71**	J

Bolded >detection

🟧 > NYSDEC AWQS

Acronyms

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N - normal

NL - not listed

NYSDEC - New York State Department of Environmental Con

Q - qualifier

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Table 3-2C
Groundwater Sample Detections - Metals
Former Duofold Corporation
Ilion, New York

				Location ID	DF-MW-09				DF-MW-10				DF-MW-11				DF-MW-12				DF-TWP-02			
				Sample Date	11/10/2016		11/10/2016		11/9/2016		11/9/2016		11/9/2016		11/9/2016		11/9/2016		11/9/2016		11/10/2016		11/10/2016	
				Sample ID	DF-MW-09-1		DF-MW-09-1-F		DF-MW-10-1		DF-MW-10-1-F		DF-MW-11-1		DF-MW-11-1-F		DF-MW-12-1		DF-MW-12-1-F		DF-TWP-02-1		DF-TWP-02-1-F	
				Matrix	WG		WG		WG		WG		WG		WG		WG		WG		WG		WG	
				Sample Type	N		N		N		N		N		N		N		N		N		N	
				Parent Sample Code																				
				CLP #	MBD4R1		MBDQQ2		MBD4R2		MBDQQ3		MBD4R3		MBDQQ4		MBD4R4		MBDQQ5		MBD4R5		MBDQQ6	
CAS No.	Compound	EPA RSLs	NYSDEC AWQS	Unit	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
7429-90-5	Aluminum	NL	NL	µg/L	**26.8**		**3.8**	J	**19.6**		20	U	**14.7**	J	**2.4**	J	**121**		20	U	**67.2**		**1.4**	J
7440-36-0	Antimony	6	3	µg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
7440-38-2	Arsenic	10	25	µg/L	**0.48**	J	**0.29**	J	**0.17**	J	**0.12**	J	**0.15**	J	**0.11**	J	**0.32**	J	1	U	**12.1**		**11.5**	
7440-39-3	Barium	2000	1000	µg/L	**126**		**118**		**78.1**		**76.8**		**71.5**		**70.7**		**61.2**		**58.2**		**90.4**		**85.4**	
7440-41-7	Beryllium	4	3	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
7440-43-9	Cadmium	5	5	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
7440-70-2	Calcium Metal	NL	NL	µg/L	**246000**		**230000**		**137000**		**136000**		**145000**		**144000**		**129000**		**125000**		**180000**		**171000**	
7440-47-3	Chromium	100	50	µg/L	2	U	2	U	2	U	2	U	**0.45**	J	**0.42**	J	**0.11**	J	2	U	2	U	2	U
7440-48-4	Cobalt	NL	NL	µg/L	**0.25**	J	**0.29**	J	**0.42**	J	**0.32**	J	1	U	1	U	**0.08**	J	1	U	**0.74**	J	**0.61**	J
7440-50-8	Copper	1300	200	µg/L	**0.88**	J	**1.4**	J	**0.54**	J	**0.62**	J	**0.36**	J	**0.65**	J	**0.81**	J	**0.51**	J	**6**		**1.1**	J
7439-89-6	Iron	NL	300	µg/L	**209**		**28.9**	J	**30**	J	**12.6**	J	**27.4**	J	**9.8**	J	**149**	J	**10.5**	J	**8870**		**8540**	
7439-92-1	Lead	15	25	µg/L	**0.72**	J	**0.07**	J	**0.16**	J	1	U	**0.18**	J	1	U	**0.39**	J	1	U	**13.7**		**0.23**	J
7439-95-4	Magnesium	NL	35000	µg/L	**21000**		**20700**		**17900**		**17900**		**21100**		**21200**		**20200**		**18900**		**10100**		**9750**	
7439-96-5	Manganese	NL	300	µg/L	**1010**		**984**		**1280**		**1220**		**26.7**		**2.5**		**39.2**		**3.1**		**553**		**544**	
7440-02-0	Nickel	NL	100	µg/L	1.5		1.4		0.83	J	0.76	J	0.28	J	**0.24**	J	**0.43**	J	**0.09**	J	**1.8**		**1.4**	
7440-09-7	Potassium	NL	NL	µg/L	**5920**		**5900**		**3020**		**3040**		**2800**		**2840**		**2560**		**2540**		**3690**		**3670**	
7782-49-2	Selenium	50	10	µg/L	**4.2**	J	**3.9**	J	5	UJ	5	UJ	**4.3**	J	**3.5**	J	**2**	J	**1.8**	J	**21.1**	J	**18.7**	J
7440-22-4	Silver	NL	50	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
7440-23-5	Sodium	NL	20,000	µg/L	**6200**		**8900**		**28300**		**28800**		**47800**		**48200**		**49700**		**49500**		**2830**		**2840**	
7440-28-0	Thallium	2	0.5	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
7440-62-2	Vanadium	NL	NL	µg/L	**0.52**	J	**0.4**	J	**0.05**	J	**0.03**	J	**0.09**	J	**0.06**	J	**0.29**	J	**0.05**	J	**0.38**	J	**0.11**	J
7440-66-6	Zinc	NL	2000	µg/L	**6.3**		**6.8**		**1**	J	**1.6**	J	**2.1**		**2.3**		**1.7**	J	**1**	J	**10.2**		**9.2**	

Bolded >detection

🟧 > NYSDEC AWQS

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NL - not listed

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Table 3-2C
Groundwater Sample Detections - Metals
Former Duofold Corporation
Ilion, New York

				Location ID	DF-TWP-03								DF-TWP-07				DF-TWP-18				DF-TWP-19			
				Sample Date	11/10/2016		11/10/2016		11/10/2016		11/10/2016		11/10/2016		11/10/2016		11/10/2016		11/10/2016		11/10/2016		11/10/2016	
				Sample ID	DF-TWP-03-1		GW-900-2		DF-TWP-03-1-F		GW-900-2-F		DF-TWP-07-1		DF-TWP-07-1-F		DF-TWP-18-1		DF-TWP-18-1-F		DF-TWP-19-1		DF-TWP-19-1	
				Matrix	WG		WG		WG		WG		WG		WG		WG		WG		WG		WG	
				Sample Type	N		FD		N		FD		N		N		N		N		N		N	
				Parent Sample Code			DF-TWP-03-1				DF-TWP-03-1-F													
				CLP #	MBD4R6		MBDQN7		MBDQQ7		MBDQR7		MBD4R7		MBDQQ8		MBDQN4		MBDQR4		MBDQN5		MBDQR5	
CAS No.	Compound	EPA RSLs	NYSDEC AWQS	Unit	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
7429-90-5	Aluminum	NL	NL	µg/L	**134**		**119**		20	U	20	U	**2.5**	J	20	U	**13**	J	**38.2**		**17.5**	J	20	U
7440-36-0	Antimony	6	3	µg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
7440-38-2	Arsenic	10	25	µg/L	**0.79**	J	**0.64**	J	**0.67**	J	**0.55**	J	1	U	**0.12**	J	**18.4**		**17**		**2.2**		**2**	
7440-39-3	Barium	2000	1000	µg/L	**74.7**		**75.3**		**72.4**		**72.8**		**79.5**		**79.7**		**214**		**203**		**69**		**67.7**	
7440-41-7	Beryllium	4	3	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
7440-43-9	Cadmium	5	5	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
7440-70-2	Calcium Metal	NL	NL	µg/L	**133000**		**134000**		**130000**		**131000**		**141000**		**142000**		**122000**		**122000**		147000		144000	
7440-47-3	Chromium	100	50	µg/L	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	**0.11**	J	2	U
7440-48-4	Cobalt	NL	NL	µg/L	**0.28**	J	**0.26**	J	**0.17**	J	**0.17**	J	1	U	1	U	**0.14**	J	**0.22**	J	**0.32**	J	**0.31**	J
7440-50-8	Copper	1300	200	µg/L	**0.48**	J	**0.36**	J	2	U	**0.11**	J	**0.09**	J	**0.15**	J	2	U	2	U	**0.2**	J	**0.23**	J
7439-89-6	Iron	NL	300	µg/L	**272**		**219**		**128**	J	**102**	J	**11.7**	J	**8**	J	**7190**		**6580**		**476**		**423**	
7439-92-1	Lead	15	25	µg/L	**0.52**	J	**0.41**	J	1	U	1	U	1	U	1	U	1	U	**0.07**	J	**0.11**	J	1	U
7439-95-4	Magnesium	NL	35000	µg/L	**23600**		**23700**		**23400**		**23200**		**21800**		**22100**		**13300**		**13600**		**16200**		**16300**	
7439-96-5	Manganese	NL	300	µg/L	**241**		**223**		**242**		**221**		**1.6**		**1.1**		**1140**		**1100**		**1350**		**1340**	
7440-02-0	Nickel	NL	100	µg/L	**0.26**	J	**0.21**	J	**0.06**	J	**0.08**	J	1	U	1	U	**0.14**	J	**0.37**	J	**0.73**	J	**0.73**	J
7440-09-7	Potassium	NL	NL	µg/L	**1550**		**1570**		**1500**		**1530**		**3290**		**3350**		**827**		**848**		**3290**		**3330**	
7782-49-2	Selenium	50	10	µg/L	**1.7**	J	**1.8**	J	**2.3**	J	**2.4**	J	**3.2**	J	**3.5**	J	5	UJ	5	UJ	5	UJ	5	UJ
7440-22-4	Silver	NL	50	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
7440-23-5	Sodium	NL	20,000	µg/L	**35300**		**35900**		**35300**		**35200**		**44500**		**45200**		**4400**		**4710**		**43400**		**43800**	
7440-28-0	Thallium	2	0.5	µg/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
7440-62-2	Vanadium	NL	NL	µg/L	**0.29**	J	**0.27**	J	5	U	5	U	**0.04**	J	**0.05**	J	**0.06**	J	**0.12**	J	**0.07**	J	**0.04**	J
7440-66-6	Zinc	NL	2000	µg/L	**1.1**	J	**1.2**	J	**0.28**	J	**0.38**	J	**1.1**	J	**2.8**		**0.47**	J	**0.92**	J	**0.77**	J	**1.5**	J

Bolded	>detection
🟧	> NYSDEC AWQS

Acronyms

µg/L - microgram per liter

AWQS - Ambient Water Quality Standards

CLP - Contract Laboratory Program

EPA - Environmental Protection Agency

FD - Field Duplicate

ID - identification

J - estimated results

N - normal

NL - not listed

NYSDEC - New York State Department of Environmental Con:

Q - qualifier

RSLs - Regional Screening Levels

WG - groundwater

U - undetected

Table 3-3A
Trip Blank and Field Blank Detections - VOCs
Former Duofold Corporation
Ilion, New York

		Sample ID	TB-01		TB-02		TB-03		TB-04		TB-05		FB-GW-1		FB-SB-A	
		Sample Date	11/7/2016		11/8/2016		11/9/2016		11/10/2016		11/11/2016		11/9/2016		11/9/2016	
		Matrix	WQ		WQ		WQ		WQ		WQ		WQ		WQ	
		Sample Type	TB		TB		TB		TB		TB		FB		FB	
		CLP #	BDQN9		BDQP0		BDQP1		BDQP2		BDQP3		BDQN8		BD4Q2	
CAS No.	Compound	Unit	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
71-55-6	1,1,1-Trichloroethane	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
79-34-5	1,1,2,2-Tetrachloroethane	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
79-00-5	1,1,2-Trichloroethane	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
75-34-3	1,1-Dichloroethane	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
75-35-4	1,1-Dichloroethene	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	UJ	0.5	U	5	U
87-61-6	1,2,3-Trichlorobenzene	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
120-82-1	1,2,4-trichlorobenzene	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
96-12-8	1,2-Dibromo-3-chloropropane	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
106-93-4	1,2-Dibromoethane	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
95-50-1	1,2-Dichlorobenzene	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
107-06-2	1,2-Dichloroethane	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
78-87-5	1,2-Dichloropropane	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
541-73-1	1,3-Dichlorobenzene	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
106-46-7	1,4-Dichlorobenzene	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
78-93-3	2-Butanone	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	10	U
591-78-6	2-Hexanone	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	10	U
108-10-1	4-Methyl-2-pentanone	µg/L	5	U	5	U	5	U	5	U	5	U	5	U	10	U
67-64-1	Acetone	µg/L	**14**		**11**		**12**		**10**		**11**		**12**		**9.2**	J
71-43-2	Benzene	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
74-97-5	Bromochloromethane	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
75-27-4	Bromodichloromethane	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
75-25-2	Bromoform	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
74-83-9	Bromomethane	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
75-15-0	Carbon disulfide	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
56-23-5	Carbon tetrachloride	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
108-90-7	Chlorobenzene	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
75-00-3	Chloroethane	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
67-66-3	Chloroform	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
74-87-3	Chloromethane	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
156-59-2	cis-1,2-Dichloroethene	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	UJ	0.5	U	5	U
10061-01-5	cis-1,3-Dichloropropene	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
110-82-7	Cyclohexane	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
124-48-1	Dibromochloromethane	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
75-71-8	Dichlorodifluoromethane	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
100-41-4	Ethylbenzene	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
98-82-8	Isopropylbenzene	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	UJ	0.5	U	5	U
179601-23-1	m,p-xylene	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
79-20-9	Methyl Acetate	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
1634-04-4	Methyl tert-butyl Ether	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
108-87-2	Methylcyclohexane	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
75-09-2	Methylene chloride	µg/L	**0.39**	J	**0.37**	J	**0.39**	J	0.5	U	0.5	U	**0.39**	J	5	U
95-47-6	o-xylene	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
100-42-5	Styrene	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
127-18-4	Tetrachloroethene	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
108-88-3	Toluene	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
156-60-5	trans-1,2-Dichloroethene	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	UJ	0.5	U	5	U
10061-02-6	trans-1,3-Dichloropropene	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
79-01-6	Trichloroethene	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
75-69-4	Trichlorofluoromethane	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
75-01-4	Vinyl chloride	µg/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U

Bolded > detection

Acronyms
µg/L - micrograms per liter
CLP - Contract Laboratory Program
FB - field blank
ID - identification
J - estimated results
Q - qualifier
TB - trip blank
VOCs - volatile organic compounds
WQ - water quality
U - undetected
UJ - estimated undetected

Table 3-3B
Field Blank Detections - SVOCs
Former Duofold Corporation
Ilion, New York

		Sample ID	FB-GW-1		FB-SB-A	
		Sample Date	11/9/2016		11/9/2016	
		Matrix	FB		FB	
		Sample Type	WQ		WQ	
		CLP #	BDQN8		BD4Q2	
CAS No.	Compound	Unit	Result	Q	Result	Q
92-52-4	1,1-Biphenyl	µg/L	5.1	U	5.1	U
95-94-3	1,2,4,5-Tetrachlorobenzene	µg/L	5.1	U	5.1	U
123-91-1	1,4-Dioxane	µg/L	2	UJ	2	UJ
108-60-1	2,2-oxybis(1-Chloropropane)	µg/L	10	U	10	U
58-90-2	2,3,4,6-Tetrachlorophenol	µg/L	5.1	U	5.1	U
95-95-4	2,4,5-Trichlorophenol	µg/L	5.1	U	5.1	U
88-06-2	2,4,6-Trichlorophenol	µg/L	5.1	U	5.1	U
120-83-2	2,4-Dichlorophenol	µg/L	5.1	U	5.1	U
105-67-9	2,4-Dimethylphenol	µg/L	5.1	U	5.1	U
51-28-5	2,4-Dinitrophenol	µg/L	10	U	10	U
121-14-2	2,4-Dinitrotoluene	µg/L	5.1	U	5.1	U
606-20-2	2,6-Dinitrotoluene	µg/L	5.1	U	5.1	U
91-58-7	2-Chloronaphthalene	µg/L	5.1	U	5.1	U
95-57-8	2-Chlorophenol	µg/L	5.1	U	5.1	U
91-57-6	2-Methylnaphthalene	µg/L	5.1	U	5.1	U
95-48-7	2-Methylphenol	µg/L	10	U	10	U
88-74-4	2-Nitroaniline	µg/L	5.1	U	5.1	U
88-75-5	2-Nitrophenol	µg/L	5.1	U	5.1	U
91-94-1	3,3-Dichlorobenzidine	µg/L	10	U	10	U
99-09-2	3-Nitroaniline	µg/L	10	U	10	U
534-52-1	4,6-Dinitro-2-methylphenol	µg/L	10	U	10	U
101-55-3	4-Bromophenyl-phenylether	µg/L	5.1	U	5.1	U
59-50-7	4-Chloro-3-methylphenol	µg/L	**4.8**	J	**4.3**	J
106-47-8	4-Chloroaniline	µg/L	10	U	10	UJ
7005-72-3	4-Chlorophenyl-phenylether	µg/L	5.1	U	5.1	U
106-44-5	4-Methylphenol	µg/L	10	U	10	U
100-01-6	4-Nitroaniline	µg/L	10	U	10	U
100-02-7	4-Nitrophenol	µg/L	10	U	10	U
83-32-9	Acenaphthene	µg/L	5.1	U	5.1	U
208-96-8	Acenaphthylene	µg/L	5.1	U	5.1	U
98-86-2	Acetophenone	µg/L	10	U	10	U
120-12-7	Anthracene	µg/L	5.1	U	5.1	U
1912-24-9	Atrazine	µg/L	10	U	10	U
100-52-7	Benzaldehyde	µg/L	**2**	J	**1.8**	J
56-55-3	Benzo(a)anthracene	µg/L	5.1	U	5.1	U
50-32-8	Benzo(a)pyrene	µg/L	5.1	U	5.1	U
205-99-2	Benzo(b)fluoranthene	µg/L	5.1	U	5.1	U
191-24-2	Benzo(g,h,i)perylene	µg/L	5.1	U	5.1	U
207-08-9	Benzo(k)fluoranthene	µg/L	5.1	U	5.1	U
111-91-1	Bis(2-Chloroethoxy)methane	µg/L	5.1	U	5.1	U
111-44-4	Bis(2-Chloroethyl)ether	µg/L	10	U	10	U
117-81-7	Bis(2-ethylhexyl)phthalate	µg/L	5.1	U	5.1	U
85-68-7	Butylbenzylphthalate	µg/L	5.1	U	5.1	U
105-60-2	Caprolactam	µg/L	10	U	10	U

Table 3-3B
Field Blank Detections - SVOCs
Former Duofold Corporation
Ilion, New York

		Sample ID	FB-GW-1		FB-SB-A	
		Sample Date	11/9/2016		11/9/2016	
		Matrix	FB		FB	
		Sample Type	WQ		WQ	
		CLP #	BDQN8		BD4Q2	
CAS No.	Compound	Unit	Result	Q	Result	Q
86-74-8	Carbazole	µg/L	10	U	10	U
218-01-9	Chrysene	µg/L	5.1	U	5.1	U
53-70-3	Dibenzo(a,h)anthracene	µg/L	5.1	U	5.1	U
132-64-9	Dibenzofuran	µg/L	5.1	U	5.1	U
84-66-2	Diethylphthalate	µg/L	5.1	U	5.1	U
131-11-3	Dimethylphthalate	µg/L	5.1	U	5.1	U
84-74-2	Di-n-butylphthalate	µg/L	5.1	U	5.1	U
117-84-0	Di-n-octyl phthalate	µg/L	10	U	10	U
206-44-0	Fluoranthene	µg/L	10	U	10	U
86-73-7	Fluorene	µg/L	5.1	U	5.1	U
118-74-1	Hexachlorobenzene	µg/L	5.1	U	5.1	U
87-68-3	Hexachlorobutadiene	µg/L	5.1	U	5.1	U
77-47-4	Hexachlorocyclopentadiene	µg/L	10	U	10	U
67-72-1	Hexachloroethane	µg/L	5.1	U	5.1	U
193-39-5	Indeno(1,2,3-cd)pyrene	µg/L	5.1	U	5.1	U
78-59-1	Isophorone	µg/L	5.1	U	5.1	U
91-20-3	Naphthalene	µg/L	5.1	U	5.1	U
98-95-3	Nitrobenzene	µg/L	5.1	U	5.1	U
621-64-7	N-Nitroso-di-n-propylamine	µg/L	5.1	U	5.1	U
86-30-6	N-Nitrosodiphenylamine	µg/L	5.1	U	5.1	U
87-86-5	Pentachlorophenol	µg/L	10	U	10	U
85-01-8	Phenanthrene	µg/L	5.1	U	5.1	U
108-95-2	Phenol	µg/L	10	U	10	U
129-00-0	Pyrene	µg/L	5.1	U	5.1	U

Bolded > detection

Acronyms
µg/L - micrograms per liter
CLP - Contract Laboratory Program
FB - field blank
ID - identification
J - estimated results
Q - qualifier
SVOCs - semi-volatile organic compounds
WQ - water quality
U - undetected
UJ - estimated undetected

Table 3-3C
Field Blank Detections - PCBs
Former Duofold Corporation
Ilion, New York

		Sample ID	FB-SB-A	
		Sample Date	11/9/2016	
		Matrix	FB	
		Sample Type	WQ	
		CLP #	BD4Q2	
CAS No.	Compound	Unit	Result	Q
11096-82-5	Aroclor 1260	µg/L	1	U
11097-69-1	Aroclor 1254	µg/L	1	U
11100-14-4	Aroclor 1268	µg/L	1	U
11104-28-2	Aroclor 1221	µg/L	1	U
11141-16-5	Aroclor 1232	µg/L	1	U
12672-29-6	Aroclor 1248	µg/L	1	U
12674-11-2	Aroclor 1016	µg/L	1	U
37324-23-5	Aroclor 1262	µg/L	1	U
53469-21-9	Aroclor 1242	µg/L	1	U

Acronyms

µg/L - micrograms per liter
CLP - Contract Laboratory Program
FB - field blank
ID - identification
PCBs - polychlorinated biphenyls
Q - qualifier
WQ - water quality
U - undetected

Table 3-3D
Field Blank Detections - Pesticides
Former Duofold Corporation
Ilion, New York

		Sample ID	FB-SB-A	
		Sample Date	11/9/2016	
		Matrix	FB	
		Sample Type	WQ	
		CLP #	BD4Q2	
CAS No.	**Compound**	**Unit**	**Result**	**Q**
72-54-8	4,4'-DDD	µg/L	0.1	U
72-55-9	4,4'-DDE	µg/L	0.1	U
50-29-3	4,4'-DDT	µg/L	0.1	U
309-00-2	Aldrin	µg/L	0.05	U
319-84-6	alpha-BHC	µg/L	0.05	U
319-85-7	beta-BHC	µg/L	0.05	U
5103-71-9	cis-Chlordane	µg/L	0.05	U
319-86-8	delta-BHC	µg/L	0.05	U
60-57-1	Dieldrin	µg/L	0.1	U
959-98-8	Endosulfan I	µg/L	0.05	U
33213-65-9	Endosulfan II	µg/L	0.1	U
1031-07-8	Endosulfan sulfate	µg/L	0.1	U
72-20-8	Endrin	µg/L	0.1	U
7421-93-4	Endrin aldehyde	µg/L	0.1	U
53494-70-5	Endrin ketone	µg/L	0.1	U
58-89-9	gamma-BHC (Lindane)	µg/L	0.05	U
76-44-8	Heptachlor	µg/L	0.05	U
1024-57-3	Heptachlor epoxide	µg/L	0.05	U
72-43-5	Methoxychlor	µg/L	0.5	U
8001-35-2	Toxaphene	µg/L	5	U
5103-74-2	trans-Chlordane	µg/L	0.05	U

Acronyms

µg/L - micrograms per liter
CLP - Contract Laboratory Program
FB - field blank
ID - identification
Q - qualifier
WQ - water quality
U - undetected

Table 3-3E
Field Blank Detections - Metals
Former Duofold Corporation
Ilion, New York

		Sample ID	FB-GW-1		FB-SB-A	
		Sample Date	11/9/2016		11/9/2016	
		Matrix	FB		FB	
		Sample Type	WQ		WQ	
		CLP #	MBDQN8		MBD4Q2	
CAS No.	**Compound**	**Unit**	**Result**	**Q**	**Result**	**Q**
7429-90-5	Aluminum	µg/L	20	U	200	U
7440-36-0	Antimony	µg/L	2	U	60	U
7440-38-2	Arsenic	µg/L	1	U	10	U
7440-39-3	Barium	µg/L	10	U	200	U
7440-41-7	Beryllium	µg/L	1	U	5	U
7440-43-9	Cadmium	µg/L	1	U	5	U
7440-70-2	Calcium	µg/L	**5.5**	J	5000	U
7440-47-3	Chromium	µg/L	2	U	10	UJ
7440-48-4	Cobalt	µg/L	1	U	50	U
7440-50-8	Copper	µg/L	2	U	25	U
7439-89-6	Iron	µg/L	200	U	100	UJ
7439-92-1	Lead	µg/L	1	U	10	U
7439-95-4	Magnesium	µg/L	500	U	5000	U
7439-96-5	Manganese	µg/L	1	U	15	U
7440-02-0	Nickel	µg/L	1	U	40	U
7440-09-7	Potassium	µg/L	500	U	5000	U
7782-49-2	Selenium	µg/L	5	UJ	35	U
7440-22-4	Silver	µg/L	1	U	10	U
7440-23-5	Sodium	µg/L	500	U	5000	U
7440-28-0	Thallium	µg/L	1	U	25	U
7440-62-2	Vanadium	µg/L	5	U	50	UJ
7440-66-6	Zinc	µg/L	**0.23**	J	60	U

Bolded > detection

Acronyms

µg/L - micrograms per liter
CLP - Contract Laboratory Program
FB - field blank
ID - identification
J - estimated results
Q - qualifier
WQ - water quality
U - undetected
UJ - estimated undetected

Table 3-3F
Field Blank Detections - TCLP Metals
Former Duofold Corporation
Ilion, New York

		Sample ID	FB-SB-A	
		Sample Date	11/9/2016	
		Matrix	WQ	
		Sample Type	FB	
		CLP #	MBD4Q2	
CAS No.	**Compound**	**Unit**	**Result**	**Q**
7440-38-2	Arsenic	µg/L	5	UJ
7440-39-3	Barium	µg/L	**0.096**	J
7440-43-9	Cadmium	µg/L	1	U
7440-47-3	Chromium	µg/L	5	U
7439-92-1	Lead	µg/L	**0.053**	J
7439-97-6	Mercury	µg/L	0.2	U
7782-49-2	Selenium	µg/L	1	U
7440-22-4	Silver	µg/L	1	U

Bolded > detection

Acronyms

µg/L - micrograms per liter
CLP - Contract Laboratory Program
FB - field blank
ID - identification
J - estimated results
Q - qualifier
TCLP - toxicity characteristic leaching procedure
WQ - water quality
U - undetected
UJ - estimated undetected

Figures

N

Site Location Map

0 760
Feet

Figure 1-1
Ilion, NY

CDM Smith

estradal C:\Users\estradal\Desktop\TBA Projects\Duofold\Report Figures\Figure 1-1 Site Location Map.mxd 3/31/2017

Figure 2-1

Ilion, NY

Overall Site Plan and Herkimer County Tax Map

CDM Smith

estradal C:\Users\estradal\Desktop\TBA Projects\Duofold\Report Figures\Figure 1-2 Overall Site Plan and Herkimer Co Tax Map.mxd 4/4/2017

N

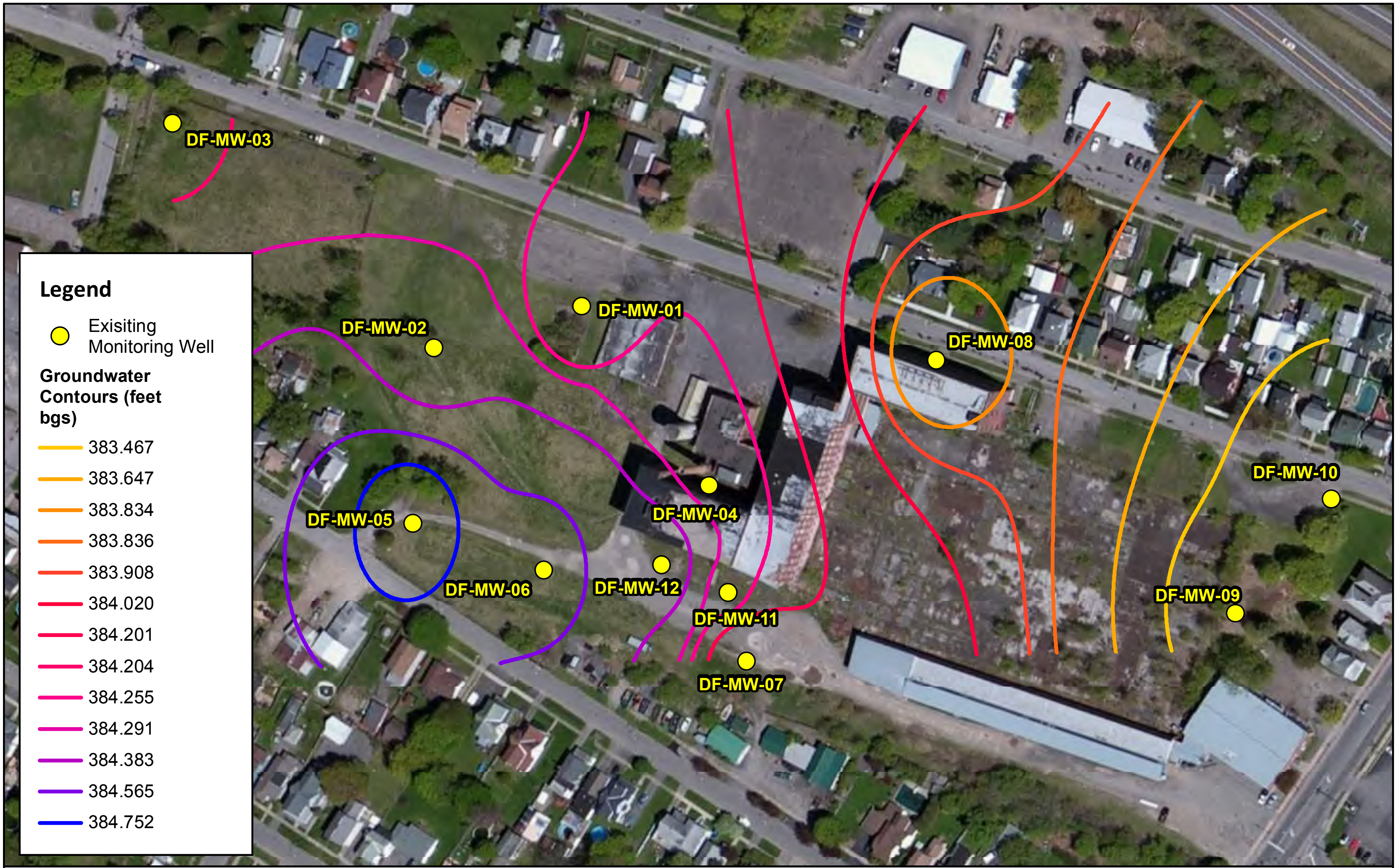
Sample Location Plan

0 140
Feet

Figure 3-1
Ilion, NY

CDM Smith

estradal C:\Users\estradal\Desktop\TBA Projects\Duofold\Report Figures\Figure 3-1 Sample Location Plan.mxd 3/31/2017



Notes:

1. Existing monitoring well top of casing elevations were taken from the 2014 Nature's Way Investigation.
2. bgs - below ground surface

Existing Monitoring Well Groundwater Contour Map

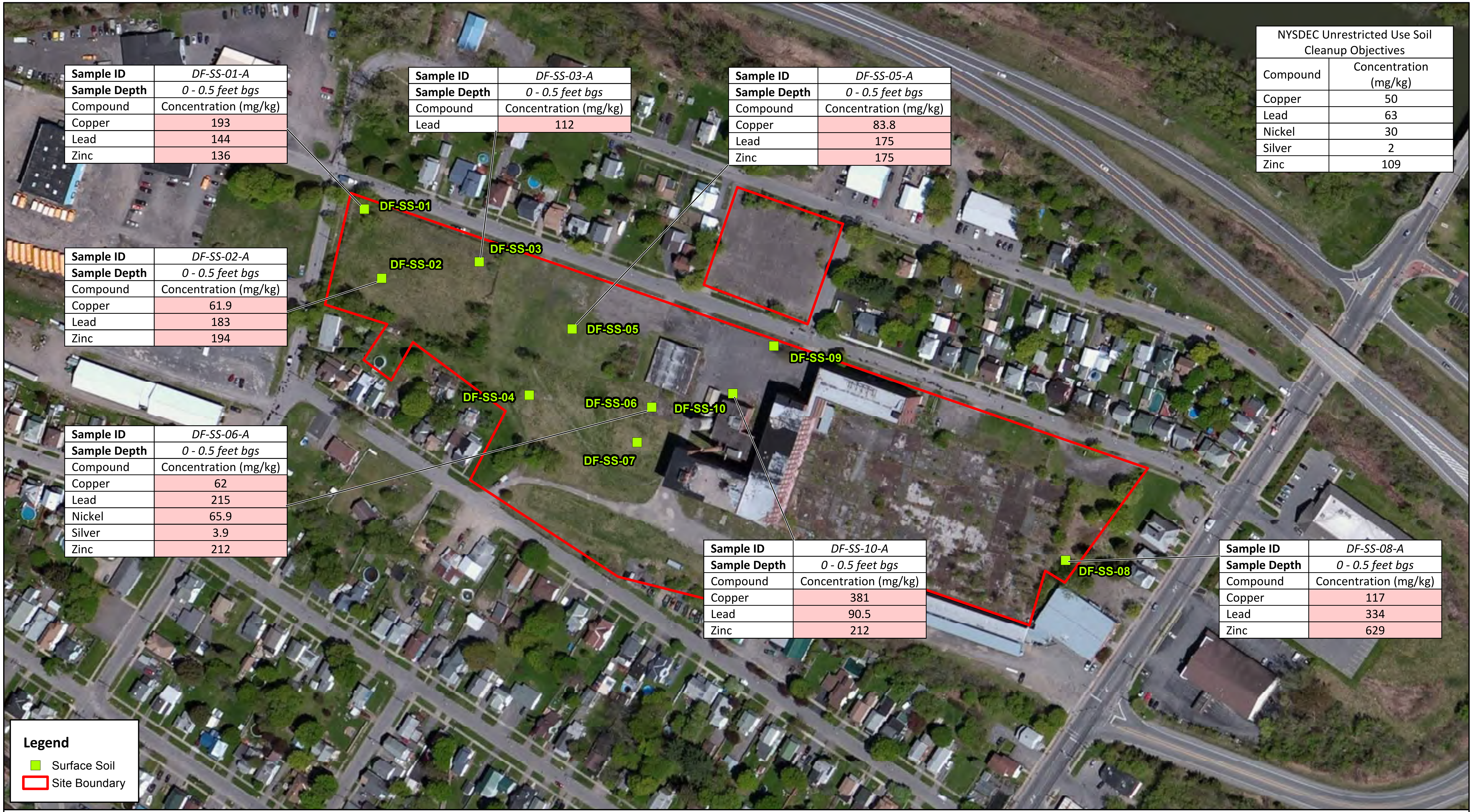
0 140 Feet

Figure 3-2

Ilion, NY

CDM Smith

estradal C:\Users\estradal\Desktop\TBA Projects\Duofold\Report Figures\Figure 3-2 Existing Monitoring Well GW Contour Map.mxd 4/4/2017



NYSDEC Unrestricted Use Soil Cleanup Objectives	
Compound	Concentration (mg/kg)
Copper	50
Lead	63
Nickel	30
Silver	2
Zinc	109

Sample ID	*DF-SS-01-A*
Sample Depth	*0 - 0.5 feet bgs*
Compound	Concentration (mg/kg)
Copper	193
Lead	144
Zinc	136

Sample ID	*DF-SS-03-A*
Sample Depth	*0 - 0.5 feet bgs*
Compound	Concentration (mg/kg)
Lead	112

Sample ID	*DF-SS-05-A*
Sample Depth	*0 - 0.5 feet bgs*
Compound	Concentration (mg/kg)
Copper	83.8
Lead	175
Zinc	175

Sample ID	*DF-SS-02-A*
Sample Depth	*0 - 0.5 feet bgs*
Compound	Concentration (mg/kg)
Copper	61.9
Lead	183
Zinc	194

Sample ID	*DF-SS-06-A*
Sample Depth	*0 - 0.5 feet bgs*
Compound	Concentration (mg/kg)
Copper	62
Lead	215
Nickel	65.9
Silver	3.9
Zinc	212

Sample ID	*DF-SS-10-A*
Sample Depth	*0 - 0.5 feet bgs*
Compound	Concentration (mg/kg)
Copper	381
Lead	90.5
Zinc	212

Sample ID	*DF-SS-08-A*
Sample Depth	*0 - 0.5 feet bgs*
Compound	Concentration (mg/kg)
Copper	117
Lead	334
Zinc	629

N

Notes:
1. mg/kg - milligrams per kilogram
2. Results highlighted in red exceed Unrestricted Use SCOs.
3. SCO - Soil Cleanup Objective
4. bgs - below ground surface
5. ID - identification

Metal Exceedances in Surface Soil

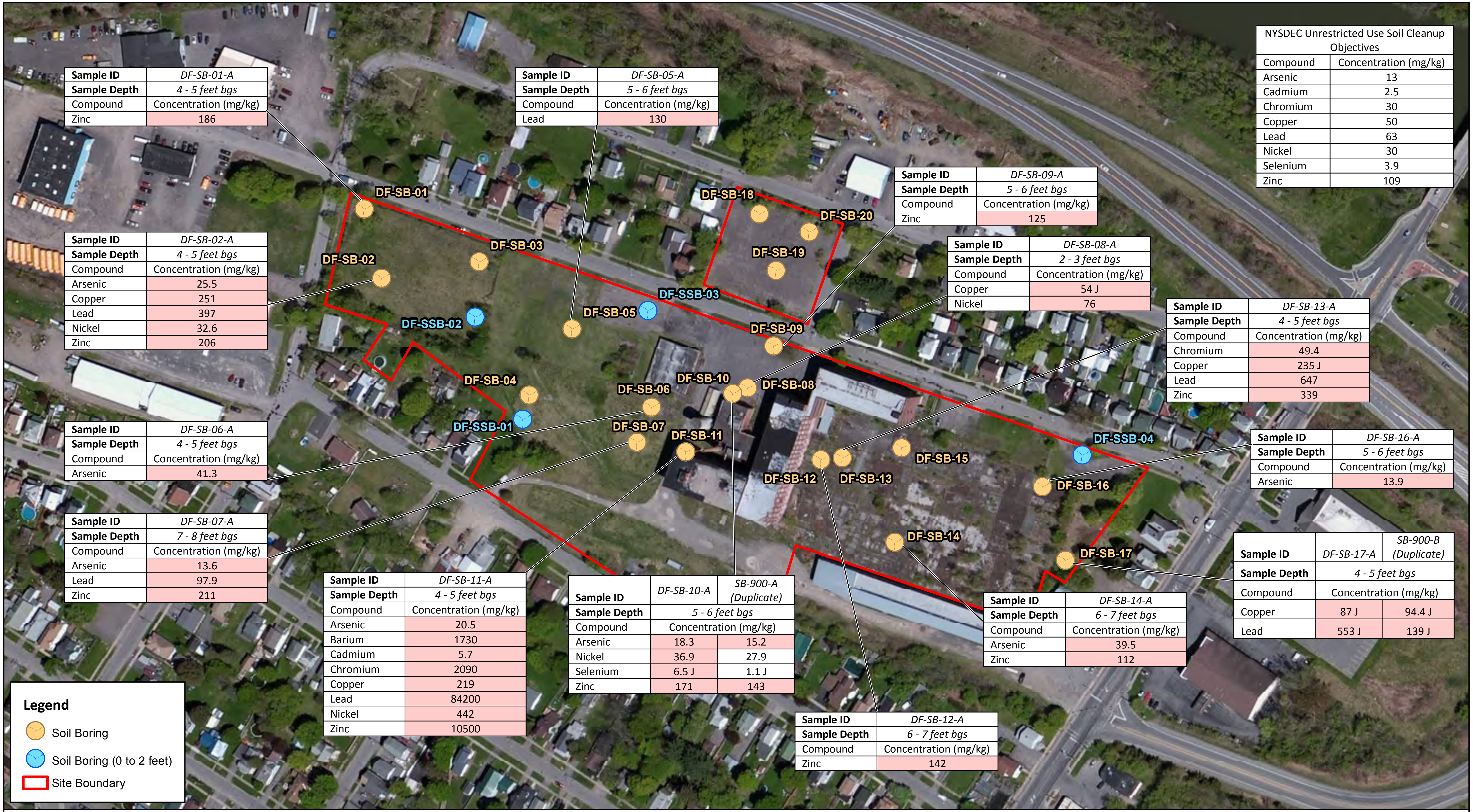
0 140 Feet

Figure 4-1

Ilion, NY

CDM Smith

estradal C:\Users\estradal\Desktop\TBA Projects\Duofold\Report Figures\Figure 4-1 Metal Exceedances in Surface.mxd 4/4/2017



Sample ID	DF-SB-01-A
Sample Depth	4 - 5 feet bgs
Compound	Concentration (mg/kg)
Zinc	186

Sample ID	DF-SB-05-A
Sample Depth	5 - 6 feet bgs
Compound	Concentration (mg/kg)
Lead	130

NYSDEC Unrestricted Use Soil Cleanup Objectives	
Compound	Concentration (mg/kg)
Arsenic	13
Cadmium	2.5
Chromium	30
Copper	50
Lead	63
Nickel	30
Selenium	3.9
Zinc	109

Sample ID	DF-SB-09-A
Sample Depth	5 - 6 feet bgs
Compound	Concentration (mg/kg)
Zinc	125

Sample ID	DF-SB-02-A
Sample Depth	4 - 5 feet bgs
Compound	Concentration (mg/kg)
Arsenic	25.5
Copper	251
Lead	397
Nickel	32.6
Zinc	206

Sample ID	DF-SB-08-A
Sample Depth	2 - 3 feet bgs
Compound	Concentration (mg/kg)
Copper	54 J
Nickel	76

Sample ID	DF-SB-13-A
Sample Depth	4 - 5 feet bgs
Compound	Concentration (mg/kg)
Chromium	49.4
Copper	235 J
Lead	647
Zinc	339

Sample ID	DF-SB-06-A
Sample Depth	4 - 5 feet bgs
Compound	Concentration (mg/kg)
Arsenic	41.3

Sample ID	DF-SB-16-A
Sample Depth	5 - 6 feet bgs
Compound	Concentration (mg/kg)
Arsenic	13.9

Sample ID	DF-SB-07-A
Sample Depth	7 - 8 feet bgs
Compound	Concentration (mg/kg)
Arsenic	13.6
Lead	97.9
Zinc	211

Sample ID	DF-SB-17-A	SB-900-B (Duplicate)
Sample Depth	4 - 5 feet bgs	
Compound	Concentration (mg/kg)	
Copper	87 J	94.4 J
Lead	553 J	139 J

Sample ID	DF-SB-11-A
Sample Depth	4 - 5 feet bgs
Compound	Concentration (mg/kg)
Arsenic	20.5
Barium	1730
Cadmium	5.7
Chromium	2090
Copper	219
Lead	84200
Nickel	442
Zinc	10500

Sample ID	DF-SB-10-A	SB-900-A (Duplicate)
Sample Depth	5 - 6 feet bgs	
Compound	Concentration (mg/kg)	
Arsenic	18.3	15.2
Nickel	36.9	27.9
Selenium	6.5 J	1.1 J
Zinc	171	143

Sample ID	DF-SB-14-A
Sample Depth	6 - 7 feet bgs
Compound	Concentration (mg/kg)
Arsenic	39.5
Zinc	112

Sample ID	DF-SB-12-A
Sample Depth	6 - 7 feet bgs
Compound	Concentration (mg/kg)
Zinc	142

N

Notes:
1. J - estimated result value.
2. bgs - below ground surface
3. Results highlighted in red exceed Unrestricted Use SCOs.
4. ID - identification
5. mg/kg - milligrams per kilogram
6. SCO - Soil Cleanup Objective

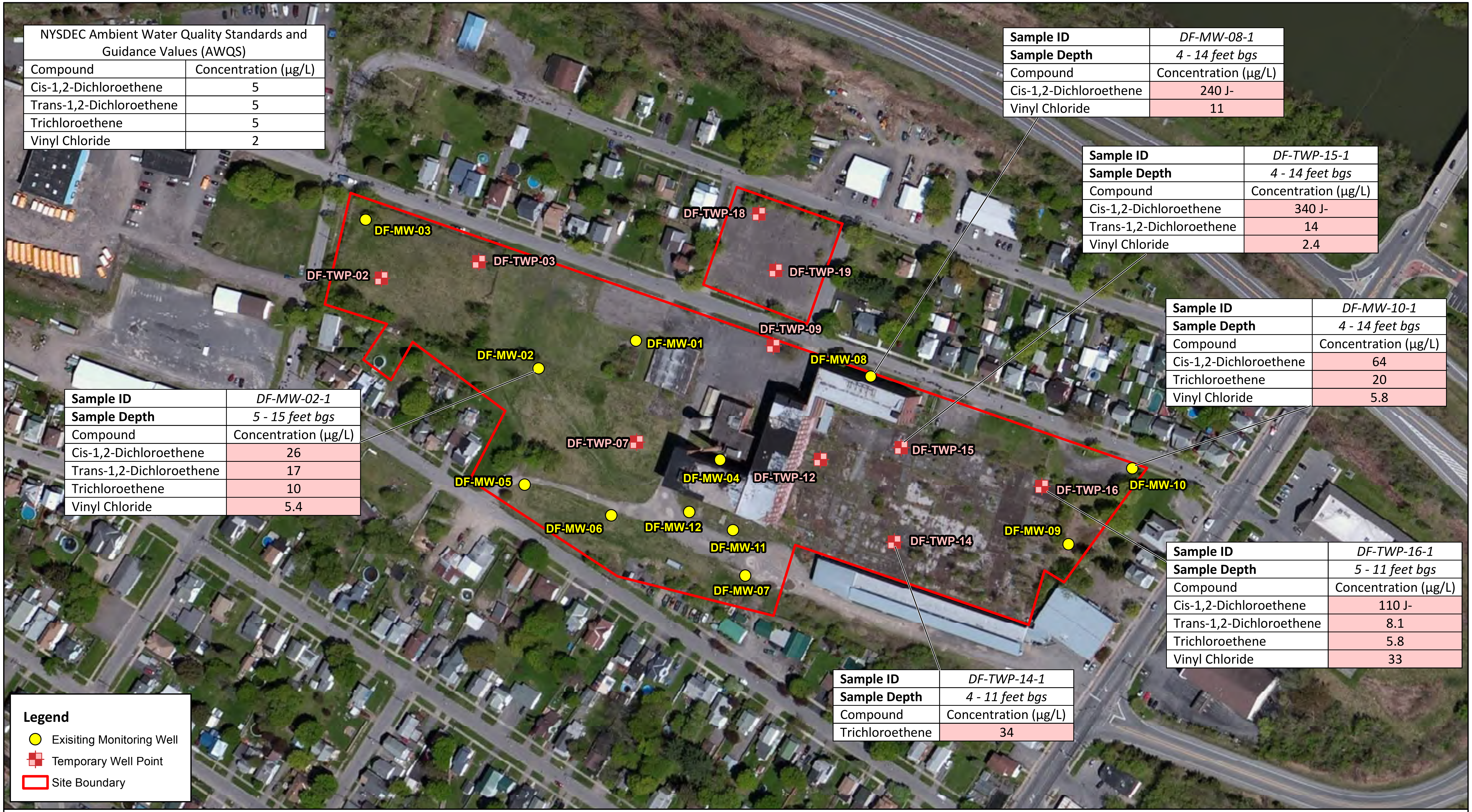
Metal Exceedances in Subsurface Soil

0 140 Feet

Figure 4-2
Ilion, NY

CDM Smith

estradal C:\Users\estradal\Desktop\TBA Projects\Duofold\Report Figures\Figure 4-2 Metal Exceedances in Subsurf.mxd 4/4/2017



NYSDEC Ambient Water Quality Standards and Guidance Values (AWQS)	
Compound	Concentration (µg/L)
Cis-1,2-Dichloroethene	5
Trans-1,2-Dichloroethene	5
Trichloroethene	5
Vinyl Chloride	2

Sample ID	*DF-MW-08-1*
Sample Depth	*4 - 14 feet bgs*
Compound	Concentration (µg/L)
Cis-1,2-Dichloroethene	240 J-
Vinyl Chloride	11

Sample ID	*DF-TWP-15-1*
Sample Depth	*4 - 14 feet bgs*
Compound	Concentration (µg/L)
Cis-1,2-Dichloroethene	340 J-
Trans-1,2-Dichloroethene	14
Vinyl Chloride	2.4

Sample ID	*DF-MW-10-1*
Sample Depth	*4 - 14 feet bgs*
Compound	Concentration (µg/L)
Cis-1,2-Dichloroethene	64
Trichloroethene	20
Vinyl Chloride	5.8

Sample ID	*DF-MW-02-1*
Sample Depth	*5 - 15 feet bgs*
Compound	Concentration (µg/L)
Cis-1,2-Dichloroethene	26
Trans-1,2-Dichloroethene	17
Trichloroethene	10
Vinyl Chloride	5.4

Sample ID	*DF-TWP-16-1*
Sample Depth	*5 - 11 feet bgs*
Compound	Concentration (µg/L)
Cis-1,2-Dichloroethene	110 J-
Trans-1,2-Dichloroethene	8.1
Trichloroethene	5.8
Vinyl Chloride	33

Sample ID	*DF-TWP-14-1*
Sample Depth	*4 - 11 feet bgs*
Compound	Concentration (µg/L)
Trichloroethene	34

Legend

● Exisiting Monitoring Well
▨ Temporary Well Point
▭ Site Boundary

N

Notes:
1. J- = estimated result value, biased low
2. bgs - below ground surface
3. Results highlighted in red exceed AWQS.
4. µg/L - micrograms per liter
5. ID - identification

Volatile Organic Compound Exceedances in Groundwater

0 140
Feet

Figure 4-3
Ilion, NY

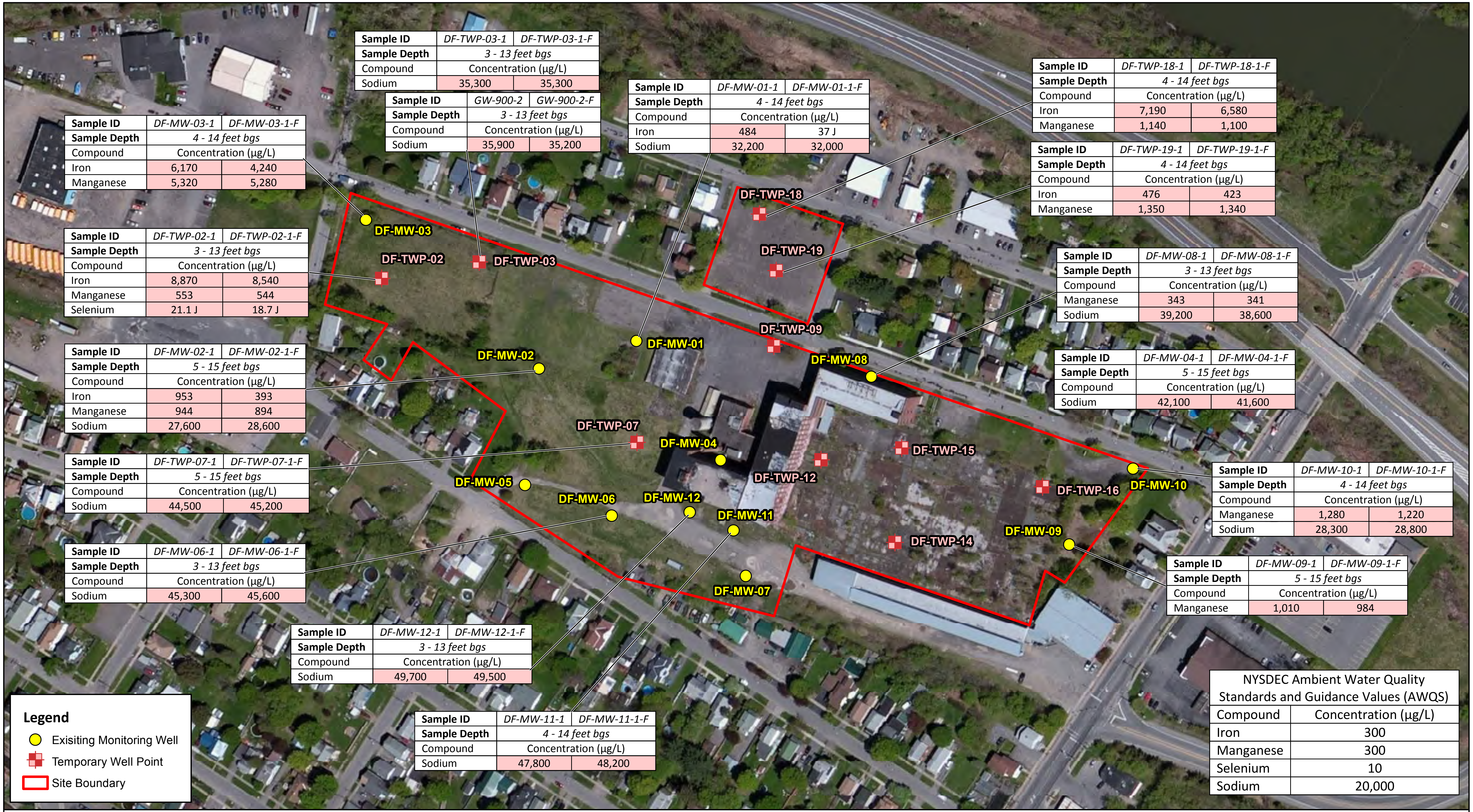
CDM Smith

estradal C:\Users\estradal\Desktop\TBA Projects\Duofold\Report Figures\Figure 4-3 VOC Exceedances in GW.mxd 4/4/2017

Figure 4-4

Ilion, NY

Metal Exceedances in Groundwater



Sample ID	DF-TWP-03-1	DF-TWP-03-1-F
Sample Depth	3 - 13 feet bgs	
Compound	Concentration (µg/L)	
Sodium	35,300	35,300

Sample ID	GW-900-2	GW-900-2-F
Sample Depth	3 - 13 feet bgs	
Compound	Concentration (µg/L)	
Sodium	35,900	35,200

Sample ID	DF-MW-01-1	DF-MW-01-1-F
Sample Depth	4 - 14 feet bgs	
Compound	Concentration (µg/L)	
Iron	484	37 J
Sodium	32,200	32,000

Sample ID	DF-TWP-18-1	DF-TWP-18-1-F
Sample Depth	4 - 14 feet bgs	
Compound	Concentration (µg/L)	
Iron	7,190	6,580
Manganese	1,140	1,100

Sample ID	DF-TWP-19-1	DF-TWP-19-1-F
Sample Depth	4 - 14 feet bgs	
Compound	Concentration (µg/L)	
Iron	476	423
Manganese	1,350	1,340

Sample ID	DF-MW-03-1	DF-MW-03-1-F
Sample Depth	4 - 14 feet bgs	
Compound	Concentration (µg/L)	
Iron	6,170	4,240
Manganese	5,320	5,280

Sample ID	DF-TWP-02-1	DF-TWP-02-1-F
Sample Depth	3 - 13 feet bgs	
Compound	Concentration (µg/L)	
Iron	8,870	8,540
Manganese	553	544
Selenium	21.1 J	18.7 J

Sample ID	DF-MW-08-1	DF-MW-08-1-F
Sample Depth	3 - 13 feet bgs	
Compound	Concentration (µg/L)	
Manganese	343	341
Sodium	39,200	38,600

Sample ID	DF-MW-02-1	DF-MW-02-1-F
Sample Depth	5 - 15 feet bgs	
Compound	Concentration (µg/L)	
Iron	953	393
Manganese	944	894
Sodium	27,600	28,600

Sample ID	DF-MW-04-1	DF-MW-04-1-F
Sample Depth	5 - 15 feet bgs	
Compound	Concentration (µg/L)	
Sodium	42,100	41,600

Sample ID	DF-TWP-07-1	DF-TWP-07-1-F
Sample Depth	5 - 15 feet bgs	
Compound	Concentration (µg/L)	
Sodium	44,500	45,200

Sample ID	DF-MW-10-1	DF-MW-10-1-F
Sample Depth	4 - 14 feet bgs	
Compound	Concentration (µg/L)	
Manganese	1,280	1,220
Sodium	28,300	28,800

Sample ID	DF-MW-06-1	DF-MW-06-1-F
Sample Depth	3 - 13 feet bgs	
Compound	Concentration (µg/L)	
Sodium	45,300	45,600

Sample ID	DF-MW-09-1	DF-MW-09-1-F
Sample Depth	5 - 15 feet bgs	
Compound	Concentration (µg/L)	
Manganese	1,010	984

Sample ID	DF-MW-12-1	DF-MW-12-1-F
Sample Depth	3 - 13 feet bgs	
Compound	Concentration (µg/L)	
Sodium	49,700	49,500

Sample ID	DF-MW-11-1	DF-MW-11-1-F
Sample Depth	4 - 14 feet bgs	
Compound	Concentration (µg/L)	
Sodium	47,800	48,200

Legend

- ● Exisiting Monitoring Well
- 🟥 Temporary Well Point
- ▭ Site Boundary

NYSDEC Ambient Water Quality Standards and Guidance Values (AWQS)

Compound	Concentration (µg/L)
Iron	300
Manganese	300
Selenium	10
Sodium	20,000

Notes:

1. J- = estimated result value, biased low
2. bgs - below ground surface
3. Results highlighted in red exceed AWQS.
4. µg/L - micrograms per liter
5. ID - identification

estradal C:\Users\estradal\Desktop\TBA Projects\Duofold\Report Figures\Figure 4-4 Metal Exceedances in GW.mxd 4/4/2017

Appendix A

Appendix A

Geophysical Investigation Report

DELTA Geophysics Inc.

GEOPHYSICAL INVESTIGATION REPORT

SITE LOCATION:

7 Spruce Street,
Ilion, New York

PREPARED FOR:

CDM Smith
14 Wall Street, Suite 1702,
New York, New York

PREPARED BY:

Joshua Hess
Delta Geophysics Inc.
738 Front Street
Catasauqua, PA 18032

October 6, 2016

Delta Geophysics, Inc. (Delta) is pleased to provide the results of the geophysical survey conducted at 7 Spruce Street, Ilion, New York.

1.0 INTRODUCTION

From October 3rd through October 6th, 2016 Delta Geophysics personnel performed a limited geophysical investigation at 7 Spruce Street, Ilion, New York. Field activities concluded on October 6th, 2016. Multiple areas throughout the site were to be surveyed and were specified by the client. Subsurface conditions were unknown at the time of survey. Surface conditions consisted of asphalt, concrete, grass, soil and dense vegetation.

2.0 SCOPE OF WORK

The survey was conducted to locate and mark detectable underground utilities and/or anomalies throughout the client specified survey areas.

3.0 METHODOLOGY

Selection of survey equipment is dependent site conditions and project objectives. For this project the technician utilized the following equipment to survey the area of concern:

- Geophysical Survey Systems Inc. SIR-3000 cart-mounted Ground Penetrating Radar (GPR) unit with a 400 Mhz antenna.
- Geonics EM-31 Terrain Conductivity meter
- Radiodetection RD7000 precision utility locator.
- Fisher M-Scope TW-6 pipe and cable locator.
- Trimble Pathfinder Pro XRS DGPS.

Ground penetrating radar (commonly called GPR) is a geophysical method that has been developed over the past thirty years for shallow, high-resolution, subsurface investigations of the earth. GPR uses high frequency pulsed electromagnetic waves (generally 10 MHz to 1,000 MHz) to acquire subsurface information. Energy is propagated downward into the ground and is reflected back to the surface from boundaries at which there are electrical property contrasts. GPR is a method that is commonly used for environmental, engineering, archeological, and other shallow investigations.

The GSSI SIR-3000 GPR can accept a wide variety of antennas which provide various depths of penetration and levels of resolution. The 400 MHz antenna can achieve depths of penetration up to about 20 feet, but this depth may be greatly reduced due to site-specific conditions. Signal penetration decreases with increased soil conductivity. Conductive materials attenuate or absorb the GPR signal. As depth increases the return signal becomes weaker. Penetration is the greatest in unsaturated sands and fine gravels. Clayey, highly saline or saturated soils, areas covered by steel reinforced concrete, foundry slag, or other highly conductive materials significantly reduces GPR depth of penetration.

The GPR was configured to transmit to a depth of approximately 10 feet below the subsurface, but actual signal penetration was limited to approximately 1-2 feet below ground surface (bgs). The limiting factor was signal attenuation from near surface soils.

The electromagnetic (EM) method uses the principle of electromagnetic induction to measure the variability of electrical conductivity of subsurface materials. The large EM response to metal makes this technique particularly well suited to identifying buried metal objects such as underground storage tanks, buried drums, pipelines, reinforced building foundations, or other metal components of buried structures. It is, however, equally sensitive to metal objects on the ground surface, and it is important to take careful field notes that indicate the position of surface metal to avoid misinterpretation. Instruments of this type are more sensitive to near surface features i.e. reinforced concrete and this fact may sometimes mask features underneath.

The EM-31 is an electromagnetic surveying technique where the direct readout of the instrument is the bulk electrical conductivity of an equivalent homogeneous earth at that position referred to as “terrain conductivity”. Terrain conductivity is commonly used to detect lateral variations in electrical conductivity along a traverse or over a broad region. These variations can be due to conductive contaminant plumes in the groundwater, shallow discontinuous clay and silt horizons, shallow bedrock features such as voids, disturbed filled-in areas such as buried trenches, or buried metallic objects such as drums, tanks, or utility lines.

For the interpretation of high conductivity targets (like steel drums or metallic containers in this case), the in-phase component is the most discriminative. Lower contrast targets such as clay layers, contaminant plumes, and filled-in trenches are better indicated in the conductivity or quadrature data set. For this survey the EM-31 was set to record at 1 second intervals, a distance equivalent of approximately 2.5 feet. Survey line spacing was approximately 5 feet on center.

The RD7000 precision utility locator uses radio emission to trace the location of metal bearing utilities. This radio emission can be active or passive. Active tracing requires the attachment of a radio transmitter to the utility, passive tracing uses radio emissions that are present on the utility. Underground electrical utilities typically emit radio signals that this device can detect.

The TW-6 is designed to find pipes, cables and other metallic objects such as underground storage tanks. One surveyor can carry both the transmitter and receiver together, making it ideally suited for exploration type searches of ferrous metal masses.

Metal detectors of this type operate by generating a magnetic field at the transmitter which causes metallic objects in the subsurface to generate a secondary magnetic field. The induced secondary field is detected by the receiver, which generates an audible tone equal to the strength of the secondary field.

The Pathfinder Pro XRS Mapping System is a 12 channel differential beacon GPS receiver. The Pro XRS uses an integrated differential beacon receiver and antenna to receive real-time differential corrections from a subscription-based satellite correction service. This system provides for real-time sub-meter position data collection. This system is used in a wide range of applications, including utility asset management, environmental monitoring, and natural resource and land management. Feature and attribute data are input with a hand-held Asset Surveyor data logger. The GPS Pathfinder was used to tag each EM-61 reading with geographic coordinate for processing and mapping purposes.

4.0 SURVEY FINDINGS

All accessible areas within the survey areas were examined during this investigation. All areas were examined with the RD7000 for potential subsurface utilities then surveyed with GPR and TW-6 for other potential anomalies. EM data was collected where possible. Based on the data gathered, the following utilities were detected: water, gas, sanitary sewer and storm sewer. Additionally, a potential building foundation was detected. All detectable utilities were marked onsite with appropriate colors. Anomalous features and unknown utilities were marked onsite in pink paint. Site map (100316.1) is included with all located subsurface features.

5.0 SURVEY LIMITATIONS

GPR depth of penetration was limited to approximately 1-2 feet bgs. The limiting factor was due to conductive soils. Building walls, parked cars, dense vegetation, area fencing and debris limited equipment usage over portions of the survey area. Delta did not have access to buildings located adjacent to the property. Interior access may aid Delta in detecting unknown utilities or utilities otherwise not detectable without a direct connection to the pipe or conduit.

6.0 WARRANTIES AND DISCLAIMER

As with any geophysical method, it must be stressed that caution be used during any excavation or intrusive testing in proximity to any anomalies indicated in this report. In addition, the absence of detected signatures does not preclude the possibility that targets may exist. To the extent the client desires more definitive conclusions than are warranted by the currently available facts; it is specifically Delta’s intent that the conclusions stated herein will be intended as guidance.

This report is based upon the application of scientific principles and professional judgment to certain facts with resultant subjective interpretations. Professional judgments expressed herein are based on the facts currently available within the limit or scope of work, budget and schedule. Delta represents that the services were performed in a manner consistent with currently accepted professional practices employed by geophysical/geological consultants under similar circumstances. No other representations to Client, express or implied, and no warranty or guarantee is included or intended in this agreement, or in any report, document, or otherwise.

This report was prepared pursuant to the contract Delta has with the Client. That contractual relationship included an exchange of information about the property that was unique and between Delta and its client and serves as the basis upon which this report was prepared. Because of the importance of the understandings between Delta and its client, reliance or any use of this report by anyone other than the Client, for whom it was prepared, is prohibited and therefore not foreseeable to Delta.

Reliance or use by any such third party without explicit authorization in the report does not make said third party a third party beneficiary to Delta's contract with the Client. Any such unauthorized reliance on or use of this report, including any of its information or conclusions, will be at the third party's risk. For the same reasons, no warranties or representations, expressed or implied in this report, are made to any such third party.

LEGEND

○	UTILITY VALVE COVER
◯	MANHOLE COVER
	FIRE HYDRANT/ SHUTOFF VALVE
	GAS
	STORM SEWER
	SANITARY SEWER
	WATER
	UNKNOWN UTILITY
—·—×—·—	FENCE

0 60 120 240 360

GRAPHIC SCALE IN FEET

NOTES:

This site plan was produced from data positioned by differential GPS measurments collected in the field. Due to the errors normally present in DGPS data, this document is not intended or represented to be of survey precision. Caution should be used in all field measurments based on this site plan.

As with any geophysical method, it must be stressed that caution be used during any excavation or intrusive testing in proximity of any anomalies indicated in this document The absence of detected signatures does not preclude the possibility that targets exist. The geophysical data and results presented in this site plan are based upon the application of scientific principles and professional judgements to certain facts with resultant subjective interpretations. Professional judgements expressed herein are based on the facts currently available within the limits of the existing data, scope of work, budget, and schedule.

Reliance or use by any such third party without explicit authorization in the document does not make said third party a third party benificiary to Delta's contract with the client. Any such unauthorized reliance on or use of this document, including any of its information or conclusions, will be at the third party's risk. For the same reasons, no warranties or representations, expressed or implied in this document, are made to any such third party.

DATE	10/6/16
SCALE	1'' = 120'
DWG NO.	100316.1
SHT NO.	1 OF 1
PROJECT.	

