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2011 Annual Report of Operations and Maintenance Activities
Central Elevated Landfill Area
Former Sinclair Refinery Site, Operable Unit 1
Wellsville, New York

Dear Mike:

Enclosed are two copies of the *2011 Annual Report of Operations and Maintenance Activities* for the Central Elevated Landfill Area at the Former Sinclair Refinery Site, Operable Unit 1 (OU1) in Wellsville, New York. The report presents a discussion of the operation and maintenance activities that occurred for this OU1 project during 2011.

If you have any questions regarding this submittal, please do not hesitate to contact me at 443-807-6233.

Sincerely,

Eric J. Larson
Project Manager

Enclosures

Cc: (with attachments)
Maurice Moore, NYSDEC
Martin Schmidt, URS
Jerry Palmer, On-Site Technical Services
David A. Howe Public Library, Wellsville NY

2011 ANNUAL REPORT OF OPERATIONS AND MAINTENANCE ACTIVITIES

FORMER SINCLAIR REFINERY SITE
OPERABLE UNIT ONE
CENTRAL ELEVATED LANDFILL AREA

WELLSVILLE, NEW YORK

Prepared For
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1.0 OVERVIEW

1.1 Introduction

This document presents the 2011 Annual Report of the Operation and Maintenance Activities for the Central Elevated Landfill Area (CELA) at the Former Sinclair Refinery Site Operable Unit 1 (OU1) located in the Town of Wellsville, New York, (please see Figure 1A). This document has been prepared by On-Site Technical Services, Inc. (On-Site), of Wellsville, New York for the Atlantic Richfield Company (Atlantic Richfield). Operation and Maintenance procedures for this project are detailed in the *Operations and Maintenance Plan for Central Elevated Landfill Area and Refinery Surface Soils, Wellsville, New York,* dated April 1993 (O&M Plan), prepared by GeoSyntec Consultants (GeoSyntec), Atlanta, Georgia with subsequent updates. An electronic copy of this report is included as Appendix A.

1.2 Project Background

An Administrative Order of Consent (AOC), between Atlantic Richfield and the United States Environmental Protection Agency (USEPA) dated May 1, 1992, provided that Atlantic Richfield remediate the CELA and excavate certain surface soils in sections of Operable Unit 2 (OU2). To accomplish the CELA remediation, a contract to construct a soil-bentonite cutoff wall and a RCRA cap over the consolidated wastes at the CELA was awarded to Geo-Con, Inc., Monroeville, Pennsylvania, in spring 1992. The contractor mobilized in May 1992 and the final project inspection was conducted on July 7, 1993 (please see Figure 1b for site features). The excavation of surface soils in OU2 was completed by a combination of Geo-Con and Bakers of Jericho Hill, Inc., Alfred, New York. The surface soil remedy included removal of defined soils to an approximate depth of one foot at several locations on the Site, and backfilling with a 12-inch layer of approved borrow material.

Subsection 38 of the AOC provided that Atlantic Richfield prepares an O&M plan for operations and maintenance of the CELA and defined surface soils. GeoSyntec prepared the O&M Plan in April 1993. The O&M Plan has been modified since 1993, with concurrence from the USEPA, on specific requirements, which are discussed in this report. O&M of the defined surface soil excavation areas is covered under routine OU2 operations. No change in land use occurred at the former refinery surface soil areas during 2011. Regrading and restoration work of the CELA cover is associated with the Phase II-2 Remedial Action construction plans and was conducted during 2011. Due to the construction activities, some maintenance activities were not conducted and some site features were modified. Current site features are presented in Figure 1C.

1.3 Report Format

The remainder of this report is organized as follows.

- Section 2 outlines the currently approved operation requirements.
- Section 3 presents the currently approved maintenance requirements.
- Section 4 details O&M activities completed during 2011.
- Section 5 provides the results of 2011 monitoring activities.
- Section 6 presents the conclusions and recommendations.

2.0 OPERATIONS REQUIREMENTS

2.1 Inspection Requirements

The O&M Plan outlines the following visual inspections to be performed on a quarterly basis, or following any extreme natural event, which may jeopardize the integrity of the project components. These requirements are based on the 1993 O&M plan. A revised O&M plan was submitted to the USEPA on November 1, 2011 and is currently under review.

CELA Cap Vegetative Cover: visually inspect for erosion; stressed vegetation; sediment build-up; local subsidence or loss of grade; water ponding; turf height; evidence of activity of burrowing animals; growth of trees, weeds or undesirable vegetation; evidence of fires or vandalism; perform soil pH test (every three years); evidence of unauthorized traffic on cover; and slope instability or sloughing.

Gas Vent System: visually inspect for excess sediment accumulation and vegetative growth over the vent pipes; erosion or washout around the vent pipes; and damage to vent pipes due to vandalism, cap traffic, or natural disaster.

Open Well Piezometers: visually inspect for excess sediment accumulation and any vegetative growth over the protective cover; erosion around the surface casing/CELA Cap interface; proper function of the protective cover cap and lock; excess rust on the surface casing and lock; ponding between protective casing and the riser pipe; or any evidence of vandalism, damage, or any conditions which would allow willful, negligent, or accidental discharge of any undesired substances into the piezometers.

Groundwater Monitoring Wells: visually inspect for excess sediment accumulation and any vegetative growth over the protective cover; erosion around the concrete surface seal; cracks in the concrete surface seal; separation between the concrete surface seal

and the surface casing; proper function of the surface casing cap and lock; excess rust on the surface casing and lock; ponding between the surface casing and the riser pipe; or any evidence of vandalism, damage, or any conditions which would allow willful, negligent, or accidental discharge of any undesired substances into the monitoring wells.

Surface Water Drainage System: visually inspect for any condition which would in any way impede, restrict, or redirect surface water drainage such as dislodged riprap; washouts; erosion; sediment accumulation; gullies and ruts in the drainage swales and appurtenances; excess rusting, holes, cracks, sediment accumulation; foreign objects; and washouts at the berm-culvert interface in the drainage culvert which penetrates the Genesee River Channelization Dike.

Security Fence: visually inspect for proper clearance between fence gates and the ground; proper function of gate lock and hinges; holes; excess rust; ruts or burrows beneath the fence; vegetation growing onto or through the fence; improper connection between posts and chain link mesh; loose posts; cracks in the post foundations; and general signs of deterioration.

2.2 Subsidence and Settlement Surveys

Twenty-five settlement plates, each consisting of a sleeved metal rod attached to a flat metal plate, incorporated into the cap design, were previously surveyed by a New York State licensed professional land surveyor to detect settlement or subsidence of the materials underlying the cap. In a letter dated October 5, 2009, Atlantic Richfield proposed that the annual settlement plate survey be suspended until after the RCRA cell is constructed on top of the existing CELA for placement of impacted soils from the Phase II remedial action activities at Operable Unit 2 (OU2) and operation and maintenance requirements for the combined area are determined. In an e-mail dated October 8, 2009, the EPA agreed with the proposal to temporarily suspend the annual survey. The settlement plates were removed during 2010 as part of OU2 Phase II remedial construction activities. A revised O&M plan was submitted on November 1, 2011.

2.3 Groundwater Observation Requirements

A total of 11 groundwater observation wells and six open well piezometers have been installed on and around the CELA. Section 6.2.3 of the O&M Plan provides that groundwater wells be sampled quarterly for one year to establish baseline conditions and

twice per year thereafter. Samples obtained from both upgradient and downgradient wells are used to determine if there is any statistical change in groundwater conditions.

The statistical analysis performed in 2000, as documented in the 2000 Annual Report of Operations and Maintenance Activities, recommended the groundwater sampling requirement be reduced to annual sampling starting in 2001. This recommendation was approved by the USEPA in a letter dated June 2001 (Appendix B), and was implemented in 2001. Fluid level measurements, including non-aqueous phase liquid (NAPL) measurements, have continued on a semi-annual basis due to seasonal fluctuations.

In 2002 Atlantic Richfield requested to discontinue dissolved metals and semi-volatile organic compound (SVOC) analysis and to continue total metals, volatile organic compounds (VOC) and field parameter testing. In a November 2002 letter (Appendix B), the USEPA approved the discontinuation of the dissolved metal analysis contingent upon New York State Department of Environmental Conservation (NYSDEC) collecting split samples during the 2003 sampling event. NYSDEC collected split samples as part of the 2003 sampling event and dissolved metal analysis was discontinued starting in 2004. Also, in a June 27, 2005 email from USEPA to Atlantic Richfield (Appendix B), the USEPA agreed to suspend SVOC analysis. SVOC analysis was discontinued starting with the 2005 sampling event. Therefore, the current groundwater sampling frequency is annual with analysis for total metals and VOCs.

Groundwater data is compared with historical data to evaluate fluctuation of constituents. Graphs are prepared for groundwater indicator parameters and other constituents of interest. Groundwater data is compared with federal Maximum Contaminant Levels (MCLs) and Drinking Water Equivalent Levels (DWELs).

2.4 Static Groundwater Elevations

Semi-annual static groundwater elevations are routinely evaluated in the observation wells and piezometers. Groundwater contour maps are constructed semi-annually and included in the annual report.

2.5 Piezometer Evaluation Program

The liquid level within the CELA is evaluated semi-annually to determine the apparent thickness of light non-aqueous phase liquid (LNAPL), if present, and to document that the liquid level remains a minimum of 1 ft below the elevation of the tie-in of the CELA cap to

the top of the slurry wall. The elevation of the top of the slurry wall varies from 1497 ft to 1501 ft. Also, if the accumulation of LNAPL in any of the piezometers is greater than 2 ft, it will be removed and properly disposed.

2.6 Gas Vent Evaluation

As part of OU2 Phase II-2 construction activities a majority of the gas vents were removed. Gas vents GV-1 and GV-13 remain. Each gas vent is evaluated semi-annually, using a Photo-Ionization Detector (PID) or Flame-Ionization Detector (FID), for emission of organic compounds. At least one monitoring event is conducted during the summer months. Results of the gas vent evaluation are recorded on a form located in Appendix C of the O&M Plan.

2.7 Storm Water Evaluation

To comply with the substantive requirements of a storm water discharge permit, a storm water grab sample is required to be collected from the outfall of the 42-inch diameter drainage culvert semi-annually (shown on Figure 1B). A grab sample is collected following a storm event that is greater than 0.1 in. of precipitation and at least 72 hours has passed since the previous storm event of at least 0.1 in. of precipitation. Analytical parameter lists for this sampling are located in section 6.6.2 of the O&M Plan. However, due to the site construction no storm water samples were collected in 2011. Storm water from the CELA was managed in accordance with the site construction Storm Water Pollution Prevention Plan.

3.0 MAINTENANCE REQUIREMENTS

3.1 Vegetation

Vegetation is mowed during the summer months after the grass goes to seed and reaches a height of more than six inches. Mowing is not lower than four inches. Prior to winter, grass is allowed to grow to eight to twelve inches. Fertilizer is applied as needed, based on agronomic soil tests performed every three years. Lime is applied as necessary to maintain soil pH above 5.8. Replacement of eroded topsoil, reseeding, and mulching is performed on an as needed basis. Routine maintenance includes the removal of sediment and removal of woody or undesirable vegetation.

3.2 Gas Vent System

The only anticipated maintenance of the passive gas vent system is repair or replacement of standpipes in the event they are damaged.

3.3 Observation Wells and Open Well Piezometers

Routine maintenance of the observation wells and piezometers includes removal of sediment accumulation and vegetation from the casing surface; repair of erosion around the concrete surface seals; filling cracks in the concrete surface seal and casing; and replacement of the surface casing cap and locks.

3.4 Surface Drainage Features

As part of restoration work completed on the CELA in 2010, the rip-rap within the rock chutes was removed and replaced with vegetation as per the approved OU2 Phase II-2 Remedial Action construction plans. Routine maintenance of the culvert includes removal of foreign objects and mowing of the vegetation.

3.5 Access Roads

Maintenance of the access roads is performed as needed and includes repairs due to water ponding; removal of woody growth; and addition of new aggregate to fill ruts or depressed areas.

3.6 Security Fence

Routine maintenance of the security fence includes the removal of soil below the fence gate to ensure proper clearance; repair or replacement of gate locks and hinges; repair of holes; replacement of soil whenever ruts or burrows occur below the fence; removal of vegetation growing onto or through the fence; resetting of connection between posts and chain link mesh; replacement of rusted chain link mesh; and securing of loose posts.

4.0 2011 OPERATIONS AND MAINTENANCE ACTIVITIES

4.1 Visual Inspections

Visual inspections of the CELA were completed on March 14, May 9, August 16 and November 18, 2011. The inspections consisted of a complete walk-through visual inspection and completion of the Inspection Checklists (please see Appendix C). A summary of the inspections are included in the following sections.

4.1.1 CELA Cap Vegetative Cover

The CELA cap was mowed, as construction activities allowed, two times during 2011. Construction activities were ongoing at the CELA re-use area during 2011 (Please see

Figure 1B for site features prior to 2011). Regrading and restoration work of the CELA cover in 2011 were associated with the approved OU2 Phase II-2 Remedial Action construction plans (please see Figure 1C for site features following 2011 construction activities).

4.1.2 Gas Vent System

The gas vent system appears to be in good condition. No notable changes from previous conditions were observed during the 2011 inspections.

4.1.3 Open Well Piezometers

The six open well piezometers were inspected and appear in good condition.

4.1.4 Groundwater Observation Wells

The 11 groundwater observation wells were inspected and are in good condition.

4.1.5 Surface Water Drainage System

The surface water drainage system is functioning as designed. Rip-rap within East-West trending rock chutes was removed and replaced with vegetation during 2010 as part of OU2 Phase II remedial construction activities.

4.1.6 Security Fence

The security fence is in overall excellent condition with no visible damage to the surrounding area at the base of the fence poles. All ground rods are properly bonded to the fence and ground posts. An additional gate was installed at the Southwest side for the temporary haul road as part of OU2 Phase II remedial construction activities.

4.2 2011 Monitoring Activities

4.2.1 Settlement Plate Survey

As stated in Section 2.2, the settlement plates were removed during 2010 as part of OU2 Phase II remedial action construction activities. As approved by USEPA, settlement plate monitoring has been temporarily suspended.

Based on visual observations, the cap continues to have positive drainage with no areas of ponding water or abnormally soft ground. Quarterly visual inspections of the CELA cap

are continuing as required. Any signs of CELA cap differential settlement will be immediately addressed.

4.2.2 Groundwater Evaluation

On-Site performed annual groundwater sampling at the 11 observation wells (MWR-01 through MWR-11) between June 13 and 16, 2011 (see Figure 1C for well locations). A bladder pump was utilized for purging and sampling the wells. Field parameters including pH, Conductivity, Turbidity, Dissolved Oxygen, Temperature and Oxidation Reduction Potential were measured throughout purge and at time of sampling (please see Table 8). Laboratory analysis of groundwater samples was performed by Lancaster Laboratories of Lancaster, Pennsylvania for total Target Analyte List metals (method 6010B) and Target Compound List VOCs (method 8260B). Discussion of groundwater conditions are presented in Section 5.2. Groundwater analytical results are presented in Tables 1 through 4. Groundwater sampling field forms are included as Appendix D.

4.2.3 Liquid Level Evaluation

Static water levels were measured with an oil/water interface probe in the 11 observation wells and six piezometers prior to the annual groundwater sampling event on June 13, 2011 and during the static water level monitoring event on July 13, 2011. The static water levels are presented in Table 5 and water table contour maps for the June and July 2011 events are provided as Figures 2 and 3, respectively.

The static water level data were subtracted from the surveyed elevation of the top of the casing to calculate the water elevations as shown in Table 5. These data were plotted and contoured on a site base map to represent the potentiometric surface for the June 2011 monitoring event (Figure 2) and July 2011 monitoring event (Figure 3). Each contour represents a line of equivalent water elevation. The direction of groundwater flow is from higher to lower elevation approximately perpendicular to the contours. The O&M plan discusses determining both groundwater flow direction and rate. As presented on Figures 2 and 3, the direction of groundwater flow is generally towards the CELA; however, the presence of the slurry wall restricts flow across the landfill. The soil-bentonite slurry wall is designed to restrict groundwater flow with a hydraulic conductivity of 1×10^{-7} cm/sec or less.

Light Non-Aqueous Phase Liquid (LNAPL) was detected at MWR-02, which was socked three times prior to sampling. The last sock was removed on June 16, 2011 prior to sampling MWR-02. Based on the manufacturer information, the total

approximate amount of LNAPL removed from MWR-02 by socking is 132 fluid ounces. Additional discussion of liquid level monitoring is provided in Section 5.1.

4.2.4 Gas Vent Evaluation

Gas vents GV-1 and GV-13 were evaluated with a Mini Rae Photo Ionization Detector (PID) on August 16, 2011 and September 26, 2011 (see Figure 1C for locations). Prior to use, the PID was calibrated according to manufacturer specification with 100 ppm Isobutylene gas. PID readings were measured directly at the gas vent, and approximately five feet upwind and downwind of each vent. Weather conditions on August 16, 2011 were approximately 77°F, sunny with winds at approximately 5 to 10 mph from the northwest. Weather conditions on September 26, 2011 were approximately 77°F with light winds out of the southwest at approximately 0 to 5 mph. Emission levels at upwind and downwind locations vary during the evaluations and are listed in the table below.

Date	Gas Vent Location	Upwind Reading	Downwind Reading	Vent Reading
8/16/2011	V-1	0.5	0.5	0.5
8/16/2011	V-13	24.6	24	28
9/26/2011	V-1	0.5	1.7	27.6
9/26/2011	V-13	0.5	2	30.3

Gas vent evaluation data are included in Appendix E of this report.

4.2.5 Storm Water Evaluation

There were no storm water samples collected from the CELA Outfall culvert at the North end of the CELA during 2011 (please see Figure 1C). Storm water from the CELA was managed in accordance with the site construction Storm Water Pollution Prevention Plan. Table 6 compares storm water results from 2005 to 2011.

4.2.6 Soil pH and Agronomic Soil Test

Discontinuation of annual soil pH analysis but continuation of agronomic soil testing (includes soil pH) every three years, was approved by USEPA via a June 27, 2005 email correspondence from USEPA to Atlantic Richfield (included in Appendix B). This change was based upon demonstrated stable soil pH values over several years. Agronomic soil testing was performed as scheduled during 2009 as documented in the 2009 annual report.

4.3 Maintenance Activities

Maintenance activities during 2011 included routine mowing of the cap. The CELA was mowed two times during 2011. During the first quarter 2011 inspection, it was noted that a sunken area was present in the northern most area of the west side of the CELA. The area was filled in and no further maintenance has been required. There was no other maintenance or repair required in 2011.

5.0 RESULTS

5.1 Liquid Levels

5.1.1 Liquid Elevations vs. Slurry Wall Elevation

Liquid level elevation inside the slurry wall should be a minimum of 1 ft below the elevation of the top of the slurry wall. The slurry wall elevation varies between 1497 and 1501 ft. The highest water level measured inside the CELA slurry wall during 2011 was 1492.98 ft in P-02 on June 13, 2011. This level is well below the minimum of 1 ft below the top of the slurry wall and is consistent with historical measurements. The static water elevations and water table contours for June and July 2011 are presented as Figures 2 and 3, respectively and are consistent with historic levels.

5.1.2 LNAPL Thickness

Since 1993, LNAPL has been detected intermittently in observation wells MWR-02 and MWR-03 and piezometers P-4 and P-6. The maximum apparent LNAPL thickness of 1.02 ft was measured in MWR-02 during May 2007 and again in June 2011. The maximum apparent LNAPL thickness measured inside the slurry wall was 0.40 ft, measured in P-6 during August 1993. This measured thickness is well below the 2 ft thickness requiring removal. A graph of LNAPL thickness over time for each of the two wells and two piezometers is presented as Figure 4. During 2011, LNAPL was detected at MWR-02 in both June and July monitoring events with an apparent thickness of 1.02 ft and 0.28 ft, respectively. Generally, it appears that LNAPL thicknesses have varied over time, with observation well MWR-02 consistently containing the most LNAPL. Historically LNAPL has been removed from wells using absorbent socks prior to each groundwater sampling event. In 2011, approximately 132 oz. of LNAPL were recovered from MWR-02 (please see Table 9).

5.2 Groundwater Conditions

5.2.1 MCL and DWEL Comparison

Table 1 compares frequency of detection, minimum detection, and maximum detection between the baseline sampling conducted in 1993 and the 2011 event. Table 2 presents the analytical results for each well from 2003 to 2011. Table 3 presents a comparison between the 2011 MWR-07 sample and its duplicate. Analytical results from the duplicate sample compare favorably with the original sample results.

Well sampling was conducted using a non-dedicated bladder pump. After each well was sampled, the pump and tubing were cleaned using a three step washing procedure: (i) Liqui-Nox® soap and tap water wash; (ii) tap water rinse; followed by (iii) distilled water rinse. An equipment rinsate blank was collected from the pump and tubing used for sampling. The equipment blank was collected by: i) following the cleaning procedure detailed above; ii) pumping laboratory provided de-ionized water through the pump and tubing; and iii) collecting the de-ionized water in sample bottles. Table 4 presents the equipment blank results as non-detect, with the following exception. A low level estimated concentration of 2-Butanone (0.0034 J mg/L) was detected in the field equipment rinsate blank, however it was not detected in any of the groundwater samples and therefore has no effect on the data useability.

Since 1993, several metals, Bis (2-ethylhexyl) phthalate and Methylene Chloride have exceeded USEPA Maximum Contaminant Levels (MCLs) at one time or another. The 2011 annual groundwater sampling event was conducted between June 13 and June 16, 2011. Analytical results from the 11 observation wells sampled indicate various metal detections. VOCs were not detected in 2011. The 2011 groundwater analytical results were compared to MCLs and New York State Department of Environmental Conservation (NYSDEC) Class GA Groundwater Standards (NYSDEC Class GA Standards). Arsenic and chromium are the only parameters exceeding MCLs or DWELs during 2011. The table below lists the 2011 exceedances.

Location	Date Sampled	Parameter	Result (mg/L)	USEPA MCL
MWR-02	6/16/2011	Arsenic	0.0283	0.01
MWR-03	6/15/2011	Arsenic	0.0537	0.01
MWR-05	6/15/2011	Chromium	0.892	0.1
MWR-10	6/14/2011	Arsenic	0.0587	0.01
MWR-11	6/14/2011	Chromium	0.553	0.1

Total Metals including antimony, arsenic, beryllium, cadmium, chromium, lead, and thallium; bis (2-ethylhexyl) phthalate (SVOC); and methylene chloride (VOC) have periodically exceeded MCLs in water samples collected from observation wells. The maximum detected arsenic concentration exceeded the MCL for potable water (revised in 2001) every year since the 1993 baseline sampling, with exceedances periodically occurring at each well. Total chromium has exceeded the MCL every year except 2000 and 2001.

5.2.2 Statistical Analysis

Antimony, Arsenic, Beryllium, Cadmium and Chromium are the parameters that have shown MCL exceedances since 2004. Therefore, these parameters were evaluated for statistical analysis. The evaluation included reviewing the last 16 results for each of these five metals from the eleven monitoring wells, which includes data from 1998 through 2011 (Please see Table 7A). Monitoring well analytical results with three or more detections of an individual metal were included in the statistics. Parameters with three or more detections at a given monitoring well include: (i) Arsenic at MWR-01, MWR-02, MWR-03, MWR-08, MWR-09 and MWR-10; and (ii) Chromium at MWR-01, MWR-04, MWR-05, MWR-06 and MWR-11. Therefore, statistical analysis was performed on these 11 metal/location combinations. In conducting this analysis, one-half the detection limit was used for non-detect results and field duplicate results were excluded. Table 7B presents the data used in the statistical analysis and includes one-half detection limit for non-detects.

The statistical analysis was conducted using the Mann-Kendall test using a normal approximation method in accordance with *USEPA Data Quality Assessment: Statistical Methods for Practitioners EPA QA/G-9S*, dated February 2006. In this analysis, a null hypothesis of “There is no trend” is tested against an alternative hypothesis of either “There is an upward trend” or “There is a downward trend”. This analysis involves using a triangular table to compute a Statistic (S) and test it against a critical value and a probability value at a 5% significance level (95% confidence level). If both criteria are met, then the null hypothesis of no trend is rejected in favor of the alternative hypothesis. Rejecting the null hypothesis suggests that the alternative hypothesis may be true. Alternative hypotheses are upward trend for S greater than zero and downward trend for S less than zero. If only one criterion or neither criteria are met, then the result is not enough evidence to show a trend. These statistical analyses are presented in Table 7C attached.

The statistical analysis showed the following results: (i) Arsenic exhibits evidence of decreasing trends at MWR-01, MWR-02 and MWR-08; and (ii) No statistically significant trend at the 5% significance level (95% confidence level) at the other metal/location combinations tested. Please refer to Table 7C for additional details.

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Inspections

Inspections of the CELA are being conducted on a quarterly basis. Groundwater observation wells, open well piezometers, gas vents, and pipe sleeves appear in good condition. Other physical aspects such as the fences, gates, CELA vegetative cover, and drainage swales are operating or growing properly and serve their function. Inspections will continue to be performed quarterly, consistent with the current O&M Plan.

6.2 Monitoring Programs

6.2.1 Groundwater Evaluation

In general, the 2011 groundwater analytical results are consistent with recent historical data obtained from the Site. Various metals have historically been detected at the Site and were also observed in 2011. Statistical analysis of Arsenic and Chromium concentrations in groundwater indicate a combination of decreasing and stable trends. VOCs continue to be non-detect.

6.2.2 Other Evaluations

Other activities are being conducted, including: liquid level evaluation; gas vent evaluation; and storm water evaluation. These evaluations have shown that the CELA is performing as designed.

6.3 Maintenance

Maintenance continues to be conducted as indicated by the O&M Plan. Anticipated maintenance for 2011 includes routine mowing during the summer months in areas not under construction.

6.4 Revised OM&M Procedures

Atlantic Richfield has submitted a revised operation, maintenance and monitoring (OM&M) plan for USEPA and NYSDEC comment on November 1, 2011. Agency comments have been received and a final draft OM&M plan is anticipated to be submitted to the agencies in the fourth quarter 2012.

REFERENCES

"Operation and Maintenance Plan for Central Elevated Landfill Area and Areas of Remediated Refinery Surface Soils", GeoSyntec Consultants, April 1993.

"Statistical Evaluation of 1993 Groundwater Monitoring Data Sinclair Refinery Site Wellsville, New York", GeoSyntec Consultants, March 1994.

"Data Quality Assessment: Statistical Methods for Practitioners", EPA QA/G-9S. Office of Environmental Information. Washington DC, February 2006

Table 1

Comparison of 1993 Baseline Groundwater Data
to 2011 Groundwater Data
Former Sinclair Refinery Site (OU-1)
Wellsville, New York
(mg/L)

Parameter	1993 Baseline Detection Frequency[1]	2011 Detection Frequency	1993 Minimum Detection[1]	2011 Minimum Detection	1993 Maximum Detection[1]	2011 Maximum Detection	2011 MCL[2] Exceedances	MCL[2]
Aluminum	42/44	4/11	0.231	0.0882	17.789	0.183		
Antimony	2/44	0/11	0.068		0.083	0.0058 U		0.006
Arsenic	36/44	5/11	0.012	0.0062	0.16	0.0587	3	0.01
Arsenic, dissolved	4/44	NA	0.01		0.056	NA		
Barium	18/44	11/11	0.241	0.0464	0.763	0.477		2
Barium, dissolved	9/44	NA	0.232		0.398	NA		
Beryllium	11/44	0/11	0.007		0.009	0.00024 U		0.004
Cadmium	16/44	6/11	0.005	0.00034	0.08	0.0017		0.005
Calcium	33/44	11/11	16.1	13.4	48.33	52.2		
Calcium, dissolved	28/44	NA	15.96		46.08	NA		
Chromium	29/44	9/11	0.015	0.0015	11.2	0.892	2	0.1
Chromium, dissolved	3/44	NA	0.005		0.014	NA		
Cobalt	2/44	7/11	0.003	0.00067	0.025	0.0023		
Copper	10/44	7/11	0.026	0.0018	0.153	0.0134		1.3
Copper, dissolved	4/44	NA	0.026		0.042	NA		
Iron	44/44	11/11	0.6	0.341	65.2	54.7		
Iron, dissolved	32/44	NA	0.104		22.6	NA		
Lead	28/44	3/11	0.005	0.0022	0.7	0.0025		0.015
Lead, dissolved	8/44	NA	0.004		1.003	NA		
Magnesium	38/44	11/11	4.71	3.86	63.581	39.1		
Magnesium, dissolved	36/44	NA	6.07		61.021	NA		
Manganese	42/44	11/11	0.212	0.0209	16.013	12.5		
Manganese, dissolved	43/44	NA	0.193		14.98	NA		
Nickel	8/44	9/11	0.04	0.001	0.2	0.0816		
Nickel, dissolved	3/44	NA	0.054		0.118	NA		
Potassium	14/44	11/11	1.87	1.19	59.34	3.46		
Potassium, dissolved	12/44	NA	1.72		5	NA		
Selenium	2/44	0/11	0.08		0.1	0.0069 U		0.05
Silver	5/44	0/11	0.017		0.473	0.00091 U		
Silver, dissolved	1/44	NA	0.015		0.015	NA		
Sodium	39/44	11/11	6.5	5.36	23.37	21.6		
Sodium, dissolved	39/44	NA	5		20.02	NA		
Thallium	6/44	0/11	0.132		0.396	0.0042 U		0.002
Thallium, dissolved	1/44	NA	0.156		0.156	NA		
Vanadium	1/44	9/11	0.061	0.0011	0.061	0.0042		
Zinc	27/44	9/11	0.022	0.0032	0.2	0.0093		
Zinc, dissolved	7/44	NA	0.023		0.063	NA		
Benzo(a)anthracene	1/44	NA	0.001		0.001	NA		
bis(2-Ethylhexyl) phthalate	2/44	NA	0.005		0.007	NA		0.006
Di-n-butylphthalate	9/44	NA	0.0009		0.005	NA		
Di-n-octylphthalate	1/44	NA	0.001		0.001	NA		
Naphthalene	1/44	NA	0.001		0.001	NA		
Pyrene	1/44	NA	0.008		0.008	NA		
1,1-Dichloroethane	1/44	0/11	0.001		0.001	0.001 U		
Acetone	3/44	0/11	0.006		0.019	0.006 U		
Benzene	1/44	0/11	0.0009		0.0009	0.0005 U		0.005
cis/trans1,2-Dichloroethene	1/44	NA	0.002		0.002	0.0008 U		0.07
Dichloromethane (Methylene chloride)	4/44	0/11	0.001		1.342	0.002 U		0.005
Tetrachloroethene	1/44	0/11	0.002		0.002	0.0008 U		0.005

Notes:
[1] Geosyntec, 1994
[2] United States Environmental Protection Agency Maximum Contaminant Level
NA - Not analyzed
1/44 - One parameter detection out of 44 samples
U - Concentration not detected at specified detection limit

Table 2

2004 - 2011 Groundwater Analytical Results
Former Sinclair Refinery Site (OU-1)
Wellsville, New York
(mg/L)

Parameter	MWR-01 6/15/2004	MWR-01 7/7/2005	MWR-01 5/31/2006	MWR-01 5/30/2007	MWR-01 5/29/2008	MWR-01 5/27/2009	MWR-01 6/9/2010	MWR-01 6/16/2011
Inorganic Compounds								
Aluminum	0.1 U	0.2 U	0.1 U	0.2 U	0.0802 U	0.0802 U	0.0834 U	0.0801 U
Antimony	0.005 U	0.005 U	0.089	0.006 U	0.0097 U	0.0097 U	0.01 U	0.0058 U
Arsenic	0.0126	0.005	0.008 U	0.008 U	0.0102 U	0.0072 U	0.0098 U	0.0062 J
Barium	0.245	0.21	0.2 U	0.2 U	0.172	0.164	0.166	0.187
Beryllium	0.005 U	0.005 U	0.0201	0.001 U	0.0009 U	0.0014 U	0.0015 J	0.00024 U
Cadmium	0.004 U	0.004 U	0.008	0.004 U	0.002 U	0.002 U	0.002 U	0.00027 U
Calcium	36.8	34.3	31.8	27.7	30.4	28.3	29	31.9
Chromium	0.01 U	0.01 U	0.01 U	0.01 U	0.003 U	0.0085 J	0.0075 J	0.0121 J
Cobalt	0.05 U	0.05 U	0.05 U	0.05 U	0.0022 J	0.0022 J	0.0023 U	0.0022 J
Copper	0.025 U	0.025 U	0.025 U	0.025 U	0.0027 U	0.0044 J	0.0027 U	0.003 J
Iron	2.91	1.54	1	1.02	1.16	1.43	1.69	2.39
Lead	0.003 U	0.003 U	0.003 U	0.003 U	0.0069 U	0.0069 U	0.0069 U	0.0024 J
Magnesium	25	22.7	21.6	20.5	19.4	18.8	19.2	20.3
Manganese	14	13.5	12.5	11.7	13.3	11.7	11.3	12.5
Mercury	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.000056 U	0.000056 U	0.000056 U	0.000026 U
Nickel	0.04 U	0.04 U	0.04 U	0.04 U	0.0056 U	0.0018 U	0.0105	0.0019 J
Potassium	5 U	5 U	5 U	10 U	1.74	1.37	1.38	1.47
Selenium	0.005 U	0.005 U	0.01 U	0.01 U	0.0107 U	0.0089 U	0.0089 U	0.0069 U
Silver	0.01 U	0.01 U	0.01 U	0.01 U	0.0022 U	0.0023 U	0.0023 U	0.00091 U
Sodium	23.2	24.3	23.5	23.1	24.2	22	22.1	21.6
Thallium	0.01 U	0.01 U	0.01 U	0.01 U	0.014 U	0.014 U	0.014 U	0.0042 U
Vanadium	0.05 U	0.05 U	0.05 U	0.05 U	0.0048 J	0.0025 U	0.0025 U	0.0034 J
Zinc	0.02 U	0.0221	0.02 U	0.02 U	0.0081 U	0.0081 U	0.0081 U	0.0032 J
Volatile Organic Compounds								
1,1,1-Trichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
1,1,2,2-Tetrachloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1,2-Trichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
1,1-Dichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
1,2-Dichlorobenzene	0.002 U							
1,2-Dichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloropropane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,3-Dichlorobenzene	0.002 U							
1,4-Dichlorobenzene	0.002 U							
2-Butanone (MEK)	0.01 U	0.01 U	0.01 U	0.01 U	0.003 U	0.003 U	0.003 U	0.003 U
2-Hexanone	0.005 U	0.005 U	0.005 U	0.005 U	0.003 U	0.003 U	0.003 U	0.003 U
4-Methyl-2-pentanone	0.005 U	0.005 U	0.005 U	0.005 U	0.003 U	0.003 U	0.003 U	0.003 U
Acetone	0.01 U	0.01 U	0.01 U	0.01 U	0.006 U	0.006 U	0.006 U	0.006 U
Benzene	0.001 U	0.001 U	0.001 U	0.001 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
Bromodichloromethane					0.001 U	0.001 U	0.001 U	0.001 U
Bromoform	0.004 U	0.004 U	0.004 U	0.004 U	0.001 U	0.001 U	0.001 U	0.001 U
Bromomethane	0.002 U	0.002 U	0.002 U	0.002 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon disulfide	0.002 U	0.002 U	0.002 U	0.002 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon tetrachloride	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chlorobenzene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Chloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloroform	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Chloromethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
cis-1,2-Dichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
cis-1,3-Dichloropropene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Dibromochloromethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Dichlorobromomethane	0.001 U	0.001 U	0.001 U	0.001 U				
Dichloromethane (Methylene chloride)	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Ethyl benzene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
m&p-Xylene	0.0005 J	0.001 U	0.001 U	0.001 U				

Please see page 22 for notes.