GEOPHYSICAL INVESTIGATION
7 SPRUCE STREET, ILION, NEW YORK

FOR

CDM SMITH

DELTA Geophysics Inc.
738 Front Street, Catasauqua, PA 18032
Phone: (610) 231-3701

Appendix B

Appendix B

Field Log Book and Equipment Calibration Forms

CONTENTS

PAGE	REFERENCE	DATE

Location Ilion, NY Date 10/3/16

Project / Client Dunafold, EPA

Geophysical Survey/PGS

0700 Eric Rosenzweig & John Blaum on site from CDM Smith to lay out the Grid for the passive Gas survey (PGS) and oversee Geophysical Survey (GPR)

710 Josh Hess & Dylan Morgenveck on site from Delta to Conduct GPR survey.

715 Conducted morning H&S meeting
- weather overcast ≈60°

720 Conducted site walk
- JB & ER starting PGS Grid
Delta following Behind w/ GPR unit Clearing locations.

730 JB made the call that the Grid spacing on the drawing was off

ERosenzweig 10/3/16

Location Ilion, NY Date 10/3/16

Project / Client Duafold / Epa
GPR Survey / PGS

and we would mark
the locations in a 100x
100 ft Grid as proposed
800 Ilion mayor Terry
Leonard onsite ((315) 895-
7449) on site. Asked if
the DPW could brush hog
overgrown area along
Pleasant Ave & Spruce St.
815 Jim Trevett (Ilion fire Chief)
on site to see when
we would need Access
to the onsite Bldg's.
Cell: (315) 868-0551
Fire dept: (315) 894-6048
900 Buildings opened
- while inside discovered
probable Asbestos Containing
Materials (ACM's) in the
form of pipe insulation
& 9x9 in Floor tiles
- made the call to exit
Building and Not
Conduct further work
10/3/16

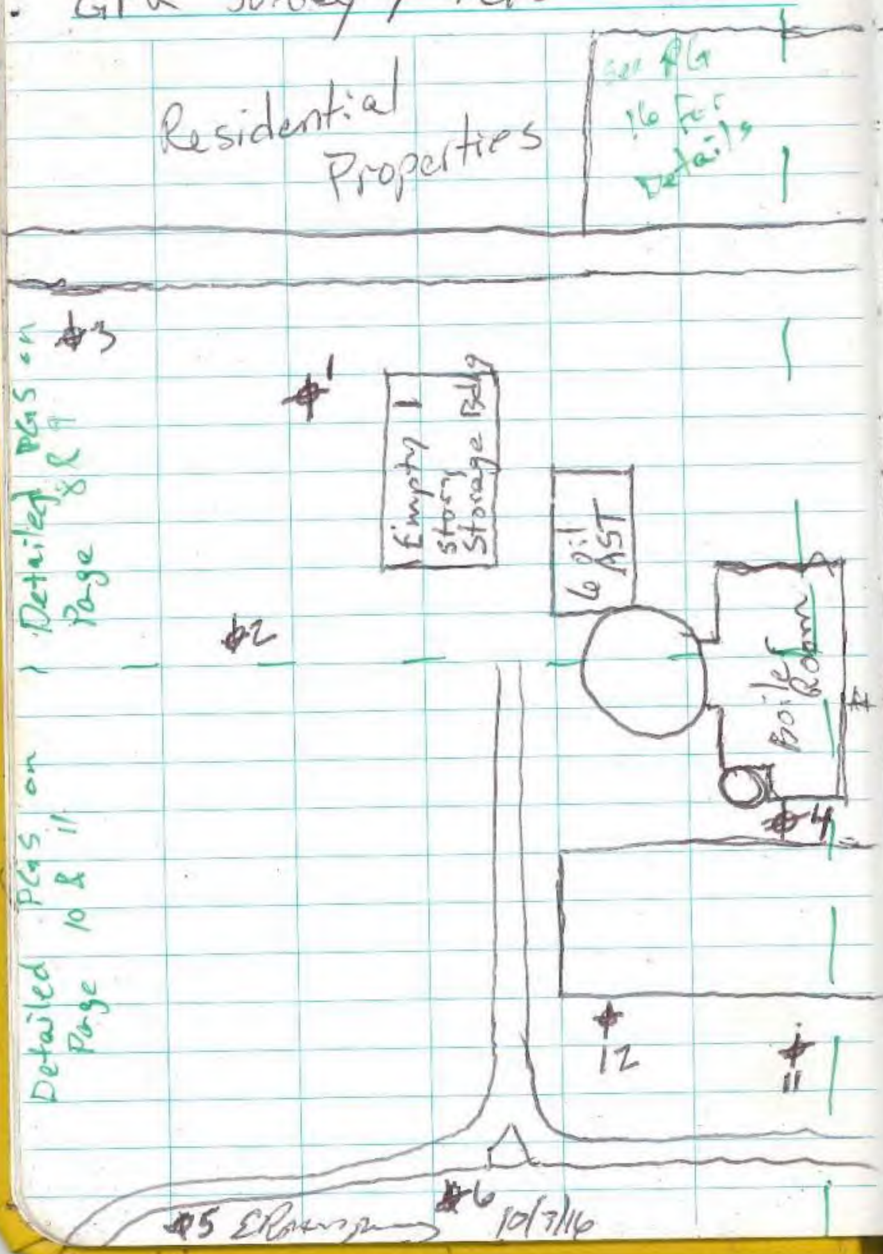
Location Ilion, NY Date 10/3/16

Project / Client Duafold / EPA
GPR Survey / PGS

until an offical ACM
Survey is done
1020 Jack Sterling on site
from the Ilion DPW
- Showed him area to
be cleared
1130 Jack back on site
and began clearing
area w/ a bobcat
S 590 w/ a Brush hog
attachment.
- JB off site
1230 Delta off site for
lunch
1245 Area cleared & Ilion
DPW off site.
- Delta Back on site

Location Ilion, NY Date 10/3/16

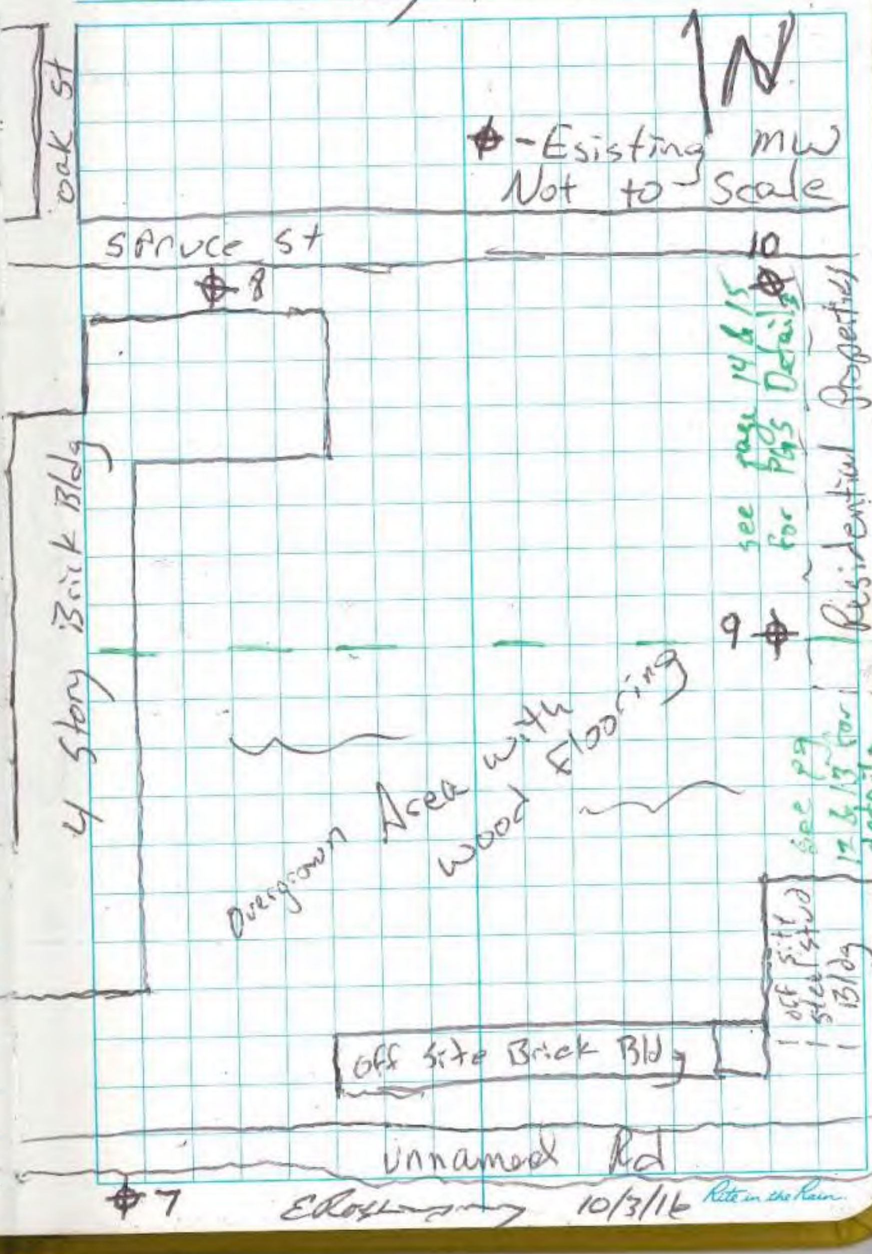
Project / Client Duofold / EPA
GPR Survey / PGS



10/3/16

Location Ilion, NY Date 10/3/16

Project / Client Duafold / EPA
GPR Survey / PGS



10/3/16

Location Ilion, NY Date 10/3/16

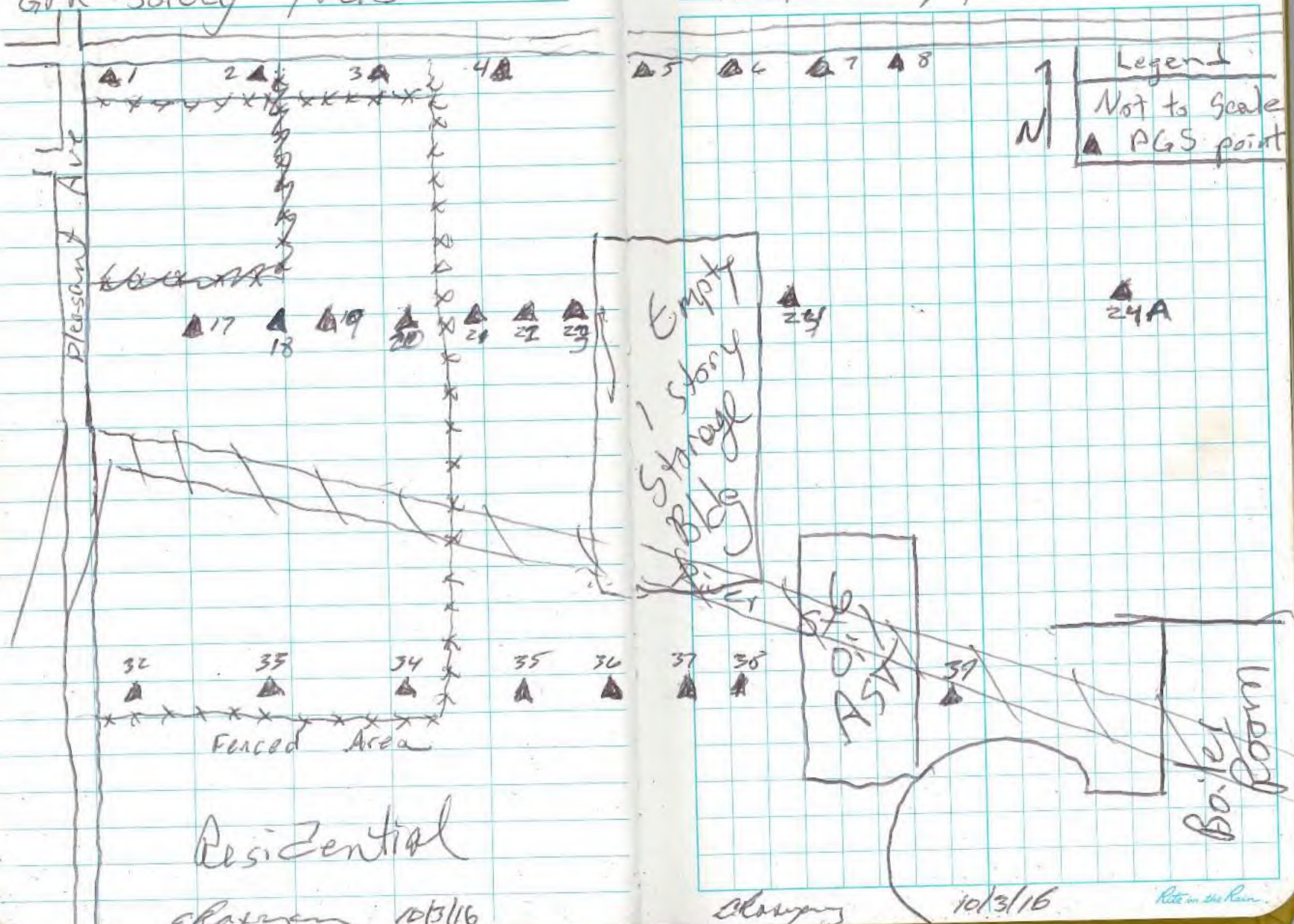
Project / Client Duofold / EPA

GPR Survey / PGS

Location Ilion, NY Date 10/3/16

Project / Client Duofold / EPA

GPR survey / PGS



EKasyany 10/3/16

EKasyany 10/3/16

Location Ilion, NY Date 10/3/16

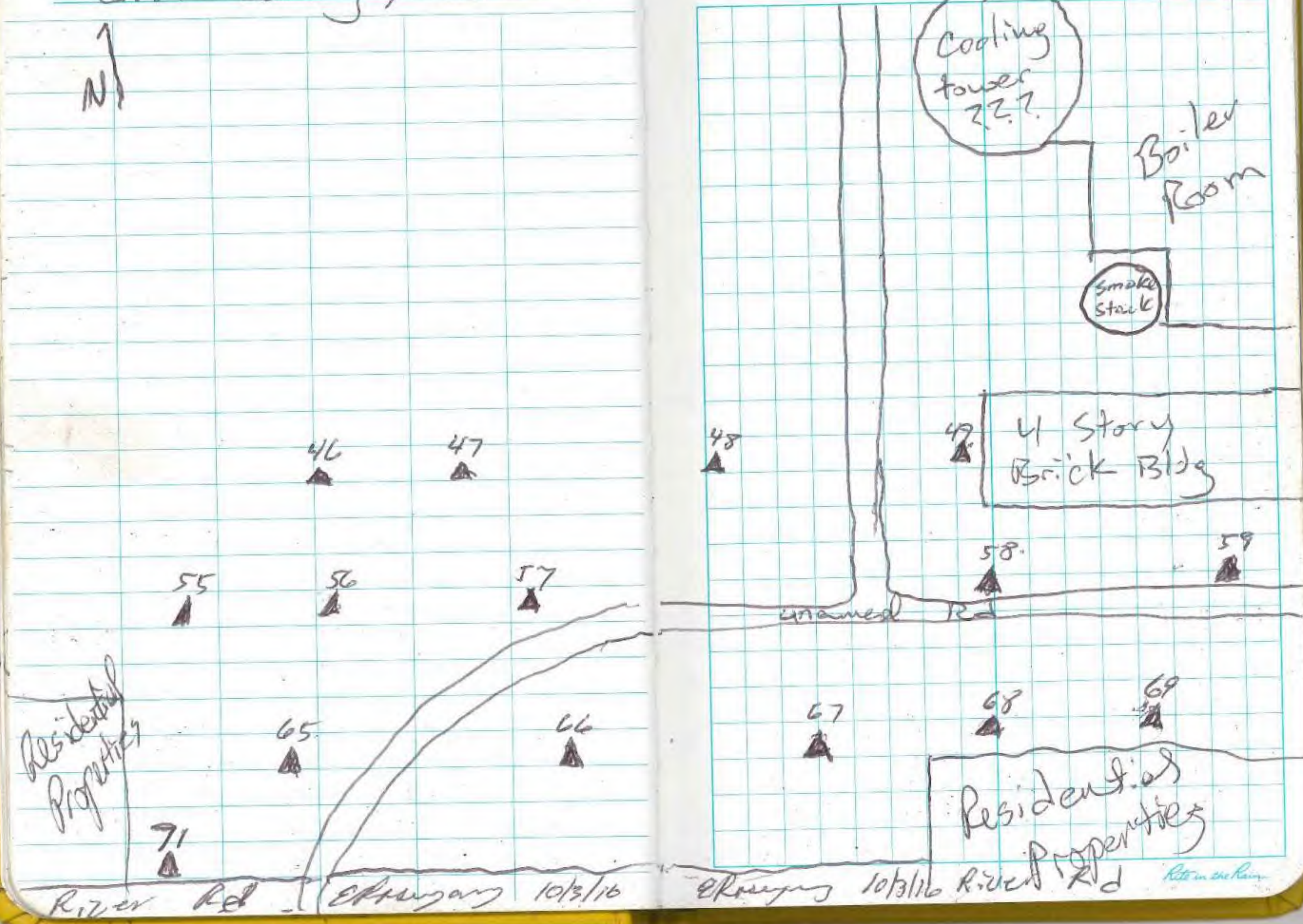
Project / Client Duofold / EPA

GPR Survey / PGS

Location Ilion, NY Date 10/3/16

Project / Client Duofold / EPA

GPR Survey / PGS

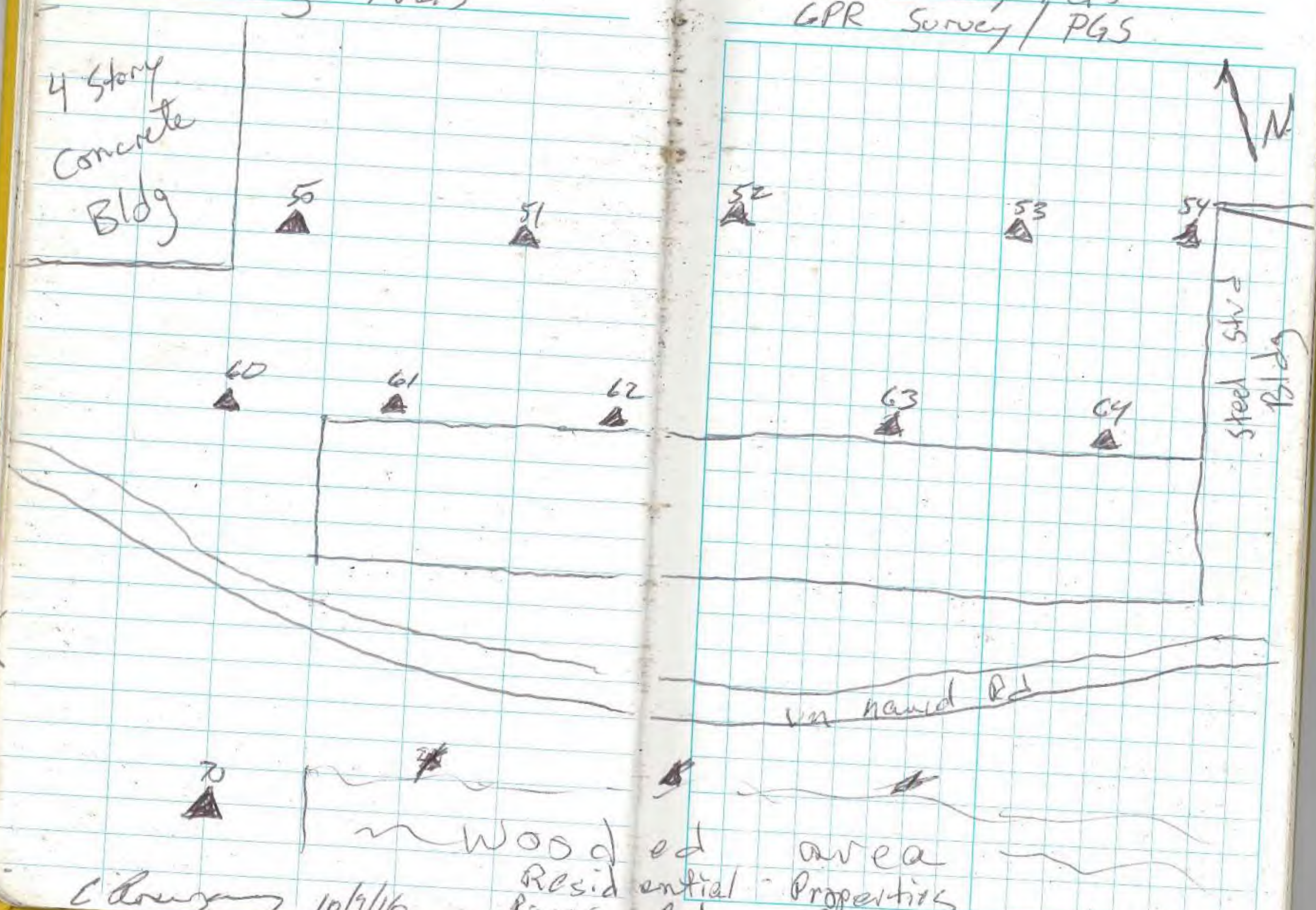


10/3/16

10/3/16

Location Ilion, NY Date 10/3/16
Project / Client Duofold / EPA
GPR Survey / PGS

Location Ilion, NY Date 10/3/16
Project / Client Duofold, PGS
GPR Survey / PGS

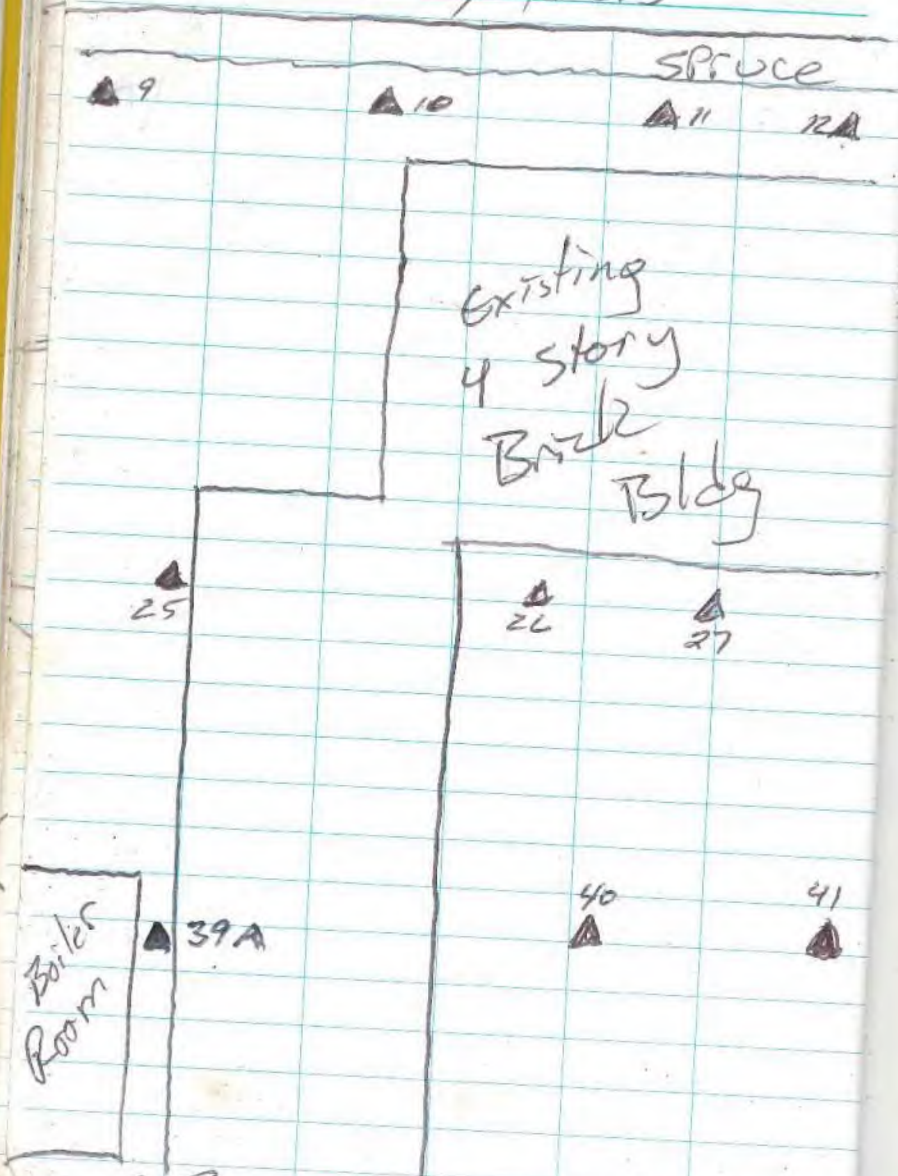


10/3/16

10/3/16

Location Ilion, NY Date 10/3/16

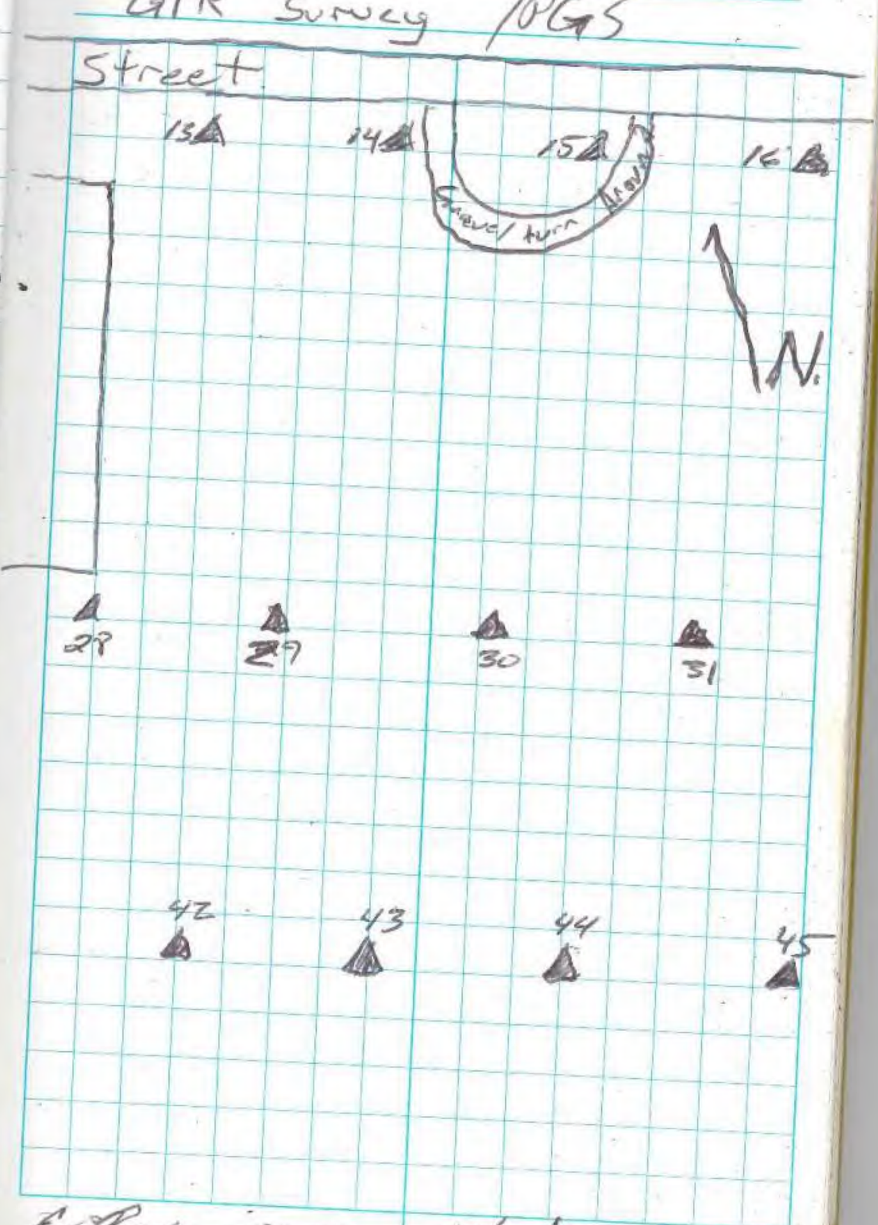
Project / Client Duofold / EPA GPR Survey / PGS



10/3/16

Location Ilion, NY Date 10/3/16

Project / Client Duofold / EPA GPR Survey / PGS

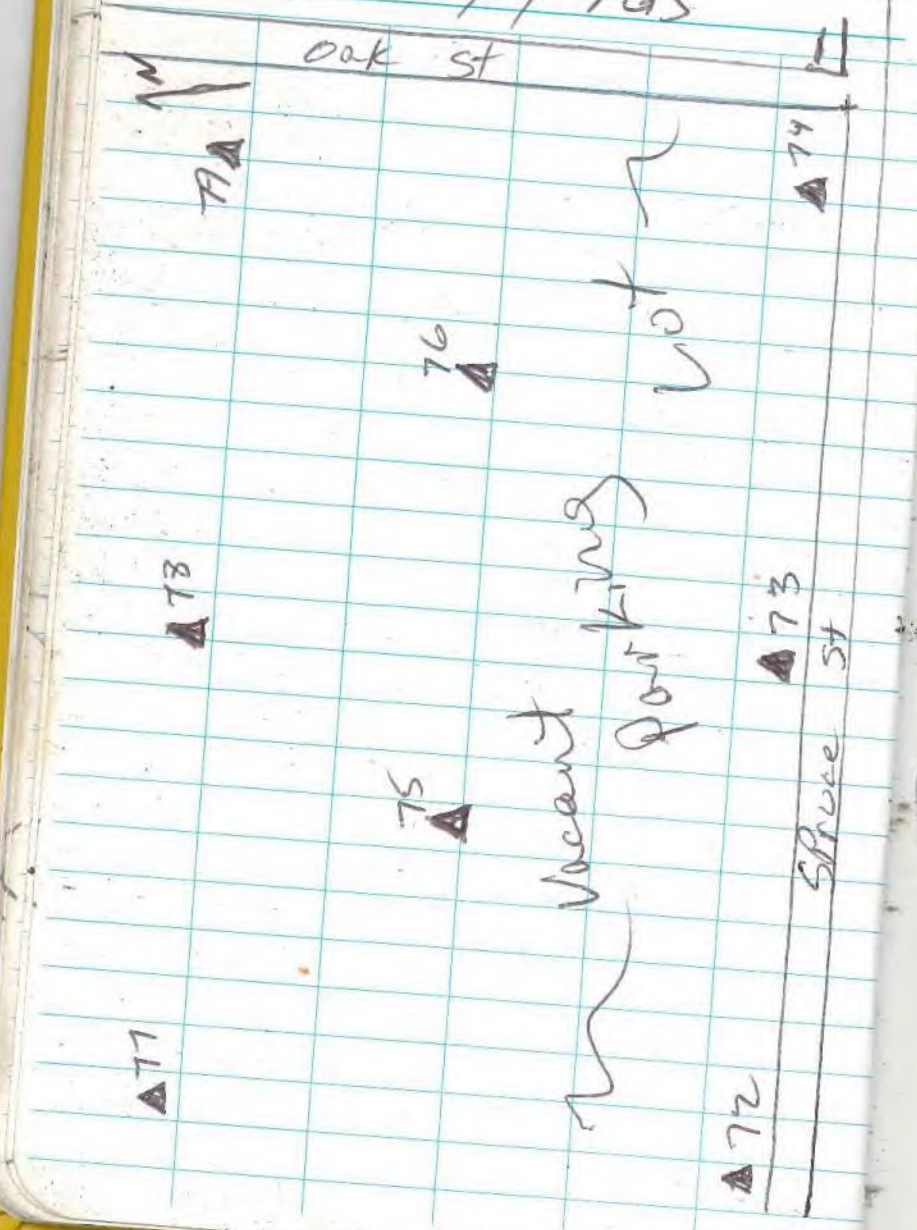


10/3/16

Location Ilion, NY Date 10/3/16

Project / Client Duofold / EPA

GPR Survey / PGS



Location Ilion, NY Date 10/3/16

Project / Client Duofold / EPA

GPR Survey / PGS

1530 Rain Developing

1700 Delta done for the day packed up & off site

10/3/16

Location Ilion, NY Date 10/4/16

Project / Client Duafold / EPA
GPR survey / PGS

0700 E Rosenzweig on Site from CDM Smith
-Weather Overcast ≈ 55

0730 Dylan Morzeneck & Ryan Schneider on site from Delta

0745 Ryan Schneider on site from Beacon Environmental Services

BEACON-USA.COM

BEACON ENVIRONMENTAL SERVICES, INC.

2203A Commerce Road
Suite 1
Forest Hill, MD 21050
410.838.8780 x111 •P

Ryan Schneider
Senior Project Manager
ryan.schneider@beacon-usa.com

800 Conducted morning H&S meeting. Topics discussed slip/trip/falls. poor site Conditions w/ Sink holes & uncovered Catch Basins

E Rosenzweig 10/4/16

Location Ilion, NY Date 10/4/16

Project / Client Duafold / EPA
GPR Survey / PGS

901	installed	DF-PGS-1
908	installed	DF-PGS-17
915	installed	DF-PGS-2
921	installed	DF-PGS-3
925	installed	DF-PGS-4
929	installed	DF-PGS-5
933	installed	DF-PGS-6
937	installed	DF-PGS-7
941	installed	DF-PGS-8
945	installed	DF-PGS-9
951	installed	DF-PGS-10
955	installed	DF-PGS-11
1001	installed	DF-PGS-12
1007	installed	DF-PGS-13
1013	installed	DF-PGS-14
1022	installed	DF-PGS-15
1024	installed	DF-PGS-16
1100	installed	DF-PGS-18
1104	installed	DF-PGS-19
1109	installed	DF-PGS-20
1114	installed	DF-PGS-32
1118	installed	DF-PGS-33
1123	installed	DF-PGS-34
1128	installed	DF-PGS-21

10/4/16

Location Ilion, NY Date 10/4/16
Project / Client Duofold / EPA
GPR Survey / PGS

1137 installed DF-PGS-22
1140 Delta off site for lunch
1141 installed DF-PGS-23
1147 installed DF-PGS-35
1159 installed DF-PGS-36
1204 installed DF-PSG-37
1208 installed DF-PSG-38
1215 installed DF-PGG-49
1218 installed DF-PSG-48
1225 installed DF-PSG-47
- Note: Hit concrete pad
1230 Delta back on site
1232 installed DF-PSG-46
1234 installed DF-PSG-55
1240 installed DF-PGG-56
1243 installed DF-PSG-57
1248 installed DF-PSG-58
1256 installed DF-PSG-59
1300 installed DF-PSG-70
1307 installed DF-PSG-69
1318 installed DF-PSG-68
1318 installed DF-PSG-67
1325 installed DF-PSG-66

10/4/16

Location Ilion, NY Date 10/4/16
Project / Client DuaFold / EPA
GPR Survey / PGS

1343 installed DF-PGS-65
1320 installed DF-PGS-71
1354 installed DF-PSG-24
1409 installed DF-PSG-24A
1413 installed DF-PSG-39
1419 installed DF-PSG-25
1423 installed DF-PSG-39A
1431 installed DF-PSG-74
1437 installed DF-PSG-73
1441 installed DF-PSG-72
1446 installed DF-PSG-75
1448 installed DF-PSG-76
1455 installed DF-PSG-77
1501 installed DF-PSG-78
1506 installed DF-PSG-79
1520 installed DF-PSG-60
1527 installed DF-PSG-61
1544 installed DF-PGS-27
1547 installed DF-PGS-28
1556 installed DF-PGS-29
1603 installed DF-PGS-30
1606 installed DF-PGS-31
1630 Finished [illegible] and off site

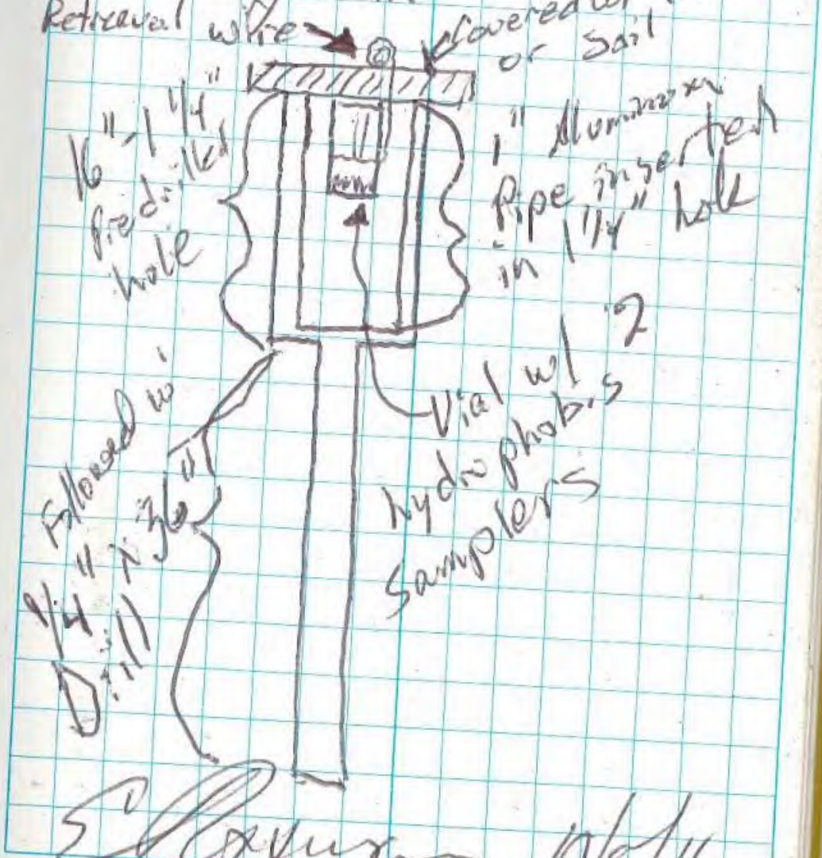
10/4/16

Location Ilion, NY Date 10/5/16
Project / Client Duofold / EPA
GPR Survey / PGS

0700 E Rosenzweig on site from CDM
-Weather: Clear ≈ 50
-Tasks: complete installation of PGS points
start EM-31 portion of GPR Survey
715 Conducted H&S meeting
806 intalled DF-PGS-26
827 installed DF-PGS-40
834 installed DF-PGS-50
840 installed DF-PGS-41
849 installed DF-PGS-51
856 installed DF-PGS-62
904 installed DF PGS - 63
936 installed DF PGS - 53
852 installed DF-PGS - 52
848 installed DF-PGS - 42
944 installed DF-PGS-43
950 installed DF PGS-44
959 installed DF PGS-54
1002 installed DF PGS-64
ER 10/5/16 ~~installed DF-PGS 55~~
1005 installed DF-PGS- 45
E Rosenzweig 10/5/16

Location Ilion, NY Date 10/5/16
Project / Client Duofold / EPA
GPR Survey / PGS

1045 Completed the install of 81 Passive Gas Survey points.
-Ryan off site.
typical installation diagram



E Rosenzweig 10/5/16

Location Ilion, NY Date 10/5/16

Project / Client Duofold / EPA

GPR Survey / PGS

1115 Collecting GPS

DF-PGS-1

5737304.74' N HAE

12413206.72' E 287.21

DF-PGS-2

5737263,96' N HAE

12413301.11' E 290.16

DF PGS-3

5737246.71' N HAE

12413395.50' E 290.77

DF PGS-4

5737190.06' N HAE

12413506,64 E 291.16

DF-PGS-5

5737153.66' N HAE

12413608.79' E 289.42

DF-PGS-6

5737124.90' N HAE

12413703.84' E 290.59

DF-PGS-7

5737090.78' N HAE

12413799.51' E 288.98

10/5/16

Location Ilion, NY Date 10/5/16

Project / Client Duofold / EPA

GPR Survey / PGS

DF-PGS-8

5737058.84' N HAE

12413894.96' E 287.36

DF-PGS-9

5737028.41' N HAE

12413991.22' E 287.09

DF-PGS-10

5736993.15' N HAE

12414088.69' E 292.63

DF-PGS-11

573695307' N HAE

12414181.24' E 289.16

DF-PGS-12

5736925.78' N HAE

12414275.40' E 287.28

DF-PGS-13

5736912.40' N HAE

12414379.45' E 287.30

DF-PGS-14

5736865.87' N HAE

12414470.01' E 283.64

DF-PGS-15

5736837.22' N HAE

12414568.43' E 289.38

10/5/16

Location Ilion, NY

Project / Client Duofold / EPA Date 10/5/16

GPR Survey / PGS

DF-PGS-16
5736824.55'N HAE
12414627.45'E 292.79

DF-PGS-17
5737174.06'N HAE
12413182.30'E 298.35

DF-PGS-18
5737199.68'N HAE
12413248.21'E 291.00

DF-PGS-19
5737156.93'N HAE
12413328.92'E 290.40

DF-PGS-20
5739122.34'N HAE
12413430.33'E 291.11

DF-PGS-21
5737089.41'N HAE
12413535.74'E 288.09

DF-PGS-22
5737053.50'N HAE
12413639.27'E 288.89

DF-PGS-23
5737039.37'N HAE
12413731.34'E 289.36

10/5/16

Location Ilion, NY

Project / Client Duofold / EPA Date 10/5/16

GPR. Survey / PGS

DF-PGS-24
5736988.99'N HAE
12413837.43'E 285.80

DF-PGS-25
5736936.88 HAE
12413984.07 298.38

DF-PGS-26
5736883.65'N HAE
12414100.32'E 321.78

DF-PGS-27
5736840.49'N HAE
12414303.48'E 295.29

DF-PGS-28
5736810.27'N HAE
12414304.88'E 291.12

DF-PGS-29
5736810.22'N HAE
12414402.35'E 287.36

DF-PGS-30
5736779.14'N HAE
12414497.53'E 291.26

DF-PGS-31
5736766.50'N HAE
12414567.98'E 287.44

10/5/16

Location Ilion, NY Date 10/5/16
Project / Client Duofold / EPA
GPR Survey / PGS

DF-PGS-24A	
5736964.61'N	HAE
12413925.59'E	291.16
DF-PGS-32	
5737114.14'N	HAE
12413204.43'E	290.52
DF-PGS-33	
5737102.94'N	HAE
12413272.53'E	293.86
DF-PGS-34	
5737071.78'N	HAE
12413358.17'E	296.16
DF-PGS-35	
5737021.79'N	HAE
12413470.99'E	294.71
DF-PGS-36	
5736991.50'N	HAE
12413565.02'E	294.62
DF-PGS-37	
5736952.54'N	HAE
12413671.04'E	293.88
DF-PGS-38	
5736390.45'N	HAE
12413746.04'E	287.85

10/5/16

Location Ilion NY Date 10/5/16
Project / Client Duofold / EPA
GPR Survey / PGS

DF-PGS-39	
5736923.18'N	HAE
12413863.24'E	320.57
DF-PGS-39A	
5736860.23'N	HAE
12413970.44'E	283.59
DF-PGS-40	
5736848.30'N	HAE
12414038.62'E	287.67
DF-PGS-41	
5736812.83'N	HAE
12414121.59'E	287.01
DF-PGS-42	
5736788.09'N	HAE
12414211.26'E	289.80
DF-PGS-43	
5736760.09'N	HAE
12414313.85'E	290.94
DF-PGS-44	
5736723.30'N	HAE
12414413.06'E	290.05
DF-PGS-45	
5736690.96'N	HAE
12414502.09'E	296.97

10/5/16

Location Ilion, NY
Date 10/5/16
Project / Client Duofold / EPA
GPR Survey / PGS

DF-PGS-46	
5736928.13'N	HAE
12413487.64'E	296.69
DF-PGS-47	
5736893.32'N	HAE
12413590.14'E	291.60
DF PGS-48	
5736860.07'N	HAE
12413706.04'E	291.25
DF-PGS-49	
5736823.47'N	HAE
12413810.81'E	288.27
DF-PGS-50	
5736749.55'N	HAE
12414050.06'E	288.21
DF-PGS-51	
5736721.06'N	HAE
12414148.21'E	289.54
DF-PGS-52	
5736692.88'N	HAE
12414230.23'E	291.26
DF-PGS-53	
5736675.71'N	HAE
12414350.56'E	298.88

10/5/16

Location Ilion, NY
Date 10/5/16
Project / Client Duofold / EPA.
GPR Survey / PGS

DF-PGS-54	
5736639.70'N	HAE
12414437.11'E	297.60
DF-PGS-55	
5736846.44'N	HAE
12413511.56'E	296.15
DF-PGS-56	
5736799.61'N	HAE
12413618.04'E	291.72
DF-PGS-57	
5736760.50'N	HAE
12413736.74'E	292.20
DF-PGS-58	
5736726.93'N	HAE
12413835.29'E	292.55
DF-PGS-59	
5736701.67'N	HAE
12413930.85'E	292.85
DF-PGS-60	
5736670.10'N	HAE
12414028.39'E	290.26
DF-PGS-61	
5736636.57'N	HAE
12414122.99'E	300.38

10/5/16

Location Ilion, NY Date 10/5/16
Project / Client Duofold / EPA
GPR Survey / PGS

DF-PGS-62	
5736594.58'N	HAE
12414199.29'E	284.74
DF-PGS-63	
5736579.28'N	HAE
12414301.72'E	304.51
DF-PGS-64	
5736558.51'N	HAE
12414391.47'E	290.64
DF-PGS-65	
5736770.49'N	HAE
12413470.91'E	292.85
DF-PGS-66	
5736729.20'N	HAE
12413565.13'E	295.28
DF-PGS-67	
5736701.92	HAE
12413664.39	290.50
DF-PGS-68	HAE
5736663.23	291.25
12413771.57	
DF-PGS-69	
5736635.84	HAE
12413865.90	285.37

10/5/16

Location Ilion, NY Date 10/5/16
Project / Client Duofold / EPA
GPR Survey / PGS

DF-PGS-70	
5736590.05	HAE
12413960.07	292.46
DF-PGS-71	
5736650.38	HAE
12413659.12	290.02
DF-PGS-72	
5737121.35'N	HAE
12413843.59'E	287.15
DF-PGS-73	
5737101.01'N	HAE
12413926.67'E	293.38
DF-PGS-74	
5737076.83'N	HAE
12414016.73'E	288.65
DF-PGS-75	
5737181.27'N	HAE
12413912.81'E	287.50
DF-PGS-76	
5737173.55'N	HAE
12413996.80'E	289.40
DF-PGS-77	
5737897.67'N	HAE
12413890.28'E	290.53

10/5/16

Location Ilion, NY Date 10/5/16

Project / Client Duofold / EPA

GPR Survey / PGS

DF-PGS-78	
5737268.76'N	HAE
12413989.05'E	289.48
DF-PGS-79	
5737239.03'N	HAE
12414061.42'E	297.16

1530 GPR is complete for the day
- off site

10/5/16

Location Ilion, NY Date 10/6/16

Project / Client Duofold / EPA

GPR Survey

0630 Delta on site w/ a 2 man crew to complete the GPR Survey
- E Rosenzweig on site from CDM Smith
- weather foggy ≈ 50°

~~700~~ - Detla having software issues - trouble shooting unit.

700 conducted H&S meeting

715 - Software issues resolved began survey
- Gauging All wells:

well id	DTW	DTB	Well dia
mw-1	8.16	14.35	2"
mw-2	9.81	15.61	2"
mw-3	7.98	14.37	2"
mw-4	9.51	15.65	2"
mw-5	8.41	15.18	2"
mw-6	8.39	12.64	2"
mw-7	8.45	13.58	2"
mw-8	7.48	13.22	2"
mw-9	9.55	15.64	2"
mw-10	8.28	14.42	2"

10/6/16

Location Ilion, NY Date 10/6/16
Project / Client Duofold / EPA
GPR Survey

well id	DTW	DTB	comments
mw-11	9.02	14.07	2"
mw-12	9.15	13.10	2"

1530 Delta Completed GPR Survey - off site

10/6/16

E Rosenzweig

E Rosenzweig 10/6/16

Location Ilion, NY Date 10/20/16
Project / Client Duofold / EPA
PSG Sample Retreival

0700 Ryan Schneider on Site from Beacon Environmental to Retreive samples

0715 E Rosenzweig on Site From CDM Smith
- Weather: Overcast ≈ 50°
- had AM H&S meeting

0720 Began Retreiving

Sample time	Sample id
07:25	DFPGS 1
07:26	DFPGS 2
0728	DFPGS 3
0730	DFPGS 4
0732	DFPGS 5
0736	DFPGS 6
0737	DFPGS 7
0739	DFPGS 8
0741	DFPGS 9
0743	DFPGS 10
0745	DFPGS 11
0753	DFPGS 12
0754	DFPGS 13
0756	DFPGS 14

E Rosenzweig 10/20/16

Location Ilion, NY Date 10/20/16

Project / Client Duofold / EPA

PSG Sample Retreival

missing	DFPGS 15
803	DFPGS 16
0722	DFPGS 17
813	DFPGS 18
815 (sample uncovered)	19
823	DFPGS 20
825	DFPGS 21
827	DFPGS 22
829	DFPGS 23
840	DFPGS 24
845	DFPGS 25
1011	DFPGS 26
1009	DFPGS 27
1007	DFPGS 28
1006	DFPGS 29
1004	DFPGS 30
1002	DFPGS 31
816	DFPGS 32
819	DFPGS 33
821	DFPGS 34
834	DFPGS 35
835 (Uncovered)	DFPGS 36
837	DFPGS 37
838	DFPGS 38

10/20/16

Location Ilion, NY Date 10/20/16

Project / Client Duofold / EPA

PSG Sample Retreival

842	DFPGS 39
949	DFPGS 40
951	DFPGS 41
953	DFPGS 42
955	DFPGS 43
958	DFPGS 44
1001	DFPGS 45
854	DFPGS 46
856	DFPGS 47
858	DFPGS 48
900	DFPGS 49
946	DFPGS 50
943	DFPGS 51
941	DFPGS 52
940	DFPGS 53
937	DFPGS 54
902	DFPGS 55
908	DFPGS 56
913	DFPGS 57
917	DFPGS 58
918	DFPGS 59
923	DFPGS 60
930	DFPGS 61
932	DFPGS 62

10/20/16

Location Ilion, NY Date 10/20/16

Project / Client Duofold / EPA

PGS sample retrieval

933	DFPGS	63
935	DFPGS	64
904	DFPGS	65
906	DFPGS	66
911	DFPGS	67
915	DFPGS	68
920	DFPGS	69
921	DFPGS	70
910	DFPGS	71
1024	DFPGS	72
1023	DFPGS	73
1021	DFPGS	74
1026	DFPGS	75
1028	DFPGS	76
1030	DFPGS	77
1032	DFPGS	78
1033	DFPGS	79
843	DFPGS	84A
847	DFPGS	39A

10/20/16

Location Ilion, NY Date 11/7/16

Project / Client Duofold / EPA

~~PGS~~ Soil Sampling

0715 Lia Estrada & Eric Rosenzweig on Site from CDM Smith to Collect Surface & Sub Surface Soil Samples
- Weather Clear ≈ 35°
-- Reviewed & Signed HASP

745 Walking Site to mark out sampling locations.

945 Collected SS-01 Colocated w/ SB-01 Analysis: Pest/TAL Metals TCLP Metals

955 Collected SS-02 Colocated w/ SB-02 Analysis: Pest/TAL Metals TCLP Metals

1000 Collected SS-03 Colocated w SB-03 Analysis: Pest/TAL Metals TCLP Metals

11/7/2016

Location Ilion, NY Date 11/7/16
Project / Client Duofold / EPA
Soil & Subsurface Soil

1010 Collected SS-05
Colocated w/ SB-05
Analysis: Pest/TCLP Metals
TAL Metals

1015 Collected SS-04
Colocated w/ SB-04
Analysis: Pest/TCLP Metals
TAL Metals

1025 Collected SS-06
Colocated w/ SB-06
Analysis: Pest/TCLP Metals
TAL Metals

1030 Collected SS-07
Colocated w/ SB-07
Analysis: Pest/TCLP Metals
TAL Metals

1035 Collected Dup of SS-07
ID: SB-900-C
Analysis: Pest

1055 Collected SS-10
Colocated w/ SB-10
Analysis: Pest/TAL Metals
TCLP Metals

11/7/16

Location Ilion, NY Date 11/7/16
Project / Client Duofold / EPA
Soil & Subsurface Soil Sampling

1100 Collected SS-09
Colocated w/ SB-09
Analysis: Pest/TCL Metals
TCLP Metals

☆ MS/MSD SAMPLE

1110 Collected SS-08
Colocated w/ SB-17
Analysis: Pest/TCL Metals
TCLP Metals.

1115 Chris from Talon Drilling Called and informed us that they were having car trouble and would not be arriving until later today therefor will NOT be starting drilling until tomorrow.

- ZE & ER Labeling bottles and taping on Cables

1230 Alison Rhelly on Site from CDM Smith w/ Field equiptment and to start sampling existing wells

11/7/16

Location Ilion, NY Date 11/7/16

Project / Client Duofold / EPA

GW/SS/SB Sampling

- Sampled existing wells MW-1 & MW-2
Analysis: VOC, SVOC
TAL Metals (2)
(filtered & Unfiltered)
- 4 Cooler Shipped to Chemtech
Air bill # 777653014820
1600 off site

11/7/16

Location Ilion, NY Date 11/7/16

Project / Client Duofold / EPA

GW/SS/SB Sampling

730 Lia Estrada, E. Rosenzweig & A Reilly on site from CDM Smith
- Ryan & Chris on site from Talon Drilling to Advance DPT Soil Borings w/ a 7720 DT
- Conducted morning H&S Meeting

800 Set up on DF-SB-01-A

0-5' Recovery 47"
PID 0.0/0.0
8" Dark Brown M SAND
18" Brown F SAND
↓ Brown Silt & Clay - wet

5-10' Recovery 53"
PID 0.0/0.0
↓ SAA

820 Collected sample from 4-5'
Analysis: VOC / PCBs / SVOC
TCLP & TAL Metals
& % moist

11/8/16

Location ~~Doel~~ Ilion, NY Date 11/8/16

Project / Client Duofold / EPA

GW/SS/SB Sampling

840 Set up on DF-SB/GWP-02-A

0-5' Recovery 41 PID 0.0/0.0

↓ Dark Brown F-M SAND

Some Coal, Ash, Brick

wet @ 4.5'

5-10 Recovery 35" PID 0.0/0.0

14" SAA

↓ light Brown CLAY DRY

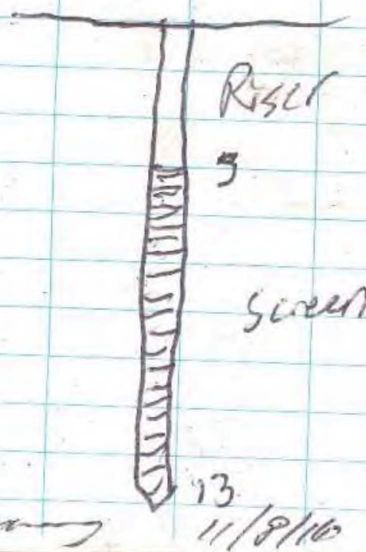
845 Collected Sample From 4-5'

Analysis: VOC/SVOC/PCB

TAL/TCLP Metals

& % Moist

CLP # BD4L6



11/8/16

Location Ilion, NY Date 11/8/16

Project / Client Duofold / EPA

GW/SS/SB Sampling

900 Set up on DF-SB/GWP-03-A

0-5' Recovery 40" PID 0.0/0.0

14" Dark Brown F-M SAND

Some Ash

↓ Brown F-C SAND - wet @ 4'

5-10 Recovery 35" PID 0.0/0.0

8" SAA

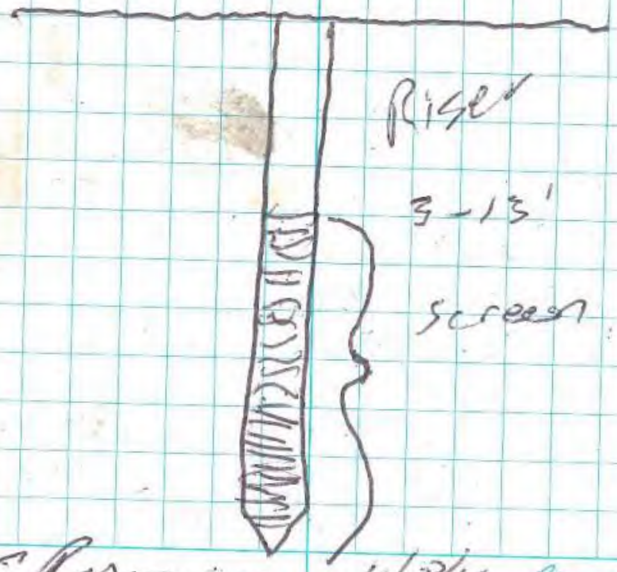
↓ Brown CLAY

Analysis: VOC SVOC, PCB, TAL/TCLP

Metals & % Moist

910 Sample time

CLP # BD4L7



11/8/16

Location Ilion, NY Date 11/8/16

Project / Client Duofold / EPA

SS/SB/GW Sampling

915 Setup on SSB-02

Recovery 23" PID 0.0

↓ Dark Brown VF-M SAND

Some Ash

920 Collected Sample

Analysis TCLP Metals

CLP # MBD4N6

930 Set up on DF-SB-5-A

0-5' Recovery 42" PID 0.0/0.0

↓ Brown VF-F SAND

little Brick, Ash, Gravel

5-10' Recovery 29" PID 0.0/0.0

10' S.A.A - Wet

↓ Brown F SAND AND GRAVEL

935 Collected sample from 5-6'

Analysis: VOC, SVOC, PCB, TCL/TAL

Metals & % Moisture

CLP # BD4L9

950 Set up on DF-SB-04-A

MS / MSD SAMPLE

~~0 5'~~ ER 11/8/16

Refusal @ 4' First Attempt

Refusal @ 4' Second Attempt

Refusal @ 4' Third Attempt

11/8/16

Location Ilion, NY Date 11/8/16

Project / Client Duofold / EPA

SS/SB/GW Sampling

SB-04 Continued

0-5' Recovery 36" PID 0.0/0.0

↓ Brown F-M SAND some

brick, Gravel & Concrete

1000 Sample time (3-4' BGS)

CLP # BD4L8

Analysis: VOC/SVOC/PCB/TCL/TAL

Metals % moisture

1010 Set up on DF-SSB-01-A

Recovery 18" PID 0.0

↓ Dark Brown F-C SAND Some

Brick & Ash

1015 Collected Sample from 1-2'

Analysis: TCLP Metals

CLP # MBD4N5

1020 Set up on DF-SB-06-A

0-5 Recovery 39" PID 0.0/0.0

11" Dark Brown F SAND AND ASH

8" Light Brown VF-F SAND

4" Dark Brown F SAND AND ASH

12" light Brown SILT-VF SAND

Trace Brick

↓ Dark Grey F SAND AND ASH

Wet @ 4'

11/8/16

Location Ilion, NY Date 11/8/16
Project / Client Duofold / EPA
SS/SB/GW Mon

SB-06 Cont
5-10' Recovery 31" PID 0.0/0.0
4" SAA
↓ light Brown SILT & CLAY
little Gravel
1030 Collected sample from 4-5'
Analysis: VOC, SVOC, PCB, TCLP
TAL Metals % Moisture
CLP # BD4M0
1040 Set upon DF-SB/TWP-07-A
0-5' Recovery 38 PID 0.0/0.0
14" Brown F SAND little
Ash
↓ BRICK
5-10' Recovery 27" PID 0.0/0.0
4" SAA
↓ Brown VF-F SAND trace
Ash / Brick wet @ 7'
1045 Collected sample from 7-8'
Analysis: VOC, SVOC, PCB, TCLP, TAL
metals % Moisture
CLP # BD4M1

11/8/16

Location Ilion, NY Date 11/8/16
Project / Client Duofold / EPA
SS/SB/GW Mon

1115 Set up on DF-SB-13-A
0-5' Recovery 22" PID 0.0/0.0
4" Concrete
2" Black F SAND AND ASH
↓ Brown F SAND little Brick
Ash - moist @ 5'
5-10 - NO Recovery
10-15' Recovery 13" PID 0.0/0.0
↓ SAA
1120 Collected Sample from 4-5'
Analysis: VOC, SVOC, PCB, TCLP, TAL
Metals, % Moisture
CLP # BD4MC
MS/MSD SAMPLE
~~A~~ had to advance 3 - 0-5'
Cores to get sample Volume
1145 ~~Collect~~ Set up on DF-SB/TWP-12-A
0-5' Recovery 34" PID 0.0/0.0
Brown F SAND little Ash
Brick, Gravel
5-10' Recovery 42" PID 65.3 / 11.6
6" SAA
↓ Gray SILT & CLAY
Strong Petroleum odor

11/8/16

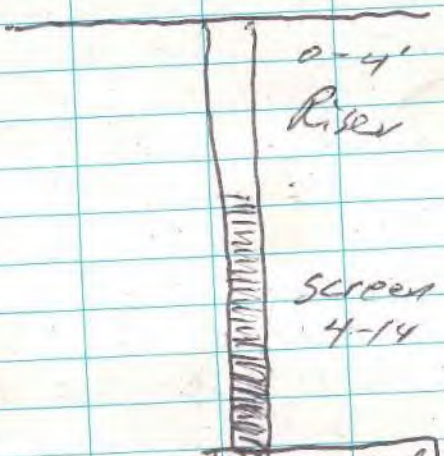
Location Ilion, NY Date 11/8/16

Project / Client Duofold / EPA

GW/SS/SB sampling

SB-12 Con't

1155 Collected Sample from 6-7'
Analysis: VOC, SVOC, PCB, TCLP, TAL
Metals, % Moisture
CLP # BD4M6



1205 Set up on DF-SB-11-A
Took 3 Attempts to get any
Recovery from 0-5'
0-5' Recovery 5" PID 834
2" Concrete
↓ Dark brown F-C SAND
Saturated
5-10' Recovery 6" PID 624
1215 Collected Sample from 4-5'
11/8/16

Location Ilion, NY Date 11/8/16

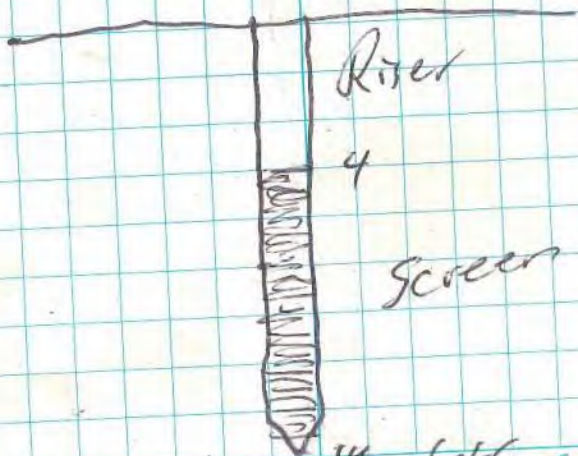
Project / Client Duofold / EPA

SS/SB/GW Sampling

Analysis: VOC, SVOC, PCB, TCLP
TAL Metals % Moisture
CLP # BD4M5

1300 Set up on DF-SB/TW08-15-A
0-5' Recovery 37" PID 0.0
3" Concrete
↓ Brown F SAND wet@4'
5-10' Recovery 52 PID 0.0
18" SAA
↓ Grey CLAY

1310 Collected Sample from 4-5'
Analysis VOC, SVOC, PCB, TCLP, TAL
Metals, % Moisture
CLP # BD4N0



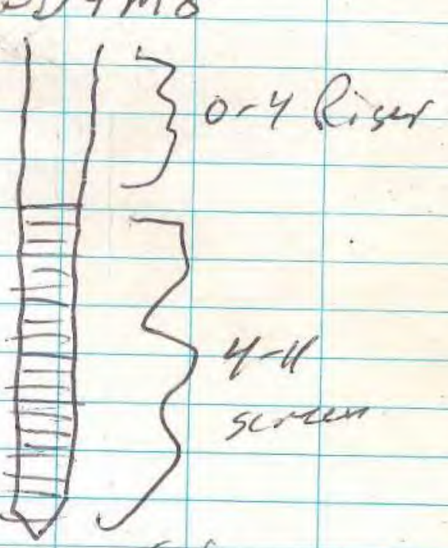
11/8/16

Location Ilion, NY Date 11/8/16

Project / Client Duofold / EPA

SS/SB/GW Sampling

1320 Set up on DF-SB/TWP-14-A
0-5 Recovery 27" PID 0.0/0.0
3" Concrete
3" Black M-C SAND
↓ Brown SILT & CLAY
5-10' Recovery 30" PID 0.0/0.0
6" SAA
8" Brown F-M SAND & GRAVEL
↓ Brown SILT & CLAY
1335 Collected sample from 6-7'
Analysis: VOC, SVOC, PCB, TCLP, TAL Metals, % Moisture
CLP # BDYM8



11/8/16

Location Ilion, NY Date 11/8/16

Project / Client Duofold / EPA

SS/SB/GW Sampling

1348 Set up on DF-SB-17-A
Duplicat SAMPLE
Dup ID SB-900-B
0-5' Recovery 42" PID 0.0/0.0
8" Dark brown F-SAND
Some Ash trace gravel
↓ Brown VF-F SAND
little gravel
5-10 Recovery 41" PID 0.0/0.0
6" SAA
18" Gray SILT & CLAY
↓ Brown VF SAND little Gravel
1350 Collected sample from 4-5'
1355 Collected DUP SAMPLE
SB-900-B
1410 Set up on DF-SB/TWP-16-A
0-5' Recovery 19" PID 0.0/0.0
6" Concrete
↓ Dark Grey VF SAND
trace Brick
5-10' Recovery 57" PID 0.0/0.0
10" SAA — Wet @ 5'
↓ Gray CLAY

11/8/16

Location Ilion, NY Date 11/8/16

Project / Client Duofold / EPA SS/GW/SB Sampling

1425 Collected Sample from
SB-16 - 5-6'
Analysis: VOC, SVOC, PCP, TCLP,
TAL Metals, % Moisture
CLP# BD4N0

1440 Set up on DF-SSB-04
PID 0.0
0-2' Recovery 18"
8" Dark brown VF-F SAND
↓ Brown VF-F SAND trace
Brick/Gravel

1445 Collected sample from 1-2'
CLP# MBD4N6
Analysis TCLP Metals

1600 A total of 8 Coolers were shipped to Chemtech w/
Air Bill # 777664591061

11/8/16

Location Ilion, NY Date 11/9/16

Project / Client Duofold / EPA SS/SB/GW Sampling

730 Lia Estrada & A. Rielly on site from CDM Smith

800 E Rosenzweig on site from CDM Smith
- Chris & Ryan on site from Talon
- Weather Rain ≈ 45°
- Conducted AM H&S Meeting

830 Set up on SSB-3
PID 0.0
0-2' Recovery 14"
↓ Dark Brown F SAND
Some Ash Gravel & Brick

840 Collected Sample from 1-2'
Analysis: TCLP Metals
CLP# MBD4N7

845 Set up on DF-SB-10-A
PID 0.0/0.0
0-5 Recovery 41
↓ Dark brown F-M SAND
Some Brick, Ash, Gravel
PID 0.0/0.0
5-10' Recovery 42
6" SAND
17 Brown VF SAND little Gravel
↓ Brown CLAY

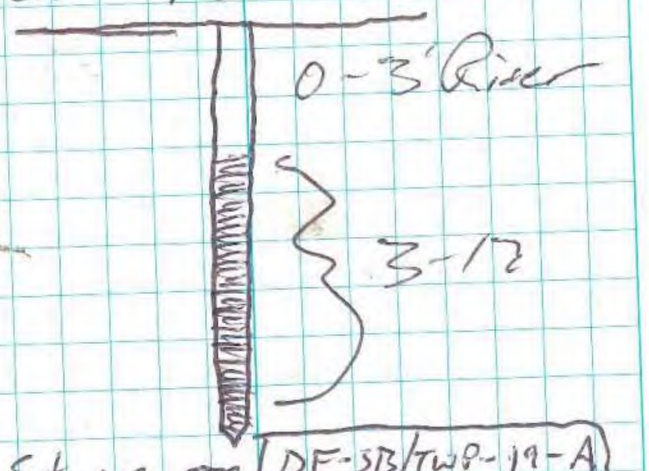
11/9/16

Location Ilion, NY Date 11/9/16
Project / Client Duofold / EPA
SS/SB/GW Mon

855 Collected Sample from
5-6'
Analysis: VOC, SVOC, PCB, TCLP, TAL
Metals, % Moisture
CLP # BD4M4
* DUP Sample: Sample id
SB-900A
CLP # BD4P9
900 Sample time
920 Set up on DF-SB-08-A
-Refusal @ 3' BGS 4 times
0-3' Dark Brown F-M SAND
some Ash, Gravel trace
Brick
925 Collected Sample from 2-3'
Analysis: VOC, SVOC, PCB, TCLP, TAL
Metals, % Moisture
CLP# BD4M2 PID 0.0
930 Set up on DF-SB/TWP-09-A
0-5' Recovery 6" PID 0.0
↓ Dark Brown VF-F SAND
little Gravel
5-10' Recovery 7" PID 0.0
↓ Brown SILT & CLAY
11/9/16

Location Ilion, NY Date 11/9/16
Project / Client Duofold / EPA
SS/SB/GW Mon

940 Collected Sample from 5-6'
Analysis: VOC, SVOC, PCB, TCLP, TAL
Metals, % Moisture
CLP # BD4M3

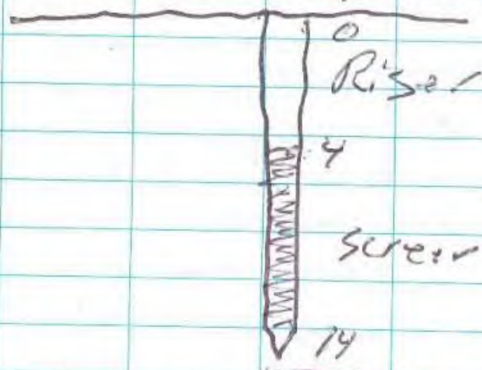


1010 Set up on DF-SB/TWP-19-A
0-5' Recovery 38 PID 0.0/0.0
25" Brown F SAND little Gravel
Ash
↓ Grey CLAY
5-10 Recovery 44" PID 0.0/0.0
30" SAA
↓ Light Brown SAND & GRAVEL
1015 Collected Sample from
4-5'
CLP # BD4N3
11/9/16

Location Ilion, NY Date 11/9/16

Project / Client Duofold / EPA
SS/SB/GW Mon

SB-19 Cont
Analysis: VOC, SVOC, PCB, TCLP, TAL
Metals % Moisture



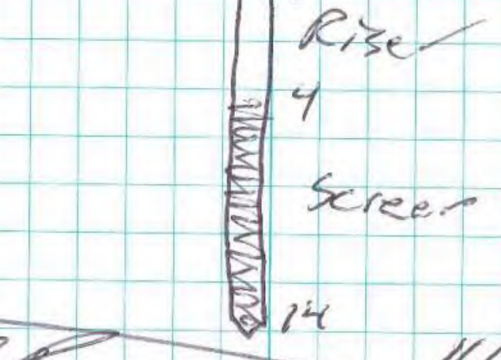
1020 Set up on DF-SB-20-A
0-5' Recovery 27" PID 0.0/0.0
6" Dark Brown F SAND
↓ Brown F SAND & GRAVEL
5-10' Recovery PID
6" SAA
17" Brown SILT & CLAY
↓ Brown F SAND & GRAVEL
1030 Collected Sample from 4-5'
Analysis: VOC, SVOC, PCB, TCLP, TAL
Metals % Moisture
CLP# BD4N4

11/9/16

Location Ilion, NY Date 11/9/16

Project / Client Duofold / EPA
SS/SB/GW Mon

1040 Set up on DF-SB/TWP-18-A
0-5' Recovery 31" PID 0.0/0.0
7" Black F-M SAND & Some
Coal & Ash
↓ Brown F-M SAND Some
Gravel
5-10 Recovery 49" PID 0.0/0.0
16" SAA - WET
15" Grey CLAY
↓ Brown SAND & GRAVEL
1050 Collected sample from 5-6'
Analysis: VOC, SVOC, PCB, TCLP, TAL
Metals % Moisture
CLP# BD4N2



11/9/16

Location Ilion, NY Date 11/09/16
Project / Client Duofold / EPA
GW/SS/SB mon / Well development

1600 developed the following
wells:
TWP-02
TWP-03
TWP-07
TWP-18
TWP-19
TWP-09
Shipped 7 Coolers to Chemtech
with air Bill # 777674213037
- Sampled the following wells:

Location Ilion, NY Date 11/10/16
Project / Client Duofold / EPA
GW Mon

730 E Rosenzweig, L. Estrada &
A. Rielly on site from
CDM Smith
- Ryan & Chris on site
from TAlon
- Weather Clear ≈ 30°
- Conducted AM H&S
meeting
800 Talon Developing the
following wells:
TWP- 17
TWP- 14
TWP- 15
TWP 16
→ CDM Sampling the following
wells

TWP-2	MW-9
TWP-3	MW-10
TWP-7	TWP-18
TWP-9	TWP-19

1600 - Shipped a total of 5 Coolers
to Chemtech w/ Air Bill
777683547082

ERosenzweig 11/10/16

Location ~~Duofold~~ Ilion, NY Date 11/9/16

Project / Client Duofold / EPA
Well development

1120 Setup to begin Newly installed wells See separate log sheets

11/11/16

Location Ilion, NY Date 11/11/16

Project / Client Duofold, EPA
GW Mon

0730 E Rosenzweig, L. Estrada & A. Rielly on site from CDM Smith to complete Ground water monitoring
- Ryan & Chris on site from Talon
- Weather: Clear ≈ 40°
- Conducted AM H&S meeting

800 - Talon Abandoned temporary well points
- CDM sampling the following wells:

TWP-14 TWP-15
TWP-12 TWP-16

Shipped 3 Coolers to ChemTech w/ Air Bill
#777690297562
777690297985

Location Ilion, NY Date 11/14/16
Project / Client DuoFold / EPA
IDW ~~Sampling~~ GPS

1000 E Rosenzweig on site to GPS sample locations
- Weather Clear ≈ 40°

SB-01 / SS-01
N 43.020904
E -75.037703

SB/TWP/SS-02
N 43.020567
E -75.037597

SB/TWP/SS-03
N 43.020638
E -75.036953

SB/SS-04
N 43.019991
E -75.036639

SB/SS-05
N 43.020306
E -75.036350

SB/SS-06
N 43.019921
E -75.035836

11/14/16

Location Ilion, NY Date 11/14/16
Project / Client Duofold / EPA
IDW sampling / GPS

SB/TWP/SS-07
N 43.019753
E -75.035936

SB-08 | SS-08
N 43.020006
E -75.035202

SB/TWP/SS-09
N 43.020297
E -75.035037

SB-10 / ~~SS-10~~ ER 11/14/16
N 43.019980
E -75.035301

SB-11
N ~~43.01[illegible]~~ 43.019702
E -75.035617

SB/TWP-12
N 43.019653
E -75.034728

SB-13
N 43.019659
E -75.034586

SB/TWP-14
N 43.019247
E -75.034251

11/14/16

Rite in the Rain

Location Ilion, NY Date 11/14/16
Project / Client Duofold / EPA,
IDW Sampling / GPS

SB/TWP-15
N 43.019702
E -75.034195
SB/TWP-16
N 43.019502
E -75.033274
~~SB/SS-17~~ ER SB-17/SS-10
N 43.019144
E -75.033132
SB/TWP-18
N 43.020844
E -75.035103
SB/TWP-19
N ~~au~~ 43.020569
E -75.034999
SB-20
N 43.020752
E -75.034779
SSB-1
N 43.019874
E -75.036686
SSB-02
N 43.020371
E -75.036985
11/14/16

Location Ilion NY Date 11/14/16
Project / Client Duofold / EPA
IDW Sampling / GPS

SSB-3
N 43.020387
E -75.035849
SSB-4
N 43.019652
E -75.033008

Eugene Streiter on site from Seacoast to Sample IDW for off site disposal

11/14/16

Location Ilion, NY Date 11/14/16

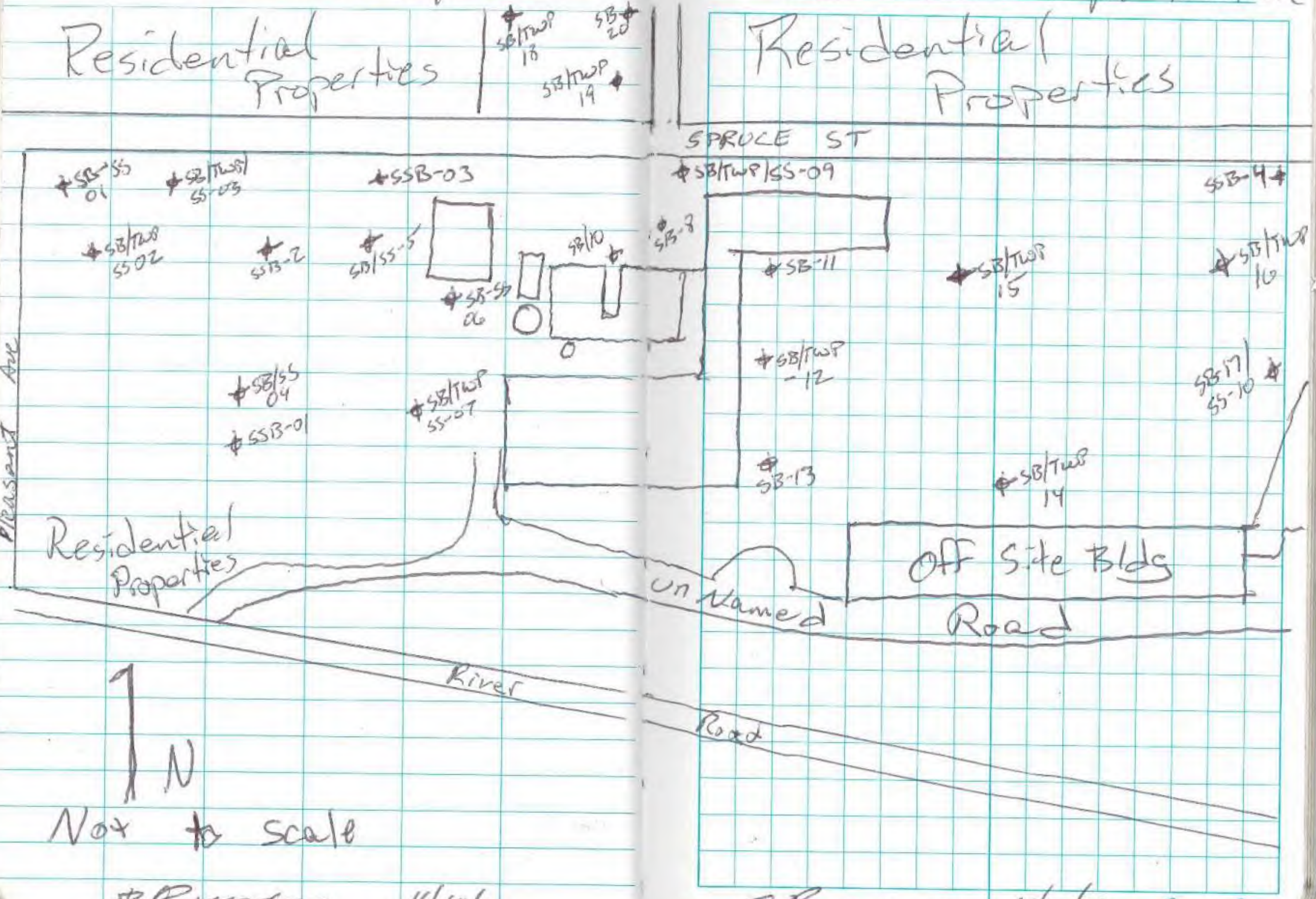
Project / Client Dunfold, EPA

Site Plan Sample locations

Location Ilion, NY Date 11/14/16

Project / Client Duofold / EPA

Site Plan - Sample location



11/14/16

11/14/16

Appendix C

Appendix C

Passive Soil Gas Survey Report

BEACON ENVIRONMENTAL SERVICES, INC.

The Leaders in Soil Gas Surveys
and Vapor Intrusion Monitoring

CDM Smith
14 Wall Street, Suite 1702
New York, NY 10005
Attn: Ms. Tonya Bennett

Passive Soil Gas Survey – Analytical Report
Date: November 23, 2016
Beacon Project No. 3378

Project Reference:	Former Duofold Site, Herkimer, NY
Samplers Installed:	October 4 and 5, 2016
Samplers Retrieved:	October 20, 2016
Samples Received:	October 21, 2016
Analyses Completed:	October 26, 2016
Laboratory Data Issued:	November 2, 2016

EPA Method 8260C

All samples were successfully analyzed using thermal desorption-gas chromatography/mass spectrometry (TD-GC/MS) instrumentation to target a custom compound list following EPA Method 8260C. Laboratory results are reported in nanograms (ng) of specific compound per sample.

Laboratory QA/QC procedures included internal standards, surrogates, and blanks based on EPA Method 8260C. Analyses and reporting were in accordance with BEACON's Quality Assurance Project Plan.

Reporting limits

The reporting limit (RL) is 10 nanograms (ng) for vinyl chloride, 1,1-dichloroethene, trans-1,2-dichloroethene, cis-1,2-dichloroethene, trichloroethene, and tetrachloroethene; 25 ng for the remaining individual compounds; and 5,000 ng for Total Petroleum Hydrocarbons (TPH). **Table 1** provides survey results in nanograms per sampler by sample-point number and compound name. For the six (6) compounds listed above, measurements below the limit of quantitation (10 ng) but above the limit of detection (5 ng) are flagged with a “J.” The RLs represent a baseline above which results exceed laboratory-determined limits of precision and accuracy. Any field sample measurements above the upper calibration standard are estimated; however, these values are reported without qualifiers because all reported measurements are relative to each other and are appropriate to meet the survey objectives of locating source areas and vapor intrusion pathways and defining the lateral extent of contamination.

Calibration Verification

The continuing calibration verification (CCV) values for the calibration check compounds were all within ±20% of the true values as defined by the initial five-point calibration and met the requirements specified in Beacon Environmental’s Quality Assurance Project Plan.

Method Blanks/Trip Blanks

Laboratory method blanks are run with each sample batch to identify contamination present in the laboratory. If contamination is detected on a method blank, measurements of identical compounds in that sample batch are flagged in the laboratory report. The laboratory method blanks analyzed in connection with the present samples revealed no contamination.

The trip blank is a sampler prepared, transported, and analyzed with other samples but intentionally not exposed. Any target compounds identified on the trip blanks are reported in the laboratory data. The analyses of the trip blanks (Trip-1 through Trip-4 in **Table 1**) reported none of the targeted compounds.

Passive Soil-Gas Survey Notes

When sample locations are covered with or near the edge of an artificial surface (*e.g.*, asphalt or concrete), the concentrations of compounds in soil gas are often significantly higher than the concentrations would be if the surfacing were not present. Thus, a reading taken below or near an impermeable surface is much higher than it would be in the absence of such a cap. Therefore, the sample location conditions should be evaluated when comparing results between locations.

Survey findings are exclusive to this project and when the spatial relationships are compared with results of other BEACON Surveys it is necessary to incorporate survey and site information from both investigations (*e.g.*, depth to sources, soil types, porosity, soil moisture, presence of impervious surfacing, sample collection times). BEACON recommends the guidelines stated in **Attachment 1** to establish a relationship between reported soil-gas measurements and actual subsurface contaminant concentrations, which will indicate those measurements representing significant subsurface contamination.

BEACON's passive soil-gas samplers are prepared with two sets of adsorbent cartridges for subsequent duplicate or confirmatory sample analysis. At the client's request, duplicate analysis was performed for four (4) field samples. The field sample duplicates were designated "D" following the sample number. When comparing quantitative results, a duplicate correspondence should be considered when the relative percent difference (RPD) between the two samples is less than or equal to 100%. For the purpose of calculating correspondences, all non-detections should be assigned, as a baseline value, the RL for the specific contaminant. Based on these assumptions, a 100% correlation was found between the field sample duplicates and their base samples.

Project Details

Samplers were deployed on October 4 and 5, 2016, and were retrieved on October 20, 2016. **Attachment 2** describes standard field procedures. Individual deployment and retrieval times will be found in the Chain of Custody Form (**Attachment 3**).

Eighty (80) field samples, four (4) field sample duplicates, and four (4) trip blanks were received by BEACON on October 21, 2016. Adsorbent cartridges from the passive samplers were thermally desorbed, then analyzed using gas chromatography/mass spectrometry (GC/MS) equipment, in accordance with EPA Method 8260C, as described in **Attachment 4**. BEACON's laboratory analyzed each sample for the targeted compounds; analyses were completed on October 26, 2016. Following a laboratory review, results were provided on November 2, 2016.

<u>Attachments:</u>

-1- Applying Results From Passive Soil-Gas Surveys
-2- Field Procedures
-3- Chain-of-Custody Form
-4- Laboratory Procedures

ALL DATA MEET REQUIREMENTS AS SPECIFIED IN THE BEACON ENVIRONMENTAL SERVICES, INC. QUALITY ASSURANCE PROJECT PLAN AND THE RESULTS RELATE ONLY TO THE SAMPLES REPORTED. BEACON ENVIRONMENTAL SERVICES IS ACCREDITED TO ISO/IEC 17025:2005, AND THE WORK PERFORMED WAS IN ACCORDANCE WITH ISO/IEC 17025:2005 REQUIREMENTS, WITH THE EXCEPTION THAT SAMPLES WERE ANALYZED WITHIN A 24-HOUR TUNE WINDOW AND 2-METHYLNAPHTHALENE AND TPH C_4-C_9 AND TPH C_{10}-C_{15} ARE NOT INCLUDED IN BEACON'S SCOPE OF ACCREDITATION. THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL, WITHOUT THE WRITTEN APPROVAL OF THE LABORATORY. RELEASE OF THE DATA CONTAINED IN THIS DATA PACKAGE HAS BEEN AUTHORIZED BY THE LABORATORY DIRECTOR OR HIS SIGNEE, AS VERIFIED BY THE FOLLOWING SIGNATURES:

Steven C. Thornley

Steven C. Thornley
Laboratory Director

Patti J. Riggs

Patti J. Riggs
Quality Manager

Table 1

Beacon Environmental Services, Inc.
2203A Commerce Road, Suite 1
Forest Hill, MD 21050 USA

Analysis by EPA Method 8260C

Client Sample ID:	Lb161024s	Trip-1	Trip-2	Trip-3	Trip-4	DFPGS-1
Project Number:		3378	3378	3378	3378	3378
Lab File ID:	S16102403	S16102405	S16102406	S16102407	S16102408	S16102409
Received Date:		10/21/2016	10/21/2016	10/21/2016	10/21/2016	10/21/2016
Analysis Date:	10/24/2016	10/24/2016	10/24/2016	10/24/2016	10/24/2016	10/24/2016
Analysis Time:	11:09	11:56	12:20	12:43	13:06	13:30
Matrix:						Soil Gas
Units:	ng	ng	ng	ng	ng	ng
COMPOUNDS						
Vinyl Chloride	<10	<10	<10	<10	<10	<10
1,1-Dichloroethene	<10	<10	<10	<10	<10	<10
1,1,2-Trichlorotrifluoroethane (Fr.113)	<25	<25	<25	<25	<25	<25
trans-1,2-Dichloroethene	<10	<10	<10	<10	<10	<10
Methyl-t-butyl ether	<25	<25	<25	<25	<25	<25
1,1-Dichloroethane	<25	<25	<25	<25	<25	<25
cis-1,2-Dichloroethene	<10	<10	<10	<10	<10	<10
Chloroform	<25	<25	<25	<25	<25	<25
1,2-Dichloroethane	<25	<25	<25	<25	<25	<25
1,1,1-Trichloroethane	<25	<25	<25	<25	<25	<25
Carbon Tetrachloride	<25	<25	<25	<25	<25	<25
Benzene	<25	<25	<25	<25	<25	<25
Trichloroethene	<10	<10	<10	<10	<10	<10
1,4-Dioxane	<25	<25	<25	<25	<25	<25
1,1,2-Trichloroethane	<25	<25	<25	<25	<25	<25
Toluene	<25	<25	<25	<25	<25	<25
1,2-Dibromoethane (EDB)	<25	<25	<25	<25	<25	<25
Tetrachloroethene	<10	<10	<10	<10	<10	<10
1,1,1,2-Tetrachloroethane	<25	<25	<25	<25	<25	<25
Chlorobenzene	<25	<25	<25	<25	<25	<25
Ethylbenzene	<25	<25	<25	<25	<25	<25
p & m-Xylene	<25	<25	<25	<25	<25	<25
1,1,2,2-Tetrachloroethane	<25	<25	<25	<25	<25	<25
o-Xylene	<25	<25	<25	<25	<25	<25
1,2,3-Trichloropropane	<25	<25	<25	<25	<25	<25
Isopropylbenzene	<25	<25	<25	<25	<25	<25
1,3,5-Trimethylbenzene	<25	<25	<25	<25	<25	<25
1,2,4-Trimethylbenzene	<25	<25	<25	<25	<25	<25
1,3-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,4-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,2-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,2,4-Trichlorobenzene	<25	<25	<25	<25	<25	<25
Naphthalene	<25	<25	<25	<25	<25	<25
1,2,3-Trichlorobenzene	<25	<25	<25	<25	<25	<25
2-Methylnaphthalene	<25	<25	<25	<25	<25	<25
TPH C_4-C_9	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000
TPH C_{10}-C_{15}	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000

Results in nanograms (ng). J = Values below limit of quantitation (LOQ) but above limit of detection (LOD). B = Detected in method blank.

Table 1

Beacon Environmental Services, Inc.
2203A Commerce Road, Suite 1
Forest Hill, MD 21050 USA

Analysis by EPA Method 8260C

Client Sample ID:	DFPGS-2	DFPGS-3	DFPGS-4	DFPGS-5	DFPGS-6	DFPGS-7
Project Number:	3378	3378	3378	3378	3378	3378
Lab File ID:	S16102410	S16102411	S16102412	S16102413	S16102414	S16102415
Received Date:	10/21/2016	10/21/2016	10/21/2016	10/21/2016	10/21/2016	10/21/2016
Analysis Date:	10/24/2016	10/24/2016	10/24/2016	10/24/2016	10/24/2016	10/24/2016
Analysis Time:	13:53	14:16	14:40	15:03	15:26	15:50
Matrix:	Soil Gas	Soil Gas	Soil Gas	Soil Gas	Soil Gas	Soil Gas
Units:	ng	ng	ng	ng	ng	ng
COMPOUNDS						
Vinyl Chloride	<10	<10	<10	<10	<10	<10
1,1-Dichloroethene	<10	<10	<10	<10	<10	<10
1,1,2-Trichlorotrifluoroethane (Fr.113)	<25	<25	<25	<25	<25	<25
trans-1,2-Dichloroethene	<10	<10	<10	<10	<10	<10
Methyl-t-butyl ether	<25	<25	<25	<25	<25	<25
1,1-Dichloroethane	<25	<25	<25	<25	<25	<25
cis-1,2-Dichloroethene	<10	<10	<10	<10	<10	<10
Chloroform	<25	<25	<25	<25	<25	<25
1,2-Dichloroethane	<25	<25	<25	<25	<25	<25
1,1,1-Trichloroethane	<25	<25	<25	<25	<25	<25
Carbon Tetrachloride	<25	<25	<25	<25	<25	<25
Benzene	<25	<25	<25	<25	<25	<25
Trichloroethene	<10	<10	<10	<10	<10	<10
1,4-Dioxane	<25	<25	<25	<25	<25	<25
1,1,2-Trichloroethane	<25	<25	<25	<25	<25	<25
Toluene	<25	<25	<25	<25	<25	<25
1,2-Dibromoethane (EDB)	<25	<25	<25	<25	<25	<25
Tetrachloroethene	<10	**9 J**	**174**	**25**	**7 J**	<10
1,1,1,2-Tetrachloroethane	<25	<25	<25	<25	<25	<25
Chlorobenzene	<25	<25	<25	<25	<25	<25
Ethylbenzene	<25	<25	<25	<25	<25	<25
p & m-Xylene	<25	<25	<25	<25	<25	<25
1,1,2,2-Tetrachloroethane	<25	<25	<25	<25	<25	<25
o-Xylene	<25	<25	<25	<25	<25	<25
1,2,3-Trichloropropane	<25	<25	<25	<25	<25	<25
Isopropylbenzene	<25	<25	<25	<25	<25	<25
1,3,5-Trimethylbenzene	<25	<25	<25	<25	<25	<25
1,2,4-Trimethylbenzene	<25	<25	<25	<25	<25	<25
1,3-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,4-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,2-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,2,4-Trichlorobenzene	<25	<25	<25	<25	<25	<25
Naphthalene	<25	<25	<25	<25	<25	<25
1,2,3-Trichlorobenzene	<25	<25	<25	<25	<25	<25
2-Methylnaphthalene	<25	<25	<25	<25	<25	<25
TPH C_4-C_9	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000
TPH C_{10}-C_{15}	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000

Results in nanograms (ng). J = Values below limit of quantitation (LOQ) but above limit of detection (LOD). B = Detected in method blank.

Table 1

Beacon Environmental Services, Inc.
2203A Commerce Road, Suite 1
Forest Hill, MD 21050 USA

Analysis by EPA Method 8260C

Client Sample ID:	DFPGS-8	DFPGS-9	DFPGS-10	DFPGS-11	DFPGS-12	DFPGS-13
Project Number:	3378	3378	3378	3378	3378	3378
Lab File ID:	S16102416	S16102417	S16102418	S16102419	S16102420	S16102421
Received Date:	10/21/2016	10/21/2016	10/21/2016	10/21/2016	10/21/2016	10/21/2016
Analysis Date:	10/24/2016	10/24/2016	10/24/2016	10/24/2016	10/24/2016	10/24/2016
Analysis Time:	16:13	16:37	17:00	17:23	17:46	18:09
Matrix:	Soil Gas	Soil Gas	Soil Gas	Soil Gas	Soil Gas	Soil Gas
Units:	ng	ng	ng	ng	ng	ng
COMPOUNDS						
Vinyl Chloride	<10	<10	<10	<10	**185**	<10
1,1-Dichloroethene	<10	<10	<10	<10	**11**	<10
1,1,2-Trichlorotrifluoroethane (Fr.113)	<25	<25	<25	<25	<25	<25
trans-1,2-Dichloroethene	<10	<10	<10	<10	**10 J**	<10
Methyl-t-butyl ether	<25	<25	<25	<25	<25	<25
1,1-Dichloroethane	<25	<25	<25	<25	<25	<25
cis-1,2-Dichloroethene	<10	<10	<10	<10	**242**	**17**
Chloroform	<25	<25	<25	<25	<25	<25
1,2-Dichloroethane	<25	<25	<25	<25	<25	<25
1,1,1-Trichloroethane	<25	<25	<25	<25	<25	<25
Carbon Tetrachloride	<25	<25	<25	<25	<25	<25
Benzene	<25	<25	<25	<25	**147**	**38**
Trichloroethene	<10	<10	<10	<10	**214**	**8 J**
1,4-Dioxane	<25	<25	<25	<25	<25	<25
1,1,2-Trichloroethane	<25	<25	<25	<25	<25	<25
Toluene	<25	<25	<25	<25	<25	**33**
1,2-Dibromoethane (EDB)	<25	<25	<25	<25	<25	<25
Tetrachloroethene	<10	<10	<10	<10	**19**	**241**
1,1,1,2-Tetrachloroethane	<25	<25	<25	<25	<25	<25
Chlorobenzene	<25	<25	<25	<25	<25	<25
Ethylbenzene	<25	<25	<25	<25	<25	<25
p & m-Xylene	<25	<25	<25	<25	<25	**30**
1,1,2,2-Tetrachloroethane	<25	<25	<25	<25	<25	<25
o-Xylene	<25	<25	<25	<25	<25	<25
1,2,3-Trichloropropane	<25	<25	<25	<25	<25	<25
Isopropylbenzene	<25	<25	<25	<25	<25	<25
1,3,5-Trimethylbenzene	<25	<25	<25	<25	<25	<25
1,2,4-Trimethylbenzene	<25	<25	<25	<25	<25	<25
1,3-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,4-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,2-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,2,4-Trichlorobenzene	<25	<25	<25	<25	<25	<25
Naphthalene	<25	<25	<25	<25	<25	<25
1,2,3-Trichlorobenzene	<25	<25	<25	<25	<25	<25
2-Methylnaphthalene	<25	<25	<25	<25	<25	<25
TPH C_4-C_9	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000
TPH C_{10}-C_{15}	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000

Results in nanograms (ng). J = Values below limit of quantitation (LOQ) but above limit of detection (LOD). B = Detected in method blank.

Table 1

Beacon Environmental Services, Inc.
2203A Commerce Road, Suite 1
Forest Hill, MD 21050 USA

Analysis by EPA Method 8260C

Client Sample ID:	DFPGS-14	DFPGS-16	DFPGS-16-D	DFPGS-17	DFPGS-18	DFPGS-19
Project Number:	3378	3378	3378	3378	3378	3378
Lab File ID:	S16102422	S16102423	S16102424	S16102425	S16102426	S16102427
Received Date:	10/21/2016	10/21/2016	10/21/2016	10/21/2016	10/21/2016	10/21/2016
Analysis Date:	10/24/2016	10/24/2016	10/24/2016	10/24/2016	10/24/2016	10/24/2016
Analysis Time:	18:33	18:56	19:19	19:43	20:07	20:29
Matrix:	Soil Gas	Soil Gas	Soil Gas	Soil Gas	Soil Gas	Soil Gas
Units:	ng	ng	ng	ng	ng	ng
COMPOUNDS						
Vinyl Chloride	<10	<10	<10	<10	<10	<10
1,1-Dichloroethene	<10	<10	<10	<10	<10	<10
1,1,2-Trichlorotrifluoroethane (Fr.113)	<25	<25	<25	<25	<25	<25
trans-1,2-Dichloroethene	<10	<10	<10	<10	<10	<10
Methyl-t-butyl ether	<25	<25	<25	<25	<25	<25
1,1-Dichloroethane	<25	<25	<25	<25	<25	<25
cis-1,2-Dichloroethene	<10	<10	<10	<10	<10	<10
Chloroform	<25	<25	<25	<25	<25	<25
1,2-Dichloroethane	<25	<25	<25	<25	<25	<25
1,1,1-Trichloroethane	<25	<25	<25	<25	<25	<25
Carbon Tetrachloride	<25	<25	<25	<25	<25	<25
Benzene	<25	<25	<25	<25	<25	<25
Trichloroethene	<10	<10	<10	<10	<10	<10
1,4-Dioxane	<25	<25	<25	<25	<25	<25
1,1,2-Trichloroethane	<25	<25	<25	<25	<25	<25
Toluene	<25	<25	<25	<25	<25	<25
1,2-Dibromoethane (EDB)	<25	<25	<25	<25	<25	<25
Tetrachloroethene	**9 J**	<10	<10	<10	**13**	<10
1,1,1,2-Tetrachloroethane	<25	<25	<25	<25	<25	<25
Chlorobenzene	<25	<25	<25	<25	<25	<25
Ethylbenzene	<25	<25	<25	<25	<25	<25
p & m-Xylene	<25	<25	<25	<25	<25	<25
1,1,2,2-Tetrachloroethane	<25	<25	<25	<25	<25	<25
o-Xylene	<25	<25	<25	<25	<25	<25
1,2,3-Trichloropropane	<25	<25	<25	<25	<25	<25
Isopropylbenzene	<25	<25	<25	<25	<25	<25
1,3,5-Trimethylbenzene	<25	<25	<25	<25	<25	<25
1,2,4-Trimethylbenzene	<25	<25	<25	<25	<25	<25
1,3-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,4-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,2-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,2,4-Trichlorobenzene	<25	<25	<25	<25	<25	<25
Naphthalene	<25	<25	<25	<25	<25	<25
1,2,3-Trichlorobenzene	<25	<25	<25	<25	<25	<25
2-Methylnaphthalene	<25	<25	<25	<25	<25	<25
TPH C_4-C_9	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000
TPH C_{10}-C_{15}	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000

Results in nanograms (ng). J = Values below limit of quantitation (LOQ) but above limit of detection (LOD). B = Detected in method blank.

Table 1

Beacon Environmental Services, Inc.
2203A Commerce Road, Suite 1
Forest Hill, MD 21050 USA

Analysis by EPA Method 8260C

Client Sample ID:	DFPGS-20	DFPGS-21	DFPGS-22	DFPGS-23	DFPGS-24	DFPGS-24A
Project Number:	3378	3378	3378	3378	3378	3378
Lab File ID:	S16102428	S16102429	S16102430	S16102431	S16102432	S16102433
Received Date:	10/21/2016	10/21/2016	10/21/2016	10/21/2016	10/21/2016	10/21/2016
Analysis Date:	10/24/2016	10/24/2016	10/24/2016	10/24/2016	10/24/2016	10/24/2016
Analysis Time:	20:53	21:16	21:39	22:03	22:26	22:49
Matrix:	Soil Gas	Soil Gas	Soil Gas	Soil Gas	Soil Gas	Soil Gas
Units:	ng	ng	ng	ng	ng	ng
COMPOUNDS						
Vinyl Chloride	<10	<10	<10	<10	<10	<10
1,1-Dichloroethene	<10	<10	<10	<10	<10	<10
1,1,2-Trichlorotrifluoroethane (Fr.113)	<25	<25	<25	<25	<25	<25
trans-1,2-Dichloroethene	<10	<10	<10	<10	<10	<10
Methyl-t-butyl ether	<25	<25	<25	<25	<25	<25
1,1-Dichloroethane	<25	<25	<25	<25	<25	<25
cis-1,2-Dichloroethene	<10	<10	<10	<10	<10	<10
Chloroform	<25	<25	<25	<25	<25	<25
1,2-Dichloroethane	<25	<25	<25	<25	<25	<25
1,1,1-Trichloroethane	<25	<25	<25	<25	<25	<25
Carbon Tetrachloride	<25	<25	<25	<25	<25	<25
Benzene	<25	<25	<25	**26**	<25	<25
Trichloroethene	<10	<10	<10	<10	<10	<10
1,4-Dioxane	<25	<25	<25	<25	<25	<25
1,1,2-Trichloroethane	<25	<25	<25	<25	<25	<25
Toluene	<25	<25	**319**	<25	<25	<25
1,2-Dibromoethane (EDB)	<25	<25	<25	<25	<25	<25
Tetrachloroethene	**7 J**	<10	<10	**8 J**	<10	**100**
1,1,1,2-Tetrachloroethane	<25	<25	<25	<25	<25	<25
Chlorobenzene	<25	<25	<25	<25	<25	<25
Ethylbenzene	<25	<25	**27**	<25	<25	<25
p & m-Xylene	<25	<25	**101**	<25	<25	<25
1,1,2,2-Tetrachloroethane	<25	<25	<25	<25	<25	<25
o-Xylene	<25	<25	**37**	<25	<25	<25
1,2,3-Trichloropropane	<25	<25	<25	<25	<25	<25
Isopropylbenzene	<25	<25	<25	<25	<25	<25
1,3,5-Trimethylbenzene	<25	<25	<25	<25	<25	<25
1,2,4-Trimethylbenzene	<25	<25	<25	<25	<25	<25
1,3-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,4-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,2-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,2,4-Trichlorobenzene	<25	<25	<25	<25	<25	<25
Naphthalene	<25	<25	<25	<25	<25	<25
1,2,3-Trichlorobenzene	<25	<25	<25	<25	<25	<25
2-Methylnaphthalene	<25	<25	<25	<25	<25	<25
TPH C_4-C_9	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000
TPH C_{10}-C_{15}	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000

Results in nanograms (ng). J = Values below limit of quantitation (LOQ) but above limit of detection (LOD). B = Detected in method blank.

Table 1

Beacon Environmental Services, Inc.
2203A Commerce Road, Suite 1
Forest Hill, MD 21050 USA

Analysis by EPA Method 8260C

Client Sample ID:	DFPGS-25	DFPGS-26	DFPGS-27	DFPGS-28	DFPGS-29	DFPGS-30
Project Number:	3378	3378	3378	3378	3378	3378
Lab File ID:	S16102434	S16102435	S16102436	S16102437	S16102438	S16102439
Received Date:	10/21/2016	10/21/2016	10/21/2016	10/21/2016	10/21/2016	10/21/2016
Analysis Date:	10/24/2016	10/24/2016	10/25/2016	10/25/2016	10/25/2016	10/25/2016
Analysis Time:	23:13	23:37	0:00	0:23	0:46	1:09
Matrix:	Soil Gas	Soil Gas	Soil Gas	Soil Gas	Soil Gas	Soil Gas
Units:	ng	ng	ng	ng	ng	ng
COMPOUNDS						
Vinyl Chloride	<10	**245**	<10	<10	**35**	<10
1,1-Dichloroethene	<10	<10	<10	<10	<10	<10
1,1,2-Trichlorotrifluoroethane (Fr.113)	<25	<25	<25	<25	<25	<25
trans-1,2-Dichloroethene	<10	<10	<10	<10	<10	<10
Methyl-t-butyl ether	<25	<25	<25	<25	<25	<25
1,1-Dichloroethane	<25	<25	<25	<25	<25	<25
cis-1,2-Dichloroethene	<10	**172**	<10	<10	**50**	<10
Chloroform	<25	**102**	<25	<25	<25	<25
1,2-Dichloroethane	<25	<25	<25	<25	<25	<25
1,1,1-Trichloroethane	<25	<25	<25	<25	<25	<25
Carbon Tetrachloride	<25	<25	<25	<25	<25	<25
Benzene	<25	**6,562**	**28**	<25	**58**	**39**
Trichloroethene	**10**	<10	**287**	**12**	**12**	**15**
1,4-Dioxane	<25	<25	<25	<25	<25	<25
1,1,2-Trichloroethane	<25	<25	<25	<25	<25	<25
Toluene	<25	**440**	**55**	**30**	**35**	**38**
1,2-Dibromoethane (EDB)	<25	<25	<25	<25	<25	<25
Tetrachloroethene	**44**	**7 J**	**46**	**658**	**564**	**595**
1,1,1,2-Tetrachloroethane	<25	<25	<25	<25	<25	<25
Chlorobenzene	<25	**40**	<25	<25	<25	<25
Ethylbenzene	<25	**165**	**50**	<25	<25	**269**
p & m-Xylene	<25	**658**	**219**	**34**	**77**	**1,793**
1,1,2,2-Tetrachloroethane	<25	<25	<25	<25	<25	<25
o-Xylene	<25	**444**	**114**	**29**	**79**	**1,872**
1,2,3-Trichloropropane	<25	<25	<25	<25	<25	<25
Isopropylbenzene	<25	**2,149**	<25	<25	**59**	**704**
1,3,5-Trimethylbenzene	<25	**245**	<25	**275**	**423**	**8,865**
1,2,4-Trimethylbenzene	<25	**232**	<25	**611**	**1,164**	**14,604**
1,3-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,4-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,2-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,2,4-Trichlorobenzene	<25	<25	<25	<25	<25	<25
Naphthalene	<25	**1,060**	**31**	**121**	**154**	**4,818**
1,2,3-Trichlorobenzene	<25	<25	<25	<25	<25	<25
2-Methylnaphthalene	<25	**1,161**	**30**	**58**	**49**	**1,236**
TPH C_4-C_9	<5,000	**270,956**	<5,000	**19,130**	**15,893**	**103,547**
TPH C_{10}-C_{15}	<5,000	**321,883**	**10,885**	**63,531**	**49,516**	**389,683**

Results in nanograms (ng). J = Values below limit of quantitation (LOQ) but above limit of detection (LOD). B = Detected in method blank.

Table 1

Beacon Environmental Services, Inc.
2203A Commerce Road, Suite 1
Forest Hill, MD 21050 USA

Analysis by EPA Method 8260C

Client Sample ID:	DFPGS-31	DFPGS-32	DFPGS-33	DFPGS-34	DFPGS-35	DFPGS-35-D
Project Number:	3378	3378	3378	3378	3378	3378
Lab File ID:	S16102440	S16102441	S16102442	S16102443	S16102444	S16102445
Received Date:	10/21/2016	10/21/2016	10/21/2016	10/21/2016	10/21/2016	10/21/2016
Analysis Date:	10/25/2016	10/25/2016	10/25/2016	10/25/2016	10/25/2016	10/25/2016
Analysis Time:	1:33	1:56	2:19	2:43	3:06	3:30
Matrix:	Soil Gas	Soil Gas	Soil Gas	Soil Gas	Soil Gas	Soil Gas
Units:	ng	ng	ng	ng	ng	ng
COMPOUNDS						
Vinyl Chloride	<10	<10	<10	<10	<10	<10
1,1-Dichloroethene	<10	<10	<10	<10	<10	<10
1,1,2-Trichlorotrifluoroethane (Fr.113)	<25	<25	<25	<25	<25	<25
trans-1,2-Dichloroethene	<10	<10	<10	<10	<10	<10
Methyl-t-butyl ether	<25	<25	<25	<25	<25	<25
1,1-Dichloroethane	<25	<25	<25	<25	<25	<25
cis-1,2-Dichloroethene	<10	<10	<10	<10	<10	<10
Chloroform	<25	<25	<25	<25	<25	<25
1,2-Dichloroethane	<25	<25	<25	<25	<25	<25
1,1,1-Trichloroethane	<25	<25	<25	<25	<25	<25
Carbon Tetrachloride	<25	<25	<25	<25	<25	<25
Benzene	<25	**27**	<25	<25	<25	<25
Trichloroethene	<10	<10	<10	<10	**504**	**363**
1,4-Dioxane	<25	<25	<25	<25	<25	<25
1,1,2-Trichloroethane	<25	<25	<25	<25	<25	<25
Toluene	<25	<25	<25	<25	<25	<25
1,2-Dibromoethane (EDB)	<25	<25	<25	<25	<25	<25
Tetrachloroethene	<10	**8 J**	<10	<10	**6 J**	<10
1,1,1,2-Tetrachloroethane	<25	<25	<25	<25	<25	<25
Chlorobenzene	<25	<25	<25	<25	<25	<25
Ethylbenzene	<25	<25	<25	<25	<25	<25
p & m-Xylene	<25	**37**	<25	<25	<25	<25
1,1,2,2-Tetrachloroethane	<25	<25	<25	<25	<25	<25
o-Xylene	<25	**36**	<25	<25	<25	<25
1,2,3-Trichloropropane	<25	<25	<25	<25	<25	<25
Isopropylbenzene	<25	<25	<25	<25	<25	<25
1,3,5-Trimethylbenzene	**38**	<25	<25	<25	<25	<25
1,2,4-Trimethylbenzene	**212**	**61**	**42**	**34**	<25	<25
1,3-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,4-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,2-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,2,4-Trichlorobenzene	<25	<25	<25	<25	<25	<25
Naphthalene	**95**	<25	<25	<25	<25	<25
1,2,3-Trichlorobenzene	<25	<25	<25	<25	<25	<25
2-Methylnaphthalene	**25**	<25	<25	<25	<25	<25
TPH C_4-C_9	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000
TPH C_{10}-C_{15}	**10,682**	<5,000	<5,000	<5,000	<5,000	<5,000

Results in nanograms (ng). J = Values below limit of quantitation (LOQ) but above limit of detection (LOD). B = Detected in method blank.

Table 1

Beacon Environmental Services, Inc.
2203A Commerce Road, Suite 1
Forest Hill, MD 21050 USA

Analysis by EPA Method 8260C

Client Sample ID:	DFPGS-36	DFPGS-37	DFPGS-38	DFPGS-39	DFPGS-39A	DFPGS-40
Project Number:	3378	3378	3378	3378	3378	3378
Lab File ID:	S16102446	S16102447	S16102448	S16102449	S16102450	S16102451
Received Date:	10/21/2016	10/21/2016	10/21/2016	10/21/2016	10/21/2016	10/21/2016
Analysis Date:	10/25/2016	10/25/2016	10/25/2016	10/25/2016	10/25/2016	10/25/2016
Analysis Time:	3:53	4:17	4:40	5:03	5:27	5:50
Matrix:	Soil Gas	Soil Gas	Soil Gas	Soil Gas	Soil Gas	Soil Gas
Units:	ng	ng	ng	ng	ng	ng
COMPOUNDS						
Vinyl Chloride	**246**	<10	<10	<10	<10	<10
1,1-Dichloroethene	**42**	<10	<10	<10	<10	<10
1,1,2-Trichlorotrifluoroethane (Fr.113)	**45**	**57**	**729**	<25	<25	<25
trans-1,2-Dichloroethene	**34**	<10	<10	<10	<10	<10
Methyl-t-butyl ether	<25	<25	<25	<25	<25	<25
1,1-Dichloroethane	<25	<25	<25	<25	<25	<25
cis-1,2-Dichloroethene	**21,543**	**64**	**6 J**	<10	<10	**13**
Chloroform	<25	<25	<25	<25	<25	<25
1,2-Dichloroethane	<25	<25	<25	<25	<25	<25
1,1,1-Trichloroethane	<25	<25	<25	<25	<25	<25
Carbon Tetrachloride	<25	<25	<25	<25	<25	<25
Benzene	<25	**41**	**34**	<25	<25	**171**
Trichloroethene	**6,703**	**32**	<10	<10	<10	**943**
1,4-Dioxane	<25	<25	<25	<25	<25	<25
1,1,2-Trichloroethane	<25	<25	<25	<25	<25	<25
Toluene	<25	**43**	**28**	<25	<25	**1,213**
1,2-Dibromoethane (EDB)	<25	<25	<25	<25	<25	<25
Tetrachloroethene	**10,581**	**112**	**17**	**6 J**	**9 J**	**619**
1,1,1,2-Tetrachloroethane	<25	<25	<25	<25	<25	<25
Chlorobenzene	<25	<25	<25	<25	<25	<25
Ethylbenzene	<25	<25	<25	<25	<25	**67**
p & m-Xylene	<25	**33**	<25	<25	<25	**238**
1,1,2,2-Tetrachloroethane	<25	<25	<25	<25	<25	<25
o-Xylene	<25	**28**	**38**	<25	<25	**115**
1,2,3-Trichloropropane	<25	<25	<25	<25	<25	<25
Isopropylbenzene	<25	<25	<25	<25	<25	**2,504**
1,3,5-Trimethylbenzene	<25	<25	<25	<25	<25	**104**
1,2,4-Trimethylbenzene	<25	<25	<25	<25	<25	**159**
1,3-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,4-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,2-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,2,4-Trichlorobenzene	<25	<25	<25	<25	<25	<25
Naphthalene	<25	<25	<25	<25	<25	**3,171**
1,2,3-Trichlorobenzene	<25	<25	<25	<25	<25	<25
2-Methylnaphthalene	<25	<25	<25	<25	<25	**4,393**
TPH C_4-C_9	<5,000	<5,000	**6,331**	<5,000	<5,000	**164,785**
TPH C_{10}-C_{15}	<5,000	<5,000	<5,000	<5,000	<5,000	**341,895**

Results in nanograms (ng). J = Values below limit of quantitation (LOQ) but above limit of detection (LOD). B = Detected in method blank.

Table 1

Beacon Environmental Services, Inc.
2203A Commerce Road, Suite 1
Forest Hill, MD 21050 USA

Analysis by EPA Method 8260C

Client Sample ID:	DFPGS-41	DFPGS-42	DFPGS-43	DFPGS-44	DFPGS-45	DFPGS-46
Project Number:	3378	3378	3378	3378	3378	3378
Lab File ID:	S16102452	S16102453	C16102540	C16102539	C16102538	S16102457
Received Date:	10/21/2016	10/21/2016	10/21/2016	10/21/2016	10/21/2016	10/21/2016
Analysis Date:	10/25/2016	10/25/2016	10/26/2016	10/26/2016	10/26/2016	10/25/2016
Analysis Time:	6:13	6:36	0:54	0:33	0:11	8:10
Matrix:	Soil Gas	Soil Gas	Soil Gas	Soil Gas	Soil Gas	Soil Gas
Units:	ng	ng	ng	ng	ng	ng
COMPOUNDS						
Vinyl Chloride	<10	**12**	<10	<10	<10	<10
1,1-Dichloroethene	**9 J**	**232**	<10	<10	<10	<10
1,1,2-Trichlorotrifluoroethane (Fr.113)	**175**	<25	<25	<25	<25	<25
trans-1,2-Dichloroethene	**8 J**	**143**	<10	<10	<10	<10
Methyl-t-butyl ether	<25	<25	<25	<25	<25	<25
1,1-Dichloroethane	<25	<25	<25	<25	<25	<25
cis-1,2-Dichloroethene	**9 J**	**5,803**	**5 J**	<10	<10	<10
Chloroform	**103**	**147**	<25	<25	<25	<25
1,2-Dichloroethane	<25	<25	<25	<25	<25	<25
1,1,1-Trichloroethane	<25	<25	<25	<25	<25	<25
Carbon Tetrachloride	<25	<25	<25	<25	<25	<25
Benzene	**65**	**131**	<25	<25	<25	**44**
Trichloroethene	**1,797**	**253,885**	**205**	**10**	<10	**310**
1,4-Dioxane	<25	<25	<25	<25	<25	<25
1,1,2-Trichloroethane	<25	<25	<25	<25	<25	<25
Toluene	**122**	**35**	**34**	<25	<25	**28**
1,2-Dibromoethane (EDB)	<25	<25	<25	<25	<25	<25
Tetrachloroethene	**4,431**	**8,790**	**13,418**	**221**	<10	**21**
1,1,1,2-Tetrachloroethane	<25	<25	<25	<25	<25	<25
Chlorobenzene	<25	<25	<25	<25	<25	<25
Ethylbenzene	<25	<25	<25	<25	<25	<25
p & m-Xylene	**68**	<25	**36**	<25	<25	**25**
1,1,2,2-Tetrachloroethane	<25	<25	<25	<25	<25	<25
o-Xylene	**31**	<25	<25	<25	<25	**25**
1,2,3-Trichloropropane	<25	<25	<25	<25	<25	<25
Isopropylbenzene	<25	<25	<25	<25	<25	<25
1,3,5-Trimethylbenzene	<25	<25	<25	<25	<25	<25
1,2,4-Trimethylbenzene	**28**	<25	<25	<25	<25	<25
1,3-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,4-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,2-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,2,4-Trichlorobenzene	<25	<25	<25	<25	<25	<25
Naphthalene	**1,019**	**192**	<25	**25**	<25	<25
1,2,3-Trichlorobenzene	<25	<25	<25	<25	<25	<25
2-Methylnaphthalene	**542**	**122**	<25	<25	<25	<25
TPH C_4-C_9	<5,000	<5,000	<5,000	<5,000	<5,000	**6,215**
TPH C_{10}-C_{15}	**14,024**	<5,000	**6,242**	**6,562**	<5,000	<5,000

Results in nanograms (ng). J = Values below limit of quantitation (LOQ) but above limit of detection (LOD). B = Detected in method blank.

Table 1

Beacon Environmental Services, Inc.
2203A Commerce Road, Suite 1
Forest Hill, MD 21050 USA

Analysis by EPA Method 8260C

Client Sample ID:	DFPGS-47	DFPGS-48	DFPGS-49	DFPGS-50	DFPGS-51	LB161025c
Project Number:	3378	3378	3378	3378	3378	
Lab File ID:	S16102458	S16102459	S16102460	S16102461	S16102462	C16102503
Received Date:	10/21/2016	10/21/2016	10/21/2016	10/21/2016	10/21/2016	
Analysis Date:	10/25/2016	10/25/2016	10/25/2016	10/25/2016	10/25/2016	10/25/2016
Analysis Time:	8:33	8:57	9:20	9:43	10:07	10:53
Matrix:	Soil Gas	Soil Gas	Soil Gas	Soil Gas	Soil Gas	
Units:	ng	ng	ng	ng	ng	ng
COMPOUNDS						
Vinyl Chloride	<10	<10	<10	<10	<10	<10
1,1-Dichloroethene	<10	<10	<10	<10	<10	<10
1,1,2-Trichlorotrifluoroethane (Fr.113)	**2,284**	**61**	**40**	<25	<25	<25
trans-1,2-Dichloroethene	<10	<10	<10	<10	<10	<10
Methyl-t-butyl ether	<25	<25	<25	<25	<25	<25
1,1-Dichloroethane	<25	<25	<25	<25	<25	<25
cis-1,2-Dichloroethene	<10	<10	<10	<10	<10	<10
Chloroform	<25	<25	<25	<25	<25	<25
1,2-Dichloroethane	<25	<25	<25	<25	<25	<25
1,1,1-Trichloroethane	<25	<25	<25	<25	<25	<25
Carbon Tetrachloride	<25	<25	<25	<25	<25	<25
Benzene	<25	<25	<25	**58**	**50**	<25
Trichloroethene	**28**	**23**	**17**	**496**	**69**	<10
1,4-Dioxane	<25	<25	<25	<25	<25	<25
1,1,2-Trichloroethane	<25	<25	<25	<25	<25	<25
Toluene	<25	<25	<25	**35**	<25	<25
1,2-Dibromoethane (EDB)	<25	<25	<25	<25	<25	<25
Tetrachloroethene	**779**	**135**	**8 J**	**1,894**	**2,384**	<10
1,1,1,2-Tetrachloroethane	<25	<25	<25	<25	<25	<25
Chlorobenzene	<25	<25	<25	<25	<25	<25
Ethylbenzene	<25	<25	<25	<25	<25	<25
p & m-Xylene	<25	<25	<25	**27**	<25	<25
1,1,2,2-Tetrachloroethane	<25	<25	<25	<25	<25	<25
o-Xylene	<25	<25	<25	<25	<25	<25
1,2,3-Trichloropropane	<25	<25	<25	<25	<25	<25
Isopropylbenzene	<25	<25	<25	<25	<25	<25
1,3,5-Trimethylbenzene	<25	<25	<25	<25	<25	<25
1,2,4-Trimethylbenzene	<25	<25	<25	<25	<25	<25
1,3-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,4-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,2-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,2,4-Trichlorobenzene	<25	<25	<25	<25	<25	<25
Naphthalene	<25	**1,715**	**25**	**250**	**164**	<25
1,2,3-Trichlorobenzene	<25	<25	<25	<25	<25	<25
2-Methylnaphthalene	<25	**388**	<25	**109**	**50**	<25
TPH C_4-C_9	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000
TPH C_{10}-C_{15}	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000

Results in nanograms (ng). J = Values below limit of quantitation (LOQ) but above limit of detection (LOD). B = Detected in method blank.

Table 1

Beacon Environmental Services, Inc.
2203A Commerce Road, Suite 1
Forest Hill, MD 21050 USA

Analysis by EPA Method 8260C

Client Sample ID:	DFPGS-52	DFPGS-53	DFPGS-54	DFPGS-55	DFPGS-55-D	DFPGS-56
Project Number:	3378	3378	3378	3378	3378	3378
Lab File ID:	C16102505	C16102506	C16102507	C16102508	C16102509	C16102510
Received Date:	10/21/2016	10/21/2016	10/21/2016	10/21/2016	10/21/2016	10/21/2016
Analysis Date:	10/25/2016	10/25/2016	10/25/2016	10/25/2016	10/25/2016	10/25/2016
Analysis Time:	11:36	11:58	12:19	12:41	13:37	13:59
Matrix:	Soil Gas	Soil Gas	Soil Gas	Soil Gas	Soil Gas	Soil Gas
Units:	ng	ng	ng	ng	ng	ng
COMPOUNDS						
Vinyl Chloride	<10	<10	<10	<10	<10	<10
1,1-Dichloroethene	**85**	<10	<10	<10	<10	<10
1,1,2-Trichlorotrifluoroethane (Fr.113)	<25	<25	<25	<25	<25	<25
trans-1,2-Dichloroethene	**73**	<10	<10	<10	<10	<10
Methyl-t-butyl ether	<25	<25	<25	<25	<25	<25
1,1-Dichloroethane	<25	<25	<25	<25	<25	<25
cis-1,2-Dichloroethene	**743**	**35**	<10	<10	<10	<10
Chloroform	**37**	<25	<25	<25	<25	<25
1,2-Dichloroethane	<25	<25	<25	<25	<25	<25
1,1,1-Trichloroethane	<25	<25	<25	<25	<25	<25
Carbon Tetrachloride	<25	<25	<25	<25	<25	<25
Benzene	**523**	**115**	**42**	<25	<25	<25
Trichloroethene	**52,465**	**386**	**78**	**37**	**22**	**15**
1,4-Dioxane	<25	<25	<25	<25	<25	<25
1,1,2-Trichloroethane	<25	<25	<25	<25	<25	<25
Toluene	**193**	**30**	**26**	<25	<25	<25
1,2-Dibromoethane (EDB)	<25	<25	<25	<25	<25	<25
Tetrachloroethene	**1,257**	**2,037**	**229**	<10	<10	<10
1,1,1,2-Tetrachloroethane	<25	<25	<25	<25	<25	<25
Chlorobenzene	<25	<25	<25	<25	<25	<25
Ethylbenzene	**99**	<25	<25	<25	<25	<25
p & m-Xylene	**249**	<25	<25	<25	<25	<25
1,1,2,2-Tetrachloroethane	<25	<25	<25	<25	<25	<25
o-Xylene	**108**	<25	<25	<25	<25	<25
1,2,3-Trichloropropane	<25	<25	<25	<25	<25	<25
Isopropylbenzene	<25	<25	<25	<25	<25	<25
1,3,5-Trimethylbenzene	<25	**90**	<25	<25	<25	<25
1,2,4-Trimethylbenzene	<25	**132**	<25	<25	<25	<25
1,3-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,4-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,2-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,2,4-Trichlorobenzene	<25	<25	<25	<25	<25	<25
Naphthalene	**67**	**581**	**260**	<25	<25	<25
1,2,3-Trichlorobenzene	<25	<25	<25	<25	<25	<25
2-Methylnaphthalene	<25	**343**	**353**	<25	<25	<25
TPH C_4-C_9	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000
TPH C_{10}-C_{15}	**9,807**	**17,350**	**6,778**	<5,000	<5,000	<5,000

Results in nanograms (ng). J = Values below limit of quantitation (LOQ) but above limit of detection (LOD). B = Detected in method blank.

Table 1

Beacon Environmental Services, Inc.
2203A Commerce Road, Suite 1
Forest Hill, MD 21050 USA

Analysis by EPA Method 8260C

Client Sample ID:	DFPGS-57	DFPGS-58	DFPGS-59	DFPGS-60	DFPGS-61	DFPGS-62
Project Number:	3378	3378	3378	3378	3378	3378
Lab File ID:	C16102511	C16102512	C16102513	C16102514	C16102515	C16102516
Received Date:	10/21/2016	10/21/2016	10/21/2016	10/21/2016	10/21/2016	10/21/2016
Analysis Date:	10/25/2016	10/25/2016	10/25/2016	10/25/2016	10/25/2016	10/25/2016
Analysis Time:	14:21	14:41	15:03	15:25	15:47	16:09
Matrix:	Soil Gas	Soil Gas	Soil Gas	Soil Gas	Soil Gas	Soil Gas
Units:	ng	ng	ng	ng	ng	ng
COMPOUNDS						
Vinyl Chloride	<10	<10	<10	<10	<10	<10
1,1-Dichloroethene	<10	<10	<10	<10	<10	<10
1,1,2-Trichlorotrifluoroethane (Fr.113)	**43**	**658**	**39**	<25	<25	<25
trans-1,2-Dichloroethene	<10	<10	<10	<10	<10	<10
Methyl-t-butyl ether	<25	<25	<25	<25	<25	<25
1,1-Dichloroethane	<25	<25	<25	<25	<25	<25
cis-1,2-Dichloroethene	<10	<10	<10	<10	<10	<10
Chloroform	<25	<25	<25	<25	<25	<25
1,2-Dichloroethane	<25	<25	<25	<25	<25	<25
1,1,1-Trichloroethane	**40**	<25	<25	**60**	<25	<25
Carbon Tetrachloride	<25	**271**	**79**	<25	**53**	<25
Benzene	<25	<25	<25	**73**	**177**	**88**
Trichloroethene	**11**	**9 J**	**10 J**	**478**	**45**	**169**
1,4-Dioxane	<25	<25	<25	<25	<25	<25
1,1,2-Trichloroethane	<25	<25	<25	<25	<25	<25
Toluene	<25	<25	<25	**36**	**90**	**52**
1,2-Dibromoethane (EDB)	<25	<25	<25	<25	<25	<25
Tetrachloroethene	**61**	<10	**1,491**	**72**	**3,121**	**3,197**
1,1,1,2-Tetrachloroethane	<25	<25	<25	<25	<25	<25
Chlorobenzene	<25	<25	<25	<25	<25	<25
Ethylbenzene	<25	<25	<25	<25	<25	<25
p & m-Xylene	<25	<25	<25	<25	**66**	**37**
1,1,2,2-Tetrachloroethane	<25	<25	<25	<25	<25	<25
o-Xylene	<25	<25	<25	<25	**29**	<25
1,2,3-Trichloropropane	<25	<25	<25	<25	<25	<25
Isopropylbenzene	<25	<25	<25	<25	<25	<25
1,3,5-Trimethylbenzene	<25	<25	<25	<25	<25	<25
1,2,4-Trimethylbenzene	<25	<25	<25	<25	**39**	**35**
1,3-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,4-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,2-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,2,4-Trichlorobenzene	<25	<25	<25	<25	<25	<25
Naphthalene	<25	<25	<25	**173**	**424**	**139**
1,2,3-Trichlorobenzene	<25	<25	<25	<25	<25	<25
2-Methylnaphthalene	<25	<25	<25	**78**	**78**	**30**
TPH C_4-C_9	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000
TPH C_{10}-C_{15}	<5,000	<5,000	<5,000	<5,000	**5,357**	<5,000

Results in nanograms (ng). J = Values below limit of quantitation (LOQ) but above limit of detection (LOD). B = Detected in method blank.

Table 1

Beacon Environmental Services, Inc.
2203A Commerce Road, Suite 1
Forest Hill, MD 21050 USA

Analysis by EPA Method 8260C

Client Sample ID:	DFPGS-63	DFPGS-64	DFPGS-65	DFPGS-66	DFPGS-67	DFPGS-68
Project Number:	3378	3378	3378	3378	3378	3378
Lab File ID:	C16102517	C16102518	C16102519	C16102520	C16102521	C16102522
Received Date:	10/21/2016	10/21/2016	10/21/2016	10/21/2016	10/21/2016	10/21/2016
Analysis Date:	10/25/2016	10/25/2016	10/25/2016	10/25/2016	10/25/2016	10/25/2016
Analysis Time:	16:31	16:53	17:15	17:36	17:59	18:20
Matrix:	Soil Gas	Soil Gas	Soil Gas	Soil Gas	Soil Gas	Soil Gas
Units:	ng	ng	ng	ng	ng	ng
COMPOUNDS						
Vinyl Chloride	<10	<10	<10	<10	<10	<10
1,1-Dichloroethene	<10	<10	<10	<10	<10	<10
1,1,2-Trichlorotrifluoroethane (Fr.113)	<25	**28**	<25	<25	<25	<25
trans-1,2-Dichloroethene	<10	<10	<10	<10	<10	<10
Methyl-t-butyl ether	<25	<25	<25	<25	<25	<25
1,1-Dichloroethane	<25	<25	<25	<25	<25	<25
cis-1,2-Dichloroethene	<10	<10	<10	<10	<10	<10
Chloroform	<25	<25	<25	<25	<25	<25
1,2-Dichloroethane	<25	<25	<25	<25	<25	<25
1,1,1-Trichloroethane	<25	<25	<25	<25	<25	<25
Carbon Tetrachloride	<25	<25	<25	<25	<25	<25
Benzene	**29**	**28**	<25	<25	<25	<25
Trichloroethene	**137**	**27**	<10	<10	<10	<10
1,4-Dioxane	<25	<25	<25	<25	<25	<25
1,1,2-Trichloroethane	<25	<25	<25	<25	<25	<25
Toluene	**1,079**	<25	<25	<25	<25	<25
1,2-Dibromoethane (EDB)	<25	<25	<25	<25	<25	<25
Tetrachloroethene	**428**	**57**	<10	<10	<10	<10
1,1,1,2-Tetrachloroethane	<25	<25	<25	<25	<25	<25
Chlorobenzene	<25	<25	<25	<25	<25	<25
Ethylbenzene	**112**	<25	<25	<25	<25	<25
p & m-Xylene	**699**	**30**	<25	<25	<25	<25
1,1,2,2-Tetrachloroethane	<25	<25	<25	<25	<25	<25
o-Xylene	**734**	<25	<25	<25	<25	<25
1,2,3-Trichloropropane	<25	<25	<25	<25	<25	<25
Isopropylbenzene	**359**	<25	<25	<25	<25	<25
1,3,5-Trimethylbenzene	**2,920**	<25	<25	<25	<25	<25
1,2,4-Trimethylbenzene	**5,100**	**29**	<25	<25	<25	<25
1,3-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,4-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,2-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,2,4-Trichlorobenzene	<25	<25	<25	<25	<25	<25
Naphthalene	**5,648**	**329**	<25	<25	<25	<25
1,2,3-Trichlorobenzene	<25	<25	<25	<25	<25	<25
2-Methylnaphthalene	**9,261**	**514**	**80**	<25	<25	<25
TPH C_4-C_9	**182,661**	<5,000	<5,000	<5,000	<5,000	<5,000
TPH C_{10}-C_{15}	**326,850**	**10,012**	<5,000	<5,000	<5,000	<5,000

Results in nanograms (ng). J = Values below limit of quantitation (LOQ) but above limit of detection (LOD). B = Detected in method blank.

Table 1

Beacon Environmental Services, Inc.
2203A Commerce Road, Suite 1
Forest Hill, MD 21050 USA

Analysis by EPA Method 8260C

Client Sample ID:	DFPGS-69	DFPGS-70	DFPGS-71	DFPGS-72	DFPGS-73	DFPGS-74
Project Number:	3378	3378	3378	3378	3378	3378
Lab File ID:	C16102523	C16102524	C16102525	C16102526	C16102527	C16102528
Received Date:	10/21/2016	10/21/2016	10/21/2016	10/21/2016	10/21/2016	10/21/2016
Analysis Date:	10/25/2016	10/25/2016	10/25/2016	10/25/2016	10/25/2016	10/25/2016
Analysis Time:	18:42	19:04	19:27	19:49	20:10	20:32
Matrix:	Soil Gas	Soil Gas	Soil Gas	Soil Gas	Soil Gas	Soil Gas
Units:	ng	ng	ng	ng	ng	ng
COMPOUNDS						
Vinyl Chloride	<10	<10	<10	<10	<10	<10
1,1-Dichloroethene	<10	<10	<10	<10	<10	<10
1,1,2-Trichlorotrifluoroethane (Fr.113)	<25	<25	<25	**65**	<25	<25
trans-1,2-Dichloroethene	<10	<10	<10	<10	<10	<10
Methyl-t-butyl ether	<25	<25	<25	<25	<25	<25
1,1-Dichloroethane	<25	<25	<25	<25	<25	<25
cis-1,2-Dichloroethene	<10	<10	<10	<10	<10	<10
Chloroform	<25	<25	<25	<25	<25	<25
1,2-Dichloroethane	<25	<25	<25	<25	<25	<25
1,1,1-Trichloroethane	<25	<25	<25	<25	<25	<25
Carbon Tetrachloride	<25	<25	<25	<25	<25	<25
Benzene	<25	<25	<25	<25	<25	<25
Trichloroethene	<10	<10	<10	<10	<10	<10
1,4-Dioxane	<25	<25	<25	<25	<25	<25
1,1,2-Trichloroethane	<25	<25	<25	<25	<25	<25
Toluene	<25	<25	<25	<25	<25	<25
1,2-Dibromoethane (EDB)	<25	<25	<25	<25	<25	<25
Tetrachloroethene	<10	<10	<10	**15**	<10	**16**
1,1,1,2-Tetrachloroethane	<25	<25	<25	<25	<25	<25
Chlorobenzene	<25	<25	<25	<25	<25	<25
Ethylbenzene	<25	<25	<25	<25	<25	<25
p & m-Xylene	<25	<25	<25	<25	<25	<25
1,1,2,2-Tetrachloroethane	<25	<25	<25	<25	<25	<25
o-Xylene	<25	<25	<25	<25	<25	<25
1,2,3-Trichloropropane	<25	<25	<25	<25	<25	<25
Isopropylbenzene	<25	<25	<25	<25	<25	<25
1,3,5-Trimethylbenzene	<25	<25	<25	<25	<25	<25
1,2,4-Trimethylbenzene	<25	<25	<25	<25	<25	<25
1,3-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,4-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,2-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,2,4-Trichlorobenzene	<25	<25	<25	<25	<25	<25
Naphthalene	<25	<25	<25	<25	<25	<25
1,2,3-Trichlorobenzene	<25	<25	<25	<25	<25	<25
2-Methylnaphthalene	<25	<25	<25	<25	<25	<25
TPH C_4-C_9	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000
TPH C_{10}-C_{15}	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000

Results in nanograms (ng). J = Values below limit of quantitation (LOQ) but above limit of detection (LOD). B = Detected in method blank.