Table 2

2004 - 2011 Groundwater Analytical Results
Former Sinclair Refinery Site (OU-1)
Wellsville, New York
(mg/L)

Parameter	MWR-01 6/15/2004	MWR-01 7/7/2005	MWR-01 5/31/2006	MWR-01 5/30/2007	MWR-01 5/29/2008	MWR-01 5/27/2009	MWR-01 6/9/2010	MWR-01 6/16/2011
VOC's Continued								
o-Xylene	0.001 U	0.001 U	0.001 U	0.001 U				
Phenol	0.005 U							
Styrene	0.005 U	0.005 U	0.005 U	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
Tetrachloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Toluene	0.0011	0.001 U	0.001 U	0.001 U	0.0007 U	0.0007 U	0.0007 U	0.0007 U
trans-1,2-Dichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
trans-1,3-Dichloropropene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Trichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Vinyl chloride	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Xylenes (total)					0.0008 U	0.0008 U	0.0008 U	0.0008 U

Please see page 22 for notes.

Table 2

2004 - 2011 Groundwater Analytical Results
Former Sinclair Refinery Site (OU-1)
Wellsville, New York
(mg/L)

Parameter	MWR-02 6/17/2004	MWR-02 7/12/2005	MWR-02 6/2/2006	MWR-02 6/4/2007	MWR-02 5/30/2008	MWR-02 5/28/2009	MWR-02 6/10/2010	MWR-02 6/16/2011
Inorganic Compounds								
Aluminum	0.2 U	0.1 U	0.1 U	0.2 U	0.0802 U	0.0802 U	0.0834 U	0.141 J
Antimony	0.005 U	0.005 U	0.006 U	0.006 U	0.0097 U	0.0097 U	0.01 U	0.0058 U
Arsenic	0.0532	0.005 U	0.0501	0.0491	0.0524	0.058	0.045	0.0283
Barium	0.458	0.2 U	0.416	0.416	0.365	0.381	0.369	0.477
Beryllium	0.005 U	0.005 U	0.001 U	0.001 U	0.0009 U	0.0014 U	0.0016 J	0.00024 U
Cadmium	0.004 U	0.004 U	0.004 U	0.004 U	0.002 U	0.002 U	0.002 U	0.0017 J
Calcium	39.8	5 U	34.3	30.3	36.7	31	38.8	48.5
Chromium	0.01 U	0.01 U	0.01 U	0.01 U	0.003 U	0.0034 U	0.0034 U	0.0018 J
Cobalt	0.05 U	0.05 U	0.05 U	0.05 U	0.0021 U	0.0021 U	0.0023 U	0.00062 U
Copper	0.025 U	0.025 U	0.025 U	0.025 U	0.0027 U	0.0027 U	0.0027 U	0.00094 U
Iron	40.7	0.1 U	37.2	35.7	40.3	37.2	46.9	54.7
Lead	0.003 U	0.003 U	0.003 U	0.003 U	0.0069 U	0.0069 U	0.0069 U	0.0022 U
Magnesium	31.4	5 U	27	25.7	25.1	24.5	31.1	39.1
Manganese	7.98	0.015 U	7.69	7.74	8.74	8.03	7.89	10.6
Mercury	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.000056 U	0.000056 U	0.000056 U	0.000026 U
Nickel	0.04 U	0.04 U	0.04 U	0.04 U	0.0056 U	0.0018 U	0.003 U	0.0028 J
Potassium	5 U	5 U	5 U	10 U	1.62	1.77	2.03	2.26
Selenium	0.005 U	0.005 U	0.01 U	0.01 U	0.0107 U	0.0089 U	0.0089 U	0.0069 U
Silver	0.01 U	0.01 U	0.01 U	0.01 U	0.0022 U	0.0024 J	0.0023 U	0.00091 U
Sodium	18.7	5 U	21.3	21.5	20.9	20.9	18.4	18.7
Thallium	0.01 U	0.01 U	0.01 U	0.01 U	0.014 U	0.014 U	0.014 U	0.0042 U
Vanadium	0.05 U	0.05 U	0.05 U	0.05 U	0.0025 U	0.0025 U	0.0025 U	0.0039 J
Zinc	0.02 U	0.02 U	0.02 U	0.02 U	0.0081 U	0.0081 U	0.0081 U	0.0032 U
Volatile Organic Compounds								
1,1,1-Trichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
1,1,2,2-Tetrachloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1,2-Trichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
1,1-Dichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
1,2-Dichlorobenzene	0.002 U							
1,2-Dichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloropropane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,3-Dichlorobenzene	0.002 U							
1,4-Dichlorobenzene	0.002 U							
2-Butanone (MEK)	0.01 U	0.01 U	0.01 U	0.01 U	0.003 U	0.003 U	0.003 U	0.003 U
2-Hexanone	0.005 U	0.005 U	0.005 U	0.005 U	0.003 U	0.003 U	0.003 U	0.003 U
4-Methyl-2-pentanone	0.005 U	0.005 U	0.005 U	0.005 U	0.003 U	0.003 U	0.003 U	0.003 U
Acetone	0.01 U	0.01 U	0.01 U	0.01 U	0.006 U	0.006 U	0.006 U	0.006 U
Benzene	0.001 U	0.001 U	0.001 U	0.001 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
Bromodichloromethane					0.001 U	0.001 U	0.001 U	0.001 U
Bromoform	0.004 U	0.004 U	0.004 U	0.004 U	0.001 U	0.001 U	0.001 U	0.001 U
Bromomethane	0.002 U	0.002 U	0.002 U	0.002 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon disulfide	0.002 U	0.002 U	0.002 U	0.002 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon tetrachloride	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chlorobenzene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Chloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloroform	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Chloromethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
cis-1,2-Dichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
cis-1,3-Dichloropropene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Dibromochloromethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Dichlorobromomethane	0.001 U	0.001 U	0.001 U	0.001 U				
Dichloromethane (Methylene chloride)	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Ethyl benzene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
m&p-Xylene	0.001 U	0.001 U	0.001 U	0.001 U				

Please see page 22 for notes.

Table 2

2004 - 2011 Groundwater Analytical Results
Former Sinclair Refinery Site (OU-1)
Wellsville, New York
(mg/L)

Parameter	MWR-02 6/17/2004	MWR-02 7/12/2005	MWR-02 6/2/2006	MWR-02 6/4/2007	MWR-02 5/30/2008	MWR-02 5/28/2009	MWR-02 6/10/2010	MWR-02 6/16/2011
VOC's Continued								
o-Xylene	0.001 U	0.001 U	0.001 U	0.001 U				
Phenol	0.005 U							
Styrene	0.005 U	0.005 U	0.005 U	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
Tetrachloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Toluene	0.00033 J	0.001 U	0.001 U	0.001 U	0.0007 U	0.0007 U	0.0007 U	0.0007 U
trans-1,2-Dichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
trans-1,3-Dichloropropene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Trichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Vinyl chloride	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Xylenes (total)					0.0008 U	0.0008 U	0.0008 U	0.0008 U

Please see page 22 for notes.

Table 2

2004 - 2011 Groundwater Analytical Results
Former Sinclair Refinery Site (OU-1)
Wellsville, New York
(mg/L)

Parameter	MWR-03 6/17/2004	MWR-03 7/12/2005	MWR-03 6/1/2006	MWR-03 6/4/2007	MWR-03 5/29/2008	MWR-03 5/28/2009	MWR-03 6/10/2010	MWR-03 6/15/2011
Inorganic Compounds								
Aluminum	0.2 U	0.1 U	0.1 U	0.2 U	0.0802 U	0.0802 U	0.0834 U	0.141 J
Antimony	0.005 U	0.005 U	0.006 U	0.006 U	0.0097 U	0.0097 U	0.01 U	0.0058 U
Arsenic	0.0124	0.01	0.008 U	0.008 U	0.0128 J	0.0072 U	0.0098 U	0.0537
Barium	0.251	0.286	0.243	0.257	0.23	0.204	0.197	0.274
Beryllium	0.005 U	0.005 U	0.001 U	0.001 U	0.0009 U	0.0014 U	0.0016 J	0.00024 U
Cadmium	0.004 U	0.004 U	0.004 U	0.004 U	0.002 U	0.002 U	0.002 U	0.00039 J
Calcium	41.4	43.6	35.7	33.2	33.6	27.8	29.1	37.8
Chromium	0.01 U	0.01 U	0.01 U	0.01 U	0.003 U	0.0034 U	0.0034 U	0.0038 J
Cobalt	0.05 U	0.05 U	0.05 U	0.05 U	0.0021 U	0.0021 U	0.0023 U	0.00067 J
Copper	0.025 U	0.025 U	0.025 U	0.025 U	0.0027 U	0.0027 U	0.0027 U	0.0033 J
Iron	3.7	3.97	3.66	3.59	3.97	1.99	2.02	10.8
Lead	0.003 U	0.003 U	0.003 U	0.003 U	0.0069 U	0.0069 U	0.0069 U	0.0025 J
Magnesium	23.2	24.8	21.9	21.6	19.9	16.6	17.5	24.3
Manganese	3	3.31	2.73	2.87	2.82	2.45	2.5	3.79
Mercury	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.000056 U	0.000056 U	0.000056 U	0.000026 U
Nickel	0.04 U	0.04 U	0.04 U	0.04 U	0.0056 U	0.0018 U	0.003 U	0.00095 U
Potassium	5 U	5 U	5 U	10 U	2.12	1.87	1.66	1.99
Selenium	0.005 U	0.005 U	0.01 U	0.01 U	0.0107 U	0.0089 U	0.0089 U	0.0069 U
Silver	0.01 U	0.01 U	0.01 U	0.01 U	0.0022 U	0.0023 U	0.0023 U	0.00091 U
Sodium	12.2	12.5	11.2	10.7	11.2	10.6	11	11.8
Thallium	0.01 U	0.01 U	0.01 U	0.01 U	0.014 U	0.014 U	0.014 U	0.0042 U
Vanadium	0.05 U	0.05 U	0.05 U	0.05 U	0.0025 U	0.0025 U	0.0025 U	0.0012 J
Zinc	0.02 U	0.02 U	0.02 U	0.02 U	0.0081 U	0.0081 U	0.0081 U	0.0054 J
Volatile Organic Compounds								
1,1,1-Trichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
1,1,2,2-Tetrachloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1,2-Trichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
1,1-Dichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
1,2-Dichlorobenzene	0.002 U							
1,2-Dichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloropropane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,3-Dichlorobenzene	0.002 U							
1,4-Dichlorobenzene	0.002 U							
2-Butanone (MEK)	0.01 U	0.01 U	0.01 U	0.01 U	0.003 U	0.003 U	0.003 U	0.003 U
2-Hexanone	0.005 U	0.005 U	0.005 U	0.005 U	0.003 U	0.003 U	0.003 U	0.003 U
4-Methyl-2-pentanone	0.005 U	0.005 U	0.005 U	0.005 U	0.003 U	0.003 U	0.003 U	0.003 U
Acetone	0.01 U	0.01 U	0.01 U	0.01 U	0.006 U	0.006 U	0.006 U	0.006 U
Benzene	0.001 U	0.001 U	0.001 U	0.001 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
Bromodichloromethane					0.001 U	0.001 U	0.001 U	0.001 U
Bromoform	0.004 U	0.004 U	0.004 U	0.004 U	0.001 U	0.001 U	0.001 U	0.001 U
Bromomethane	0.002 U	0.002 U	0.002 U	0.002 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon disulfide	0.002 U	0.002 U	0.002 U	0.002 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon tetrachloride	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chlorobenzene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Chloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloroform	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Chloromethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
cis-1,2-Dichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
cis-1,3-Dichloropropene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Dibromochloromethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Dichlorobromomethane	0.001 U	0.001 U	0.001 U	0.001 U				
Dichloromethane (Methylene chloride)	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Ethyl benzene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
m&p-Xylene	0.001 U	0.001 U	0.001 U	0.001 U				

Please see page 22 for notes.

Table 2

2004 - 2011 Groundwater Analytical Results
Former Sinclair Refinery Site (OU-1)
Wellsville, New York
(mg/L)

Parameter	MWR-03 6/17/2004	MWR-03 7/12/2005	MWR-03 6/1/2006	MWR-03 6/4/2007	MWR-03 5/29/2008	MWR-03 5/28/2009	MWR-03 6/10/2010	MWR-03 6/15/2011
VOC's Continued								
o-Xylene	0.001 U	0.001 U	0.001 U	0.001 U				
Phenol	0.005 U							
Styrene	0.005 U	0.005 U	0.005 U	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
Tetrachloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Toluene	0.00071 J	0.001 U	0.001 U	0.001 U	0.0007 U	0.0007 U	0.0007 U	0.0007 U
trans-1,2-Dichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
trans-1,3-Dichloropropene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Trichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Vinyl chloride	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Xylenes (total)					0.0008 U	0.0008 U	0.0008 U	0.0008 U

Please see page 22 for notes.

Table 2

2004 - 2011 Groundwater Analytical Results
Former Sinclair Refinery Site (OU-1)
Wellsville, New York
(mg/L)

Parameter	MWR-04 6/16/2004	MWR-04 7/11/2005	MWR-04 6/1/2006	MWR-04 6/1/2007	MWR-04 5/29/2008	MWR-04 5/28/2009	MWR-04 6/10/2010	MWR-04 6/15/2011
Inorganic Compounds								
Aluminum	0.2 U	0.1 U	0.1 U	0.2 U	0.0802 U	0.0802 U	0.0834 U	0.0801 U
Antimony	0.005 U	0.005 U	0.006 U	0.006 U	0.0097 U	0.0109 J	0.01 U	0.0058 U
Arsenic	0.005 U	0.005 U	0.008 U	0.008 U	0.0102 U	0.0072 U	0.0098 U	0.0051 U
Barium	0.2 U	0.2 U	0.2 U	0.2 U	0.0762	0.0617	0.0792	0.0949
Beryllium	0.005 U	0.005 U	0.001 U	0.001 U	0.0009 U	0.0014 U	0.0016 J	0.00024 U
Cadmium	0.004 U	0.004 U	0.004 U	0.004 U	0.002 U	0.002 U	0.002 U	0.00027 U
Calcium	17.9	17.5	16	17.6	15.7	15.5	15	17.9
Chromium	0.01 U	0.01 U	0.01 U	0.0697	0.0287	0.0034 U	0.0494	0.0559
Cobalt	0.05 U	0.05 U	0.05 U	0.05 U	0.0021 U	0.0021 U	0.0023 U	0.0016 J
Copper	0.025 U	0.025 U	0.025 U	0.025 U	0.0027 U	0.0027 U	0.0027 U	0.00094 U
Iron	0.1 U	0.125	0.1 U	0.171	0.131 J	0.0522 U	0.484	0.341
Lead	0.003 U	0.003 U	0.003 U	0.003 U	0.0069 U	0.0069 U	0.0069 U	0.0022 U
Magnesium	5 U	5 U	5 U	5.1	4.42	4.23	4.4	5.2
Manganese	3.12	0.971	0.665	3.27	2.88	1.5	1.99	3.38
Mercury	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.000056 U	0.000056 U	0.000056 U	0.000026 U
Nickel	0.04 U	0.04 U	0.04 U	0.04 U	0.0071 J	0.0071 J	0.0355	0.0341
Potassium	5 U	5 U	5 U	10 U	1.23	1.28	1.24	1.3
Selenium	0.005 U	0.005 U	0.01 U	0.01 U	0.0107 U	0.0089 U	0.0089 U	0.0069 U
Silver	0.01 U	0.01 U	0.01 U	0.01 U	0.0022 U	0.0023 U	0.0023 U	0.00091 U
Sodium	8.23	8.59	8.06	10 U	7.88	9.38	8.67	8.16
Thallium	0.01 U	0.01 U	0.01 U	0.01 U	0.014 U	0.014 U	0.014 U	0.0042 U
Vanadium	0.05 U	0.05 U	0.05 U	0.05 U	0.0025 U	0.0025 U	0.0025 U	0.0011 J
Zinc	0.02 U	0.02 U	0.02 U	0.02 U	0.0081 U	0.0081 U	0.0081 U	0.0032 J
Volatile Organic Compounds								
1,1,1-Trichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
1,1,2,2-Tetrachloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1,2-Trichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
1,1-Dichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
1,2-Dichlorobenzene	0.002 U							
1,2-Dichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloropropane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,3-Dichlorobenzene	0.002 U							
1,4-Dichlorobenzene	0.002 U							
2-Butanone (MEK)	0.01 U	0.01 U	0.01 U	0.01 U	0.003 U	0.003 U	0.003 U	0.003 U
2-Hexanone	0.005 U	0.005 U	0.005 U	0.005 U	0.003 U	0.003 U	0.003 U	0.003 U
4-Methyl-2-pentanone	0.005 U	0.005 U	0.005 U	0.005 U	0.003 U	0.003 U	0.003 U	0.003 U
Acetone	0.01 U	0.01 U	0.01 U	0.01 U	0.006 U	0.006 U	0.006 U	0.006 U
Benzene	0.001 U	0.001 U	0.001 U	0.001 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
Bromodichloromethane					0.001 U	0.001 U	0.001 U	0.001 U
Bromoform	0.004 U	0.004 U	0.004 U	0.004 U	0.001 U	0.001 U	0.001 U	0.001 U
Bromomethane	0.002 U	0.002 U	0.002 U	0.002 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon disulfide	0.002 U	0.002 U	0.002 U	0.002 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon tetrachloride	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chlorobenzene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Chloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloroform	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Chloromethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
cis-1,2-Dichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
cis-1,3-Dichloropropene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Dibromochloromethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Dichlorobromomethane	0.001 U	0.001 U	0.001 U	0.001 U				
Dichloromethane (Methylene chloride)	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Ethyl benzene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
m&p-Xylene	0.001 U	0.001 U	0.001 U	0.001 U				

Please see page 22 for notes.

Table 2

2004 - 2011 Groundwater Analytical Results
Former Sinclair Refinery Site (OU-1)
Wellsville, New York
(mg/L)

Parameter	MWR-04 6/16/2004	MWR-04 7/11/2005	MWR-04 6/1/2006	MWR-04 6/1/2007	MWR-04 5/29/2008	MWR-04 5/28/2009	MWR-04 6/10/2010	MWR-04 6/15/2011
VOC's Continued								
o-Xylene	0.001 U	0.001 U	0.001 U	0.001 U				
Phenol	0.005 U							
Styrene	0.005 U	0.005 U	0.005 U	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
Tetrachloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Toluene	0.001 U	0.001 U	0.001 U	0.001 U	0.0007 U	0.0007 U	0.0007 U	0.0007 U
trans-1,2-Dichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
trans-1,3-Dichloropropene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Trichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Vinyl chloride	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Xylenes (total)					0.0008 U	0.0008 U	0.0008 U	0.0008 U

Please see page 22 for notes.

Table 2

2004 - 2011 Groundwater Analytical Results
Former Sinclair Refinery Site (OU-1)
Wellsville, New York
(mg/L)

Parameter	MWR-05 6/16/2004	MWR-05 7/11/2005	MWR-05 6/1/2006	MWR-05 6/1/2007	MWR-05 5/29/2008	MWR-05 5/28/2009	MWR-05 6/10/2010	MWR-05 6/15/2011
Inorganic Compounds								
Aluminum	0.2 U	0.1 U	0.1 U	0.2 U	0.0802 U	0.0802 U	0.0834 U	0.0801 U
Antimony	0.005 U	0.005 U	0.006 U	0.006 U	0.0097 U	0.0097 U	0.01 U	0.0058 U
Arsenic	0.005 U	0.005 U	0.008 U	0.008 U	0.0102 U	0.0072 U	0.0098 U	0.0051 U
Barium	0.2 U	0.2 U	0.2 U	0.2 U	0.0472	0.0584	0.0473	0.0606
Beryllium	0.005 U	0.005 U	0.001 U	0.001 U	0.0009 U	0.0014 U	0.0016 J	0.00024 U
Cadmium	0.004 U	0.004 U	0.004 U	0.004 U	0.002 U	0.002 U	0.002 U	0.00027 U
Calcium	15.7	83.6	12.9	11	11.5	14	11.4	13.4
Chromium	0.0247	0.01 U	0.0197	0.0613	0.094	0.0378	0.0801	0.892
Cobalt	0.05 U	0.05 U	0.05 U	0.05 U	0.0021 U	0.0021 U	0.0023 U	0.00062 U
Copper	0.025 U	0.025 U	0.025 U	0.025 U	0.0027 U	0.0027 U	0.0027 U	0.0097 J
Iron	0.137	0.267	0.166	0.488	0.603	0.24	0.522	3.58
Lead	0.003 U	0.003 U	0.003 U	0.003 U	0.0069 U	0.0069 U	0.0069 U	0.0022 U
Magnesium	5 U	66.7	5 U	5 U	3.28	4.16	3.34	3.86
Manganese	0.371	0.0777	0.0198	0.015 U	0.0327	0.0312	0.0186	0.0209
Mercury	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.000056 U	0.000056 U	0.000056 U	0.000026 U
Nickel	0.04 U	0.04 U	0.04 U	0.04 U	0.0595	0.0261	0.0617	0.032
Potassium	5 U	5 U	5 U	10 U	1.11	1.34	1.13	1.19
Selenium	0.005 U	0.005 U	0.01 U	0.01 U	0.0107 U	0.0089 U	0.0089 U	0.0069 U
Silver	0.01 U	0.01 U	0.01 U	0.01 U	0.0022 U	0.0023 U	0.0023 U	0.00091 U
Sodium	9.4	174	8.35	10 U	8.01	9.54	8.71	9.05
Thallium	0.01 U	0.01 U	0.01 U	0.01 U	0.014 U	0.014 U	0.014 U	0.0042 U
Vanadium	0.05 U	0.05 U	0.05 U	0.05 U	0.0025 U	0.0025 U	0.0025 U	0.0042 J
Zinc	0.02 U	0.02 U	0.02 U	0.02 U	0.0081 U	0.0081 U	0.0081 U	0.0043 J
Volatile Organic Compounds								
1,1,1-Trichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
1,1,2,2-Tetrachloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1,2-Trichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
1,1-Dichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
1,2-Dichlorobenzene	0.002 U							
1,2-Dichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloropropane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,3-Dichlorobenzene	0.002 U							
1,4-Dichlorobenzene	0.002 U							
2-Butanone (MEK)	0.01 U	0.01 U	0.01 U	0.01 U	0.003 U	0.003 U	0.003 U	0.003 U
2-Hexanone	0.005 U	0.005 U	0.005 U	0.005 U	0.003 U	0.003 U	0.003 U	0.003 U
4-Methyl-2-pentanone	0.005 U	0.005 U	0.005 U	0.005 U	0.003 U	0.003 U	0.003 U	0.003 U
Acetone	0.01 U	0.01 U	0.01 U	0.01 U	0.006 U	0.006 U	0.006 U	0.006 U
Benzene	0.001 U	0.001 U	0.001 U	0.001 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
Bromodichloromethane					0.001 U	0.001 U	0.001 U	0.001 U
Bromoform	0.004 U	0.004 U	0.004 U	0.004 U	0.001 U	0.001 U	0.001 U	0.001 U
Bromomethane	0.002 U	0.002 U	0.002 U	0.002 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon disulfide	0.002 U	0.002 U	0.002 U	0.002 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon tetrachloride	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chlorobenzene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Chloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloroform	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Chloromethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
cis-1,2-Dichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
cis-1,3-Dichloropropene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Dibromochloromethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Dichlorobromomethane	0.001 U	0.001 U	0.001 U	0.001 U				
Dichloromethane (Methylene chloride)	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Ethyl benzene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
m&p-Xylene	0.001 U	0.001 U	0.001 U	0.001 U				

Please see page 22 for notes.

Table 2

2004 - 2011 Groundwater Analytical Results
Former Sinclair Refinery Site (OU-1)
Wellsville, New York
(mg/L)

Parameter	MWR-05 6/16/2004	MWR-05 7/11/2005	MWR-05 6/1/2006	MWR-05 6/1/2007	MWR-05 5/29/2008	MWR-05 5/28/2009	MWR-05 6/10/2010	MWR-05 6/15/2011
VOC's Continued								
o-Xylene	0.001 U	0.001 U	0.001 U	0.001 U				
Phenol	0.005 U							
Styrene	0.005 U	0.005 U	0.005 U	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
Tetrachloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Toluene	0.00033 J	0.001 U	0.001 U	0.001 U	0.0007 U	0.0007 U	0.0007 U	0.0007 U
trans-1,2-Dichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
trans-1,3-Dichloropropene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Trichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Vinyl chloride	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Xylenes (total)					0.0008 U	0.0008 U	0.0008 U	0.0008 U

Please see page 22 for notes.

Table 2

2004 - 2011 Groundwater Analytical Results
Former Sinclair Refinery Site (OU-1)
Wellsville, New York
(mg/L)

Parameter	MWR-06 6/16/2004	MWR-06 7/11/2005	MWR-06 6/1/2006	MWR-06 5/31/2007	MWR-06 5/29/2008	MWR-06 5/27/2009	MWR-06 6/9/2010	MWR-06 6/15/2011
Inorganic Compounds								
Aluminum	0.2 U	0.1 U	0.1 U	0.2 U	0.0802 U	0.0802 U	0.0834 U	0.0801 U
Antimony	0.005 U	0.0057	0.0517	0.006 U	0.0097 U	0.0097 U	0.01 U	0.0058 U
Arsenic	0.005 U	0.005 U	0.008 U	0.008 U	0.0102 U	0.0072 U	0.0098 U	0.0067 J
Barium	0.2 U	0.2 U	0.2 U	0.2 U	0.12	0.103	0.112	0.144
Beryllium	0.005 U	0.005 U	0.0104	0.001 U	0.0009 U	0.0014 U	0.0016 J	0.00024 U
Cadmium	0.004 U	0.004 U	0.0044	0.004 U	0.002 U	0.002 U	0.002 U	0.00035 J
Calcium	26.9	28.9	26.8	26.2	25.9	21.8	23.8	28.1
Chromium	0.01 U	0.01 U	0.01 U	0.01 U	0.003 U	0.0034 U	0.004 J	0.006 J
Cobalt	0.05 U	0.05 U	0.05 U	0.05 U	0.0021 U	0.0021 U	0.0023 U	0.0023 J
Copper	0.025 U	0.025 U	0.025 U	0.025 U	0.0027 U	0.0027 U	0.0027 U	0.00094 U
Iron	0.996	3.29	3.19	3.85	3.87	3.41	4.54	7.13
Lead	0.003 U	0.003 U	0.003 U	0.003 U	0.0069 U	0.0069 U	0.0069 U	0.0022 U
Magnesium	8.8	9.61	9.79	9.45	9.21	8.16	8.92	10.2
Manganese	5	7.03	6.76	6.82	6.59	5.87	6.52	7.95
Mercury	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.000056 U	0.000085 J	0.000056 U	0.000026 U
Nickel	0.04 U	0.04 U	0.04 U	0.04 U	0.0056 U	0.0018 U	0.003 U	0.001 J
Potassium	5 U	5 U	5 U	10 U	1.74	1.67	1.54	1.71
Selenium	0.005 U	0.005 U	0.01 U	0.01 U	0.0107 U	0.0089 U	0.0089 U	0.0069 U
Silver	0.01 U	0.01 U	0.01 U	0.01 U	0.0022 U	0.0023 U	0.0023 U	0.00091 U
Sodium	7.35	7.68	7.89	10 U	8.87	8.95	8.18	7.94
Thallium	0.01 U	0.01 U	0.01 U	0.01 U	0.014 U	0.014 U	0.014 U	0.0042 U
Vanadium	0.05 U	0.05 U	0.05 U	0.05 U	0.003 J	0.0025 U	0.0025 U	0.002 J
Zinc	0.02 U	0.02 U	0.02 U	0.02 U	0.0081 U	0.0081 U	0.0081 U	0.0032 U
Volatile Organic Compounds								
1,1,1-Trichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
1,1,2,2-Tetrachloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1,2-Trichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
1,1-Dichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
1,2-Dichlorobenzene	0.002 U							
1,2-Dichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloropropane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,3-Dichlorobenzene	0.002 U							
1,4-Dichlorobenzene	0.002 U							
2-Butanone (MEK)	0.01 U	0.01 U	0.01 U	0.01 U	0.003 U	0.003 U	0.003 U	0.003 U
2-Hexanone	0.005 U	0.005 U	0.005 U	0.005 U	0.003 U	0.003 U	0.003 U	0.003 U
4-Methyl-2-pentanone	0.005 U	0.005 U	0.005 U	0.005 U	0.003 U	0.003 U	0.003 U	0.003 U
Acetone	0.01 U	0.01 U	0.01 U	0.01 U	0.006 U	0.006 U	0.006 U	0.006 U
Benzene	0.001 U	0.001 U	0.001 U	0.001 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
Bromodichloromethane					0.001 U	0.001 U	0.001 U	0.001 U
Bromoform	0.004 U	0.004 U	0.004 U	0.004 U	0.001 U	0.001 U	0.001 U	0.001 U
Bromomethane	0.002 U	0.002 U	0.002 U	0.002 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon disulfide	0.002 U	0.002 U	0.002 U	0.002 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon tetrachloride	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chlorobenzene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Chloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloroform	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Chloromethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
cis-1,2-Dichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
cis-1,3-Dichloropropene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Dibromochloromethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Dichlorobromomethane	0.001 U	0.001 U	0.001 U	0.001 U				
Dichloromethane (Methylene chloride)	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Ethyl benzene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
m&p-Xylene	0.001 U	0.001 U	0.001 U	0.001 U				

Please see page 22 for notes.