Table 1

Beacon Environmental Services, Inc.
2203A Commerce Road, Suite 1
Forest Hill, MD 21050 USA

Analysis by EPA Method 8260C

Client Sample ID:	DFPGS-75	DFPGS-75-D	DFPGS-76	DFPGS-77	DFPGS-78	DFPGS-79
Project Number:	3378	3378	3378	3378	3378	3378
Lab File ID:	C16102529	C16102530	C16102531	C16102532	C16102533	C16102534
Received Date:	10/21/2016	10/21/2016	10/21/2016	10/21/2016	10/21/2016	10/21/2016
Analysis Date:	10/25/2016	10/25/2016	10/25/2016	10/25/2016	10/25/2016	10/25/2016
Analysis Time:	20:54	21:16	21:38	21:59	22:21	22:43
Matrix:	Soil Gas	Soil Gas	Soil Gas	Soil Gas	Soil Gas	Soil Gas
Units:	ng	ng	ng	ng	ng	ng
COMPOUNDS						
Vinyl Chloride	<10	<10	<10	<10	<10	<10
1,1-Dichloroethene	<10	<10	<10	<10	<10	<10
1,1,2-Trichlorotrifluoroethane (Fr.113)	<25	<25	<25	<25	<25	<25
trans-1,2-Dichloroethene	<10	<10	<10	<10	<10	<10
Methyl-t-butyl ether	<25	<25	<25	<25	<25	<25
1,1-Dichloroethane	<25	<25	<25	<25	<25	<25
cis-1,2-Dichloroethene	<10	<10	<10	<10	<10	<10
Chloroform	<25	<25	<25	<25	<25	<25
1,2-Dichloroethane	<25	<25	<25	<25	<25	<25
1,1,1-Trichloroethane	<25	<25	<25	<25	<25	<25
Carbon Tetrachloride	<25	<25	<25	<25	<25	<25
Benzene	<25	<25	<25	<25	<25	<25
Trichloroethene	<10	<10	<10	<10	<10	<10
1,4-Dioxane	<25	<25	<25	<25	<25	<25
1,1,2-Trichloroethane	<25	<25	<25	<25	<25	<25
Toluene	<25	<25	<25	<25	<25	<25
1,2-Dibromoethane (EDB)	<25	<25	<25	<25	<25	<25
Tetrachloroethene	**6 J**	<10	**88**	**321**	**7 J**	<10
1,1,1,2-Tetrachloroethane	<25	<25	<25	<25	<25	<25
Chlorobenzene	<25	<25	<25	<25	<25	<25
Ethylbenzene	<25	<25	<25	<25	<25	<25
p & m-Xylene	**35**	**35**	<25	<25	<25	**28**
1,1,2,2-Tetrachloroethane	<25	<25	<25	<25	<25	<25
o-Xylene	<25	<25	<25	<25	<25	<25
1,2,3-Trichloropropane	<25	<25	<25	<25	<25	<25
Isopropylbenzene	<25	<25	<25	<25	<25	<25
1,3,5-Trimethylbenzene	<25	<25	<25	<25	<25	<25
1,2,4-Trimethylbenzene	<25	<25	<25	<25	<25	<25
1,3-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,4-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,2-Dichlorobenzene	<25	<25	<25	<25	<25	<25
1,2,4-Trichlorobenzene	<25	<25	<25	<25	<25	<25
Naphthalene	<25	<25	<25	<25	<25	<25
1,2,3-Trichlorobenzene	<25	<25	<25	<25	<25	<25
2-Methylnaphthalene	<25	<25	<25	<25	<25	<25
TPH C_4-C_9	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000
TPH C_{10}-C_{15}	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000

Results in nanograms (ng). J = Values below limit of quantitation (LOQ) but above limit of detection (LOD). B = Detected in method blank.

Attachments

Attachment 1

APPLYING RESULTS FROM PASSIVE SOIL-GAS SURVEYS

The utility of soil-gas surveys is directly proportional to their accuracy in reflecting and representing changes in the subsurface concentrations of source compounds. Passive soil-gas survey results are the mass collected from the vapor-phase emanating from the source(s). The vapor-phase is merely a fractional trace of the source(s) and, as a matter of convenience, the units used in reporting detection values from passive soil-gas surveys are smaller than those employed for source-compound concentrations.

Passive soil gas data are reported in mass of compounds identified per sample location (e.g., nanograms (ng) or micrograms (µg) per sampler). Results from a passive soil gas survey typically are then used to guide where follow-on intrusive samples should be collected to obtain corresponding concentrations of the contaminants in soil, soil gas, and/or groundwater, as well as eliminate those areas where intrusive samples are not required. It is not practical to report passive soil gas data as concentration because the sampler's uptake rates of the compounds are often greater than the replenishment rates of the compounds around the sampler, which results in low bias measurements, and the replenishment rates will be dependent on several factors that include, at a minimum, soil gas concentrations, soil porosity and permeability, and soil moisture level.

Whatever the relative concentrations of source and associated soil gas, best results are realized when the ratio of soil-gas measurements to actual subsurface concentrations remains as close to constant as the real world permits. It is the reliability and consistency of this ratio, not the particular units of mass (*e.g.*, nanograms) that determine usefulness. Thus, BEACON emphasizes the necessity of conducting — at minimum — follow-on intrusive sampling in areas that show relatively high soil-gas measurements to obtain corresponding concentrations of soil and groundwater contaminants. These correspondent values furnish the basis for approximating a relationship. For extrapolating passive soil gas results to vapor intrusion evaluations, we recommend a minimum of three passive soil gas locations be converted to a shallow vapor well then sampled using an active soil gas method. Once a relationship is established, it can be used in conjunction with the remaining soil-gas measurements to estimate subsurface contaminant concentrations across the survey field. (See www.beacon-usa.com/passivesoilgas.html, Publication 1: *Mass to Concentration Tie-In for PSG Surveys* and Publication 4: *Groundwater and PSG Correlation*.) It is important to keep in mind, however, that specific conditions at individual sample points, including soil porosity and permeability, depth to contamination, and perched ground water, can have an impact on soil-gas measurements at those locations.

When passive soil-gas surveys are utilized as described above, the data provide information that can yield substantial savings in drilling costs and in time. They furnish, among other things, a checklist of compounds expected at each survey location and help to determine how and where drilling budgets can most effectively be spent. Passive soil-gas surveys can also be used as a remediation or general site monitoring tool that can be implemented on a quarterly, semi-annual or annual basis.

Attachment 2

FIELD PROCEDURES FOR PASSIVE SOIL-GAS SURVEYS

The following field procedures are routinely used during a BEACON Passive Soil-Gas Survey. Modifications can be and are incorporated from time to time in response to individual project requirements. In all instances, BEACON adheres to EPA-approved Quality Assurance and Quality Control practices.

A. Field personnel carry a BESURE Sample Collection Kit™ and support equipment to the site and deploy the passive samplers in a prearranged survey pattern. A passive sampler consists of a borosilicate glass vial containing hydrophobic adsorbent cartridges with a length of wire attached to the vial for retrieval. Although samplers require only one person for emplacement and retrieval, the specific number of field personnel required depends upon the scope and schedule of the project. Each Sampler emplacement generally takes less than two minutes.

B. At each survey point a field technician clears vegetation as needed and, using a hammer drill with a 1″- to 1½″-diameter bit, creates a hole 12 to 14 inches deep. [Note: For locations covered with asphalt, concrete, or gravel surfacing, the field technician drills a 1″- to 1½″-diameter hole through the surfacing to the soils beneath]. The technician then, using a hammer drill with a ½″ diameter bit, creates a hole three-feet deep. The hole is then sleeved with a 1″-diameter metal sleeve.

C. The technician then removes the solid plastic cap from a sampler and replaces it with a Sampling Cap (a plastic cap with a hole covered by screen meshing). The technician inserts the sampler, with the Sampling Cap end facing down, into the hole (**see attached figure**). The sampler is then covered with an aluminum foil plug and soils for uncapped locations or, for capped locations, an aluminum foil plug and a concrete patch. The sampler's location, time and date of emplacement, and other relevant information are recorded on the Field Deployment Form.

D. One or more trip blanks are included as part of the quality-control procedures.

E. Once all the samplers have been deployed, field personnel schedule sampler recovery and depart, taking all other equipment and materials with them.

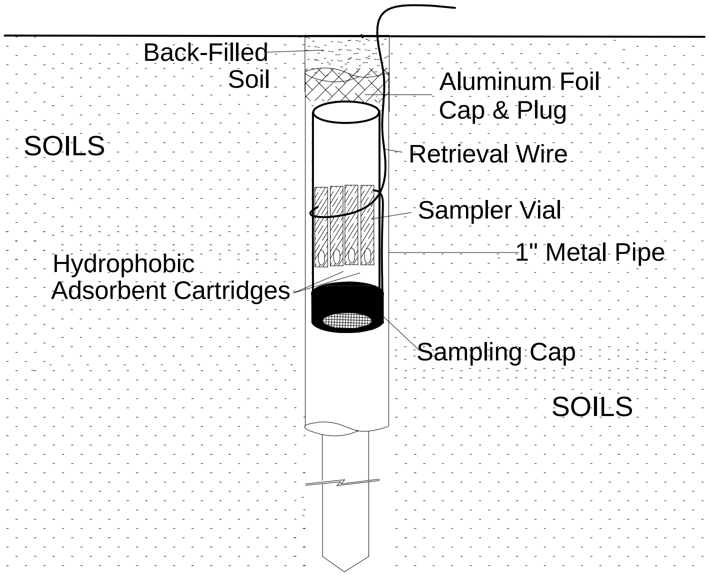
F. Field personnel retrieve the samplers at the end of the exposure period. At each location, a field technician withdraws the sampler from its hole, removes the retrieval wire, and wipes the outside of the vial clean using gauze cloth; following removal of the Sampling Cap, the threads of the vial are also cleaned. A solid plastic cap is screwed onto the vial and the sample location number is written on the label. The technician then records sample-point location, date, time, etc. on the Field Deployment Form.

G. Sampling holes are refilled with soil, sand, or other suitable material. If samplers have been installed through asphalt or concrete, the hole is filled to grade with a plug of cold patch or cement.

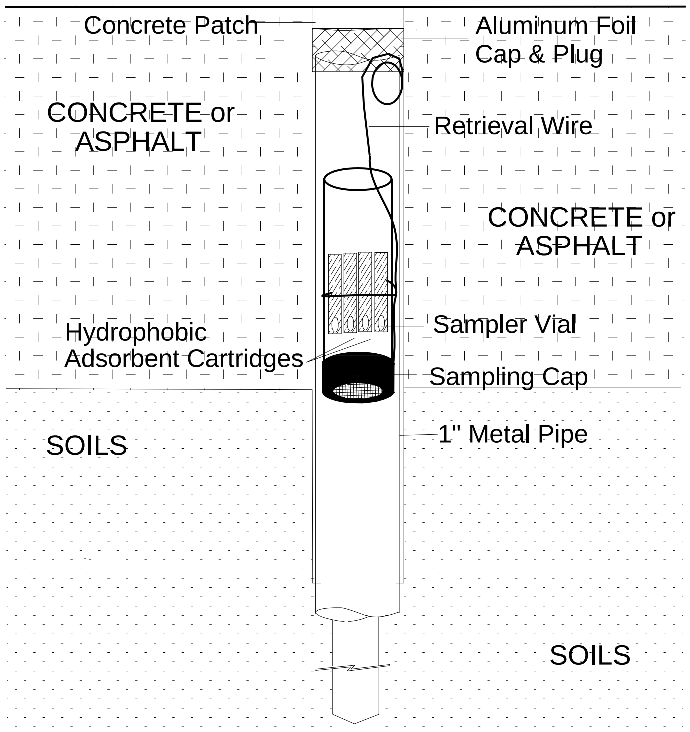
H. Following retrieval, field personnel ship or transport the passive samplers to BEACON's laboratory.

BEACON'S PASSIVE SOIL-GAS SAMPLER

DEPLOYMENT THROUGH SOILS



DEPLOYMENT THROUGH AN ASPHALT/CONCRETE CAP



Attachment 3

Chain of Custody Form

BEACON ENVIRONMENTAL SERVICES, INC.

CHAIN-OF-CUSTODY
PASSIVE SOIL-GAS SAMPLES

2203A Commerce Road, Suite 1
Forest Hill, MD 21050 USA
P: 1-410-838-8780 | F: 1-410-838-8740

Project Information		Client Information		
Beacon Project No.:	3378	Company Name:	CDM	Client PO No.:
Site Name:	Former Duofold	Office Location:		
Site Location:	Herkimer, NY	Samples Submitted By:	Schneider / Rosenzweig	Expedited Turnaround Time
Analytical Method:	U.S. EPA Method 8260C	Contact Phone No.:	443-987-4693	☐ Rush (Specify): ____ days
Target Compounds:				

Field Sample ID	Date Emplaced: 10-4-16 Time Emplaced	Date Retrieved: 10-20-16 Time Retrieved	Sampling Hole Depth (inches)	Type of Surface (Soil/Asphalt/ Concrete/Gravel)	Optional Sample Information (e.g., Description of Sample Location, Sample Condition, PID/FID Readings)
DFPGS-1	09:01	07:25	36	SOIL	Intersection of Spruce + Pleasant
2	09:15	07:26	"	SOIL	
3	09:21	07:28	"	SOIL	
4	09:25	07:30	"	SOIL	
5	09:29	07:32	"	SOIL	
6	09:33	7:36	"	SOIL	
7	09:37	7:37	"	SOIL	
8	09:41	7:39	"	SOIL	
9	09:45	7:41	"	SOIL	
10	09:51	7:43	"	SOIL	
11	09:55	7:45	"	SOIL	
12	10:01	7:53	"	ASPHALT/GRAVEL	At entrance to PKG. AREA
13	10:07	7:54	"	SOIL	
14	10:13	7:56	"	SOIL	
15	10:22		"	ASPHALT/GRAVEL	

Special Notes/Instructions:

Shipment of Field Kit to Laboratory — Custody Seal # **Intact? Y N** RYAN Delivered

Relinquished by:	Date/Time	Courier	Received by:	Date/Time
		Ryan Schneider	Augusto Benavides	10-21-16 8:56h

BEACON ENVIRONMENTAL SERVICES, INC.

CHAIN-OF-CUSTODY
PASSIVE SOIL-GAS SAMPLES

2203A Commerce Road, Suite 1
Forest Hill, MD 21050 USA
P: 1-410-838-8780 | F: 1-410-838-8740

Project Information		Client Information		
Beacon Project No.:	3378	Company Name:	CDM	Client PO No.:
Site Name:	Former Dudfold	Office Location:		
Site Location:	Herkimer, NY	Samples Submitted By:	Schneider	Expedited Turnaround Time
Analytical Method:	U.S. EPA Method 8260C	Contact Phone No.:		☐ Rush (Specify): ____ days
Target Compounds:	Beacon Standard TCL			

Field Sample ID	Date Emplaced 10/4/16 Time Emplaced	Date Retrieved 10-20-16 Time Retrieved	Sampling Hole Depth (inches)	Type of Surface (Soil/Asphalt/ Concrete/Gravel)	Optional Sample Information (e.g., Description of Sample Location, Sample Condition, PID/FID Readings)
DFPGS-16	~~09:08~~ 10:24	8:03	36	~~Soil~~ SOIL	
17	09:08	07:22	"	SOIL	
18	11:00	8:13	"	SOIL	
19	11:04	8:15	"	SOIL	
20	11:09	8:23	"	SOIL	
21	11:28	8:25	"	SOIL	
22	11:37	8:27	"	SOIL	
23	11:41	829	"	SOIL	
24	13:54	840	"	ASPHALT	
25	14:19	845	"	ASPHALT	
26	10/5 08:06	1011	"	Concrete	
27	15:44	1009	"	CONCRETE	
28	15:47	1007	"	CONCRETE	
29	15:56	1006	"	SOIL/CONCRETE	Beneath broken up concrete
30	16:03	1004	"	Concrete	
31	16:06	1002	"	Soil	
32	11:14	8:16	"	SOIL	
33	11:18	8:19	"	SOIL	
34	11:23	8:21	"	SOIL	
35	11:47	834	"	Soil	

Special Notes/Instructions:

Page 2 of ____

BEACON ENVIRONMENTAL SERVICES, INC.

CHAIN-OF-CUSTODY
PASSIVE SOIL-GAS SAMPLES

2203A Commerce Road, S.
Forest Hill, MD 21050 USA
P: 1-410-838-8780 | F: 1-410-838-8740

Project Information		Client Information		
Beacon Project No.:	3378	Company Name:		Client PO No.:
Site Name:	Former Duofold	Office Location:		
Site Location:	Herkimer, NY	Samples Submitted By:		Expedited Turnaround Time
Analytical Method:	U.S. EPA Method 8260C	Contact Phone No.:		☐ Rush (Specify): ____ days
Target Compounds:	Beacon Standard TCL			

Field Sample ID	Date Emplaced 10-4-16 Time Emplaced	Date Retrieved Time Retrieved	Sampling Hole Depth (inches)	Type of Surface (Soil/Asphalt/ Concrete/Gravel)	Optional Sample Information (e.g., Description of Sample Location, Sample Condition, PID/FID Readings)
DFPGS-36	11:59	835	36	SOIL	
37	12:04	837	"	SOIL	
38	12:08	838	"	SOIL	
39	14:13	842	"	SOIL	
40	10/5 08:27	~~948~~ 949	"	Concrete	
41	10/5 08:40	951	"	Concrete	
42	10/5 08:48	953	"	ASPHALT	
43	10/5 09:44	955	"	Concrete	
44	10/5 09:50	958	"	Concrete	
45	10/5 10:05	1001	"	SOIL	
46	12:32	854		SOIL	
47	12:25	856	"	SOIL	
48	12:18	858	"	SOIL	
49	12:15	900	"	SOIL	
50	10/5 08:34	946	"	Concrete	
51	10/5 08:44	943	"	Concrete	
52	10/5 08:52	941	"	Concrete	
53	10/5 09:36	940	"	Concrete	
54	10/5 09:59	937	"	Concrete	
55	12:34	902	"	SOIL	

Special Notes/Instructions:

Page 3 of ____

BEACON ENVIRONMENTAL SERVICES, INC.

CHAIN-OF-CUSTODY
PASSIVE SOIL-GAS SAMPLES

2203A Commerce Road, Suite 1
Forest Hill, MD 21050 USA
P: 1-410-838-8780 | F: 1-410-838-8740

Project Information		Client Information		
Beacon Project No.:	3378	Company Name:		Client PO No.:
Site Name:	Former Duofold	Office Location:		
Site Location:	Herkimer, NY	Samples Submitted By:		Expedited Turnaround Time
Analytical Method:	U.S. EPA Method 8260C	Contact Phone No.:		☐ Rush (Specify): ____ days
Target Compounds:	Beacon Standard TCL			

Field Sample ID	Date Emplaced	Time Emplaced	Date Retrieved	Time Retrieved	Sampling Hole Depth (inches)	Type of Surface (Soil/Asphalt/ Concrete/Gravel)	Optional Sample Information (e.g., Description of Sample Location, Sample Condition, PID/FID Readings)
DFPGS-56	10/4	12:40		908	36	SOIL	
57	10/4	12:43		913	"	SOIL	
58	10/4	12:48		917	"	SOIL/GRAVEL	
59	10/4	12:56		918	"	SOIL	
60	10/4	15:20		923	"	SOIL	
61	10/4	15:27		930	"	ASPHALT	
62	10/5	08:56		932	"	ASPHALT	
63	10/5	09:04		933	"	WOOD/CONCRETE	
64	10/5	10:02		935	"	ASPHALT	
65	10/4	13:43		904	"	SOIL/GRAVEL	
66	10/4	13:25		906	"	SOIL	
67	10/4	13:18		911	"	SOIL	
68	10/4	13:12		915	"	SOIL	
69	10/4	13:07		920	"	SOIL	
70	10/4	13:00		921	"	SOIL	
71	10/4	13:20		910	"	SOIL	
72	10/4	14:41		1024	"	SOIL/ASPHALT	
73	10/4	14:37		1023	"	SOIL/ASPHALT	
74	10/4	14:31		1021	"	SOIL/ASPHALT	CORNER OF PKG LOT ACROSS ST
75	10/4	14:46		1026	"	ASPHALT	

Special Notes/Instructions:

Page 4 **of** ____

BEACON ENVIRONMENTAL SERVICES, INC.

CHAIN-OF-CUSTODY
PASSIVE SOIL-GAS SAMPLES

2203A Commerce Road, Suite 1
Forest Hill, MD 21050 USA
P: 1-410-838-8780 | F: 1-410-838-8740

Project Information		**Client Information**		
Beacon Project No.:	3378	Company Name:		Client PO No.:
Site Name:		Office Location:		
Site Location:		Samples Submitted By:		Expedited Turnaround Time
Analytical Method:	U.S. EPA Method 8260C	Contact Phone No.:		☐ Rush (Specify): ____ days
Target Compounds:	Beacon Standard TCL			

Field Sample ID	**Date Emplaced**	**Time Emplaced**	**Date Retrieved**	**Time Retrieved**	**Sampling Hole Depth (inches)**	**Type of Surface (Soil/Asphalt/ Concrete/Gravel)**	**Optional Sample Information (e.g., Description of Sample Location, Sample Condition, PID/FID Readings)**
24A	10/4	14:05		843	36	ASPHALT	
39A	10/4	14:23		847	"	ASPHALT	
76	10/4	14:48		1028	"	SOIL/ASPHALT	IN SOIL IN CRACK IN PKG LOT
77	10/4	14:55		1030	"	SOIL/ASPHALT	" " "
78	10/4	15:01		1032	"	SOIL	
79	10/4	15:06		1033	"	SOIL	

Special Notes/Instructions:

Attachment 4

LABORATORY PROCEDURES FOR PASSIVE SOIL-GAS SAMPLES

Following are laboratory procedures used with BEACON Passive Soil-Gas Surveys, a screening technology for expedited site investigation. After exposure, adsorbent cartridges from the passive samplers are analyzed using U.S. EPA Method 8260C as a guidance document, a capillary gas chromatographic/mass spectrometric method, modified to accommodate high temperature thermal desorption of the adsorbent cartridges and to meet the objectives of reporting semi-quantitative data. This procedure is summarized as follows:

A. The adsorbent cartridges are loaded with internal standards and surrogates prior to loading the autosampler with the cartridges. The loaded cartridges are purged in a helium flow. Then the cartridges are thermally desorbed in a helium flow onto a focusing trap. Any analytes in the helium stream are adsorbed onto a focusing trap.

B. Following trap focusing, the trap is thermally desorbed onto a Rxi-624Sil MS 20m, 0.18 mm ID, 1.00 micron film thickness capillary column.

C. The GC/MS is scanned between 35 and 300 Atomic Mass Units (AMU) at 3.12 scans per second.

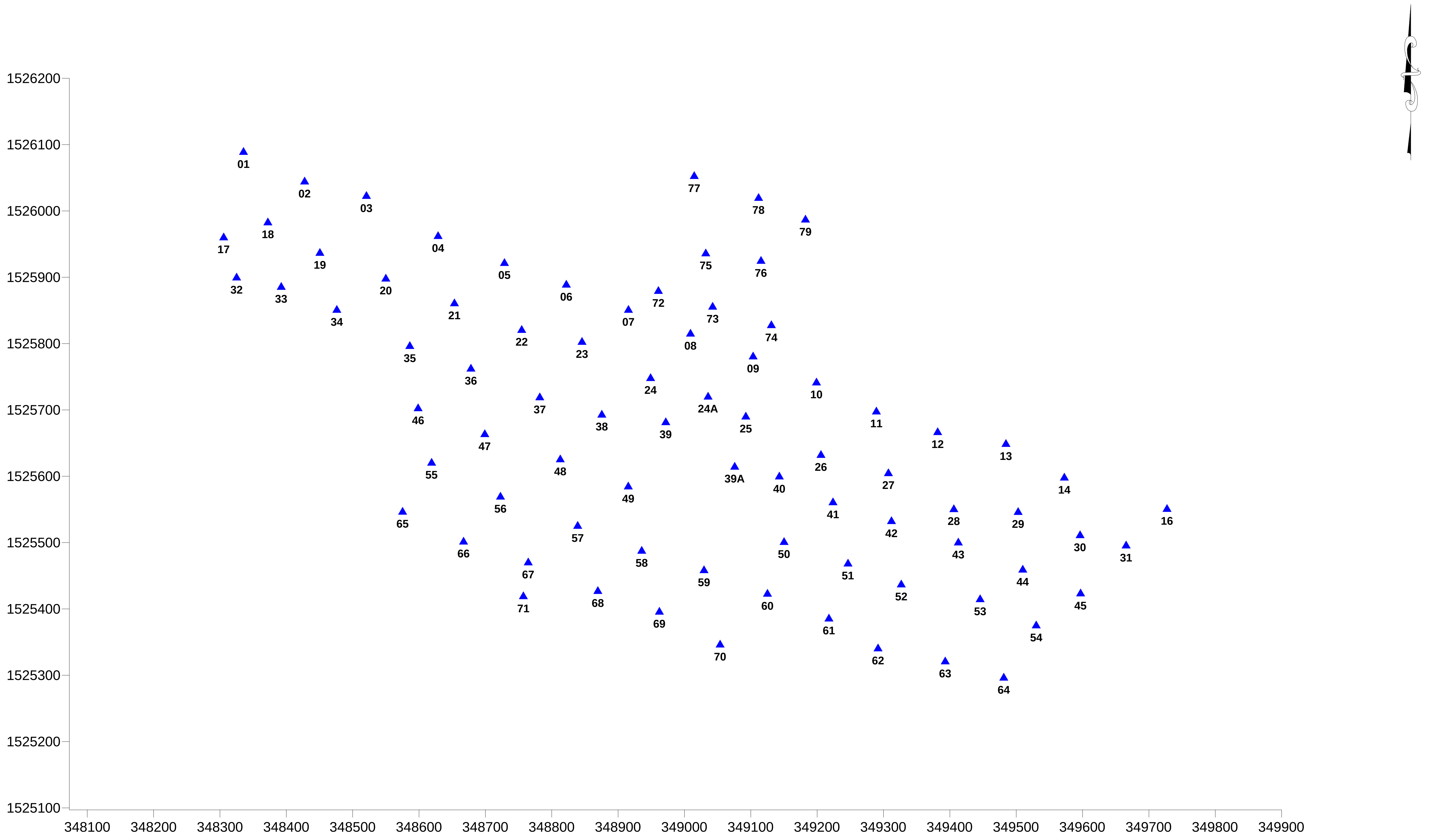
D. BFB tuning criteria and the initial five-point calibration procedures are those stated in method SW846-8260C. System performance and calibration check criteria are met prior to analysis of samples. A laboratory method blank is analyzed after the daily standard to determine that the system is contaminant-free.

E. The instrumentation used for these analyses includes:

- Agilent 7890-5975c Gas Chromatograph/Mass Spectrometer;
- Markes Unity2 thermal desorber;
- Markes UltrA2 autosampler; and
- Markes Mass Flow Controller Modules.

and

- Agilent 7890-5975c Gas Chromatograph/Mass Spectrometer; and
- Markes TD100 thermal desorption system.



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www.Beacon-USA.com 1-410-838-8780
Beacon Project No. 3378, November 2016

LEGEND

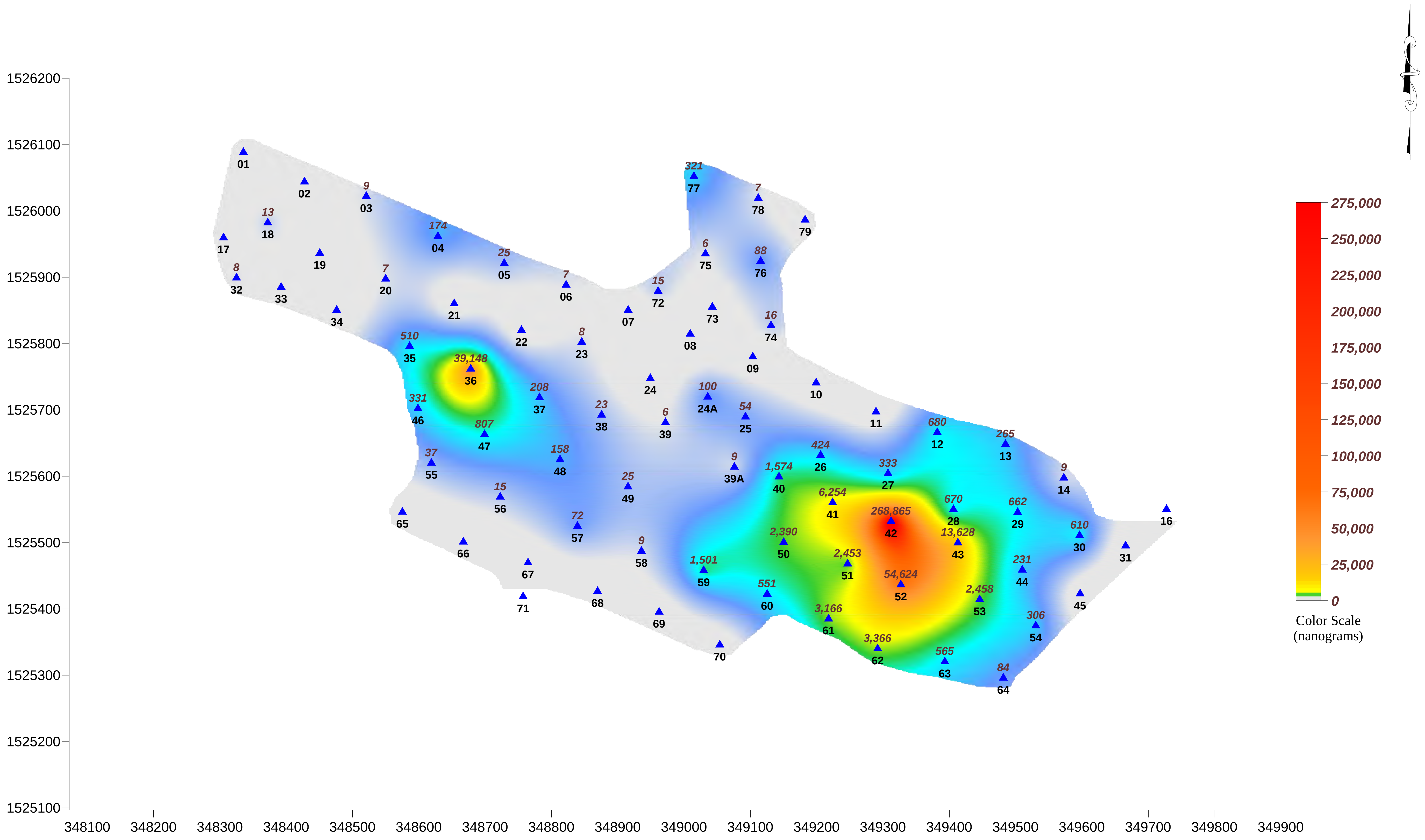
▲ 77 PASSIVE SOIL-GAS SAMPLE LOCATION

Scale in Feet
0 150 300

System: US State Plane
Zone: New York East FIPS 3101
Datum: NAD 1983
Coordinate Units: Feet

Figure 1
Passive Soil-Gas Survey
Sample Locations

Former Duofold Site
Herkimer, NY



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1,000 NANOGRAMS/SAMPLER

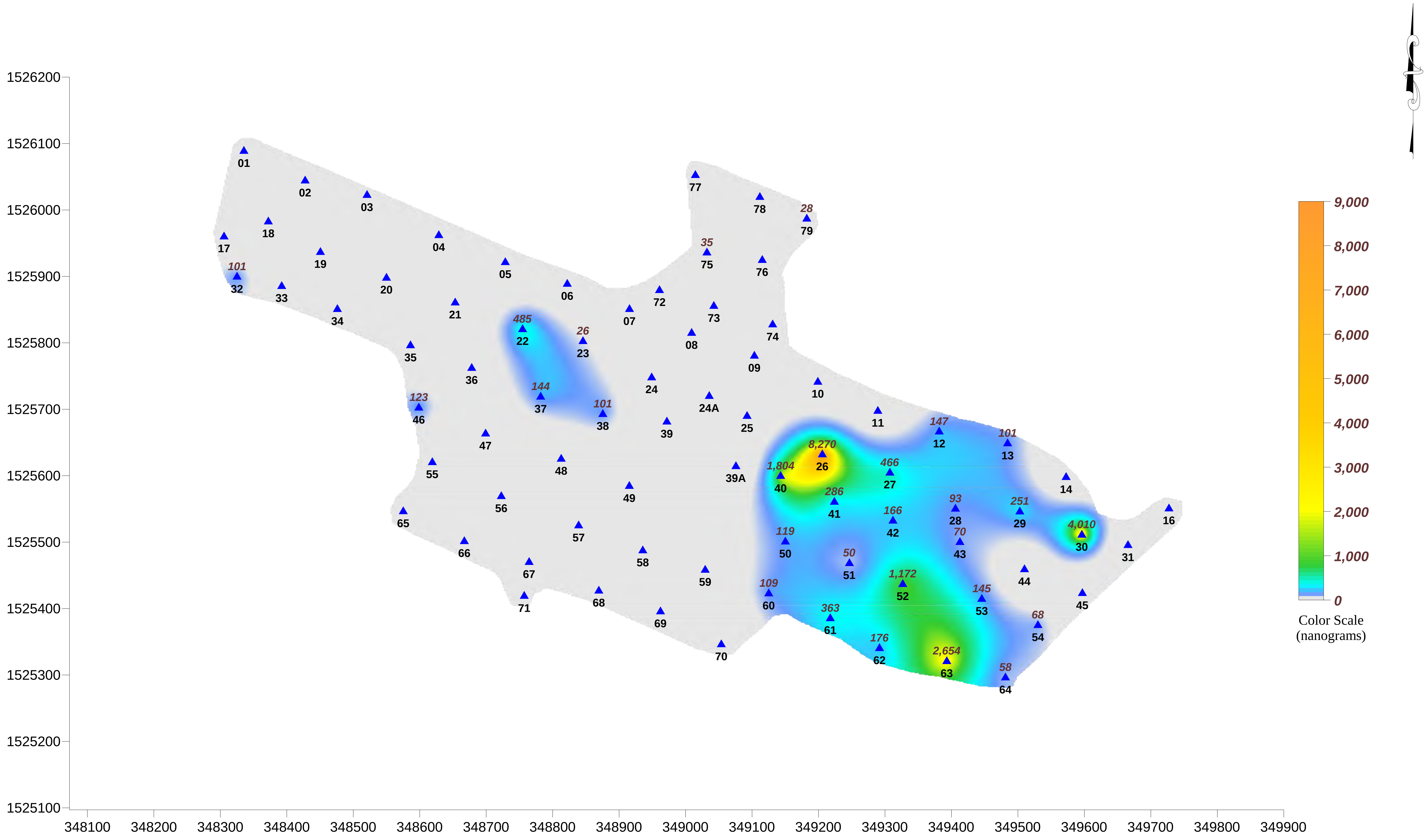
▲ 77 PASSIVE SOIL-GAS SAMPLE LOCATION

Scale in Feet
0 150 300

System:	US State Plane
Zone:	New York East FIPS 3101
Datum:	NAD 1983
Coordinate Units:	Feet

Figure 2
Passive Soil-Gas Survey
PCE + Breakdown Products

Former Duofold Site
Herkimer, NY



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Beacon Project No. 3378, November 2016

LEGEND

1,000	NANOGRAMS/SAMPLER
▲ 77	PASSIVE SOIL-GAS SAMPLE LOCATION

Scale in Feet
0 150 300

System:	US State Plane
Zone:	New York East FIPS 3101
Datum:	NAD 1983
Coordinate Units:	Feet

Figure 3
Passive Soil-Gas Survey
Total BTEX

Former Duofold Site
Herkimer, NY

Appendix D

Appendix D

Soil Boring and Temporary Well Construction Logs

CDM Smith
Raritan Plaza I
110 Fieldcrest Ave, 6th Floor
Edison, New Jersey 08837

Page 1 of 1

Boring Name: SB-01

Client: EPA
Project Location: Ilion, NY

Project Name: Duofold
Project Number: 101995.3323.029.DIR6

Drilling Contractor: Talon
Drilling Method: Direct Push
Sample Method: Acetate liner
Drilling Date: 11/8/2016
North: 43.020404
East: -75.037703

Surface Elevation (ft amsl): NM
Total Depth: 10'
Depth to Initial Water Level (ft bgs):
Field Screening Instrument: PID
Logged by: ESR

Depth (ft. bgs)	Sample Number	Blows per 6 inches	Sample Interval (ft)	Recovery (ft)	OVM Reading (ppm)	Graphic Log	Material Description
		NA		47"	0.0		8" Dark Brown M SAND 18" Brown F SAND ↓ Brown SILT & CLAY - wet
	X		4-5'		0.0		
5				53	0.0		Same As Above (SAA)
					0.0		
10							

Remarks:

Boring Completion Depth ft bgs 10'

CDM Smith

Raritan Plaza I
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Edison, New Jersey 08837

Page 1 of 1

Boring Name: SB/TWP-02

Client: EPA
Project Location: Ilion, NY

Project Name: Duofold
Project Number: 101995.3323.029.DIR6

Drilling Contractor: Talon
Drilling Method: Direct Push
Sample Method: Acetate liner
Drilling Date: 11/8/2016
North: 43.020567
East: -75.037597

Surface Elevation (ft amsl): NM
Total Depth: 13'
Depth to Initial Water Level (ft bgs):
Field Screening Instrument: PID
Logged by: ESR

Depth (ft. bgs)	Sample Number	Blows per 6 inches	Sample Interval (ft)	Recovery (ft)	OVM Reading (ppm)	Graphic Log	Material Description
		NA		41"	0.0		Dark brown F-M SAND Some coal, Ash, and Brick ▼ at 4.5'
	X		4-5		0.0		
5				35"	0.0		14" SAA ↓ light brown CLAY (Dry)
					0.0		
10							
13							

Remarks:

Boring Completion Depth ft bgs 13'

CDM Smith

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Edison, New Jersey 08837

Page 1 of 1

Boring Name: SB/TWP-03

Client: EPA
Project Location: Ilion, NY

Project Name: Duofold
Project Number: 101995.3323.029.DIR6

Drilling Contractor: Talon
Drilling Method: Direct Push
Sample Method: Acetate liner
Drilling Date: 11/8/2016
North: 43.020638
East: -75.036953

Surface Elevation (ft amsl): NM
Total Depth: 13
Depth to Initial Water Level (ft bgs):
Field Screening Instrument: PID
Logged by: ESR

Depth (ft. bgs)	Sample Number	Blows per 6 inches	Sample Interval (ft)	Recovery (ft)	OVM Reading (ppm)	Graphic Log	Material Description
	X	NA	4-5	40"	0.0 0.0		14" dark brown F-M SAND Some Ash. ↓ brown F-C SAND ▼ at 4'
				35"	0.0 0.0		8" SAA ↓ brown CLAY

Remarks:

Boring Completion Depth ft bgs 13

CDM Smith

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Edison, New Jersey 08837

Page 1 of 1

Boring Name: SB-04

Client: EPA
Project Location: Ilion, NY

Project Name: Duofold
Project Number: 101995.3323.029.DIR6

Drilling Contractor: Talon
Drilling Method: Direct Push
Sample Method: Acetate liner
Drilling Date: 11/8/2016
North: 43.01999
East: -75.036639

Surface Elevation (ft amsl): NM
Total Depth: 10'
Depth to Initial Water Level (ft bgs):
Field Screening Instrument: PID
Logged by: ESR

Depth (ft. bgs)	Sample Number	Blows per 6 inches	Sample Interval (ft)	Recovery (ft)	OVM Reading (ppm)	Graphic Log	Material Description
		NA		36"	0.0		↓ brown F-M SAND some brick, gravel, and concrete
	X		3-4		0.0		

Remarks: Refusal at 4' BGS 3 times in a Row Collected Sample From 3-4' BGS

Boring Completion Depth ft bgs 10'

CDM Smith

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Edison, New Jersey 08837

Page 1 of 1

Boring Name: SB-05

Client: EPA
Project Location: Ilion, NY

Project Name: Duofold
Project Number: 101995.3323.029.DIR6

Drilling Contractor: Talon
Drilling Method: Direct Push
Sample Method: Acetate liner
Drilling Date: 11/8/2016
North: 43.020306
East: -75.036350

Surface Elevation (ft amsl): NM
Total Depth: 10'
Depth to Initial Water Level (ft bgs):
Field Screening Instrument: PID
Logged by: ESR

Depth (ft. bgs)	Sample Number	Blows per 6 inches	Sample Interval (ft)	Recovery (ft)	OVM Reading (ppm)	Graphic Log	Material Description
		NA		42"	0.0		↓ brown VF-F SAND little ash, brick & Gravel
					0.0		
	X		5-6	29"	0.0		10" SAA - wet ↓ brown F SAND AND GRAVEL
					0.0		

Remarks:

Boring Completion Depth ft bgs 10'

CDM Smith

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Edison, New Jersey 08837

Page 1 of 1

Boring Name: SB-06

Client: EPA
Project Location: Ilion, NY

Project Name: Duofold
Project Number: 101995.3323.029.DIR6

Drilling Contractor: Talon
Drilling Method: Direct Push
Sample Method: Acetate liner
Drilling Date: 11/8/2016
North: 43.019921
East: -75.035836

Surface Elevation (ft amsl): NM
Total Depth: 10'
Depth to Initial Water Level (ft bgs):
Field Screening Instrument: PID
Logged by: ESR

Depth (ft. bgs)	Sample Number	Blows per 6 inches	Sample Interval (ft)	Recovery (ft)	OVM Reading (ppm)	Graphic Log	Material Description
0–5	X	NA	4-5	39"	0.0 0.0		11" dark brown F SAND AND ASH 8" light brown VF-F SAND 4" dark brown F SAND AND ASH 12" light brown SILT & VF-SAND trace brick ↓ dark gray F-SAND AND ASH ▼ at 4' BGS
5–10				31"	0.0 0.0		4" SAA ↓ light brown SILT AND CLAY little gravel

Remarks:

Boring Completion Depth ft bgs 10'

CDM Smith
Raritan Plaza I
110 Fieldcrest Ave, 6th Floor
Edison, New Jersey 08837

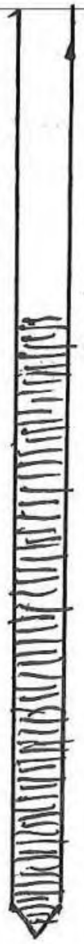
Page 1 of 1

Boring Name: SB/TWP-07

Client: EPA
Project Location: Ilion, NY
Project Name: Duofold
Project Number: 101995.3323.029.DIR6

Drilling Contractor: Talon
Drilling Method: Direct Push
Sample Method: Acetate liner
Drilling Date: 11/8/2016
North: 43.019753
East: -75.035936

Surface Elevation (ft amsl): NM
Total Depth: 15
Depth to Initial Water Level (ft bgs): 7'
Field Screening Instrument: PID
Logged by: ESR

Depth (ft. bgs)	Sample Number	Blows per 6 inches	Sample Interval (ft)	Recovery (ft)	OVM Reading (ppm)	Graphic Log	Material Description
		NA		38"	0.0 0.0		14" Brown F SAND little ash ↓ Brick
5	X		7-8	21"	0.0 0.0		4" SAA ↓ brown VF-F SAND trace ash, Brick wet @ 7'BGS
10							
15							

Remarks:

Boring Completion Depth ft bgs 15

CDM Smith Raritan Plaza I 110 Fieldcrest Ave, 6th Floor Edison, New Jersey 08837	Page 1 of 1 **Boring Name:** SB-08
Client: EPA **Project Location:** Ilion, NY	**Project Name:** Duofold **Project Number:** 101995.3323.029.DIR6
Drilling Contractor: Talon **Drilling Method:** Direct Push **Sample Method:** Acetate liner **Drilling Date:** 11/9/2016 **North:** 43.020006 **East:** -75.035202	**Surface Elevation (ft amsl):** NM **Total Depth:** 3 **Depth to Initial Water Level (ft bgs):** NA **Field Screening Instrument:** PID **Logged by:** ESR

Depth (ft. bgs)	Sample Number	Blows per 6 inches	Sample Interval (ft)	Recovery (ft)	OVM Reading (ppm)	Graphic Log	Material Description
	X	NA	2-3	22"	0.0		dark brown F-M SAND some ash, gravel trace brick
5							
10							

Remarks:

Boring Completion Depth ft bgs 3'

CDM Smith

Raritan Plaza I
110 Fieldcrest Ave, 6th Floor
Edison, New Jersey 08837

Page 1 of 1

Boring Name: SB/TWP-09

Client: EPA
Project Location: Ilion, NY

Project Name: Duofold
Project Number: 101995.3323.029.DIR6

Drilling Contractor: Talon
Drilling Method: Direct Push
Sample Method: Acetate liner
Drilling Date: 11/9/2016
North: 43.020297
East: -75.035037

Surface Elevation (ft amsl): NM
Total Depth: 13
Depth to Initial Water Level (ft bgs): 5
Field Screening Instrument: PID
Logged by: ESR

Depth (ft. bgs)	Sample Number	Blows per 6 inches	Sample Interval (ft)	Recovery (ft)	OVM Reading (ppm)	Graphic Log	Material Description
		NA		6"	0.0 0.0		↓ dark brown VF-F SAND little gravel
5	X		5-6	7"	0.0 0.0		↓ brown SILT AND CLAY
10							

Remarks:

Boring Completion Depth ft bgs 13

CDM Smith

Raritan Plaza I
110 Fieldcrest Ave, 6th Floor
Edison, New Jersey 08837

Page 1 of 1

Boring Name: SB-10

Client: EPA
Project Location: Ilion, NY

Project Name: Duofold
Project Number: 101995.3323.029.DIR6

Drilling Contractor: Talon
Drilling Method: Direct Push
Sample Method: Acetate liner
Drilling Date: 11/9/2016
North: 43.019980
East: -75.035301

Surface Elevation (ft amsl): NM
Total Depth: 10'
Depth to Initial Water Level (ft bgs): 5'
Field Screening Instrument: PID
Logged by: ESR

Depth (ft. bgs)	Sample Number	Blows per 6 inches	Sample Interval (ft)	Recovery (ft)	OVM Reading (ppm)	Graphic Log	Material Description
		NA		41"	0.0		↓ dark brown F-M SAND some brick, ash, gravel
					0.0		
	X		5-6	42"	0.0		6" SAA 17" brown VF SAND little gravel ↓ brown CLAY
					0.0		

Remarks:

Boring Completion Depth ft bgs 10'

CDM Smith

Raritan Plaza I
110 Fieldcrest Ave, 6th Floor
Edison, New Jersey 08837

Page 1 of 1

Boring Name: SB-11

Client: EPA
Project Location: Ilion, NY

Project Name: Duofold
Project Number: 101995.3323.029.DIR6

Drilling Contractor: Talon
Drilling Method: Direct Push
Sample Method: Acetate liner
Drilling Date: 11/8/2016
North: 43.019702
East: -75.035617

Surface Elevation (ft amsl): NM
Total Depth: 10
Depth to Initial Water Level (ft bgs): 4
Field Screening Instrument: PID
Logged by: ESR

Depth (ft. bgs)	Sample Number	Blows per 6 inches	Sample Interval (ft)	Recovery (ft)	OVM Reading (ppm)	Graphic Log	Material Description
	X	NA	4-5	5"	834		2" Concrete ↓ dark brown F-C SAND — Saturated
5				6"	624		↓ SAA
10							

Remarks:

Boring Completion Depth ft bgs 10'

CDM Smith

Raritan Plaza I
110 Fieldcrest Ave, 6th Floor
Edison, New Jersey 08837

Page 1 of 1

Boring Name: SB/TWP-12

Client: EPA

Project Location: Ilion, NY

Project Name: Duofold

Project Number: 101995.3323.029.DIR6

Drilling Contractor: Talon
Drilling Method: Direct Push
Sample Method: Acetate liner
Drilling Date: 11/8/2016
North: 43.019653
East: -75.034728

Surface Elevation (ft amsl): NM
Total Depth:
Depth to Initial Water Level (ft bgs):
Field Screening Instrument: PID
Logged by: ESR

Depth (ft. bgs)	Sample Number	Blows per 6 inches	Sample Interval (ft)	Recovery (ft)	OVM Reading (ppm)	Graphic Log	Material Description
		NA		34"	0.0 0.0		34" brown F SAND little ash, brick, gravel
	X		6-7	42"	65.3 11.6		6" SAA ↓ Gray SILT AND CLAY - Strong petrolium odor

Remarks:

Boring Completion Depth ft bgs ________

CDM Smith

Raritan Plaza I
110 Fieldcrest Ave, 6th Floor
Edison, New Jersey 08837

Page 1 of 1

Boring Name: SB-13

Client: EPA
Project Location: Ilion, NY

Project Name: Duofold
Project Number: 101995.3323.029.DIR6

Drilling Contractor: Talon
Drilling Method: Direct Push
Sample Method: Acetate liner
Drilling Date: 11/8/2016
North: 43.019659
East: -75.034586

Surface Elevation (ft amsl): NM
Total Depth:
Depth to Initial Water Level (ft bgs):
Field Screening Instrument: PID
Logged by: ESR

Depth (ft. bgs)	Sample Number	Blows per 6 inches	Sample Interval (ft)	Recovery (ft)	OVM Reading (ppm)	Graphic Log	Material Description
		NA		22"	0.0 0.0		4" Concrete 2" black F SAND AND ASH ↓ brown F SAND little brick, and ash - wet @ 5'
	X		4-5				
5				0			No Recovery
10				13"	0.0 0.0		↓ Brown F SAND trace gravel
15							

Remarks:

Boring Completion Depth ft bgs ________

CDM Smith

Raritan Plaza I
110 Fieldcrest Ave, 6th Floor
Edison, New Jersey 08837

Page 1 of 1

Boring Name: SB/TWP-14

Client: EPA
Project Location: Ilion, NY

Project Name: Duofold
Project Number: 101995.3323.029.DIR6

Drilling Contractor: Talon
Drilling Method: Direct Push
Sample Method: Acetate liner
Drilling Date: 11/8/2016
North: 43.019247
East: -75.034251

Surface Elevation (ft amsl): NM
Total Depth: 11
Depth to Initial Water Level (ft bgs): 6
Field Screening Instrument: PID
Logged by: ESR

Depth (ft. bgs)	Sample Number	Blows per 6 inches	Sample Interval (ft)	Recovery (ft)	OVM Reading (ppm)	Graphic Log	Material Description
		NA		27"	0.0 0.0		3" Concrete 3" black M-C SAND ↓ brown SILT AND CLAY
	x		6-7		0.0 0.0		6" SAA 8" Brown F-M SAND AND GRAVEL ↓ brown SILT AND CLAY

Remarks:

Boring Completion Depth ft bgs 11

CDM Smith

Raritan Plaza I
110 Fieldcrest Ave, 6th Floor
Edison, New Jersey 08837

Page 1 of 1

Boring Name: SB/TWP-15

Client: EPA
Project Location: Ilion, NY

Project Name: Duofold
Project Number: 101995.3323.029.DIR6

Drilling Contractor: Talon
Drilling Method: Direct Push
Sample Method: Acetate liner
Drilling Date: 11/8/2016
North: 43.019702
East: -75.034195

Surface Elevation (ft amsl): NM
Total Depth: 14
Depth to Initial Water Level (ft bgs): 4'
Field Screening Instrument: PID
Logged by: ESR

Depth (ft. bgs)	Sample Number	Blows per 6 inches	Sample Interval (ft)	Recovery (ft)	OVM Reading (ppm)	Graphic Log	Material Description
		NA		39"	0.0 0.0		3" Concrete ↓ brown F SAND- wet @ 4'
5	X		4-5				
				50"	0.0 0,0		18" SAA ↓ gray CLAY
10							
15							

Remarks:

Boring Completion Depth ft bgs 14

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Boring Name: SB/TWP-16

Client: EPA
Project Location: Ilion, NY

Project Name: Duofold
Project Number: 101995.3323.029.DIR6

Drilling Contractor: Talon
Drilling Method: Direct Push
Sample Method: Acetate liner
Drilling Date: 11/8/2016
North: 43.019582
East: -75.033274

Surface Elevation (ft amsl): NM
Total Depth: 11
Depth to Initial Water Level (ft bgs): 5
Field Screening Instrument: PID
Logged by: ESR

Depth (ft. bgs)	Sample Number	Blows per 6 inches	Sample Interval (ft)	Recovery (ft)	OVM Reading (ppm)	Graphic Log	Material Description
		NA		19"	0.0 0.0		6" Concrete ↓ dark grey VF SAND trace brick
5	X		5-6	57"	0.0 0.0		10" SAA ↓ Gray CLAY
10							

Remarks:

Boring Completion Depth ft bgs 11

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Boring Name: SB-17

Client: EPA
Project Location: Ilion, NY

Project Name: Duofold
Project Number: 101995.3323.029.DIR6

Drilling Contractor: Talon
Drilling Method: Direct Push
Sample Method: Acetate liner
Drilling Date: 11/8/2016
North: 43.019194
East: -75.033132

Surface Elevation (ft amsl): NM
Total Depth: 10
Depth to Initial Water Level (ft bgs): 5'
Field Screening Instrument: PID
Logged by: ESR

Depth (ft. bgs)	Sample Number	Blows per 6 inches	Sample Interval (ft)	Recovery (ft)	OVM Reading (ppm)	Graphic Log	Material Description
		NA		42"	0.0 0.0		8" dark brown F-SAND Some Ash, trace gravel ↓ brown VF-F SAND little gravel
5	X		4-5				
				41"	0.0 0.0		6" SAA 18" brown, VF SAND, little gravel ↓ Gray SILT AND CLAY
10							

Remarks:

Boring Completion Depth ft bgs 10

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Boring Name: SB/TWP-18

Client: EPA
Project Location: Ilion, NY

Project Name: Duofold
Project Number: 101995.3323.029.DIR6

Drilling Contractor: Talon
Drilling Method: Direct Push
Sample Method: Acetate liner
Drilling Date: 11/9/2016
North: 43.020844
East: -75.035103

Surface Elevation (ft amsl): NM
Total Depth: 14'
Depth to Initial Water Level (ft bgs): 5
Field Screening Instrument: PID
Logged by: ESR

Depth (ft. bgs)	Sample Number	Blows per 6 inches	Sample Interval (ft)	Recovery (ft)	OVM Reading (ppm)	Graphic Log	Material Description
		NA		31"	0.0 0.0		7" black F-M SAND some coal and Ash ↓ brown F-M SAND some gravel
5	X		5-6	49"	0.0 0.0		16" SAA 15" gray CLAY ↓ brown SAND AND GRAVEL
10							
15							

Remarks:

Boring Completion Depth ft bgs 14'

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Boring Name: SB/TWP-19

Client: EPA
Project Location: Ilion, NY

Project Name: Duofold
Project Number: 101995.3323.029.DIR6

Drilling Contractor: Talon
Drilling Method: Direct Push
Sample Method: Acetate liner
Drilling Date: 11/9/2016
North: 43.020569
East: -75.034999

Surface Elevation (ft amsl): NM
Total Depth: 14
Depth to Initial Water Level (ft bgs): 5
Field Screening Instrument: PID
Logged by: ESR

Depth (ft. bgs)	Sample Number	Blows per 6 inches	Sample Interval (ft)	Recovery (ft)	OVM Reading (ppm)	Graphic Log	Material Description
		NA		38	0.0		25" brown F SAND little gravel, Ash ↓ Gray CLAY
					0.0		
	X		4-5				
5				49"	0.0		30" SAA ↓ light brown SAND AND GRAVEL
					0.0		
10							
15							

Remarks:

Boring Completion Depth ft bgs 14'

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Boring Name: SB-20

Client: EPA
Project Location: Ilion, NY

Project Name: Duofold
Project Number: 101995.3323.029.DIR6

Drilling Contractor: Talon
Drilling Method: Direct Push
Sample Method: Acetate liner
Drilling Date: 11/9/2016
North: 43.020752
East: -75.034779

Surface Elevation (ft amsl): NM
Total Depth: 10'
Depth to Initial Water Level (ft bgs): 4'
Field Screening Instrument: PID
Logged by: ESR

Depth (ft. bgs)	Sample Number	Blows per 6 inches	Sample Interval (ft)	Recovery (ft)	OVM Reading (ppm)	Graphic Log	Material Description
		NA		27"	0.0		6" dark brown F SAND ↓ brown F SAND AND GRAVEL
	X		4-5'		0.0		
				32"	0.0		6" SAA 17" brown SILT AND CLAY ↓ brown F SAND AND GRAVEL
					0.0		

Remarks:

Boring Completion Depth ft bgs 10'

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Boring Name: SSB-01

Client: EPA
Project Location: Ilion, NY

Project Name: Duofold
Project Number: 101995.3323.029.DIR6

Drilling Contractor: Talon
Drilling Method: Direct Push
Sample Method: Acetate liner
Drilling Date: 11/8/2016
North: 43.019874
East: -75.036686

Surface Elevation (ft amsl): NM
Total Depth: 2'
Depth to Initial Water Level (ft bgs):
Field Screening Instrument: PID
Logged by: ESR

Depth (ft. bgs)	Sample Number	Blows per 6 inches	Sample Interval (ft)	Recovery (ft)	OVM Reading (ppm)	Graphic Log	Material Description
	X	NA	1-2'	18"	0.0		↓ dark brown F-C SAND some brick and ash

Remarks:

Boring Completion Depth ft bgs 2'

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Boring Name: SSB-02

Client: EPA
Project Location: Ilion, NY

Project Name: Duofold
Project Number: 101995.3323.029.DIR6

Drilling Contractor: Talon
Drilling Method: Direct Pushe
Sample Method: Acetate liner
Drilling Date: 11/8/2016
North: 43.020371
East: -75.036985

Surface Elevation (ft amsl): NM
Total Depth: 2'
Depth to Initial Water Level (ft bgs):
Field Screening Instrument: PID
Logged by: ESR

Depth (ft. bgs)	Sample Number	Blows per 6 inches	Sample Interval (ft)	Recovery (ft)	OVM Reading (ppm)	Graphic Log	Material Description
2'	X	NA	1-2'	20"	0.0		↓ dark brown VF-F SAND little gravel

Remarks:

Boring Completion Depth ft bgs 2'

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Boring Name: SSB-03

Client: EPA
Project Location: Ilion, NY

Project Name: Duofold
Project Number: 101995.3323.029.DIR60

Drilling Contractor: Talon
Drilling Method: Direct Push
Sample Method: Acetate liner
Drilling Date: 11/9/2016
North: 43.020387
East: -75.035249

Surface Elevation (ft amsl): NM
Total Depth: 2'
Depth to Initial Water Level (ft bgs):
Field Screening Instrument: PID
Logged by: ESR

Depth (ft. bgs)	Sample Number	Blows per 6 inches	Sample Interval (ft)	Recovery (ft)	OVM Reading (ppm)	Graphic Log	Material Description
2	X	NA	1-2	14"	0.0		↓ dark brown F SAND some ash, Gravel, and brick

Remarks:

Boring Completion Depth ft bgs ________

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Boring Name: SSB-04

Client: EPA
Project Location: Ilion, NY

Project Name: Duofold
Project Number: 101995.3323.029.DIR6

Drilling Contractor: Talon
Drilling Method: Direct Push
Sample Method: Acetate liner
Drilling Date: 11/9/2016
North: 43.019652
East: -75.033008

Surface Elevation (ft amsl): NM
Total Depth: 2'
Depth to Initial Water Level (ft bgs):
Field Screening Instrument: PID
Logged by: ESR

Depth (ft. bgs)	Sample Number	Blows per 6 inches	Sample Interval (ft)	Recovery (ft)	OVM Reading (ppm)	Graphic Log	Material Description
2	X	NA	1-2	18"	0.0		↓ brown VF-F SAND trace brick and gravel.

Remarks:

Boring Completion Depth ft bgs 2'

Appendix E

Appendix E

Groundwater Sampling Logs

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LOW FLOW GROUNDWATER SAMPLING PURGE RECORD
Former Duofold Corporation
Ilion, New York

DATE: 11/7/16

SAMPLERS: AR

WEATHER CONDITIONS: Sunny 50°F

SAMPLE ID: DF-MW-01-11-F

CLP ID: (M)BD4Q3

SAMPLE TIME: 1340

WELL #: MW-1

DEPTH OF PUMP INTAKE: 13 [✓ ft TIC] or ft BGS (circle one)

SCREENED/OPEN BOREHOLE INTERVAL: 4-14 [✓ ft TIC] or ft BGS (circle one)

SAMPLE FLOW RATE: 200 **ml/minute**

	Instrument Type/Model: Complete and/or Circle at right	YSI Model #____ / [✓ Horiba U-22] (circle one) Other (specify)____		Instrument:

CURRENT TIME	VOLUME PURGED	DEPTH TO WATER	FLOW RATE	DRAWDOWN (± 0.3 FT)	pH (± 0.1 SU)	SPECIFIC CONDUCTIVITY (± 3%)	DISSOLVED OXYGEN (± 10%)	TEMP. (± 10%)	REDOX POTENTIAL (± 10 mV)	TURBIDITY (± 10%)
24-Hour	gallons / [✓ liters] (circle	ft TIC / ft BGS (circle one)	Units: ml/min	ft TIC / ft BGS	SU	S/cm, [✓ mS/cm^c] or µS/cm (circle one)	mg/L (not %)	Units: °C	mV	NTUs
13:00	1.25	No WLM JE	250		7.06	0.871	0.34	18.15	103	0.0 NR
1305					7.00	0.869	0.00	12.87	111	—
1310					6.99	0.870	—	12.61	113	291
1315					6.98	0.870	—	12.57	115	99.8
1320					6.98	0.868	—	12.60	117	45.4
1325					6.97	0.867	—	12.64	117	41.6
13~~28~~30 AR					6.97	0.868		12.58	118	17.6
1333					6.97	0.868		12.60	117	16.5

Drawdown is not to exceed 0.3 feet. Flow rate should not exceed 500 ml/min during purging or 250 ml/min during sampling. Readings should be taken every three to five minutes. The well is considered stabilized and ready for sampling when the indicator parameters have stabilized for three consecutive readings by the measurements indicated in parenthesis.

Typical values: DO = 0.3 - 10 mg/L
Redox Potential = -100 - +600 mV
Turbidity = 0 - >500 NTUs
Spec. Conductivity (µS/cm) = 0.01 - 5,000; up to 10,000 in industrial, ~55,000 in high salt content water. Note: 1,000 µS/cm = 1 mS/cm
TIC = Top of Inner Casing
BGS = Below Ground Surface

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LOW FLOW GROUNDWATER SAMPLING PURGE RECORD
Former Duofold Corporation
Ilion, New York

DATE: 11/7/16

WELL #: MW-01

SAMPLERS: AR

DEPTH OF PUMP INTAKE: 13 [✓ ft TIC] or ft BGS (circle one)

WEATHER CONDITIONS: Sunny 50°F

SCREENED/OPEN BOREHOLE INTERVAL: 4 - 14 ft TIC or ft BGS (circle one)

SAMPLE ID: DF-MW-01-1/F

CLP ID: BD4Q3

SAMPLE TIME: 1340

SAMPLE FLOW RATE: 200 ml/minute

Instrument Type/Model: Complete and/or Circle at right — YSI Model #______ [✓ Horiba U-22] (circle one) Other (specify)______ | Instrument:

CURRENT TIME	VOLUME PURGED	DEPTH TO WATER	FLOW RATE	DRAWDOWN (± 0.3 FT)	pH (± 0.1 SU)	SPECIFIC CONDUCTIVITY (± 3%)	DISSOLVED OXYGEN (± 10%)	TEMP. (± 10%)	REDOX POTENTIAL (± 10 mV)	TURBIDITY (± 10%)
24-Hour	gallons / [✓ liters] (circle	[✓ ft TIC] / ft BGS (circle one)	Units: ml/min	[✓ ft TIC] / ft BGS	SU	S/cm, [✓ mS/cm] / or µS/cm (circle one)	mg/L (not %)	Units: °C	mV	NTUs
1336			250		6.97	0.866	—	12.62	115	17.4
1340	SAMPLE									

Drawdown is not to exceed 0.3 feet. Flow rate should not exceed 500 ml/min during purging or 250 ml/min during sampling. Readings should be taken every three to five minutes. The well is considered stabilized and ready for sampling when the indicator parameters have stabilized for three consecutive readings by the measurements indicated in parenthesis.

Typical values:
DO = 0.3 - 10 mg/L
Redox Potential = -100 - +600 mV
Turbidity = 0 - >500 NTUs
Spec. Conductivity (µS/cm) = 0.01 - 5,000; up to 10,000 in industrial, ~55,000 in high salt content water. Note: 1,000 µS/cm = 1 mS/cm
TIC = Top of Inner Casing
BGS = Below Ground Surface

LOW FLOW GROUNDWATER SAMPLING PURGE RECORD
Former Duofold Corporation
Ilion, New York

DATE: 11/7/16

WELL #: MW-02

SAMPLERS: AR

DEPTH OF PUMP INTAKE: 14 [✓ ft TIC] or ft BGS (circle one)

WEATHER CONDITIONS: Sunny 55°F

SCREENED/OPEN BOREHOLE INTERVAL: 5-15 [✓ ft TIC] or ft BGS (circle one)

SAMPLE ID: DF-MW-02.1 (-F) **SAMPLE TIME:** 1455 **SAMPLE FLOW RATE:** 200 ml/minute

CLP ID: (M)BD4Q4

		Instrument Type/Model: Complete and/or Circle at right			YSI Model #______ / [✓ Horiba U-22] (circle one) Other (specify)______					Instrument:
CURRENT TIME	VOLUME PURGED	DEPTH TO WATER	FLOW RATE	DRAWDOWN (± 0.3 FT)	pH (± 0.1 SU)	SPECIFIC CONDUCTIVITY (± 3%)	DISSOLVED OXYGEN (± 10%)	TEMP. (± 10%)	REDOX POTENTIAL (± 10 mV)	TURBIDITY (± 10%)
24-Hour	gallons / [✓ liters] (circle	ft TIC / ft BGS (circle one)	Units: ml/min	ft TIC / ft BGS	SU	S/cm, [✓ mS/cm] or µS/cm (circle one)	mg/L (not %)	Units: °C	mV	NTUs
1420	1.25	No WLM	250		6.66	0.928	0.33	15.79	-2.0	275
1425					6.63	0.916	0.01	15.80	-12.0	146
1430					6.63	0.909	0.01	15.33	1.0	70.7
1435					6.66	0.897	0.01	15.14	7.0	57.8
1440					6.69	0.881	0.01	15.27	7.0	37.1
1445					6.71	0.873	0.01	15.25	9.0	32.4
1448					6.73	0.864	0.01	15.30	9.0	30.8
1451					6.74	0.860	0.01	15.27	10.0	30.3

Drawdown is not to exceed 0.3 feet. Flow rate should not exceed 500 ml/min during purging or 250 ml/min during sampling. Readings should be taken every three to five minutes. The well is considered stabilized and ready for sampling when the indicator parameters have stabilized for three consecutive readings by the measurements indicated in parenthesis.

Typical values: DO = 0.3 - 10 mg/L Redox Potential = -100 - +600 mV Turbidity = 0 - >500 NTUs
Spec. Conductivity (µS/cm) = 0.01 - 5,000; up to 10,000 in industrial, ~55,000 in high salt content water. Note: 1,000 µS/cm = 1 mS/cm
TIC = Top of Inner Casing BGS = Below Ground Surface

LOW FLOW GROUNDWATER SAMPLING PURGE RECORD
Former Duofold Corporation
Ilion, New York

DTW: 7.05 TIC
DTB: 14.15 TIC

DATE: 11/8/16

WELL #: MW-03

SAMPLERS: AR

DEPTH OF PUMP INTAKE: 13 **[✓ ft TIC] or ft BGS (circle one)**

WEATHER CONDITIONS: sunny 35°F

SCREENED/OPEN BOREHOLE INTERVAL: 4 - 14 **[✓ ft TIC] or ft BGS (circle one)**

SAMPLE ID: DF-MW-03-1(-F) **SAMPLE TIME:** 900 **SAMPLE FLOW RATE:** 200 **ml/minute**
CLP ID: (M)3D4Q5

		Instrument Type/Model: Complete and/or Circle at right			YSI Model #______ / [✓ Horiba U-22] (circle one) Other (specify)______					Instrument:
CURRENT TIME	VOLUME PURGED	DEPTH TO WATER	FLOW RATE	DRAWDOWN (± 0.3 FT)	pH (± 0.1 SU)	SPECIFIC CONDUCTIVITY (± 3%)	DISSOLVED OXYGEN (± 10%)	TEMP. (± 10%)	REDOX POTENTIAL (± 10 mV)	TURBIDITY (± 10%)
24-Hour	gallons / [✓ liters] (circle)	[✓ ft TIC] / ft BGS (circle one)	Units: mL/min	ft TIC / ft BGS	SU	S/cm, [✓ mS/cm] / or µS/cm (circle one)	mg/L (not %)	Units: °C	mV	NTUs
8:25	1.25	7.05	250	—	6.63	1.16	0.01	10.36	-52	1000
830	↓	7.08	↓	0.03	6.74	1.15	0.01	11.01	-44	499
835	↓	7.05	↓	0	6.62	1.14	0.01	11.18	-38	411
840	↓	7.05	↓	0	6.60	1.14	0.01	11.13	-40	308
845	↓	7.05	↓	0	6.61	1.14	0.01	11.17	-42	184
850	↓	7.05	↓	0	6.61	1.14	0.01	11.08	-42	147
853	↓	7.05	↓	0	6.61	1.14	0.01	11.07	-42	153
857		7.05	↓	0	6.62	1.14	0.01	11.02	-41	152

Drawdown is not to exceed 0.3 feet. Flow rate should not exceed 500 ml/min during purging or 250 ml/min during sampling. Readings should be taken every three to five minutes. The well is considered stabilized and ready for sampling when the indicator parameters have stabilized for three consecutive readings by the measurements indicated in parenthesis.

Typical values:
DO = 0.3 - 10 mg/L
Redox Potential = -100 - +600 mV
Turbidity = 0 - >500 NTUs
Spec. Conductivity (µS/cm) = 0.01 - 5,000; up to 10,000 in industrial, ~55,000 in high salt content water. Note: 1,000 µS/cm = 1 mS/cm
TIC = Top of Inner Casing
BGS = Below Ground Surface

DTB 15.50 TIC
DTW 8.56 TIC

LOW FLOW GROUNDWATER SAMPLING PURGE RECORD
Former Duofold Corporation
Ilion, New York

DATE: 11/8/16

WELL #: MW-04

SAMPLERS: AR

DEPTH OF PUMP INTAKE: 14.5 **[✓ ft TIC] or ft BGS (circle one)**

WEATHER CONDITIONS: clear 45°F

SCREENED/OPEN BOREHOLE INTERVAL: 5-15 **[✓ ft TIC] or ft BGS (circle one)**

SAMPLE ID: DF-MW-04-1(-F)

CLP ID: (M)BD4Q6

SAMPLE TIME: 1035

SAMPLE FLOW RATE: 200 **ml/minute**

		Instrument Type/Model: Complete and/or Circle at right			YSI Model #______ / [✓ Horiba U-22] Other (specify)______		(circle one)			Instrument:
CURRENT TIME	VOLUME PURGED	DEPTH TO WATER	FLOW RATE	DRAWDOWN (± 0.3 FT)	pH (± 0.1 SU)	SPECIFIC CONDUCTIVITY (± 3%)	DISSOLVED OXYGEN (± 10%)	TEMP. (± 10%)	REDOX POTENTIAL (± 10 mV)	TURBIDITY (± 10%)
24-Hour	gallons / [✓ liters] (circle	[✓ ft TIC] / ft BGS (circle one)	Units: mL/min	[✓ ft TIC] / ft BGS	SU	S/cm, [✓ mS/cm] or µS/cm (circle one)	mg/L (not %)	Units: °C	mV	NTUs
1005	1.25	8.60	250	—	7.07	0.880	2.29	11.69	109	734
1010	↓	8.60	↓	0	7.10	0.837	0.01	12.10	107	231
1015		8.61		0.01	7.09	0.838	0.01	12.18	110	92.2
1020		8.61		0	7.08	0.850	0.01	12.23	114	46.8
1025		8.61		0	7.07	0.860	0.01	12.28	116	24.1
1028		8.61		0	7.07	0.862	0.01	12.30	118	22.3
1031		8.61		0	7.07	0.868	0.01	12.28	118	20.9
1035	SAMPLE									

Drawdown is not to exceed 0.3 feet. Flow rate should not exceed 500 ml/min during purging or 250 ml/min during sampling. Readings should be taken every three to five minutes. The well is considered stabilized and ready for sampling when the indicator parameters have stabilized for three consecutive readings by the measurements indicated in parenthesis.

Typical values: DO = 0.3 - 10 mg/L Redox Potential = -100 - +600 mV Turbidity = 0 - >500 NTUs
Spec. Conductivity (µS/cm) = 0.01 - 5,000; up to 10,000 in industrial, ~55,000 in high salt content water. Note: 1,000 µS/cm = 1 mS/cm
TIC = Top of Inner Casing BGS = Below Ground Surface

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DTW 7.38 TIC
DTB 14.95 TIC

LOW FLOW GROUNDWATER SAMPLING PURGE RECORD
Former Duofold Corporation
Ilion, New York

DATE: 11/8/16

WELL #: MW-05

SAMPLERS: PR

DEPTH OF PUMP INTAKE: 14 ft [✓ TIC] or ft BGS (circle one)

WEATHER CONDITIONS: Sunny 50°F

SCREENED/OPEN BOREHOLE INTERVAL: 5-15 [✓ ft TIC] or ft BGS (circle one)

SAMPLE ID: DF MW-05-1(-F)

CLP ID(M) BD4Q7

SAMPLE TIME: 1155

SAMPLE FLOW RATE: 200 ml/minute

		Instrument Type/Model: Complete and/or Circle at right			YSI Model # ______ / [✓ Horiba U-22] (circle one) Other (specify)______					Instrument:
CURRENT TIME	VOLUME PURGED	DEPTH TO WATER	FLOW RATE	DRAWDOWN (± 0.3 FT)	pH (± 0.1 SU)	SPECIFIC CONDUCTIVITY (± 3%)	DISSOLVED OXYGEN (± 10%)	TEMP. (± 10%)	REDOX POTENTIAL (± 10 mV)	TURBIDITY (± 10%)
24-Hour	gallons / [✓ liters] (circle)	[✓ ft TIC] / ft BGS (circle one)	Units: mL/min	[✓ ft TIC] / ft BGS	SU	S/cm, [✓ mS/cm^c] / or µS/cm (circle one)	mg/L (not %)	Units: °C	mV	NTUs
1115	1.25	7.62	250	—	6.81	0.751	2.99	12.73	150	743
1120		7.68	250	+0.06	6.80	0.741	1.65	13.54	149	244
1125		7.68		0	6.79	0.738	1.48	13.82	148	122
1130		7.68		0	6.79	0.730	1.36	13.93	149	77.6
1135		7.68		0	6.79	0.727	1.21	14.03	151	55.1
1140		7.70		+0.02	6.79	0.729	1.08	14.14	151	42.1
1145	↓	7.70		0	6.78	0.731	0.90	14.41	152	28.0
1148		7.70	↓	0	6.78	0.730	0.86	14.51	152	26.3

Drawdown is not to exceed 0.3 feet. Flow rate should not exceed 500 ml/min during purging or 250 ml/min during sampling. Readings should be taken every three to five minutes. The well is considered stabilized and ready for sampling when the indicator parameters have stabilized for three consecutive readings by the measurements indicated in parenthesis.

Typical values: DO = 0.3 - 10 mg/L Redox Potential = -100 - +600 mV Turbidity = 0 - >500 NTUs
Spec. Conductivity (µS/cm) = 0.01 - 5,000; up to 10,000 in industrial, ~55,000 in high salt content water. Note: 1,000 µS/cm = 1 mS/cm
TIC = Top of Inner Casing BGS = Below Ground Surface

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LOW FLOW GROUNDWATER SAMPLING PURGE RECORD
Former Duofold Corporation
Ilion, New York

DATE: 11/8/16

WELL #: MW-05

SAMPLERS: AR

DEPTH OF PUMP INTAKE: 14 [✓ ft TIC] or ft BGS (circle one)

WEATHER CONDITIONS: Sunny 50°F

SCREENED/OPEN BOREHOLE INTERVAL: 5-15 [✓ ft TIC] or ft BGS (circle one)

SAMPLE ID: DF-MW-05-1(-F)

CLP ID: (M)BD4Q7

SAMPLE TIME: 1155

SAMPLE FLOW RATE: 200 ml/minute

		Instrument Type/Model: Complete and/or Circle at right			YSI Model # ______ [✓ Horiba U-22] (circle one) Other (specify)______					Instrument:
CURRENT TIME	VOLUME PURGED	DEPTH TO WATER	FLOW RATE	DRAWDOWN (± 0.3 FT)	pH (± 0.1 SU)	SPECIFIC CONDUCTIVITY (± 3%)	DISSOLVED OXYGEN (± 10%)	TEMP. (± 10%)	REDOX POTENTIAL (± 10 mV)	TURBIDITY (± 10%)
24-Hour	gallons / [✓ liters] (circle	[✓ ft TIC] / ft BGS (circle one)	Units: ml/min	[✓ ft TIC] / ft BGS	SU	S/cm, [✓ mS/cm] / or µS/cm (circle one)	mg/L (not %)	Units: °C	mV	NTUs
1151	0.75	7.70	250		6.78	0.730	0.85	14.58	152	24.6
1154	/	7.70			6.78	0.730	0.82	14.60	152	24.9
1155	Collect	DF-MW-05-1								
	1200	Collect	GW-900-1, CLP # BDGN6							

Drawdown is not to exceed 0.3 feet. Flow rate should not exceed 500 ml/min during purging or 250 ml/min during sampling. Readings should be taken every three to five minutes. The well is considered stabilized and ready for sampling when the indicator parameters have stabilized for three consecutive readings by the measurements indicated in parenthesis.

Typical values: DO = 0.3 - 10 mg/L Redox Potential = -100 - +600 mV Turbidity = 0 - >500 NTUs
Spec. Conductivity (µS/cm) = 0.01 - 5,000; up to 10,000 in industrial, ~55,000 in high salt content water. Note: 1,000 µS/cm = 1 mS/cm
TIC = Top of Inner Casing BGS = Below Ground Surface

DTW 7.45 TIC
DTB 12.35 TIC

LOW FLOW GROUNDWATER SAMPLING PURGE RECORD
Former Duofold Corporation
Ilion, New York

DATE: 11/8/16

WELL #: MW-06

SAMPLERS: AR

DEPTH OF PUMP INTAKE: 11 [✓ ft TIC] or ft BGS (circle one)

WEATHER CONDITIONS: Sunny 65°F

SCREENED/OPEN BOREHOLE INTERVAL: 2 - 12 ft TIC or ft BGS (circle one)

SAMPLE ID: DF-MW-06-1(EF)
CLP ID: (M)BD4Q8

SAMPLE TIME: 1340 **SAMPLE FLOW RATE:** 200 ml/minute

		Instrument Type/Model: Complete and/or Circle at right			YSI Model #______/[✓ Horiba U-22] (circle one) Other (specify)______					Instrument:
CURRENT TIME	VOLUME PURGED	DEPTH TO WATER	FLOW RATE	DRAWDOWN (± 0.3 FT)	pH (± 0.1 SU)	SPECIFIC CONDUCTIVITY (± 3%)	DISSOLVED OXYGEN (± 10%)	TEMP. (± 10%)	REDOX POTENTIAL (± 10 mV)	TURBIDITY (± 10%)
24-Hour	gallons / [✓ liters] (circle	[✓ ft TIC] / ft BGS (circle one)	Units: mL/min	[✓ ft TIC] / ft BGS	SU	S/cm, [✓ mS/cm] / or µS/cm (circle one)	mg/L (not %)	Units: °C	mV	NTUs
1305	1.25	7.45	250	—	7.12	0.905	3.38	16.52	149	168
1310	↓	7.48	↓	0.03	7.11	0.908	2.07	16.32	147	149
1315		7.48		0	7.11	0.909	1.63	16.13	147	112
1320		7.48		0	7.11	0.912	1.47	15.95	148	105
1325		7.48		0	7.11	0.910	1.34	15.93	148	77.6
1330		7.48		0	7.11	0.909	1.31	15.89	149	59.7
1333		7.48		0	7.11	0.911	1.35	15.88	149	54.4
1336		7.48		0	7.11	0.914	1.28	15.92	147	50.2

Drawdown is not to exceed 0.3 feet. Flow rate should not exceed 500 ml/min during purging or 250 ml/min during sampling. Readings should be taken every three to five minutes. The well is considered stabilized and ready for sampling when the indicator parameters have stabilized for three consecutive readings by the measurements indicated in parenthesis.

Typical values: DO = 0.3 - 10 mg/L Redox Potential = -100 - +600 mV Turbidity = 0 - >500 NTUs
Spec. Conductivity (µS/cm) = 0.01 - 5,000; up to 10,000 in industrial, ~55,000 in high salt content water. Note: 1,000 µS/cm = 1 mS/cm
TIC = Top of Inner Casing BGS = Below Ground Surface

LOW FLOW GROUNDWATER SAMPLING PURGE RECORD
Former Duofold Corporation
Ilion, New York

DTW 7.48
DTB 13.6

DATE: 11/9/16

WELL #: MW-07

SAMPLERS: AR

DEPTH OF PUMP INTAKE: 12 [✓ **ft TIC**] **or ft BGS (circle one)**

WEATHER CONDITIONS: Cloudy 50F

SCREENED/OPEN BOREHOLE INTERVAL: 3-13 [✓ **ft TIC**] **or ft BGS (circle one)**

SAMPLE ID: DF-MW-07-1(-F)
CLP ID(m)BD4Q9

SAMPLE TIME: 1215

SAMPLE FLOW RATE: 200 **ml/minute**

		Instrument Type/Model: Complete and/or Circle at right			YSI Model #____________ / [✓ Horiba U-22] (circle one) Other (specify)____________					Instrument:
CURRENT TIME	VOLUME PURGED	DEPTH TO WATER	FLOW RATE	DRAWDOWN (± 0.3 FT)	pH (± 0.1 SU)	SPECIFIC CONDUCTIVITY (± 3%)	DISSOLVED OXYGEN (± 10%)	TEMP. (± 10%)	REDOX POTENTIAL (± 10 mV)	TURBIDITY (± 10%)
24-Hour	gallons / liters (circle	[✓ ft TIC] / ft BGS (circle one)	Units: mL/min	ft TIC / ft BGS	SU	S/cm, [✓ mS/cm^c] / or µS/cm (circle one)	mg/L (not %)	Units: °C	mV	NTUs
1148		7.48	250		7.14	0.954	3.43	12.59	241	196
1153		7.48			7.08	0.959	1.54	12.86	246	106
1158		7.48			7.08	0.956	1.31	12.93	250	48.1
1203		7.48			7.08	0.953	1.37	12.92	251	36.5
1206		7.48			7.07	0.951	1.29	12.92	253	31.4
1209		7.48			7.08	0.952	1.26	12.92	253	31.7
1212		7.48			7.08	0.958	1.26	12.90	254	31.4
1215	—	—	SAMPLE —							

Drawdown is not to exceed 0.3 feet. Flow rate should not exceed 500 ml/min during purging or 250 ml/min during sampling. Readings should be taken every three to five minutes. The well is considered stabilized and ready for sampling when the indicator parameters have stabilized for three consecutive readings by the measurements indicated in parenthesis.

Typical values: DO = 0.3 - 10 mg/L Redox Potential = -100 - +600 mV Turbidity = 0 - >500 NTUs
Spec. Conductivity (µS/cm) = 0.01 - 5,000; up to 10,000 in industrial, ~55,000 in high salt content water. Note: 1,000 µS/cm = 1 mS/cm
TIC = Top of Inner Casing BGS = Below Ground Surface

DTW 6.67
DTB 13.2

LOW FLOW GROUNDWATER SAMPLING PURGE RECORD
Former Duofold Corporation
Ilion, New York

DATE: 11/10/16

WELL #: MW-08

SAMPLERS: AR

DEPTH OF PUMP INTAKE: 12 [✓ ft TIC] or ft BGS (circle one)

WEATHER CONDITIONS: clear, 34°F

SCREENED/OPEN BOREHOLE INTERVAL: 3-13 [✓ ft TIC] or ft BGS (circle one)

SAMPLE ID: DF-MW-08-1(-F)
CLP ID: (M) BD4R0

SAMPLE TIME: 845 **SAMPLE FLOW RATE:** 200 ml/minute

		Instrument Type/Model: Complete and/or Circle at right			YSI Model #________ / [✓ Horiba U-22] (circle one) Other (specify)________					Instrument:
CURRENT TIME	VOLUME PURGED	DEPTH TO WATER	FLOW RATE	DRAWDOWN (± 0.3 FT)	pH (± 0.1 SU)	SPECIFIC CONDUCTIVITY (± 3%)	DISSOLVED OXYGEN (± 10%)	TEMP. (± 10%)	REDOX POTENTIAL (± 10 mV)	TURBIDITY (± 10%)
24-Hour	gallons / [✓ liters] (circle	[✓ ft TIC] / ft BGS (circle one)	Units: ml/min	[✓ ft TIC] / ft BGS	SU	S/cm, [✓ mS/cm] or µS/cm (circle one)	mg/L (not %)	Units: °C	mV	NTUs
805	1.25	6.70	250	—	7.37	0.820	0.01	10.81	-9.0	392
810	↓	6.70	↓	0	7.36	0.817	0.01	10.88	-55.0	228
815		6.70		0	7.37	0.782	0.01	10.86	-83.0	124
820		6.70		0	7.38	0.764	0.01	10.87	-90.0	74.2
825		6.70		0	7.38	0.753	0.01	10.98	-92.0	40.0
830		6.70		0	7.38	0.750	0.01	10.99	-92.0	26.1
835		6.70		0	7.38	0.750	0.01	10.97	-92.0	19.9
840		6.70		0	7.38	0.749	0.01	10.98	-91.0	21.8

Drawdown is not to exceed 0.3 feet. Flow rate should not exceed 500 ml/min during purging or 250 ml/min during sampling. Readings should be taken every three to five minutes. The well is considered stabilized and ready for sampling when the indicator parameters have stabilized for three consecutive readings by the measurements indicated in parenthesis.

Typical values: DO = 0.3 - 10 mg/L Redox Potential = -100 - +600 mV Turbidity = 0 - >500 NTUs
Spec. Conductivity (µS/cm) = 0.01 - 5,000; up to 10,000 in industrial, ~55,000 in high salt content water. Note: 1,000 µS/cm = 1 mS/cm
TIC = Top of Inner Casing BGS = Below Ground Surface

DTW 8.64 TIC
DTB 15.5 TIC

LOW FLOW GROUNDWATER SAMPLING PURGE RECORD
Former Duofold Corporation
Ilion, New York

DATE: 11/10/16 **WELL #:** MW-09

SAMPLERS: AK **DEPTH OF PUMP INTAKE:** 14.5 [✓ ft TIC] or ft BGS (circle one)

WEATHER CONDITIONS: overcast 42°F **SCREENED/OPEN BOREHOLE INTERVAL:** 5 - 15 [✓ ft TIC] or ft BGS (circle one)

SAMPLE ID: DF-MW-09-1(-F) **SAMPLE TIME:** 1010 **SAMPLE FLOW RATE:** 200 **ml/minute**
CLP ID: (M)BD4R1

		Instrument Type/Model: Complete and/or Circle at right			YSI Model #_____ / [✓ Horiba U-22] (circle one) Other (specify)_____					Instrument:
CURRENT TIME	VOLUME PURGED	DEPTH TO WATER	FLOW RATE	DRAWDOWN (± 0.3 FT)	pH (± 0.1 SU)	SPECIFIC CONDUCTIVITY (± 3%)	DISSOLVED OXYGEN (± 10%)	TEMP. (± 10%)	REDOX POTENTIAL (± 10 mV)	TURBIDITY (± 10%)
24-Hour	gallons / [✓ liters] (circle	[✓ ft TIC] / ft BGS (circle one)	Units: mL/min	ft TIC / ft BGS	SU	S/cm, [✓ mS/cm] or µS/cm (circle one)	mg/L (not %)	Units: °C	mV	NTUs
946	1.25	8.65	250		6.62	1.13	0.13	10.17	163	60.7
951	↓	8.65			6.58	1.12	0.01	10.99	161	14.7
954	0.75	8.65			6.58	1.12	0.01	11.15	165	7.4
957		8.65			6.57	1.13	0.01	11.20	168	4.2
1000		8.65			6.58	1.13	0.01	11.21	171	1.0
1003		8.65			6.58	1.13	0.01	11.20	172	0.1
1006	↓	8.65	↓		6.58	1.13	0.01	11.19	173	0.1

Drawdown is not to exceed 0.3 feet. Flow rate should not exceed 500 ml/min during purging or 250 ml/min during sampling. Readings should be taken every three to five minutes. The well is considered stabilized and ready for sampling when the indicator parameters have stabilized for three consecutive readings by the measurements indicated in parenthesis.

Typical values: DO = 0.3 - 10 mg/L Redox Potential = -100 - +600 mV Turbidity = 0 - >500 NTUs
Spec. Conductivity (µS/cm) = 0.01 - 5,000; up to 10,000 in industrial, ~55,000 in high salt content water. Note: 1,000 µS/cm = 1 mS/cm
TIC = Top of Inner Casing BGS = Below Ground Surface

LOW FLOW GROUNDWATER SAMPLING PURGE RECORD
Former Duofold Corporation
Ilion, New York

DATE: 11/9/16

SAMPLERS: AR

WEATHER CONDITIONS: rainy 45 °F

SAMPLE ID: DF-MW-10-1(-F)

CLP ID: (M)BD4R2

SAMPLE TIME: 1340

WELL #: MW-10

DEPTH OF PUMP INTAKE: 14 [✓ ft TIC] or ft BGS (circle one)

SCREENED/OPEN BOREHOLE INTERVAL: 5-15 [✓ ft TIC] or ft BGS (circle one)

SAMPLE FLOW RATE: 200 ml/minute

Instrument Type/Model: Complete and/or Circle at right	YSI Model #___ [✓ / Horiba U-22] Other (specify)___	(circle one)	Instrument:

CURRENT TIME	VOLUME PURGED	DEPTH TO WATER	FLOW RATE	DRAWDOWN (± 0.3 FT)	pH (± 0.1 SU)	SPECIFIC CONDUCTIVITY (± 3%)	DISSOLVED OXYGEN (± 10%)	TEMP. (± 10%)	REDOX POTENTIAL (± 10 mV)	TURBIDITY (± 10%)
24-Hour	gallons / [✓ liters] (circle	[✓ ft TIC] / ft BGS (circle one)	Units: ml/min	[✓ ft TIC] / ft BGS	SU	S/cm, [✓ mS/cm] or µS/cm (circle one)	mg/L (not %)	Units: °C	mV	NTUs
1310	1.25	7.4	250	0	7.18	0.826	0.01	11.96	238	365
1315		7.4		0	7.14	0.817	0.01	12.44	230	172
1320		7.4		0	7.13	0.818	0.01	12.60	216	51.2
1325		7.4		0	7.13	0.818	0.01	12.64	206	16.0
1330		7.4		0	7.13	0.817	0.01	12.68	192	5.7
1333	0.75	7.4		0	7.12	0.817	0.01	12.69	186	2.2
1336		7.4		0	7.12	0.818	0.01	12.68	184	2.5
1340				SAMPLE						

Drawdown is not to exceed 0.3 feet. Flow rate should not exceed 500 ml/min during purging or 250 ml/min during sampling. Readings should be taken every three to five minutes. The well is considered stabilized and ready for sampling when the indicator parameters have stabilized for three consecutive readings by the measurements indicated in parenthesis.

Typical values: DO = 0.3 - 10 mg/L
Redox Potential = -100 - +600 mV
Turbidity = 0 - >500 NTUs
Spec. Conductivity (µS/cm) = 0.01 - 5,000; up to 10,000 in industrial, ~55,000 in high salt content water. Note: 1,000 µS/cm = 1 mS/cm
TIC = Top of Inner Casing
BGS = Below Ground Surface

DTW 8.1' TIC
DTB 13.8' TIC

LOW FLOW GROUNDWATER SAMPLING PURGE RECORD
Former Duofold Corporation
Ilion, New York

DATE: 11/9/16

WELL #: MW-11

SAMPLERS: AR

DEPTH OF PUMP INTAKE: 12.8 **[✓ ft TIC] or ft BGS (circle one)**

WEATHER CONDITIONS: rainy 47°F

SCREENED/OPEN BOREHOLE INTERVAL: 4-14 **[✓ ft TIC] or ft BGS (circle one)**

SAMPLE ID: DF-MW-11-1(-F) **SAMPLE TIME:** 900 **SAMPLE FLOW RATE:** 200 **ml/minute**
CLP ID: (M)BD4 R3

		Instrument Type/Model: Complete and/or Circle at right			YSI Model #______________ / [✓ Horiba U-22] Other (specify)________________			(circle one)		Instrument:
CURRENT TIME	VOLUME PURGED	DEPTH TO WATER	FLOW RATE	DRAWDOWN (± 0.3 FT)	pH (± 0.1 SU)	SPECIFIC CONDUCTIVITY (± 3%)	DISSOLVED OXYGEN (± 10%)	TEMP. (± 10%)	REDOX POTENTIAL (± 10 mV)	TURBIDITY (± 10%)
24-Hour	gallons / [✓ liters] (circle	[✓ ft TIC] / ft BGS (circle one)	Units:	[✓ ft TIC] / ft BGS	SU	S/cm, [✓ mS/cm] / or µS/cm (circle one)	mg/L (not %)	Units: °C	mV	NTUs
830	1.25	8.1	250	0	7.03	0.983	0.77	13.56	259	112
835		8.1		0	7.11	0.978	0.01	13.71	255	84.7
840		8.1		0	7.13	0.977	0.01	13.72	255	44.3
845		8.1		0	7.13	0.972	0.01	13.77	255	33.5
850	↓	8.1		0	7.15	0.971	0.01	13.77	256	22.1
853	0.75	8.1		0	7.15	0.971	0.01	13.78	255	22.4
856	↓	8.1	↓	0	7.14	0.971	0.01	13.76	255	21.8

Drawdown is not to exceed 0.3 feet. Flow rate should not exceed 500 ml/min during purging or 250 ml/min during sampling. Readings should be taken every three to five minutes. The well is considered stabilized and ready for sampling when the indicator parameters have stabilized for three consecutive readings by the measurements indicated in parenthesis.

Typical values: DO = 0.3 - 10 mg/L Redox Potential = -100 - +600 mV Turbidity = 0 - >500 NTUs
Spec. Conductivity (µS/cm) = 0.01 - 5,000; up to 10,000 in industrial, ~55,000 in high salt content water. Note: 1,000 µS/cm = 1 mS/cm
TIC = Top of Inner Casing BGS = Below Ground Surface

LOW FLOW GROUNDWATER SAMPLING PURGE RECORD
Former Duofold Corporation
Ilion, New York

DTW 8.25' TIC
DTB 12.92' TIC

DATE: 11/9/16

WELL #: MW-12

SAMPLERS: ATR

DEPTH OF PUMP INTAKE: 12 ft [✓ TIC] or ft BGS (circle one)

WEATHER CONDITIONS: Cloudy 46°F, light rain

SCREENED/OPEN BOREHOLE INTERVAL: 3 - 13 [✓ ft TIC] or ft BGS (circle one)

SAMPLE ID: DF-MW-12-1

CLP ID: BD4R4

SAMPLE TIME: 1045

SAMPLE FLOW RATE: 200 ml/minute

		Instrument Type/Model: Complete and/or Circle at right			YSI Model #________ / Horiba U-22 (circle one) Other (specify)________					Instrument:
CURRENT TIME	VOLUME PURGED	DEPTH TO WATER	FLOW RATE	DRAWDOWN (± 0.3 FT)	pH (± 0.1 SU)	SPECIFIC CONDUCTIVITY (± 3%)	DISSOLVED OXYGEN (± 10%)	TEMP. (± 10%)	REDOX POTENTIAL (± 10 mV)	TURBIDITY (± 10%)
24-Hour	gallons / [✓ liters] (circle	ft TIC / ft BGS (circle one)	Units: ml/min	[✓ ft TIC] / ft BGS	SU	S/cm, [✓ mS/cm] / or µS/cm (circle one)	mg/L (not %)	Units: °C	mV	NTUs
1005	1.25	8.27	250	—	7.45	0.893	4.50	12.65	233	— NR
1012		8.25		0.02	7.31	0.872	1.78	13.84	241	352
1017		8.25		0	7.30	0.874	1.12	13.90	244	243
1022		8.25		0	7.30	0.874	0.68	13.76	246	168
1027		8.25		0	7.30	0.874	1.24	13.70	247	84.6
1032		8.25		0	7.30	0.873	0.57	13.67	248	36.7
1037		8.25		0	7.28	0.873	0.66	13.67	247	10.3
1042	↓	8.25	↓	0	7.27	0.874	0.67	13.63	248	10.4

Drawdown is not to exceed 0.3 feet. Flow rate should not exceed 500 ml/min during purging or 250 ml/min during sampling. Readings should be taken every three to five minutes. The well is considered stabilized and ready for sampling when the indicator parameters have stabilized for three consecutive readings by the measurements indicated in parenthesis.

Typical values:
DO = 0.3 - 10 mg/L
Redox Potential = -100 - +600 mV
Turbidity = 0 - >500 NTUs
Spec. Conductivity (µS/cm) = 0.01 - 5,000; up to 10,000 in industrial, ~55,000 in high salt content water. Note: 1,000 µS/cm = 1 mS/cm
TIC = Top of Inner Casing
BGS = Below Ground Surface

DTW 6.88
Riser AGS: 2.27

LOW FLOW GROUNDWATER SAMPLING PURGE RECORD
Former Duofold Corporation
Ilion, New York

DATE: 8/10/16

WELL #: TWP-2

SAMPLERS: ER

DEPTH OF PUMP INTAKE: 10' [✓ ft TIC] or ft BGS (circle one)

WEATHER CONDITIONS: Clear ~ 30

SCREENED/OPEN BOREHOLE INTERVAL: 3 - 13 [✓ ft TIC] or ft BGS (circle one)

SAMPLE ID: DF-TWP-02-1(-F)

SAMPLE TIME: 840

SAMPLE FLOW RATE: ~~250~~ 200 ml/minute

CLP ID: BP4R5

		Instrument Type/Model: Complete and/or Circle at right			YSI Model #____ [✓ Horiba U-22] (circle one) Other (specify)____					Instrument:
CURRENT TIME	VOLUME PURGED	DEPTH TO WATER	FLOW RATE	DRAWDOWN (± 0.3 FT)	pH (± 0.1 SU)	SPECIFIC CONDUCTIVITY (± 3%)	DISSOLVED OXYGEN (± 10%)	TEMP. (± 10%)	REDOX POTENTIAL (± 10 mV)	TURBIDITY (± 10%)
24-Hour	gallons / [✓ liters] (circle	ft TIC / ft BGS (circle one)	Units: L/Min	[✓ ft TIC] / ft BGS	SU	S/cm, [✓ mS/cm] or µS/cm (circle one)	mg/L (not %)	Units: °C	mV	NTUs
800	2.5	6.98	.500	0.10	7.07	0.725	0.01	6.42	-39	47.8
805	5	7.04	.500	0.16	6.91	0.713	0.01	7.15	-42	36.2
810	7.5	7.10	.500	0.22	6.90	0.704	0.01	7.23	-45	27.9
815	10	7.14	.500	~~[illegible]~~ 0.26	6.78	0.697	0.01	7.57	-47	22.3
820	12.5	7.15	.500	0.27	6.76	0.695	0.01	7.94	-50	18.2
825	15	7.16	.500	0.28	6.76	0.693	0.01	8.14	-53	14.6
830	17.5	7.17	.500	0.29	6.74	0.689	0.01	8.29	-55	12.9
835	20	7.17	.500	0.29	6.74	0.686	0.01	8.61	-59	11.7

Drawdown is not to exceed 0.3 feet. Flow rate should not exceed 500 ml/min during purging or 250 ml/min during sampling. Readings should be taken every three to five minutes. The well is considered stabilized and ready for sampling when the indicator parameters have stabilized for three consecutive readings by the measurements indicated in parenthesis.

Typical values: DO = 0.3 - 10 mg/L Redox Potential = -100 - +600 mV Turbidity = 0 - >500 NTUs
Spec. Conductivity (µS/cm) = 0.01 - 5,000; up to 10,000 in industrial, ~55,000 in high salt content water. Note: 1,000 µS/cm = 1 mS/cm
TIC = Top of Inner Casing BGS = Below Ground Surface

1 of 2

DUP SAMPLE id: GW-900-2

DTW: 8.35
Riser AGS: 0.95

LOW FLOW GROUNDWATER SAMPLING PURGE RECORD
Former Duofold Corporation
Ilion, New York

CLP# BDQN7
Sample time 1010

DATE: 11/10/16

WELL #: TWP-03

SAMPLERS: ER

DEPTH OF PUMP INTAKE: 12 [✓ ft TIC] or ft BGS (circle one)

WEATHER CONDITIONS: clear ~32°

SCREENED/OPEN BOREHOLE INTERVAL: 3 - 13 [✓ ft TIC] or ft BGS (circle one)

SAMPLE ID: DF-TWP-03-1 (-F)
CLP ID: BD4R6

SAMPLE TIME: 1005 SAMPLE FLOW RATE: ~~300~~ 200 ER ml/minute

		Instrument Type/Model: Complete and/or Circle at right			YSI Model #_____ / [✓ Horiba U-22] (circle one) Other (specify)_____					Instrument:
CURRENT TIME	VOLUME PURGED	DEPTH TO WATER	FLOW RATE	DRAWDOWN (± 0.3 FT)	pH (± 0.1 SU)	SPECIFIC CONDUCTIVITY (± 3%)	DISSOLVED OXYGEN (± 10%)	TEMP. (± 10%)	REDOX POTENTIAL (± 10 mV)	TURBIDITY (± 10%)
24-Hour	gallons / [✓ liters] (circle	ft TIC / ft BGS (circle one)	Units: L/Min	ft TIC / ft BGS	SU	S/cm, [✓ mS/cm] or µS/cm (circle one)	mg/L (not %)	Units: °C	mV	NTUs
910	2.5	8.36	.500	0.01	7.07	0.710	0.01	10.34	-36	638
915	5	8.36	.500	0.01	7.09	0.703	0.01	10.57	-38	478
920	7.5	8.37	.500	0.02	7.11	0.699	0.01	10.86	-39	176
925	10	8.37	.500	0.02	7.13	0.695	0.01	10.90	-38	130
930	12.5	8.37	.500	0.02	7.14	0.694	0.01	10.95	-37	97.6
935	15	8.37	.500	0.02	7.14	0.694	0.01	11.00	-37	89.7
940	17.5	8.37	.500	0.02	7.14	0.693	0.01	11.11	-36	73.2
945	20	8.37	.500	0.02	7.15	0.691	0.01	11.29	-36	59.8

Drawdown is not to exceed 0.3 feet. Flow rate should not exceed 500 ml/min during purging or 250 ml/min during sampling. Readings should be taken every three to five minutes. The well is considered stabilized and ready for sampling when the indicator parameters have stabilized for three consecutive readings by the measurements indicated in parenthesis.

Typical values: DO = 0.3 - 10 mg/L
Redox Potential = -100 - +600 mV
Turbidity = 0 - >500 NTUs
Spec. Conductivity (µS/cm) = 0.01 - 5,000; up to 10,000 in industrial, ~55,000 in high salt content water. Note: 1,000 µS/cm = 1 mS/cm
TIC = Top of Inner Casing
BGS = Below Ground Surface

2 of 2

LOW FLOW GROUNDWATER SAMPLING PURGE RECORD

Former Duofold Corporation
Ilion, New York

DATE: 11/10/16

WELL #: TWP-03

SAMPLERS: ER

DEPTH OF PUMP INTAKE: 12 [✓ ft TIC] or ft BGS (circle one)

WEATHER CONDITIONS: Clear ≈ 35°

SCREENED/OPEN BOREHOLE INTERVAL: 3 - 13 [✓ ft TIC] or ft BGS (circle one)

SAMPLE ID: DF-TWP-03-1(-F) SAMPLE TIME: 1005 SAMPLE FLOW RATE: ~~[illegible]~~ 200 ER ml/minute

CLP ID: BD4R6

		Instrument Type/Model: Complete and/or Circle at right			YSI Model #______ / [✓ Horiba U-22] Other (specify)______			(circle one)		Instrument:
CURRENT TIME	VOLUME PURGED	DEPTH TO WATER	FLOW RATE	DRAWDOWN (± 0.3 FT)	pH (± 0.1 SU)	SPECIFIC CONDUCTIVITY (± 3%)	DISSOLVED OXYGEN (± 10%)	TEMP. (± 10%)	REDOX POTENTIAL (± 10 mV)	TURBIDITY (± 10%)
24-Hour	gallons / [✓ liters] (circle	[✓ ft TIC] / ft BGS (circle one)	Units: L/min	[✓ ft TIC] / ft BGS	SU	S/cm, [✓ mS/cm] or µS/cm (circle one)	mg/L (not %)	Units: °C	mV	NTUs
950	22.5	8.37	.500	0.02	7.15	0.690	0.01	11.31	-36	48.7
955	25	8.37	.500	0.02	7.16	0.689	0.01	11.32	-35	45.6
1000	27.5	8.37	.500	0.02	7.15	0.686	0.01	11.37	-33	42.3

Drawdown is not to exceed 0.3 feet. Flow rate should not exceed 500 ml/min during purging or 250 ml/min during sampling. Readings should be taken every three to five minutes. The well is considered stabilized and ready for sampling when the indicator parameters have stabilized for three consecutive readings by the measurements indicated in parenthesis.

Typical values: DO = 0.3 - 10 mg/L Redox Potential = -100 - +600 mV Turbidity = 0 - >500 NTUs
Spec. Conductivity (µS/cm) = 0.01 - 5,000; up to 10,000 in industrial, ~55,000 in high salt content water. Note: 1,000 µS/cm = 1 mS/cm
TIC = Top of Inner Casing BGS = Below Ground Surface

DTW 9.82
Riser AGS: 0.20

LOW FLOW GROUNDWATER SAMPLING PURGE RECORD
Former Duofold Corporation
Ilion, New York

DATE: 11/10/16

SAMPLERS: ER

WEATHER CONDITIONS: Clear ≈40

SAMPLE ID: DF-TWP-07-1 (-F)

CLP ID: BD4R7

WELL #: TWP-7

DEPTH OF PUMP INTAKE: 11 [✓ ft TIC] or ft BGS (circle one)

SCREENED/OPEN BOREHOLE INTERVAL: 5-15 [✓ ft TIC] or ft BGS (circle one)

SAMPLE TIME: 1125 SAMPLE FLOW RATE: 200 ml/minute

		Instrument Type/Model: Complete and/or Circle at right			YSI Model #______ [✓ Horiba U-22] (circle one) Other (specify)______					Instrument:
CURRENT TIME	VOLUME PURGED	DEPTH TO WATER	FLOW RATE	DRAWDOWN (± 0.3 FT)	pH (± 0.1 SU)	SPECIFIC CONDUCTIVITY (± 3%)	DISSOLVED OXYGEN (± 10%)	TEMP. (± 10%)	REDOX POTENTIAL (± 10 mV)	TURBIDITY (± 10%)
24-Hour	gallons / [✓ liters] (circle	[✓ ft TIC] / ft BGS (circle one)	Units: L/M	[✓ ft TIC] / ft BGS	SU	S/cm, [✓ mS/cm] or µS/cm (circle one)	mg/L (not %)	Units: °C	mV	NTUs
1045	2.5	9.82	.500	0.00	7.15	0.779	7.53	11.53	89	331
1050	5	9.82	.500	0.00	7.02	0.769	2.74	11.86	101	236
1055	7.5	9.82	.500	0.00	7.00	0.767	2.66	11.98	106	120
1100	10	9.82	.500	0.00	6.99	0.767	2.68	12.03	109	82.0
1105	12.5	9.82	.500	0.00	6.99	0.765	2.56	12.05	113	29.4
1110	15	9.82	.500	0.00	6.89	0.767	2.50	12.08	116	15.2
1115	17.5	9.82	.500	0.00	6.98	0.760	2.10	12.10	118	13.7
1120	20	9.82	.500	0.00	6.98	0.757	2.34	12.12	120	12.2

Drawdown is not to exceed 0.3 feet. Flow rate should not exceed 500 ml/min during purging or 250 ml/min during sampling. Readings should be taken every three to five minutes. The well is considered stabilized and ready for sampling when the indicator parameters have stabilized for three consecutive readings by the measurements indicated in parenthesis.

Typical values: DO = 0.3 - 10 mg/L Redox Potential = -100 - +600 mV Turbidity = 0 - >500 NTUs
Spec. Conductivity (µS/cm) = 0.01 - 5,000; up to 10,000 in industrial, ~55,000 in high salt content water. Note: 1,000 µS/cm = 1 mS/cm
TIC = Top of Inner Casing BGS = Below Ground Surface

DTW: 8.57
Riser AGS:

LOW FLOW GROUNDWATER SAMPLING PURGE RECORD
Former Duofold Corporation
Ilion, New York

DATE: 11/10/16

WELL #: TWP-09

SAMPLERS: ER

DEPTH OF PUMP INTAKE: 12 [✓ ft TIC] or ft BGS (circle one)

WEATHER CONDITIONS: Clear ≈ 45

SCREENED/OPEN BOREHOLE INTERVAL: 3-13 [✓ ft TIC] or ft BGS (circle one)

SAMPLE ID: DF-TWP-09-1 (-F)

SAMPLE TIME: 1210

SAMPLE FLOW RATE: 200 ml ml/minute

CLP ID: B04R8

		Instrument Type/Model: Complete and/or Circle at right			YSI Model #______ / [✓ Horiba U-22] (circle one) Other (specify)______					Instrument:
CURRENT TIME	VOLUME PURGED	DEPTH TO WATER	FLOW RATE	DRAWDOWN (± 0.3 FT)	pH (± 0.1 SU)	SPECIFIC CONDUCTIVITY (± 3%)	DISSOLVED OXYGEN (± 10%)	TEMP. (± 10%)	REDOX POTENTIAL (± 10 mV)	TURBIDITY (± 10%)
24-Hour	gallons / [✓ liters] (circle	[✓ ft TIC] / ft BGS (circle one)	Units: L/Min	[✓ ft TIC] / ft BGS	SU	S/cm, [✓ mS/cm^c] or µS/cm (circle one)	mg/L (not %)	Units: °C	mV	NTUs
1140	2.5	8.57	.500	0.01	7.17	0.785	0.01	12.29	101	323
1145	5	8.58	.500	0.01	6.99	0.775	0.01	12.86	58	259
1150	7.5	8.58	.500	0.01	6.93	0.762	0.01	13.10	39	212
1155	10	8.58	.500	0.01	6.90	0.759	0.01	13.57	34	185
1200	12.5	8.58	.500	0.01	6.87	0.755	0.01	14.11	33	172
1205	15	8.58	.500	0.01	6.86	0.753	0.01	14.39	33	160

Drawdown is not to exceed 0.3 feet. Flow rate should not exceed 500 ml/min during purging or 250 ml/min during sampling. Readings should be taken every three to five minutes. The well is considered stabilized and ready for sampling when the indicator parameters have stabilized for three consecutive readings by the measurements indicated in parenthesis.

Typical values: DO = 0.3 - 10 mg/L Redox Potential = -100 - +600 mV Turbidity = 0 - >500 NTUs
Spec. Conductivity (µS/cm) = 0.01 - 5,000; up to 10,000 in industrial, ~55,000 in high salt content water. Note: 1,000 µS/cm = 1 mS/cm
TIC = Top of Inner Casing BGS = Below Ground Surface

DTW - 10.07
Stickup AGS - 0.84

LOW FLOW GROUNDWATER SAMPLING PURGE RECORD
Former Duofold Corporation
Ilion, New York

DATE: 11/11/16

WELL #: TWP-12

SAMPLERS: Overcast ≈ 40

DEPTH OF PUMP INTAKE: 12 [✓ ft TIC] or ft BGS (circle one)

WEATHER CONDITIONS: ER

SCREENED/OPEN BOREHOLE INTERVAL: 4 - 14 ft TIC or ft BGS (circle one)

SAMPLE ID: DF-TWP-12-1 (-F)

CLP ID: BD4R9

SAMPLE TIME: 1015

SAMPLE FLOW RATE: 200 JE ml/minute

		Instrument Type/Model: Complete and/or Circle at right			YSI Model #____ / [✓ Horiba U-22] (circle one) Other (specify)____					Instrument:
CURRENT TIME	VOLUME PURGED	DEPTH TO WATER	FLOW RATE	DRAWDOWN (± 0.3 FT)	pH (± 0.1 SU)	SPECIFIC CONDUCTIVITY (± 3%)	DISSOLVED OXYGEN (± 10%)	TEMP. (± 10%)	REDOX POTENTIAL (± 10 mV)	TURBIDITY (± 10%)
24-Hour	gallons / [✓ liters] (circle	ft TIC / ft BGS (circle one)	Units:	ft TIC / ft BGS	SU	S/cm, [✓ mS/cm] or µS/cm (circle one)	mg/L (not %)	Units: °C	mV	NTUs
925	2.5	10.07	.500	0.0	7.20	0.639	0.01	10.72	134	543
930	5	10.07	.500	0.0	7.16	0.659	0.01	10.73	122	365
935	7.5	10.07	.500	0.0	7.16	0.667	0.01	10.71	108	211
940	10	10.07	.500	0.0	7.16	0.672	0.01	10.71	103	148
945	12.5	10.07	.500	0.0	7.16	0.675	0.01	10.70	96	71.4
950	15	10.07	.500	0.0	7.16	0.677	0.01	10.63	92	25.6
955	17.5	10.07	.500	0.0	7.16	0.675	0.01	10.63	89	20.3
1000	20	10.07	.500	0.0	7.16	0.677	0.01	10.61	86	24.8

Drawdown is not to exceed 0.3 feet. Flow rate should not exceed 500 ml/min during purging or 250 ml/min during sampling. Readings should be taken every three to five minutes. The well is considered stabilized and ready for sampling when the indicator parameters have stabilized for three consecutive readings by the measurements indicated in parenthesis.

Typical values: DO = 0.3 - 10 mg/L Redox Potential = -100 - +600 mV Turbidity = 0 - >500 NTUs
Spec. Conductivity (µS/cm) = 0.01 - 5,000; up to 10,000 in industrial, ~55,000 in high salt content water. Note: 1,000 µS/cm = 1 mS/cm
TIC = Top of Inner Casing BGS = Below Ground Surface

LOW FLOW GROUNDWATER SAMPLING PURGE RECORD
Former Duofold Corporation
Ilion, New York

DATE: 11/11/16

WELL #: TWP-12

SAMPLERS: ER

DEPTH OF PUMP INTAKE: 12 ft TIC or ft BGS (circle one)

WEATHER CONDITIONS: Overcast & 40°

SCREENED/OPEN BOREHOLE INTERVAL: 4 - 14 [✓ ft TIC] or ft BGS (circle one)

SAMPLE ID: DF-TWP-12-1

CLP ID: BD4R9

SAMPLE TIME: 1015

SAMPLE FLOW RATE: 200 JE [illegible] ml/minute

		Instrument Type/Model: Complete and/or Circle at right			YSI Model #____ Other (specify)____		[✓ Horiba U-22] (circle one)			Instrument:
CURRENT TIME	VOLUME PURGED	DEPTH TO WATER	FLOW RATE	DRAWDOWN (± 0.3 FT)	pH (± 0.1 SU)	SPECIFIC CONDUCTIVITY (± 3%)	DISSOLVED OXYGEN (± 10%)	TEMP. (± 10%)	REDOX POTENTIAL (± 10 mV)	TURBIDITY (± 10%)
24-Hour	gallons / liters (circle	ft TIC / ft BGS (circle one)	Units:	ft TIC / ft BGS	SU	S/cm, [✓ mS/cm] or μS/cm (circle one)	mg/L (not %)	Units: °C	mV	NTUs
1005	22.5	10.07	.500	0.0	7.15	0.681	0.01	10.61	84	22.7
1010	25	10.07	.500	0.0	7.15	0.686	0.01	10.73	82	21.2

Drawdown is not to exceed 0.3 feet. Flow rate should not exceed 500 ml/min during purging or 250 ml/min during sampling. Readings should be taken every three to five minutes. The well is considered stabilized and ready for sampling when the indicator parameters have stabilized for three consecutive readings by the measurements indicated in parenthesis.

Typical values: DO = 0.3 - 10 mg/L | Redox Potential = -100 - +600 mV | Turbidity = 0 - >500 NTUs

Spec. Conductivity (μS/cm) = 0.01 - 5,000; up to 10,000 in industrial, ~55,000 in high salt content water. Note: 1,000 μS/cm = 1 mS/cm

TIC = Top of Inner Casing | BGS = Below Ground Surface

DTW-13.12
Riser: AGS-3.55

LOW FLOW GROUNDWATER SAMPLING PURGE RECORD
Former Duofold Corporation
Ilion, New York

MS/MSD Sample

DATE: 11/11/16

WELL #: TWP-14

SAMPLERS: ER

DEPTH OF PUMP INTAKE: 10 [✓ ft TIC] or ft BGS (circle one)

WEATHER CONDITIONS: Clear ~~[illegible]~~ 40°

SCREENED/OPEN BOREHOLE INTERVAL: 4-14 ft TIC or ft BGS (circle one)

SAMPLE ID: DF-[illegible]-14-1 (-F)

SAMPLE TIME: 0900

SAMPLE FLOW RATE: ~~[illegible]~~ 200 ml/minute

CLP ID: BDRN1

		Instrument Type/Model: Complete and/or Circle at right			YSI Model #____ [✓ Horiba U-22] (circle one) Other (specify)____					Instrument:
CURRENT TIME	VOLUME PURGED	DEPTH TO WATER	FLOW RATE	DRAWDOWN (± 0.3 FT)	pH (± 0.1 SU)	SPECIFIC CONDUCTIVITY (± 3%)	DISSOLVED OXYGEN (± 10%)	TEMP. (± 10%)	REDOX POTENTIAL (± 10 mV)	TURBIDITY (± 10%)
24-Hour	gallons / [✓ liters] (circle	[✓ ft TIC] / ft BGS (circle one)	Units:	[✓ ft TIC] / ft BGS	SU	S/cm, [✓ mS/cm] or µS/cm (circle one)	mg/L (not %)	Units: °C	mV	NTUs
815	2.5	13.13	.500	0.01	7.02	0.652	0.01	9.44	152	451
820	5	13.13	.500	0.01	6.92	0.654	2.83	10.28	143	300
825	7.5	13.14	.500	0.02	6.88	0.653	2.32	11.08	133	182
830	10	13.14	.500	0.02	6.87	0.647	2.31	11.57	123	112
835	12.5	13.14	.500	0.02	6.86	0.642	3.72	11.77	116	69.0
840	15	13.14	.500	0.02	6.86	0.639	3.40	11.96	~~340~~ 109	30.8
843	17.5	13.14	.500	0.02	6.85	0.633	3.30	12.01	104	19.1
846	20	13.14	.500	0.02	6.86	0.631	3.80	12.04	102	6.8

Drawdown is not to exceed 0.3 feet. Flow rate should not exceed 500 ml/min during purging or 250 ml/min during sampling. Readings should be taken every three to five minutes. The well is considered stabilized and ready for sampling when the indicator parameters have stabilized for three consecutive readings by the measurements indicated in parenthesis.

Typical values: DO = 0.3 - 10 mg/L Redox Potential = -100 - +600 mV Turbidity = 0 - >500 NTUs
Spec. Conductivity (µS/cm) = 0.01 - 5,000; up to 10,000 in industrial, ~55,000 in high salt content water. Note: 1,000 µS/cm = 1 mS/cm
TIC = Top of Inner Casing BGS = Below Ground Surface

2 of 2

LOW FLOW GROUNDWATER SAMPLING PURGE RECORD
Former Duofold Corporation
Ilion, New York

DATE: 11/11/16

WELL #: TWP-14 MS/MSD

SAMPLERS: ER

DEPTH OF PUMP INTAKE: 10' [✓ ft TIC] or ft BGS (circle one)

WEATHER CONDITIONS: Clear ≈ 40

SCREENED/OPEN BOREHOLE INTERVAL: 4 - 14 ft TIC or ft BGS (circle one)

SAMPLE ID: DF-TWP-14-1(-F)

SAMPLE TIME: 900

SAMPLE FLOW RATE: 200 JE ml/minute

CLP ID: BDQN1

		Instrument Type/Model: Complete and/or Circle at right			YSI Model #______ / [✓ Horiba U-22] (circle one) Other (specify)______					Instrument:
CURRENT TIME	VOLUME PURGED	DEPTH TO WATER	FLOW RATE	DRAWDOWN (± 0.3 FT)	pH (± 0.1 SU)	SPECIFIC CONDUCTIVITY (± 3%)	DISSOLVED OXYGEN (± 10%)	TEMP. (± 10%)	REDOX POTENTIAL (± 10 mV)	TURBIDITY (± 10%)
24-Hour	gallons / [✓ liters] (circle	[✓ ft TIC] / ft BGS (circle one)	Units:	[✓ ft TIC] / ft BGS	SU	S/cm, [✓ mS/cm] or µS/cm (circle one)	mg/L (not %)	Units: °C	mV	NTUs
849	22.5	13.14	.500	0.02	6.89	0.628	2.71	12.01	100	8.2
852	25	13.14	.500	0.02	6.85	0.632	2.56	11.98	98	7.8
855	27.5	13.14	.500	0.02	6.85	0.633	2.44	12.01	96	7.1

Drawdown is not to exceed 0.3 feet. Flow rate should not exceed 500 ml/min during purging or 250 ml/min during sampling. Readings should be taken every three to five minutes. The well is considered stabilized and ready for sampling when the indicator parameters have stabilized for three consecutive readings by the measurements indicated in parenthesis.

Typical values:
DO = 0.3 - 10 mg/L
Redox Potential = -100 - +600 mV
Turbidity = 0 - >500 NTUs
Spec. Conductivity (µS/cm) = 0.01 - 5,000; up to 10,000 in industrial, ~55,000 in high salt content water. Note: 1,000 µS/cm = 1 mS/cm
TIC = Top of Inner Casing
BGS = Below Ground Surface

DTW 6.9 TIC
DTB 14.8 TIC
TIC - ~4" AG

LOW FLOW GROUNDWATER SAMPLING PURGE RECORD
Former Duofold Corporation
Ilion, New York

DATE: 11/11/16

WELL #: TWP-15

SAMPLERS: AR

DEPTH OF PUMP INTAKE: 13 [✓ ft TIC] or ft BGS (circle one)

WEATHER CONDITIONS: rain 40°F

SCREENED/OPEN BOREHOLE INTERVAL: 4 - 14 [✓ ft TIC] or ft BGS (circle one)

SAMPLE ID: DF-TWP-15-1C-F)
CLP ID: BDQN2

SAMPLE TIME: 945 SAMPLE FLOW RATE: 200 ml/minute

		Instrument Type/Model: Complete and/or Circle at right			YSI Model #______ [✓ / Horiba U-22] (circle one) Other (specify)______					Instrument:
CURRENT TIME	VOLUME PURGED	DEPTH TO WATER	FLOW RATE	DRAWDOWN (± 0.3 FT)	pH (± 0.1 SU)	SPECIFIC CONDUCTIVITY (± 3%)	DISSOLVED OXYGEN (± 10%)	TEMP. (± 10%)	REDOX POTENTIAL (± 10 mV)	TURBIDITY (± 10%)
24-Hour	gallons / [✓ liters] (circle	[✓ ft TIC] / ft BGS (circle one)	Units: ml/min	[✓ ft TIC] / ft BGS	SU	S/cm, [✓ mS/cm] or µS/cm (circle one)	mg/L (not %)	Units: °C	mV	NTUs
926		7.1	100		7.32	0.69	6.51	13.10	-16	217
931		7.8			7.23	0.662	5.31	13.30	-30	186
935		9.6			7.32	0.666	6.96	12.89	-39	116
941		12.1			7.31	0.671	8.38	12.92	-67	46.2
945	well going dry - collect sample									

Drawdown is not to exceed 0.3 feet. Flow rate should not exceed 500 ml/min during purging or 250 ml/min during sampling. Readings should be taken every three to five minutes. The well is considered stabilized and ready for sampling when the indicator parameters have stabilized for three consecutive readings by the measurements indicated in parenthesis.

Typical values: DO = 0.3 - 10 mg/L
Redox Potential = -100 - +600 mV
Turbidity = 0 - >500 NTUs
Spec. Conductivity (µS/cm) = 0.01 - 5,000; up to 10,000 in industrial, ~55,000 in high salt content water. Note: 1,000 µS/cm = 1 mS/cm
TIC = Top of Inner Casing
BGS = Below Ground Surface

9 62
DTW ~~10~~.65 TIC
DTB 14.9 TIC
TIC = ~6" AGS

LOW FLOW GROUNDWATER SAMPLING PURGE RECORD

Former Duofold Corporation
Ilion, New York

DATE: 11/11/16

WELL #: TWP-16

SAMPLERS: AR

DEPTH OF PUMP INTAKE: 13.9 [✓ ft TIC] or ft BGS (circle one)

WEATHER CONDITIONS: cloudy, 45°F

SCREENED/OPEN BOREHOLE INTERVAL: 5-15 ft TIC or ft BGS (circle one)

SAMPLE ID: DF-TWP-16-1(-F) **SAMPLE TIME:** 845 **SAMPLE FLOW RATE:** 200 ml/minute

CLP ID: BDQN3

		Instrument Type/Model: Complete and/or Circle at right			YSI Model # [✓ / Horiba U-~~22~~ 52] (circle one) Other (specify)					Instrument:
CURRENT TIME	VOLUME PURGED	DEPTH TO WATER	FLOW RATE	DRAWDOWN (± 0.3 FT)	pH (± 0.1 SU)	SPECIFIC CONDUCTIVITY (± 3%)	DISSOLVED OXYGEN (± 10%)	TEMP. (± 10%)	REDOX POTENTIAL (± 10 mV)	TURBIDITY (± 10%)
24-Hour	gallons / [✓ liters] (circle	[✓ ft TIC] / ft BGS (circle one)	Units: ml/min	[✓ ft TIC] / ft BGS	SU	S/cm, [✓ mS/cm] / or µS/cm (circle one)	mg/L (not %)	Units: °C	mV	NTUs
820	1.25	9.95	250	—	7.10	0.696	1.12	14.62	-64	286
825	↓	9.65	↓	0.3	7.06	0.710	0.01	15.29	-51	63.9
830		9.65		0	7.06	0.722	0.01	15.37	-47	16.2
835		9.65		0	7.06	0.727	0.01	15.46	-46	3.6
838	0.75	9.65		0	7.06	0.730	0.01	15.46	-46	0.5
841	↓	9.65		0	7.06	0.731	0.01	15.47	-47	0.1
844		9.65		0	7.06	0.731	0.01	15.49	-47	0.1
845										

Drawdown is not to exceed 0.3 feet. Flow rate should not exceed 500 ml/min during purging or 250 ml/min during sampling. Readings should be taken every three to five minutes. The well is considered stabilized and ready for sampling when the indicator parameters have stabilized for three consecutive readings by the measurements indicated in parenthesis.

Typical values: DO = 0.3 - 10 mg/L Redox Potential = -100 - +600 mV Turbidity = 0 - >500 NTUs
Spec. Conductivity (µS/cm) = 0.01 - 5,000; up to 10,000 in industrial, ~55,000 in high salt content water. Note: 1,000 µS/cm = 1 mS/cm
TIC = Top of Inner Casing BGS = Below Ground Surface

DTW 6.85 TIC
DTB 14.8 TIC
TIC = ~14" AGS

LOW FLOW GROUNDWATER SAMPLING PURGE RECORD
Former Duofold Corporation
Ilion, New York

DATE: 11/10/16

WELL #: TWP-18

SAMPLERS: AK

DEPTH OF PUMP INTAKE: 13.8 [✓ ft TIC] or ft BGS (circle one)

WEATHER CONDITIONS: Sunny 50°F

SCREENED/OPEN BOREHOLE INTERVAL: 5-15 ft TIC or ft BGS (circle one)

SAMPLE ID: DF-TWP-18-1(-F) SAMPLE TIME: 1310 SAMPLE FLOW RATE: 200 ml/minute

CLP ID: BDQN4

Instrument Type/Model: Complete and/or Circle at right — YSI Model #______________ / [✓ Horiba U-~~22~~ 52] (circle one) Other (specify)______________ — Instrument:

CURRENT TIME	VOLUME PURGED	DEPTH TO WATER	FLOW RATE	DRAWDOWN (± 0.3 FT)	pH (± 0.1 SU)	SPECIFIC CONDUCTIVITY (± 3%)	DISSOLVED OXYGEN (± 10%)	TEMP. (± 10%)	REDOX POTENTIAL (± 10 mV)	TURBIDITY (± 10%)
24-Hour	gallons / [✓ liters] (circle	ft [✓ TIC] / ft BGS (circle one)	Units: ml/min	[✓ ft TIC] / ft BGS	SU	S/cm, [✓ mS/cm], or µS/cm (circle one)	mg/L (not %)	Units: °C	mV	NTUs
1246	1.25	6.85	250	—	7.27	0.636	2.33	16.96	-73.0	64.1
1251		6.85		0	7.18	0.618	0.01	17.34	-77.0	13.7
1256		6.85		0	7.18	0.616	0.01	17.48	-90.0	0.5
1301		6.85		0	7.20	0.620	0.01	17.52	-101	0.1
1306		6.85		0	7.20	0.624	0.01	17.58	-106	0.1
1309	0.75	6.85		0	7.21	0.626	0.01	17.59	-108	0.1
1310	SAMPLE									

Drawdown is not to exceed 0.3 feet. Flow rate should not exceed 500 ml/min during purging or 250 ml/min during sampling. Readings should be taken every three to five minutes. The well is considered stabilized and ready for sampling when the indicator parameters have stabilized for three consecutive readings by the measurements indicated in parenthesis.

Typical values: DO = 0.3 - 10 mg/L Redox Potential = -100 - +600 mV Turbidity = 0 - >500 NTUs
Spec. Conductivity (µS/cm) = 0.01 - 5,000; up to 10,000 in industrial, ~55,000 in high salt content water. Note: 1,000 µS/cm = 1 mS/cm
TIC = Top of Inner Casing BGS = Below Ground Surface

LOW FLOW GROUNDWATER SAMPLING PURGE RECORD
Former Duofold Corporation
Ilion, New York

DTW 7.3 TIC
DTB 14.8 TIC

DATE: 11/10/16

SAMPLERS: AR

WEATHER CONDITIONS: Sunny 50°F

WELL #: TWP-19

TIC = ~16" AGS

DEPTH OF PUMP INTAKE: 13.8 [✓ ft TIC] or ft BGS (circle one)

SCREENED/OPEN BOREHOLE INTERVAL: 5-15 ft TIC or ft BGS (circle one)

SAMPLE ID: DF-TWP-19-1(-F) **SAMPLE TIME:** 1210 **SAMPLE FLOW RATE:** 200 ml/minute

CLP ID: BDQN5

		Instrument Type/Model: Complete and/or Circle at right			YSI Model #______ / Other (specify)______	[✓ Horiba U-~~22~~ 52] (circle one)				Instrument:
CURRENT TIME	VOLUME PURGED	DEPTH TO WATER	FLOW RATE	DRAWDOWN (± 0.3 FT)	pH (± 0.1 SU)	SPECIFIC CONDUCTIVITY (± 3%)	DISSOLVED OXYGEN (± 10%)	TEMP. (± 10%)	REDOX POTENTIAL (± 10 mV)	TURBIDITY (± 10%)
24-Hour	gallons / [✓ liters] (circle	[✓ ft TIC] / ft BGS (circle one)	Units: ml/min	[✓ ft TIC] / ft BGS	SU	S/cm, [✓ mS/cm^c] or µS/cm (circle one)	mg/L (not %)	Units: °C	mV	NTUs
1136	1.25	7.35	250	0	7.23 ~~15.2~~	0.959	0.01	15.42	-86.0	253
1141	↓	7.35	↓	0	7.20	0.936	0.01	15.93	-75.0	192
1146		7.35		0	7.19	0.914	0.01	16.36	-62.0	12.3
1151		7.35		6	7.19	0.912	0.01	16.44	-62.0	10.1
1156		7.35		0	7.19	0.912	0.01	16.69	-60.0	5.2
1201	0.75	7.35		6	7.19	0.911	0.01	16.74	-57.0	0.9
1204	↓	7.35		0	7.19	0.909	0.01	16.81	-55.0	0.1
1207					7.19	0.907	0.01	16.93	-54.0	0.1

Drawdown is not to exceed 0.3 feet. Flow rate should not exceed 500 ml/min during purging or 250 ml/min during sampling. Readings should be taken every three to five minutes. The well is considered stabilized and ready for sampling when the indicator parameters have stabilized for three consecutive readings by the measurements indicated in parenthesis.

Typical values: DO = 0.3 - 10 mg/L Redox Potential = -100 - +600 mV Turbidity = 0 - >500 NTUs
Spec. Conductivity (µS/cm) = 0.01 - 5,000; up to 10,000 in industrial, ~55,000 in high salt content water. Note: 1,000 µS/cm = 1 mS/cm
TIC = Top of Inner Casing BGS = Below Ground Surface

Appendix F

Appendix F

Waste Manifests

NON-HAZARDOUS WASTE MANIFEST

Please print or type (Form designed for use on elite (12 pitch) typewriter)

NON-HAZARDOUS WASTE

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. C-SBG

Manifest Document No. 121416-2

2. Page 1 of 1

3. Generator's Name and Mailing Address
U.S. EPA REGION 2/DUOFOLD SITE ATTN: A. DEVINE
290 BROADWAY, 19th FL., NY, NY 10007

4. Generator's Phone (212) 637-4158

5. Transporter 1 Company Name FREEHOLD CARTAGE, INC.

6. US EPA ID Number NJD 054 126 164

A. State Transporter's ID

B. Transporter 1 Phone 732-462-1001

7. Transporter 2 Company Name

8. US EPA ID Number

C. State Transporter's ID

D. Transporter 2 Phone

9. Designated Facility Name and Site Address
ENVIRONMENTAL RECOVERY CORP
1076 OLD MANHEIM PIKE
LANCASTER, PA 17601

10. US EPA ID Number PAD 987 266 749

E. State Facility's ID 301344

F. Facility's Phone 717-393-2627

GENERATOR

11. WASTE DESCRIPTION	12. Containers No.	Type	13. Total Quantity	14. Unit Wt./Vol.
a. NONHAZARDOUS, NON REGULATED (GROUNDWATER) APPROVAL # 1612-06648-LWT	2	DM	500	P
b. NONHAZARDOUS, NON REGULATED (SOIL CUTTINGS) APPROVAL # 1612-06649-SOT	1	DM	200	P
c. NONHAZARDOUS, NON REGULATED (PPE/DEBRIS) APPROVAL # 1612-06650 SPT	1	DM	200	P
d.				

G. Additional Descriptions for Materials Listed Above

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information

SITE ADDRESS: 7 SPRUCE ST., ILION, NY 13357

16. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.