Table 2

2004 - 2011 Groundwater Analytical Results
Former Sinclair Refinery Site (OU-1)
Wellsville, New York
(mg/L)

Parameter	MWR-06 6/16/2004	MWR-06 7/11/2005	MWR-06 6/1/2006	MWR-06 5/31/2007	MWR-06 5/29/2008	MWR-06 5/27/2009	MWR-06 6/9/2010	MWR-06 6/15/2011
VOC's Continued								
o-Xylene	0.001 U	0.001 U	0.001 U	0.001 U				
Phenol	0.005 U							
Styrene	0.005 U	0.005 U	0.005 U	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
Tetrachloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Toluene	0.00061 J	0.001 U	0.001 U	0.001 U	0.0007 U	0.0007 U	0.0007 U	0.0007 U
trans-1,2-Dichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
trans-1,3-Dichloropropene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Trichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Vinyl chloride	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Xylenes (total)					0.0008 U	0.0008 U	0.0008 U	0.0008 U

Please see page 22 for notes.

Table 2

2004 - 2011 Groundwater Analytical Results
Former Sinclair Refinery Site (OU-1)
Wellsville, New York
(mg/L)

Parameter	MWR-07 6/16/2004	MWR-07 7/7/2005	MWR-07 6/1/2006	MWR-07 5/31/2007	MWR-07 5/29/2008	MWR-07 5/27/2009	MWR-07 6/9/2010	MWR-07 6/14/2011
Inorganic Compounds								
Aluminum	0.2 U	0.2 U	0.1 U	0.2 U	0.0802 U	0.0802 U	0.0834 U	0.0882 J
Antimony	0.005 U	0.005 U	0.0082	0.006 U	0.0097 U	0.0097 U	0.01 U	0.0058 U
Arsenic	0.005 U	0.005 U	0.008 U	0.008 U	0.0102 U	0.0072 U	0.0098 U	0.0051 U
Barium	0.2 U	0.2 U	0.2 U	0.2 U	0.0507	0.0403	0.0502	0.0464
Beryllium	0.005 U	0.005 U	0.001 U	0.001 U	0.0009 U	0.0014 U	0.0014 J	0.00024 U
Cadmium	0.004 U	0.004 U	0.004 U	0.004 U	0.002 U	0.002 U	0.002 U	0.00044 J
Calcium	17.7	15.9	14.6	14.3	17.2	15.1	16.2	19.4
Chromium	0.01 U	0.01 U	0.01 U	0.01 U	0.003 U	0.0034 U	0.0034 U	0.0082 J
Cobalt	0.05 U	0.05 U	0.05 U	0.05 U	0.0021 U	0.0021 U	0.0023 U	0.00062 U
Copper	0.025 U	0.025 U	0.025 U	0.025 U	0.0027 U	0.0027 U	0.0028 J	0.0031 J
Iron	0.1 U	0.409	0.1 U	0.111	0.114 J	0.562	0.414	0.607
Lead	0.003 U	0.003 U	0.003 U	0.003 U	0.0069 U	0.0069 U	0.0069 U	0.0022 U
Magnesium	5.15	5 U	5 U	5 U	4.56	4.21	3.89	3.93
Manganese	0.877	2.58	0.24	0.402	0.884	1.49	0.503	0.771
Mercury	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.000056 U	0.000056 U	0.000056 U	0.000026 U
Nickel	0.04 U	0.04 U	0.04 U	0.04 U	0.0056 U	0.0018 U	0.003 U	0.0015 J
Potassium	5 U	5 U	5 U	10 U	1.72	1.84	1.92	1.62
Selenium	0.005 U	0.005 U	0.01 U	0.01 U	0.0107 U	0.0089 U	0.0089 U	0.0069 U
Silver	0.01 U	0.01 U	0.01 U	0.01 U	0.0022 U	0.0023 U	0.0023 U	0.00091 U
Sodium	9.39	9.93	9.33	10 U	9.89	9.74	10.2	9.79
Thallium	0.01 U	0.01 U	0.01 U	0.01 U	0.014 U	0.014 U	0.014 U	0.0042 U
Vanadium	0.05 U	0.05 U	0.05 U	0.05 U	0.0025 U	0.0025 U	0.0025 U	0.0011 J
Zinc	0.02 U	0.02 U	0.02 U	0.02 U	0.0081 U	0.0081 U	0.0081 U	0.0061 J
Volatile Organic Compounds								
1,1,1-Trichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
1,1,2,2-Tetrachloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1,2-Trichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
1,1-Dichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
1,2-Dichlorobenzene	0.002 U							
1,2-Dichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloropropane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,3-Dichlorobenzene	0.002 U							
1,4-Dichlorobenzene	0.002 U							
2-Butanone (MEK)	0.01 U	0.01 U	0.01 U	0.01 U	0.003 U	0.003 U	0.003 U	0.003 U
2-Hexanone	0.005 U	0.005 U	0.005 U	0.005 U	0.003 U	0.003 U	0.003 U	0.003 U
4-Methyl-2-pentanone	0.005 U	0.005 U	0.005 U	0.005 U	0.003 U	0.003 U	0.003 U	0.003 U
Acetone	0.01 U	0.01 U	0.01 U	0.01 U	0.006 U	0.006 U	0.006 U	0.006 U
Benzene	0.001 U	0.001 U	0.001 U	0.001 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
Bromodichloromethane					0.001 U	0.001 U	0.001 U	0.001 U
Bromoform	0.004 U	0.004 U	0.004 U	0.004 U	0.001 U	0.001 U	0.001 U	0.001 U
Bromomethane	0.002 U	0.002 U	0.002 U	0.002 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon disulfide	0.002 U	0.002 U	0.002 U	0.002 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon tetrachloride	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chlorobenzene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Chloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloroform	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Chloromethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
cis-1,2-Dichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
cis-1,3-Dichloropropene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Dibromochloromethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Dichlorobromomethane	0.001 U	0.001 U	0.001 U	0.001 U				
Dichloromethane (Methylene chloride)	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Ethyl benzene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
m&p-Xylene	0.001 U	0.001 U	0.001 U	0.001 U				

Please see page 22 for notes.

Table 2

2004 - 2011 Groundwater Analytical Results
Former Sinclair Refinery Site (OU-1)
Wellsville, New York
(mg/L)

Parameter	MWR-07 6/16/2004	MWR-07 7/7/2005	MWR-07 6/1/2006	MWR-07 5/31/2007	MWR-07 5/29/2008	MWR-07 5/27/2009	MWR-07 6/9/2010	MWR-07 6/14/2011
VOC's Continued								
o-Xylene	0.001 U	0.001 U	0.001 U	0.001 U				
Phenol	0.005 U							
Styrene	0.005 U	0.005 U	0.005 U	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
Tetrachloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Toluene	0.00062 J	0.001 U	0.001 U	0.001 U	0.0007 U	0.0007 U	0.0007 U	0.0007 U
trans-1,2-Dichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
trans-1,3-Dichloropropene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Trichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Vinyl chloride	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Xylenes (total)					0.0008 U	0.0008 U	0.0008 U	0.0008 U

Please see page 22 for notes.

Table 2

2004 - 2011 Groundwater Analytical Results
Former Sinclair Refinery Site (OU-1)
Wellsville, New York
(mg/L)

Parameter	MWR-08 6/15/2004	MWR-08 7/7/2005	MWR-08 5/31/2006	MWR-08 5/30/2007	MWR-08 5/28/2008	MWR-08 5/27/2009	MWR-08 6/8/2010	MWR-08 6/13/2011
Inorganic Compounds								
Aluminum	0.1 U	0.2 U	0.1 U	0.2 U	0.0802 U	0.0802 U	0.0834 U	0.0801 U
Antimony	0.005 U	0.005 U	0.0252	0.006 U	0.0097 U	0.0097 U	0.01 U	0.0058 U
Arsenic	0.0086	0.005 U	0.008 U	0.015	0.0102 U	0.0072 U	0.0098 U	0.0051 U
Barium	0.2 U	0.2 U	0.2 U	0.2 U	0.0965	0.0954	0.0823	0.117
Beryllium	0.005 U	0.005 U	0.0044	0.001 U	0.0009 U	0.0014 U	0.0014 J	0.00024 U
Cadmium	0.004 U	0.004 U	0.004 U	0.004 U	0.002 U	0.002 U	0.002 U	0.00027 U
Calcium	21	18.2	18.4	19.8	23.6	21.8	18.9	34.8
Chromium	0.01 U	0.01 U	0.01 U	0.01 U	0.003 U	0.0034 U	0.0034 U	0.0011 U
Cobalt	0.05 U	0.05 U	0.05 U	0.05 U	0.0021 U	0.0021 U	0.0023 U	0.00088 J
Copper	0.025 U	0.025 U	0.025 U	0.025 U	0.0027 U	0.0027 U	0.0027 U	0.0035 J
Iron	3.37	2.69	3.07	6.27	2.44	2.38	1.73	1.83
Lead	0.003 U	0.003 U	0.003 U	0.003 U	0.0069 U	0.0069 U	0.0069 U	0.0022 U
Magnesium	22.8	18.3	18.4	18.6	19.2	18	14.7	22.1
Manganese	3.07	2.81	2.91	2.16	2.36	2.7	3.06	2.02
Mercury	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.000056 U	0.000056 U	0.000056 U	0.000026 U
Nickel	0.04 U	0.04 U	0.04 U	0.04 U	0.0056 U	0.0074 J	0.0061 J	0.0086 J
Potassium	5 U	5 U	5 U	10 U	2.13	1.86	1.66	2.27
Selenium	0.005 U	0.005 U	0.01 U	0.01 U	0.0107 U	0.0089 U	0.0089 U	0.0069 U
Silver	0.01 U	0.01 U	0.01 U	0.01 U	0.0022 U	0.0023 U	0.0023 U	0.00091 U
Sodium	8.13	7.7	7.09	10 U	7.07	6.39	6.76	5.36
Thallium	0.01 U	0.01 U	0.01 U	0.01 U	0.014 U	0.014 U	0.014 U	0.0042 U
Vanadium	0.05 U	0.05 U	0.05 U	0.05 U	0.0025 U	0.0025 U	0.0025 U	0.00096 U
Zinc	0.02 U	0.02 U	0.02 U	0.02 U	0.0081 U	0.0081 U	0.0081 U	0.0093 J
Volatile Organic Compounds								
1,1,1-Trichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
1,1,2,2-Tetrachloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1,2-Trichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
1,1-Dichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
1,2-Dichlorobenzene	0.002 U							
1,2-Dichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloropropane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,3-Dichlorobenzene	0.002 U							
1,4-Dichlorobenzene	0.002 U							
2-Butanone (MEK)	0.01 U	0.01 U	0.01 U	0.01 U	0.003 U	0.003 U	0.003 U	0.003 U
2-Hexanone	0.005 U	0.005 U	0.005 U	0.005 U	0.003 U	0.003 U	0.003 U	0.003 U
4-Methyl-2-pentanone	0.005 U	0.005 U	0.005 U	0.005 U	0.003 U	0.003 U	0.003 U	0.003 U
Acetone	0.01 U	0.01 U	0.01 U	0.01 U	0.006 U	0.006 U	0.006 U	0.006 U
Benzene	0.001 U	0.001 U	0.001 U	0.001 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
Bromodichloromethane					0.001 U	0.001 U	0.001 U	0.001 U
Bromoform	0.004 U	0.004 U	0.004 U	0.004 U	0.001 U	0.001 U	0.001 U	0.001 U
Bromomethane	0.002 U	0.002 U	0.002 U	0.002 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon disulfide	0.002 U	0.002 U	0.002 U	0.002 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon tetrachloride	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chlorobenzene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Chloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloroform	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Chloromethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
cis-1,2-Dichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
cis-1,3-Dichloropropene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Dibromochloromethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Dichlorobromomethane	0.001 U	0.001 U	0.001 U	0.001 U				
Dichloromethane (Methylene chloride)	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Ethyl benzene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
m&p-Xylene	0.001 U	0.001 U	0.001 U	0.001 U				

Please see page 22 for notes.

Table 2

2004 - 2011 Groundwater Analytical Results
Former Sinclair Refinery Site (OU-1)
Wellsville, New York
(mg/L)

Parameter	MWR-08 6/15/2004	MWR-08 7/7/2005	MWR-08 5/31/2006	MWR-08 5/30/2007	MWR-08 5/28/2008	MWR-08 5/27/2009	MWR-08 6/8/2010	MWR-08 6/13/2011
VOC's Continued								
o-Xylene	0.001 U	0.001 U	0.001 U	0.001 U				
Phenol	0.005 U							
Styrene	0.005 U	0.005 U	0.005 U	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
Tetrachloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Toluene	0.0004 J	0.001 U	0.001 U	0.001 U	0.0007 U	0.0007 U	0.0007 U	0.0007 U
trans-1,2-Dichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
trans-1,3-Dichloropropene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Trichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Vinyl chloride	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Xylenes (total)					0.0008 U	0.0008 U	0.0008 U	0.0008 U

Please see page 22 for notes.

Table 2

2004 - 2011 Groundwater Analytical Results
Former Sinclair Refinery Site (OU-1)
Wellsville, New York
(mg/L)

Parameter	MWR-09 6/15/2004	MWR-09 7/6/2005	MWR-09 5/31/2006	MWR-09 5/31/2007	MWR-09 5/28/2008	MWR-09 5/26/2009	MWR-09 6/9/2010	MWR-09 6/13/2011
Inorganic Compounds								
Aluminum	0.1 U	0.2 U	0.1 U	0.2 U	0.0802 U	0.0802 U	0.0834 U	0.0801 U
Antimony	0.005 U	0.005 U	0.0506	0.006 U	0.0097 U	0.0097 U	0.01 U	0.0058 U
Arsenic	0.005 U	0.016	0.0202	0.008 U	0.0162 J	0.0174 J	0.0098 U	0.0051 U
Barium	0.2 U	0.215	0.2	0.2 U	0.162	0.206	0.16	0.21
Beryllium	0.005 U	0.005 U	0.0103	0.001 U	0.0009 U	0.0014 U	0.0015 J	0.00024 U
Cadmium	0.004 U	0.004 U	0.0043	0.004 U	0.002 U	0.002 U	0.002 U	0.00034 J
Calcium	42.7	38.5	36	38.8	34.9	38.7	37.9	52.2
Chromium	0.01 U	0.01 U	0.01 U	0.01 U	0.003 U	0.0034 U	0.0034 U	0.0011 U
Cobalt	0.05 U	0.05 U	0.05 U	0.05 U	0.0021 U	0.0021 U	0.0023 U	0.00062 U
Copper	0.025 U	0.025 U	0.025 U	0.025 U	0.0027 U	0.0027 U	0.0027 U	0.0018 J
Iron	8.35	11.7	11.9	9.63	8.74	12.4	7.93	5.59
Lead	0.003 U	0.003 U	0.003 U	0.003 U	0.0069 U	0.0069 U	0.0069 U	0.0022 U
Magnesium	21.6	21	20.3	20.2	16.9	20	17.6	23.6
Manganese	9.05	7.71	6.67	5.63	4.5	6.06	3.17	2.26
Mercury	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.000056 U	0.000063 J	0.000056 U	0.000026 U
Nickel	0.04 U	0.04 U	0.04 U	0.04 U	0.0056 U	0.0018 U	0.003 U	0.00095 U
Potassium	5 U	5 U	5 U	10 U	2.57	2.32	2.52	2.87
Selenium	0.005 U	0.005 U	0.01 U	0.01 U	0.0107 U	0.0089 U	0.0089 U	0.0069 U
Silver	0.01 U	0.01 U	0.01 U	0.01 U	0.0022 U	0.0023 U	0.0023 U	0.00091 U
Sodium	20.5	20.4	16.8	15.7	13.9	14	11.5	15
Thallium	0.01 U	0.01 U	0.01 U	0.01 U	0.014 U	0.014 U	0.014 U	0.0042 U
Vanadium	0.05 U	0.05 U	0.05 U	0.05 U	0.0025 U	0.0025 U	0.0025 U	0.00096 U
Zinc	0.02 U	0.02 U	0.02 U	0.02 U	0.0081 U	0.0081 U	0.0081 U	0.0044 J
Volatile Organic Compounds								
1,1,1-Trichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
1,1,2,2-Tetrachloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1,2-Trichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
1,1-Dichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
1,2-Dichlorobenzene	0.002 U							
1,2-Dichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloropropane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,3-Dichlorobenzene	0.002 U							
1,4-Dichlorobenzene	0.002 U							
2-Butanone (MEK)	0.01 U	0.01 U	0.01 U	0.01 U	0.003 U	0.003 U	0.003 U	0.003 U
2-Hexanone	0.005 U	0.005 U	0.005 U	0.005 U	0.003 U	0.003 U	0.003 U	0.003 U
4-Methyl-2-pentanone	0.005 U	0.005 U	0.005 U	0.005 U	0.003 U	0.003 U	0.003 U	0.003 U
Acetone	0.01 U	0.01 U	0.01 U	0.01 U	0.006 U	0.006 U	0.006 U	0.006 U
Benzene	0.001 U	0.001 U	0.001 U	0.001 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
Bromodichloromethane					0.001 U	0.001 U	0.001 U	0.001 U
Bromoform	0.004 U	0.004 U	0.004 U	0.004 U	0.001 U	0.001 U	0.001 U	0.001 U
Bromomethane	0.002 U	0.002 U	0.002 U	0.002 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon disulfide	0.002 U	0.002 U	0.002 U	0.002 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon tetrachloride	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chlorobenzene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Chloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloroform	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Chloromethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
cis-1,2-Dichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
cis-1,3-Dichloropropene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Dibromochloromethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Dichlorobromomethane	0.001 U	0.001 U	0.001 U	0.001 U				
Dichloromethane (Methylene chloride)	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Ethyl benzene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
m&p-Xylene	0.001 U	0.001 U	0.001 U	0.001 U				

Please see page 22 for notes.

Table 2

2004 - 2011 Groundwater Analytical Results
Former Sinclair Refinery Site (OU-1)
Wellsville, New York
(mg/L)

Parameter	MWR-09 6/15/2004	MWR-09 7/6/2005	MWR-09 5/31/2006	MWR-09 5/31/2007	MWR-09 5/28/2008	MWR-09 5/26/2009	MWR-09 6/9/2010	MWR-09 6/13/2011
VOC's Continued								
o-Xylene	0.001 U	0.001 U	0.001 U	0.001 U				
Phenol	0.005 U							
Styrene	0.005 U	0.005 U	0.005 U	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
Tetrachloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Toluene	0.00045 J	0.001 U	0.001 U	0.001 U	0.0007 U	0.0007 U	0.0007 U	0.0007 U
trans-1,2-Dichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
trans-1,3-Dichloropropene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Trichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Vinyl chloride	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Xylenes (total)					0.0008 U	0.0008 U	0.0008 U	0.0008 U

Please see page 22 for notes.

Table 2

2004 - 2011 Groundwater Analytical Results
Former Sinclair Refinery Site (OU-1)
Wellsville, New York
(mg/L)

Parameter	MWR-10 6/15/2004	MWR-10 7/6/2005	MWR-10 5/31/2006	MWR-10 5/31/2007	MWR-10 5/28/2008	MWR-10 5/26/2009	MWR-10 6/8/2010	MWR-10 6/14/2011
Inorganic Compounds								
Aluminum	0.1 U	0.2 U	0.1 U	0.2 U	0.0802 U	0.0802 U	0.0834 U	0.0801 U
Antimony	0.005 U	0.005 U	0.0605	0.006 U	0.0097 U	0.0097 U	0.01 U	0.0058 U
Arsenic	0.045	0.0475	0.0373	0.0371	0.0381	0.0311	0.0534	0.0587
Barium	0.245	0.228	0.251	0.239	0.228	0.242	0.322	0.305
Beryllium	0.005 U	0.005 U	0.0131	0.001 U	0.0009 U	0.0014 U	0.0014 J	0.00024 U
Cadmium	0.004 U	0.004 U	0.0055	0.004 U	0.002 U	0.002 U	0.002 U	0.00077 J
Calcium	33.6	31.6	30.7	29.9	30.4	29.6	33.8	33.6
Chromium	0.01 U	0.01 U	0.01 U	0.01 U	0.003 U	0.0034 U	0.0034 U	0.0015 J
Cobalt	0.05 U	0.05 U	0.05 U	0.05 U	0.0021 U	0.0021 U	0.0023 U	0.0013 J
Copper	0.025 U	0.025 U	0.025 U	0.025 U	0.0027 U	0.0027 U	0.0027 U	0.00094 U
Iron	14.2	13.3	18.7	17	17	19.4	32.9	26.6
Lead	0.003 U	0.003 U	0.003 U	0.003 U	0.0069 U	0.0069 U	0.0069 U	0.0022 U
Magnesium	23.4	20.6	19.1	19.3	17.7	16.7	16.8	17.6
Manganese	8.46	7.68	8.43	7.82	7.33	7.79	9.39	8.43
Mercury	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.000056 U	0.000056 U	0.000056 U	0.000026 U
Nickel	0.04 U	0.04 U	0.04 U	0.04 U	0.0056 U	0.0018 U	0.003 U	0.0011 J
Potassium	5 U	5 U	5 U	10 U	1.66	1.3	1.21	1.38
Selenium	0.005 U	0.005 U	0.01 U	0.01 U	0.0107 U	0.0089 U	0.0089 U	0.0069 U
Silver	0.01 U	0.01 U	0.01 U	0.01 U	0.0022 U	0.0023 U	0.0023 U	0.00091 U
Sodium	22.8	24.8	21.9	20.3	20.3	17.8	17.6	17.4
Thallium	0.01 U	0.01 U	0.01 U	0.01 U	0.014 U	0.014 U	0.014 U	0.0042 U
Vanadium	0.05 U	0.05 U	0.05 U	0.05 U	0.0031 J	0.0025 U	0.0025 U	0.003 J
Zinc	0.02 U	0.02 U	0.02 U	0.02 U	0.0081 U	0.0081 U	0.0081 U	0.0045 J
Volatile Organic Compounds								
1,1,1-Trichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
1,1,2,2-Tetrachloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1,2-Trichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
1,1-Dichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
1,2-Dichlorobenzene	0.002 U							
1,2-Dichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloropropane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,3-Dichlorobenzene	0.002 U							
1,4-Dichlorobenzene	0.002 U							
2-Butanone (MEK)	0.01 U	0.01 U	0.01 U	0.01 U	0.003 U	0.003 U	0.003 U	0.003 U
2-Hexanone	0.005 U	0.005 U	0.005 U	0.005 U	0.003 U	0.003 U	0.003 U	0.003 U
4-Methyl-2-pentanone	0.005 U	0.005 U	0.005 U	0.005 U	0.003 U	0.003 U	0.003 U	0.003 U
Acetone	0.01 U	0.01 U	0.01 U	0.01 U	0.006 U	0.006 U	0.006 U	0.006 U
Benzene	0.001 U	0.001 U	0.001 U	0.001 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
Bromodichloromethane					0.001 U	0.001 U	0.001 U	0.001 U
Bromoform	0.004 U	0.004 U	0.004 U	0.004 U	0.001 U	0.001 U	0.001 U	0.001 U
Bromomethane	0.002 U	0.002 U	0.002 U	0.002 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon disulfide	0.002 U	0.002 U	0.002 U	0.002 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon tetrachloride	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chlorobenzene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Chloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloroform	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Chloromethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
cis-1,2-Dichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
cis-1,3-Dichloropropene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Dibromochloromethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Dichlorobromomethane	0.001 U	0.001 U	0.001 U	0.001 U				
Dichloromethane (Methylene chloride)	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Ethyl benzene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
m&p-Xylene	0.001 U	0.001 U	0.001 U	0.001 U				

Please see page 22 for notes.

Table 2

2004 - 2011 Groundwater Analytical Results
Former Sinclair Refinery Site (OU-1)
Wellsville, New York
(mg/L)

Parameter	MWR-10 6/15/2004	MWR-10 7/6/2005	MWR-10 5/31/2006	MWR-10 5/31/2007	MWR-10 5/28/2008	MWR-10 5/26/2009	MWR-10 6/8/2010	MWR-10 6/14/2011
VOC's Continued								
o-Xylene	0.001 U	0.001 U	0.001 U	0.001 U				
Phenol	0.005 U							
Styrene	0.005 U	0.005 U	0.005 U	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
Tetrachloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Toluene	0.00041 J	0.001 U	0.001 U	0.001 U	0.0007 U	0.0007 U	0.0007 U	0.0007 U
trans-1,2-Dichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
trans-1,3-Dichloropropene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Trichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Vinyl chloride	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Xylenes (total)					0.0008 U	0.0008 U	0.0008 U	0.0008 U

Please see page 22 for notes.

Table 2

2004 - 2011 Groundwater Analytical Results
Former Sinclair Refinery Site (OU-1)
Wellsville, New York
(mg/L)

Parameter	MWR-11 6/17/2004	MWR-11 7/7/2005	MWR-11 5/31/2006	MWR-11 5/30/2007	MWR-11 5/28/2008	MWR-11 5/26/2009	MWR-11 6/8/2010	MWR-11 6/14/2011
Inorganic Compounds								
Aluminum	0.2 U	0.2 U	0.1 U	0.2 U	0.0964 J	0.0802 U	0.0834 U	0.183 J
Antimony	0.005 U	0.005 U	0.006 U	0.006 U	0.0097 U	0.0097 U	0.01 U	0.0058 U
Arsenic	0.005 U	0.005 U	0.008 U	0.008 U	0.0102 U	0.0072 U	0.0098 U	0.0051 U
Barium	0.2 U	0.2 U	0.2 U	0.2 U	0.0736	0.107	0.11	0.0939
Beryllium	0.005 U	0.005 U	0.001 U	0.001 U	0.0009 U	0.0014 U	0.0014 J	0.00024 U
Cadmium	0.004 U	0.004 U	0.004 U	0.004 U	0.002 U	0.002 U	0.002 U	0.00027 U
Calcium	28.1	27.3	25.5	24	24.3	41	44.8	34.6
Chromium	0.193	0.604	0.21	0.24	0.309	0.282	0.23	0.553
Cobalt	0.05 U	0.05 U	0.05 U	0.05 U	0.0021 U	0.0025 J	0.0023 U	0.0017 J
Copper	0.025 U	0.025 U	0.025 U	0.025 U	0.0063 J	0.0082 J	0.0094 J	0.0134
Iron	0.781	2.79	0.942	0.974	1.5	1.68	1.57	3.3
Lead	0.003 U	0.003 U	0.003 U	0.003 U	0.0069 U	0.0069 U	0.0069 U	0.0022 J
Magnesium	6.12	6.04	5.78	5.85	5.82	9.2	9.5	7.02
Manganese	0.0152	0.0454	0.0241	0.015 U	0.0129	0.0503	0.0359	0.0421
Mercury	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.000056 U	0.000056 U	0.000056 U	0.000026 U
Nickel	0.105	0.218	0.079	0.0643	0.102	0.206	0.0918	0.0816
Potassium	5 U	5 U	5 U	10 U	3.93	3.95	3.82	3.46
Selenium	0.005 U	0.005 U	0.01 U	0.01 U	0.0107 U	0.0089 U	0.0089 U	0.0069 U
Silver	0.01 U	0.01 U	0.01 U	0.01 U	0.0022 U	0.0023 U	0.0023 U	0.00091 U
Sodium	30.2	29	27.7	24.6	23.7	29.3	28.8	20.8
Thallium	0.01 U	0.01 U	0.01 U	0.01 U	0.014 U	0.014 U	0.014 U	0.0042 U
Vanadium	0.05 U	0.05 U	0.05 U	0.05 U	0.0025 U	0.0025 U	0.0025 U	0.0034 J
Zinc	0.02 U	0.0374	0.02 U	0.02 U	0.0081 U	0.0081 U	0.0081 U	0.0038 J
Volatile Organic Compounds								
1,1,1-Trichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
1,1,2,2-Tetrachloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1,2-Trichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
1,1-Dichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
1,2-Dichlorobenzene	0.002 U							
1,2-Dichloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,2-Dichloropropane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,3-Dichlorobenzene	0.002 U							
1,4-Dichlorobenzene	0.002 U							
2-Butanone (MEK)	0.01 U	0.01 U	0.01 U	0.01 U	0.003 U	0.003 U	0.003 U	0.003 U
2-Hexanone	0.005 U	0.005 U	0.005 U	0.005 U	0.003 U	0.003 U	0.003 U	0.003 U
4-Methyl-2-pentanone	0.005 U	0.005 U	0.005 U	0.005 U	0.003 U	0.003 U	0.003 U	0.003 U
Acetone	0.01 U	0.01 U	0.01 U	0.01 U	0.006 U	0.006 U	0.006 U	0.006 U
Benzene	0.001 U	0.001 U	0.001 U	0.001 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
Bromodichloromethane					0.001 U	0.001 U	0.001 U	0.001 U
Bromoform	0.004 U	0.004 U	0.004 U	0.004 U	0.001 U	0.001 U	0.001 U	0.001 U
Bromomethane	0.002 U	0.002 U	0.002 U	0.002 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon disulfide	0.002 U	0.002 U	0.002 U	0.002 U	0.001 U	0.001 U	0.001 U	0.001 U
Carbon tetrachloride	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chlorobenzene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Chloroethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloroform	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Chloromethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
cis-1,2-Dichloroethene	0.00067 J	0.0012	0.00095 J	0.00066 J	0.0008 U	0.0008 U	0.0008 U	0.0008 U
cis-1,3-Dichloropropene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Dibromochloromethane	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Dichlorobromomethane	0.001 U	0.001 U	0.001 U	0.001 U				
Dichloromethane (Methylene chloride)	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Ethyl benzene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
m&p-Xylene	0.001 U	0.001 U	0.001 U	0.001 U				

Please see page 22 for notes.

Table 2

2004 - 2011 Groundwater Analytical Results
Former Sinclair Refinery Site (OU-1)
Wellsville, New York
(mg/L)

Parameter	MWR-11 6/17/2004	MWR-11 7/7/2005	MWR-11 5/31/2006	MWR-11 5/30/2007	MWR-11 5/28/2008	MWR-11 5/26/2009	MWR-11 6/8/2010	MWR-11 6/14/2011
VOC's Continued								
o-Xylene	0.001 U	0.001 U	0.001 U	0.001 U				
Phenol	0.005 U							
Styrene	0.005 U	0.005 U	0.005 U	0.005 U	0.001 U	0.001 U	0.001 U	0.001 U
Tetrachloroethene	0.00047 J	0.00083 J	0.00057 J	0.00058 J	0.0008 U	0.0008 U	0.0008 U	0.0008 U
Toluene	0.00068 J	0.001 U	0.001 U	0.001 U	0.0007 U	0.0007 U	0.0007 U	0.0007 U
trans-1,2-Dichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.0008 U	0.0008 U	0.0008 U	0.0008 U
trans-1,3-Dichloropropene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Trichloroethene	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Vinyl chloride	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Xylenes (total)					0.0008 U	0.0008 U	0.0008 U	0.0008 U

Notes:
U - Concentration not detected at specified detection limit
J/UJ - Estimated value

Table 3

2011 Groundwater Duplicate Sample Comparison
Former Sinclair Refinery Site (OU-1)
Wellsville, New York
(mg/L)

Parameter	MWR07-0611	DUP1-0611
Inorganic Compounds		
Aluminum	0.0882 J	0.0801 U
Antimony	0.0058 U	0.0058 U
Arsenic	0.0051 U	0.0051 U
Barium	0.0464	0.0475
Beryllium	0.00024 U	0.00024 U
Cadmium	0.00044 J	0.00046 J
Calcium	19.4	20
Chromium	0.0082 J	0.0083 J
Cobalt	0.00062 U	0.00062 U
Copper	0.0031 J	0.00094 U
Iron	0.607	0.649
Lead	0.0022 U	0.0026 J
Magnesium	3.93	4.04
Manganese	0.771	0.793
Mercury	0.000026 U	0.000026 U
Nickel	0.0015 J	0.0017 J
Potassium	1.62	1.65
Selenium	0.0069 U	0.0069 U
Silver	0.00091 U	0.00091 U
Sodium	9.79	10
Thallium	0.0042 U	0.0042 U
Vanadium	0.0011 J	0.0013 J
Zinc	0.0061 J	0.0065 J
Volatile Organic Compounds		
1,1,1-Trichloroethane	0.0008 U	0.0008 U
1,1,2,2-Tetrachloroethane	0.001 U	0.001 U
1,1,2-Trichloroethane	0.0008 U	0.0008 U
1,1-Dichloroethane	0.001 U	0.001 U
1,1-Dichloroethene	0.0008 U	0.0008 U
1,2-Dichloroethane	0.001 U	0.001 U
1,2-Dichloropropane	0.001 U	0.001 U
2-Butanone (MEK)	0.003 U	0.003 U
2-Hexanone	0.003 U	0.003 U
4-Methyl-2-pentanone	0.003 U	0.003 U
Acetone	0.006 U	0.006 U
Benzene	0.0005 U	0.0005 U
Bromodichloromethane	0.001 U	0.001 U
Bromoform	0.001 U	0.001 U
Bromomethane	0.001 U	0.001 U
Carbon disulfide	0.001 U	0.001 U
Carbon tetrachloride	0.001 U	0.001 U
Chlorobenzene	0.0008 U	0.0008 U
Chloroethane	0.001 U	0.001 U
Chloroform	0.0008 U	0.0008 U
Chloromethane	0.001 U	0.001 U
cis-1,2-Dichloroethene	0.0008 U	0.0008 U
cis-1,3-Dichloropropene	0.001 U	0.001 U

Parameter	MWR07-0611	DUP1-0611
VOC's Continued		
Dibromochloromethane	0.001 U	0.001 U
Dichloromethane (Methylene chloride)	0.002 U	0.002 U
Ethyl benzene	0.0008 U	0.0008 U
Styrene	0.001 U	0.001 U
Tetrachloroethene	0.0008 U	0.0008 U
Toluene	0.0007 U	0.0007 U
trans-1,2-Dichloroethene	0.0008 U	0.0008 U
trans-1,3-Dichloropropene	0.001 U	0.001 U
Trichloroethene	0.001 U	0.001 U
Vinyl chloride	0.001 U	0.001 U
Xylenes (total)	0.0008 U	0.0008 U

Notes:
U - Concentration not detected at specified detection limit
J/UJ - Estimated value

Table 4

2011 Field Equipment Rinsate Blank Analytical Results
Former Sinclair Refinery Site (OU-1)
Wellsville, New York
(mg/L)

Parameter	EB1-0611
Inorganic Compounds	
Aluminum	0.0801 U
Antimony	0.0058 U
Arsenic	0.0051 U
Barium	0.0012 J
Beryllium	0.00024 U
Cadmium	0.00027 U
Calcium	0.0705 U
Chromium	0.0011 U
Cobalt	0.00062 U
Copper	0.0462
Iron	0.0141 U
Lead	0.0022 U
Magnesium	0.0093 J
Manganese	0.0024 J
Mercury	0.000026 U
Nickel	0.0011 J
Potassium	0.0874 U
Selenium	0.0069 U
Silver	0.00091 U
Sodium	0.0647 U
Thallium	0.0042 U
Vanadium	0.00096 U
Zinc	0.0032 U
Volatile Organic Compounds	
1,1,1-Trichloroethane	0.0008 U
1,1,2,2-Tetrachloroethane	0.001 U
1,1,2-Trichloroethane	0.0008 U
1,1-Dichloroethane	0.001 U
1,1-Dichloroethene	0.0008 U
1,2-Dichloroethane	0.001 U
1,2-Dichloropropane	0.001 U
2-Butanone (MEK)	0.0034 J
2-Hexanone	0.003 U
4-Methyl-2-pentanone	0.003 U
Acetone	0.006 U
Benzene	0.0005 U
Bromodichloromethane	0.001 U
Bromoform	0.001 U
Bromomethane	0.001 U
Carbon disulfide	0.001 U
Carbon tetrachloride	0.001 U
Chlorobenzene	0.0008 U
Chloroethane	0.001 U
Chloroform	0.0008 U
Chloromethane	0.001 U
cis-1,2-Dichloroethene	0.0008 U
cis-1,3-Dichloropropene	0.001 U

Parameter	EB1-0611
Dibromochloromethane	0.001 U
Dichloromethane (Methylene chloride)	0.002 U
Ethyl benzene	0.0008 U
Styrene	0.001 U
Tetrachloroethene	0.0008 U
Toluene	0.0007 U
trans-1,2-Dichloroethene	0.0008 U
trans-1,3-Dichloropropene	0.001 U
Trichloroethene	0.001 U
Vinyl chloride	0.001 U
Xylenes (total)	0.0008 U

Notes:
U - Concentration not detected at specified detection limit
J/UJ - Estimated value

Table 5

2011 Liquid Level Monitoring
Former Sinclair Refinery Site (OU-1)
Wellsville, New York

Location	Depth to Water (ft)	Dept to Product (ft)	Measuring Point Elevation	Water Elevation (ft amsl)
June 13, 2011				
MWR-01	9.75		1502.04	1492.29
MWR-02	15.48	14.46	1506.48	1491.00
MWR-03	14.62		1506.59	1491.97
MWR-04	14.43		1507.52	1493.09
MWR-05	13.60		1507.62	1494.02
MWR-06	12.81		1508.50	1495.69
MWR-07	13.08		1508.29	1495.21
MWR-08	13.54		1508.60	1495.06
MWR-09	10.51		1505.46	1494.95
MWR-10	9.36		1502.25	1492.89
MWR-11	10.69		1511.30	1500.61
P-01	16.67		1509.23	1492.56
P-02	19.39		1512.37	1492.98
P-03	17.28		1510.18	1492.90
P-04	16.67		1509.45	1492.78
P-05	13.14		1505.81	1492.67
P-06	19.65		1512.21	1492.56
July 13, 2011				
MWR-01	10.37		1502.04	1491.67
MWR-02	15.28	15.00	1506.48	1491.20
MWR-03	15.05		1506.59	1491.54
MWR-04	14.67		1507.52	1492.85
MWR-05	13.83		1507.62	1493.79
MWR-06	13.16		1508.50	1495.34
MWR-07	13.54		1508.29	1494.75
MWR-08	13.77		1508.60	1494.83
MWR-09	11.69		1505.46	1493.77
MWR-10	9.31		1502.25	1492.94
MWR-11	11.46		1511.30	1499.84
P-01	17.34		1509.23	1491.89
P-02	20.16		1512.37	1492.21
P-03	18.07		1510.18	1492.11
P-04	17.41		1509.45	1492.04
P-05	13.88		1505.81	1491.93
P-06	20.30		1512.21	1491.91

Table 6

Storm Water Analytical Results (2005-2011)
Former Sinclair Refinery Site (OU-1)
Wellsville, New York
(mg/L except where noted)

Parameter	6/6/2005 OF-0605	3/9/2006 OF-0306	12/1/2006 OF-1206	3/2/2007 OF-0307	10/24/2007 OF-1007	8/6/2008 OF-0808	1/25/2010 OF-0110	Class A Standard[1]
Inorganic Compounds								
Arsenic	0.005 U	0.008 U	0.008 U	0.008 U	0.008 U	0.0102 U	0.0072 U	0.05
Barium	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**1.54**	0.0261	1
Calcium	29.9	21.8	45.3	19.3	34.6	56.7	18.8	
Chromium	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.003 U	0.003 U	0.05
Lead	0.003 U	0.003 U	0.003 U	0.0038	0.003 U	0.0069 U	0.0069 U	0.05
Magnesium	5.25	5 U	9.41	5 U	5.25	**47.9**	3.18	35
Magnesium, dissolved	5 U	5 U	9.54	5 U	5.08	4.21	2.96	
Mercury	0.0002 U	0.0002 U	0.0004 U	0.0002 U	0.0002 U	0.000056 U	0.000056 U	0.0007
Selenium	0.005 U	0.01 U	0.01 U	0.01 U	0.01 U	0.0107 U	0.0089 U	0.01
Silver	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.0022U	0.0023 U	0.05
Oil & Grease								
Oil & Grease	5.2 U	5.1 U	5.1 U	5 U	5 U	2.7 J	1.4 U	
pH								
Field pH (std. units)	7.98	7.6	7.78	7.6	7.73	8.11	7.4	6.5-8.5
Wet Chemistry								
Biochemical Oxygen Demand	2 U	6.1	2 U	3.7	2 U	3.7 U	2.9 U	
Chemical Oxygen Demand	20 U		20 U	44.6	20 U	5	23.5 J	
Cyanide	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.005 U	0.005 U	9
Nitrate Nitrogen	5.4	0.86	1.2	1.4	3.3	1.9	0.13	10
Nitrate-Nitrite	5.4	0.86	1.2	1.4	3.3	2.1	0.13	10
Nitrite Nitrogen	0.01	0.01 U	0.01 U	0.01 U	0.01 U	0.015 U	0.015 U	1
Phosphorus	0.11		0.05 U	0.13	0.14	0.08 U	0.12	
Total Dissolved Solids	108	76	156	62	109	102	74.5	500
Total Kjeldahl Nitrogen	0.57		0.53	0.8	0.37	0.5 U	0.5 U	
Total Organic Carbon (TOC)	2.9	10.3	2.9	4.8	2.2	2.6	5.6	
Total Suspended Solids	4	20	4 U	6	5	3 U	18	
Acute Toxicity								
Ceriodaphnia dubia (24-H) (% Mortality)	ND	0	0	NA	NA	NA	NA	
Ceriodaphnia dubia (48-H) (% Mortality)	ND	0	10	0	5	50	5	
Pimephales promelas (24-H) (% Mortality)	ND	0	0	NA	NA	NA	NA	
Pimephales promelas (48-H) (% Mortality)	ND	0	2.5	0	0	2.5	5	

Notes:
[1] New York State Department of Environmental Conservation 6 NYCRR Parts 700-706 Class A Surface Water Standard
Concentrations in **bold** exceed Class A Standards
[2] Storm water sampling and analysis was not conducted during 2011 due to ongoing OU2 Phase II construction activities.
U - Concentration not detected at specified detection limit
ND - Non detect (0% Mortality)
NA - Not Analyzed
J - Estimated Value

Table 7A

Select Groundwater Analytical Results 1998-2011
Former Sinclair Refinery Site OU-1
(mg/L)

MWR-01

Parameter	9/25/1998	5/6/1999	10/22/1999	4/20/2000	10/11/2000	5/9/2001	4/19/2002	4/24/2003	6/15/2004	7/7/2005	5/31/2006	5/30/2007	5/29/2008	5/27/2009	6/9/2010	6/16/2011	Detections
Antimony	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.006 U	0.06 U	0.06 U	0.005 U	0.005 U	0.089	0.006 U	0.0097 U	0.0097 U	0.01 U	0.0058 U	1
Arsenic	0.0104	0.0205	0.0112	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.0126	0.005	0.008 U	0.008 U	0.0102 U	0.0072 U	0.0098 U	0.0062 J	6
Beryllium	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.004 U	0.005 U	0.005 U	0.005 U	0.005 U	0.0201	0.001 U	0.0009 U	0.0014 U	0.0015 J	0.00024 U	2
Cadmium	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.004 U	0.004 U	0.008	0.004 U	0.002 U	0.002 U	0.002 U	0.00027 U	1
Chromium	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.003 U	0.0085 J	0.0075 J	0.0121 J	3

MWR-02

Parameter	9/25/1998	5/7/1999	10/21/1999	4/20/2000	10/12/2000	5/9/2001	4/19/2002	4/24/2003	6/17/2004	7/12/2005	6/2/2006	6/4/2007	5/30/2008	5/28/2009	6/10/2010	6/16/2011	Detections
Antimony	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.006 U	0.06 U	0.06 U	0.005 U	0.005 U	0.006 U	0.006 U	0.0097 U	0.0097 U	0.01 U	0.0058 U	0
Arsenic	0.0765	0.0447	0.0681	0.0697	0.0557	0.0496	0.0562	0.0579	0.0532	0.005 U	0.0501	0.0491	0.0524	0.058	0.045	0.0283	15
Beryllium	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.004 U	0.005 U	0.005 U	0.005 U	0.005 U	0.001 U	0.001 U	0.0009 U	0.0014 U	0.0016 J	0.00024 U	1
Cadmium	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.004 U	0.004 U	0.004 U	0.004 U	0.002 U	0.002 U	0.002 U	0.0017 J	1
Chromium	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.003 U	0.0034 U	0.0034 U	0.0018 J	1

MWR-03

Parameter	9/24/1998	5/6/1999	10/21/1999	4/20/2000	10/11/2000	5/8/2001	4/18/2002	4/24/2003	6/17/2004	7/12/2005	6/1/2006	6/4/2007	5/29/2008	5/28/2009	6/10/2010	6/15/2011	Detections
Antimony	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.006 U	0.06 U	0.06 U	0.005 U	0.005 U	0.006 U	0.006 U	0.0097 U	0.0097 U	0.01 U	0.0058 U	0
Arsenic	0.0203	0.01 U	0.0128	0.01 U	0.0129	0.01 U	0.01 U	0.01 U	0.0124	0.01	0.008 U	0.008 U	0.0128 J	0.0072 U	0.0098 U	0.0537	7
Beryllium	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.004 U	0.005 U	0.005 U	0.005 U	0.005 U	0.001 U	0.001 U	0.0009 U	0.0014 U	0.0016 J	0.00024 U	1
Cadmium	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.004 U	0.004 U	0.004 U	0.004 U	0.002 U	0.002 U	0.002 U	0.00039 J	1
Chromium	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.003 U	0.0034 U	0.0034 U	0.0038 J	1

MWR-04

Parameter	9/24/1998	5/6/1999	10/21/1999	4/20/2000	10/11/2000	5/7/2001	4/18/2002	4/23/2003	6/16/2004	7/11/2005	6/1/2006	6/1/2007	5/29/2008	5/28/2009	6/10/2010	6/15/2011	Detections
Antimony	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.006 U	0.06 U	0.06 U	0.005 U	0.005 U	0.006 U	0.006 U	0.0097 U	0.0109 J	0.01 U	0.0058 U	1
Arsenic	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.005 U	0.005 U	0.008 U	0.008 U	0.0102 U	0.0072 U	0.0098 U	0.0051 U	0
Beryllium	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.004 U	0.005 U	0.005 U	0.005 U	0.005 U	0.001 U	0.001 U	0.0009 U	0.0014 U	0.0016 J	0.00024 U	1
Cadmium	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.004 U	0.004 U	0.004 U	0.004 U	0.002 U	0.002 U	0.002 U	0.00027 U	0
Chromium	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.225	0.01 U	0.01 U	0.01 U	0.01 U	0.0697	0.0287	0.0034 U	0.0494	0.0559	5

MWR-05

Parameter	9/24/1998	5/6/1999	10/21/1999	4/20/2000	10/11/2000	5/7/2001	4/18/2002	4/23/2003	6/16/2004	7/11/2005	6/1/2006	6/1/2007	5/29/2008	5/28/2009	6/10/2010	6/15/2011	Detections
Antimony	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.006 U	0.06 U	0.06 U	0.005 U	0.005 U	0.006 U	0.006 U	0.0097 U	0.0097 U	0.01 U	0.0058 U	0
Arsenic	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.005 U	0.005 U	0.008 U	0.008 U	0.0102 U	0.0072 U	0.0098 U	0.0051 U	0
Beryllium	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.004 U	0.005 U	0.005 U	0.005 U	0.005 U	0.001 U	0.001 U	0.0009 U	0.0014 U	0.0016 J	0.00024 U	1
Cadmium	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.004 U	0.004 U	0.004 U	0.004 U	0.002 U	0.002 U	0.002 U	0.00027 U	0
Chromium	0.0508	0.0567	0.0414	0.0114	0.01 U	0.0303	0.14	0.0348	0.0247	0.01 U	0.0197	0.0613	0.094	0.0378	0.0801	0.892	14

MWR-06

Parameter	9/24/1998	5/6/1999	10/21/1999	4/19/2000	10/11/2000	5/8/2001	4/18/2002	4/23/2003	6/16/2004	7/11/2005	6/1/2006	5/31/2007	5/29/2008	5/27/2009	6/9/2010	6/15/2011	Detections
Antimony	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.006 U	0.06 U	0.06 U	0.005 U	0.0057	0.0517	0.006 U	0.0097 U	0.0097 U	0.01 U	0.0058 U	2
Arsenic	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.005 U	0.005 U	0.008 U	0.008 U	0.0102 U	0.0072 U	0.0098 U	0.0067 J	1
Beryllium	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.004 U	0.005 U	0.005 U	0.005 U	0.005 U	0.0104	0.001 U	0.0009 U	0.0014 U	0.0016 J	0.00024 U	2
Cadmium	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.004 U	0.004 U	0.0044	0.004 U	0.002 U	0.002 U	0.002 U	0.00035 J	2
Chromium	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.0594	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.003 U	0.0034 U	0.004 J	0.006 J	3

Please see page 2 for notes.

Table 7A

Select Groundwater Analytical Results 1998-2011
Former Sinclair Refinery Site OU-1
(mg/L)

MWR-07

Parameter	9/24/1998	5/5/1999	10/20/1999	4/19/2000	10/10/2000	5/7/2001	4/18/2002	4/23/2003	6/16/2004	7/7/2005	6/1/2006	5/31/2007	5/29/2008	5/27/2009	6/9/2010	6/14/2011	Detections
Antimony	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.006 U	0.06 U	0.06 U	0.005 U	0.005 U	0.0082	0.006 U	0.0097 U	0.0097 U	0.01 U	0.0058 U	1
Arsenic	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.005 U	0.005 U	0.008 U	0.008 U	0.0102 U	0.0072 U	0.0098 U	0.0051 U	0
Beryllium	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.004 U	0.005 U	0.005 U	0.005 U	0.005 U	0.001 U	0.001 U	0.0009 U	0.0014 U	0.0014 J	0.00024 U	1
Cadmium	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.004 U	0.004 U	0.004 U	0.004 U	0.002 U	0.002 U	0.002 U	0.00044 J	1
Chromium	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.003 U	0.0034 U	0.0034 U	0.0082 J	1

MWR-08

Parameter	9/24/1998	5/6/1999	10/22/1999	4/20/2000	10/12/2000	5/1/2001	4/17/2002	4/22/2003	6/15/2004	7/7/2005	5/31/2006	5/30/2007	5/28/2008	5/27/2009	6/8/2010	6/13/2011	Detections
Antimony	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.006 U	0.06 U	0.06 U	0.005 U	0.005 U	0.0252	0.006 U	0.0097 U	0.0097 U	0.01 U	0.0058 U	1
Arsenic	0.0257	0.01 U	0.0107	0.0106	0.0167	0.01 U	0.01 U	0.01 U	0.0086	0.005 U	0.008 U	0.015	0.0102 U	0.0072 U	0.0098 U	0.0051 U	6
Beryllium	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.004 U	0.005 U	0.005 U	0.005 U	0.005 U	0.0044	0.001 U	0.0009 U	0.0014 U	0.0014 J	0.00024 U	2
Cadmium	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.004 U	0.004 U	0.004 U	0.004 U	0.002 U	0.002 U	0.002 U	0.00027 U	0
Chromium	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.003 U	0.0034 U	0.0034 U	0.0011 U	0

MWR-09

Parameter	10/13/1998	5/5/1999	10/20/1999	4/19/2000	10/10/2000	5/1/2001	4/17/2002	4/22/2003	6/15/2004	7/6/2005	5/31/2006	5/31/2007	5/28/2008	5/26/2009	6/9/2010	6/13/2011	Detections
Antimony	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.006 U	0.06 U	0.06 U	0.005 U	0.005 U	0.0506	0.006 U	0.0097 U	0.0097 U	0.01 U	0.0058 U	1
Arsenic	0.0432	0.0146	0.0261	0.0184	0.0278	0.0112	0.0123	0.0238	0.005 U	0.016	0.0202	0.008 U	0.0162 J	0.0174 J	0.0098 U	0.0051 U	12
Beryllium	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.004 U	0.005 U	0.005 U	0.005 U	0.005 U	0.0103	0.001 U	0.0009 U	0.0014 U	0.0015 J	0.00024 U	1
Cadmium	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.004 U	0.004 U	0.0043	0.004 U	0.002 U	0.002 U	0.002 U	0.00034 J	2
Chromium	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.003 U	0.0034 U	0.0034 U	0.0011 U	0

MWR-10

Parameter	10/13/1998	5/5/1999	10/20/1999	4/19/2000	10/10/2000	5/1/2001	4/17/2002	4/22/2003	6/15/2004	7/6/2005	5/31/2006	5/31/2007	5/28/2008	5/26/2009	6/8/2010	6/14/2011	Detections
Antimony	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.006 U	0.06 U	0.06 U	0.005 U	0.005 U	0.0605	0.006 U	0.0097 U	0.0097 U	0.01 U	0.0058 U	1
Arsenic	0.0426	0.0319	0.035	0.0304	0.0359	0.0448	0.0586	0.0437	0.045	0.0475	0.0373	0.0371	0.0381	0.0311	0.0534	0.0587	16
Beryllium	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.004 U	0.005 U	0.005 U	0.005 U	0.005 U	0.0131	0.001 U	0.0009 U	0.0014 U	0.0014 J	0.00024 U	2
Cadmium	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.004 U	0.004 U	0.0055	0.004 U	0.002 U	0.002 U	0.002 U	0.00077 J	2
Chromium	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.003 U	0.0034 U	0.0034 U	0.0015 J	1

MWR-11

Parameter	10/13/1998	5/5/1999	10/20/1999	4/19/2000	10/10/2000	5/8/2001	4/17/2002	4/22/2003	6/17/2004	7/7/2005	5/31/2006	5/30/2007	5/28/2008	5/26/2009	6/8/2010	6/14/2011	Detections
Antimony	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.006 U	0.06 U	0.06 U	0.005 U	0.005 U	0.006 U	0.006 U	0.0097 U	0.0097 U	0.01 U	0.0058 U	0
Arsenic	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.005 U	0.005 U	0.008 U	0.008 U	0.0102 U	0.0072 U	0.0098 U	0.0051 U	0
Beryllium	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.004 U	0.005 U	0.005 U	0.005 U	0.005 U	0.001 U	0.001 U	0.0009 U	0.0014 U	0.0014 J	0.00024 U	1
Cadmium	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.004 U	0.004 U	0.004 U	0.004 U	0.002 U	0.002 U	0.002 U	0.00027 U	0
Chromium	0.19	0.174	0.0902	0.0378	0.0998	0.0597	0.836	0.122	0.193	0.604	0.21	0.24	0.309	0.282	0.23	0.553	16

Notes:
U - Concentration not detected at specified detection limit
J/UJ - Estimate value
Select results include results for parameters that have exceeded the USEPA MCL since 2004.
Detections - Number of results above detection limits

Please see page 2 for notes.

Table 7B

Groundwater Analytical Results 1998-2011 Used in Statistical Analysis
Former Sinclair Refinery Site OU1
(mg/L with 1/2 detection limit for non-detects)

MWR-01

Parameter	9/25/1998	5/6/1999	10/22/1999	4/20/2000	10/11/2000	5/9/2001	4/19/2002	4/24/2003	6/15/2004	7/7/2005	5/31/2006	5/30/2007	5/29/2008	5/27/2009	6/9/2010	6/16/2011	Detections
Arsenic	0.0104	0.0205	0.0112	0.005	0.005	0.005	0.005	0.005	0.0126	0.005	0.004	0.004	0.005	0.0036	0.0049	0.0062 J	6
Chromium	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.0015	0.0085 J	0.0075 J	0.0121 J	3

MWR-02

Parameter	9/25/1998	5/7/1999	10/21/1999	4/20/2000	10/12/2000	5/9/2001	4/19/2002	4/24/2003	6/17/2004	7/12/2005	6/2/2006	6/4/2007	5/30/2008	5/28/2009	6/10/2010	6/16/2011	Detections
Arsenic	0.0765	0.0447	0.0681	0.0697	0.0557	0.0496	0.0562	0.0579	0.0532	0.0025	0.0501	0.0491	0.0524	0.058	0.045	0.0283	15

MWR-03

Parameter	9/24/1998	5/6/1999	10/21/1999	4/20/2000	10/11/2000	5/8/2001	4/18/2002	4/24/2003	6/17/2004	7/12/2005	6/1/2006	6/4/2007	5/29/2008	5/28/2009	6/10/2010	6/15/2011	Detections
Arsenic	0.0203	0.005	0.0128	0.005	0.0129	0.005	0.005	0.005	0.0124	0.01	0.004	0.004	0.0128 J	0.0036	0.0098	0.0537	7

MWR-04

Parameter	9/24/1998	5/6/1999	10/21/1999	4/20/2000	10/11/2000	5/7/2001	4/18/2002	4/23/2003	6/16/2004	7/11/2005	6/1/2006	6/1/2007	5/29/2008	5/28/2009	6/10/2010	6/15/2011	Detections
Chromium	0.005	0.005	0.005	0.005	0.005	0.005	0.225	0.005	0.005	0.005	0.005	0.0697	0.0287	0.0017	0.0494	0.0559	5

MWR-05

Parameter	9/24/1998	5/6/1999	10/21/1999	4/20/2000	10/11/2000	5/7/2001	4/18/2002	4/23/2003	6/16/2004	7/11/2005	6/1/2006	6/1/2007	5/29/2008	5/28/2009	6/10/2010	6/15/2011	Detections
Chromium	0.0508	0.0567	0.0414	0.0114	0.005	0.0303	0.14	0.0348	0.0247	0.005	0.0197	0.0613	0.094	0.0378	0.0801	0.892	14

MWR-06

Parameter	9/24/1998	5/6/1999	10/21/1999	4/19/2000	10/11/2000	5/8/2001	4/18/2002	4/23/2003	6/16/2004	7/11/2005	6/1/2006	5/31/2007	5/29/2008	5/27/2009	6/9/2010	6/15/2011	Detections
Chromium	0.005	0.005	0.005	0.005	0.005	0.005	0.0594	0.005	0.005	0.005	0.005	0.005	0.0015	0.0017	0.004 J	0.006 J	3

MWR-08

Parameter	9/24/1998	5/6/1999	10/22/1999	4/20/2000	10/12/2000	5/1/2001	4/17/2002	4/22/2003	6/15/2004	7/7/2005	5/31/2006	5/30/2007	5/28/2008	5/27/2009	6/8/2010	6/13/2011	Detections
Arsenic	0.0257	0.005	0.0107	0.0106	0.0167	0.005	0.005	0.006	0.0086	0.0025	0.004	0.015	0.0051	0.0036	0.0098	0.00255	6

MWR-09

Parameter	10/13/1998	5/5/1999	10/20/1999	4/19/2000	10/10/2000	5/1/2001	4/17/2002	4/22/2003	6/15/2004	7/6/2005	5/31/2006	5/31/2007	5/28/2008	5/26/2009	6/9/2010	6/13/2011	Detections
Arsenic	0.0432	0.0146	0.0261	0.0184	0.0278	0.0112	0.0123	0.0238	0.0025	0.016	0.0202	0.004	0.0162 J	0.0174 J	0.0534	0.00255	12

MWR-10

Parameter	10/13/1998	5/5/1999	10/20/1999	4/19/2000	10/10/2000	5/1/2001	4/17/2002	4/22/2003	6/15/2004	7/6/2005	5/31/2006	5/31/2007	5/28/2008	5/26/2009	6/8/2010	6/14/2011	Detections
Arsenic	0.0426	0.0319	0.035	0.0304	0.0359	0.0448	0.0586	0.0437	0.045	0.0475	0.0373	0.0371	0.0381	0.0311	0.0534	0.0587	16

MWR-11

Parameter	10/13/1998	5/5/1999	10/20/1999	4/19/2000	10/10/2000	5/8/2001	4/17/2002	4/22/2003	6/17/2004	7/7/2005	5/31/2006	5/30/2007	5/28/2008	5/26/2009	6/8/2010	6/14/2011	Detections
Chromium	0.19	0.174	0.0902	0.0378	0.0998	0.0597	0.836	0.122	0.193	0.604	0.21	0.24	0.309	0.282	0.23	0.553	16

Table 7C

Statistical Analysis of Groundwater Data 1998-2011
Former Sinclair Refinery Site OU1
(mg/L with 1/2 detection limit for non-detects)

MWR-01 Arsenic

COMPUTATIONS: Compute Statistic (S).

Date	09/25/98	05/06/99	10/22/99	04/20/00	10/11/00	05/09/01	04/19/02	04/24/03	06/15/04	07/07/05	05/31/06	05/30/07	05/29/08	05/27/09	06/09/10	06/16/11		
Event	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**		
Result	**0.0104**	**0.0205**	**0.0112**	**0.005**	**0.005**	**0.005**	**0.005**	**0.005**	**0.0126**	**0.005**	**0.004**	**0.004**	**0.005**	**0.0036**	**0.0098**	**0.0062**	**Count "+"**	**Count "-"**
0.0104	0	+	+	-	-	-	-	-	+	-	-	-	-	-	-	-	3	12
0.0205		0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	14
0.0112			0	-	-	-	-	-	+	-	-	-	-	-	-	-	1	12
0.005				0	0	0	0	0	+	0	-	-	0	-	+	+	3	3
0.005					0	0	0	0	+	0	-	-	0	-	+	+	3	3
0.005						0	0	0	+	0	-	-	0	-	+	+	3	3
0.005							0	0	+	0	-	-	0	-	+	+	3	3
0.005								0	+	0	-	-	0	-	+	+	3	3
0.0126									0	-	-	-	-	-	-	-	0	7
0.005										0	-	-	0	-	+	+	2	3
0.004											0	0	+	-	+	+	3	1
0.004												0	+	-	+	+	3	1
0.005													0	-	+	+	2	1
0.0036														0	+	+	1	0
0.0098															0	-	0	0
																	30	66
																	Total "+"	Total "-"

S = Total Number of "+" minus Total Number of "-" = -36

STEP 1. Null Hypothesis: H_0: There is no trend.

STEP 2. Alternative Hypothesis: H_A: There is a downward trend.

STEP 3. Test Statistics:

$z_o = S - sign(S) / V(S)^{0.5}$ Where: sign(S) = 1 if S > 0, 0 if S = 0, and -1 if S < 0

and $V(S) = 1/18\{n(n-1)(2n+5) - [t_1(t_1-1)(2t_1+5)+[t_2(t_2-1)(2t_2+5)+\ldots \text{ up to } t_g]\}$

Where: n (number of samples) = 16

t_1 = number of tied samples in the first group = 7

t_2 = number of tied samples in second group = 2

g = the number of tied sample groups

V(S) = 448.00

z_o = -1.6536

STEP 4. a) Critical Value: From Table A-2, $z_{0.95}$ (critical value at 5% significance level) = 1.645

STEP 4. b) Probability Value: Using Table A-1, p-value = ($P(Z > z_o)$ = 0.04914

STEP 5. a) Conclusion: For testing the hypothesis, H_0 (no trend) against H_A - reject H_0 if absolute value of z_o is > $z_{0.95}$

Since absolute value z_o = 1.6536 > 1.645

we reject the null hypothesis of no trend

STEP 5. b) Conclusion: For testing the hypothesis, H0 (no trend) against HA - reject H0 if p-value is less than significance level = 0.05.

Since p-value = 0.04914 < 0.05

we reject the null hypothesis of no trend

Therefore: **We reject the null hypothesis of no trend in favor of the alternative hypothesis (i.e. evidence of a downward trend).**

Reference: *USEPA Data Quality Assessment: Statistical Methods for Practitioner EPA QA/G-9S,* dated February 2006

Table 7C

Statistical Analysis of Groundwater Data 1998-2011
Former Sinclair Refinery Site OU1
(mg/L with 1/2 detection limit for non-detects)

MWR-01 Chromium

COMPUTATIONS: Compute Statistic (S).