Printed/Typed Name Brian Kohut on Behalf of

Signature

Date Month 12 Day 14 Year 16

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name Brian Kohut

Signature

Date Month 12 Day 14 Year 16

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Date Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator; Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name

Signature

Date Month Day Year

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Rev. 3/95

Appendix G

Appendix G

Data Validation Report

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
DESA/HWSB/HWSS
2890, Woodbridge Avenue, Edison, NJ 08837

EXECUTIVE NARRATIVE

Case No.: 46633	**SDG No.**: BD4L5
Site: Former Duofold Corp. (Brownfield)	**Laboratory**: CHM
Number of Samples: 60 Soil	**Sampling dates**: 11/08/16
Analysis: VOA, BNA, PCB	**Validation SOP:** HW-33A (Rev 0), HW-35A (Rev 0) HW-37A (Rev 0)

QAPP:
Contractor:CDM Smith
Contractor Document: DCN # 3323-029-02902

SUMMARY OF DEFINITIONS:
Critical: Results have an unacceptable level of uncertainty and should not be used for making decisions. Data have been qualified "R" rejected.
Major: A level of uncertainty exists that may not meet the data quality objectives for the project. A bias is likely to be present in the results. Data has been qualified "J" estimated. "J+" and "J-" represent likely direction of the bias.
Minor: The level of uncertainty is acceptable. No significant bias in the data was observed.

Critical Findings:
VOA, Sample BD4M5 have analytes that have been qualified R.

Major Findings:
VOA: Several samples have anyaltes qualified J.
BNA: Two samples have anayltes qualified J.
Aroclor: One sample has analytes qualified J.

Minor Findings:
None.

COMMENTS: None

Reviewer Name(s): Russell Arnone

Approver's Signature:

Date: 01/11/17

Name:

Affiliation: USEPA/R2/HWSB/HWSS

Data Qualifier Definitions (National Functional Guidelines)

Qualifier Symbol	**Explanation**		
	INORGANICS	**ORGANICS**	**CHLORINATED DIOXIN/FURAN**
U	The analyte was analyzed for, but was not detected above the level of the reported quantitation limit.	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted Contract Required Quantitation Limit (CRQL) for sample and method	The analyte was analyzed for but not detected. The value preceding the "U" may represent the adjusted Contract Required Quantitation Limit (see DLM02.X, Exhibit D, Section 1.2 and Table 2), or the sample specific estimated detection limit (EDL, see Method 8290A, Section 11.9.5).
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the CRQL.	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to an issue with the quality of the data generated because certain QC criteria were not met, or the concentration of the analyte was below the adjusted CRQL).
J+	The result is an estimated quantity, but the result may be biased high.	The result is an estimated quantity, but the result may be biased high.	
J–	The result is an estimated quantity, but the result may be biased low.	The result is an estimated quantity, but the result may be biased low.	
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.	The analyte was not detected at a level greater than or equal to the adjusted CRQL. However, the reported adjusted CRQL is approximate and may be inaccurate or imprecise.	The analyte was not detected (see definition of "U" flag, above). The reported value should be considered approximate.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.	The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.	The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
N		The analysis indicates the presence of an analyte for which there is presumptive evidence to make a “tentative identification”.	
NJ		The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.	
C		This qualifier applies to pesticide and Aroclor results when the identification has been confirmed by Gas Chromatograph/Mass Spectrometer (GC/MS).	
X		This qualifier applies to pesticide and Aroclor results when GC/MS analysis was attempted but was unsuccessful.	

DATA ASSESSMENT

ANALYSIS: VOA

The current SOP HW-33A/VOA (Revision 0) July 2015, USEPA Region II Data Validation SOP for Statement of Work SOM02.2 for evaluating organic data has been applied. Data has been reviewed according to TDF specifications, the National Functional Guidelines Report and the CCS Semi- Automated Screening Results Report. Tentatively Indentified Compounds (TICS) for VOA organic fraction is not validated.

1. HOLDING TIME:

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimated, "J". The non-detects (sample quantitation limits) will be flagged as estimated, "J", or unusable, "R", if the holding times are grossly exceeded. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

2. DEUTERATED MONITORING COMPOUNDS (DMC's)

All samples are spiked with DMC compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured DMC recovery concentrations were outside contract specifications, qualifications were applied to the samples and analytes as shown below.

The following volatile samples have one or more DMC/SMC recovery values less than the primary lower limit but greater than or equal to the expanded lower limit of the criteria window. Detected compounds are qualified J-. Non-detected compounds are qualified UJ.

1,2-Dichloroethane-d4 BD4M5
Trichlorofluromethane, 1,1,2-Trichloro-1,2,2-trifluoroethane, Methyl acetate, Methylene chloride, Methyl-tert-butyl ether, 1,1,1-Trichloroethane, Carbon tetrachloride, 1,2-Dibromoethane, 1,2-Dichloroethane

The following samples have DMC/Surrogate percent recoveries less than the expanded minimum criteria. Detects are qualified as estimated J-. Non-detects are qualified as unusable R.

1,1,2,2-Tetrachloroethane-d2 BD4M5
1,1,2,2 Tetrachloroethane, 1,2 Dibromo 3 chloropropane

The following samples have DMC/Surrogate perecent recoveries greater than the primary maximum criteria. Detects are estimated J+. Non-detects compounds are not qualified.

Benzene-d6 BD4L5, BD4L6, BD4M5, BD4L9
Benzene

1,2-Dichloropropane-d6 BD4N0, BD4L9, BD4M5, BD4L6, BD4L9(RX), BD4L5
Cyclohexane, Methylcyclohexane, 1,2-Dichloropropane, Bromodichloromethane

Toluene-d8 BD4M5, BD4L6
Trichloroethene, Toluene, Tetrachloroethene, Ethylbenzene, O-Xylene, m,p Xylene, Styrene, Isopropylbenzene

2-Hexanone-d5 BD4M5, BD4L6
4-Methyl-2-pentanone, 2-Hexanone

1,1,2,2-Tetrachloroethane-d2 BD4L6, BD4L9, BD4M5ME
1,1,2,2 Tetrachloroethane, 1,2 Dibromo 3 chloropropane

1,2-Dichlorobenzene-d4 BD4L6, BD4M5ME, BD4L6
Chlorobenzene, 1,3Dichlorobenzene, 1,4Dichlorobenzene, 1,2Dichlorobenzene, 1,2,4 Trichlorobenzene, 1,2,3 Trichlorobenzene

3. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD):

MS/MSD data are generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD data may be used in conjunction with other QC criteria for additional qualification of data. Qualifications were applied to the samples and analytes as shown below.

Not applicable.

4. BLANK CONTAMINATION:

Quality assurance (QA) blanks, i.e., method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Trip blanks measure cross-contamination of samples during shipment. Field and rinse blanks measure cross-contamination of samples during field operations. Depending on the amount of contamination present in the QA blanks, the analytes are qualified as non-detects, "U". Qualifications were applied to the samples and analytes as shown below.

A) Method blank contamination:

The following volatile samples have common contaminant analyte concentrations reported less than the CRQL. The associated method blank has common contaminant analyte concentration less than the CRQL. Detected compounds are qualified U. Sample concentrations have been reported at the CRQLs.

Methylene chloride BD4L7, BD4L8, BD4L9, BD4M1, BD4M6, BD4M7, BD4M8, BD4M9, BD4N0, BD4N1, BD4N2, BD4Q0

B) Field or rinse blank contamination:

The following sample is reported less than the CRQL. The trip blank is reported less than the CRQL. Report sample result as CRQL value with a U.
NONE

C) Trip blank contamination for VOA aqueous samples:

No qualification applied due to trip blank contamination.

D) Storage Blank associated with VOA samples only:

No qualification applied due to trip blank contamination.

E) Tentatively Identified Compounds:

Tentatively Identified Compounds (TICs) for VOA organic fraction are not validated.

5. MASS SPECTROMETER TUNING:

Tuning and performance criteria are established to ensure adequate mass resolution, proper identification of compounds and to some degree, sufficient instrument sensitivity. These criteria are not sample specific. Instrument performance is determined using standard materials. Therefore, these criteria should be met in all circumstances. The tuning standard for volatile organics is (BFB) Bromofluorobenzene. If the mass calibration is in error, all associated data will be classified as unusable "R". Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

6. CALIBRATION:

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration checks document that the instrument is giving satisfactory daily performance.

A) Response Factor GC/MS:

The response factor measures the instrument's response to specific chemical compounds. The response factor for the Target Compound List (TCL) must be ≥ 0.05, and ≥ 0.01 for the twenty-two analytes with poor response, and ≥ 0.005 for 1,4-Dioxane in both the initial and opening CCV. For a closing CCV RRF for all Target compounds must ≥ 0.01 and ≥ 0.005 for

1,4-Dioxane. A value < 0.05, or < 0.01 for the poor performers and < 0.005 for 1,4-Dioxane indicates a serious detection and quantitation problem (poor sensitivity). Analytes detected in the sample will be qualified as estimated, "J". All non-detects for that compound will be rejected "R". Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

B) Percent Relative Standard Deviation (%RSD) and Percent Difference (%D):

Percent RSD is calculated from the initial calibration and is used to indicate the stability of the specific compound response factor over increasing concentration. Percent D compares the response factor of the continuing calibration check to the mean response factor (RRF) from the initial calibration. Percent D is a measure of the instrument's daily performance. Percent RSD must be < 20% for Target compounds, < 40% for the poor performers, and < 50% for 1,4-Dioxane. %D must be < 25% for Target compounds, < 40% for the poor performers, and < 50% for 1,4-Dioxane for the opening CCV. For the closing CCV %D must be < 50% for all Target compounds. A value outside of these limits indicates potential detection and quantitation errors. For these reasons, all positive results are flagged as estimated, "J". Non-detects are flagged "UJ" for %D values outside criteria only. If %RSD exceeds QC criteria, non-detects may be qualified using professional judgment. Qualifications were applied to the samples and analytes as shown below.

The following samples are associated with an initial calibration percent relative deviation (%RSD) outside criteria. Detects are qualified as estimated J, Non-detects are not qualified.

O-Xylene BD4L5, BD4L6, BD4L7, BD4L8, BD4L9, BD4M0, BD4M1, BD4M2, BD4M3, BD4M4, BD4M5, BD4M6, BD4M7, BD4M8, BD4M9, BD4N0, BD4N1, BD4N2, BD4N3, BD4Q0,

7. INTERNAL STANDARDS PERFORMANCE GC/MS:

Internal standards (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during every experimental run. The internal standard area count must be in the range of 50% - 200 % of the associated continuing calibration internal standard area. The retention time of the internal standards must not vary more than 30 seconds from the associated continuing calibration standard. If the area count is greater than 200%, all positive results quantitated using that IS are qualified as estimated “J-”, and non-detects are not qualified. If the area count is less than 50% of the associated standard, all positive results for compounds quantitated with that IS are qualified as estimated “J+” and all non-detects are qualified “R”.

If an internal standard retention time varies by more than 30 seconds, the reviewer will use professional judgment to determine either partial or total rejection of the data for that sample fraction. Qualifications were applied to the samples and analytes as shown below.

The following volatile samples have internal standard area response greater than or equal to expanded minimum criteria and less than primary minimum criteria. Detects are qualified as estimated J+. Non-detects are qualified as estimated UJ.

The following volatile samples have internal standard area counts that are outside the lower limit of primary criteria. Detected compounds are qualified J+. Non-detected compounds are qualified UJ.

1,4-Dichlorobenzene-d4 BD4L9, BD4L5, BD4L9RE
1,2,3-Trichlorobenzene, 1,2,4-Trichlorobenzene, 1,2-Dibromo-3-chloropropane, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, Bromoform

Chlorobenzene-d5
BD4L6, BD4L9, BD4M5

1,4-Difluorobenzene
BD4M5

The following volatile samples have internal standard area counts that are outside the EXPANDED lower limit of primary criteria. Detected compounds are qualified J+. Non-detected compounds are qualified R.

1,4-Dichlorobenzene-d4 BD4L6
1,2,3-Trichlorobenzene, 1,2,4-Trichlorobenzene, 1,2-Dibromo-3-chloropropane, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, Bromoform

8. FIELD DUPLICATES:

Not applicable.

9. COMPOUND IDENTIFICATION:

Target compounds are identified on the GC/MS by using the analyte's relative retention time (RRT) and by comparison to the ion spectra obtained from known standards. For the results to be a positive hit, the sample peak must be within a window of 0.06 RRT units of the standard compound and have ion spectra which has a ratio of the primary and secondary m/z intensities within 20% of that in the standard compound. For the tentatively identified compounds (TIC) the ion spectra must match accurately. In the cases where there is not an adequate ion spectrum match, the laboratory may have provided false positive identifications. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

10. CONTRACT PROBLEMS NON-COMPLIANCE:

None.

11. FIELD DOCUMENTATION:

No problems were identified.

12. OTHER PROBLEMS:

None.

13. DILUTIONS, RE-EXTRACTIONS & REANALYSIS:

Samples may be reanalyzed after dilution, re-extraction and for other QC reasons. In such cases, the best result values are used. See summary report and EDD for applicable samples and analytes.

ANALYSIS: BNA

The current SOP HW-35A (Revision 0) July 2015, USEPA Region II for the evaluation of Semi-Volatile organic data generated through Statement of Work SOM02.2 has been applied. Data has been reviewed according to TDF specifications, the National Functional Guidelines Report and the CCS Semi-Automated Screening Results Report. Tentatively Identified Compounds (TICs) for BNA organic fraction is not validated.

1. HOLDING TIME:

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded, qualifications will be applied as per SOP HW-35A (Rev 0).

No problems were found for this criterion.

2. DEUTERATED MONITORING COMPOUNDS (DMCs)

All samples are spiked with DMC compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured DMC recovery limits were outside Table 6 of SOP HW-35A (Revision 0), qualifications were applied as per Table 7 of SOP HW-35A (Revision 0) to all the samples and analytes as shown below.

The following semivolatile samples have one or more DMC/SMC recovery values less than the primary lower limit but greater than or equal to the expanded lower limit of the criteria window. Detected compounds are qualified J-. Non-detected compounds are qualified UJ.

1,4-Dioxane-d8

1,4 Dioxane
BD4L8

The following samples have DMC % recoveries greater than primary maximum criteria. Detects are qualified as estimated estimated J. Nondetects are not qualified.

Bis-(2-Chloroethyl) ether-d8

Bis-(2-Chloroethyl) ether, 2,2'-Oxybis (1-chloropropane), Bis (2-chloroethoxy) methane
BD4M5

3. MATRIX SPIKE/MATRIX SPIKE DUPLICATES (MS/MSD):

MS/MSD data are generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD data may be used in conjunction with other QC criteria for additional qualification of data. Qualifications were applied to the samples and analytes as shown below.

Not applicable.

4. BLANK CONTAMINATION:

Quality assurance (QA) blanks, i.e., method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Trip blanks measure cross-contamination of samples during shipment. Field and rinse blanks measure cross-contamination of samples during field operations. Depending on the amount of contamination present in the QA blanks, the analytes are qualified as per Table 5 of SOP HW-,m

No problems were found for this criterion.

C) Tentatively Identified Compounds:

Tentatively Identified Compounds (TICs) for BNA organic fraction are not validated.

5. MASS SPECTROMETER TUNING:

Tuning and performance criteria are established to ensure adequate mass resolution, proper identification of compounds and to some degree, sufficient instrument sensitivity. These criteria are not sample specific. Instrument performance is determined using standard materials. Therefore, these criteria should be met in all circumstances. The tuning standard for Semi-volatiles is Decafluorotriphenyl-phosphine (DFTPP). If the mass calibration is in error, all associated data will be classified as unusable "R".

No problems were found for this criterion.

6. CALIBRATION:

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration checks document that the instrument is giving satisfactory daily performance.

A) Response Factor GC/MS:

The response factor measures the instrument's response to specific chemical compounds. All analytes for initial and continuing calibration should meet the minimum RRF criteria as listed in Table 2 of SOP HW 35A (Rev 0). If RRF is less than minimum RRF as specified in Table 2 for all target analytes, use professional judgment and all detects in the sample will be qualified as "J+" or "R". All non-detects for that compound will be rejected "R". Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

B) Percent Relative Standard Deviation (%RSD) and Percent Difference (%D):

Percent RSD is calculated from the initial calibration and is used to indicate the stability of the specific compound response factor over increasing concentration. Percent D compares the response factor of the continuing calibration check to the mean response factor (RRF) from the initial calibration. Percent D is a measure of the instrument's daily performance.

Percent RSD must be less than maximum %RSD in Table 2 of SOP HW 35A (Rev 0) for all target analytes. For the opening or closing CCV %D must be within the inclusive opening or closing maximum %D limits as listed in Table 2 of SOP HW 35A (Rev 0) for all Target compounds. A value outside of these limits indicates potential detection and quantitation errors. For these reasons, all positive results are flagged as estimated, "J" and Non-detects are flagged "UJ" for %D values outside criteria only. If %RSD exceeds QC criteria, detects may be qualified as "J" and use professional judgment to qualify non-detects. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

7. INTERNAL STANDARDS PERFORMANCE GC/MS:

Internal standards (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during every experimental run. The internal standard area count must be in the range as specified in Table 10 of SOP HW 35A (Rev 0) of the associated continuing calibration internal standard area. The retention time of the internal standards must be within the range as specified in Table 10 of SOP HW 35A (Rev 0). If the area count is greater than, all positive results quantitated using that IS are qualified as estimated "J-", and non-detects are not qualified. If the area count is less than the associated standard, all positive results for compounds quantitated with that IS are qualified as estimated "J+" and all non-detects are qualified "R".

If an internal standard retention time were not met as specified in Table 10 of SOP HW 35A (Rev 0), the reviewer will use professional judgment to determine either partial or total rejection of the data for that sample fraction. Qualifications were applied to the samples and analytes as shown below. Qualifications were applied to the samples and analytes as shown below.

The following semivolatile samples have internal standard area response greater than or equal to expanded minimum criteria and less than primary minimum criteria. Detects are qualified as estimated J+. Non-detects are qualified as estimated UJ.

No problems were found for this criterion

8. FIELD DUPLICATES:

Not applicable.

9. COMPOUND IDENTIFICATION:

A) Semi-Volatile Fractions:

TCL compounds are identified on the GC/MS by using the analyte's relative retention time (RRT) and by comparison to the ion spectra obtained from known standards. For the results to be a positive hit, the sample peak must be within 0.06 RRT units of the standard compound and have ion spectra which have a ratio of the primary and secondary m/e intensities within 20% of that in the standard compound. For the tentatively identified compounds (TIC) the ion spectra must match accurately. In the cases where there is not an adequate ion spectrum match, the laboratory may have provided false positive identifications. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

10. CONTRACT PROBLEMS NON-COMPLIANCE:

None.

11. FIELD DOCUMENTATION:

No problems were identified.

12. OTHER PROBLEMS:

None

13. DILUTIONS, RE-EXTRACTIONS and REANALYSIS:

Samples may be re-analyzed for dilution, re-extraction and for other QC reasons. In such cases, the best result values are used. See summary report and EDD for applicable samples and analytes.

ANALYSIS: PCB

The current SOP HW-37A (Revision 0) July 2015, USEPA Region II for the evaluation of PCB data generated through Statement of Work SOM02.2 has been applied. Data have been reviewed according to TDF specifications, the National Functional Guidelines Report and the CCS Semi-Automated Screening Results Report.

1. HOLDING TIME:

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimated, "J". Use professional judgment to qualify the non-detects (sample quantitation limits), if the holding times are grossly exceeded. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

2. SURROGATES:

All samples are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured surrogate recovery were outside Table 5 of the SOP HW-37A (Revision 0), qualifications were applied to the samples and analytes as shown below.

The following sample has DMC/surrogate percent recoveries less than the primary minimum criteria but greater than or equal to the expanded minimum criteria. Detects are qualified J-. Nondetects are qualified as estimated UJ.

Decachlorobiphenyl
BD4M4

3. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD):

MS/MSD data are generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD data may be used in conjunction with other QC criteria for additional qualification of data. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

4. Laboratory Control Samples (LCS):

LCS data provides information on the accuracy of the analytical method and laboratory performance. If LCS recoveries fell outside of the acceptable limits, qualifications were applied to the associated samples and compounds as shown below.

No problems were found for this criterion.

5. BLANK CONTAMINATION:

Quality assurance (QA) blanks, i.e., method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure cross-contamination of samples during field operations. Depending on the concentration of the analyte in the blank, the analytes are qualified as non-detects U. Qualifications were applied to the samples and analytes as shown below.

A) Method blank contamination:

No problems were found for this criterion.

B) Field or rinse blank contamination:

No problems were found for this criterion.

6. CALIBRATION:

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration checks document that the instrument is giving satisfactory daily performance.

A) Percent Relative Standard Deviation (%RSD):

For the PCB fraction, if %RSD exceeds 20% for all analytes and the two surrogates, qualify all associated positive results "J" and use professional judgment to qualify non-detects. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

B) Percent Difference (%D):

For opening CCV, or closing CCV that is used as an opening CCV for the next 12-hour period, if %D exceeds 25% for analytes and the two surrogates, qualify all associated positive results “J” and non-detects “UJ”.

For closing CCV, if %D exceeds 50% for all analytes and the two surrogates, qualify all associated positive results “J” and non-detects “UJ”. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

7. FIELD DUPLICATES:

Not applicable.

8. COMPOUND IDENTIFICATION:

A) PCB Fraction:

The retention times of reported compounds must fall within the calculated retention time windows for the two chromatographic columns and a GC/MS confirmation is required if the concentration exceeds 10ng/ml in the final sample extract. Qualifications were applied to the samples and analytes as shown below.

Percent Differences	**Qualifier**
0% - 25%	No qualification
26% - 200%	Professional Judgment
101% - 200% (interference detected, either column)	JN

> 50% (pesticide value < CRQL, value raised to CRQL)	U
> 200%	R

The following samples were qualified for % difference on the two columns.

No problems were found for this criterion.

9. CONTRACT PROBLEMS NON-COMPLIANCE:

None.

10. FIELD DOCUMENTATION:

No problems were identified.

11. OTHER PROBLEMS:

None.

12. DILUTIONS, RE-EXTRACTIONS & RE-ANALYSIS:

Samples may be re-analyzed for dilution, re-extraction and for other QC reasons. In such cases, the best result values are used. See summary report and EDD for applicable samples and analytes.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
DESA/HWSB/HWSS
2890, Woodbridge Avenue, Edison, NJ 08837

EXECUTIVE NARRATIVE

Case No.: 46633
Site Name: Former Duofold Corporation
Number of Samples: 19(Soil)
Analysis: VOA, SVOA and Aroclors

SDG No.: BD4N4
Laboratory: Chemtech
Sampling dates: 11/09/2016
Validation SOP: HW-33A (Rev 0), HW-35A (Rev 0), HW-36A (Rev 0), HW-37A (Rev 0)

QAPP:
Contractor: CDM Smith, 14 Wall Street, Suite 1701, New York
Reference: Document No. 3323-02960, Dated October 10, 2016

SUMMARY OF DEFINITIONS:

Critical: Results have an unacceptable level of uncertainty and should not be used for making decisions. Data have been qualified "R" rejected.

Major: A level of uncertainty exists that may not meet the data quality objectives for the project. A bias is likely to be present in the results. Data has been qualified "J" estimated. "J+" and "J-" represent likely direction of the bias.

Minor: The level of uncertainty is acceptable. No significant bias in the data was observed.

Critical Findings:

None

Major Findings:

Samples have analytes that have been qualified J, J+ or J-;

Minor Findings:

Detect values between MDL and CRQL are reported as estimated "J" values unless otherwise stated.

COMMENTS: Qualifications applied are summarized in Summary Reports.

Name: Narendra Kumar **Date: 01/ 05 /2017**

Affiliation: USEPA/R2/HWSB/HWSS

Data Qualifier Definitions (National Functional Guidelines)

Qualifier Symbol	Explanation		
	INORGANICS	**ORGANICS**	**CHLORINATED DIOXIN/FURAN**
U	The analyte was analyzed for, but was not detected above the level of the reported quantitation limit.	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted Contract Required Quantitation Limit (CRQL) for sample and method	The analyte was analyzed for but not detected. The value preceding the "U" may represent the adjusted Contract Required Quantitation Limit (see DLM02.X, Exhibit D, Section 1.2 and Table 2), or the sample specific estimated detection limit (EDL, see Method 8290A, Section 11.9.5).
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the CRQL.	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to an issue with the quality of the data generated because certain QC criteria were not met, or the concentration of the analyte was below the adjusted CRQL).
J+	The result is an estimated quantity, but the result may be biased high.	The result is an estimated quantity, but the result may be biased high.	
J–	The result is an estimated quantity, but the result may be biased low.	The result is an estimated quantity, but the result may be biased low.	
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.	The analyte was not detected at a level greater than or equal to the adjusted CRQL. However, the reported adjusted CRQL is approximate and may be inaccurate or imprecise.	The analyte was not detected (see definition of "U" flag, above). The reported value should be considered approximate.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.	The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.	The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
N		The analysis indicates the presence of an analyte for which there is presumptive evidence to make a “tentative identification”.	
NJ		The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.	
C		This qualifier applies to pesticide and Aroclor results when the identification has been confirmed by Gas Chromatograph/Mass Spectrometer (GC/MS).	
X		This qualifier applies to pesticide and Aroclor results when GC/MS analysis was attempted but was unsuccessful.	

DATA ASSESSMENT

ANALYSIS: VOA

The current SOP HW-33A (Revision 0) July 2015, USEPA Region II for the evaluation of Volatile organic data generated through Statement of Work SOM02.2 has been applied. Data have been reviewed according to TDF specifications, the National Functional Guidelines Report and the CCS Semi-Automated Screening Results Report. Tentatively Identified Compounds (TICs) for VOA organic fraction is not validated.

1. HOLDING TIME:

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimated, "J". The non-detects (sample quantitation limits) will be flagged as estimated, "J", or unusable, "R", if the holding times are grossly exceeded. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

2. DEUTERATED MONITORING COMPOUNDS (DMC's)

All samples are spiked with DMC compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured DMC recovery limits were outside Table 6 of the SOP HW-33A (Revision 0) qualifications were applied as per Table 7 SOP HW-33A (Revision 0) to all the samples and analytes as shown below.

The following samples have DMC/surrogate percent recoveries greater than the primary maximum criteria Detects are qualified as estimated J+. Non detects are not qualified.

1,2-Dichloropropane-d6, BD4P9

3. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD):

MS/MSD data are generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD data may be used in conjunction with other QC criteria for additional qualification of data. Qualifications were applied to the samples and analytes as shown below.

Not applicable.

4. BLANK CONTAMINATION:

Quality assurance (QA) blanks, i.e., method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during

sample preparation or field activity. Method blanks measure laboratory contamination. Trip blanks measure cross-contamination of samples during shipment. Field and rinse blanks measure cross-contamination of samples during field operations. Depending on the amount of contamination present in the QA blanks, the analytes are qualified as per Table 5 of SOP HW-33A (Rev 0).

A) Method blank contamination:

The following samples have analyte results reported less than CRQLs. The associated method blank results are less than CRQLs. Detects are qualified U. Sample results have been reported at CRQLs.

Methylene chloride, BD4N4

B) Field or rinse blank contamination:

Sample BD4Q2 is the field blank sample (VOA analysis reported in SDG # BD4Q3) and has Acetone (9.2 ug/L) < CRQL. The following samples have analyte concentration > CRQL. No qualifications were applied.

Acetone, BD4N4 (33 ug/kg), BD4P9 (170 ug/kg), BD4P9RE (170ug/kg)

C) Trip blank contamination for VOA aqueous samples:

BDQP1 identified as trip blank is in the SDG# BD4Q3. This has analyte concentration (12 ug/mL) > CRQL. The following samples have analyte results reported > CRQL and > trip blank concentrations. No qualifications were applied.

Acetone, BD4N4 (33 ug/kg), BD4P9 (170 ug/kg), BD4P9RE (170ug/kg)

D) Storage Blank associated with VOA samples only:

The following samples have analyte results reported less than CRQLs. The associated storage blank results are less than CRQLs. Detects are qualified U. Sample results have been reported at CRQLs.

Methylene chloride, BD4N4

E) Tentatively Identified Compounds:

Tentatively Identified Compounds (TICs) for VOA organic fractions are not validated.

5. MASS SPECTROMETER TUNING:

Tuning and performance criteria are established to ensure adequate mass resolution, proper identification of compounds and to some degree, sufficient instrument sensitivity. These criteria are not sample specific. Instrument performance is determined using standard materials. Therefore, these criteria should be met in all circumstances. The tuning standard for volatile organics is (BFB) Bromofluorobenzene. If the mass calibration

is in error, all associated data will be classified as unusable "R". Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

6. CALIBRATION:

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration checks document that the instrument is giving satisfactory daily performance.

A) Response Factor GC/MS:

The response factor measures the instrument's response to specific chemical compounds. All analytes for initial and continuing calibration should meet the minimum RRF criteria as listed in Table 2 of SOP HW 33A (Rev 0). If RRF is less than minimum RRF as specified in Table 2 for all target analytes, use professional judgment and all detects in the sample will be qualified as "J+" or "R". All non-detects for that compound will be rejected "R". Qualifications were applied to the samples and analytes as shown below.

No issues were identified for this criterion.

B) Percent Relative Standard Deviation (%RSD) and Percent Difference (%D):

Percent RSD is calculated from the initial calibration and is used to indicate the stability of the specific compound response factor over increasing concentration. Percent D compares the response factor of the continuing calibration check to the mean response factor (RRF) from the initial calibration. Percent D is a measure of the instrument's daily performance.

Percent RSD must be less than maximum %RSD in Table 2 of SOP HW 33A (Rev 0) for all target analytes. For the opening or closing CCV %D must be within the inclusive opening or closing maximum %D limits as listed in Table 2 of SOP HW 33A (Rev 0) for all Target compounds. A value outside of these limits indicates potential detection and quantitation errors. For these reasons, all positive results are flagged as estimated, "J" and Non-detects are flagged "UJ" for %D values outside criteria only. If %RSD exceeds QC criteria, detects may be qualified as "J" and use professional judgment to qualify non-detects. Qualifications were applied to the samples and analytes as shown below.

The following samples are associated with an initial calibration percent relative standard deviation (%RSD) outside criteria. Detects are qualified as estimated J. Non detects are not qualified.

o-Xylene, **BD4N4, BD4P9**

7. INTERNAL STANDARDS PERFORMANCE GC/MS:

Internal standards (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during every experimental run. The internal standard area count must be in the range as specified in Table 9 of SOP HW 33A (Rev 0) of the associated continuing calibration internal standard area. The retention time of the internal standards must be within the range as specified in Table 9 of SOP HW 33A (Rev 0). If the area count is greater than, all positive results quantitated using that IS are qualified as estimated "J-", and non-detects are not qualified. If the area count is less than the associated standard, all positive results for compounds quantitated with that IS are qualified as estimated "J+" and all non-detects are qualified "R".

If an internal standard retention time were not met as specified in Table 9 of SOP HW 33A (Rev 0), the reviewer will use professional judgment to determine either partial or total rejection of the data for that sample fraction. Qualifications were applied to the samples and analytes as shown below. Qualifications were applied to the samples and analytes as shown below.

The following samples have internal standard area response greater than or equal to expanded minimum criteria and less than primary minimum criteria. Detects are qualified as estimated J+. Nondetects are qualified as estimated UJ.

Chlorobenzene-d5, 1,4-Dichlorobenzene-d4, BD4P9, BD4P9RE

8. FIELD DUPLICATES:

Samples BD4P9 in this SDG is field duplicate of the sample BD4M4 which is in the SDG # BD4L5.

Detects Acetone, 2-Butanone and Methylene chloride are present in both samples at comparable levels. No qualifications were applied for this criterion.

9. COMPOUND IDENTIFICATION:

Target compounds are identified on the GC/MS by using the analyte's relative retention time (RRT) and by comparison to the ion spectra obtained from known standards. For the results to be a positive hit, the sample peak must be within a window of 0.06 RRT units of the standard compound and have ion spectra which has a ratio of the primary and secondary m/z intensities within 20% of that in the standard compound. For the tentatively identified compounds (TIC) the ion spectra must match accurately. In the cases where there is not an adequate ion spectrum match, the laboratory may have provided false positive identifications. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion. No qualifications were applied for this criterion.

10. CONTRACT PROBLEMS NON-COMPLIANCE:

The laboratory reported lower quality results (3 failed internal standard) from reanalysis. Initial analysis with two IS failure was not reported by the laboratory. SMO was unable to get the issue corrected.

11. FIELD DOCUMENTATION:

None.

12. OTHER PROBLEMS:

The laboratory reported inferior results (3 failed internal standard) from reanalysis. Initial analysis with two IS failure was not reported by the laboratory. SMO was unable to get the issue corrected.

13. DILUTIONS, RE-EXTRACTIONS & REANALYSIS:

Samples may be re-analyzed for dilution, re-extraction and for other QC reasons. In such cases, the best result values are used. The following sample had a reanalysis.

BD4L9

ANALYSIS: Semivolatiles

The current SOP HW-35A (Revision 0) July 2015, USEPA Region II for the evaluation of Semi-Volatile organic data generated through Statement of Work SOM02.2 has been applied. Data have been reviewed according to TDF specifications, the National Functional Guidelines Report and the CCS Semi-Automated Screening Results Report. Tentatively Identified Compounds (TICs) for BNA organic fraction is not validated.

1. HOLDING TIME:

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded, qualifications will be applied as per SOP HW-35A (Rev 0).

No problems were found for this criterion.

2. DEUTERATED MONITORING COMPOUNDS (DMCs)

All samples are spiked with DMC compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured DMC recovery limits were outside Table 6 of SOP HW-35A (Revision 0), qualifications were applied as per Table 7 of SOP HW-35A (Revision 0) to all the samples and analytes as shown below.

The following samples have DMC/surrogate percent recoveries less than the primary minimum criteria. Detects are qualified as estimated J-. Nondetects are qualified as estimated UJ.

4-Chloroaniline-d4, BD4Q2

The following samples have DMC/surrogate percent recoveries less than the primary minimum criteria but greater than or equal to the expanded minimum criteria. Detects are qualified as estimated J-. Nondetects are qualified as estimated UJ.

1,4-Dioxane-d8, BD4Q2

3. MATRIX SPIKE/MATRIX SPIKE DUPLICATES (MS/MSD):

MS/MSD data are generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD data may be used in conjunction with other QC criteria for additional qualification of data. Qualifications were applied to the samples and analytes as shown below.

Not applicable.

4. BLANK CONTAMINATION:

Quality assurance (QA) blanks, i.e., method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Trip blanks measure cross-contamination of samples during shipment. Field and rinse blanks measure cross-contamination of samples during field operations. Depending on the amount of contamination present in the QA blanks, the analytes are qualified as per Table 5 of SOP HW-35A (Rev 0).

No problems were found for this criterion.

A) Method blank contamination:

No problems were found for this criterion.

B) Field or rinse blank contamination:

Sample BD4Q2 is field blank which has the following detects < CRQL

Benzaldehyde, 4-Chloro-3-methylphenol

Compounds were nondetects in the samples. No qualification was applied.

C) Tentatively Identified Compounds:

Tentatively Identified Compounds (TICs) for SVOA organic fraction are not validated.

5. MASS SPECTROMETER TUNING:

Tuning and performance criteria are established to ensure adequate mass resolution, proper identification of compounds and to some degree, sufficient instrument sensitivity. These criteria are not sample specific. Instrument performance is determined using standard materials. Therefore, these criteria should be met in all circumstances. The

tuning standard for Semi-volatiles is Decafluorotriphenyl-phosphine (DFTPP). If the mass calibration is in error, all associated data will be classified as unusable "R".

No problems were found for this criterion.

6. CALIBRATION:

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration checks document that the instrument is giving satisfactory daily performance.

A) Response Factor GC/MS:

The response factor measures the instrument's response to specific chemical compounds. All analytes for initial and continuing calibration should meet the minimum RRF criteria as listed in Table 2 of SOP HW 35A (Rev 0). If RRF is less than minimum RRF as specified in Table 2 for all target analytes, use professional judgment and all detects in the sample will be qualified as "J+" or "R". All non-detects for that compound will be rejected "R". Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

B) Percent Relative Standard Deviation (%RSD) and Percent Difference (%D):

Percent RSD is calculated from the initial calibration and is used to indicate the stability of the specific compound response factor over increasing concentration. Percent D compares the response factor of the continuing calibration check to the mean response factor (RRF) from the initial calibration. Percent D is a measure of the instrument's daily performance.

Percent RSD must be less than maximum %RSD in Table 2 of SOP HW 35A (Rev 0) for all target analytes. For the opening or closing CCV %D must be within the inclusive opening or closing maximum %D limits as listed in Table 2 of SOP HW 35A (Rev 0) for all Target compounds. A value outside of these limits indicates potential detection and quantitation errors. For these reasons, all positive results are flagged as estimated, "J" and Non-detects are flagged "UJ" for %D values outside criteria only. If %RSD exceeds QC criteria, detects may be qualified as "J" and use professional judgment to qualify non-detects. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

7. INTERNAL STANDARDS PERFORMANCE GC/MS:

Internal standards (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during every experimental run. The internal standard area count must be in the range as specified in Table 10 of SOP HW 35A (Rev 0) of the associated continuing calibration internal standard area. The retention time of the internal standards

must be within the range as specified in Table 10 of SOP HW 35A (Rev 0). If the area count is greater than, all positive results quantitated using that IS are qualified as estimated "J-", and non-detects are not qualified. If the area count is less than the associated standard, all positive results for compounds quantitated with that IS are qualified as estimated "J+" and all non-detects are qualified "R".

If an internal standard retention time were not met as specified in Table 10 of SOP HW 35A (Rev 0), the reviewer will use professional judgment to determine either partial or total rejection of the data for that sample fraction. Qualifications were applied to the samples and analytes as shown below. Qualifications were applied to the samples and analytes as shown below.

No issues were identified for this criterion.

8. FIELD DUPLICATES:

Samples BD4P9 in this SDG is field duplicate of the sample BD4M4 which is in the SDG # BD4L5.

Dimethylphthalate Conc (ug/kg)

BD4P9	BD4M4
520	890

No Qualifications were applied.

Phenol Conc.(ug/kg)

BD4P9	BD4M4
150	200

No qualifications were applied.

9. COMPOUND IDENTIFICATION:

A) Semi-Volatile Fractions:

TCL compounds are identified on the GC/MS by using the analyte's relative retention time (RRT) and by comparison to the ion spectra obtained from known standards. For the results to be a positive hit, the sample peak must be within 0.06 RRT units of the standard compound and have ion spectra which have a ratio of the primary and secondary m/e intensities within 20% of that in the standard compound. For the tentatively identified compounds (TIC) the ion spectra must match accurately. In the cases where there is not an adequate ion spectrum match, the laboratory may have provided false positive identifications. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

10. CONTRACT PROBLEMS NON-COMPLIANCE:

None

11. FIELD DOCUMENTATION:

No problems were identified.

12. OTHER PROBLEMS:

None

13. DILUTIONS, RE-EXTRACTIONS and REANALYSIS:

Samples may be re-analyzed for dilution, re-extraction and for other QC reasons. In such cases, the best result values are used. See summary report and EDD for applicable samples and analytes.

ANALYSIS: Aroclors

The current SOP HW-37A (Revision 0) July 2015, USEPA Region II for the evaluation of PCB data generated through Statement of Work SOM02.2 has been applied. Data have been reviewed according to TDF specifications, the National Functional Guidelines Report and the CCS Semi-Automated Screening Results Report.

1. HOLDING TIME:

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimated, "J". Use professional judgment to qualify the non-detects (sample quantitation limits), if the holding times are grossly exceeded. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

2. SURROGATES:

All samples are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured surrogate recovery were outside Table 5 of the SOP HW-37A (Revision 0), qualifications were applied to the samples and analytes as shown below.

No problems were identified in the samples for this criterion.

3. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD):

MS/MSD data are generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD data may be used in conjunction with

other QC criteria for additional qualification of data. Qualifications were applied to the samples and analytes as shown below.

The relative percent difference (RPD) between the following matrix spike and matrix spike duplicate recoveries is outside criteria. Detects are qualified as estimated J. Nondetects are not qualified.

Aroclor 1060, BD3H1

4. Laboratory Control Samples (LCS):

LCS data provides information on the accuracy of the analytical method and laboratory performance. If LCS recoveries fell outside of the acceptable limits, qualifications were applied to the associated samples and compounds as shown below.

No problems were found for this criterion.

5. BLANK CONTAMINATION:

Quality assurance (QA) blanks, i.e., method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure cross-contamination of samples during field operations. Depending on the concentration of the analyte in the blank, the analytes are qualified as non-detects U. Qualifications were applied to the samples and analytes as shown below.

A) Method blank contamination:

No problems were found for this criterion.

B) Field or rinse blank contamination:

No problems were found for this criterion

6. CALIBRATION:

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration checks document that the instrument is giving satisfactory daily performance.

A) Percent Relative Standard Deviation (%RSD):

For the PCB fraction, if %RSD exceeds 20% for all analytes and the two surrogates, qualify all associated positive results "J" and use professional judgment to qualify non-detects. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

B) Percent Difference (%D):

For opening CCV, or closing CCV that is used as an opening CCV for the next 12-hour period, if %D exceeds 25% for analytes and the two surrogates, qualify all associated positive results "J" and non-detects "UJ".

For closing CCV, if %D exceeds 50% for all analytes and the two surrogates, qualify all associated positive results "J" and non-detects "UJ". Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

7. FIELD DUPLICATES:

Samples BD4P9 in this SDG is field duplicate of the sample BD4M4 which is in the SDG # BD4L5. Analytes are nondetects in both samples. No qualification was required for this criterion.

8. COMPOUND IDENTIFICATION:

A) PCB Fraction:

The retention times of reported compounds must fall within the calculated retention time windows for the two chromatographic columns and a GC/MS confirmation is required if the concentration exceeds 10ng/ml in the final sample extract. Qualifications were applied to the samples and analytes as shown below.

Percent Differences	**Qualifier**
0% - 25%	No qualification
26% - 200%	Professional Judgment
101% - 200% (interference detected, either column)	JN
> 50% (Aroclor value < CRQL, value raised to CRQL)	U
> 200%	R

Samples and analytes were all nondetects.

9. CONTRACT PROBLEMS NON-COMPLIANCE:

None

10. FIELD DOCUMENTATION:

No problems were identified.

11. OTHER PROBLEMS:

None

12. DILUTIONS, RE-EXTRACTIONS & RE-ANALYSIS:

Samples may be re-analyzed for dilution, re-extraction and for other QC reasons. In such cases, the best result values are used. See summary report and EDD for applicable samples and analytes.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
DESA/HWSB/HWSS
2890, Woodbridge Avenue, Edison, NJ 08837

EXECUTIVE NARRATIVE

Case No.: 46534
Site Name: SKYBELL MILL
Number of Samples: 19(Soil)
Analysis: PEST

SDG No.: BD3G6
Laboratory: KAP
Sampling dates: 11/07, 09/2016
Validation SOP: HW-36A (Rev 0)

QAPP:
Contractor: CDM Smith, 14 Wall Street, Suite 1701, New York
Reference: Document No. 3323-02960, Dated October 10, 2016

SUMMARY OF DEFINITIONS:

Critical: Results have an unacceptable level of uncertainty and should not be used for making decisions. Data have been qualified "R" rejected.

Major: A level of uncertainty exists that may not meet the data quality objectives for the project. A bias is likely to be present in the results. Data has been qualified "J" estimated. "J+" and "J-" represent likely direction of the bias.

Minor: The level of uncertainty is acceptable. No significant bias in the data was observed.

Critical Findings:

None

Major Findings:

Samples have analytes that have been qualified J, J+ or J-;

Minor Findings:

Detect values between MDL and CRQL are reported as estimated "J" values unless otherwise stated.

COMMENTS: Qualifications applied are summarized in Summary Reports.

Name: Narendra Kumar

Date: 01/ 05/2017

Affiliation: USEPA/R2/HWSB/HWSS

Data Qualifier Definitions (National Functional Guidelines)

Qualifier Symbol	Explanation		
	INORGANICS	**ORGANICS**	**CHLORINATED DIOXIN/FURAN**
U	The analyte was analyzed for, but was not detected above the level of the reported quantitation limit.	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted Contract Required Quantitation Limit (CRQL) for sample and method	The analyte was analyzed for but not detected. The value preceding the "U" may represent the adjusted Contract Required Quantitation Limit (see DLM02.X, Exhibit D, Section 1.2 and Table 2), or the sample specific estimated detection limit (EDL, see Method 8290A, Section 11.9.5).
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the CRQL.	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to an issue with the quality of the data generated because certain QC criteria were not met, or the concentration of the analyte was below the adjusted CRQL).
J+	The result is an estimated quantity, but the result may be biased high.	The result is an estimated quantity, but the result may be biased high.	
J–	The result is an estimated quantity, but the result may be biased low.	The result is an estimated quantity, but the result may be biased low.	
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.	The analyte was not detected at a level greater than or equal to the adjusted CRQL. However, the reported adjusted CRQL is approximate and may be inaccurate or imprecise.	The analyte was not detected (see definition of "U" flag, above). The reported value should be considered approximate.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.	The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.	The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
N		The analysis indicates the presence of an analyte for which there is presumptive evidence to make a “tentative identification”.	
NJ		The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.	
C		This qualifier applies to pesticide and Aroclor results when the identification has been confirmed by Gas Chromatograph/Mass Spectrometer (GC/MS).	
X		This qualifier applies to pesticide and Aroclor results when GC/MS analysis was attempted but was unsuccessful.	

DATA ASSESSMENT

ANALYSIS: PESTICIDES

The current SOP HW-36A (Revision 0) July 2015, USEPA Region II for the evaluation of Pesticides data generated through Statement of Work SOM02.2 has been applied. Data have been reviewed according to TDF specifications, the National Functional Guidelines Report and the CCS Semi-Automated Screening Results Report.

1. HOLDING TIME:

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimated, "J". Use professional judgment to qualify the non-detects (sample quantitation limits), if the holding times are grossly exceeded. If the holding times are grossly exceeded. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

2. SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured surrogate recovery were outside Table 7 of the SOP HW-36A (Revision 0), qualifications were applied to the samples and analytes as shown below.

The following samples have DMC/surrogate percent recoveries less than the primary minimum criteria but greater than or equal to the expanded minimum criteria. Detects are qualified as estimated J-. Nondetects are qualified as estimated UJ.

Decachlorobiphenyl, BD4P0, BD4Q1, BD4P3, BD4P7, BD4P6, BD4P2, BD4P4, BD4P5, BD4P1

3. MATRIX SPIKE/MATRIX SPIKE DUPLICATES (MS/MSD):

MS/MSD data are generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD data may be used in conjunction with other QC criteria for additional qualification of data. Qualifications were applied to the samples and analytes as shown below.

The relative percent difference (RPD) between the following matrix spike and matrix spike duplicate recoveries is outside criteria. Detects are qualified as estimated J. Nondetects are not qualified.

No problems were found for this criterion.

4. LABORATORY CONTROL SAMPLE RECOVERY (LCS):

LCS data is generated to determine the long-term precision and accuracy of the analytical method. The LCS may be used in conjunction with other QC criteria for additional qualification of data. Qualifications were applied to the samples and analytes as shown below.

No issues were identified for this criterion.

5. GPC CALIBRATION VERIFICATION:

The following samples are associated to a GPC Calibration Verification Check with percent recoveries greater than the maximum criteria. Detects and non-detects were not qualified. qualified.

No issues were identified for this criterion

6. BLANK CONTAMINATION:

Quality assurance (QA) blanks, i.e., method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure cross-contamination of samples during field operations. Depending on the concentration of the analyte in the blank, the analytes are qualified as non-detects, "U". Qualifications were applied to the samples and analytes as shown below.

A) Method/Instrument blank contamination:

No problems were found for this criterion.

B) Field or rinse blank contamination:

BD4Q2 is the field blank sample. No contaminant was found.

7. CALIBRATION:

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration checks document that the instrument is giving satisfactory daily performance.

A) Percent Relative Standard Deviation (%RSD) and Percent Difference (%D):

For the PESTICIDE fraction, if %RSD exceeds 20% for all analytes except alpha-BHC and delta-BHC 25%, for the two surrogates and Toxaphene 30%, qualify all associated positive

results "J" and use professional judgment to qualify non-detects. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

A) **The Percent Difference (%D) for each of the SCP and surrogate in the PEM used for CCV must be greater than or equal to -25% and less than or equal to 25.0%. The Percent Difference (%D) between the calibration Factor (CF) for each of the SCP and surrogate in the Calibration Verification Standard (CS3) and the mean calibration factor from the initial calibration must be greater than or equal to -25% and less than or equal to 25.0%. The Percent Difference not within limits, detected associated compounds are qualified "J" and non-detected associated compounds are qualified "UJ". Qualifications were applied to the samples and analytes as shown below.**

No problems were found for this criterion.

8. FIELD DUPLICATES:

Samples BD4Q1 is field duplicate of the sample BD4P5. All analytes were non-detects in both samples. No qualifications were required for this criterion.

9. COMPOUND IDENTIFICATION:

The retention times of reported compounds must fall within the calculated retention time windows for the two chromatographic columns and a GC/MS confirmation is required if the concentration exceeds 10ng/ml in the final sample extract. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

10. CONTRACT PROBLEMS NON-COMPLIANCE:

Laboratory did not fill out the forms correctly.

11. FIELD DOCUMENTATION:

No problems were identified.

12. OTHER PROBLEMS:

None

13. DILUTIONS, RE-EXTRACTIONS & REANALYSIS:

Samples may be re-analyzed for dilution, re-extraction and for other QC reasons. In such cases, the best result values are used. See summary report and EDD for applicable samples and analytes.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
DESA/HWSB/HWSS
2890, Woodbridge Avenue, Edison, NJ 08837

EXECUTIVE NARRATIVE

Case No.: 46633
Site Name: Former Duofold Corporation
Number of Samples: 19(Soil)
Analysis: TVOA, VOA and SVOA

SDG No.: BD4Q3
Laboratory: Chemtech
Sampling dates: 11/07-09/2016
Validation SOP: HW-33A (Rev 0), HW-35A (Rev 0), HW-34A (Rev 0)

QAPP:
Contractor: CDM Smith, 14 Wall Street, Suite 1701, New York
Reference: Document No. 3323-02960, Dated October 10, 2016

SUMMARY OF DEFINITIONS:

Critical: Results have an unacceptable level of uncertainty and should not be used for making decisions. Data have been qualified "R" rejected.

Major: A level of uncertainty exists that may not meet the data quality objectives for the project. A bias is likely to be present in the results. Data has been qualified "J" estimated. "J+" and "J-" represent likely direction of the bias.

Minor: The level of uncertainty is acceptable. No significant bias in the data was observed.

Critical Findings:

None

Major Findings:

Samples have analytes that have been qualified J, J+ or J-;

Minor Findings:

Detect values between MDL and CRQL are reported as estimated "J" values unless otherwise stated.

COMMENTS: Qualifications applied are summarized in Summary Reports.

Name: Narendra Kumar **Date: 01/05/2016**

Affiliation: USEPA/R2/HWSB/HWSS

Data Qualifier Definitions (National Functional Guidelines)

Qualifier Symbol	Explanation		
	INORGANICS	**ORGANICS**	**CHLORINATED DIOXIN/FURAN**
U	The analyte was analyzed for, but was not detected above the level of the reported quantitation limit.	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted Contract Required Quantitation Limit (CRQL) for sample and method	The analyte was analyzed for but not detected. The value preceding the "U" may represent the adjusted Contract Required Quantitation Limit (see DLM02.X, Exhibit D, Section 1.2 and Table 2), or the sample specific estimated detection limit (EDL, see Method 8290A, Section 11.9.5).
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the CRQL.	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to an issue with the quality of the data generated because certain QC criteria were not met, or the concentration of the analyte was below the adjusted CRQL).
J+	The result is an estimated quantity, but the result may be biased high.	The result is an estimated quantity, but the result may be biased high.	
J–	The result is an estimated quantity, but the result may be biased low.	The result is an estimated quantity, but the result may be biased low.	
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.	The analyte was not detected at a level greater than or equal to the adjusted CRQL. However, the reported adjusted CRQL is approximate and may be inaccurate or imprecise.	The analyte was not detected (see definition of "U" flag, above). The reported value should be considered approximate.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.	The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.	The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
N		The analysis indicates the presence of an analyte for which there is presumptive evidence to make a “tentative identification”.	
NJ		The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.	
C		This qualifier applies to pesticide and Aroclor results when the identification has been confirmed by Gas Chromatograph/Mass Spectrometer (GC/MS).	
X		This qualifier applies to pesticide and Aroclor results when GC/MS analysis was attempted but was unsuccessful.	

DATA ASSESSMENT

ANALYSIS: TVOA

The current SOP HW-34A (Revision 0) July 2015, USEPA Region II for the evaluation of Trace Volatile organic data generated through Statement of Work SOM02.2 has been applied. Data have been reviewed according to TDF specifications, the National Functional Guidelines Report and the CCS Semi-Automated Screening Results Report. Tentatively Identified Compounds (TICs) for TVOA organic fraction is not validated.

1. HOLDING TIME:

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimated, "J". The non-detects (sample quantitation limits) will be flagged as unusable, "R". Use professional judgment to qualify detects and non-detects for aqueous sample whose temperature is above 6º C or below 2º C Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

2. DEUTERATED MONITORING COMPOUNDS (DMC's)

All samples are spiked with DMC compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured DMC recovery limits were outside Table 6 of the SOP HW 34A (Rev 0), qualifications were applied as per Table 7 of the SOP HW 34A (Rev 0) to all the samples and analytes as shown below.

The following samples have DMC/surrogate percent recoveries less than the primary minimum criteria but greater than or equal to the expanded minimum criteria. Detects are qualified as estimated J-. Non-detects are qualified as estimated UJ.

1,1-Dichloroethene-d2 BD4Q5

3. MATRIX SPIKE/ MATRIX SPIKE RECOVERY:

MS/MSD data is generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD data may be used in conjunction with other QC criteria for additional qualification of data.

Not applicable.

4. BLANK CONTAMINATION:

Quality assurance (QA) blanks, i.e., method, trip, field, or rinse blanks are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Trip blanks measure cross-contamination of samples during shipment. Field and rinse blanks measure cross-contamination of samples during field operations. Depending on the amount of contamination present in the QA blanks, the analytes are qualified as per Table 5 of SOP HW-34A (Rev 0).

A) Method blank contamination:

No problems were found for this criterion.

B) Field or rinse blank contamination:

Sample BDQN8 is field blank sample and has Acetone (12ug/L) as the only contaminant. Associated Samples are BDQP1(trip blank), BDQN8, BD4R4, BD4R3, BD4R2 and BD4Q9 (Sampling date **11/9/2016**). Samples were qualified as below:

Acetone:

BDQP1, BDQP0, BDQN9, trip blanks, not qualified

BD4R2 and **BD4Q9** (Sampling date **11/9/2016),** “U” at CRQL

BD4Q8, BD4Q6 and BD4Q5 (Sampling date 11/8/2016), “U” at CRQL.

BD4Q4 and BD4Q3 (Sampling date 11-7-2016) were qualified using higher trip blank sample as below.

C) Trip blank contamination:

Sample BDQP1 is the trip blank associated with samples BDQN8, BD4R4, BD4R3, BD4R2 and BD4Q9 (Sampling date 11/9/2016). This sample has Acetone and Methylene chloride as contaminants.

Acetone: This trip blank sample has Acetone as the same contaminant at the same level (12ug/L) as the field blank above. Samples were qualified using field blank as above.

Methylene chloride: This trip blank sample has Methylene chloride also as a contaminant at (0.39 ug/L), <CRQL. The following samples were qualified.

BD4Q9, BD4R4

Sample BDQP0 is trip blank associated with samples BDQN6, BD4Q8, BD4Q7, BD4Q6 and BD4Q5 (Sampling date 11/8/2016).

Acetone: This trip blank sample has Acetone as the same contaminant at lower level (11ug/L) as the field blank above. Samples were qualified using field blank.

Methylene chloride: This trip blank sample has Methylene chloride as the contaminant at (0.37 ug/L), <CRQL. Associated samples were qualified as follows:

No associated sample has methylene chloride detected.

Sample BDQN9 is trip blank has Acetone (14 ug/L) >CRQL and Methylene chloride (0.39 ug/L) < CRQL. Associated samples BD4Q4 and BD4Q3 (Sampling date 11-7-2016) were qualified as follows.

Acetone: BD4Q3
Methylene chloride: None

D) Storage Blank associated with VOA samples only:

No problems were found for this criterion.

E) Tentatively Identified Compounds:

Tentatively Identified Compounds (TICs) for TVOA organic fraction are not validated.

5. MASS SPECTROMETER TUNING:

Tuning and performance criteria are established to ensure adequate mass resolution, proper identification of compounds and to some degree, sufficient instrument sensitivity. These criteria are not sample specific. Instrument performance is determined using standard materials. Therefore, these criteria should be met in all circumstances. The tuning standard for volatile organics is (BFB) Bromofluorobenzene. If the mass calibration is in error, all associated data will be classified as unusable "R". Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

6. CALIBRATION:

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration checks document that the instrument is giving satisfactory daily performance.

A) Response Factor GC/MS:

The response factor measures the instrument's response to specific chemical compounds. All analytes for initial and continuing calibration should meet the minimum RRF criteria as listed in Table 2 of SOP HW 34A (Rev 0). If RRF is less than minimum RRF specified in Table 2 for all target analytes, use professional judgment and all detects in the sample will be qualified as "J+" or "R". All non-detects for that compound will be rejected "R". Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

B) Percent Relative Standard Deviation (%RSD) and Percent Difference (%D):

Percent RSD is calculated from the initial calibration and is used to indicate the stability of the specific compound response factor over increasing concentration. Percent D compares the response factor of the continuing calibration check to the mean response factor (RRF) from the initial calibration.

Percent RSD must be less than maximum %RSD in Table 2 of SOP HW 34A (Rev 0) for all target analytes. For the opening or closing CCV %D must be within the inclusive opening or closing maximum %D limits as listed in Table 2 of SOP HW 34A (Rev 0) for all Target compounds. A value outside of these limits indicates potential detection and quantitation errors. For these reasons, all positive results are flagged as estimated, "J" and Non-detects are flagged "UJ" for %D values outside criteria only. If %RSD exceeds QC criteria, detects may be qualified as "J" and use professional judgment to qualify non-detects. Qualifications were applied to the samples and analytes as shown below.

No qualifications were applied for this criterion.

7. INTERNAL STANDARDS PERFORMANCE GC/MS:

Internal standards (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during every experimental run. The internal standard area count must be in the range as specified in Table 9 of SOP HW 34A (Rev 0) of the associated continuing calibration internal standard area. The retention time of the internal standards must be within the range as specified in Table 9 of SOP HW 34A (Rev 0). If the area count is greater than, all positive results quantitated using that IS are qualified as estimated "J-", and non-detects are not qualified. If the area count is less than the associated standard, all positive results for compounds quantitated with that IS are qualified as estimated "J+" and all non-detects are qualified "R".

If an internal standard retention time were not met as specified in Table 9 of SOP HW 34A (Rev 0), the reviewer will use professional judgment to determine either partial or total rejection of the data for that sample fraction. Qualifications were applied to the samples and analytes as shown below. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

8. FIELD DUPLICATES:

Samples BDQN6 and BD4Q7 are field duplicates. Samples did not contain any analytes of interest. No qualifications were required for this criterion.

9. COMPOUND IDENTIFICATION:

Target compounds are identified on the GC/MS by using the analyte's relative retention time (RRT) and by comparison to the ion spectra obtained from known standards. For the results to be a positive hit, the sample peak must be within a window of 0.06 RRT units of the standard compound and have ion spectra which has a ratio of the primary and secondary m/z intensities within 20% of that in the standard compound. For the tentatively identified compounds (TIC) the ion spectra must match accurately. In the cases where there is not an adequate ion spectrum match, the laboratory may have provided false positive identifications. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

10. CONTRACT PROBLEMS NON-COMPLIANCE:

None.

11. FIELD DOCUMENTATION:

No problems were identified.

12. OTHER PROBLEMS:

None.

13. DILUTIONS, RE-EXTRACTIONS & REANALYSIS:

Samples may be re-analyzed for dilution, re-extraction and for other QC reasons. In such cases, the best result values are used. See summary report and EDD for applicable samples and analytes.

ANALYSIS: VOA

The current SOP HW-33A (Revision 0) July 2015, USEPA Region II for the evaluation of Volatile organic data generated through Statement of Work SOM02.2 has been applied. Data have been reviewed according to TDF specifications, the National Functional Guidelines Report and the CCS Semi-Automated Screening Results Report. Tentatively Identified Compounds (TICs) for VOA organic fraction is not validated.

There is only one sample, BD4Q2 for VOA analysis in this SDG. This is field blank per trip report.

1. HOLDING TIME:

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimated, "J". The non-detects (sample quantitation limits) will be flagged as estimated, "J", or unusable, "R", if the holding times are grossly exceeded. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

2. DEUTERATED MONITORING COMPOUNDS (DMC's)

All samples are spiked with DMC compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured DMC recovery limits were outside Table 6 of the SOP HW-33A (Revision 0) qualifications were applied as per Table 7 SOP HW-33A (Revision 0) to all the samples and analytes as shown below.

No issues were found for this criterion.

3. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD):

MS/MSD data are generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD data may be used in conjunction with other QC criteria for additional qualification of data. Qualifications were applied to the samples and analytes as shown below.

Not applicable.

4. BLANK CONTAMINATION:

Quality assurance (QA) blanks, i.e., method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Trip blanks measure cross-contamination of samples during shipment. Field and rinse blanks measure cross-contamination of samples during field operations. Depending on the amount of contamination present in the QA blanks, the analytes are qualified as per Table 5 of SOP HW-33A (Rev 0).

A) Method blank contamination:

No problems were identified for this criterion.

B) Field or rinse blank contamination:

Sample BD4Q2 is the field blank sample itself and has Acetone (9.2 ug/L) <CRQL. No qualifications were applied to this result.

C) Trip blank contamination for VOA aqueous samples:

Not applicable

D) Storage Blank associated with VOA samples only:

No problems were identified for this criterion.

E) Tentatively Identified Compounds:

Tentatively Identified Compounds (TICs) for VOA organic fractions are not validated.

5. MASS SPECTROMETER TUNING:

Tuning and performance criteria are established to ensure adequate mass resolution, proper identification of compounds and to some degree, sufficient instrument sensitivity. These criteria are not sample specific. Instrument performance is determined using standard materials. Therefore, these criteria should be met in all circumstances. The tuning standard for volatile organics is (BFB) Bromofluorobenzene. If the mass calibration is in error, all associated data will be classified as unusable "R". Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

6. CALIBRATION:

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration checks document that the instrument is giving satisfactory daily performance.

A) Response Factor GC/MS:

The response factor measures the instrument's response to specific chemical compounds. All analytes for initial and continuing calibration should meet the minimum RRF criteria as listed in Table 2 of SOP HW 33A (Rev 0). If RRF is less than minimum RRF as specified in Table 2 for all target analytes, use professional judgment and all detects in the sample will be qualified as "J+" or "R". All non-detects for that compound will be rejected "R". Qualifications were applied to the samples and analytes as shown below.

No issues were identified for this criterion.

B) Percent Relative Standard Deviation (%RSD) and Percent Difference (%D):

Percent RSD is calculated from the initial calibration and is used to indicate the stability of the specific compound response factor over increasing concentration. Percent D compares the response factor of the continuing calibration check to the mean response factor (RRF) from the initial calibration. Percent D is a measure of the instrument's daily performance.

Percent RSD must be less than maximum %RSD in Table 2 of SOP HW 33A (Rev 0) for all target analytes. For the opening or closing CCV %D must be within the inclusive opening

or closing maximum %D limits as listed in Table 2 of SOP HW 33A (Rev 0) for all Target compounds. A value outside of these limits indicates potential detection and quantitation errors. For these reasons, all positive results are flagged as estimated, "J" and Non-detects are flagged "UJ" for %D values outside criteria only. If %RSD exceeds QC criteria, detects may be qualified as “J” and use professional judgment to qualify non-detects. Qualifications were applied to the samples and analytes as shown below.

No issues were found for this criterion.

7. INTERNAL STANDARDS PERFORMANCE GC/MS:

Internal standards (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during every experimental run. The internal standard area count must be in the range as specified in Table 9 of SOP HW 33A (Rev 0) of the associated continuing calibration internal standard area. The retention time of the internal standards must be within the range as specified in Table 9 of SOP HW 33A (Rev 0). If the area count is greater than, all positive results quantitated using that IS are qualified as estimated “J-”, and non-detects are not qualified. If the area count is less than the associated standard, all positive results for compounds quantitated with that IS are qualified as estimated “J+” and all non-detects are qualified “R”.

If an internal standard retention time were not met as specified in Table 9 of SOP HW 33A (Rev 0), the reviewer will use professional judgment to determine either partial or total rejection of the data for that sample fraction. Qualifications were applied to the samples and analytes as shown below. Qualifications were applied to the samples and analytes as shown below.

No issues were found for this criterion.

8. FIELD DUPLICATES:

Not applicable.

9. COMPOUND IDENTIFICATION:

Target compounds are identified on the GC/MS by using the analyte's relative retention time (RRT) and by comparison to the ion spectra obtained from known standards. For the results to be a positive hit, the sample peak must be within a window of 0.06 RRT units of the standard compound and have ion spectra which has a ratio of the primary and secondary m/z intensities within 20% of that in the standard compound. For the tentatively identified compounds (TIC) the ion spectra must match accurately. In the cases where there is not an adequate ion spectrum match, the laboratory may have provided false positive identifications. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion. No qualifications were applied for this criterion.

10. CONTRACT PROBLEMS NON-COMPLIANCE:

None.

11. FIELD DOCUMENTATION:

None.

12. OTHER PROBLEMS:

None.

13. DILUTIONS, RE-EXTRACTIONS & REANALYSIS:

Samples may be re-analyzed for dilution, re-extraction and for other QC reasons. In such cases, the best result values are used. See summary report and EDD for applicable samples and analytes.

ANALYSIS: Semivolatiles

The current SOP HW-35A (Revision 0) July 2015, USEPA Region II for the evaluation of Semi-Volatile organic data generated through Statement of Work SOM02.2 has been applied. Data have been reviewed according to TDF specifications, the National Functional Guidelines Report and the CCS Semi-Automated Screening Results Report. Tentatively Identified Compounds (TICs) for BNA organic fraction is not validated.

1. HOLDING TIME:

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded, qualifications will be applied as per SOP HW-35A (Rev 0).

No problems were found for this criterion.

2. DEUTERATED MONITORING COMPOUNDS (DMCs)

All samples are spiked with DMC compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured DMC recovery limits were outside Table 6 of SOP HW-35A (Revision 0), qualifications were applied as per Table 7 of SOP HW-35A (Revision 0) to all the samples and analytes as shown below.

The following samples have DMC/surrogate percent recoveries less than the primary minimum criteria. Detects are qualified as estimated J-. Nondetects are qualified as estimated UJ.

4-Chloroaniline-d4, BD4Q7, BD4R3
4-Nitrophenol-d4, BD4Q7

The following samples have DMC/surrogate percent recoveries less than the primary minimum criteria but greater than or equal to the expanded minimum criteria. Detects are qualified as estimated J-. Nondetects are qualified as estimated UJ.

1,4-Dioxane-d8, BD4R2, BD4R3, BD4Q5, BD4Q6, BD4R4, BD4Q7, BD4Q8, BD4Q9, BDQN6, BDQN8, BD4Q4

3. MATRIX SPIKE/MATRIX SPIKE DUPLICATES (MS/MSD):

MS/MSD data are generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD data may be used in conjunction with other QC criteria for additional qualification of data. Qualifications were applied to the samples and analytes as shown below.

Not applicable.