Date	09/25/98	05/06/99	10/22/99	04/20/00	10/11/00	05/09/01	04/19/02	04/24/03	06/15/04	07/07/05	05/31/06	05/30/07	05/29/08	05/27/09	06/09/10	06/16/11		
Event	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**		
Result	**0.005**	**0.005**	**0.005**	**0.005**	**0.005**	**0.005**	**0.005**	**0.005**	**0.0126**	**0.005**	**0.004**	**0.004**	**0.0015**	**0.0085**	**0.0075**	**0.0121**	**Count "+"**	**Count "-"**
0.005	0	0	0	0	0	0	0	0	+	0	-	-	-	+	+	+	4	3
0.005		0	0	0	0	0	0	0	+	0	-	-	-	+	+	+	4	3
0.005			0	0	0	0	0	0	+	0	-	-	-	+	+	+	4	3
0.005				0	0	0	0	0	+	0	-	-	-	+	+	+	4	3
0.005					0	0	0	0	+	0	-	-	-	+	+	+	4	3
0.005						0	0	0	+	0	-	-	-	+	+	+	4	3
0.005							0	0	+	0	-	-	-	+	+	+	4	3
0.005								0	+	0	-	-	-	+	+	+	4	3
0.0126									0	-	-	-	-	-	-	-	0	7
0.005										0	-	-	-	+	+	+	3	3
0.004											0	0	-	+	+	+	3	1
0.004												0	-	+	+	+	3	1
0.0015													0	+	+	+	3	0
0.0085														0	-	+	0	1
0.0075															0	+	0	0
																	44	37
																	Total "+"	Total "-"

S = Total Number of "+" minus Total Number of "-" = 7

STEP 1. Null Hypothesis: H_0: There is no trend.

STEP 2. Alternative Hypothesis: H_A: There is an upward trend.

STEP 3. Test Statistics:

z_o = S - sign(S) / V(S)^0.5 Where: sign(S) = 1 if S > 0, 0 if S = 0, and -1 if S < 0

and V(S) = 1/18{n(n-1)(2n+5) - [$t_1(t_1-1)(2t_1+5)$+[$t_2(t_2-1)(2t_2+5)$+… up to t_g]}

Where: n (number of samples) = 16

t_1 = number of tied samples in the first group = 9

t_2 = number of tied samples in second group = 2

g = the number of tied sample groups

V(S) = 400.33

z_o = 0.2999

STEP 4. a) Critical Value: From Table A-2, $z_{0.95}$ (critical value at 5% significance level) = 1.645

STEP 4. b) Probability Value: Using Table A-1, p-value = ($P(Z > z_o)$) = 0.617862

STEP 5. a) Conclusion: For testing the hypothesis, H_0 (no trend) against H_A - reject H_0 if absolute value of z_o is > $z_{0.95}$

Since absolute value z_o = 0.2999 < 1.645

we fail to reject the null hypothesis of no trend

STEP 5. b) Conclusion: For testing the hypothesis, H0 (no trend) against HA - reject H0 if p-value is less than significance level = 0.05.

Since p-value = 0.617862 > 0.05

we fail to reject the null hypothesis of no trend

Therefore:

We fail to reject the null hypothesis of no trend at the 5% significance level (i.e. there is evidence of an upward trend but not enough to over rule no trend).

Reference: *USEPA Data Quality Assessment: Statistical Methods for Practitioner EPA QA/G-9S,* dated February 2006

Table 7C

Statistical Analysis of Groundwater Data 1998-2011
Former Sinclair Refinery Site OU1
(mg/L with 1/2 detection limit for non-detects)

MWR-02 Arsenic

COMPUTATIONS: Compute Statistic (S).

Date	09/25/98	05/07/99	10/21/99	04/20/00	10/12/00	05/09/01	04/19/02	04/24/03	06/17/04	07/12/05	06/02/06	06/04/07	05/30/08	05/28/09	06/10/10	06/16/11		
Event	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**		
Result	**0.0765**	**0.0447**	**0.0681**	**0.0697**	**0.0557**	**0.0496**	**0.0562**	**0.0579**	**0.0532**	**0.0025**	**0.0501**	**0.0491**	**0.0524**	**0.058**	**0.045**	**0.0283**	**Count "+"**	**Count "-"**
0.0765	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	15
0.0447		0	+	+	+	+	+	+	+	-	+	+	+	+	+	-	12	2
0.0681			0	+	-	-	-	-	-	-	-	-	-	-	-	-	1	12
0.0697				0	-	-	-	-	-	-	-	-	-	-	-	-	0	12
0.0557					0	-	+	+	-	-	-	-	-	+	-	-	3	8
0.0496						0	+	+	+	-	+	-	+	+	-	-	6	4
0.0562							0	+	-	-	-	-	-	+	-	-	2	7
0.0579								0	-	-	-	-	-	+	-	-	1	7
0.0532									0	-	-	-	-	+	-	-	1	6
0.0025										0	+	+	+	+	+	+	6	0
0.0501											0	-	+	+	-	-	2	3
0.0491												0	+	+	-	-	2	2
0.0524													0	+	-	-	1	2
0.058														0	-	-	0	2
0.045															0	-	0	1
																	37	82
																	Total "+"	Total "-"

S = Total Number of "+" minus Total Number of "-" = **-45**

STEP 1. Null Hypothesis: H_0: There is no trend.

STEP 2. Alternative Hypothesis: H_A: There is a downward trend.

STEP 3. Test Statistics:

z_o = S - sign(S) / V(S)^0.5 Where: sign(S) = 1 if S > 0, 0 if S = 0, and -1 if S < 0

and V(S) = 1/18{n(n-1)(2n+5) - [$t_1(t_1-1)(2t_1+5)$+[$t_2(t_2-1)(2t_2+5)$+… up to t_g]}

Where: n (number of samples) = 16

t_1 = number of tied samples in the first group = 0

t_2 = number of tied samples in second group = 0

g = the number of tied sample groups

V(S) = 493.33

z_o = -1.9810

STEP 4. a) Critical Value: From Table A-2, $z_{0.95}$ (critical value at 5% significance level) = 1.645

STEP 4. b) Probability Value: Using Table A-1, p-value = ($P(Z > z_o)$ = 0.02384

STEP 5. a) Conclusion: For testing the hypothesis, H_0 (no trend) against H_A - reject H_0 if absolute value of z_o is > $z_{0.95}$

Since absolute value z_o = 1.9810 > 1.645

we reject the null hypothesis of no trend

STEP 5. b) Conclusion: For testing the hypothesis, H0 (no trend) against HA - reject H0 if p-value is less than significance level = 0.05.

Since p-value = 0.02384 < 0.05

we reject the null hypothesis of no trend

Therefore: **We reject the null hypothesis of no trend in favor of the alternative hypothesis (i.e. evidence of downward trend).**

Reference: *USEPA Data Quality Assessment: Statistical Methods for Practitioner EPA QA/G-9S,* dated February 2006

Table 7C

Statistical Analysis of Groundwater Data 1998-2011
Former Sinclair Refinery Site OU1
(mg/L with 1/2 detection limit for non-detects)

MWR-03 Arsenic

COMPUTATIONS: Compute Statistic (S).

Date	09/24/98	05/06/99	10/21/99	04/20/00	10/11/00	05/08/01	04/18/02	04/24/03	06/17/04	07/12/05	06/01/06	06/04/07	05/29/08	05/28/09	06/10/10	06/10/10		
Event	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**		
Result	**0.0203**	**0.005**	**0.0128**	**0.005**	**0.0129**	**0.005**	**0.005**	**0.005**	**0.0124**	**0.01**	**0.004**	**0.004**	**0.0128**	**0.0036**	**0.0098**	**0.0537**	**Count "+"**	**Count "-"**
0.0203	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	1	14
0.005		0	+	0	+	0	0	0	+	+	-	-	+	-	+	+	7	3
0.0128			0	-	+	-	-	-	-	-	-	-	0	-	-	+	2	10
0.005				0	+	0	0	0	+	+	-	-	+	-	+	+	6	3
0.0129					0	-	-	-	-	-	-	-	-	-	-	+	1	10
0.005						0	0	0	+	+	-	-	+	-	+	+	5	3
0.005							0	0	+	+	-	-	+	-	+	+	5	3
0.005								0	+	+	-	-	+	-	+	+	5	3
0.0124									0	-	-	-	+	-	-	+	2	5
0.01										0	-	-	+	-	-	+	2	4
0.004											0	0	+	-	+	+	3	1
0.004												0	+	-	+	+	3	1
0.0128													0	-	-	+	1	2
0.0036														0	+	+	2	0
0.0098															0	+	1	0
																	45	62
																	Total "+"	Total "-"

S = Total Number of "+" minus Total Number of "-" = -17

STEP 1. Null Hypothesis: H_0: There is no trend.

STEP 2. Alternative Hypothesis: H_A: There is a downward trend.

STEP 3. Test Statistics:

$z_o = S - sign(S) / V(S)^{0.5}$ Where: sign(S) = 1 if S > 0, 0 if S = 0, and -1 if S < 0

and $V(S) = 1/18\{n(n-1)(2n+5) - [t_1(t_1-1)(2t_1+5)+[t_2(t_2-1)(2t_2+5)+\ldots$ up to $t_g]\}$

Where: n (number of samples) = 16

t_1 = number of tied samples in the first group = 5

t_2 = number of tied samples in second group = 2

t_3 = number of tied samples in third group = 2

g = the number of tied sample groups

V(S) = 474.67

z_o = -0.7344

STEP 4. a) Critical Value: From Table A-2, $z_{0.95}$ (critical value at 5% significance level) = 1.645

STEP 4. b) Probability Value: Using Table A-1, p-value = ($P(Z > z_o)$ = 0.231336

STEP 5. a) Conclusion: For testing the hypothesis, H_0 (no trend) against H_A - reject H_0 if absolute value of z_o is > $z_{0.95}$

Since absolute value z_o = 0.7344 < 1.645

we fail to reject the null hypothesis of no trend

STEP 5. b) Conclusion: For testing the hypothesis, H0 (no trend) against HA - reject H0 if p-value is less than significance level = 0.05.

Since p-value = 0.231336 > 0.05

we fail to reject the null hypothesis of no trend

Therefore:

We fail to reject the null hypothesis of no trend at the 5% significance level (i.e. there is evidence of a downward trend but not enough to over rule no trend).

Reference: *USEPA Data Quality Assessment: Statistical Methods for Practitioner EPA QA/G-9S,* dated February 2006

Table 7C

Statistical Analysis of Groundwater Data 1998-2011
Former Sinclair Refinery Site OU1
(mg/L with 1/2 detection limit for non-detects)

MWR-04 Chromium

COMPUTATIONS: Compute Statistic (S).

Date	09/24/98	05/06/99	10/21/99	04/20/00	10/11/00	05/07/01	04/18/02	04/23/03	06/16/04	07/11/05	06/01/06	06/01/07	05/29/08	05/28/09	06/10/10	06/15/11		
Event	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**		
Result	**0.005**	**0.005**	**0.005**	**0.005**	**0.005**	**0.005**	**0.225**	**0.005**	**0.005**	**0.005**	**0.005**	**0.0697**	**0.0287**	**0.0017**	**0.0494**	**0.0559**	**Count "+"**	**Count "-"**
0.005	0	0	0	0	0	0	+	0	0	0	0	+	+	-	+	+	5	1
0.005		0	0	0	0	0	+	0	0	0	0	+	+	-	+	+	5	1
0.005			0	0	0	0	+	0	0	0	0	+	+	-	+	+	5	1
0.005				0	0	0	+	0	0	0	0	+	+	-	+	+	5	1
0.005					0	0	+	0	0	0	0	+	+	-	+	+	5	1
0.005						0	+	0	0	0	0	+	+	-	+	+	5	1
0.225							0	-	-	-	-	-	-	-	-	-	0	9
0.005								0	0	0	0	+	+	-	+	+	4	1
0.005									0	0	0	+	+	-	+	+	4	1
0.005										0	0	+	+	-	+	+	4	1
0.005											0	+	+	-	+	+	4	1
0.0697												0	-	-	-	-	0	4
0.0287													0	-	+	+	2	1
0.0017														0	+	+	2	0
0.0494															0	+	1	0
																	50	24
																	Total "+"	Total "-"

S = Total Number of "+" minus Total Number of "-" = **26**

STEP 1. Null Hypothesis: H_0: There is no trend.

STEP 2. Alternative Hypothesis: H_A: There is an upward trend.

STEP 3. Test Statistics:

$z_o = S - sign(S) / V(S)^{0.5}$ Where: sign(S) = 1 if S > 0, 0 if S = 0, and -1 if S < 0

and $V(S) = 1/18\{n(n-1)(2n+5) - [t_1(t_1-1)(2t_1+5)+[t_2(t_2-1)(2t_2+5)+\ldots$ up to $t_g]\}$

Where: n (number of samples) = 16

t_1 = number of tied samples in the first group = 10

t_2 = number of tied samples in second group = 0

g = the number of tied sample groups

V(S) = 368.33

z_o = 1.3026

STEP 4. a) Critical Value: From Table A-2, $z_{0.95}$ (critical value at 5% significance level) = 1.645

STEP 4. b) Probability Value: Using Table A-1, p-value = $(P(Z > z_o)$ = 0.903642

STEP 5. a) Conclusion: For testing the hypothesis, H_0 (no trend) against H_A - reject H_0 if absolute value of z_o is > $z_{0.95}$

Since absolute value z_o = 1.3026 < 1.645

we fail to reject the null hypothesis of no trend

STEP 5. b) Conclusion: For testing the hypothesis, H0 (no trend) against HA - reject H0 if p-value is less than significance level = 0.05.

Since p-value = 0.903642 > 0.05

we fail to reject the null hypothesis of no trend

Therefore:

We fail to reject the null hypothesis of no trend at the 5% significance level (i.e. there is evidence of a upward trend but not enough to over rule no trend)

Reference: *USEPA Data Quality Assessment: Statistical Methods for Practitioner EPA QA/G-9S,* dated February 2006

Table 7C

Statistical Analysis of Groundwater Data 1998-2011
Former Sinclair Refinery Site OU1
(mg/L with 1/2 detection limit for non-detects)

MWR-05 Chromium

COMPUTATIONS: Compute Statistic (S).

Date	09/24/98	05/06/99	10/21/99	04/20/00	10/11/00	05/07/01	04/18/02	04/23/03	06/16/04	07/11/05	06/01/06	06/01/07	05/29/08	05/28/09	06/10/10	06/15/11		
Event	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**		
Result	**0.0508**	**0.0567**	**0.0414**	**0.0114**	**0.005**	**0.0303**	**0.14**	**0.0348**	**0.0247**	**0.005**	**0.0197**	**0.0613**	**0.094**	**0.0378**	**0.0801**	**0.892**	**Count "+"**	**Count "-"**
0.0508	0	+	-	-	-	-	+	-	-	-	-	+	+	-	+	+	6	9
0.0567		0	-	-	-	-	+	-	-	-	-	+	+	-	+	+	5	9
0.0414			0	-	-	-	+	-	-	-	-	+	+	-	+	+	5	8
0.0114				0	-	+	+	+	+	-	+	+	+	+	+	+	10	2
0.005					0	+	+	+	+	0	+	+	+	+	+	+	10	0
0.0303						0	+	+	-	-	-	+	+	+	+	+	7	3
0.14							0	-	-	-	-	-	-	-	-	+	1	8
0.0348								0	-	-	-	+	+	+	+	+	5	3
0.0247									0	-	-	+	+	+	+	+	5	2
0.005										0	+	+	+	+	+	+	6	0
0.0197											0	+	+	+	+	+	5	0
0.0613												0	+	-	+	+	3	1
0.094													0	-	-	+	1	2
0.0378														0	+	+	2	0
0.0801															0	+	1	0
																	71	47
																	Total "+"	Total "-"

S = Total Number of "+" minus Total Number of "-" = 24

STEP 1. Null Hypothesis: H_0: There is no trend.

STEP 2. Alternative Hypothesis: H_A: There is an upward trend.

STEP 3. Test Statistics:

z_o = S - sign(S) / V(S)^0.5 Where: sign(S) = 1 if S > 0, 0 if S = 0, and -1 if S < 0

and V(S) = 1/18{n(n-1)(2n+5) - [$t_1(t_1-1)(2t_1+5)$+[$t_2(t_2-1)(2t_2+5)$+… up to t_g]}

Where: n (number of samples) = 16

t_1 = number of tied samples in the first group = 2

t_2 = number of tied samples in second group = 0

g = the number of tied sample groups

V(S) = 492.33

z_o = 1.0366

STEP 4. a) Critical Value: From Table A-2, $z_{0.95}$ (critical value at 5% significance level) = 1.645

STEP 4. b) Probability Value: Using Table A-1, p-value = (P(Z > z_o) = 0.850018

STEP 5. a) Conclusion: For testing the hypothesis, H_0 (no trend) against H_A - reject H_0 if absolute value of z_o is > $z_{0.95}$

Since absolute value z_o = 1.0366 < 1.645

we fail to reject the null hypothesis of no trend

STEP 5. b) Conclusion: For testing the hypothesis, H0 (no trend) against HA - reject H0 if p-value is less than significance level = 0.05.

Since p-value = 0.850018 > 0.05

we fail to reject the null hypothesis of no trend

Therefore:

We fail to reject the null hypothesis of no trend at the 5% significance level (i.e. there is evidence of a upward trend but not enough to over rule no trend)

Reference: *USEPA Data Quality Assessment: Statistical Methods for Practitioner EPA QA/G-9S,* dated February 2006

Table 7C

Statistical Analysis of Groundwater Data 1998-2011
Former Sinclair Refinery Site OU1
(mg/L with 1/2 detection limit for non-detects)

MWR-06 Chromium

COMPUTATIONS: Compute Statistic (S).

Date	09/24/98	05/06/99	10/21/99	04/19/00	10/11/00	05/08/01	04/18/02	04/23/03	06/16/04	07/11/05	06/01/06	05/31/07	05/29/08	05/27/09	06/09/10	06/15/11		
Event	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
Result	0.005	0.005	0.005	0.005	0.005	0.005	0.0594	0.005	0.005	0.005	0.005	0.005	0.0015	0.0017	0.004	0.006	Count "+"	Count "-"
0.005	0	0	0	0	0	0	+	0	0	0	0	0	-	-	-	+	2	3
0.005		0	0	0	0	0	+	0	0	0	0	0	-	-	-	+	2	3
0.005			0	0	0	0	+	0	0	0	0	0	-	-	-	+	2	3
0.005				0	0	0	+	0	0	0	0	0	-	-	-	+	2	3
0.005					0	0	+	0	0	0	0	0	-	-	-	+	2	3
0.005						0	+	0	0	0	0	0	-	-	-	+	2	3
0.0594							0	-	-	-	-	-	-	-	-	-	0	9
0.005								0	0	0	0	0	-	-	-	+	1	3
0.005									0	0	0	0	-	-	-	+	1	3
0.005										0	0	0	-	-	-	+	1	3
0.005											0	0	-	-	-	+	1	3
0.005												0	-	-	-	+	1	3
0.0015													0	+	+	+	3	0
0.0017														0	+	+	2	0
0.004															0	+	1	0
																	22	42
																	Total "+"	Total "-"

S = Total Number of "+" minus Total Number of "-" = -20

STEP 1. Null Hypothesis: H_0: There is no trend.

STEP 2. Alternative Hypothesis: H_A: There is a downward trend.

STEP 3. Test Statistics:

z_o = S - sign(S) / V(S)^0.5 Where: sign(S) = 1 if S > 0, 0 if S = 0, and -1 if S < 0

and V(S) = 1/18{n(n-1)(2n+5) - [$t_1(t_1-1)(2t_1+5)$+[$t_2(t_2-1)(2t_2+5)$+… up to t_g]}

Where: n (number of samples) = 16

t_1 = number of tied samples in the first group = 11

t_2 = number of tied samples in second group = 0

g = the number of tied sample groups

V(S) = 328.33

z_o = -1.0486

STEP 4. a) Critical Value: From Table A-2, $z_{0.95}$ (critical value at 5% significance level) = 1.645

STEP 4. b) Probability Value: Using Table A-1, p-value = ($P(Z > z_o)$ = 0.147222

STEP 5. a) Conclusion: For testing the hypothesis, H_0 (no trend) against H_A - reject H_0 if absolute value of z_o is > $z_{0.95}$

Since absolute value z_o = 1.0486 < 1.645

we fail to reject the null hypothesis of no trend

STEP 5. b) Conclusion: For testing the hypothesis, H0 (no trend) against HA - reject H0 if p-value is less than significance level = 0.05.

Since p-value = 0.147222 > 0.05

we fail to reject the null hypothesis of no trend

Therefore:

We fail to reject the null hypothesis of no trend at the 5% significance level (i.e. there is evidence of a downward trend but not enough to over rule no trend)

Reference: *USEPA Data Quality Assessment: Statistical Methods for Practitioner EPA QA/G-9S,* dated February 2006

Table 7C

Statistical Analysis of Groundwater Data 1998-2011
Former Sinclair Refinery Site OU1
(mg/L with 1/2 detection limit for non-detects)

MWR-08 Arsenic

COMPUTATIONS: Compute Statistic (S).

Date	09/24/98	05/06/99	10/22/99	04/20/00	10/12/00	05/01/01	04/17/02	04/22/03	06/15/04	07/07/05	05/31/06	05/30/07	05/28/08	05/27/09	06/08/10	06/13/11		
Event	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**		
Result	**0.0257**	**0.005**	**0.0107**	**0.0106**	**0.0167**	**0.005**	**0.005**	**0.005**	**0.0086**	**0.0025**	**0.004**	**0.015**	**0.005**	**0.0036**	**0.0098**	**0.0025**	**Count "+"**	**Count "-"**
0.0257	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	15
0.005		0	+	+	+	0	0	0	+	-	-	+	0	-	+	-	6	4
0.0107			0	-	+	-	-	-	-	-	-	+	-	-	-	-	2	11
0.0106				0	+	-	-	-	-	-	-	+	-	-	-	-	2	10
0.0167					0	-	-	-	-	-	-	-	-	-	-	-	0	11
0.005						0	0	0	+	-	-	+	0	-	+	-	3	4
0.005							0	0	+	-	-	+	0	-	+	-	3	4
0.005								0	+	-	-	+	0	-	+	-	3	4
0.0086									0	-	-	+	-	-	+	-	2	5
0.0025										0	+	+	+	+	+	0	5	0
0.004											0	+	+	-	+	-	3	2
0.015												0	-	-	-	-	0	4
0.005													0	-	+	-	1	2
0.0036														0	+	-	1	1
0.0098															0	-	0	1
																	31	77
																	Total "+"	Total "-"

S = Total Number of "+" minus Total Number of "-" = -46

STEP 1. Null Hypothesis: H_0: There is no trend.

STEP 2. Alternative Hypothesis: H_A: There is a downward trend.

STEP 3. Test Statistics:

$z_o = S - sign(S) / V(S)^{0.5}$ Where: sign(S) = 1 if S > 0, 0 if S = 0, and -1 if S < 0

and $V(S) = 1/18\{n(n-1)(2n+5) - [t_1(t_1-1)(2t_1+5)+[t_2(t_2-1)(2t_2+5)+\ldots$ up to $t_g]\}$

Where: n (number of samples) = 16

t_1 = number of tied samples in the first group = 5

t_2 = number of tied samples in second group = 0

g = the number of tied sample groups

V(S) = 476.67

z_o = -2.0611

STEP 4. a) Critical Value: From Table A-2, $z_{0.95}$ (critical value at 5% significance level) = 1.645

STEP 4. b) Probability Value: Using Table A-1, p-value = $(P(Z > z_o)$ = 0.019645

STEP 5. a) Conclusion: For testing the hypothesis, H_0 (no trend) against H_A - reject H_0 if absolute value of z_o is > $z_{0.95}$

Since absolute value z_o = 2.0611 > 1.645

we reject the null hypothesis of no trend

STEP 5. b) Conclusion: For testing the hypothesis, H0 (no trend) against HA - reject H0 if p-value is less than significance level = 0.05.

Since p-value = 0.019645 < 0.05

we reject the null hypothesis of no trend

Therefore: **We reject the null hypothesis of no trend in favor of the alternative hypothesis (i.e. evidence of downward trend).**

Reference: *USEPA Data Quality Assessment: Statistical Methods for Practitioner EPA QA/G-9S,* dated February 2006

Table 7C

Statistical Analysis of Groundwater Data 1998-2011
Former Sinclair Refinery Site OU1
(mg/L with 1/2 detection limit for non-detects)

MWR-09 Arsenic

COMPUTATIONS: Compute Statistic (S).

Date	10/13/98	05/05/99	10/20/99	04/19/00	10/10/00	05/01/01	04/17/02	04/22/03	06/15/04	07/06/05	05/31/06	05/31/07	05/28/08	05/26/09	06/09/10	06/13/11		
Event	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**		
Result	**0.0432**	**0.0146**	**0.0261**	**0.0184**	**0.0278**	**0.0112**	**0.0123**	**0.0238**	**0.0025**	**0.016**	**0.0202**	**0.004**	**0.0162**	**0.0174**	**0.0534**	**0.0025**	**Count "+"**	**Count "-"**
0.0432	0	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	1	14
0.0146		0	+	+	+	-	-	+	-	+	+	-	+	+	+	-	9	5
0.0261			0	-	+	-	-	-	-	-	-	-	-	-	+	-	2	11
0.0184				0	+	-	-	+	-	-	+	-	-	-	+	-	4	8
0.0278					0	-	-	-	-	-	-	-	-	-	+	-	1	10
0.0112						0	+	+	-	+	+	-	+	+	+	-	7	3
0.0123							0	+	-	+	+	-	+	+	+	-	6	3
0.0238								0	-	-	-	-	-	-	+	-	1	7
0.0025									0	+	+	+	+	+	+	0	6	0
0.016										0	+	-	+	+	+	-	4	2
0.0202											0	-	-	-	+	-	1	4
0.004												0	+	+	+	-	3	1
0.0162													0	+	+	-	2	1
0.0174														0	+	-	1	1
0.0534															0	-	0	1
																	48	70
																	Total "+"	Total "-"

S = Total Number of "+" minus Total Number of "-" = -22

STEP 1. Null Hypothesis: H_0: There is no trend.

STEP 2. Alternative Hypothesis: H_A: There is a downward trend.

STEP 3. Test Statistics:

z_o = S - sign(S) / V(S)^0.5 Where: sign(S) = 1 if S > 0, 0 if S = 0, and -1 if S < 0

and V(S) = 1/18{n(n-1)(2n+5) - [$t_1(t_1-1)(2t_1+5)$+[$t_2(t_2-1)(2t_2+5)$+… up to t_g]}

Where: n (number of samples) = 16

t_1 = number of tied samples in the first group = 0

t_2 = number of tied samples in second group = 0

g = the number of tied sample groups

V(S) = 493.33

z_o = -0.9455

STEP 4. a) Critical Value: From Table A-2, $z_{0.95}$ (critical value at 5% significance level) = 1.645

STEP 4. b) Probability Value: Using Table A-1, p-value = ($P(Z > z_o)$ = 0.172225

STEP 5. a) Conclusion: For testing the hypothesis, H_0 (no trend) against H_A - reject H_0 if absolute value of z_o is > $z_{0.95}$

Since absolute value z_o = 0.9455 < 1.645

we fail to reject the null hypothesis of no trend

STEP 5. b) Conclusion: For testing the hypothesis, H0 (no trend) against HA - reject H0 if p-value is less than significance level = 0.05.

Since p-value = 0.172225 > 0.05

we fail to reject the null hypothesis of no trend

Therefore:

We fail to reject the null hypothesis of no trend at the 5% significance level (i.e. there is evidence of a downward trend but not enough to over rule no trend)

Reference: *USEPA Data Quality Assessment: Statistical Methods for Practitioner EPA QA/G-9S,* dated February 2006

Table 7C

Statistical Analysis of Groundwater Data 1998-2011
Former Sinclair Refinery Site OU1
(mg/L with 1/2 detection limit for non-detects)

MWR-10 Arsenic

COMPUTATIONS: Compute Statistic (S).

Date	10/13/98	05/05/99	10/20/99	04/19/00	10/10/00	05/01/01	04/17/02	04/22/03	06/15/04	07/06/05	05/31/06	05/31/07	05/28/08	05/26/09	06/08/10	06/14/11		
Event	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**		
Result	**0.0426**	**0.0319**	**0.035**	**0.0304**	**0.0359**	**0.0448**	**0.0586**	**0.0437**	**0.045**	**0.0475**	**0.0373**	**0.0371**	**0.0381**	**0.0311**	**0.0534**	**0.0587**	**Count "+"**	**Count "-"**
0.0426	0	-	-	-	-	+	+	+	+	+	-	-	-	-	+	+	7	8
0.0319		0	+	-	+	+	+	+	+	+	+	+	+	-	+	+	12	2
0.035			0	-	+	+	+	+	+	+	+	+	+	-	+	+	11	2
0.0304				0	+	+	+	+	+	+	+	+	+	+	+	+	12	0
0.0359					0	+	+	+	+	+	+	+	+	-	+	+	10	1
0.0448						0	+	-	+	+	-	-	-	-	+	+	5	5
0.0586							0	-	-	-	-	-	-	-	-	+	1	8
0.0437								0	+	+	-	-	-	-	+	+	4	4
0.045									0	+	-	-	-	-	+	+	3	4
0.0475										0	-	-	-	-	+	+	2	4
0.0373											0	-	+	-	+	+	3	2
0.0371												0	+	-	+	+	3	1
0.0381													0	-	+	+	2	1
0.0311														0	+	+	2	0
0.0534															0	+	1	0
																	78	42
																	Total "+"	Total "-"

S = Total Number of "+" minus Total Number of "-" = **36**

STEP 1. Null Hypothesis: H_0: There is no trend.

STEP 2. Alternative Hypothesis: H_A: There is an upward trend.

STEP 3. Test Statistics:

$z_o = S - sign(S) / V(S)^{0.5}$ Where: sign(S) = 1 if S > 0, 0 if S = 0, and -1 if S < 0

and $V(S) = 1/18\{n(n-1)(2n+5) - [t_1(t_1-1)(2t_1+5)+[t_2(t_2-1)(2t_2+5)+\ldots \text{ up to } t_g]\}$

Where: n (number of samples) = 16

t_1 = number of tied samples in the first group = 0

t_2 = number of tied samples in second group = 0

g = the number of tied sample groups

V(S) = 493.33

z_o = 1.5758

STEP 4. a) Critical Value: From Table A-2, $z_{0.95}$ (critical value at 5% significance level) = 1.645

STEP 4. b) Probability Value: Using Table A-1, p-value = ($P(Z > z_o)$) = 0.942438

STEP 5. a) Conclusion: For testing the hypothesis, H_0 (no trend) against H_A - reject H_0 if absolute value of z_o is > $z_{0.95}$

Since absolute value z_o = 1.5758 < 1.645

we fail to reject the null hypothesis of no trend

STEP 5. b) Conclusion: For testing the hypothesis, H0 (no trend) against HA - reject H0 if p-value is less than significance level = 0.05.

Since p-value = 0.942438 > 0.05

we fail to reject the null hypothesis of no trend

Therefore:

We fail to reject the null hypothesis of no trend at the 5% significance level (i.e. there is evidence of an upward trend but not enough to over rule no trend)

Reference: *USEPA Data Quality Assessment: Statistical Methods for Practitioner EPA QA/G-9S,* dated February 2006

Table 7C

Statistical Analysis of Groundwater Data 1998-2011
Former Sinclair Refinery Site OU1
(mg/L with 1/2 detection limit for non-detects)

MWR-11 Chromium

COMPUTATIONS: Compute Statistic (S).

Date	10/13/98	05/05/99	10/20/99	04/19/00	10/10/00	05/08/01	04/17/02	04/22/03	06/17/04	07/07/05	05/31/06	05/30/07	05/28/08	05/26/09	06/08/10	06/14/11		
Event	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**		
Result	**0.19**	**0.174**	**0.0902**	**0.0378**	**0.0998**	**0.0597**	**0.836**	**0.122**	**0.193**	**0.604**	**0.21**	**0.24**	**0.309**	**0.282**	**0.23**	**0.553**	**Count "+"**	**Count "-"**
0.19	0	-	-	-	-	-	+	-	+	+	+	+	+	+	+	+	9	6
0.174		0	-	-	-	-	+	-	+	+	+	+	+	+	+	+	9	5
0.0902			0	-	+	-	+	+	+	+	+	+	+	+	+	+	11	2
0.0378				0	+	+	+	+	+	+	+	+	+	+	+	+	12	0
0.0998					0	-	+	+	+	+	+	+	+	+	+	+	10	1
0.0597						0	+	+	+	+	+	+	+	+	+	+	10	0
0.836							0	-	-	-	-	-	-	-	-	-	0	9
0.122								0	+	+	+	+	+	+	+	+	8	0
0.193									0	+	+	+	+	+	+	+	7	0
0.604										0	-	-	-	-	-	-	0	6
0.21											0	+	+	+	+	+	5	0
0.24												0	+	+	-	+	3	1
0.309													0	-	-	+	1	2
0.282														0	-	+	1	1
0.23															0	+	1	0
																	86	33
																	Total "+"	Total "-"

S = Total Number of "+" minus Total Number of "-" = 53

STEP 1. Null Hypothesis: H_0: There is no trend.

STEP 2. Alternative Hypothesis: H_A: There is an upward trend.

STEP 3. Test Statistics:

z_o = S - sign(S) / V(S)^0.5 Where: sign(S) = 1 if S > 0, 0 if S = 0, and -1 if S < 0

and V(S) = 1/18{n(n-1)(2n+5) - [$t_1(t_1-1)(2t_1+5)$+[$t_2(t_2-1)(2t_2+5)$+… up to t_g]}

Where: n (number of samples) = 16

t_1 = number of tied samples in the first group = 0

t_2 = number of tied samples in second group = 0

g = the number of tied sample groups

V(S) = 493.33

z_o = 2.3412

STEP 4. a) Critical Value: From Table A-2, $z_{0.95}$ (critical value at 5% significance level) = 1.645

STEP 4. b) Probability Value: Using Table A-1, p-value = ($P(Z > z_o)$ = 0.990424

STEP 5. a) Conclusion: For testing the hypothesis, H_0 (no trend) against H_A - reject H_0 if absolute value of z_o is > $z_{0.95}$

Since absolute value z_o = 2.3412 > 1.645

we reject the null hypothesis of no trend

STEP 5. b) Conclusion: For testing the hypothesis, H0 (no trend) against HA - reject H0 if p-value is less than significance level = 0.05.

Since p-value = 0.990424 > 0.05

we fail to reject the null hypothesis of no trend

Therefore:

We fail to reject the null hypothesis of no trend at the 5% significance level (i.e. there is evidence of an upward trend but not enough to over rule no trend)

Reference: *USEPA Data Quality Assessment: Statistical Methods for Practitioner EPA QA/G-9S,* dated February 2006

Table 8

2011 Groundwater Field Parameters
Former Sinclair Refinery Site OU-1
Wellsville, New York

Monitoring Well	Date	pH (s.u.)	Conductivity (us/cm)	Turbidity (NTU)	D.O. (mg/L)	Temp (°C)	ORP (mV)
MWR-1	16-Jun-11	6.44	423	12.2	0.99	13.76	86.4
MWR-2	16-Jun-11	6.56	721	5.06	0.98	11.77	-65.2
MWR-3	15-Jun-11	6.69	424	53.3	6.55	13.61	22.9
MWR-4	15-Jun-11	6.55	175	3.94	0.28	15.77	93.0
MWR-5	15-Jun-11	6.34	144	14.7	0.42	14.20	84.3
MWR-6	15-Jun-11	6.43	279	7.24	0.49	12.17	14.0
MWR-7	14-Jun-11	6.39	185	5.08	0.51	10.78	78.6
MWR-8	13-Jun-11	6.40	336	4.97	1.86	12.8	55.1
MWR-9	13-Jun-11	6.28	484	8.90	0.50	12.88	-8.9
MWR-10	14-Jun-11	6.41	449	45.6	1.76	10.75	-7.2
MWR-11	14-Jun-11	6.58	321	30.0	2.61	10.93	87.7

Note:
pH, Conductivity, Dissolved Oxygen (D.O.), Temperature and Oxygen Reduction Potential (ORP) are measured with a YSI 556 meter. Turbidity is measured with a YSI 2200P meter.

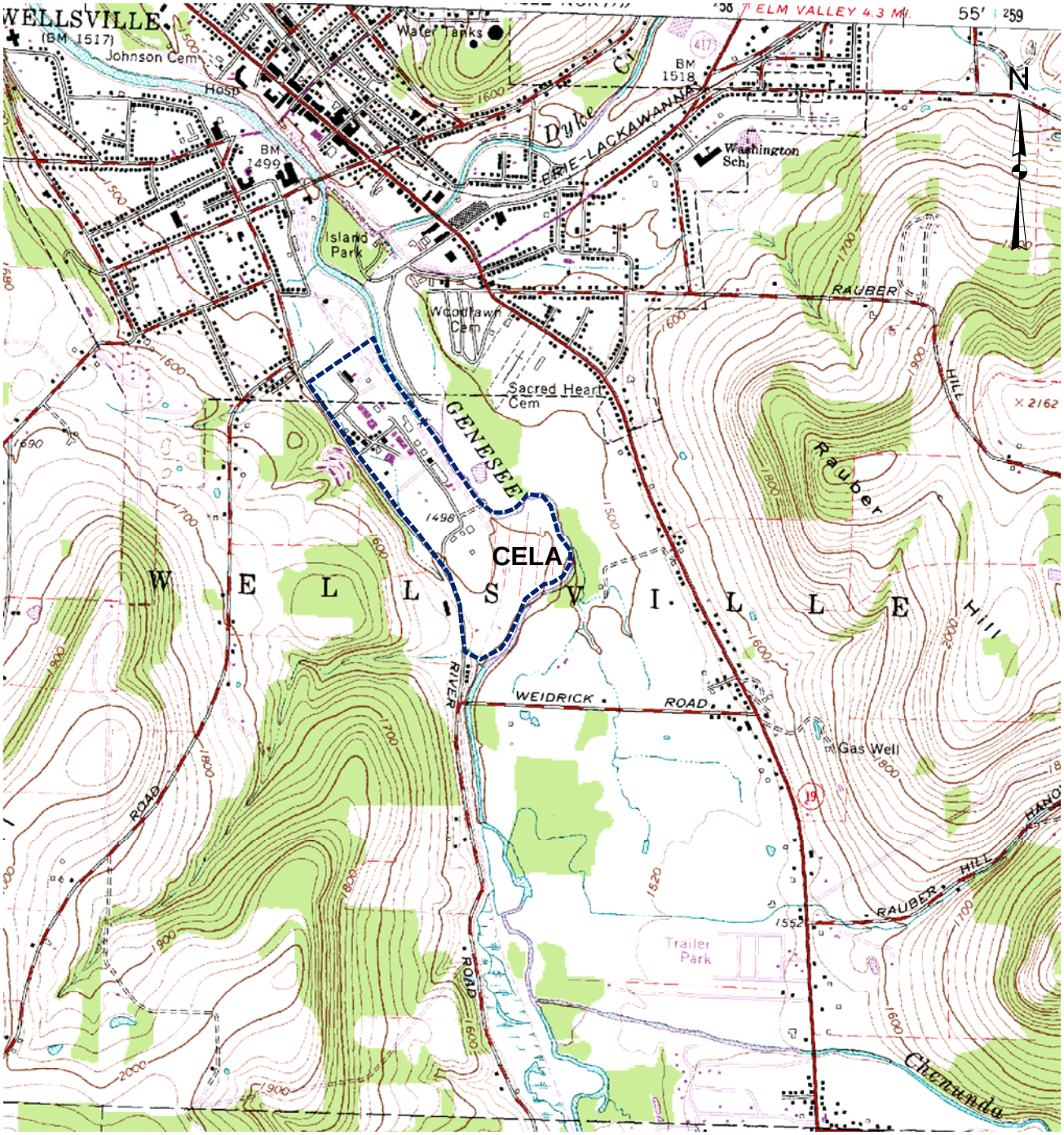
Table 9

2011 LNAPL Measurements and Removal
Former Sinclair Refinery Site OU-1
Wellsville, New York

Date	Depth to LNAPL (ft)	Depth to Water (ft)	Apparent LNAPL Thickness (ft)	Comment	Sock LNAPL Saturation (in)	Approximate LNAPL Removed (oz)
MWR-02						
6/13/2011	14.46	15.48	1.02	1 30" sock installed	NA	NA
6/14/2011	14.57	NM	NM	1 30" sock removed - 1/2 saturated	16	43
6/14/2011	NM	NM	NM	1 30" sock installed	NA	NA
6/15/2011	14.67	NM	NM	1 30" sock removed - 1/2 saturdated	17	46
6/15/2011	NM	NM	NM	1 30" sock installed	NA	NA
6/16/2011	14.74	15.46	0.72	1 30" sock removed - 1/2 saturated	16	43
				2011 Total LNAPL Removed (oz):		**132**

Notes:
The approximate quantities of LNAPL removed are based on the length of sock saturation and the manufacturers information indicates that one 3" x 30" sock absorbs 81 oz of NAPL. Every inch of absorbancy on sock = 2.7 oz of NAPL.
Ex: 4" of absorbancy on 30" sock (2.7oz x 4 in.) = 10.8 oz.
NM - Not measured
NA - Not applicable

SITE LOCATION



SOURCE: WELLSVILLE SOUTH, NY USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE, DATED 1965.

Legend

Approximate Site Boundary

2,000 1,000 0 2,000 Feet

1 inch = 2,000 feet

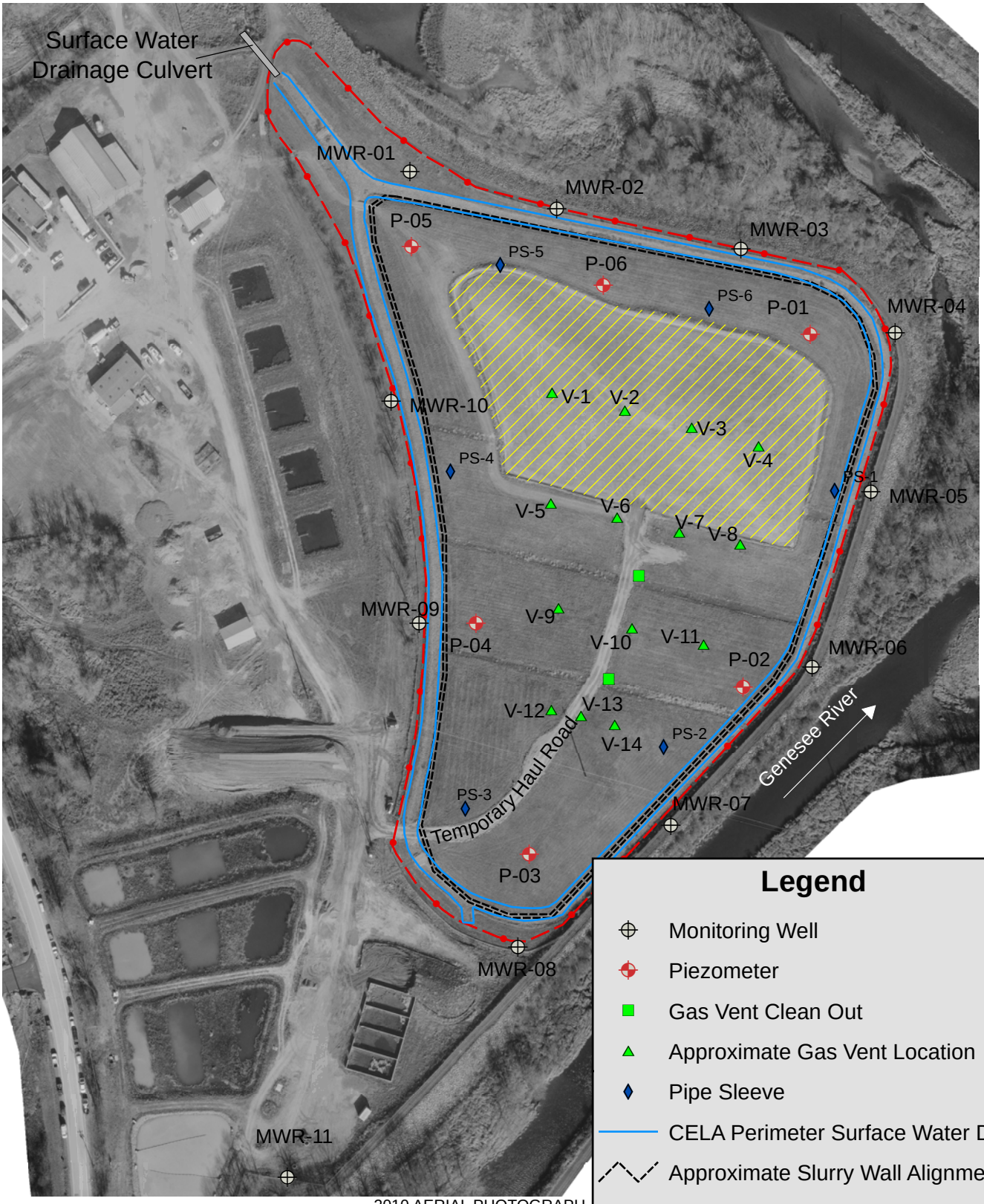
ON-SITE TECHNICAL SERVICES, INC.

72 Railroad Avenue Wellsville, NY 14895

FIGURE NO.	1a
PROJECT	WELLSVILLE OU-1
DOCUMENT NO.	2011 CELA REPORT
FILE NO.	SITELOC.MXD

N:\ARCO_WLSV\OU1REPORTS\2011CELAREPORT\FIGURES\SITELOC.MXD

Site Features Prior to 2011 Construction Activities



Legend

- Monitoring Well
- Piezometer
- Gas Vent Clean Out
- Approximate Gas Vent Location
- Pipe Sleeve
- CELA Perimeter Surface Water Drain
- Approximate Slurry Wall Alignment
- Perimeter Fence
- CELA Re-Use Area

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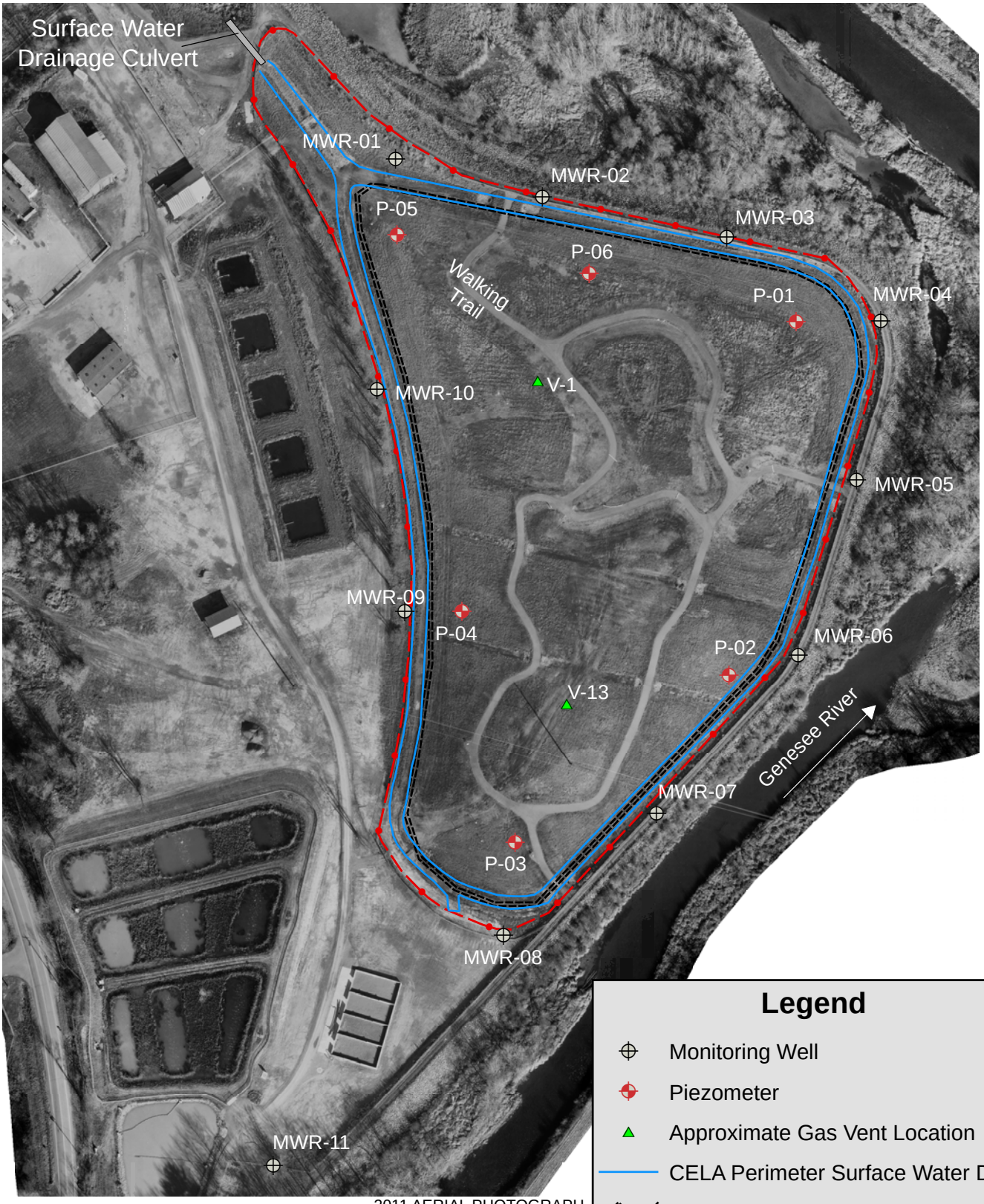
72 Railroad Avenue Wellsville, NY 14895

FIGURE NO.	1B
PROJECT	WELLSVILLE OU-1
DOCUMENT	2011 CELA REPORT
FILE NO.	SITEFEATURES.MXD

N:\ARCO_WLSV\OU1REPORTS\2011CELAREPORT\FIGURES\SITEFEATURES.MXD

Site Features Following 2011 Construction Activities



Legend

- Monitoring Well
- Piezometer
- Approximate Gas Vent Location
- CELA Perimeter Surface Water Drain
- Approximate Slurry Wall Alignment
- Perimeter Fence

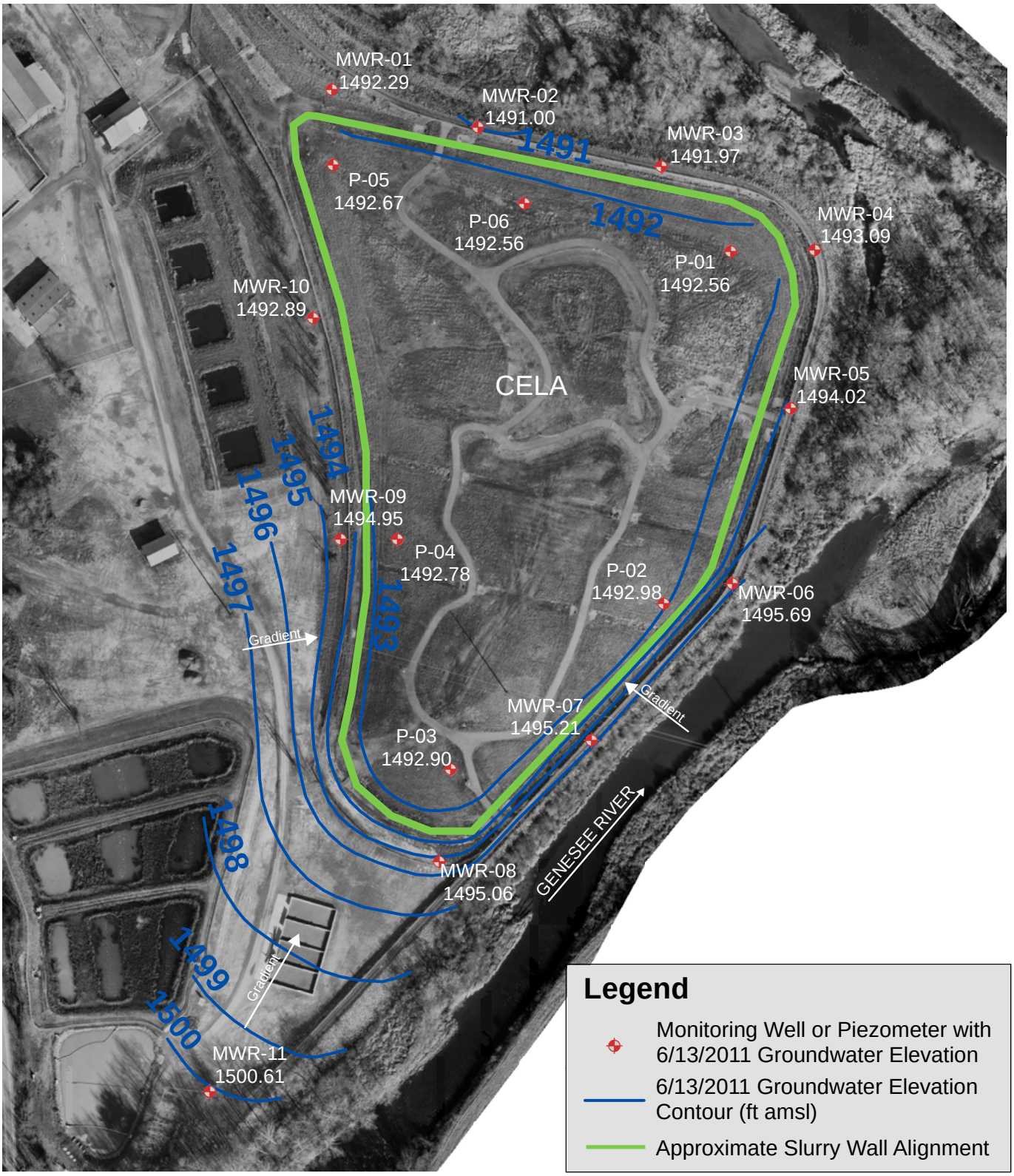
ON-SITE TECHNICAL SERVICES, INC.

72 Railroad Avenue Wellsville, NY 14895

FIGURE NO.	1C
PROJECT	WELLSVILLE OU-1
DOCUMENT	2011 CELA REPORT
FILE NO.	SITEFEATURES.MXD

N:\ARCO_WLSV\OU1REPORTS\2011CELAREPORT\FIGURES\SITEFEATURES.MXD

JUNE 13, 2011 WATER TABLE CONTOUR MAP



2011 AERIAL PHOTOGRAPH

ON-SITE TECHNICAL SERVICES, INC.

72 Railroad Avenue Wellsville, NY 14895

FIGURE NO.	2
PROJECT	WELLSVILLE OU-1
DOCUMENT	2011 CELA REPORT
FILE NO.	FIG2.MXD

N:\ARCO_WLSV\OU1 REPORTS\2011CELA REPORT\FIGURES\FIG2.MXD

JULY 13, 2011 WATER TABLE CONTOUR MAP

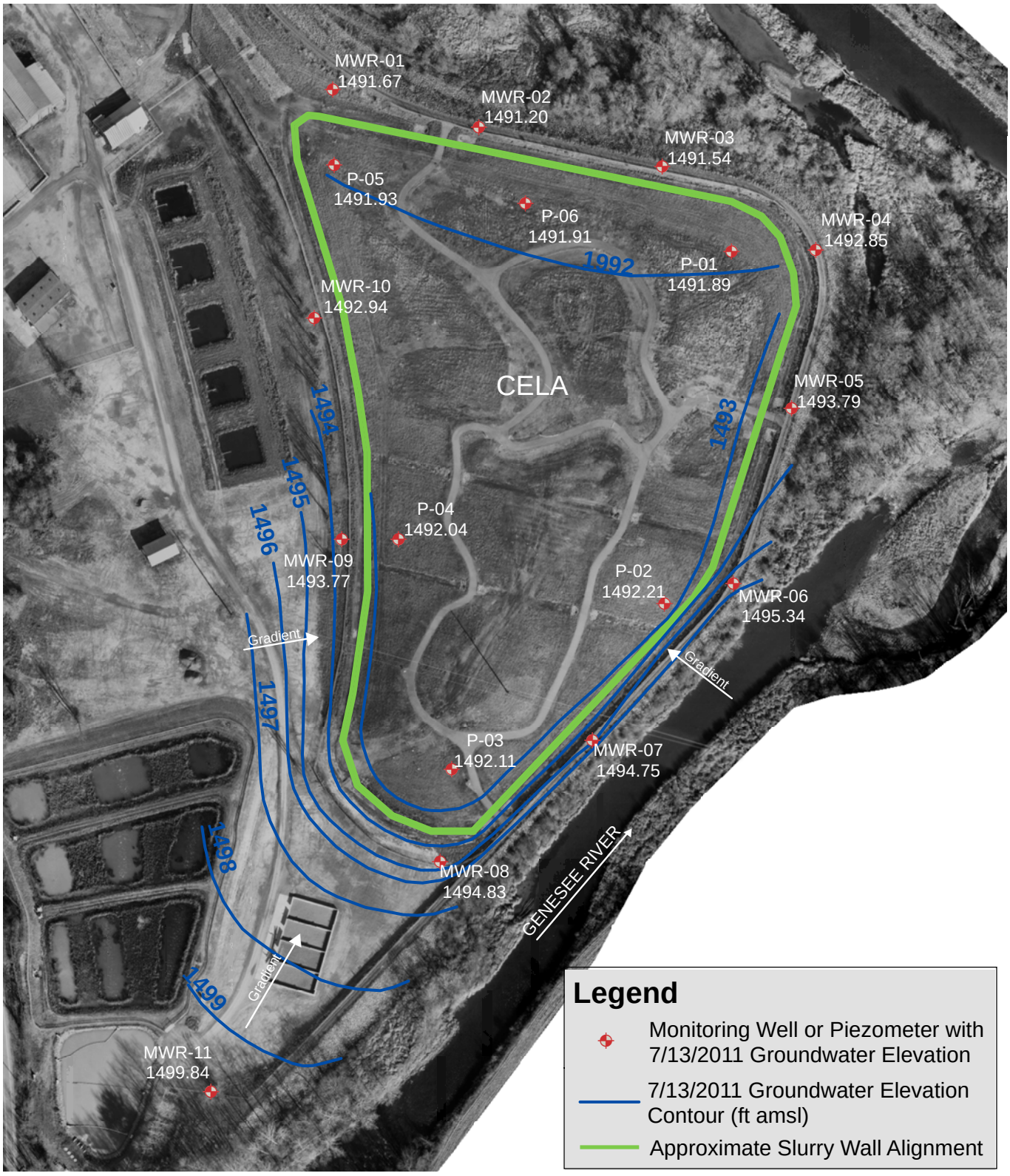


FIGURE NO.	3
PROJECT	WELLSVILLE OU-1
DOCUMENT	2011 CELA REPORT
FILE NO.	FIG3.MXD

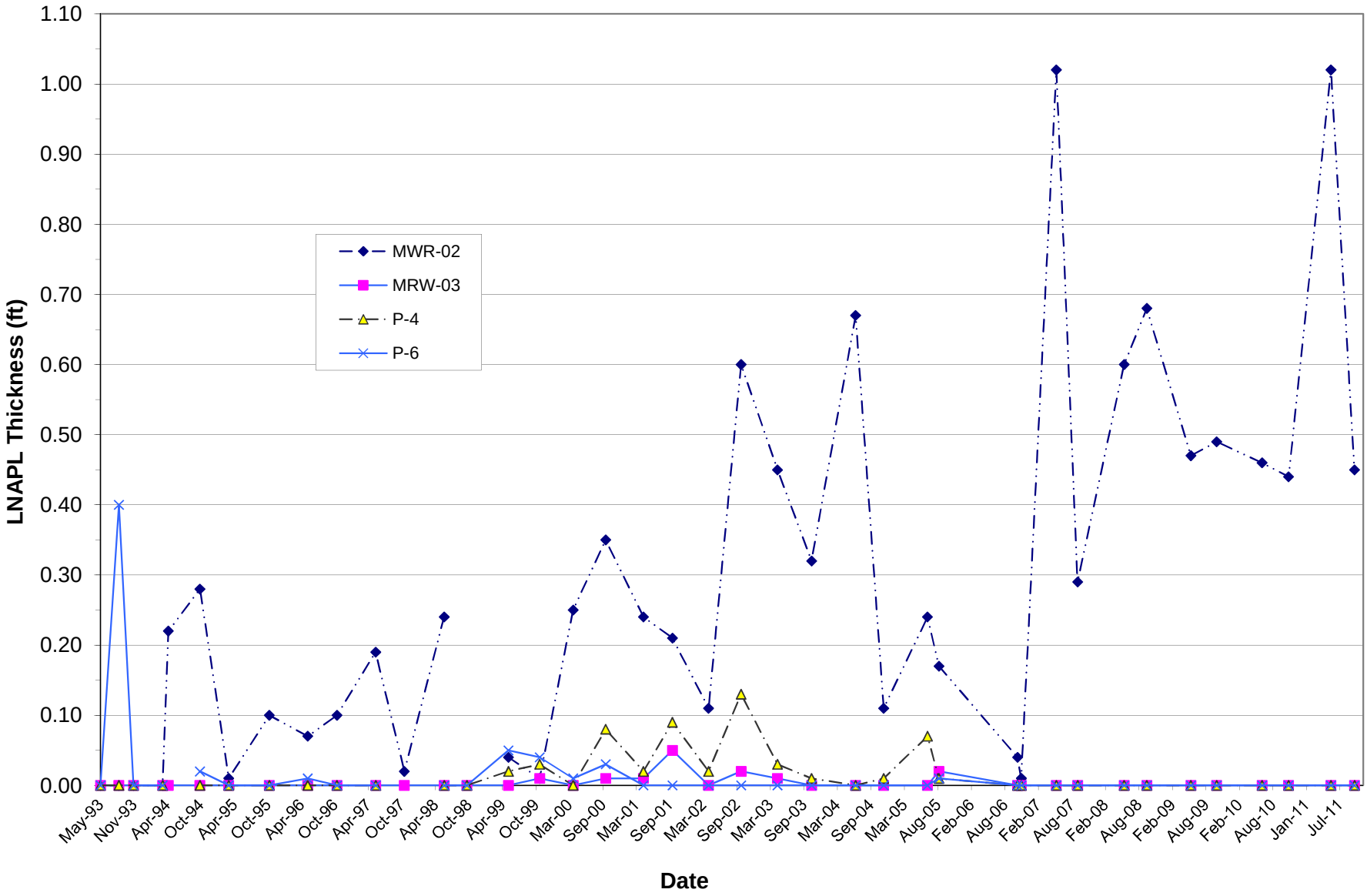
ON-SITE TECHNICAL SERVICES, INC.

72 Railroad Avenue Wellsville, NY 14895

N:\ARCO_WLSV\OU1 REPORTS\2011CELA REPORT\FIGURES\FIG3.MXD

Figure 4

LNAPL Thickness 1993-2011



Atlantic Richfield Company

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May 24, 2010

Mr. Michael J. Negrelli
Remedial Project Manager
U.S. Environmental Protection Agency
Region 2
290 Broadway Avenue
NYC SB2 – 20th Floor
New York, NY 10007-1866

2009 Annual Report of Operations and Maintenance Activities
Central Elevated Landfill Area
Former Sinclair Refinery Site, Operable Unit 1
Wellsville, New York

Dear Mike:

Please find enclosed two copies of the 2009 Annual Report of Operations and Maintenance Activities for the Central Elevated Landfill Area at the Former Sinclair Refinery Site, Operable Unit 1 (OU1) in Wellsville, New York. This report presents a discussion of the operation and maintenance activities that occurred for the OU1 project during 2009.

As you are aware, Operable Unit 2 Phase II-2 construction activities related to the CELA spoil re-use area have commenced. Atlantic Richfield is committed to maintaining the CELA as required by the current O&M requirements. However, due to ongoing construction activities, certain O&M activities such as cap mowing, gas vent monitoring and storm water monitoring may realize only partial completion during 2010.

If you have any questions regarding this submittal, please do not hesitate to contact me at 443-807-6233.

Sincerely,

Eric J. Larson
Operations Project Manager

Attachments

Cc: (with attachments)
Maurice Moore, NYSDEC
Martin Schmidt, URS
Jerry Palmer, On-Site Technical Services
David A. Howe Public Library, Wellsville NY

-----Original Message-----
From: Negrelli.Mike@epamail.epa.gov
[mailto:Negrelli.Mike@epamail.epa.gov]
Sent: Thursday, October 08, 2009 5:22 PM
To: Larson, Eric J
Cc: mfmoore@gw.dec.state.ny.us
Subject: Sinclair Refinery

Eric-
This email will serve as EPA's response to BP/ARCO's proposals to EPA in correspondence dated October 5, 2009 with respect to the ongoing remediation at the Sinclair Refinery Site in Wellsville, NY.

The first proposal entails the suspension of the annual CELA cap settlement plate surveying done under operation and maintenance activities for the OU1 remedial action. As past surveys have supported the overall stability of the cap, and given that an additional cell will be constructed on top of the CELA as part of 2010 construction activities, EPA agrees with the proposal to temporarily suspend the annual survey.