4. BLANK CONTAMINATION:

Quality assurance (QA) blanks, i.e., method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Trip blanks measure cross-contamination of samples during shipment. Field and rinse blanks measure cross-contamination of samples during field operations. Depending on the amount of contamination present in the QA blanks, the analytes are qualified as per Table 5 of SOP HW-35A (Rev 0).

No problems were found for this criterion.

A) Method blank contamination:

No problems were found for this criterion.

B) Field or rinse blank contamination:

Sample BDQN8 is field blank and has the following detects < CRQL

Benzaldehyde (2ug/L) and 4-Chloro-3-methylphenol (4.8 ug/L)

Compounds were nondetects in the samples. No qualification was applied.

C) Tentatively Identified Compounds:

Tentatively Identified Compounds (TICs) for SVOA organic fraction are not validated.

5. MASS SPECTROMETER TUNING:

Tuning and performance criteria are established to ensure adequate mass resolution, proper identification of compounds and to some degree, sufficient instrument sensitivity. These criteria are not sample specific. Instrument performance is determined using standard materials. Therefore, these criteria should be met in all circumstances. The

tuning standard for Semi-volatiles is Decafluorotriphenyl-phosphine (DFTPP). If the mass calibration is in error, all associated data will be classified as unusable "R".

No problems were found for this criterion.

6. CALIBRATION:

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration checks document that the instrument is giving satisfactory daily performance.

A) Response Factor GC/MS:

The response factor measures the instrument's response to specific chemical compounds. All analytes for initial and continuing calibration should meet the minimum RRF criteria as listed in Table 2 of SOP HW 35A (Rev 0). If RRF is less than minimum RRF as specified in Table 2 for all target analytes, use professional judgment and all detects in the sample will be qualified as "J+" or "R". All non-detects for that compound will be rejected "R". Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

B) Percent Relative Standard Deviation (%RSD) and Percent Difference (%D):

Percent RSD is calculated from the initial calibration and is used to indicate the stability of the specific compound response factor over increasing concentration. Percent D compares the response factor of the continuing calibration check to the mean response factor (RRF) from the initial calibration. Percent D is a measure of the instrument's daily performance.

Percent RSD must be less than maximum %RSD in Table 2 of SOP HW 35A (Rev 0) for all target analytes. For the opening or closing CCV %D must be within the inclusive opening or closing maximum %D limits as listed in Table 2 of SOP HW 35A (Rev 0) for all Target compounds. A value outside of these limits indicates potential detection and quantitation errors. For these reasons, all positive results are flagged as estimated, "J" and Non-detects are flagged "UJ" for %D values outside criteria only. If %RSD exceeds QC criteria, detects may be qualified as "J" and use professional judgment to qualify non-detects. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

7. INTERNAL STANDARDS PERFORMANCE GC/MS:

Internal standards (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during every experimental run. The internal standard area count must be in the range as specified in Table 10 of SOP HW 35A (Rev 0) of the associated continuing calibration internal standard area. The retention time of the internal standards

must be within the range as specified in Table 10 of SOP HW 35A (Rev 0). If the area count is greater than, all positive results quantitated using that IS are qualified as estimated "J-", and non-detects are not qualified. If the area count is less than the associated standard, all positive results for compounds quantitated with that IS are qualified as estimated "J+" and all non-detects are qualified "R".

If an internal standard retention time were not met as specified in Table 10 of SOP HW 35A (Rev 0), the reviewer will use professional judgment to determine either partial or total rejection of the data for that sample fraction. Qualifications were applied to the samples and analytes as shown below. Qualifications were applied to the samples and analytes as shown below.

No issues were identified for this criterion.

8. FIELD DUPLICATES:

Samples BDQN6 and BD4Q7 are field duplicates. Samples did not contain any analytes of interest. No qualifications were required for this criterion.

9. COMPOUND IDENTIFICATION:

A) Semi-Volatile Fractions:

TCL compounds are identified on the GC/MS by using the analyte's relative retention time (RRT) and by comparison to the ion spectra obtained from known standards. For the results to be a positive hit, the sample peak must be within 0.06 RRT units of the standard compound and have ion spectra which have a ratio of the primary and secondary m/e intensities within 20% of that in the standard compound. For the tentatively identified compounds (TIC) the ion spectra must match accurately. In the cases where there is not an adequate ion spectrum match, the laboratory may have provided false positive identifications. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

10. CONTRACT PROBLEMS NON-COMPLIANCE:

None

11. FIELD DOCUMENTATION:

No problems were identified.

12. OTHER PROBLEMS:

None

13. DILUTIONS, RE-EXTRACTIONS and REANALYSIS:

Samples may be re-analyzed for dilution, re-extraction and for other QC reasons. In such cases, the best result values are used. See summary report and EDD for applicable samples and analytes.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
DESA/HWSB/HWSS
2890, Woodbridge Avenue, Edison, NJ 08837

EXECUTIVE NARRATIVE

Case No.: 46633
Site Name: Former Duofold Corporation
Number of Samples: 28 water
Analysis: TVOA and SVOA

SDG No.: BD4R0
Laboratory: Chemtech
Sampling dates: 11/10-11/2016
Validation SOP: HW-33A (Rev 0), HW-35A (Rev 0), HW-34A (Rev 0)

QAPP:
Contractor: CDM Smith, 14 Wall Street, Suite 1701, New York
Reference: Document No. 3323-02960, Dated October 10, 2016

SUMMARY OF DEFINITIONS:

Critical: Results have an unacceptable level of uncertainty and should not be used for making decisions. Data have been qualified "R" rejected.

Major: A level of uncertainty exists that may not meet the data quality objectives for the project. A bias is likely to be present in the results. Data has been qualified "J" estimated. "J+" and "J-" represent likely direction of the bias.

Minor: The level of uncertainty is acceptable. No significant bias in the data was observed.

Critical Findings:

None

Major Findings:

Samples have analytes that have been qualified J, J+ or J-;

Minor Findings:

Detect values between MDL and CRQL are reported as estimated "J" values unless otherwise stated.

COMMENTS: Qualifications applied are summarized in Summary Reports.

Name: Narendra Kumar **Date: 01/05/2016**

Affiliation: USEPA/R2/HWSB/HWSS

Data Qualifier Definitions (National Functional Guidelines)

Qualifier Symbol	Explanation		
	INORGANICS	**ORGANICS**	**CHLORINATED DIOXIN/FURAN**
U	The analyte was analyzed for, but was not detected above the level of the reported quantitation limit.	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted Contract Required Quantitation Limit (CRQL) for sample and method	The analyte was analyzed for but not detected. The value preceding the "U" may represent the adjusted Contract Required Quantitation Limit (see DLM02.X, Exhibit D, Section 1.2 and Table 2), or the sample specific estimated detection limit (EDL, see Method 8290A, Section 11.9.5).
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the CRQL.	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to an issue with the quality of the data generated because certain QC criteria were not met, or the concentration of the analyte was below the adjusted CRQL).
J+	The result is an estimated quantity, but the result may be biased high.	The result is an estimated quantity, but the result may be biased high.	
J–	The result is an estimated quantity, but the result may be biased low.	The result is an estimated quantity, but the result may be biased low.	
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.	The analyte was not detected at a level greater than or equal to the adjusted CRQL. However, the reported adjusted CRQL is approximate and may be inaccurate or imprecise.	The analyte was not detected (see definition of "U" flag, above). The reported value should be considered approximate.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.	The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.	The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
N		The analysis indicates the presence of an analyte for which there is presumptive evidence to make a “tentative identification”.	
NJ		The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.	
C		This qualifier applies to pesticide and Aroclor results when the identification has been confirmed by Gas Chromatograph/Mass Spectrometer (GC/MS).	
X		This qualifier applies to pesticide and Aroclor results when GC/MS analysis was attempted but was unsuccessful.	

DATA ASSESSMENT

ANALYSIS: TVOA

The current SOP HW-34A (Revision 0) July 2015, USEPA Region II for the evaluation of Trace Volatile organic data generated through Statement of Work SOM02.2 has been applied. Data have been reviewed according to TDF specifications, the National Functional Guidelines Report and the CCS Semi-Automated Screening Results Report. Tentatively Identified Compounds (TICs) for TVOA organic fraction is not validated.

1. HOLDING TIME:

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimated, "J". The non-detects (sample quantitation limits) will be flagged as unusable, "R". Use professional judgment to qualify detects and non-detects for aqueous sample whose temperature is above 6º C or below 2º C Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

2. DEUTERATED MONITORING COMPOUNDS (DMC's)

All samples are spiked with DMC compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured DMC recovery limits were outside Table 6 of the SOP HW 34A (Rev 0), qualifications were applied as per Table 7 of the SOP HW 34A (Rev 0) to all the samples and analytes as shown below.

The following samples have DMC/surrogate percent recoveries less than the primary minimum criteria but greater than or equal to the expanded minimum criteria. Detects are qualified as estimated J-. Non-detects are qualified as estimated UJ.

1,1-Dichloroethene-d2, BD4R0, BD4R5, BD4R9, BDQN1, BDQN2, BDQN3, BDQP3

3. MATRIX SPIKE/ MATRIX SPIKE RECOVERY:

MS/MSD data is generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD data may be used in conjunction with other QC criteria for additional qualification of data.

Not applicable.

4. BLANK CONTAMINATION:

Quality assurance (QA) blanks, i.e., method, trip, field, or rinse blanks are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Trip blanks measure cross-contamination of samples during shipment. Field and rinse blanks measure cross-contamination of samples during field operations. Depending on the amount of contamination present in the QA blanks, the analytes are qualified as per Table 5 of SOP HW-34A (Rev 0).

A) Method blank contamination:

No problems were found for this criterion.

B) Field or rinse blank contamination:

Not applicable

C) Trip blank contamination:

Sample BDQP2 is the trip blank associated with samples BD4R0, BD4R1, BD4R5, BD4R6, BD4R7, BD4R8, BDQN4, BDQN5, BDQN7, BDQP2 (Sampling date 11/10/2016). This sample has Acetone = CRQL (10 ug/L). Samples were qualified as below

Acetone: BD4R6

Sample BDQP3 is trip blank associated with samples BDQN1, BDQN2 and BDQN3 (Sampling date 11/11/2016). This trip blank sample has Acetone > CRQL (10 ug/L). Samples were qualified as below:

Acetone, not detected in any associated sample. No qualification was required.

D) Storage Blank associated with VOA samples only:

No problems were found for this criterion.

E) Tentatively Identified Compounds:

Tentatively Identified Compounds (TICs) for TVOA organic fraction are not validated.

5. MASS SPECTROMETER TUNING:

Tuning and performance criteria are established to ensure adequate mass resolution, proper identification of compounds and to some degree, sufficient instrument sensitivity. These criteria are not sample specific. Instrument performance is determined using standard materials. Therefore, these criteria should be met in all circumstances. The tuning standard for volatile organics is (BFB) Bromofluorobenzene. If the mass calibration is in error, all associated data will be classified as unusable "R". Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

6. CALIBRATION:

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration checks document that the instrument is giving satisfactory daily performance.

A) Response Factor GC/MS:

The response factor measures the instrument's response to specific chemical compounds. All analytes for initial and continuing calibration should meet the minimum RRF criteria as listed in Table 2 of SOP HW 34A (Rev 0). If RRF is less than minimum RRF specified in Table 2 for all target analytes, use professional judgment and all detects in the sample will be qualified as "J+" or "R". All non-detects for that compound will be rejected "R". Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

B) Percent Relative Standard Deviation (%RSD) and Percent Difference (%D):

Percent RSD is calculated from the initial calibration and is used to indicate the stability of the specific compound response factor over increasing concentration. Percent D compares the response factor of the continuing calibration check to the mean response factor (RRF) from the initial calibration.

Percent RSD must be less than maximum %RSD in Table 2 of SOP HW 34A (Rev 0) for all target analytes. For the opening or closing CCV %D must be within the inclusive opening or closing maximum %D limits as listed in Table 2 of SOP HW 34A (Rev 0) for all Target compounds. A value outside of these limits indicates potential detection and quantitation errors. For these reasons, all positive results are flagged as estimated, "J" and Non-detects are flagged "UJ" for %D values outside criteria only. If %RSD exceeds QC criteria, detects may be qualified as "J" and use professional judgment to qualify non-detects. Qualifications were applied to the samples and analytes as shown below.

The following samples are associated with an opening or closing CCV with % Difference exceeding criteria. Detecteds are qualified as estimated J. Nondetects are qualified as estimated UJ.

Isopropylbenzene, BD4R0, BD4R9, BDQN1, BDQN2, BDQN3, BDQP3

7. INTERNAL STANDARDS PERFORMANCE GC/MS:

Internal standards (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during every experimental run. The internal standard area count must be in the range as specified in Table 9 of SOP HW 34A (Rev 0) of the associated continuing calibration internal standard area. The retention time of the internal standards must be within the range as specified in Table 9 of SOP HW 34A (Rev 0). If the area count is greater

than, all positive results quantitated using that IS are qualified as estimated "J-", and non-detects are not qualified. If the area count is less than the associated standard, all positive results for compounds quantitated with that IS are qualified as estimated "J+" and all non-detects are qualified "R".

If an internal standard retention time were not met as specified in Table 9 of SOP HW 34A (Rev 0), the reviewer will use professional judgment to determine either partial or total rejection of the data for that sample fraction. Qualifications were applied to the samples and analytes as shown below. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

8. FIELD DUPLICATES:

Samples BDQN7 is duplicate of BD4R6. No problems were found for this criterion. No qualification was required.

9. COMPOUND IDENTIFICATION:

Target compounds are identified on the GC/MS by using the analyte's relative retention time (RRT) and by comparison to the ion spectra obtained from known standards. For the results to be a positive hit, the sample peak must be within a window of 0.06 RRT units of the standard compound and have ion spectra which has a ratio of the primary and secondary m/z intensities within 20% of that in the standard compound. For the tentatively identified compounds (TIC) the ion spectra must match accurately. In the cases where there is not an adequate ion spectrum match, the laboratory may have provided false positive identifications. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

10. CONTRACT PROBLEMS NON-COMPLIANCE:

None.

11. FIELD DOCUMENTATION:

No problems were identified.

12. OTHER PROBLEMS:

None.

13. DILUTIONS, RE-EXTRACTIONS & REANALYSIS:

Samples may be re-analyzed for dilution, re-extraction and for other QC reasons. In such cases, the best result values are used. See summary report and EDD for applicable samples and analytes.

ANALYSIS: Semivolatiles

The current SOP HW-35A (Revision 0) July 2015, USEPA Region II for the evaluation of Semi-Volatile organic data generated through Statement of Work SOM02.2 has been applied. Data have been reviewed according to TDF specifications, the National Functional Guidelines Report and the CCS Semi-Automated Screening Results Report. Tentatively Identified Compounds (TICs) for BNA organic fraction is not validated.

1. HOLDING TIME:

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded, qualifications will be applied as per SOP HW-35A (Rev 0).

No problems were found for this criterion.

2. DEUTERATED MONITORING COMPOUNDS (DMCs)

All samples are spiked with DMC compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured DMC recovery limits were outside Table 6 of SOP HW-35A (Revision 0), qualifications were applied as per Table 7 of SOP HW-35A (Revision 0) to all the samples and analytes as shown below.

The following samples have DMC/surrogate percent recoveries less than the primary minimum criteria. Detects are qualified as estimated J-. Nondetects are qualified as estimated UJ.

4-Chloroaniline-d4, BD4R1, BD4R5, BD4R6, BD4R7, BD4R8, BDQN7

The following samples have DMC/surrogate percent recoveries less than the primary minimum criteria but greater than or equal to the expanded minimum criteria. Detects are qualified as estimated J-. Nondetects are qualified as estimated UJ.

1,4-Dioxane-d8, BD4R7, BD4R1, BD4R0, BDQN5, BDQN3, BDQN2, BD4R9, BDQN7, BDQN4, BD4R8, BD4R5, BDQN1, BD4R6.

3. MATRIX SPIKE/MATRIX SPIKE DUPLICATES (MS/MSD):

MS/MSD data are generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD data may be used in conjunction with other QC criteria for additional qualification of data. Qualifications were applied to the samples and analytes as shown below.

Not applicable.

4. BLANK CONTAMINATION:

Quality assurance (QA) blanks, i.e., method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Trip blanks measure cross-contamination of samples during shipment. Field and rinse blanks measure cross-contamination of samples during field operations. Depending on the amount of contamination present in the QA blanks, the analytes are qualified as per Table 5 of SOP HW-35A (Rev 0).

No problems were found for this criterion.

A) Method blank contamination:

No problems were found for this criterion.

B) Field or rinse blank contamination:

Not applicable.

C) Tentatively Identified Compounds:

Tentatively Identified Compounds (TICs) for SVOA organic fraction are not validated.

5. MASS SPECTROMETER TUNING:

Tuning and performance criteria are established to ensure adequate mass resolution, proper identification of compounds and to some degree, sufficient instrument sensitivity. These criteria are not sample specific. Instrument performance is determined using standard materials. Therefore, these criteria should be met in all circumstances. The tuning standard for Semi-volatiles is Decafluorotriphenyl-phosphine (DFTPP). If the mass calibration is in error, all associated data will be classified as unusable "R".

No problems were found for this criterion.

6. CALIBRATION:

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration checks document that the instrument is giving satisfactory daily performance.

A) Response Factor GC/MS:

The response factor measures the instrument's response to specific chemical compounds. All analytes for initial and continuing calibration should meet the minimum RRF criteria as listed in Table 2 of SOP HW 35A (Rev 0). If RRF is less than minimum RRF as specified in Table 2 for all target analytes, use professional judgment and all detects in

the sample will be qualified as "J+" or "R". All non-detects for that compound will be rejected "R". Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

B) Percent Relative Standard Deviation (%RSD) and Percent Difference (%D):

Percent RSD is calculated from the initial calibration and is used to indicate the stability of the specific compound response factor over increasing concentration. Percent D compares the response factor of the continuing calibration check to the mean response factor (RRF) from the initial calibration. Percent D is a measure of the instrument's daily performance.

Percent RSD must be less than maximum %RSD in Table 2 of SOP HW 35A (Rev 0) for all target analytes. For the opening or closing CCV %D must be within the inclusive opening or closing maximum %D limits as listed in Table 2 of SOP HW 35A (Rev 0) for all Target compounds. A value outside of these limits indicates potential detection and quantitation errors. For these reasons, all positive results are flagged as estimated, "J" and Non-detects are flagged "UJ" for %D values outside criteria only. If %RSD exceeds QC criteria, detects may be qualified as "J" and use professional judgment to qualify non-detects. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

7. INTERNAL STANDARDS PERFORMANCE GC/MS:

Internal standards (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during every experimental run. The internal standard area count must be in the range as specified in Table 10 of SOP HW 35A (Rev 0) of the associated continuing calibration internal standard area. The retention time of the internal standards must be within the range as specified in Table 10 of SOP HW 35A (Rev 0). If the area count is greater than, all positive results quantitated using that IS are qualified as estimated "J-", and non-detects are not qualified. If the area count is less than the associated standard, all positive results for compounds quantitated with that IS are qualified as estimated "J+" and all non-detects are qualified "R".

If an internal standard retention time were not met as specified in Table 10 of SOP HW 35A (Rev 0), the reviewer will use professional judgment to determine either partial or total rejection of the data for that sample fraction. Qualifications were applied to the samples and analytes as shown below. Qualifications were applied to the samples and analytes as shown below.

No issues were identified for this criterion.

8. FIELD DUPLICATES:

Samples BDQN7 is duplicate of BD4R6. No analytes were detected. No qualification was required.

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9. COMPOUND IDENTIFICATION:

A) Semi-Volatile Fractions:

TCL compounds are identified on the GC/MS by using the analyte's relative retention time (RRT) and by comparison to the ion spectra obtained from known standards. For the results to be a positive hit, the sample peak must be within 0.06 RRT units of the standard compound and have ion spectra which have a ratio of the primary and secondary m/e intensities within 20% of that in the standard compound. For the tentatively identified compounds (TIC) the ion spectra must match accurately. In the cases where there is not an adequate ion spectrum match, the laboratory may have provided false positive identifications. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

10. CONTRACT PROBLEMS NON-COMPLIANCE:

None

11. FIELD DOCUMENTATION:

No problems were identified.

12. OTHER PROBLEMS:

None

13. DILUTIONS, RE-EXTRACTIONS and REANALYSIS:

Samples may be re-analyzed for dilution, re-extraction and for other QC reasons. In such cases, the best result values are used. See summary report and EDD for applicable samples and analytes.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
DESA/HWSB/HWSS
2890, Woodbridge Avenue, Edison, NJ 08837

EXECUTIVE NARRATIVE

Case No.: 46633
Site: Former Duofold Corporation (Brownfield)

Number of Samples: 17 (16 Soil, 1 Water)
Analysis: TCLP Metals (ICP-AES), TCLP Mercury (CVAA)

SDG No.: MBD4M6
Laboratory: Chemtech Consulting Group (CHM)
Sampling dates: 11/08/2016, 11/09/2016
Validation SOP: HW-3a and 3c (Rev 0)

QAPP
Contractor: CDM-Smith
Contractor Document No.: 3323-029-02960

SUMMARY OF DEFINITIONS:

Critical: Results have an unacceptable level of uncertainty and should not be used for making decisions. Data have been qualified “R” rejected.
Major: A level of uncertainty exists that may not meet the data quality objectives for the project. A bias is likely to be present in the results. Data has been qualified “J” estimated. “J+” and “J-“ represent likely direction of the bias.
Minor: The level of uncertainty is acceptable. No significant bias in the data was observed.

Critical Findings: None

Major Findings: Samples have analyte(s) that have been qualified J.

Minor Findings: None

COMMENT: Results greater than detection limits (MDL) and below quantitation limits (CRQL) are qualified as estimated J.

Reviewer Name(s): A Aoanan (SEE)

Approver’s Signature:

Date: 1/06/2017

Name: Narendra Kumar

Affiliation: USEPA/R2/HWSB/HWSS

Data Qualifier Definitions (National Functional Guidelines)

Qualifier Symbol	**Explanation**		
	INORGANICS	**ORGANICS**	**CHLORINATED DIOXINS/FURANS**
U	The analyte was analyzed for, but was not detected above the level of the reported quantitation limit.	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted Contract Required Quantitation Limit (CRQL) for sample and method	The analyte was analyzed for but not detected. The value preceding the "U" may represent the adjusted Contract Required Quantitation Limit (see DLM02.X, Exhibit D, Section 1.2 and Table 2), or the sample specific estimated detection limit (EDL, see Method 8290A, Section 11.9.5).
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the CRQL.	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to an issue with the quality of the data generated because certain QC criteria were not met, or the concentration of the analyte was below the adjusted CRQL).
J+	The result is an estimated quantity, but the result may be biased high.	The result is an estimated quantity, but the result may be biased high.	
J–	The result is an estimated quantity, but the result may be biased low.	The result is an estimated quantity, but the result may be biased low.	
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.	The analyte was not detected at a level greater than or equal to the adjusted CRQL. However, the reported adjusted CRQL is approximate and may be inaccurate or imprecise.	The analyte was not detected (see definition of "U" flag, above). The reported value should be considered approximate.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.	The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.	The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
N		The analysis indicates the presence of an analyte for which there is presumptive evidence to make a “tentative identification”.	
NJ		The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.	
C		This qualifier applies to pesticide and Aroclor results when the identification has been confirmed by Gas Chromatograph/Mass Spectrometer (GC/MS).	
X		This qualifier applies to pesticide and Aroclor results when GC/MS analysis was attempted but was unsuccessful.	

DATA ASSESSMENT

ANALYSIS: METALS ICP-AES (TCLP)

The current SOP HW-3a (Revision 0) July 2015, USEPA Region II for the evaluation of ICP-AES metals generated through Statement of Work ISOM02.2 has been applied. Data have been reviewed according to TDF specifications, the National Functional Guidelines (NFG) Report and the CCS Semi-Automated Screening Results Report.

1. HOLDING TIME AND PRESERVATION

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time or pH (aqueous samples are not within the acceptable range, the data may not be valid. Those analytes detected in the samples whose holding time (180 days) or pH (≤ 2) have not been met, will be qualified as estimated, "J"; the non-detects will be flagged as unusable, "R". Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

2. CALIBRATION

Method requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable quantitative data for the metals on the Inorganic Target Analyte List (TAL). Initial Calibration Verification (ICV) demonstrates that the instrument is capable of acceptable performance at the beginning of the analytical run. Continuing Calibration Verification (CCV) demonstrates that the initial calibration is still valid by checking the performance of the instrument on a continuing basis.

A) INITIAL CALIBRATION

A blank and at least five calibration standards shall be used to establish each analytical curve. At least one of these standards shall be at or below the Contract Required Quantitation Limit (CRQL). The calibration curve shall be fitted using linear regression or weighted linear regression. The curve may be forced through zero. The curve must have a correlation coefficient ≥ 0.995. The percent differences calculated for all of the non-zero standards must be within ±30% of the true value of the standard. The y-intercept of the curve must be less than the CRQL. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

B) INITIAL AND CONTINUING CALIBRATION VERIFICATION

Immediately after each system has been calibrated, the accuracy of the initial calibration must be verified and documented for each target analyte by the analysis of an ICV solution(s). The CCV standard shall be analyzed at a frequency of every two hours during an analytical run. The CCV

standard shall also be analyzed at the beginning of the run, and again after the last analytical sample. The percent recovery acceptable limits for ICV/CCV are 90 – 110%. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

3. BLANK CONTAMINATION

Quality assurance (QA) blanks, i.e., method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field activity. Calibration blanks — Initial Calibration Blank (ICB) and Continuing Calibration Blank (CCB), are used to ensure a stable instrument baseline before and during the analysis of analytical samples. The Preparation Blank (PB) is used to assess the level of contamination introduced to the analytical samples throughout the sample preparation process. Field and rinse blanks (FB and RB) measure cross-contamination of samples during field operations. Qualifications were applied to the samples and analytes as shown below.

The following samples have analyte results less than or equal to CRQLs. The associated **CCB** analyte results are less than or equal to CRQLs. Detects are qualified as **U**. Sample results are reported at CRQLs.

Lead – MBD4M6, MBD4N8, MBD4Q2
Silver – MBD4M2, MBD4M9, MBD4N7, MBD4P9

FIELD BLANK (MBD4Q2)

MBD4Q2 was identified as field blank (FB-SB-A) sample in the trip report for the sampling dates. No analyte was above CRQL, no data was qualified with the *Field Blank criterion*.

4. INTERFERENCE CHECK SAMPLE

The Interference Check Sample (ICS) verifies the analytical instrument's ability to overcome interferences typical of those found in samples. The laboratory should have analyzed and reported ICS results for all elements being reported from the analytical run and for all interferents (target and non-target) for these reported elements. The ICS consists of two solutions: Solution A and Solution AB. Solution A consists of the interferents, and Solution AB consists of the analytes mixed with the interferents. Results for the analysis of ICS Solution must fall within the control limits of ± 20% or ±CRQL (whichever is greater) of the true value for the analytes and interferents included in the solution. If results that are ≥ MDL are observed for analytes that are not present in the ICS solution, the possibility of false positives exists. If negative results are observed for analytes that are not present in the ICS solution, and their absolute value is ≥ MDL, the possibility of false negatives in the samples exists. In general, ICP sample data can be accepted if the concentrations of Al, Ca, Fe, and Mg in the sample are found to be less than or equal to their respective concentrations in the ICS. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

5. SPIKE SAMPLE ANALYSIS

The spiked sample analysis is designed to provide information about the effect of each sample matrix on the sample preparation procedures and the measurement methodology. The spike Percent Recovery (%R) shall be within the established acceptance limits of 75 – 125%. However, spike recovery limits do not apply when the sample concentration is ≥ 4x the spike added. For a matrix spike analysis that does not meet the technical criteria, the action was applied to only the field sample used to prepare the matrix spike sample.

No problems were found for this criterion.

6. DUPLICATE SAMPLE ANALYSIS

The objective of duplicate sample analysis is to demonstrate acceptable method precision by the laboratory at the time of analysis. A control limit of 35% for soil/sediment and 20% for aqueous for the Relative Percent Difference (RPD) shall be used for original and duplicate sample values > five times (5x) the CRQL. A control limit of the CRQL shall be used if either the sample or duplicate value is ≤ 5x the CRQL. For a duplicate sample analysis that does not meet the technical criteria, the action was applied to only the field sample used to prepare the duplicate sample.

No problems were found for this criterion.

7. FIELD DUPLICATE

Field duplicates may be taken and analyzed as an indication of overall precision. These analyses measure both field and laboratory precision. A control limit of 50% for soil/sediment and 20% for aqueous for the Relative Percent Difference (RPD) shall be used for original and duplicate sample values ≥ five times (5x) the Contract Required Quantitation Limit (CRQL). A control limit of the CRQL shall be used if either the sample or duplicate value is < 5x the CRQL. For field duplicates analysis that does not meet the technical criteria, the action was applied to only the field sample and it's duplicate.

MBD4N1 (DF-SB-17-A, parent) and **MBD4Q0** (SB-900-B, duplicate), and **MBD4M4** (DF-SB-10-A, parent) and **MBD4P9** (SB-900-A, duplicate) are Field Duplicate (FD) samples, respectively.

No problems were found for this criterion.

8. LABORATORY CONTROL SAMPLE

The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. Aqueous/water, soil/sediment, wipe, and filter LCSs shall be analyzed for each analyte utilizing the same sample preparations, analytical methods, and Quality Assurance/Quality Control (QA/QC) procedures as employed for the samples. All LCS Percent Recoveries (%R) must fall within the control limits of 70-130%, except for Sb and Ag which must fall within the control limits of 50-150%. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

9. ICP SERIAL DILUTION

The serial dilution of samples quantitated by Inductively Coupled Plasma determines whether or not significant physical or chemical interferences exist due to sample matrix. If the analyte concentration is sufficiently high [concentration in the original sample is > 50 times (50x) the Method Detection Limit (MDL)], the Percent Difference (%D) between the original determination and the serial dilution analysis (a five-fold dilution) after correction for dilution shall be less than 10. For a serial dilution analysis that does not meet the technical criteria, the action was applied to only the field sample used to prepare the serial dilution sample.

No problems were found for this criterion.

10. PERCENT SOLIDS

The laboratory is required to perform the percent solids determination prior to sample preparation and analysis. All results of a sample with percent solids less than 50% are qualified estimated, "J". Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion. Not applicable.

11. OTHER ISSUES

Per laboratory narrative, it appears that the aqueous Field Blank (FB) sample **MBD4Q2** was preserved with nitric acid (HNO_3), pH less than 2, by the contractor/sampler. Water samples should not be preserved for TCLP Metals and TCLP Mercury analyses. Region 2 instructed the laboratory to proceed with the analyses and note the issue in the SDG Narrative.

No other issues were found for this SDG.

DATA ASSESSMENT

ANALYSIS: MERCURY (TCLP)

The current SOP HW-3c (Revision 0) July 2015, USEPA Region II for the evaluation of Mercury generated through Statement of Work ISOM02.2 has been applied. Data have been reviewed according to TDF specifications, the National Functional Guidelines Report and the CCS Semi-Automated Screening Results Report.

1. HOLDING TIME AND PRESERVATION

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time, pH (aqueous samples), or cooler temperature are not within the acceptable range, the data may not be valid. Those analytes detected in the samples whose holding time (28 days) and pH (≤2) have not been met, will be qualified as estimated, "J"; the non-detects (sample quantitation limits) will be flagged as unusable, "R". Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

2. CALIBRATION

Method requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable quantitative data for mercury. Initial Calibration Verification (ICV) demonstrates that the instrument is capable of acceptable performance at the beginning of the analytical run. Continuing Calibration Verification (CCV) demonstrates that the initial calibration is still valid by checking the performance of the instrument on a continuing basis.

A) INITIAL CALIBRATION

A blank and at least five calibration standards shall be used to establish each analytical curve. At least one of the standards shall be at or below the CRQL. The calibration curve shall be fitted using linear regression or weighted linear regression. The curve may be forced through zero. The curve must have a correlation coefficient ≥ 0.995. The percent differences calculated for all of the non-zero standards must be within ± 30% of the true value of the standard. The y-intercept of the curve must be less than the CRQL. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

B) INITIAL AND CONTINUING CALIBRATION VERIFICATION

Immediately after each system has been calibrated, the accuracy of the initial calibration must be verified and documented for mercury by the analysis of an ICV solution(s). The CCV standard shall be analyzed at a frequency of every hour during an analytical run. The CCV standard shall also be analyzed at the beginning of the run, and again after the last analytical sample. The percent recovery acceptable limits for ICV/CCV are 85 – 115%. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

3. BLANK CONTAMINATION

Quality assurance (QA) blanks, i.e., method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure cross-contamination of samples during field operations. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

FIELD BLANK (MBD4Q2)

MBD4Q2 was identified as field blank (FB-SB-A) sample in the trip report for the sampling dates. No analyte was above CRQL, no data was qualified with the *Field Blank criterion*.

4. SPIKE SAMPLE ANALYSIS

The spiked sample analysis is designed to provide information about the effect of each sample matrix on the sample preparation procedures and the measurement methodology. The spike Percent Recovery (%R) shall be within the established acceptance limits of 75 – 125%. However, spike recovery limits do not apply when the sample concentration is ≥ 4x the spike added. For a matrix spike analysis that does not meet the technical criteria, the action was applied to only the field sample used to prepare the matrix spike sample.

No problems were found for this criterion.

5. DUPLICATE SAMPLE ANALYSIS

The objective of duplicate sample analysis is to demonstrate acceptable method precision by the laboratory at the time of analysis. A control limit of 35% for soil/sediment and 20% for aqueous for the Relative Percent Difference (RPD) shall be used for original and duplicate sample values > five times (5x) the CRQL. A control limit of the CRQL shall be used if either the sample or duplicate value is ≤ 5x the CRQL. For a duplicate sample analysis that does not meet the technical criteria, the action was applied to only the field sample used to prepare the duplicate sample.

No problems were found for this criterion.

6. FIELD DUPLICATE

Field duplicates may be taken and analyzed as an indication of overall precision. These analyses measure both field and laboratory precision. A control limit of 20% for the Relative Percent Difference (RPD) shall be used for original and duplicate sample values ≥ five times (5x) the Contract Required Quantitation Limit (CRQL). A control limit of the CRQL shall be used if either the sample or duplicate value is < 5x the CRQL. For field duplicates analysis that does not meet the technical criteria, the action was applied to only the field sample and it's duplicate.

MBD4N1 (DF-SB-17-A, parent) and **MBD4Q0** (SB-900-B, duplicate), and **MBD4M4** (DF-SB-10-A, parent) and **MBD4P9** (SB-900-A, duplicate) are Field Duplicate (FD) samples, respectively.

No problems were found for this criterion.

7. PERCENT SOLIDS

The laboratory is required to perform the percent solids determination prior to sample preparation and analysis. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion. Not applicable.

8. OTHER ISSUES

Per laboratory narrative, it appears that the aqueous Field Blank (FB) sample **MBD4Q2** was preserved with nitric acid (HNO_3), pH less than 2, by the contractor/sampler. Water samples should not be preserved for TCLP Metals and TCLP Mercury analyses. Region 2 instructed the laboratory to proceed with the analyses and note the issue in the SDG Narrative.

No other issues were found for this SDG.

	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY **REGION 2** **DESA/HWSB/HWSS** **2890, Woodbridge Avenue, Edison, NJ 08837**

EXECUTIVE NARRATIVE

Case No.:	46633	**SDG No.:**	MBD4M7
Site:	Former Duofold Corporation (Brownfield)	**Laboratory:**	Chemtech Consulting Group (CHM)
Number of Samples:	15 (14 Soil, 1 Water)	**Sampling dates:**	11/08 and 11/09/2016
Analysis:	Metals (ICP-AES & ICP-MS)	**Validation SOP:**	HW-3a & 3b (Rev 0)

QAPP
Contractor: CDM-Smith
Contractor Document No.: 3323-029-02960

SUMMARY OF DEFINITIONS:

Critical: Results have an unacceptable level of uncertainty and should not be used for making decisions. Data have been qualified "R" rejected.

Major: A level of uncertainty exists that may not meet the data quality objectives for the project. A bias is likely to be present in the results. Data has been qualified "J" estimated. "J+" and "J-" represent likely direction of the bias.

Minor: The level of uncertainty is acceptable. No significant bias in the data was observed.

Critical Findings: None

Major Findings: Samples have analyte(s) that have been qualified **J** and **UJ**.

Minor Findings: None

COMMENT:	Results greater than detection limits (MDL) and below quantitation limits (CRQL) are qualified as estimated **J**.

Reviewer Name(s): A Aoanan (SEE)

Approver's Signature: **Date: 1/17/2017**

Name: Narendra Kumar

Affiliation: USEPA/R2/HWSB/HWSS

Data Qualifier Definitions (National Functional Guidelines)

Qualifier Symbol	Explanation		
	INORGANICS	**ORGANICS**	**CHLORINATED DIOXINS/FURANS**
U	The analyte was analyzed for, but was not detected above the level of the reported quantitation limit.	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted Contract Required Quantitation Limit (CRQL) for sample and method	The analyte was analyzed for but not detected. The value preceding the "U" may represent the adjusted Contract Required Quantitation Limit (see DLM02.X, Exhibit D, Section 1.2 and Table 2), or the sample specific estimated detection limit (EDL, see Method 8290A, Section 11.9.5).
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the CRQL.	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to an issue with the quality of the data generated because certain QC criteria were not met, or the concentration of the analyte was below the adjusted CRQL).
J+	The result is an estimated quantity, but the result may be biased high.	The result is an estimated quantity, but the result may be biased high.	
J–	The result is an estimated quantity, but the result may be biased low.	The result is an estimated quantity, but the result may be biased low.	
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.	The analyte was not detected at a level greater than or equal to the adjusted CRQL. However, the reported adjusted CRQL is approximate and may be inaccurate or imprecise.	The analyte was not detected (see definition of "U" flag, above). The reported value should be considered approximate.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.	The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.	The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
N		The analysis indicates the presence of an analyte for which there is presumptive evidence to make a “tentative identification”.	
NJ		The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.	
C		This qualifier applies to pesticide and Aroclor results when the identification has been confirmed by Gas Chromatograph/Mass Spectrometer (GC/MS).	
X		This qualifier applies to pesticide and Aroclor results when GC/MS analysis was attempted but was unsuccessful.	

DATA ASSESSMENT

ANALYSIS: METALS ICP-AES

The current SOP HW-3a (Revision 0) July 2015, USEPA Region II for the evaluation of ICP-AES metals generated through Statement of Work ISOM02.2 has been applied. Data have been reviewed according to TDF specifications, the National Functional Guidelines Report and the CCS Semi-Automated Screening Results Report.

1. HOLDING TIME AND PRESERVATION

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time or pH (aqueous samples are not within the acceptable range, the data may not be valid. Those analytes detected in the samples whose holding time (180 days) or pH (≤ 2) have not been met, will be qualified as estimated, "J"; the non-detects will be flagged as unusable, "R". Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

2. CALIBRATION

Method requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable quantitative data for the metals on the Inorganic Target Analyte List (TAL). Initial Calibration Verification (ICV) demonstrates that the instrument is capable of acceptable performance at the beginning of the analytical run. Continuing Calibration Verification (CCV) demonstrates that the initial calibration is still valid by checking the performance of the instrument on a continuing basis.

A) INITIAL CALIBRATION

A blank and at least five calibration standards shall be used to establish each analytical curve. At least one of these standards shall be at or below the CRQL. The calibration curve shall be fitted using linear regression or weighted linear regression. The curve may be forced through zero. The curve must have a correlation coefficient ≥ 0.995. The percent differences calculated for all of the non-zero standards must be within ±30% of the true value of the standard. The y-intercept of the curve must be less than the CRQL. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

B) INITIAL AND CONTINUING CALIBRATION VERIFICATION

Immediately after each system has been calibrated, the accuracy of the initial calibration must be verified and documented for each target analyte by the analysis of an ICV solution(s). The CCV standard shall be analyzed at a frequency of every two hours during an analytical run. The CCV standard shall also be analyzed at the beginning of the run, and again after the last analytical sample.

The percent recovery acceptable limits for ICV/CCV are 90 – 110%. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

3. BLANK CONTAMINATION

Quality assurance (QA) blanks, i.e., method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field activity. Calibration blanks (ICB and CCB) are used to ensure a stable instrument baseline before and during the analysis of analytical samples. The preparation blank (PB) is used to assess the level of contamination introduced to the analytical samples throughout the sample preparation process. Field and rinse blanks measure cross-contamination of samples during field operations. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

FIELD BLANK (MBD4Q2)

Sample **MBD4Q2** was identified as field blank (FB-SB-A) sample in the trip report for the sampling dates. No analyte was above CRQL, no data was qualified with the *Field Blank criterion*.

4. INTERFERENCE CHECK SAMPLE

The Interference Check Sample (ICS) verifies the analytical instrument's ability to overcome interferences typical of those found in samples. The laboratory should have analyzed and reported ICS results for all elements being reported from the analytical run and for all interferents (target and non-target) for these reported elements. The ICS consists of two solutions: Solution A and Solution AB. Solution A consists of the interferents, and Solution AB consists of the analytes mixed with the interferents. Results for the analysis of ICS Solution must fall within the control limits of ± 20% or ±CRQL (whichever is greater) of the true value for the analytes and interferents included in the solution. If results that are ≥ MDL are observed for analytes that are not present in the ICS solution, the possibility of false positives exists. If negative results are observed for analytes that are not present in the ICS solution, and their absolute value is ≥ MDL, the possibility of false negatives in the samples exists. In general, ICP sample data can be accepted if the concentrations of Al, Ca, Fe, and Mg in the sample are found to be less than or equal to their respective concentrations in the ICS. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

5. SPIKE SAMPLE ANALYSIS

The spiked sample analysis is designed to provide information about the effect of each sample matrix on the sample preparation procedures and the measurement methodology. The spike Percent Recovery (%R) shall be within the established acceptance limits of 75 – 125%. However, spike recovery limits do not apply when the sample concentration is ≥ 4x the spike added. For a matrix spike analysis that does not meet the technical criteria, the action was applied to only the field sample used to prepare the matrix spike sample.

No spike sample analysis performed for this SDG. No problems were found for this criterion.

6. DUPLICATE SAMPLE ANALYSIS

The objective of duplicate sample analysis is to demonstrate acceptable method precision by the laboratory at the time of analysis. A control limit of 35% for soil/sediment and 20% for aqueous for the Relative Percent Difference (RPD) shall be used for original and duplicate sample values ≥ five times (5x) the Contract Required Quantitation Limit (CRQL). A control limit of the CRQL shall be used if either the sample or duplicate value is < 5x the CRQL. For a duplicate sample analysis that does not meet the technical criteria, the action was applied to only the field sample used to prepare the duplicate sample.

No problems were found for this criterion.

7. FIELD DUPLICATE

Field duplicates may be taken and analyzed as an indication of overall precision. These analyses measure both field and laboratory precision. A control limit of 50% for soil/sediment and 20% for aqueous for the Relative Percent Difference (RPD) shall be used for original and duplicate sample values ≥ five times (5x) the Contract Required Quantitation Limit (CRQL). A control limit of the CRQL shall be used if either the sample or duplicate value is < 5x the CRQL. For field duplicates analysis that does not meet the technical criteria, the action was applied to only the field sample and it's duplicate.

MBD4M4 (DF-SB-10-A, parent) and **MBD4P9** (SB-900-A, duplicate), and **MBD4N1** (DF-SB-17-A, parent) and **MBDQR7** (SB-900-B, duplicate) are Field Duplicate (FD) samples, respectively.

No problems were found with the *Field Duplicate criterion for ICP-AES*.

8. LABORATORY CONTROL SAMPLE

The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. Aqueous/water, soil/sediment, wipe, and filter LCSs shall be analyzed for each analyte utilizing the same sample preparations, analytical methods, and Quality Assurance/Quality Control (QA/QC) procedures as employed for the samples. All LCS Percent Recoveries (%R) must fall within the control limits of 70-130%, except for Sb and Ag which must fall within the control limits of 50-150%. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

9. ICP SERIAL DILUTION

The serial dilution of samples quantitated by Inductively Coupled Plasma determines whether or not significant physical or chemical interferences exist due to sample matrix. If the analyte concentration is sufficiently high [concentration in the original sample is > 50 times (50x) the Method Detection Limit (MDL)], the Percent Difference (%D) between the original determination and the serial dilution analysis (a five-fold dilution) after correction for dilution shall be less than 10. For a serial dilution

analysis that does not meet the technical criteria, the action was applied to only the field sample used to prepare the serial dilution sample.

No problems were found for this criterion.

10. PERCENT SOLIDS

The laboratory is required to perform the percent solids determination prior to sample preparation and analysis. All results of a sample with percent solids less than 50% are qualified estimated, "J". Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

11. OTHER ISSUES

None.

DATA ASSESSMENT

ANALYSIS: METALS ICP-MS

The current SOP HW-3b (Revision 0) July 2015, USEPA Region II for the evaluation of ICP-MS metals generated through Statement of Work ISOM02.2 has been applied. Data have been reviewed according to TDF specifications, the National Functional Guidelines Report and the CCS Semi-Automated Screening Results Report.

1. HOLDING TIME AND PRESERVATION

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time or pH (aqueous samples are not within the acceptable range, the data may not be valid. Those analytes detected in the samples whose holding time (180 days) or pH (≤2) have not been met, will be qualified as estimated, "J"; the non-detects will be flagged as unusable, "R". Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

2. CALIBRATION

Method requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable quantitative data for the metals on the Inorganic Target Analyte List (TAL). Initial Calibration Verification (ICV) demonstrates that the instrument is capable of acceptable performance at the beginning of the analytical run. Continuing Calibration Verification (CCV) demonstrates that the initial calibration is still valid by checking the performance of the instrument on a continuing basis.

A) INITIAL CALIBRATION

A blank and at least five calibration standards shall be used to establish each analytical curve. At least one of these standards shall be at or below the CRQL. The calibration curve shall be fitted using linear regression or weighted linear regression. The curve may be forced through zero. The curve must have a correlation coefficient ≥ 0.995. The percent differences calculated for all of the non-zero standards must be within ± 30% of the true value of the standard. The y-intercept of the curve must be less than the CRQL. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

B) INITIAL AND CONTINUING CALIBRATION VERIFICATION

Immediately after each system has been calibrated, the accuracy of the initial calibration must be verified and documented for each target analyte by the analysis of an ICV solution(s). The CCV standard shall be analyzed at a frequency of every two hours during an analytical run. The CCV standard shall also be analyzed at the beginning of the run, and again after the last analytical sample.

The percent recovery acceptable limits for ICV/CCV are 90 – 110%. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

3. BLANK CONTAMINATION

Quality assurance (QA) blanks, i.e., method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field activity. Calibration blanks (ICB and CCB) are used to ensure a stable instrument baseline before and during the analysis of analytical samples. The preparation blank is used to assess the level of contamination introduced to the analytical samples throughout the sample preparation process. Field and rinse blanks measure cross-contamination of samples during field operations. Qualifications were applied to the samples and analytes as shown below.

The following samples have analyte results greater than or equal to MDLs and less than or equal to CRQLs. The associated **ICB** analyte results are greater than or equal to MDLs and less than or equal to CRQLs. Detects are qualified as **U**. Sample results are reported at CRQLs.

Antimony – MBD4M2, MBD4M3, MBD4M6, MBD4M8, MBD4M9, MBD4N0, MBD4N2, MBD4N3, MBD4N4, MBD4P9, MBD4Q2
Beryllium – MBD4M7, MBD4M9, MBD4Q2
Copper – MBD4Q2
Sodium – MBD4Q2

The following samples have analyte results less than or equal to CRQLs. The associated **CCB** analyte results are less than or equal to CRQLs. Detects are qualified as **U**. Sample results are reported at CRQLs.

Antimony – MBD4M2, MBD4M3, MBD4M6, MBD4M8, MBD4M9, MBD4N0, MBD4N2, MBD4N3, MBD4N4, MBD4P9, MBD4Q2
Beryllium – MBD4M7, MBD4M9, MBD4Q2
Copper – MBD4Q2
Silver – MBD4M2, MBD4M3, MBD4M4, MBD4N2, MBD4N3, MBD4N4, MBD4P9
Sodium – MBD4Q2
Thallium – MBD4M2, MBD4M6, MBD4M7, MBD4M8, MBD4M9, MBD4N0, MBD4N1, MBD4N2, MBD4N3, MBD4N4, MBD4P9, MBD4Q0

The following samples have analyte results greater than or equal to MDLs and less than or equal to CRQLs. The associated **PB** analyte results are greater than or equal to MDLs and less than or equal to CRQLs. Detects are qualified as **U**. Sample results are reported at CRQLs.

Antimony – MBD4M2, MBD4M3, MBD4M6, MBD4M8, MBD4M9, MBD4N0, MBD4N2, MBD4N3, MBD4N4, MBD4P9
Beryllium – MBD4Q2
Sodium – MBD4Q2

FIELD BLANK (MBD4Q2)

Sample **MBD4Q2** was identified as field blank (FB-SB-A) sample in the trip report for the sampling dates. No analyte was above CRQL, no data was qualified with the *Field Blank criterion*.

4. INTERFERENCE CHECK SAMPLE

The Interference Check Sample (ICS) verifies the analytical instrument's ability to overcome interferences typical of those found in samples. The laboratory should have analyzed and reported ICS results for all elements being reported from the analytical run and for all interferents (target and non-target) for these reported elements. The ICS consists of two solutions: Solution A and Solution AB. Solution A consists of the interferents, and Solution AB consists of the analytes mixed with the interferents. Results for the analysis of ICS Solution must fall within the control limits of ± 20% or ±2X CRQL (whichever is greater) of the true value for the analytes and interferents included in the solution. If results that are ≥ MDL are observed for analytes that are not present in the ICS solution, the possibility of false positives exists. If negative results are observed for analytes that are not present in the ICS solution, and their absolute value is ≥ MDL, the possibility of false negatives in the samples exists. In general, ICP sample data can be accepted if the concentrations of Al, Ca, Fe, and Mg in the sample are found to be less than or equal to their respective concentrations in the ICS. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

5. SPIKE SAMPLE ANALYSIS

The spiked sample analysis is designed to provide information about the effect of each sample matrix on the sample preparation procedures and the measurement methodology. The spike Percent Recovery (%R) shall be within the established acceptance limits of 75 – 125%. However, spike recovery limits do not apply when the sample concentration is ≥ 4x the spike added. For a matrix spike analysis that does not meet the technical criteria, the action was applied to only the field sample used to prepare the matrix spike sample.

The following sample is associated with Matrix Spike sample that has spike analyte %R within 30 - 74% and Post-digestion spike analyte %R greater than or equal to 75%. Detects are qualified as **J**. Nondetects are qualified as **UJ**.

Arsenic – MBD4M7

6. DUPLICATE SAMPLE ANALYSIS

The objective of duplicate sample analysis is to demonstrate acceptable method precision by the laboratory at the time of analysis. A control limit of 35% for soil/sediment and 20% for aqueous for the Relative Percent Difference (RPD) shall be used for original and duplicate sample values ≥ five times (5x) the Contract Required Quantitation Limit (CRQL). A control limit of the CRQL shall be used if either the sample or duplicate value is < 5x the CRQL. For a duplicate sample analysis that does not meet the technical criteria, the action was applied to only the field sample used to prepare the duplicate sample.

No problems were found for this criterion.

7. FIELD DUPLICATE

Field duplicates may be taken and analyzed as an indication of overall precision. These analyses measure both field and laboratory precision. A control limit of 50% for soil/sediment and 20% for aqueous for the Relative Percent Difference (RPD) shall be used for original and duplicate sample values ≥ five times (5x) the Contract Required Quantitation Limit (CRQL). A control limit of the CRQL shall be used if either the sample or duplicate value is < 5x the CRQL. For field duplicates analysis that does not meet the technical criteria, the action was applied to only the field sample and it's duplicate.

MBD4M4 (DF-SB-10-A, parent) and **MBD4P9** (SB-900-A, duplicate), and **MBD4N1** (DF-SB-17-A, parent) and **MBD4Q0** (SB-900-B, duplicate) are Field Duplicate (FD) samples, respectively.

The following original and their field duplicate samples have analyte results greater than or equal to 5xCRQL and Relative Percent Difference (RPD) between the two samples is greater than 50%. Detected analytes are qualified **J** and non-detects, **UJ**.

Lead – MBD4N1 and MBD4Q0; MBD4M4 and MBD4P9

The following original and/or duplicate sample results are less than 5xCRQL and absolute difference between original and duplicate samples is greater than the 2xCRQL. Detected analytes are qualified **J**. Nondetects are qualified **UJ**.

Antimony – MBD4N1 and MBD4Q0
Beryllium – MBD4M4 and MBD4P9
Cadmium – MBD4M4 and MBD4P9
Selenium – MBD4M4 and MBD4P9

8. LABORATORY CONTROL SAMPLE

The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. Aqueous/water, soil/sediment, wipe, and filter LCSs shall be analyzed for each analyte utilizing the same sample preparations, analytical methods, and Quality Assurance/Quality Control (QA/QC) procedures as employed for the samples. All LCS Percent Recoveries (%R) must fall within the control limits of 70-130%, except for Sb and Ag which must fall within the control limits of 50-150%. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

9. ICP SERIAL DILUTION

The serial dilution of samples quantitated by Inductively Coupled Plasma determines whether or not significant physical or chemical interferences exist due to sample matrix. If the analyte concentration is sufficiently high [concentration in the original sample is > 50 times (50x) the Method Detection Limit (MDL)], the Percent Difference (%D) between the original determination and the serial dilution analysis (a five-fold dilution) after correction for dilution shall be less than 10. For a serial dilution analysis that does not meet the technical criteria, the action was applied to only the field sample used to prepare the serial dilution sample.

No problems were found for this criterion.

10. ICP-MS TUNE ANALYSIS

The Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) tune serves as an initial demonstration of instrument stability and precision. Prior to calibration, the laboratory shall analyze or scan the ICP-MS tuning solution at least five times (5x) consecutively. The tuning solution contains 100 µg/L of Be, Mg, Co, In, and Pb. The solution shall contain all required isotopes of the above elements. The laboratory shall make any adjustments necessary to bring peak width within the instrument manufacturer's specifications and adjust mass resolution to within 0.1 u over the range of 6-210 u. The Percent Relative Standard Deviation (%RSD) of the absolute signals for all analytes in the tuning solution must be < 5%. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

11. ICP-MS INTERNAL STANDARDS

The analysis of Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) internal standards determines the existence and magnitude of instrument drift and physical interferences. The criteria for evaluation of internal standard results apply to all analytical and Quality Control (QC) samples analyzed during the run, beginning with the calibration. All samples analyzed during a run, with the exception of the ICP-MS tune, shall contain internal standards. A minimum of five internal standards shall be added to each sample. The laboratory shall monitor the same internal standards throughout the entire analytical run and shall assign each analyte to at least one internal standard. The Percent Relative Intensity (%RI) in the sample shall fall within 60-125% of the response in the calibration blank. If the %RI of the response in the sample falls outside of these limits, the laboratory shall reanalyze the original sample at a two-fold dilution with internal standard added. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

12. PERCENT SOLIDS

The laboratory is required to perform the percent solids determination prior to sample preparation and analysis. All results of a sample with percent solids less than 50% are qualified estimated, "J". Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

13. OTHER ISSUES

None.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
DESA/HWSB/HWSS
2890, Woodbridge Avenue, Edison, NJ 08837

EXECUTIVE NARRATIVE

Case No.: 46633
Site: Former Duofold Corporation (Brownfield)

Number of Samples: 20 (Soil)
Analysis: TCLP Metals (ICP-AES), TCLP Mercury (CVAA)

SDG No.: MBD4N9
Laboratory: Chemtech Consulting Group (CHM)
Sampling dates: 11/07/2016, 11/08/2016
Validation SOP: HW-3a and 3c (Rev 0)

QAPP
Contractor: CDM-Smith
Contractor Document No.: 3323-029-02960

SUMMARY OF DEFINITIONS:

Critical: Results have an unacceptable level of uncertainty and should not be used for making decisions. Data have been qualified “R” rejected.
Major: A level of uncertainty exists that may not meet the data quality objectives for the project. A bias is likely to be present in the results. Data has been qualified “J” estimated. “J+” and “J-“ represent likely direction of the bias.
Minor: The level of uncertainty is acceptable. No significant bias in the data was observed.

Critical Findings: None

Major Findings: Samples have analyte(s) that have been qualified J.

Minor Findings: None

COMMENT:	Results greater than detection limits (MDL) and below quantitation limits (CRQL) are qualified as estimated J.

Reviewer Name(s): A Aoanan (SEE)

Approver’s Signature:

Date: 1/06/2017

Name: Narendra Kumar

Affiliation: USEPA/R2/HWSB/HWSS

Data Qualifier Definitions (National Functional Guidelines)

Qualifier Symbol	Explanation		
	INORGANICS	**ORGANICS**	**CHLORINATED DIOXINS/FURANS**
U	The analyte was analyzed for, but was not detected above the level of the reported quantitation limit.	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted Contract Required Quantitation Limit (CRQL) for sample and method	The analyte was analyzed for but not detected. The value preceding the "U" may represent the adjusted Contract Required Quantitation Limit (see DLM02.X, Exhibit D, Section 1.2 and Table 2), or the sample specific estimated detection limit (EDL, see Method 8290A, Section 11.9.5).
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the CRQL.	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to an issue with the quality of the data generated because certain QC criteria were not met, or the concentration of the analyte was below the adjusted CRQL).
J+	The result is an estimated quantity, but the result may be biased high.	The result is an estimated quantity, but the result may be biased high.	
J–	The result is an estimated quantity, but the result may be biased low.	The result is an estimated quantity, but the result may be biased low.	
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.	The analyte was not detected at a level greater than or equal to the adjusted CRQL. However, the reported adjusted CRQL is approximate and may be inaccurate or imprecise.	The analyte was not detected (see definition of "U" flag, above). The reported value should be considered approximate.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.	The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.	The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
N		The analysis indicates the presence of an analyte for which there is presumptive evidence to make a “tentative identification”.	
NJ		The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.	
C		This qualifier applies to pesticide and Aroclor results when the identification has been confirmed by Gas Chromatograph/Mass Spectrometer (GC/MS).	
X		This qualifier applies to pesticide and Aroclor results when GC/MS analysis was attempted but was unsuccessful.	

DATA ASSESSMENT

ANALYSIS: METALS ICP-AES (TCLP)

The current SOP HW-3a (Revision 0) July 2015, USEPA Region II for the evaluation of ICP-AES metals generated through Statement of Work ISOM02.2 has been applied. Data have been reviewed according to TDF specifications, the National Functional Guidelines (NFG) Report and the CCS Semi-Automated Screening Results Report.

1. HOLDING TIME AND PRESERVATION

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time or pH (aqueous samples are not within the acceptable range, the data may not be valid. Those analytes detected in the samples whose holding time (180 days) or pH (≤ 2) have not been met, will be qualified as estimated, "J"; the non-detects will be flagged as unusable, "R". Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

2. CALIBRATION

Method requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable quantitative data for the metals on the Inorganic Target Analyte List (TAL). Initial Calibration Verification (ICV) demonstrates that the instrument is capable of acceptable performance at the beginning of the analytical run. Continuing Calibration Verification (CCV) demonstrates that the initial calibration is still valid by checking the performance of the instrument on a continuing basis.

A) INITIAL CALIBRATION

A blank and at least five calibration standards shall be used to establish each analytical curve. At least one of these standards shall be at or below the Contract Required Quantitation Limit (CRQL). The calibration curve shall be fitted using linear regression or weighted linear regression. The curve may be forced through zero. The curve must have a correlation coefficient ≥ 0.995. The percent differences calculated for all of the non-zero standards must be within ±30% of the true value of the standard. The y-intercept of the curve must be less than the CRQL. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

B) INITIAL AND CONTINUING CALIBRATION VERIFICATION

Immediately after each system has been calibrated, the accuracy of the initial calibration must be verified and documented for each target analyte by the analysis of an ICV solution(s). The CCV standard shall be analyzed at a frequency of every two hours during an analytical run. The CCV

standard shall also be analyzed at the beginning of the run, and again after the last analytical sample. The percent recovery acceptable limits for ICV/CCV are 90 – 110%. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

3. BLANK CONTAMINATION

Quality assurance (QA) blanks, i.e., method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field activity. Calibration blanks — Initial Calibration Blank (ICB) and Continuing Calibration Blank (CCB), are used to ensure a stable instrument baseline before and during the analysis of analytical samples. The Preparation Blank (PB) is used to assess the level of contamination introduced to the analytical samples throughout the sample preparation process. Field and rinse blanks (FB and RB) measure cross-contamination of samples during field operations. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

FIELD BLANK - None

No Field Blank sample was identified in the Trip Report for this SDGs sampling dates.

4. INTERFERENCE CHECK SAMPLE

The Interference Check Sample (ICS) verifies the analytical instrument's ability to overcome interferences typical of those found in samples. The laboratory should have analyzed and reported ICS results for all elements being reported from the analytical run and for all interferents (target and non-target) for these reported elements. The ICS consists of two solutions: Solution A and Solution AB. Solution A consists of the interferents, and Solution AB consists of the analytes mixed with the interferents. Results for the analysis of ICS Solution must fall within the control limits of ± 20% or ±CRQL (whichever is greater) of the true value for the analytes and interferents included in the solution. If results that are ≥ MDL are observed for analytes that are not present in the ICS solution, the possibility of false positives exists. If negative results are observed for analytes that are not present in the ICS solution, and their absolute value is ≥ MDL, the possibility of false negatives in the samples exists. In general, ICP sample data can be accepted if the concentrations of Al, Ca, Fe, and Mg in the sample are found to be less than or equal to their respective concentrations in the ICS. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

5. SPIKE SAMPLE ANALYSIS

The spiked sample analysis is designed to provide information about the effect of each sample matrix on the sample preparation procedures and the measurement methodology. The spike Percent Recovery (%R) shall be within the established acceptance limits of 75 – 125%. However, spike recovery limits do not apply when the sample concentration is ≥ 4x the spike added. For a matrix spike analysis that does not meet the technical criteria, the action was applied to only the field sample used to prepare the matrix spike sample.

No problems were found for this criterion.

6. DUPLICATE SAMPLE ANALYSIS

The objective of duplicate sample analysis is to demonstrate acceptable method precision by the laboratory at the time of analysis. A control limit of 35% for soil/sediment and 20% for aqueous for the Relative Percent Difference (RPD) shall be used for original and duplicate sample values > five times (5x) the CRQL. A control limit of the CRQL shall be used if either the sample or duplicate value is ≤ 5x the CRQL. For a duplicate sample analysis that does not meet the technical criteria, the action was applied to only the field sample used to prepare the duplicate sample.

No problems were found for this criterion.

7. FIELD DUPLICATE

Field duplicates may be taken and analyzed as an indication of overall precision. These analyses measure both field and laboratory precision. A control limit of 50% for soil/sediment and 20% for aqueous for the Relative Percent Difference (RPD) shall be used for original and duplicate sample values ≥ five times (5x) the Contract Required Quantitation Limit (CRQL). A control limit of the CRQL shall be used if either the sample or duplicate value is < 5x the CRQL. For field duplicates analysis that does not meet the technical criteria, the action was applied to only the field sample and it's duplicate.

Samples **MBD4N1** (DF-SB-17-A, parent) and **MBD4Q0** (SB-900-B, duplicate) are Field Duplicate (FD) samples for the sampling date, 11/8/2016 but were not included in this SDG.

No problems were found for this criterion.

8. LABORATORY CONTROL SAMPLE

The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. Aqueous/water, soil/sediment, wipe, and filter LCSs shall be analyzed for each analyte utilizing the same sample preparations, analytical methods, and Quality Assurance/Quality Control (QA/QC) procedures as employed for the samples. All LCS Percent Recoveries (%R) must fall within the control limits of 70-130%, except for Sb and Ag which must fall within the control limits of 50-150%. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

9. ICP SERIAL DILUTION

The serial dilution of samples quantitated by Inductively Coupled Plasma determines whether or not significant physical or chemical interferences exist due to sample matrix. If the analyte concentration is sufficiently high [concentration in the original sample is > 50 times (50x) the Method Detection Limit (MDL)], the Percent Difference (%D) between the original determination and the serial dilution analysis (a five-fold dilution) after correction for dilution shall be less than 10. For a serial dilution

analysis that does not meet the technical criteria, the action was applied to only the field sample used to prepare the serial dilution sample.

No problems were found for this criterion.

10. PERCENT SOLIDS

The laboratory is required to perform the percent solids determination prior to sample preparation and analysis. All results of a sample with percent solids less than 50% are qualified estimated, "J". Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion. Not applicable.

11. OTHER ISSUES

Sample MBD4L5 was not included in the sampling Trip Report.

No other issues were found for this SDG.

DATA ASSESSMENT

ANALYSIS: MERCURY (TCLP)

The current SOP HW-3c (Revision 0) July 2015, USEPA Region II for the evaluation of Mercury generated through Statement of Work ISOM02.2 has been applied. Data have been reviewed according to TDF specifications, the National Functional Guidelines Report and the CCS Semi-Automated Screening Results Report.

1. HOLDING TIME AND PRESERVATION

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time, pH (aqueous samples), or cooler temperature are not within the acceptable range, the data may not be valid. Those analytes detected in the samples whose holding time (28 days) and pH (≤2) have not been met, will be qualified as estimated, "J"; the non-detects (sample quantitation limits) will be flagged as unusable, "R". Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

2. CALIBRATION

Method requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable quantitative data for mercury. Initial Calibration Verification (ICV) demonstrates that the instrument is capable of acceptable performance at the beginning of the analytical run. Continuing Calibration Verification (CCV) demonstrates that the initial calibration is still valid by checking the performance of the instrument on a continuing basis.

A) INITIAL CALIBRATION

A blank and at least five calibration standards shall be used to establish each analytical curve. At least one of the standards shall be at or below the CRQL. The calibration curve shall be fitted using linear regression or weighted linear regression. The curve may be forced through zero. The curve must have a correlation coefficient ≥ 0.995. The percent differences calculated for all of the non-zero standards must be within ± 30% of the true value of the standard. The y-intercept of the curve must be less than the CRQL. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

B) INITIAL AND CONTINUING CALIBRATION VERIFICATION

Immediately after each system has been calibrated, the accuracy of the initial calibration must be verified and documented for mercury by the analysis of an ICV solution(s). The CCV standard shall be analyzed at a frequency of every hour during an analytical run. The CCV standard shall also be analyzed at the beginning of the run, and again after the last analytical sample. The percent recovery acceptable limits for ICV/CCV are 85 – 115%. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

3. BLANK CONTAMINATION

Quality assurance (QA) blanks, i.e., method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure cross-contamination of samples during field operations. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

FIELD BLANK - None

No Field Blank sample was identified in the Trip Report for this SDG's sampling dates.

4. SPIKE SAMPLE ANALYSIS

The spiked sample analysis is designed to provide information about the effect of each sample matrix on the sample preparation procedures and the measurement methodology. The spike Percent Recovery (%R) shall be within the established acceptance limits of 75 – 125%. However, spike recovery limits do not apply when the sample concentration is ≥ 4x the spike added. For a matrix spike analysis that does not meet the technical criteria, the action was applied to only the field sample used to prepare the matrix spike sample.

No problems were found for this criterion.

5. DUPLICATE SAMPLE ANALYSIS

The objective of duplicate sample analysis is to demonstrate acceptable method precision by the laboratory at the time of analysis. A control limit of 35% for soil/sediment and 20% for aqueous for the Relative Percent Difference (RPD) shall be used for original and duplicate sample values > five times (5x) the CRQL. A control limit of the CRQL shall be used if either the sample or duplicate value is ≤ 5x the CRQL. For a duplicate sample analysis that does not meet the technical criteria, the action was applied to only the field sample used to prepare the duplicate sample.

No problems were found for this criterion.

6. FIELD DUPLICATE

Field duplicates may be taken and analyzed as an indication of overall precision. These analyses measure both field and laboratory precision. A control limit of 20% for the Relative Percent Difference (RPD) shall be used for original and duplicate sample values ≥ five times (5x) the Contract Required Quantitation Limit (CRQL). A control limit of the CRQL shall be used if either the sample or duplicate value is < 5x the CRQL. For field duplicates analysis that does not meet the technical criteria, the action was applied to only the field sample and it's duplicate.

Samples **MBD4N1** (DF-SB-17-A, parent) and **MBD4Q0** (SB-900-B, duplicate) are Field Duplicate (FD) samples for the sampling date, 11/8/2016 but were not included in this SDG.

No problems were found for this criterion.

7. PERCENT SOLIDS

The laboratory is required to perform the percent solids determination prior to sample preparation and analysis. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion. Not applicable.

8. OTHER ISSUES

Sample MBD4L5 was not included in the sampling Trip Report.

No other issues were found for this SDG.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
DESA/HWSB/HWSS
2890, Woodbridge Avenue, Edison, NJ 08837

EXECUTIVE NARRATIVE

Case No.: 46633
Site: Former Duofold Corporation (Brownfield)

SDG No.: MBD4P0
Laboratory: Chemtech Consulting Group (CHM)

Number of Samples: 18 (Soil)
Analysis: Metals (ICP-AES & ICP-MS)

Sampling dates: 11/07 and 11/08/2016
Validation SOP: HW-3a & 3b (Rev 0)

QAPP
Contractor: CDM-Smith
Contractor Document No.: 3323-029-02960

SUMMARY OF DEFINITIONS:

Critical: Results have an unacceptable level of uncertainty and should not be used for making decisions. Data have been qualified “R” rejected.

Major: A level of uncertainty exists that may not meet the data quality objectives for the project. A bias is likely to be present in the results. Data has been qualified “J” estimated. “J+” and “J-“ represent likely direction of the bias.

Minor: The level of uncertainty is acceptable. No significant bias in the data was observed.

Critical Findings: None

Major Findings: Samples have analyte(s) that have been qualified J.

Minor Findings: None

COMMENT:	DAR revision considers Field Duplicate samples results not included in this SDG. Results greater than detection limits (MDL) and below quantitation limits (CRQL) are qualified as estimated J.

Reviewer Name(s): A Aoanan (SEE)

Approver’s Signature:

Date: 12/19/2016

Name: Narendra Kumar

Affiliation: USEPA/R2/HWSB/HWSS

Data Qualifier Definitions (National Functional Guidelines)

Qualifier Symbol	Explanation		
	INORGANICS	ORGANICS	CHLORINATED DIOXINS/FURANS
U	The analyte was analyzed for, but was not detected above the level of the reported quantitation limit.	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted Contract Required Quantitation Limit (CRQL) for sample and method	The analyte was analyzed for but not detected. The value preceding the "U" may represent the adjusted Contract Required Quantitation Limit (see DLM02.X, Exhibit D, Section 1.2 and Table 2), or the sample specific estimated detection limit (EDL, see Method 8290A, Section 11.9.5).
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the CRQL.	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to an issue with the quality of the data generated because certain QC criteria were not met, or the concentration of the analyte was below the adjusted CRQL).
J+	The result is an estimated quantity, but the result may be biased high.	The result is an estimated quantity, but the result may be biased high.	
J–	The result is an estimated quantity, but the result may be biased low.	The result is an estimated quantity, but the result may be biased low.	
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.	The analyte was not detected at a level greater than or equal to the adjusted CRQL. However, the reported adjusted CRQL is approximate and may be inaccurate or imprecise.	The analyte was not detected (see definition of "U" flag, above). The reported value should be considered approximate.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.	The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.	The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
N		The analysis indicates the presence of an analyte for which there is presumptive evidence to make a “tentative identification”.	
NJ		The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.	
C		This qualifier applies to pesticide and Aroclor results when the identification has been confirmed by Gas Chromatograph/Mass Spectrometer (GC/MS).	
X		This qualifier applies to pesticide and Aroclor results when GC/MS analysis was attempted but was unsuccessful.	

DATA ASSESSMENT

ANALYSIS: METALS ICP-AES

The current SOP HW-3a (Revision 0) July 2015, USEPA Region II for the evaluation of ICP-AES metals generated through Statement of Work ISOM02.2 has been applied. Data have been reviewed according to TDF specifications, the National Functional Guidelines Report and the CCS Semi-Automated Screening Results Report.

1. HOLDING TIME AND PRESERVATION

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time or pH (aqueous samples are not within the acceptable range, the data may not be valid. Those analytes detected in the samples whose holding time (180 days) or pH (≤ 2) have not been met, will be qualified as estimated, "J"; the non-detects will be flagged as unusable, "R". Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

2. CALIBRATION

Method requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable quantitative data for the metals on the Inorganic Target Analyte List (TAL). Initial Calibration Verification (ICV) demonstrates that the instrument is capable of acceptable performance at the beginning of the analytical run. Continuing Calibration Verification (CCV) demonstrates that the initial calibration is still valid by checking the performance of the instrument on a continuing basis.

A) INITIAL CALIBRATION

A blank and at least five calibration standards shall be used to establish each analytical curve. At least one of these standards shall be at or below the CRQL. The calibration curve shall be fitted using linear regression or weighted linear regression. The curve may be forced through zero. The curve must have a correlation coefficient ≥ 0.995. The percent differences calculated for all of the non-zero standards must be within ±30% of the true value of the standard. The y-intercept of the curve must be less than the CRQL. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

B) INITIAL AND CONTINUING CALIBRATION VERIFICATION

Immediately after each system has been calibrated, the accuracy of the initial calibration must be verified and documented for each target analyte by the analysis of an ICV solution(s). The CCV standard shall be analyzed at a frequency of every two hours during an analytical run. The CCV standard shall also be analyzed at the beginning of the run, and again after the last analytical sample.

The percent recovery acceptable limits for ICV/CCV are 90 – 110%. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

3. BLANK CONTAMINATION

Quality assurance (QA) blanks, i.e., method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field activity. Calibration blanks (ICB and CCB) are used to ensure a stable instrument baseline before and during the analysis of analytical samples. The preparation blank (PB) is used to assess the level of contamination introduced to the analytical samples throughout the sample preparation process. Field and rinse blanks measure cross-contamination of samples during field operations. Qualifications were applied to the samples and analytes as shown below.

The following samples have analyte results greater than or equal to MDLs and less than or equal to CRQLs. The associated **PB** analyte results are greater than or equal to MDLs and less than or equal to CRQLs. Detects are qualified as **U**. Sample results are reported at CRQLs.

Sodium – MBD4L5, MBD4L6, MBD4L7, MBD4L8, MBD4L9, MBD4M0, MBD4M1, MBD4M5, MBD4N9, MBD4P0, MBD4P1, MBD4P2, MBD4P3, MBD4P4, MBD4P5, MBD4P6, MBD4P7, MBD4P8

4. INTERFERENCE CHECK SAMPLE

The Interference Check Sample (ICS) verifies the analytical instrument's ability to overcome interferences typical of those found in samples. The laboratory should have analyzed and reported ICS results for all elements being reported from the analytical run and for all interferents (target and non-target) for these reported elements. The ICS consists of two solutions: Solution A and Solution AB. Solution A consists of the interferents, and Solution AB consists of the analytes mixed with the interferents. Results for the analysis of ICS Solution must fall within the control limits of ± 20% or ±CRQL (whichever is greater) of the true value for the analytes and interferents included in the solution. If results that are ≥ MDL are observed for analytes that are not present in the ICS solution, the possibility of false positives exists. If negative results are observed for analytes that are not present in the ICS solution, and their absolute value is ≥ MDL, the possibility of false negatives in the samples exists. In general, ICP sample data can be accepted if the concentrations of Al, Ca, Fe, and Mg in the sample are found to be less than or equal to their respective concentrations in the ICS. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

5. SPIKE SAMPLE ANALYSIS

The spiked sample analysis is designed to provide information about the effect of each sample matrix on the sample preparation procedures and the measurement methodology. The spike Percent Recovery (%R) shall be within the established acceptance limits of 75 – 125%. However, spike recovery limits do not apply when the sample concentration is ≥ 4x the spike added. For a matrix spike analysis that does not meet the technical criteria, the action was applied to only the field sample used to prepare the matrix spike sample.

No problems were found for this criterion.

6. DUPLICATE SAMPLE ANALYSIS

The objective of duplicate sample analysis is to demonstrate acceptable method precision by the laboratory at the time of analysis. A control limit of 35 – 120% for soil/sediment and 20 – 100% for aqueous for the Relative Percent Difference (RPD) shall be used for original and duplicate sample values ≥ five times (5x) the Contract Required Quantitation Limit (CRQL). A control limit of the CRQL shall be used if either the sample or duplicate value is < 5x the CRQL. For a duplicate sample analysis that does not meet the technical criteria, the action was applied to only the field sample used to prepare the duplicate sample.

No problems were found for this criterion.

7. FIELD DUPLICATE

Field duplicates may be taken and analyzed as an indication of overall precision. These analyses measure both field and laboratory precision. A control limit of 50% for soil/sediment and 20% for aqueous for the Relative Percent Difference (RPD) shall be used for original and duplicate sample values ≥ five times (5x) the Contract Required Quantitation Limit (CRQL). A control limit of the CRQL shall be used if either the sample or duplicate value is < 5x the CRQL. For field duplicates analysis that does not meet the technical criteria, the action was applied to only the field sample and it's duplicate.

No field duplicates were included in this SDG. SDG's sampling dates' field duplicate samples included in other SDG(s) were the following:

MBD4N1 (DF-SB-17-A, parent) and **MBD4Q0** (SB-900-B, duplicate) are Field Duplicate (FD) samples.

No problems were found with the *Field Duplicate criterion for ICP-AES*.

8. LABORATORY CONTROL SAMPLE

The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. Aqueous/water, soil/sediment, wipe, and filter LCSs shall be analyzed for each analyte utilizing the same sample preparations, analytical methods, and Quality Assurance/Quality Control (QA/QC) procedures as employed for the samples. All LCS Percent Recoveries (%R) must fall within the control limits of 70-130%, except for Sb and Ag which must fall within the control limits of 50-150%. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

9. ICP SERIAL DILUTION

The serial dilution of samples quantitated by Inductively Coupled Plasma determines whether or not significant physical or chemical interferences exist due to sample matrix. If the analyte concentration is sufficiently high [concentration in the original sample is > 50 times (50x) the Method Detection Limit (MDL)], the Percent Difference (%D) between the original determination and the serial dilution analysis (a five-fold dilution) after correction for dilution shall be less than 10. For a serial dilution analysis that does not meet the technical criteria, the action was applied to only the field sample used to prepare the serial dilution sample.

The following soil/sediment samples are associated with Serial Dilution (SD) sample that has analyte percent different %D greater than 15% but less than 120%. The original sample analyte concentrations are greater than 50xMDLs. Detects are qualified as estimated **J**. Nondetects are not qualified.

Iron – MBD4L8

10. PERCENT SOLIDS

The laboratory is required to perform the percent solids determination prior to sample preparation and analysis. All results of a sample with percent solids less than 50% are qualified estimated, “J”. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

11. OTHER ISSUES

None.

DATA ASSESSMENT

ANALYSIS: METALS ICP-MS

The current SOP HW-3b (Revision 0) July 2015, USEPA Region II for the evaluation of ICP-MS metals generated through Statement of Work ISOM02.2 has been applied. Data have been reviewed according to TDF specifications, the National Functional Guidelines Report and the CCS Semi-Automated Screening Results Report.

1. HOLDING TIME AND PRESERVATION

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time or pH (aqueous samples are not within the acceptable range, the data may not be valid. Those analytes detected in the samples whose holding time (180 days) or pH (<u><</u>2) have not been met, will be qualified as estimated, "J"; the non-detects will be flagged as unusable, "R". Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

2. CALIBRATION

Method requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable quantitative data for the metals on the Inorganic Target Analyte List (TAL). Initial Calibration Verification (ICV) demonstrates that the instrument is capable of acceptable performance at the beginning of the analytical run. Continuing Calibration Verification (CCV) demonstrates that the initial calibration is still valid by checking the performance of the instrument on a continuing basis.

A) INITIAL CALIBRATION

A blank and at least five calibration standards shall be used to establish each analytical curve. At least one of these standards shall be at or below the CRQL. The calibration curve shall be fitted using linear regression or weighted linear regression. The curve may be forced through zero. The curve must have a correlation coefficient ≥ 0.995. The percent differences calculated for all of the non-zero standards must be within ± 30% of the true value of the standard. The y-intercept of the curve must be less than the CRQL. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

B) INITIAL AND CONTINUING CALIBRATION VERIFICATION

Immediately after each system has been calibrated, the accuracy of the initial calibration must be verified and documented for each target analyte by the analysis of an ICV solution(s). The CCV standard shall be analyzed at a frequency of every two hours during an analytical run. The CCV standard shall also be analyzed at the beginning of the run, and again after the last analytical sample.

The percent recovery acceptable limits for ICV/CCV are 90 – 110%. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

3. BLANK CONTAMINATION

Quality assurance (QA) blanks, i.e., method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field activity. Calibration blanks (ICB and CCB) are used to ensure a stable instrument baseline before and during the analysis of analytical samples. The preparation blank is used to assess the level of contamination introduced to the analytical samples throughout the sample preparation process. Field and rinse blanks measure cross-contamination of samples during field operations. Qualifications were applied to the samples and analytes as shown below.

The following samples have analyte results greater than or equal to MDLs and less than or equal to CRQLs. The associated **ICB** analyte results are greater than or equal to MDLs and less than or equal to CRQLs. Detects are qualified as **U**. Sample results are reported at CRQLs.

Antimony – MBD4L7, MBD4L8, MBD4L9, MBD4M0, MBD4M1, MBD4P1, MBD4P2, MBD4P4, MBD4P5, MBD4P7, MBD4P8
Beryllium – MBD4L5, MBD4L7, MBD4M0, MBD4M5, MBD4N9, MBD4P0, MBD4P1, MBD4P3, MBD4P4, MBD4P5, MBD4P6, MBD4P7, MBD4P8

The following samples have analyte results less than or equal to CRQLs. The associated **CCB** analyte results are less than or equal to CRQLs. Detects are qualified as **U**. Sample results are reported at CRQLs.

Antimony – MBD4L7, MBD4L8, MBD4L9, MBD4M0, MBD4M1, MBD4P1, MBD4P2, MBD4P4, MBD4P5, MBD4P7, MBD4P8
Beryllium – MBD4L5, MBD4L7, MBD4M0, MBD4M5, MBD4N9, MBD4P0, MBD4P1, MBD4P3, MBD4P4, MBD4P5, MBD4P6, MBD4P7, MBD4P8
Thallium – MBD4L9, MBD4N9, MBD4P0, MBD4P1, MBD4P2, MBD4P3, MBD4P4, MBD4P5, MBD4P6, MBD4P7, MBD4P8

The following samples have analyte results greater than or equal to MDLs and less than or equal to CRQLs. The associated **PB** analyte results are greater than or equal to MDLs and less than or equal to CRQLs. Detects are qualified as **U**. Sample results are reported at CRQLs.

Antimony – MBD4L7, MBD4L8, MBD4L9, MBD4M0, MBD4M1, MBD4P1, MBD4P2, MBD4P4, MBD4P5, MBD4P7, MBD4P8

4. INTERFERENCE CHECK SAMPLE

The Interference Check Sample (ICS) verifies the analytical instrument's ability to overcome interferences typical of those found in samples. The laboratory should have analyzed and reported ICS results for all elements being reported from the analytical run and for all interferents (target and non-target) for these reported elements. The ICS consists of two solutions: Solution A and Solution AB. Solution A consists of the interferents, and Solution AB consists of the analytes mixed with the interferents. Results for the analysis of ICS Solution must fall within the control limits of ± 20% or

±2X CRQL (whichever is greater) of the true value for the analytes and interferents included in the solution. If results that are ≥ MDL are observed for analytes that are not present in the ICS solution, the possibility of false positives exists. If negative results are observed for analytes that are not present in the ICS solution, and their absolute value is ≥ MDL, the possibility of false negatives in the samples exists. In general, ICP sample data can be accepted if the concentrations of Al, Ca, Fe, and Mg in the sample are found to be less than or equal to their respective concentrations in the ICS. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

5. SPIKE SAMPLE ANALYSIS

The spiked sample analysis is designed to provide information about the effect of each sample matrix on the sample preparation procedures and the measurement methodology. The spike Percent Recovery (%R) shall be within the established acceptance limits of 75 – 125%. However, spike recovery limits do not apply when the sample concentration is ≥ 4x the spike added. For a matrix spike analysis that does not meet the technical criteria, the action was applied to only the field sample used to prepare the matrix spike sample.

No problems were found for this criterion.

6. DUPLICATE SAMPLE ANALYSIS

The objective of duplicate sample analysis is to demonstrate acceptable method precision by the laboratory at the time of analysis. A control limit of 35 – 120% for soil/sediment and 20 – 100% for aqueous for the Relative Percent Difference (RPD) shall be used for original and duplicate sample values ≥ five times (5x) the Contract Required Quantitation Limit (CRQL). A control limit of the CRQL shall be used if either the sample or duplicate value is < 5x the CRQL. For a duplicate sample analysis that does not meet the technical criteria, the action was applied to only the field sample used to prepare the duplicate sample.

No problems were found for this criterion.

7. FIELD DUPLICATE

Field duplicates may be taken and analyzed as an indication of overall precision. These analyses measure both field and laboratory precision. A control limit of 50% for soil/sediment and 20% for aqueous for the Relative Percent Difference (RPD) shall be used for original and duplicate sample values ≥ five times (5x) the Contract Required Quantitation Limit (CRQL). A control limit of the CRQL shall be used if either the sample or duplicate value is < 5x the CRQL. For field duplicates analysis that does not meet the technical criteria, the action was applied to only the field sample and it's duplicate.

No field duplicates were included in this SDG. The SDG's sampling dates' field duplicate samples included in other SDG(s) for the requested analyses were the following:

MBD4N1 (DF-SB-17-A, parent) and **MBD4Q0** (SB-900-B, duplicate)

The following original and their field duplicate samples have analyte results greater than or equal to 5xCRQL and Relative Percent Difference (RPD) between the two samples is greater than 50%. Detected analytes are qualified **J** and non-detects, **UJ**.

Lead – MBD4N1 and MBD4Q0

The following original and/or duplicate sample results are less than 5xCRQL and absolute difference between original and duplicate samples is greater than the 2xCRQL. Detected analytes are qualified **J**. Nondetects are qualified **UJ**.

Antimony – MBD4N1 and MBD4Q0

8. LABORATORY CONTROL SAMPLE

The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. Aqueous/water, soil/sediment, wipe, and filter LCSs shall be analyzed for each analyte utilizing the same sample preparations, analytical methods, and Quality Assurance/Quality Control (QA/QC) procedures as employed for the samples. All LCS Percent Recoveries (%R) must fall within the control limits of 70-130%, except for Sb and Ag which must fall within the control limits of 50-150%. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

9. ICP SERIAL DILUTION

The serial dilution of samples quantitated by Inductively Coupled Plasma determines whether or not significant physical or chemical interferences exist due to sample matrix. If the analyte concentration is sufficiently high [concentration in the original sample is > 50 times (50x) the Method Detection Limit (MDL)], the Percent Difference (%D) between the original determination and the serial dilution analysis (a five-fold dilution) after correction for dilution shall be less than 10. For a serial dilution analysis that does not meet the technical criteria, the action was applied to only the field sample used to prepare the serial dilution sample.

No problems were found for this criterion.

10. ICP-MS TUNE ANALYSIS

The Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) tune serves as an initial demonstration of instrument stability and precision. Prior to calibration, the laboratory shall analyze or scan the ICP-MS tuning solution at least five times (5x) consecutively. The tuning solution contains 100 µg/L of Be, Mg, Co, In, and Pb. The solution shall contain all required isotopes of the above elements. The laboratory shall make any adjustments necessary to bring peak width within the instrument manufacturer's specifications and adjust mass resolution to within 0.1 u over the range of 6-210 u. The Percent Relative Standard Deviation (%RSD) of the absolute signals for all analytes in the tuning solution must be < 5%. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

11. ICP-MS INTERNAL STANDARDS

The analysis of Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) internal standards determines the existence and magnitude of instrument drift and physical interferences. The criteria for evaluation of internal standard results apply to all analytical and Quality Control (QC) samples analyzed during the run, beginning with the calibration. All samples analyzed during a run, with the exception of the ICP-MS tune, shall contain internal standards. A minimum of five internal standards shall be added to each sample. The laboratory shall monitor the same internal standards throughout the entire analytical run and shall assign each analyte to at least one internal standard. The Percent Relative Intensity (%RI) in the sample shall fall within 60-125% of the response in the calibration blank. If the %RI of the response in the sample falls outside of these limits, the laboratory shall reanalyze the original sample at a two-fold dilution with internal standard added. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

12. PERCENT SOLIDS

The laboratory is required to perform the percent solids determination prior to sample preparation and analysis. All results of a sample with percent solids less than 50% are qualified estimated, “J”. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

13. OTHER ISSUES

None.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
DESA/HWSB/HWSS
2890, Woodbridge Avenue, Edison, NJ 08837

EXECUTIVE NARRATIVE

Case No.: 46633
SDG No.: MBD4Q3
Site: Former Duofold Corporation (Brownfield)
Laboratory: Chemtech Consulting Group (CHM)

Number of Samples: 20 (Water)
Sampling dates: 11/07, 08, 09 and 11/10/2016
Analysis: Metals (ICP-MS)
Validation SOP: HW-3b (Rev 0)

QAPP
Contractor: CDM-Smith
Contractor Document No.: 3323-029-02960

SUMMARY OF DEFINITIONS:

Critical: Results have an unacceptable level of uncertainty and should not be used for making decisions. Data have been qualified “R” rejected.

Major: A level of uncertainty exists that may not meet the data quality objectives for the project. A bias is likely to be present in the results. Data has been qualified “J” estimated. “J+” and “J-“ represent likely direction of the bias.

Minor: The level of uncertainty is acceptable. No significant bias in the data was observed.

Critical Findings: None

Major Findings: Samples have analyte(s) that have been qualified UJ, and J.

Minor Findings: None

COMMENT: Results greater than detection limits (MDL) and below quantitation limits (CRQL) are qualified as estimated J.

Reviewer Name(s): A Aoanan (SEE)

Approver’s Signature:

Date: 12/29/2016

Name: Russell Arnone

Affiliation: USEPA/R2/HWSB/HWSS

Data Qualifier Definitions (National Functional Guidelines)

Qualifier Symbol	Explanation		
	INORGANICS	**ORGANICS**	**CHLORINATED DIOXINS/FURANS**
U	The analyte was analyzed for, but was not detected above the level of the reported quantitation limit.	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted Contract Required Quantitation Limit (CRQL) for sample and method	The analyte was analyzed for but not detected. The value preceding the "U" may represent the adjusted Contract Required Quantitation Limit (see DLM02.X, Exhibit D, Section 1.2 and Table 2), or the sample specific estimated detection limit (EDL, see Method 8290A, Section 11.9.5).
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the CRQL.	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to an issue with the quality of the data generated because certain QC criteria were not met, or the concentration of the analyte was below the adjusted CRQL).
J+	The result is an estimated quantity, but the result may be biased high.	The result is an estimated quantity, but the result may be biased high.	
J−	The result is an estimated quantity, but the result may be biased low.	The result is an estimated quantity, but the result may be biased low.	
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.	The analyte was not detected at a level greater than or equal to the adjusted CRQL. However, the reported adjusted CRQL is approximate and may be inaccurate or imprecise.	The analyte was not detected (see definition of "U" flag, above). The reported value should be considered approximate.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.	The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.	The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
N		The analysis indicates the presence of an analyte for which there is presumptive evidence to make a “tentative identification”.	
NJ		The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.	
C		This qualifier applies to pesticide and Aroclor results when the identification has been confirmed by Gas Chromatograph/Mass Spectrometer (GC/MS).	
X		This qualifier applies to pesticide and Aroclor results when GC/MS analysis was attempted but was unsuccessful.	

DATA ASSESSMENT

ANALYSIS: METALS ICP-MS

The current SOP HW-3b (Revision 0) July 2015, USEPA Region II for the evaluation of ICP-MS metals generated through Statement of Work ISOM02.2 has been applied. Data have been reviewed according to TDF specifications, the National Functional Guidelines Report and the CCS Semi-Automated Screening Results Report.

1. HOLDING TIME AND PRESERVATION

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time or pH (aqueous samples are not within the acceptable range, the data may not be valid. Those analytes detected in the samples whose holding time (180 days) or pH (≤2) have not been met, will be qualified as estimated, "J"; the non-detects will be flagged as unusable, "R". Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

2. CALIBRATION

Method requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable quantitative data for the metals on the Inorganic Target Analyte List (TAL). Initial Calibration Verification (ICV) demonstrates that the instrument is capable of acceptable performance at the beginning of the analytical run. Continuing Calibration Verification (CCV) demonstrates that the initial calibration is still valid by checking the performance of the instrument on a continuing basis.

A) INITIAL CALIBRATION

A blank and at least five calibration standards shall be used to establish each analytical curve. At least one of these standards shall be at or below the CRQL. The calibration curve shall be fitted using linear regression or weighted linear regression. The curve may be forced through zero. The curve must have a correlation coefficient ≥ 0.995. The percent differences calculated for all of the non-zero standards must be within ± 30% of the true value of the standard. The y-intercept of the curve must be less than the CRQL. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

B) INITIAL AND CONTINUING CALIBRATION VERIFICATION

Immediately after each system has been calibrated, the accuracy of the initial calibration must be verified and documented for each target analyte by the analysis of an ICV solution(s). The CCV standard shall be analyzed at a frequency of every two hours during an analytical run. The CCV standard shall also be analyzed at the beginning of the run, and again after the last analytical sample.

The percent recovery acceptable limits for ICV/CCV are 90 – 110%. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

3. BLANK CONTAMINATION

Quality assurance (QA) blanks, i.e., method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field activity. Calibration blanks (ICB and CCB) are used to ensure a stable instrument baseline before and during the analysis of analytical samples. The preparation blank is used to assess the level of contamination introduced to the analytical samples throughout the sample preparation process. Field and rinse blanks measure cross-contamination of samples during field operations. Qualifications were applied to the samples and analytes as shown below.

The following samples have analyte results greater than or equal to MDLs and less than or equal to CRQLs. The associated **ICB** analyte results are greater than or equal to MDLs and less than or equal to CRQLs. Detects are qualified as **U**. Sample results are reported at CRQLs.

Antimony – MBD4Q3, MBD4Q4, MBD4Q6, MBD4Q7, MBD4Q9, MBD4R1, MBD4R3, MBD4R5, MBDQN6
Sodium – MBDQN8

The following samples have analyte results less than or equal to CRQLs. The associated **CCB** analyte results are less than or equal to CRQLs. Detects are qualified as **U**. Sample results are reported at CRQLs.

Antimony – MBD4Q3, MBD4Q4, MBD4Q6, MBD4Q7, MBD4Q9, MBD4R1, MBD4R3, MBD4R5, MBDQN6
Sodium – MBDQN8

The following samples have analyte results greater than or equal to MDLs and less than or equal to CRQLs. The associated **PB** analyte results are greater than or equal to MDLs and less than or equal to CRQLs. Detects are qualified as **U**. Sample results are reported at CRQLs.

Antimony – MBD4Q3, MBD4Q4, MBD4Q6, MBD4Q7, MBD4Q9, MBD4R1, MBD4R3, MBD4R5, MBDQN6

FIELD BLANK (MBDQN8)

MBDQN8 was identified as field blank (FB-GW-1) sample in the trip report for the sampling dates. No analyte was above CRQL, no data was qualified with the *Field Blank criterion*.

4. INTERFERENCE CHECK SAMPLE

The Interference Check Sample (ICS) verifies the analytical instrument's ability to overcome interferences typical of those found in samples. The laboratory should have analyzed and reported ICS results for all elements being reported from the analytical run and for all interferents (target and non-target) for these reported elements. The ICS consists of two solutions: Solution A and Solution

AB. Solution A consists of the interferents, and Solution AB consists of the analytes mixed with the interferents. Results for the analysis of ICS Solution must fall within the control limits of ± 20% or +2X CRQL (whichever is greater) of the true value for the analytes and interferents included in the solution. If results that are ≥ MDL are observed for analytes that are not present in the ICS solution, the possibility of false positives exists. If negative results are observed for analytes that are not present in the ICS solution, and their absolute value is ≥ MDL, the possibility of false negatives in the samples exists. In general, ICP sample data can be accepted if the concentrations of Al, Ca, Fe, and Mg in the sample are found to be less than or equal to their respective concentrations in the ICS. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

5. SPIKE SAMPLE ANALYSIS

The spiked sample analysis is designed to provide information about the effect of each sample matrix on the sample preparation procedures and the measurement methodology. The spike Percent Recovery (%R) shall be within the established acceptance limits of 75 – 125%. However, spike recovery limits do not apply when the sample concentration is ≥ 4x the spike added. For a matrix spike analysis that does not meet the technical criteria, the action was applied to only the field sample used to prepare the matrix spike sample.

No problems were found for this criterion.

6. DUPLICATE SAMPLE ANALYSIS

The objective of duplicate sample analysis is to demonstrate acceptable method precision by the laboratory at the time of analysis. A control limit of 35 – 120% for soil/sediment and 20 – 100% for aqueous for the Relative Percent Difference (RPD) shall be used for original and duplicate sample values ≥ five times (5x) the Contract Required Quantitation Limit (CRQL). A control limit of the CRQL shall be used if either the sample or duplicate value is < 5x the CRQL. For a duplicate sample analysis that does not meet the technical criteria, the action was applied to only the field sample used to prepare the duplicate sample.

No problems were found for this criterion.

7. FIELD DUPLICATE

Field duplicates may be taken and analyzed as an indication of overall precision. These analyses measure both field and laboratory precision. A control limit of 50% for soil/sediment and 20% for aqueous for the Relative Percent Difference (RPD) shall be used for original and duplicate sample values ≥ five times (5x) the Contract Required Quantitation Limit (CRQL). A control limit of the CRQL shall be used if either the sample or duplicate value is < 5x the CRQL. For field duplicates analysis that does not meet the technical criteria, the action was applied to only the field sample and it's duplicate.

MBD4Q7 (DF-MW-05-1, parent) and **MBDQN6** (GW-900-1, duplicate), and **MBD4R6** (DF-TWP-03-1, parent) and **MBDQN7** (GW-900-2, duplicate) are Field Duplicate (FD) samples, respectively.

No problems were found for this criterion.

8. LABORATORY CONTROL SAMPLE

The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. Aqueous/water, soil/sediment, wipe, and filter LCSs shall be analyzed for each analyte utilizing the same sample preparations, analytical methods, and Quality Assurance/Quality Control (QA/QC) procedures as employed for the samples. All LCS Percent Recoveries (%R) must fall within the control limits of 70-130%, except for Sb and Ag which must fall within the control limits of 50-150%. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

9. ICP SERIAL DILUTION

The serial dilution of samples quantitated by Inductively Coupled Plasma determines whether or not significant physical or chemical interferences exist due to sample matrix. If the analyte concentration is sufficiently high [concentration in the original sample is > 50 times (50x) the Method Detection Limit (MDL)], the Percent Difference (%D) between the original determination and the serial dilution analysis (a five-fold dilution) after correction for dilution shall be less than 10. For a serial dilution analysis that does not meet the technical criteria, the action was applied to only the field sample used to prepare the serial dilution sample.

No problems were found for this criterion.

10. ICP-MS TUNE ANALYSIS

The Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) tune serves as an initial demonstration of instrument stability and precision. Prior to calibration, the laboratory shall analyze or scan the ICP-MS tuning solution at least five times (5x) consecutively. The tuning solution contains 100 µg/L of Be, Mg, Co, In, and Pb. The solution shall contain all required isotopes of the above elements. The laboratory shall make any adjustments necessary to bring peak width within the instrument manufacturer's specifications and adjust mass resolution to within 0.1 u over the range of 6-210 u. The Percent Relative Standard Deviation (%RSD) of the absolute signals for all analytes in the tuning solution must be < 5%. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

11. ICP-MS INTERNAL STANDARDS

The analysis of Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) internal standards determines the existence and magnitude of instrument drift and physical interferences. The criteria for evaluation of internal standard results apply to all analytical and Quality Control (QC) samples analyzed during the run, beginning with the calibration. All samples analyzed during a run, with the exception of the ICP-MS tune, shall contain internal standards. A minimum of five internal standards shall be added to each sample. The laboratory shall monitor the same internal standards throughout the entire analytical run and shall assign each analyte to at least one internal standard. The Percent Relative Intensity (%RI) in the sample shall fall within 60-125% of the response in the calibration

blank. If the %RI of the response in the sample falls outside of these limits, the laboratory shall reanalyze the original sample at a two-fold dilution with internal standard added. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

12. PERCENT SOLIDS

The laboratory is required to perform the percent solids determination prior to sample preparation and analysis. All results of a sample with percent solids less than 50% are qualified estimated, “J”. Qualifications were applied to the samples and analytes as shown below.

Not applicable for this SDG. None found.

13. OTHER ISSUES

None.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
DESA/HWSB/HWSS
2890, Woodbridge Avenue, Edison, NJ 08837

EXECUTIVE NARRATIVE

Case No.: 46633
Site: Former Duofold Corporation (Brownfield)

SDG No.: MBD4R8
Laboratory: Chemtech Consulting Group (CHM)

Number of Samples: 5 (Water)
Analysis: Metals (ICP-MS)

Sampling dates: 11/10 and 11/11/2016
Validation SOP: HW-3b (Rev 0)

QAPP
Contractor: CDM-Smith
Contractor Document No.: 3323-029-02960

SUMMARY OF DEFINITIONS:

Critical: Results have an unacceptable level of uncertainty and should not be used for making decisions. Data have been qualified “R” rejected.

Major: A level of uncertainty exists that may not meet the data quality objectives for the project. A bias is likely to be present in the results. Data has been qualified “J” estimated. “J+” and “J-“ represent likely direction of the bias.

Minor: The level of uncertainty is acceptable. No significant bias in the data was observed.

Critical Findings: None

Major Findings: Samples have analyte(s) that have been qualified **UJ**, and **J**.

Minor Findings: None

COMMENT:	Results greater than detection limits (MDL) and below quantitation limits (CRQL) are qualified as estimated J.

Reviewer Name(s): A Aoanan (SEE)

Approver’s Signature:

Date: 1/13/2017

Name: Narendra Kumar

Affiliation: USEPA/R2/HWSB/HWSS

Data Qualifier Definitions (National Functional Guidelines)

Qualifier Symbol	Explanation		
	INORGANICS	**ORGANICS**	**CHLORINATED DIOXINS/FURANS**
U	The analyte was analyzed for, but was not detected above the level of the reported quantitation limit.	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted Contract Required Quantitation Limit (CRQL) for sample and method	The analyte was analyzed for but not detected. The value preceding the "U" may represent the adjusted Contract Required Quantitation Limit (see DLM02.X, Exhibit D, Section 1.2 and Table 2), or the sample specific estimated detection limit (EDL, see Method 8290A, Section 11.9.5).
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the CRQL.	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to an issue with the quality of the data generated because certain QC criteria were not met, or the concentration of the analyte was below the adjusted CRQL).
J+	The result is an estimated quantity, but the result may be biased high.	The result is an estimated quantity, but the result may be biased high.	
J−	The result is an estimated quantity, but the result may be biased low.	The result is an estimated quantity, but the result may be biased low.	
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.	The analyte was not detected at a level greater than or equal to the adjusted CRQL. However, the reported adjusted CRQL is approximate and may be inaccurate or imprecise.	The analyte was not detected (see definition of "U" flag, above). The reported value should be considered approximate.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.	The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.	The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
N		The analysis indicates the presence of an analyte for which there is presumptive evidence to make a “tentative identification”.	
NJ		The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.	
C		This qualifier applies to pesticide and Aroclor results when the identification has been confirmed by Gas Chromatograph/Mass Spectrometer (GC/MS).	
X		This qualifier applies to pesticide and Aroclor results when GC/MS analysis was attempted but was unsuccessful.	

DATA ASSESSMENT

ANALYSIS: METALS ICP-MS

The current SOP HW-3b (Revision 0) July 2015, USEPA Region II for the evaluation of ICP-MS metals generated through Statement of Work ISOM02.2 has been applied. Data have been reviewed according to TDF specifications, the National Functional Guidelines (NFG) Report and the CCS Semi-Automated Screening Results Report.

1. HOLDING TIME AND PRESERVATION

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time or pH (aqueous samples are not within the acceptable range, the data may not be valid. Those analytes detected in the samples whose holding time (180 days) or pH (≤2) have not been met, will be qualified as estimated, "J"; the non-detects will be flagged as unusable, "R". Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

2. CALIBRATION

Method requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable quantitative data for the metals on the Inorganic Target Analyte List (TAL). Initial Calibration Verification (ICV) demonstrates that the instrument is capable of acceptable performance at the beginning of the analytical run. Continuing Calibration Verification (CCV) demonstrates that the initial calibration is still valid by checking the performance of the instrument on a continuing basis.

A) INITIAL CALIBRATION

A blank and at least five calibration standards shall be used to establish each analytical curve. At least one of these standards shall be at or below the CRQL. The calibration curve shall be fitted using linear regression or weighted linear regression. The curve may be forced through zero. The curve must have a correlation coefficient ≥ 0.995. The percent differences calculated for all of the non-zero standards must be within ± 30% of the true value of the standard. The y-intercept of the curve must be less than the CRQL. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

B) INITIAL AND CONTINUING CALIBRATION VERIFICATION

Immediately after each system has been calibrated, the accuracy of the initial calibration must be verified and documented for each target analyte by the analysis of an ICV solution(s). The CCV standard shall be analyzed at a frequency of every two hours during an analytical run. The CCV standard shall also be analyzed at the beginning of the run, and again after the last analytical sample.

The percent recovery acceptable limits for ICV/CCV are 90 – 110%. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

3. BLANK CONTAMINATION

Quality assurance (QA) blanks, i.e., method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field activity. Calibration blanks (ICB and CCB) are used to ensure a stable instrument baseline before and during the analysis of analytical samples. The preparation blank is used to assess the level of contamination introduced to the analytical samples throughout the sample preparation process. Field and rinse blanks measure cross-contamination of samples during field operations. Qualifications were applied to the samples and analytes as shown below.

The following samples have analyte results greater than or equal to MDLs and less than or equal to CRQLs. The associated **ICB** analyte results are greater than or equal to MDLs and less than or equal to CRQLs. Detects are qualified as **U**. Sample results are reported at CRQLs.

Antimony – MBDQN1, MBDQN2
Arsenic – MBD4R8, MBD4R9, MBDQN1
Copper – MBD4R8, MBD4R9, MBDQN1, MBDQN3
Lead – MBDQN2, MBDQN3, MBD4R8

The following samples have analyte results less than or equal to CRQLs. The associated **CCB** analyte results are less than or equal to CRQLs. Detects are qualified as **U**. Sample results are reported at CRQLs.

Antimony – MBDQN1, MBDQN2
Arsenic – MBD4R8, MBD4R9, MBDQN1

The following samples have analyte results greater than or equal to MDLs and less than or equal to CRQLs. The associated **PB** analyte results are greater than or equal to MDLs and less than or equal to CRQLs. Detects are qualified as **U**. Sample results are reported at CRQLs.

Antimony – MBDQN1, MBDQN2

FIELD BLANK - None

No Field Blank sample was identified in the Trip Report for this SDG's sampling dates.

4. **INTERFERENCE CHECK SAMPLE**

The Interference Check Sample (ICS) verifies the analytical instrument's ability to overcome interferences typical of those found in samples. The laboratory should have analyzed and reported ICS results for all elements being reported from the analytical run and for all interferents (target and non-target) for these reported elements. The ICS consists of two solutions: Solution A and Solution AB. Solution A consists of the interferents, and Solution AB consists of the analytes mixed with the interferents. Results for the analysis of ICS Solution must fall within the control limits of ± 20% or ±2X CRQL (whichever is greater) of the true value for the analytes and interferents included in the

solution. If results that are ≥ MDL are observed for analytes that are not present in the ICS solution, the possibility of false positives exists. If negative results are observed for analytes that are not present in the ICS solution, and their absolute value is ≥ MDL, the possibility of false negatives in the samples exists. In general, ICP sample data can be accepted if the concentrations of Al, Ca, Fe, and Mg in the sample are found to be less than or equal to their respective concentrations in the ICS. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

5. SPIKE SAMPLE ANALYSIS

The spiked sample analysis is designed to provide information about the effect of each sample matrix on the sample preparation procedures and the measurement methodology. The spike Percent Recovery (%R) shall be within the established acceptance limits of 75 – 125%. However, spike recovery limits do not apply when the sample concentration is ≥ 4x the spike added. For a matrix spike analysis that does not meet the technical criteria, the action was applied to only the field sample used to prepare the matrix spike sample.

No problems were found for this criterion.

6. DUPLICATE SAMPLE ANALYSIS

The objective of duplicate sample analysis is to demonstrate acceptable method precision by the laboratory at the time of analysis. A control limit of 35 – 120% for soil/sediment and 20 – 100% for aqueous for the Relative Percent Difference (RPD) shall be used for original and duplicate sample values ≥ five times (5x) the CRQL. A control limit of the CRQL shall be used if either the sample or duplicate value is < 5x the CRQL. For a duplicate sample analysis that does not meet the technical criteria, the action was applied to only the field sample used to prepare the duplicate sample.

No problems were found for this criterion.

7. FIELD DUPLICATE

Field duplicates may be taken and analyzed as an indication of overall precision. These analyses measure both field and laboratory precision. A control limit of 50% for soil/sediment and 20% for aqueous for the Relative Percent Difference (RPD) shall be used for original and duplicate sample values ≥ five times (5x) the CRQL. A control limit of the CRQL shall be used if either the sample or duplicate value is < 5x the CRQL. For field duplicates analysis that does not meet the technical criteria, the action was applied to only the field sample and it's duplicate.

Samples **MBD4R6** (DF-TWP-03-1, parent) and **MBDQN7** (GW-900-2, duplicate); and **MBDQQ7** (DF-TWP-03-1-F, parent) and **MBDQR7** (GW-900-2-F, duplicate) are Field Duplicate (FD) samples, respectively, for the sampling date, 11/10/2016 but were not included in this SDG.

No problems were found for this criterion.

8. LABORATORY CONTROL SAMPLE

The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. Aqueous/water, soil/sediment, wipe, and filter LCSs shall be analyzed for each analyte utilizing the same sample preparations, analytical methods, and Quality Assurance/Quality Control (QA/QC) procedures as employed for the samples. All LCS Percent Recoveries (%R) must fall within the control limits of 70-130%, except for Sb and Ag which must fall within the control limits of 50-150%. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

9. ICP SERIAL DILUTION

The serial dilution of samples quantitated by Inductively Coupled Plasma determines whether or not significant physical or chemical interferences exist due to sample matrix. If the analyte concentration is sufficiently high [concentration in the original sample is > 50 times (50x) the Method Detection Limit (MDL), the Percent Difference (%D) between the original determination and the serial dilution analysis (a five-fold dilution) after correction for dilution shall be less than 10. For a serial dilution analysis that does not meet the technical criteria, the action was applied to only the field sample used to prepare the serial dilution sample.

No problems were found for this criterion.

10. ICP-MS TUNE ANALYSIS

The Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) tune serves as an initial demonstration of instrument stability and precision. Prior to calibration, the laboratory shall analyze or scan the ICP-MS tuning solution at least five times (5x) consecutively. The tuning solution contains 100 µg/L of Be, Mg, Co, In, and Pb. The solution shall contain all required isotopes of the above elements. The laboratory shall make any adjustments necessary to bring peak width within the instrument manufacturer's specifications and adjust mass resolution to within 0.1 u over the range of 6-210 u. The Percent Relative Standard Deviation (%RSD) of the absolute signals for all analytes in the tuning solution must be < 5%. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

11. ICP-MS INTERNAL STANDARDS

The analysis of Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) internal standards determines the existence and magnitude of instrument drift and physical interferences. The criteria for evaluation of internal standard results apply to all analytical and Quality Control (QC) samples analyzed during the run, beginning with the calibration. All samples analyzed during a run, with the exception of the ICP-MS tune, shall contain internal standards. A minimum of five internal standards shall be added to each sample. The laboratory shall monitor the same internal standards throughout the entire analytical run and shall assign each analyte to at least one internal standard. The Percent Relative Intensity (%RI) in the sample shall fall within 60-125% of the response in the calibration blank. If the %RI of the response in the sample falls outside of these limits, the laboratory shall reanalyze the original sample at a two-fold dilution with internal standard added. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

12. PERCENT SOLIDS

The laboratory is required to perform the percent solids determination prior to sample preparation and analysis. All results of a sample with percent solids less than 50% are qualified estimated, “J”. Qualifications were applied to the samples and analytes as shown below.

Not applicable for this SDG. None found.

13. OTHER ISSUES

None.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
DESA/HWSB/HWSS
2890, Woodbridge Avenue, Edison, NJ 08837

EXECUTIVE NARRATIVE

Case No.: 46633
Site: Former Duofold Corporation (Brownfield)

SDG No.: MBDQP4
Laboratory: Chemtech Consulting Group (CHM)

Number of Samples: 20 (Water)
Analysis: Metals (ICP-MS)

Sampling dates: 11/07, 08, 09 and 11/10/2016
Validation SOP: HW-3b (Rev 0)

QAPP
Contractor: CDM-Smith
Contractor Document No.: 3323-029-02960

SUMMARY OF DEFINITIONS:

Critical: Results have an unacceptable level of uncertainty and should not be used for making decisions. Data have been qualified “R” rejected.
Major: A level of uncertainty exists that may not meet the data quality objectives for the project. A bias is likely to be present in the results. Data has been qualified “J” estimated. “J+” and “J-“ represent likely direction of the bias.
Minor: The level of uncertainty is acceptable. No significant bias in the data was observed.

Critical Findings: None

Major Findings: Samples have analyte(s) that have been qualified UJ, and J.

Minor Findings: None

COMMENT:	Results greater than detection limits (MDL) and below quantitation limits (CRQL) are qualified as estimated J.

Reviewer Name(s): A Aoanan (SEE)

Approver’s Signature:

Date: 12/29/2016

Name: Russell Arnone

Affiliation: USEPA/R2/HWSB/HWSS

Data Qualifier Definitions (National Functional Guidelines)

Qualifier Symbol	Explanation		
	INORGANICS	**ORGANICS**	**CHLORINATED DIOXINS/FURANS**
U	The analyte was analyzed for, but was not detected above the level of the reported quantitation limit.	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted Contract Required Quantitation Limit (CRQL) for sample and method	The analyte was analyzed for but not detected. The value preceding the "U" may represent the adjusted Contract Required Quantitation Limit (see DLM02.X, Exhibit D, Section 1.2 and Table 2), or the sample specific estimated detection limit (EDL, see Method 8290A, Section 11.9.5).
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the CRQL.	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to an issue with the quality of the data generated because certain QC criteria were not met, or the concentration of the analyte was below the adjusted CRQL).
J+	The result is an estimated quantity, but the result may be biased high.	The result is an estimated quantity, but the result may be biased high.	
J–	The result is an estimated quantity, but the result may be biased low.	The result is an estimated quantity, but the result may be biased low.	
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.	The analyte was not detected at a level greater than or equal to the adjusted CRQL. However, the reported adjusted CRQL is approximate and may be inaccurate or imprecise.	The analyte was not detected (see definition of "U" flag, above). The reported value should be considered approximate.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.	The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.	The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
N		The analysis indicates the presence of an analyte for which there is presumptive evidence to make a “tentative identification”.	
NJ		The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.	
C		This qualifier applies to pesticide and Aroclor results when the identification has been confirmed by Gas Chromatograph/Mass Spectrometer (GC/MS).	
X		This qualifier applies to pesticide and Aroclor results when GC/MS analysis was attempted but was unsuccessful.	

DATA ASSESSMENT

ANALYSIS: METALS ICP-MS

The current SOP HW-3b (Revision 0) July 2015, USEPA Region II for the evaluation of ICP-MS metals generated through Statement of Work ISOM02.2 has been applied. Data have been reviewed according to TDF specifications, the National Functional Guidelines Report and the CCS Semi-Automated Screening Results Report.

1. HOLDING TIME AND PRESERVATION

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time or pH (aqueous samples are not within the acceptable range, the data may not be valid. Those analytes detected in the samples whose holding time (180 days) or pH ($\leq$2) have not been met, will be qualified as estimated, "J"; the non-detects will be flagged as unusable, "R". Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

2. CALIBRATION

Method requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable quantitative data for the metals on the Inorganic Target Analyte List (TAL). Initial Calibration Verification (ICV) demonstrates that the instrument is capable of acceptable performance at the beginning of the analytical run. Continuing Calibration Verification (CCV) demonstrates that the initial calibration is still valid by checking the performance of the instrument on a continuing basis.

A) INITIAL CALIBRATION

A blank and at least five calibration standards shall be used to establish each analytical curve. At least one of these standards shall be at or below the CRQL. The calibration curve shall be fitted using linear regression or weighted linear regression. The curve may be forced through zero. The curve must have a correlation coefficient ≥ 0.995. The percent differences calculated for all of the non-zero standards must be within ± 30% of the true value of the standard. The y-intercept of the curve must be less than the CRQL. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

B) INITIAL AND CONTINUING CALIBRATION VERIFICATION

Immediately after each system has been calibrated, the accuracy of the initial calibration must be verified and documented for each target analyte by the analysis of an ICV solution(s). The CCV standard shall be analyzed at a frequency of every two hours during an analytical run. The CCV standard shall also be analyzed at the beginning of the run, and again after the last analytical sample.

The percent recovery acceptable limits for ICV/CCV are 90 – 110%. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

3. BLANK CONTAMINATION

Quality assurance (QA) blanks, i.e., method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field activity. Calibration blanks (ICB and CCB) are used to ensure a stable instrument baseline before and during the analysis of analytical samples. The preparation blank is used to assess the level of contamination introduced to the analytical samples throughout the sample preparation process. Field and rinse blanks measure cross-contamination of samples during field operations. Qualifications were applied to the samples and analytes as shown below.

The following samples have analyte results greater than or equal to MDLs and less than or equal to CRQLs. The associated **ICB** analyte results are greater than or equal to MDLs and less than or equal to CRQLs. Detects are qualified as **U**. Sample results are reported at CRQLs.

Antimony – MBDQP4, MBDQP5, MBDQP7, MBDQP8, MBDQQ0, MBDQQ2, MBDQQ4, MBDQQ6, MBDQR6
Sodium – MBDQR8

The following samples have analyte results less than or equal to CRQLs. The associated **CCB** analyte results are less than or equal to CRQLs. Detects are qualified as **U**. Sample results are reported at CRQLs.

Antimony – MBDQP4, MBDQP5, MBDQP7, MBDQP8, MBDQQ0, MBDQQ2, MBDQQ4, MBDQQ6, MBDQR6
Calcium – MBDQR8
Sodium – MBDQR8

The following samples have analyte results greater than or equal to MDLs and less than or equal to CRQLs. The associated **PB** analyte results are greater than or equal to MDLs and less than or equal to CRQLs. Detects are qualified as **U**. Sample results are reported at CRQLs.

Antimony – MBDQP4, MBDQP5, MBDQP7, MBDQP8, MBDQQ0, MBDQQ2, MBDQQ4, MBDQQ6, MBDQR6

FIELD BLANK (MBDQR8)

MBDQR8 was identified as field blank (FB-GW-1-F) sample in the trip report for the sampling dates. No analyte was above CRQL, no data was qualified with the *Field Blank criterion*.

4. **INTERFERENCE CHECK SAMPLE**

The Interference Check Sample (ICS) verifies the analytical instrument's ability to overcome interferences typical of those found in samples. The laboratory should have analyzed and reported ICS results for all elements being reported from the analytical run and for all interferents (target and non-target) for these reported elements. The ICS consists of two solutions: Solution A and Solution

AB. Solution A consists of the interferents, and Solution AB consists of the analytes mixed with the interferents. Results for the analysis of ICS Solution must fall within the control limits of ± 20% or ±2X CRQL (whichever is greater) of the true value for the analytes and interferents included in the solution. If results that are ≥ MDL are observed for analytes that are not present in the ICS solution, the possibility of false positives exists. If negative results are observed for analytes that are not present in the ICS solution, and their absolute value is ≥ MDL, the possibility of false negatives in the samples exists. In general, ICP sample data can be accepted if the concentrations of Al, Ca, Fe, and Mg in the sample are found to be less than or equal to their respective concentrations in the ICS. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

5. SPIKE SAMPLE ANALYSIS

The spiked sample analysis is designed to provide information about the effect of each sample matrix on the sample preparation procedures and the measurement methodology. The spike Percent Recovery (%R) shall be within the established acceptance limits of 75 – 125%. However, spike recovery limits do not apply when the sample concentration is ≥ 4x the spike added. For a matrix spike analysis that does not meet the technical criteria, the action was applied to only the field sample used to prepare the matrix spike sample.

No problems were found for this criterion.

6. DUPLICATE SAMPLE ANALYSIS

The objective of duplicate sample analysis is to demonstrate acceptable method precision by the laboratory at the time of analysis. A control limit of 35 – 120% for soil/sediment and 20 – 100% for aqueous for the Relative Percent Difference (RPD) shall be used for original and duplicate sample values ≥ five times (5x) the Contract Required Quantitation Limit (CRQL). A control limit of the CRQL shall be used if either the sample or duplicate value is < 5x the CRQL. For a duplicate sample analysis that does not meet the technical criteria, the action was applied to only the field sample used to prepare the duplicate sample.

No problems were found for this criterion.

7. FIELD DUPLICATE

Field duplicates may be taken and analyzed as an indication of overall precision. These analyses measure both field and laboratory precision. A control limit of 50% for soil/sediment and 20% for aqueous for the Relative Percent Difference (RPD) shall be used for original and duplicate sample values ≥ five times (5x) the Contract Required Quantitation Limit (CRQL). A control limit of the CRQL shall be used if either the sample or duplicate value is < 5x the CRQL. For field duplicates analysis that does not meet the technical criteria, the action was applied to only the field sample and it's duplicate.

MBDQP8 (DF-MW-05-1-F, parent) and **MBDQR6** (GW-900-1-F, duplicate), and **MBDQQ7** (DF-TWP-03-1-F, parent) and **MBDQR7** (GW-900-2-F, duplicate) are Field Duplicate (FD) samples, respectively.

No problems were found for this criterion.

8. LABORATORY CONTROL SAMPLE

The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. Aqueous/water, soil/sediment, wipe, and filter LCSs shall be analyzed for each analyte utilizing the same sample preparations, analytical methods, and Quality Assurance/Quality Control (QA/QC) procedures as employed for the samples. All LCS Percent Recoveries (%R) must fall within the control limits of 70-130%, except for Sb and Ag which must fall within the control limits of 50-150%. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

9. ICP SERIAL DILUTION

The serial dilution of samples quantitated by Inductively Coupled Plasma determines whether or not significant physical or chemical interferences exist due to sample matrix. If the analyte concentration is sufficiently high [concentration in the original sample is > 50 times (50x) the Method Detection Limit (MDL)], the Percent Difference (%D) between the original determination and the serial dilution analysis (a five-fold dilution) after correction for dilution shall be less than 10. For a serial dilution analysis that does not meet the technical criteria, the action was applied to only the field sample used to prepare the serial dilution sample.

No problems were found for this criterion.

10. ICP-MS TUNE ANALYSIS

The Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) tune serves as an initial demonstration of instrument stability and precision. Prior to calibration, the laboratory shall analyze or scan the ICP-MS tuning solution at least five times (5x) consecutively. The tuning solution contains 100 µg/L of Be, Mg, Co, In, and Pb. The solution shall contain all required isotopes of the above elements. The laboratory shall make any adjustments necessary to bring peak width within the instrument manufacturer’s specifications and adjust mass resolution to within 0.1 u over the range of 6-210 u. The Percent Relative Standard Deviation (%RSD) of the absolute signals for all analytes in the tuning solution must be < 5%. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

11. ICP-MS INTERNAL STANDARDS

The analysis of Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) internal standards determines the existence and magnitude of instrument drift and physical interferences. The criteria for evaluation of internal standard results apply to all analytical and Quality Control (QC) samples analyzed during the run, beginning with the calibration. All samples analyzed during a run, with the exception of the ICP-MS tune, shall contain internal standards. A minimum of five internal standards shall be added to each sample. The laboratory shall monitor the same internal standards throughout the entire analytical run and shall assign each analyte to at least one internal standard. The Percent

Relative Intensity (%RI) in the sample shall fall within 60-125% of the response in the calibration blank. If the %RI of the response in the sample falls outside of these limits, the laboratory shall reanalyze the original sample at a two-fold dilution with internal standard added. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

12. PERCENT SOLIDS

The laboratory is required to perform the percent solids determination prior to sample preparation and analysis. All results of a sample with percent solids less than 50% are qualified estimated, "J". Qualifications were applied to the samples and analytes as shown below.

Not applicable for this SDG. None found.

13. OTHER ISSUES

None.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
DESA/HWSB/HWSS
2890, Woodbridge Avenue, Edison, NJ 08837

EXECUTIVE NARRATIVE

Case No.: 46633
Site: Former Duofold Corporation (Brownfield)

SDG No.: MBDQQ9
Laboratory: Chemtech Consulting Group (CHM)

Number of Samples: 5 (Water)
Analysis: Metals (ICP-MS)

Sampling dates: 11/10 and 11/11/2016
Validation SOP: HW-3b (Rev 0)

QAPP
Contractor: CDM-Smith
Contractor Document No.: 3323-029-02960

SUMMARY OF DEFINITIONS:

Critical: Results have an unacceptable level of uncertainty and should not be used for making decisions. Data have been qualified “R” rejected.

Major: A level of uncertainty exists that may not meet the data quality objectives for the project. A bias is likely to be present in the results. Data has been qualified “J” estimated. “J+” and “J-“ represent likely direction of the bias.

Minor: The level of uncertainty is acceptable. No significant bias in the data was observed.

Critical Findings: None

Major Findings: Samples have analyte(s) that have been qualified **UJ**, and **J**.

Minor Findings: None

COMMENT: Results greater than detection limits (MDL) and below quantitation limits (CRQL) are qualified as estimated J.

Reviewer Name(s): A Aoanan (SEE)

Approver’s Signature:

Date: 1/18/2017

Name: Narendra Kumar

Affiliation: USEPA/R2/HWSB/HWSS

Data Qualifier Definitions (National Functional Guidelines)

Qualifier Symbol	Explanation		
	INORGANICS	ORGANICS	CHLORINATED DIOXINS/FURANS
U	The analyte was analyzed for, but was not detected above the level of the reported quantitation limit.	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted Contract Required Quantitation Limit (CRQL) for sample and method	The analyte was analyzed for but not detected. The value preceding the "U" may represent the adjusted Contract Required Quantitation Limit (see DLM02.X, Exhibit D, Section 1.2 and Table 2), or the sample specific estimated detection limit (EDL, see Method 8290A, Section 11.9.5).
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the CRQL.	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to an issue with the quality of the data generated because certain QC criteria were not met, or the concentration of the analyte was below the adjusted CRQL).
J+	The result is an estimated quantity, but the result may be biased high.	The result is an estimated quantity, but the result may be biased high.	
J–	The result is an estimated quantity, but the result may be biased low.	The result is an estimated quantity, but the result may be biased low.	
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.	The analyte was not detected at a level greater than or equal to the adjusted CRQL. However, the reported adjusted CRQL is approximate and may be inaccurate or imprecise.	The analyte was not detected (see definition of "U" flag, above). The reported value should be considered approximate.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.	The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.	The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
N		The analysis indicates the presence of an analyte for which there is presumptive evidence to make a “tentative identification”.	
NJ		The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.	
C		This qualifier applies to pesticide and Aroclor results when the identification has been confirmed by Gas Chromatograph/Mass Spectrometer (GC/MS).	
X		This qualifier applies to pesticide and Aroclor results when GC/MS analysis was attempted but was unsuccessful.	

DATA ASSESSMENT

ANALYSIS: METALS ICP-MS

The current SOP HW-3b (Revision 0) July 2015, USEPA Region II for the evaluation of ICP-MS metals generated through Statement of Work ISOM02.2 has been applied. Data have been reviewed according to TDF specifications, the National Functional Guidelines (NFG) Report and the CCS Semi-Automated Screening Results Report.

1. HOLDING TIME AND PRESERVATION

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time or pH (aqueous samples are not within the acceptable range, the data may not be valid. Those analytes detected in the samples whose holding time (180 days) or pH (≤2) have not been met, will be qualified as estimated, "J"; the non-detects will be flagged as unusable, "R". Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

2. CALIBRATION

Method requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable quantitative data for the metals on the Inorganic Target Analyte List (TAL). Initial Calibration Verification (ICV) demonstrates that the instrument is capable of acceptable performance at the beginning of the analytical run. Continuing Calibration Verification (CCV) demonstrates that the initial calibration is still valid by checking the performance of the instrument on a continuing basis.

A) INITIAL CALIBRATION

A blank and at least five calibration standards shall be used to establish each analytical curve. At least one of these standards shall be at or below the CRQL. The calibration curve shall be fitted using linear regression or weighted linear regression. The curve may be forced through zero. The curve must have a correlation coefficient ≥ 0.995. The percent differences calculated for all of the non-zero standards must be within ± 30% of the true value of the standard. The y-intercept of the curve must be less than the CRQL. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

B) INITIAL AND CONTINUING CALIBRATION VERIFICATION

Immediately after each system has been calibrated, the accuracy of the initial calibration must be verified and documented for each target analyte by the analysis of an ICV solution(s). The CCV standard shall be analyzed at a frequency of every two hours during an analytical run. The CCV standard shall also be analyzed at the beginning of the run, and again after the last analytical sample.

The percent recovery acceptable limits for ICV/CCV are 90 – 110%. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

3. BLANK CONTAMINATION

Quality assurance (QA) blanks, i.e., method, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field activity. Calibration blanks (ICB and CCB) are used to ensure a stable instrument baseline before and during the analysis of analytical samples. The preparation blank is used to assess the level of contamination introduced to the analytical samples throughout the sample preparation process. Field and rinse blanks measure cross-contamination of samples during field operations. Qualifications were applied to the samples and analytes as shown below.

The following samples have analyte results greater than or equal to MDLs and less than or equal to CRQLs. The associated **ICB** analyte results are greater than or equal to MDLs and less than or equal to CRQLs. Detects are qualified as **U**. Sample results are reported at CRQLs.

Antimony – MBDQR1, MBDQR2
Arsenic – MBDQQ9, MBDQR0, MBDQR1
Copper – MBDQQ9, MBDQR0, MBDQR1, MBDQR2, MBDQR3

The following samples have analyte results less than or equal to CRQLs. The associated **CCB** analyte results are less than or equal to CRQLs. Detects are qualified as **U**. Sample results are reported at CRQLs.

Antimony – MBDQR1, MBDQR2
Arsenic – MBDQQ9, MBDQR0, MBDQR1

FIELD BLANK - None

No Field Blank sample was identified in the Trip Report for this SDG’s sampling dates.

4. INTERFERENCE CHECK SAMPLE

The Interference Check Sample (ICS) verifies the analytical instrument’s ability to overcome interferences typical of those found in samples. The laboratory should have analyzed and reported ICS results for all elements being reported from the analytical run and for all interferents (target and non-target) for these reported elements. The ICS consists of two solutions: Solution A and Solution AB. Solution A consists of the interferents, and Solution AB consists of the analytes mixed with the interferents. Results for the analysis of ICS Solution must fall within the control limits of ± 20% or ±2X CRQL (whichever is greater) of the true value for the analytes and interferents included in the solution. If results that are ≥ MDL are observed for analytes that are not present in the ICS solution, the possibility of false positives exists. If negative results are observed for analytes that are not present in the ICS solution, and their absolute value is ≥ MDL, the possibility of false negatives in the samples exists. In general, ICP sample data can be accepted if the concentrations of Al, Ca, Fe, and Mg in the sample are found to be less than or equal to their respective concentrations in the ICS. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

5. SPIKE SAMPLE ANALYSIS

The spiked sample analysis is designed to provide information about the effect of each sample matrix on the sample preparation procedures and the measurement methodology. The spike Percent Recovery (%R) shall be within the established acceptance limits of 75 – 125%. However, spike recovery limits do not apply when the sample concentration is ≥ 4x the spike added. For a matrix spike analysis that does not meet the technical criteria, the action was applied to only the field sample used to prepare the matrix spike sample.

No problems were found for this criterion.

6. DUPLICATE SAMPLE ANALYSIS

The objective of duplicate sample analysis is to demonstrate acceptable method precision by the laboratory at the time of analysis. A control limit of 35 – 120% for soil/sediment and 20 – 100% for aqueous for the Relative Percent Difference (RPD) shall be used for original and duplicate sample values ≥ five times (5x) the CRQL. A control limit of the CRQL shall be used if either the sample or duplicate value is < 5x the CRQL. For a duplicate sample analysis that does not meet the technical criteria, the action was applied to only the field sample used to prepare the duplicate sample.

No problems were found for this criterion.

7. FIELD DUPLICATE

Field duplicates may be taken and analyzed as an indication of overall precision. These analyses measure both field and laboratory precision. A control limit of 50% for soil/sediment and 20% for aqueous for the Relative Percent Difference (RPD) shall be used for original and duplicate sample values ≥ five times (5x) the CRQL. A control limit of the CRQL shall be used if either the sample or duplicate value is < 5x the CRQL. For field duplicates analysis that does not meet the technical criteria, the action was applied to only the field sample and it's duplicate.

Samples **MBD4R6** (DF-TWP-03-1, parent) and **MBDQN7** (GW-900-2, duplicate); and **MBDQQ7** (DF-TWP-03-1-F, parent) and **MBDQR7** (GW-900-2-F, duplicate) are Field Duplicate (FD) samples, respectively, for the sampling date, 11/10/2016 but were not included in this SDG.

No problems were found for this criterion.

8. LABORATORY CONTROL SAMPLE

The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. Aqueous/water, soil/sediment, wipe, and filter LCSs shall be analyzed for each analyte utilizing the same sample preparations, analytical methods, and Quality Assurance/Quality Control (QA/QC) procedures as employed for the samples. All LCS Percent Recoveries (%R) must fall within the control limits of 70-130%, except for Sb and Ag which must fall within the control limits of 50-150%. Qualifications were applied to the samples and analytes as shown below.

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10. ICP-MS TUNE ANALYSIS

The Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) tune serves as an initial demonstration of instrument stability and precision. Prior to calibration, the laboratory shall analyze or scan the ICP-MS tuning solution at least five times (5x) consecutively. The tuning solution contains 100 µg/L of Be, Mg, Co, In, and Pb. The solution shall contain all required isotopes of the above elements. The laboratory shall make any adjustments necessary to bring peak width within the instrument manufacturer’s specifications and adjust mass resolution to within 0.1 u over the range of 6-210 u. The Percent Relative Standard Deviation (%RSD) of the absolute signals for all analytes in the tuning solution must be < 5%. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

11. ICP-MS INTERNAL STANDARDS

The analysis of Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) internal standards determines the existence and magnitude of instrument drift and physical interferences. The criteria for evaluation of internal standard results apply to all analytical and Quality Control (QC) samples analyzed during the run, beginning with the calibration. All samples analyzed during a run, with the exception of the ICP-MS tune, shall contain internal standards. A minimum of five internal standards shall be added to each sample. The laboratory shall monitor the same internal standards throughout the entire analytical run and shall assign each analyte to at least one internal standard. The Percent Relative Intensity (%RI) in the sample shall fall within 60-125% of the response in the calibration blank. If the %RI of the response in the sample falls outside of these limits, the laboratory shall reanalyze the original sample at a two-fold dilution with internal standard added. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

12. PERCENT SOLIDS

The laboratory is required to perform the percent solids determination prior to sample preparation and analysis. All results of a sample with percent solids less than 50% are qualified estimated, "J". Qualifications were applied to the samples and analytes as shown below.

Not applicable for this SDG. None found.

13. OTHER ISSUES

None.