The second proposal involves the suspension of the annual groundwater quality monitoring laid out in ARCO's April 29, 2003 letter to EPA to monitor the groundwater conditions at the site on an interim basis while the Phase 2 remedy at the site was designed and constructed. Following our telephone conversation earlier today, both ARCO and EPA agree that another round of interim groundwater monitoring collected in 2009 will produce useful data in the evaluation of the Phase 2 groundwater remedy recently constructed and operating at the site. The frequency and nature of future groundwater monitoring events will be discussed in the near future as part of the operation, maintenance, and monitoring component of the Phase 2 remedial action.

Should you have any questions regarding these issues, please do not hesitate to contact me either by email or by phone at (212) 637-4278.

Mike Negrelli
Remedial Project Manager
New York Remediation Branch

Atlantic Richfield Company

Eric J. Larson
Project Manager

Remediation Management
1 W. Pennsylvania Avenue
Suite 440
Towson, MD 21204
Phone: (410) 825-2880
Mobile: (443) 807-6233
Fax: (410) 825-8675
E-Mail: eric.larson@bp.com

October 5, 2009

Mr. Michael J. Negrelli
Remedial Project Manager
U.S. Environmental Protection Agency
Region 2
290 Broadway Avenue
NYC SB2 – 20th Floor
New York, New York 10007-1866

Suspension of CELA Cap Survey at Operable Unit 1
Former Sinclair Refinery Site
Wellsville, New York

Dear Mike:

As indicated in the *2008 Annual Report of Operation and Maintenance Activities Central Elevated Landfill Area* (CELA), Atlantic Richfield Company (ARC) is requesting suspension of the annual CELA cap survey at Operable Unit 1 (OU1) former Sinclair Refinery Site in Wellsville, New York.

CELA cap settlement plate surveying has been conducted since remedial construction was completed in 1992 as required by the operation and maintenance plan (O&M Plan). The O&M Plan provides that if a change in settlement exceeding 0.02 feet does not occur after two years, the frequency of surveys can be reduced to once every 10 years. Since 2005, the maximum two-year settlement has ranged between 0.03 feet and 0.04 feet. Also, based on visual observations, the cap continues to have positive drainage with no areas of ponding water or abnormally soft ground.

Based on surveying and visual observations conducted to date, the CELA cap does not exhibit abnormal settlement and should be considered stable. As you are aware, ARC will be constructing a RCRA Cell on top of the existing CELA in 2010 to place impacted soils from Operable Unit 2 Phase II remedial activities. ARC proposes that the annual settlement plate survey be suspended until after the new cell is constructed and operation and maintenance requirements for the combined area are determined. Quarterly visual inspections of the CELA cap will continue to be performed as required. Any signs of differential settlement will be immediately addressed.

If you have any questions regarding this letter, please do not hesitate to contact me at (443) 807-6233.

Sincerely,

Eric Larson
Project Manager

cc: Jonathan Brandes, On-Site Technical Services
Martin Schmidt, URS
File Copy

-----Original Message-----
From: Negrelli.Mike@epamail.epa.gov
[mailto:Negrelli.Mike@epamail.epa.gov]
Sent: Monday, June 27, 2005 4:08 PM
To: Hufford, Walter
Cc: mfmoore@gw.dec.state.ny.us
Subject: OU1 Monitoring

Walt-
After discussion with Maurice, we agree to ARCO's proposal to suspend SVOC analysis from the CELA monitoring program as they have been non-detect since 1998. However, EPA reserves the right to have SVOC analysis resume should conditions at the CELA change at some point in the future that would lead us to believe the analysis should be resumed. Further, I believe we have previously agreed to your request to changing the soil pH analysis from annually to every three years, both in the CELA monitoring program and partial river channelization monitoring program. Please inform Jerry Palmer and Jon Brandis at On-Site Health and Safety of this determination.

If you have any questions on this matter, please do not hesitate to contact me.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

NOV 0 8 2002

BY FEDEX

Terry Moore
Environmental Manager
BP/ARCO Environmental Remediation, L.L.C.
1701 Summit Avenue, Suite 2
Plano, TX 75074

Re: Sinclair Refinery Site, Wellsville, New York

Dear Mr. Moore:

This letter is in response to the Atlantic Richfield Company's ("ARCO's") letter to the U.S. Environmental Protection Agency ("EPA"), dated April 24, 2002, regarding proposed modifications to certain Operation and Maintenance (O&M) requirements for the first operable unit (OU1) at the Sinclair Refinery site in Wellsville, New York. Specifically, ARCO's letter requests modifications to the frequency of elevation surveys of the river channel and banks associated with OU1 and discontinuation of analyzing dissolved metals in the annual ground water sampling (total metals will continue to be analyzed).

ARCO notes that the O&M Manual for OU1 states that the frequency of surveying of cross sections of the dikes will depend on significant changes in surveying data (the elevation surveys of the river bed have no corresponding mention of changing the frequency based on observations). Surveys performed by ARCO annually for the past ten years have indicated no significant changes in survey data for either the dike cross sections or river bed. Accordingly, EPA approves modifying the survey frequency from annually to every five years. As ARCO notes in its letter, annual inspections and periodic patrols following high water events shall continue.

ARCO also requests a discontinuation of the analysis for dissolved metals in the annual ground water sampling. This request is based on recent sampling events showing metals to be below MCLs and a good correlation between dissolved and total metals concentrations (ARCO will continue to perform total metals analysis annually). Therefore, EPA approves of ARCO's proposal to discontinue dissolved metals analysis in the annual ground water sampling at OU1. However, at the request of the New York State Department of Environmental Conservation (NYSDEC), this approval shall be effective starting with the 2003 annual sampling event in order to allow the NYSDEC to collect split samples during the 2002 sampling event. Please contact Maurice Moore at the NYSDEC regional office (716-851-7220) at least two weeks prior to the sampling event in order to make arrangements.

If you have any questions on this matter, please contact me at (212) 637-4278 or by email at negrelli.mike@epa.gov.

Sincerely yours,

Michael J. Negrelli

Michael J.Negrelli
Remedial Project Manager
New York Remediation Branch

cc: Wayne Mizerak - NYSDEC
Maurice Moore - NYSDEC/R.9

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

JUN 28 200

BY FEDEX

Terry Moore
Environmental Manager
BP/ARCO Environmental Remediation, L.L.C.
2300 West Plano Parkway, Room PRC-J1633
Plano, TX 75075-8499

Re: Sinclair Refinery Site, Wellsville, New York; Annual Reporting Requirements - OU1.

Dear Mr. Moore:

This is in response to your letter to the U.S. Environmental Protection Agency (EPA) dated April 18, 2001 whereby you request modification of the annual reporting requirements associated with the Central Elevated Landfill Area and Partial River Channelization (OU1) at the Sinclair Refinery Site in Wellsville, New York. Specifically, you request that water quality measurements (chemical analysis of water samples) be performed once per year in the Spring instead of the current Spring and Fall schedule. The reasoning behind your request is that statistical analysis of groundwater quality data show no significant trends in groundwater quality over time.

Upon EPA's review of your request, and in consultation with the New York State Department of Environmental Conservation (NYSDEC), EPA approves this modification to the annual reporting requirements. However, as you state in your letter, fluid level measurements, including non-aqueous phase liquid (NAPL) measurements, will continue on a semi-annual basis due to seasonal fluctuations and all other parameters will continue to be performed in accordance with the schedule set forth in the OU1 Operation and Maintenance Plan.

If you have any questions on this matter, please call me at (212) 637-4278.

Sincerely yours,

Michael J. Negrelli
Remedial Project Manager
New York Remediation Branch

cc: M. Brekhus - BP/ARCO (Los Angeles)
D. Keenan - NYSDEC
C. Berns - EPA/ORC

FORMER SINCLAIR REFINERY SITE
WELLSVILLE, NEW YORK

CELA INSPECTION CHECKLIST FOR VEGETATIVE COVER

Completed By: Scott Watson Sheet 1 of 7

Title: Site manager Date: 3-14-11

Verified By: J. Brandes

Title: S. Geologist Date: 2/1/12

Type of Inspection (check only one):

(✓) Quarterly
( ) Other (explain)

Item Description	Condition*/Remarks
A. VEGETATIVE COVER	
1. Erosion ✓	
2. Stressed Vegetation ✓	
3. Sediment Build-Up ✓	
4. Local Subsidence or Loss of Grade ✓	
5. Water Ponding ✓	
6. Turf Height ✓	
7. Burrowing Animals ✓	
8. Weeds or Undesirable Vegetation ✓	
9. Evidence of Fires or Vandalism ✓	
10. Soil pH Check	
11. Unauthorized Traffic ✓	
12. Slope Instability or Sloughing ✓	

---

* Indicate satisfactory condition with a check; briefly describe conditions other than satisfactory; use additional sheets if more space is needed.

Recommendations for maintenance or repair (attach additional sheets as needed):

FORMER SINCLAIR REFINERY SITE
WELLSVILLE, NEW YORK

CELA INSPECTION CHECKLIST FOR GAS VENT SYSTEM

Completed By: Scott Watson Sheet 1 of 7

Title: Site manager Date: 3-14-11

Verified By: J. Brandes

Title: S. Geologist Date: 2/1/12

Type of Inspection (check only one):

(✓) Quarterly
( ) Other (explain)

Item Description	Condition*/Remarks
B. GAS VENT SYSTEM	
1. Excess Sediment Build-Up and Vegetation Growth Over Vent Pipes	✓
2. Erosion or Washout Around Vent Pipes	✓
3. Damaged Vent Pipe	✓

---

* Indicate satisfactory condition with a check; briefly describe conditions other than satisfactory; use additional sheets if more space is needed.

Recommendations for maintenance or repair (attach additional sheets as needed):

FORMER SINCLAIR REFINERY SITE
WELLSVILLE, NEW YORK

CELA INSPECTION CHECKLIST FOR OPEN WELL PIEZOMETERS

Completed By: Scott Watson Sheet 3 of 7

Title: Site manager Date: 3-14-11

Verified By: J. Brandes

Title: S. Geologist Date: 2/1/12

Type of Inspection (check only one):

(✓) Quarterly
( ) Other (explain)

Item Description	Condition*/Remarks
C. OPEN WELL PIEZOMETERS	
1. Excess Sediment Build-Up and Vegetation Growth Over Casing	✓
2. Erosion or Washout Around Piezometer Casings	✓
3. Proper Functioning of the Protective Cover Cap and Lock (Test)	✓
4. Excess Rust on the Surface Casing and Lock	✓
5. Ponding Between Protective Casing and Riser Pipe	✓

---

* Indicate satisfactory condition with a check; briefly describe conditions other than satisfactory; use additional sheets if more space is needed.

Recommendations for maintenance or repair (attach additional sheets as needed):

FORMER SINCLAIR REFINERY SITE
WELLSVILLE, NEW YORK

CELA INSPECTION CHECKLIST FOR GROUND-WATER MONITORING WELLS

Completed By: Scott Watson Sheet 4 of 7

Title: Site manager Date: 3-14-11

Verified By: J. Brandes

Title: S. Geologist Date: 2/1/12

Type of Inspection (check only one):

(✓) Quarterly
( ) Other (explain)

Item Description	Condition*/Remarks
D. GROUND-WATER MONITORING WELLS	
1. Excess Sediment-Buildup and Vegetation Growth Over the Surface Casing	✓
2. Erosion Around the Concrete Surface Seal	✓
3. Cracks in the Concrete Surface Seal	✓
4. Separation Between the Concrete Surface Seal and the Surface Casing	✓
5. Proper Function of the Surface Casing Cap and Lock	✓
6. Excess Rust on the Surface Casing and Lock	✓
7. Ponding Between the Surface Casing and the Riser Pipe	✓

---

* Indicate satisfactory condition with a check; briefly describe conditions other than satisfactory; use additional sheets if more space is needed.

Recommendations for maintenance or repair (attach additional sheets as needed):

FORMER SINCLAIR REFINERY SITE
WELLSVILLE, NEW YORK

CELA INSPECTION CHECKLIST SURFACE WATER DRAINAGE SYSTEM

Completed By: Scott Watson Sheet 5 of 7

Title: Site manager Date: 3-14-11

Verified By: J. Brindes

Title: S. Geologist Date: 2/6/12

Type of Inspection (check only one):

(✓) Quarterly
( ) Other (explain)

Item Description	Condition*/Remarks

E. SURFACE-WATER DRAINAGE SYSTEMS

1. Dislodged Riprap ✓
2. Washouts ✓
3. Erosion ✓
4. Sediment Build-Up on Riprap ✓
5. Gullies and Ruts ✓
6. Excess Rusting of Drainage Culvert ✓
7. Holes and Cracks in Drainage Culvert ✓
8. Sediment Build-Up in Drainage Culvert ✓
9. Foreign Objects ✓
10. Washout at Berm/Culvert Interface ✓

---

* Indicate satisfactory condition with a check; briefly describe conditions other than satisfactory; use additional sheets if more space is needed.

Recommendations for maintenance or repair (attach additional sheets as needed):

FORMER SINCLAIR REFINERY SITE
WELLSVILLE, NEW YORK

CELA INSPECTION CHECKLIST SECURITY FENCE

Completed By: Scott Watson Sheet 6 of 7

Title: Site manager Date: 3-14-11

Verified By: J. Brandes

Title: S. Geologist Date: 2/1/12

Type of Inspection (check only one):

(✓) Regular
( ) Immediately after heavy storm (2 in. in 24 hour)
( ) Other (explain)

Item Description	Condition*/Remarks
F. SECURITY FENCE	
1. Proper Clearance (8 in. (200 mm) Between Fence Gate and the Ground	✓
2. Proper Function of Gate Lock and Hinges	✓
3. Holes	✓
4. Excess Rust	✓
5. Ruts or Burrows Beneath the Fence	✓
6. Vegetation Growing Onto or Through the Fence	✓
7. Improper Connection Between Posts and Chain Link Mesh	✓
8. Loose Posts	✓
9. Cracks in the Post Foundation	✓
10. General Signs of Deterioration	✓

---

* Indicate satisfactory condition with a check; briefly describe conditions other than satisfactory; use additional sheets if more space is needed.

Recommendations for maintenance or repair (attach additional sheets as needed):

FORMER SINCLAIR REFINERY SITE
WELLSVILLE, NEW YORK

VISUAL OBSERVATIONS OF SETTLEMENT

Completed By: Scott Watson Sheet 7 of 7

Title: Site manager Date: 3-14-11

Verified By: J. Brandes

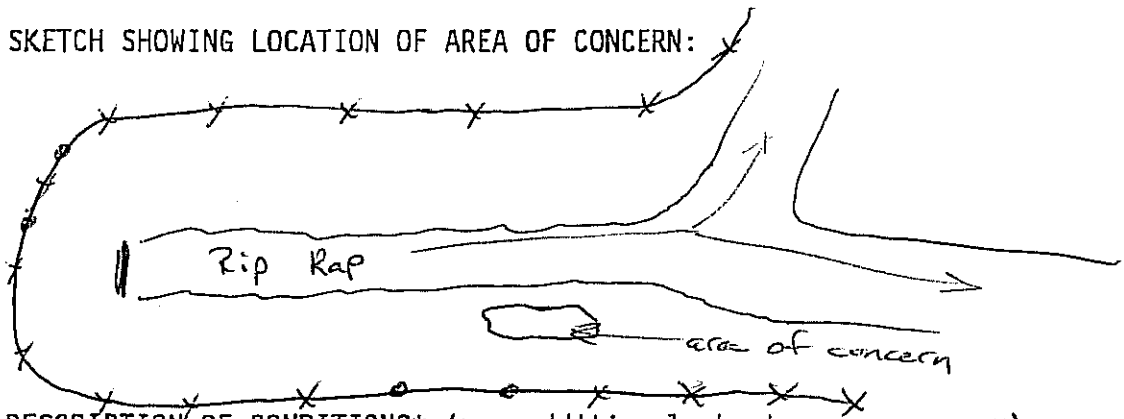
Title: S. Ecologist Date: 2/1/12

Type of Inspection (check only one):

(✓) Semi-Annual
( ) Other (explain)

xxx Fence
o—o Gate

SKETCH SHOWING LOCATION OF AREA OF CONCERN:



DESCRIPTION OF CONDITIONS* (use additional sheets as necessary):

Northern most area on west side 5'x10' area a foot below ground level. Sunken area. Last photo in inspection

* Attach photographic documentation.

FORMER SINCLAIR REFINERY SITE
WELLSVILLE, NEW YORK

CELA INSPECTION CHECKLIST FOR VEGETATIVE COVER

Completed By: S. Watson Sheet 1 of 7

Title: Site manager Date: 5-9-11

Verified By: J. Brandes

Title: S. Geologist Date: 2/1/12

Type of Inspection (check only one):

(✓) Quarterly
( ) Other (explain)

Item Description	Condition*/Remarks
A. VEGETATIVE COVER	
1. Erosion	✓
2. Stressed Vegetation	✓
3. Sediment Build-Up	✓
4. Local Subsidence or Loss of Grade	✓
5. Water Ponding	✓
6. Turf Height	✓
7. Burrowing Animals	✓
8. Weeds or Undesirable Vegetation	✓
9. Evidence of Fires or Vandalism	✓
10. Soil pH Check	✓
11. Unauthorized Traffic	✓
12. Slope Instability or Sloughing	✓

---

* Indicate satisfactory condition with a check; briefly describe conditions other than satisfactory; use additional sheets if more space is needed.

Recommendations for maintenance or repair (attach additional sheets as needed):

FORMER SINCLAIR REFINERY SITE
WELLSVILLE, NEW YORK

CELA INSPECTION CHECKLIST FOR GAS VENT SYSTEM

Completed By: S. Watson Sheet 2 of 7

Title: Site manager Date. 5-9-11

Verified By: J. Brandes

Title: S. Geologist Date: 2/1/12

Type of Inspection (check only one):

(✓) Quarterly
( ) Other (explain)

Item Description	Condition*/Remarks
B. GAS VENT SYSTEM	
1. Excess Sediment Build-Up and Vegetation Growth Over Vent Pipes	✓
2. Erosion or Washout Around Vent Pipes	✓
3. Damaged Vent Pipe	✓

---

* Indicate satisfactory condition with a check; briefly describe conditions other than satisfactory; use additional sheets if more space is needed.

Recommendations for maintenance or repair (attach additional sheets as needed):

FORMER SINCLAIR REFINERY SITE
WELLSVILLE, NEW YORK

CELA INSPECTION CHECKLIST FOR OPEN WELL PIEZOMETERS

Completed By: J. Watson Sheet 3 of 7

Title: Site Manager Date: 5-9-11

Verified By: J. Brandes

Title: S. Geologist Date: 2/c/12

Type of Inspection (check only one):

( ) Quarterly
( ) Other (explain)

Item Description	Condition*/Remarks
C. OPEN WELL PIEZOMETERS	
1. Excess Sediment Build-Up and Vegetation Growth Over Casing	✓
2. Erosion or Washout Around Piezometer Casings	✓
3. Proper Functioning of the Protective Cover Cap and Lock (Test)	✓
4. Excess Rust on the Surface Casing and Lock	✓
5. Ponding Between Protective Casing and Riser Pipe	✓

---

* Indicate satisfactory condition with a check; briefly describe conditions other than satisfactory; use additional sheets if more space is needed.

Recommendations for maintenance or repair (attach additional sheets as needed):

FORMER SINCLAIR REFINERY SITE
WELLSVILLE, NEW YORK

CELA INSPECTION CHECKLIST FOR GROUND-WATER MONITORING WELLS

Completed By: S. Watson Sheet 4 of 7

Title: Site manager Date: 5-9-11

Verified By: J. Brandes

Title: S. Geologist Date: 2/1/12

Type of Inspection (check only one):

(✓) Quarterly
( ) Other (explain)

Item Description	Condition*/Remarks
D. GROUND-WATER MONITORING WELLS	
1. Excess Sediment-Buildup and Vegetation Growth Over the Surface Casing	✓
2. Erosion Around the Concrete Surface Seal	✓
3. Cracks in the Concrete Surface Seal	✓
4. Separation Between the Concrete Surface Seal and the Surface Casing	✓
5. Proper Function of the Surface Casing Cap and Lock	✓
6. Excess Rust on the Surface Casing and Lock	✓
7. Ponding Between the Surface Casing and the Riser Pipe	✓

---

* Indicate satisfactory condition with a check; briefly describe conditions other than satisfactory; use additional sheets if more space is needed.

Recommendations for maintenance or repair (attach additional sheets as needed):

FORMER SINCLAIR REFINERY SITE
WELLSVILLE, NEW YORK

CELA INSPECTION CHECKLIST SURFACE WATER DRAINAGE SYSTEM

Completed By: S. Watson Sheet 5 of 7

Title: Site manager Date: 5-9-11

Verified By: J. Brandes

Title: S. Geologist Date: 2/1/12

Type of Inspection (check only one):

(✓) Quarterly
( ) Other (explain)

Item Description	Condition*/Remarks

E. SURFACE-WATER DRAINAGE SYSTEMS

1. Dislodged Riprap ✓
2. Washouts ✓
3. Erosion ✓
4. Sediment Build-Up on Riprap ✓
5. Gullies and Ruts ✓
6. Excess Rusting of Drainage Culvert ✓
7. Holes and Cracks in Drainage Culvert ✓
8. Sediment Build-Up in Drainage Culvert ✓
9. Foreign Objects ✓
10. Washout at Berm/Culvert Interface ✓

---

* Indicate satisfactory condition with a check; briefly describe conditions other than satisfactory; use additional sheets if more space is needed.

Recommendations for maintenance or repair (attach additional sheets as needed):

FORMER SINCLAIR REFINERY SITE
WELLSVILLE, NEW YORK

CELA INSPECTION CHECKLIST SECURITY FENCE

Completed By: S. Water Sheet 6 of 7

Title: Site manager Date: 5-9-11

Verified By: J. Brendes

Title: S. Geologist Date: 2/1/12

Type of Inspection (check only one):

(✓) Regular
( ) Immediately after heavy storm (2 in. in 24 hour)
( ) Other (explain)

Item Description	Condition*/Remarks
F. SECURITY FENCE	
1. Proper Clearance (8 in. (200 mm) Between Fence Gate and the Ground	✓
2. Proper Function of Gate Lock and Hinges	✓
3. Holes	✓
4. Excess Rust	✓
5. Ruts or Burrows Beneath the Fence	✓
6. Vegetation Growing Onto or Through the Fence	✓
7. Improper Connection Between Posts and Chain Link Mesh	✓
8. Loose Posts	✓
9. Cracks in the Post Foundation	✓
10. General Signs of Deterioration	✓

---

* Indicate satisfactory condition with a check; briefly describe conditions other than satisfactory; use additional sheets if more space is needed.

Recommendations for maintenance or repair (attach additional sheets as needed):

FORMER SINCLAIR REFINERY SITE
WELLSVILLE, NEW YORK

VISUAL OBSERVATIONS OF SETTLEMENT

Completed By: S. Wotan Sheet 7 of 7

Title: Site manager Date: 5-9-11

Verified By: J. Brandes

Title: Sr. Geologist Date: 2/1/12

Type of Inspection (check only one):

(✓) Semi-Annual
( ) Other (explain)

SKETCH SHOWING LOCATION OF AREA OF CONCERN:
Hole (settlement) at north end reported previously

DESCRIPTION OF CONDITIONS* (use additional sheets as necessary):

* Attach photographic documentation.

FORMER SINCLAIR REFINERY SITE
WELLSVILLE, NEW YORK

CELA INSPECTION CHECKLIST FOR VEGETATIVE COVER

Completed By: K. Dye, S. Weber Sheet 1 of 7

Title: _____ Date: 8-16-11

Verified By: J. Brandes

Title: S. Geologist Date: 2/1/12

Type of Inspection (check only one):

(X) Quarterly
( ) Other (explain)

Item Description	Condition*/Remarks
A. VEGETATIVE COVER	CECA cap under construction walking trails
1. Erosion ✓	
2. Stressed Vegetation ✓	
3. Sediment Build-Up ✓	
4. Local Subsidence or Loss of Grade ✓	
5. Water Ponding ✓	
6. Turf Height ✓	
7. Burrowing Animals ✓	
8. Weeds or Undesirable Vegetation ✓	
9. Evidence of Fires or Vandalism ✓	
10. Soil pH Check * NA	
11. Unauthorized Traffic ✓	
12. Slope Instability or Sloughing ✓	

---

* Indicate satisfactory condition with a check; briefly describe conditions other than satisfactory; use additional sheets if more space is needed.

Recommendations for maintenance or repair (attach additional sheets as needed):

FORMER SINCLAIR REFINERY SITE
WELLSVILLE, NEW YORK

CELA INSPECTION CHECKLIST FOR GAS VENT SYSTEM

Completed By: K. Dye S. Watson Sheet 2 of 7

Title: _____ Date: 8-16-11

Verified By: J. Brandes

Title: Sr. Geologist Date: 2/1/12

Type of Inspection (check only one):

(X) Quarterly
( ) Other (explain)

Item Description	Condition*/Remarks
B. GAS VENT SYSTEM	
1. Excess Sediment Build-Up and Vegetation Growth Over Vent Pipes	✓
2. Erosion or Washout Around Vent Pipes	✓
3. Damaged Vent Pipe	✓
Only 2- vent pipes remain after construction	

---

* Indicate satisfactory condition with a check; briefly describe conditions other than satisfactory; use additional sheets if more space is needed.

Recommendations for maintenance or repair (attach additional sheets as needed):

FORMER SINCLAIR REFINERY SITE
WELLSVILLE, NEW YORK

CELA INSPECTION CHECKLIST FOR OPEN WELL PIEZOMETERS

Completed By: K. Dye, S. Watson Sheet 3 of 7

Title: _____ Date: 8-16-11

Verified By: J. Brandes

Title: Sr. Geologist Date: 2/1/12

Type of Inspection (check only one):

(X) Quarterly
( ) Other (explain)

Item Description	Condition*/Remarks
C. OPEN WELL PIEZOMETERS	
1. Excess Sediment Build-Up and Vegetation Growth Over Casing	✓
2. Erosion or Washout Around Piezometer Casings	✓
3. Proper Functioning of the Protective Cover Cap and Lock (Test)	✓
4. Excess Rust on the Surface Casing and Lock	✓
5. Ponding Between Protective Casing and Riser Pipe	✓

---

* Indicate satisfactory condition with a check; briefly describe conditions other than satisfactory; use additional sheets if more space is needed.

Recommendations for maintenance or repair (attach additional sheets as needed):

FORMER SINCLAIR REFINERY SITE
WELLSVILLE, NEW YORK

CELA INSPECTION CHECKLIST FOR GROUND-WATER MONITORING WELLS

Completed By: K. Dye, S. Watson Sheet 4 of 7

Title: _____ Date: 8-16-11

Verified By: J. Brudes

Title: S. Geologist Date: 2/1/12

Type of Inspection (check only one):

(X) Quarterly
( ) Other (explain)

Item Description	Condition*/Remarks
D. GROUND-WATER MONITORING WELLS	
1. Excess Sediment-Buildup and Vegetation Growth Over the Surface Casing	✓
2. Erosion Around the Concrete Surface Seal	✓
3. Cracks in the Concrete Surface Seal	✓
4. Separation Between the Concrete Surface Seal and the Surface Casing	✓
5. Proper Function of the Surface Casing Cap and Lock	✓
6. Excess Rust on the Surface Casing and Lock	✓
7. Ponding Between the Surface Casing and the Riser Pipe	✓

---

* Indicate satisfactory condition with a check; briefly describe conditions other than satisfactory; use additional sheets if more space is needed.

Recommendations for maintenance or repair (attach additional sheets as needed):

FORMER SINCLAIR REFINERY SITE
WELLSVILLE, NEW YORK

CELA INSPECTION CHECKLIST SURFACE WATER DRAINAGE SYSTEM

Completed By: K. Dye, S. Watson Sheet 5 of 7

Title: _____ Date: 8-16-11

Verified By: T. Brandes

Title: S. Geologist Date: 2/1/12

Type of Inspection (check only one):

(X) Quarterly
( ) Other (explain)

Item Description	Condition*/Remarks
E. SURFACE-WATER DRAINAGE SYSTEMS	All has been removed during construction most northern tip remains
1. Dislodged Riprap ✓	
2. Washouts ✓	
3. Erosion ✓	
4. Sediment Build-Up on Riprap ✓	
5. Gullies and Ruts ✓	
6. Excess Rusting of Drainage Culvert ✓	
7. Holes and Cracks in Drainage Culvert ✓	
8. Sediment Build-Up in Drainage Culvert ✓	
9. Foreign Objects ✓	
10. Washout at Berm/Culvert Interface ✓	

---

* Indicate satisfactory condition with a check; briefly describe conditions other than satisfactory; use additional sheets if more space is needed.

Recommendations for maintenance or repair (attach additional sheets as needed):

FORMER SINCLAIR REFINERY SITE
WELLSVILLE, NEW YORK

CELA INSPECTION CHECKLIST SECURITY FENCE

Completed By: K. Dye, S. Watson Sheet 6 of 7

Title: _____ Date: 8-16-11

Verified By: J. Bandes

Title: S. Geologist Date: 2/1/12

Type of Inspection (check only one):

(X) Regular
( ) Immediately after heavy storm (2 in. in 24 hour)
( ) Other (explain)

Item Description	Condition*/Remarks
F. SECURITY FENCE	
1. Proper Clearance (8 in. (200 mm) Between Fence Gate and the Ground	✓
2. Proper Function of Gate Lock and Hinges	✓
3. Holes	✓
4. Excess Rust	✓
5. Ruts or Burrows Beneath the Fence	✓
6. Vegetation Growing Onto or Through the Fence	✓
7. Improper Connection Between Posts and Chain Link Mesh	✓
8. Loose Posts	✓
9. Cracks in the Post Foundation	✓
10. General Signs of Deterioration	✓

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* Indicate satisfactory condition with a check; briefly describe conditions other than satisfactory; use additional sheets if more space is needed.

Recommendations for maintenance or repair (attach additional sheets as needed):

FORMER SINCLAIR REFINERY SITE
WELLSVILLE, NEW YORK

VISUAL OBSERVATIONS OF SETTLEMENT

Completed By: K. Dye, S. Watson Sheet 2 of 2

Title: _____ Date: 8-16-11

Verified By: J. Brandes

Title: S. Geologist Date: 2/1/12

Type of Inspection (check only one):

(X) Semi-Annual
( ) Other (explain)

SKETCH SHOWING LOCATION OF AREA OF CONCERN:

Northern area hole reported in last quarter has been filled properly.

DESCRIPTION OF CONDITIONS* (use additional sheets as necessary):

* Attach photographic documentation.

FORMER SINCLAIR REFINERY SITE
WELLSVILLE, NEW YORK

CELA INSPECTION CHECKLIST FOR VEGETATIVE COVER

Completed By: S. Welton, K. Dye Sheet 1 of 7

Title: Tech Date: 11-18-11

Verified By: J. Braeles

Title: S. Geologist Date: 2/1/12

Type of Inspection (check only one):

(X) Quarterly
( ) Other (explain)

Item Description	Condition*/Remarks
A. VEGETATIVE COVER	
1. Erosion ✓	
2. Stressed Vegetation ✓	
3. Sediment Build-Up ✓	
4. Local Subsidence or Loss of Grade ✓	
5. Water Ponding ✓	
6. Turf Height ✓	
7. Burrowing Animals ✓	
8. Weeds or Undesirable Vegetation ✓	
9. Evidence of Fires or Vandalism ✓	
10. Soil pH Check NA	
11. Unauthorized Traffic ✓	
12. Slope Instability or Sloughing ✓	

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* Indicate satisfactory condition with a check; briefly describe conditions other than satisfactory; use additional sheets if more space is needed.

Recommendations for maintenance or repair (attach additional sheets as needed):

FORMER SINCLAIR REFINERY SITE
WELLSVILLE, NEW YORK

CELA INSPECTION CHECKLIST FOR GAS VENT SYSTEM

Completed By: S. Nelson K. Dye Sheet 2 of 7

Title: Tech Date: 11-18-11

Verified By: J. Brandes

Title: S. Ecologist Date: 2/1/12

Type of Inspection (check only one):

(X) Quarterly
( ) Other (explain)

Item Description	Condition*/Remarks
B. GAS VENT SYSTEM	
1. Excess Sediment Build-Up and Vegetation Growth Over Vent Pipes	✓
2. Erosion or Washout Around Vent Pipes	✓
3. Damaged Vent Pipe	✓

---

* Indicate satisfactory condition with a check; briefly describe conditions other than satisfactory; use additional sheets if more space is needed.

Recommendations for maintenance or repair (attach additional sheets as needed):

FORMER SINCLAIR REFINERY SITE
WELLSVILLE, NEW YORK

CELA INSPECTION CHECKLIST FOR OPEN WELL PIEZOMETERS

Completed By: S. Wilson, K. Dye Sheet 3 of 7

Title: Tech Date: 11-18-11

Verified By: J. Bowles

Title: Sr Geologist Date: 2/1/12

Type of Inspection (check only one):

(X) Quarterly
( ) Other (explain)

Item Description	Condition*/Remarks
C. OPEN WELL PIEZOMETERS	
1. Excess Sediment Build-Up and Vegetation Growth Over Casing	✓
2. Erosion or Washout Around Piezometer Casings	✓
3. Proper Functioning of the Protective Cover Cap and Lock (Test)	✓
4. Excess Rust on the Surface Casing and Lock	✓
5. Ponding Between Protective Casing and Riser Pipe	✓

---

* Indicate satisfactory condition with a check; briefly describe conditions other than satisfactory; use additional sheets if more space is needed.

Recommendations for maintenance or repair (attach additional sheets as needed):

FORMER SINCLAIR REFINERY SITE
WELLSVILLE, NEW YORK

CELA INSPECTION CHECKLIST FOR GROUND-WATER MONITORING WELLS

Completed By: S. Watson, K. Dye Sheet 4 of 7

Title: Tech Date: 11-18-11

Verified By: J. Brandes

Title: GeoLogist Date: 2/1/12

Type of Inspection (check only one):

(X) Quarterly
( ) Other (explain)

Item Description	Condition*/Remarks
D. GROUND-WATER MONITORING WELLS	
1. Excess Sediment-Buildup and Vegetation Growth Over the Surface Casing	✓
2. Erosion Around the Concrete Surface Seal	✓
3. Cracks in the Concrete Surface Seal	✓
4. Separation Between the Concrete Surface Seal and the Surface Casing	✓
5. Proper Function of the Surface Casing Cap and Lock	✓
6. Excess Rust on the Surface Casing and Lock	✓
7. Ponding Between the Surface Casing and the Riser Pipe	✓

---

* Indicate satisfactory condition with a check; briefly describe conditions other than satisfactory; use additional sheets if more space is needed.

Recommendations for maintenance or repair (attach additional sheets as needed):

FORMER SINCLAIR REFINERY SITE
WELLSVILLE, NEW YORK

CELA INSPECTION CHECKLIST SURFACE WATER DRAINAGE SYSTEM

Completed By: S. Metz, K. Dye Sheet 5 of 7

Title: Tech Date: 11-18-11

Verified By: J. Brodes

Title: S. Geologist Date: 2/1/12

Type of Inspection (check only one):

(X) Quarterly
( ) Other (explain)

Item Description	Condition*/Remarks
E. SURFACE-WATER DRAINAGE SYSTEMS	
1. Dislodged Riprap ✓	North end only (much of rip-rap has been removed as part of Phase II-2 Remedial Construction work) JEB 2/1/12
2. Washouts ✓	
3. Erosion ✓	
4. Sediment Build-Up on Riprap ✓	
5. Gullies and Ruts ✓	
6. Excess Rusting of Drainage Culvert ✓	
7. Holes and Cracks in Drainage Culvert ✓	
8. Sediment Build-Up in Drainage Culvert ✓	
9. Foreign Objects ✓	
10. Washout at Berm/Culvert Interface ✓	

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* Indicate satisfactory condition with a check; briefly describe conditions other than satisfactory; use additional sheets if more space is needed.

Recommendations for maintenance or repair (attach additional sheets as needed):

FORMER SINCLAIR REFINERY SITE
WELLSVILLE, NEW YORK

CELA INSPECTION CHECKLIST SECURITY FENCE

Completed By: S. Watson, K. Dye Sheet 6 of 7

Title: Tech Date: 11-18-11

Verified By: J. Brodes

Title: Sr. Geologist Date: 2/1/12

Type of Inspection (check only one):

(X) Regular
( ) Immediately after heavy storm (2 in. in 24 hour)
( ) Other (explain)

Item Description	Condition*/Remarks
F. SECURITY FENCE	
1. Proper Clearance (8 in. (200 mm) Between Fence Gate and the Ground	✓
2. Proper Function of Gate Lock and Hinges	✓
3. Holes	✓
4. Excess Rust	✓
5. Ruts or Burrows Beneath the Fence	✓
6. Vegetation Growing Onto or Through the Fence	✓
7. Improper Connection Between Posts and Chain Link Mesh	✓
8. Loose Posts	✓
9. Cracks in the Post Foundation	✓
10. General Signs of Deterioration	✓

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* Indicate satisfactory condition with a check; briefly describe conditions other than satisfactory; use additional sheets if more space is needed.

Recommendations for maintenance or repair (attach additional sheets as needed):

FORMER SINCLAIR REFINERY SITE
WELLSVILLE, NEW YORK

VISUAL OBSERVATIONS OF SETTLEMENT

Completed By: S. Watson K. Dye Sheet 7 of 7

Title: Tech Date: 11-18-11

Verified By: Sr Geologist, J. Brooks

Title: _____ Date: 2/6/12

Type of Inspection (check only one):

(X) Semi-Annual
( ) Other (explain)

SKETCH SHOWING LOCATION OF AREA OF CONCERN:

All is well (Previous area of settlement has been repaired)

JEB
2/6/12

DESCRIPTION OF CONDITIONS* (use additional sheets as necessary):

* Attach photographic documentation.

On-Site Technical Services, Inc.

Groundwater Purging and Sampling

Project: OU-1 Wellsville, New York **Date:** 6/16/11

Monitoring Well: MWR-01 **Sample ID:** MWR01-0611 **Arrival Time:** 0930

Weather Conditions

Temp. 68° F ( ) Sunny (Y) Partly Cloudy ( ) Cloudy ( ) Light Rain ( ) Heavy Rain ( ) Snow

Wind Conditions: 0-5

Well Condition Checklist

Bump posts: n/a Pro. casing/lock: OK Surface pad: OK

Well Visibility (paint): OK Well Label: OK Comment:

Depth & Purging Information

SWL: 9.89 ft TD 34.90 ft Start Purge: 0935

LNAPL Present: (Y) (N) Well Socked Prior to Purging: (Y) (N) How Many? n/a Sock Saturation: n/a

Purging Method: ( ) Submersible ( ) Peristaltic (Y) Other: pump #1

Pumping Rate: 98s/500mL Start Sampling: 10.50 Purge Duration: 1hr 15m. Purge Vol: 9.0

Field Parameters

Meters: YSI 556 (sn: 05H1715AO), Hach 2100P (sn: 05020C01133I) Measured in: (Y) Flow Cell ( ) Cup

Purge (gal)	Time	pH	Conductivity (us/cm)	Turbidity (ntu)	D.O. (mg/L)	Temp. (°C)	ORP (mV)	DTW (ft)
5.2	1020	Switch to Cell		16.9				9.90
6.4	10.30	6.49	423	16.7	1.05	13.39	84.4	9.90
7.75	1040	6.45	423	16.0	0.71	12.99	84.3	9.89
9.0	1050	6.44	42.3	12.2	0.99	13.76	86.4	9.90

Stabilization Criteria: 1) field parameters ± 0.1 pH, ±3% conductivity, ±10 mv ORP, ±10% DO, ±10% Turbidity; 2) 3 well volumes or dry

Final Sample clarity\color: clear/colorless Sample Odor: (Y) or (N) Explain:

Final Sample Oil Sheen: (Y) None ( ) Light ( ) Medium ( ) Heavy ( ) NAPL

Other Observations/Comments:

Analysis Requested: Metals/VOCs Number of Containers: 4

Well Sampling Completion: Time 1104 Date 6/16/11 Samplers Michelle Denhoff

On-Site Technical Services, Inc.

Groundwater Purging and Sampling

Project: OU-1 Wellsville, New York **Date:** 6/16/11

Monitoring Well: MWR-02 **Sample ID:** MWR02-0611 **Arrival Time:** 1114

Weather Conditions

Temp. 66° F ( ) Sunny (✓) Partly Cloudy ( ) Cloudy (✓) Light Rain ( ) Heavy Rain ( ) Snow

Wind Conditions: _____

Well Condition Checklist

Bump posts: n/a Pro. casing/lock: OK Surface pad: OK

Well Visibility (paint): OK Well Label: OK Comment: flush mount

Depth & Purging Information

SWL: 15.46 ft TD _____ ft Start Purge: 1120 / 6/14 / 6/15 / 6/16

LNAPL Present: (Y)(N) Well Socked Prior to Purging: (Y)(N) How Many? 3 Sock Saturation: 1=16", 1=17", 1=16"

Purging Method: ( ) Submersible ( ) Peristaltic (✓) Other: pump #1

Pumping Rate: 112s/500mL Start Sampling: 1300 Purge Duration: 1hr 40m Purge Vol: 8.25

Field Parameters

Meters: YSI 556 (sn: 05H1715AO, Hach 2100P (sn: 05020C011331) Measured in: (✓) Flow Cell ( ) Cup

Purge (gal)	Time	pH	Conductivity (us/cm)	Turbidity (ntu)	D.O. (mg/L)	Temp. (°C)	ORP (mV)	DTW (ft)
4.5	1230	Switch to Cell		9.48				
5.75	1240	6.54	720	4.46	1.77	11.69	-60.9	15.48
7.0	1250	6.56	721	4.62	1.12	11.74	-61.5	15.50
8.25	1300	6.56	721	5.06	0.98	11.77	-65.2	15.49

Stabilization Criteria: 1) field parameters ± 0.1 pH, ±3% conductivity, ±10 mv ORP, ±10% DO, ±10% Turbidity; 2) 3 well volumes or dry

Final Sample clarity\color: clear/colorless Sample Odor: (Y) or (N) Explain: hydrocarbon

Final Sample Oil Sheen: (✓) None (✓) Light ( ) Medium ( ) Heavy ( ) NAPL

Other Observations/Comments: very light sheen if any at all.

Analysis Requested: metals/VOC's Number of Containers: 4

Well Sampling Completion: Time 1315 Date 6/16/11 Samplers Michelle Denhoff

On-Site Technical Services, Inc.

Groundwater Purging and Sampling

Project: OU-1 Wellsville, New York **Date:** 6/15/11

Monitoring Well: MWR-03 **Sample ID:** MWR03-0611 **Arrival Time:** 1400

Weather Conditions

Temp. 73° F (✓) Sunny ( ) Partly Cloudy ( ) Cloudy ( ) Light Rain ( ) Heavy Rain ( ) Snow

Wind Conditions: _____

Well Condition Checklist

Bump posts: n/a Pro. casing/lock: OK Surface pad: OK

Well Visibility (paint): OK Well Label: OK Comment: flush mount

Depth & Purging Information

SWL: 14.68 ft TD 31.19 ft Start Purge: 1405

LNAPL Present: (Y) (N) Well Socked Prior to Purging: (Y) (N) How Many? n/a Sock Saturation: n/a

Purging Method: ( ) Submersible ( ) Peristaltic (✓) Other: pump #1

Pumping Rate: 10.5s/500mL Start Sampling: 1510 Purge Duration: 1hr 5m Purge Vol: 8.0

Field Parameters

Meters: YSI 556 (sn: 05H1715AB), Hach 2100P (sn: 050200011331) Measured in: (✓) Flow Cell ( ) Cup

Purge (gal)	Time	pH	Conductivity (us/cm)	Turbidity (ntu)	D.O. (mg/L)	Temp. (°C)	ORP (mV)	DTW (ft)
4.2	1435	Switch to Cell		71.3				14.71
6.0	1450	6.71	425	62.5	6.14	14.41	23.7	14.70
7.0	1500	6.69	425	56.2	6.41	13.52	23.5	14.71
8.0	1510	6.69	424	53.3	6.55	13.61	22.9	—

Stabilization Criteria: 1) field parameters ± 0.1 pH, ±3% conductivity, ±10 mv ORP, ±10% DO, ±10% Turbidity; 2) 3 well volumes or dry

Final Sample clarity\color: clear/colorless Sample Odor: (Y) or (N) Explain: _____

Final Sample Oil Sheen: (✓) None ( ) Light ( ) Medium ( ) Heavy ( ) NAPL

Other Observations/Comments: _____

Analysis Requested: Metals/VOC Number of Containers: 4

Well Sampling Completion: Time 1520 Date 6/16/11 Samplers Michelle Deohoff

On-Site Technical Services, Inc.

Groundwater Purging and Sampling

Project: OU-1 Wellsville, New York **Date:** 6/15/11

Monitoring Well: MWR-04 **Sample ID:** MWR04-0611 **Arrival Time:** 1245

Weather Conditions

Temp. 71 ° F (✓) Sunny ( ) Partly Cloudy ( ) Cloudy ( ) Light Rain ( ) Heavy Rain ( ) Snow

Wind Conditions: _____

Well Condition Checklist

Bump posts: n/a Pro. casing/lock: OK Surface pad: OK

Well Visibility (paint): OK Well Label: OK Comment: flush mount

Depth & Purging Information

SWL: 14.50 ft TD 26.92 ft Start Purge: 1250

LNAPL Present: (Y) (N) Well Socked Prior to Purging: (Y) (N) How Many? n/a Sock Saturation: n/a

Purging Method: ( ) Submersible ( ) Peristaltic (✓) Other: pump #1

Pumping Rate: 105s/500ml Start Sampling: 1350 Purge Duration: 1hr Purge Vol: 6.7

Field Parameters

Meters: YSI 556 (sn: 05H1715AO, Hach 2100P (sn: 050200011331) Measured in: (✓) Flow Cell ( ) Cup

Purge (gal)	Time	pH	Conductivity (us/cm)	Turbidity (ntu)	D.O. (mg/L)	Temp. (°C)	ORP (mV)	DTW (ft)
3.0	1320	Switch to Cell		6.93				14.56
4.2	1330	6.59	176	5.38	0.43	15.45	96.9	14.57
5.5	1340	6.57	176	6.00	0.30	15.54	94.1	14.56
6.7	1350	6.55	17.5	3.94	0.28	15.77	93.0	14.56

Stabilization Criteria: 1) field parameters ± 0.1 pH, ±3% conductivity, ±10 mv ORP, ±10% DO, ±10% Turbidity; 2) 3 well volumes or dry

Final Sample clarity\color: clear / colorless Sample Odor: (Y) or (N) Explain: _____

Final Sample Oil Sheen: (✓) None ( ) Light ( ) Medium ( ) Heavy ( ) NAPL

Other Observations/Comments: _____

Analysis Requested: Metals/VOCs Number of Containers: 4

Well Sampling Completion: Time 1356 Date 6/15/11 Samplers M Denhoff

On-Site Technical Services, Inc.

Groundwater Purging and Sampling

Project: OU-1 Wellsville, New York **Date:** 6/15/11

Monitoring Well: MWR-05 **Sample ID:** MWR05-0611 **Arrival Time:** 1043

Weather Conditions

Temp. ____° F (✓) Sunny ( ) Partly Cloudy ( ) Cloudy ( ) Light Rain ( ) Heavy Rain ( ) Snow

Wind Conditions: _____

Well Condition Checklist

Bump posts: n/a Pro. casing/lock: OK Surface pad: OK

Well Visibility (paint): OK Well Label: OK Comment: flush mount

Depth & Purging Information

SWL: 13.63 ft TD 32.89 ft Start Purge: 1055

LNAPL Present: (Y) (N) Well Socked Prior to Purging: (Y) (N) How Many? n/a Sock Saturation: n/a

Purging Method: ( ) Submersible ( ) Peristaltic ( ) Other: _____

Pumping Rate: 138s/500mL Start Sampling: 1230 Purge Duration: 1hr 35 m. Purge Vol: 7.5

Field Parameters

Meters: YSI 556 (sn: 05H1715A0), Hach 2100P (sn: 05020C011331) Measured in: (✓) Flow Cell ( ) Cup

Purge (gal)	Time	pH	Conductivity (us/cm)	Turbidity (ntu)	D.O. (mg/L)	Temp. (°C)	ORP (mV)	DTW (ft)
3.0	1125	Switch to Cell		25.3				13.67
6.0	1215	6.34	144	14.2	0.95	14.01	80.8	13.68
6.5	1220	6.34	144	9.51	0.54	13.94	81.8	pulled
7.0	1225	6.32	144	13.0	0.74	13.97	84.3	—
7.5	1230	6.34	144	14.7	0.42	14.20	84.3	—

Stabilization Criteria: 1) field parameters ± 0.1 pH, ±3% conductivity, ±10 mv ORP, ±10% DO, ±10% Turbidity; 2) 3 well volumes or dry

Final Sample clarity\color: clear/colorless Sample Odor: (Y) or (N) Explain: _____

Final Sample Oil Sheen: (✓) None ( ) Light ( ) Medium ( ) Heavy ( ) NAPL

Other Observations/Comments: _____

Analysis Requested: Metals/VOCs Number of Containers: 4

Well Sampling Completion: Time 1239 Date 6/15/11 Samplers Michelle Denhoff

On-Site Technical Services, Inc.

Groundwater Purging and Sampling

Project: OU-1 Wellsville, New York **Date:** 6/15/11

Monitoring Well: MWR-06 **Sample ID:** MWR06-0611 **Arrival Time:** 0834

Weather Conditions

Temp. 55° F (✓) Sunny ( ) Partly Cloudy ( ) Cloudy ( ) Light Rain ( ) Heavy Rain ( ) Snow

Wind Conditions: _____

Well Condition Checklist

Bump posts: n/a Pro. casing/lock: OK Surface pad: OK

Well Visibility (paint): OK Well Label: OK Comment: flush mount

Depth & Purging Information

SWL: 12.87 ft TD 34.36 ft Start Purge: 0850

LNAPL Present: (Y) (N) Well Socked Prior to Purging: (Y) (N) How Many? n/a Sock Saturation: n/a

Purging Method: ( ) Submersible ( ) Peristaltic (✓) Other: pump #1

Pumping Rate: 12 s/500 mL Start Sampling: 1030 Purge Duration: 1 hr. 40 m. Purge Vol: 10.2

Field Parameters

Meters: YSI 556 (sn: 05H1715A0), Hach 2100P (sn: 05020C011331) Measured in: (✓) Flow Cell ( ) Cup

Purge (gal)	Time	pH	Conductivity (us/cm)	Turbidity (ntu)	D.O. (mg/L)	Temp. (°C)	ORP (mV)	DTW (ft)
6.0	0945	Switch to Cell		10.6				12.90
7.0	1000	6.42	278	11.4	0.98	11.44	21.9	12.91
8.2	1010	6.44	279	10.2	1.15	11.68	20.8	12.89
9.5	1020	6.43	279	8.01	0.51	12.12	14.9	12.90
10.2	1030	6.43	279	7.24	0.49	12.17	14.0	12.89

Stabilization Criteria: 1) field parameters ± 0.1 pH, ±3% conductivity, ±10 mv ORP, ±10% DO, ±10% Turbidity; 2) 3 well volumes or dry

Final Sample clarity\color: clear/colorless Sample Odor: (Y) or (N) Explain: _____

Final Sample Oil Sheen: (✓) None ( ) Light ( ) Medium ( ) Heavy ( ) NAPL

Other Observations/Comments: _____

Analysis Requested: Metals/VOCs Number of Containers: 4

Well Sampling Completion: Time 1041 Date 6/15/11 Samplers Michelle Denhoff

On-Site Technical Services, Inc.

Groundwater Purging and Sampling

dup 1 = 152

Project: OU-1 Wellsville, New York **Date:** 6/14/11

Monitoring Well: MWR-07 **Sample ID:** MWR07-0611 **Arrival Time:** 1334

Weather Conditions

Temp. 58° F ( ) Sunny ( ) Partly Cloudy (✓) Cloudy ( ) Light Rain ( ) Heavy Rain ( ) Snow

Wind Conditions: _____

Well Condition Checklist

Bump posts: n/a Pro. casing/lock: ok Surface pad: ok

Well Visibility (paint): ok Well Label: ok Comment: flush mount

Depth & Purging Information

SWL: 13.12 ft TD 34.81 ft Start Purge: 1343

LNAPL Present: (Y) (N) Well Socked Prior to Purging: (Y) (N) How Many? n/a Sock Saturation: n/a

Purging Method: ( ) Submersible ( ) Peristaltic (✓) Other: bladder #1

Pumping Rate: 171s/500mL Start Sampling: 1510 Purge Duration: 1hr 25 m. Purge Vol: 5.0

Field Parameters

Meters: YSI 556 (sn:05H1715AO), Hach 2100P (sn:050200011331) Measured in: (✓) Flow Cell ( ) Cup

Purge (gal)	Time	pH	Conductivity (us/cm)	Turbidity (ntu)	D.O. (mg/L)	Temp. (°C)	ORP (mV)	DTW (ft)
3.0	1430	Switch to Cell		4.93				13.15
3.5	1440	6.48	186	5.41	0.95	11.80	84.9	13.14
4.0	1450	6.43	185	5.91	0.60	11.12	81.0	13.15
4.5	1500	6.42	185	4.79	0.47	10.87	79.5	13.15
5.0	1510	6.39	185	5.08	0.51	10.78	78.6	pulled

Stabilization Criteria: 1) field parameters ± 0.1 pH, ±3% conductivity, ±10 mv ORP, ±10% DO, ±10% Turbidity; 2) 3 well volumes or dry

Final Sample clarity\color: clear/colorless. Sample Odor: (Y) or (N) Explain: _____

Final Sample Oil Sheen: (✓) None ( ) Light ( ) Medium ( ) Heavy ( ) NAPL

Other Observations/Comments: _____

Analysis Requested: Metals/VOC's Number of Containers: 4/4

Well Sampling Completion: Time 1530 Date 6/14/11 Samplers Michelle Denholt

On-Site Technical Services, Inc.

Groundwater Purging and Sampling

Project: OU-1 Wellsville, New York **Date:** 6/13/11

Monitoring Well: MWR-08 **Sample ID:** MWR08-0611 **Arrival Time:** 0830

Weather Conditions

Temp. 62 ° F ( ) Sunny (✓) Partly Cloudy ( ) Cloudy ( ) Light Rain ( ) Heavy Rain ( ) Snow

Wind Conditions: _____

Well Condition Checklist

Bump posts: n/a Pro. casing/lock: OK Surface pad: OK

Well Visibility (paint): OK Well Label: OK Comment: _____

Depth & Purging Information

SWL: 13.54 ft TD 29.78 ft Start Purge: 1100

LNAPL Present: (Y) (N) Well Socked Prior to Purging: (Y) (N) How Many? n/a Sock Saturation: n/a

Purging Method: ( ) Submersible ( ) Peristaltic (✓) Other: pump #1

Pumping Rate: 117s/500mL Start Sampling: 1245 Purge Duration: 1hr 45 m. Purge Vol: 11.2

Field Parameters

Meters: YSI 556 (sn: 05H1715AD) Hach 2100P (sn: D5020CC011331) Measured in: (✓) Flow Cell ( ) Cup

Purge (gal)	Time	pH	Conductivity (us/cm)	Turbidity (ntu)	D.O. (mg/L)	Temp. (°C)	ORP (mV)	DTW (ft)
6.25	1205			6.36	Switch to Cell			13.62
7.5	1215	6.45	331	6.07	2.37	13.61	62.4	
8.75	1225	6.45	334	4.83	2.10	13.68	61.1	13.68
10.0	1235	6.40	335	4.84	1.97	13.09	57.6	pulled
11.2	1245	6.40	336	4.97	1.86	12.80	55.1	—

Stabilization Criteria: 1) field parameters ± 0.1 pH, ±3% conductivity, ±10 mv ORP, ±10% DO, ±10% Turbidity; 2) 3 well volumes or dry

Final Sample clarity\color: Clear/Colorless Sample Odor: (Y) or (N) Explain: _____

Final Sample Oil Sheen: (✓) None ( ) Light ( ) Medium ( ) Heavy ( ) NAPL

Other Observations/Comments: _____

Analysis Requested: Metals/VOCs Number of Containers: 4

Well Sampling Completion: Time 1300 Date 6/13/11 Samplers M. Benhoff

On-Site Technical Services, Inc.

Groundwater Purging and Sampling

Project: OU-1 Wellsville, New York **Date:** 6/13/11

Monitoring Well: MWR-09 **Sample ID:** MWR09-0611 **Arrival Time:** 1330

Weather Conditions

Temp. 67° F ( ) Sunny (✓) Partly Cloudy ( ) Cloudy ( ) Light Rain ( ) Heavy Rain ( ) Snow

Wind Conditions: _____

Well Condition Checklist

Bump posts: n/a Pro. casing/lock: OK Surface pad: OK

Well Visibility (paint): OK Well Label: OK Comment: _____

Depth & Purging Information

SWL: 10.47 ft TD 33.42 ft Start Purge: 1340

LNAPL Present: (Y) (N) Well Socked Prior to Purging: (Y) (N) How Many? n/a Sock Saturation: n/a

Purging Method: ( ) Submersible ( ) Peristaltic (✓) Other: pump #1

Pumping Rate: 1l6s/500mL Start Sampling: 1500 Purge Duration: ~~1340~~ 1340 Purge Vol: 9.0

Field Parameters

Meters: YSI 556 (sn: 05H1715AQ) Hach 2100P (sn: 05020C01133I) Measured in: (✓) Flow Cell ( ) Cup

Purge (gal)	Time	pH	Conductivity (us/cm)	Turbidity (ntu)	D.O. (mg/L)	Temp. (°C)	ORP (mV)	DTW (ft)
	1420	Switch to Cell		13.9				10.58
	1430	6.29	484	10.6	0.96	13.96	-0.6	10.58
	1440	6.29	484	9.41	0.74	12.82	-5.8	10.56
	1450	6.28	484	8.88	0.56	12.54	-6.1	10.57
9.0	1500	6.28	484	8.90	0.50	12.88	-8.9	10.58

Stabilization Criteria: 1) field parameters ± 0.1 pH, ±3% conductivity, ±10 mv ORP, ±10% DO, ±10% Turbidity; 2) 3 well volumes or dry

Final Sample clarity\color: clear/colorless Sample Odor: (Y) or (N) Explain: _____

Final Sample Oil Sheen: (✓) None ( ) Light ( ) Medium ( ) Heavy ( ) NAPL

Other Observations/Comments: _____

Analysis Requested: Metals/VOC's Number of Containers: 4

Well Sampling Completion: Time 1515 Date 6/13/11 Samplers M Denhoff

On-Site Technical Services, Inc.

Groundwater Purging and Sampling

Project: OU-1 Wellsville, New York **Date:** 6/14/11

Monitoring Well: MWR-10 **Sample ID:** MWR10-0611 **Arrival Time:** 0846

Weather Conditions

Temp. 52 ° F ( ) Sunny ( ) Partly Cloudy (✓) Cloudy ( ) Light Rain ( ) Heavy Rain ( ) Snow

Wind Conditions: 5 mph

Well Condition Checklist

Bump posts: n/a Pro. casing/lock: OK Surface pad: OK

Well Visibility (paint): OK Well Label: OK Comment:

Soft bottom

Depth & Purging Information

SWL: 9.42 ft TD 32.9 ft Start Purge: 0900

LNAPL Present: (Y) (N) Well Socked Prior to Purging: (Y) (N) How Many? n/a Sock Saturation: n/a

Purging Method: ( ) Submersible ( ) Peristaltic (✓) Other: pump #1

Pumping Rate: 1lt 8/500mL Start Sampling: 1030 Purge Duration: 1hr 30 m. Purge Vol: 10.75

Field Parameters

Meters: YSI 556 (sn: 05H1715AQ, Hach 2100P (sn: 050100C01331) Measured in: (✓) Flow Cell ( ) Cup

Purge (gal)	Time	pH	Conductivity (us/cm)	Turbidity (ntu)	D.O. (mg/L)	Temp. (°C)	ORP (mV)	DTW (ft)
6.0	0955	Switch to Cell		52.7				9.44
7.2	1005	6.37	450	50.2	2.18	10.35	-5.8	9.46
8.5	1015	6.39	450	52.9	1.88	10.43	-6.4	9.48
9.6	1025	6.40	449	47.3	1.81	10.72	-7.1	pumped
10.75	1030	6.41	449	45.6	1.76	10.75	-7.2	—

Stabilization Criteria: 1) field parameters ± 0.1 pH, ±3% conductivity, ±10 mv ORP, ±10% DO, ±10% Turbidity; 2) 3 well volumes or dry

Final Sample clarity\color: Slightly Cloudy Sample Odor: (Y) or (N) Explain:

Final Sample Oil Sheen: (✓) None ( ) Light ( ) Medium ( ) Heavy ( ) NAPL

Other Observations/Comments:

Analysis Requested: Metals/VOC's – MS/MSD Number of Containers: 12

Well Sampling Completion: Time 1045 Date 6/14/11 Samplers M Denhoff

On-Site Technical Services, Inc.

Groundwater Purging and Sampling

Project: OU-1 Wellsville, New York **Date:** 6/14/11

Monitoring Well: MWR-11 **Sample ID:** MWR11-0611 **Arrival Time:** 1100

Weather Conditions

Temp. 55° F ( ) Sunny (✓) Partly Cloudy ( ) Cloudy ( ) Light Rain ( ) Heavy Rain ( ) Snow

Wind Conditions: _____

Well Condition Checklist

Bump posts: n/a Pro. casing/lock: OK Surface pad: OK

Well Visibility (paint): OK Well Label: OK Comment: _____

Depth & Purging Information

SWL: 10.74 ft TD 27.04 ft Start Purge: 1110

LNAPL Present: (Y) (N) Well Socked Prior to Purging: (Y) (N) How Many? n/a Sock Saturation: n/a

Purging Method: ( ) Submersible ( ) Peristaltic (✓) Other: pump #1

Pumping Rate: 1149/500mL Start Sampling: 1230 Purge Duration: 1hr 20m. Purge Vol: 5.6

Field Parameters

Meters: YSI 556 (sn: 05H1715AQ, Hach 2100P (sn: 05020C011331) Measured in: (✓) Flow Cell ( ) Cup

Purge (gal)	Time	pH	Conductivity (us/cm)	Turbidity (ntu)	D.O. (mg/L)	Temp. (°C)	ORP (mV)	DTW (ft)
3.0	1155	Switch to Cell		73.8				
3.75	1205	6.65	316	49.8	3.06	11.24	74.1	10.76
4.5	1215	6.62	318	40.3	2.82	10.97	78.7	10.75
5.25	1225	6.58	321	30.3	2.67	10.89	86.0	10.76
5.6	1230	6.58	321	30.0	2.61	10.93	87.7	pulled

Stabilization Criteria: 1) field parameters ± 0.1 pH, ±3% conductivity, ±10 mv ORP, ±10% DO, ±10% Turbidity; 2) 3 well volumes or dry

Final Sample clarity\color: clear/colorless. Sample Odor: (Y) or (N) Explain: _____

Final Sample Oil Sheen: (✓) None ( ) Light ( ) Medium ( ) Heavy ( ) NAPL

Other Observations/Comments: _____

Analysis Requested: Metals/VOCs Number of Containers: 4

Well Sampling Completion: Time _____ Date 6/14/11 Samplers M Bunnell

FORMER SINCLAIR REFINERY SITE
WELLSVILLE, NEW YORK

GAS VENT MONITORING

Completed By: K.Dye, S.Watson Sheet 1 of 1

Title: _____ Date: 8-16-11

Verified By: _____

Title: _____ Date: _____

Type of Monitoring (check only one): 77°F 5-10 mph winds from NW

(X) Semi-Annual
( ) Other (explain)
( ) Type of Monitoring Device

Gas Vent Identification	Upwind Reading	Downwind Reading	Gas Venting Reading
V-13	24.6	24.0	28.0
V-1	0.5	0.5	0.5

.05 background

COMMENTS OR PERIMETER FENCE MONITORING RESULTS (Attach additional sheets if required):

FORMER SINCLAIR REFINERY SITE
WELLSVILLE, NEW YORK

GAS VENT MONITORING

Completed By: S. Watson Sheet 1 of 1

Title: Site manager Date: 9-26-11

Verified By: _____

Title: _____ Date: _____

Type of Monitoring (check only one): 77°F 0-5 mph winds from SW

(X) Semi-Annual
( ) Other (explain)
( ) Type of Monitoring Device

Gas Vent Identification	Upwind Reading	Downwind Reading	Gas Venting Reading
V-13	0.5	2.0	30.3
V-1	0.5	1.7	27.6

COMMENTS OR PERIMETER FENCE MONITORING RESULTS (Attach additional sheets if required):

0.5 ppm background