New York State Department of Environmental Conservation

Division of Environmental Remediation • 625 Broadway 12th Floor • Albany, New York 12233-7013

Site Management Plan
Tioga Castings Site

Foundry Street
Owego, New York

Site Number 7-54-012

New York State Department of Environmental Conservation Work Assignment D004443-8

April 2011

Report Prepared By:

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1. Introduction

This Site Management Plan SMP was developed in accordance with DER-10 to provide a framework for monitoring the effectiveness of the remedy at the Tioga Castings site. This SMP includes the following site-specific documents:

- Operation and Maintenance (O&M) Plan – identifies the procedures and contingency plans required to operate and maintain the remedy.
- Long-term Monitoring (LTM) Plan – provides the procedures and monitoring requirements to evaluate the short-and long-term effectiveness of the remedy.
- Institutional Controls/Engineering Controls (IC/EC) Plan – describes the IC/ECs that are in place to provide the appropriate levels of protection for human health and the environment.
- Site-specific Health and Safety Plan (HASP) – identifies site-related hazards and provides requirements for the appropriate personal protective equipment (PPE) for on-site personnel who conduct O&M and LTM activities.

2. Site Description and Background

The Tioga Casting Site is located on Foundry Street, Owego, Broome County, New York (Figure 1). The site is approximately seven acres with an approximately one acre landfill on the western portion of the property. Foundry operations were performed at the site from the 1940s through 1988. The facility operated a copula-type foundry and produced gray-iron castings. Solid wastes produced at the foundry (sand molds, fly ash, cast iron grindings, and copula dust) were reportedly disposed at an off-site landfill until 1979. The foundry then operated an on-site landfill for disposal of foundry wastes through its closing in 1988. In 1989 a fire destroyed most of the foundry structure. Based on the presence of materials that were found abandoned at the site, the facility was listed in the NYSDEC Inactive Hazardous Waste Disposal Registry (site number 7-54-012) as a Class 2 Site. The remains of the former foundry structure have since been razed, leaving the concrete slabs in-place.

A Record of Decision (ROD) was signed for the site in 1995. The remedy included the following items:

- Consolidation of on-site and off-site soil and waste piles that contained concentrations greater than the cleanup goals for the site in the on-site landfill.
- Maintain deed restrictions to prevent site development in areas of the site where contaminated material was present.
- Placement of a low permeability cover over the on-site landfill.
- Maintain a fence around the on-site landfill to limit site access.
- Cleaning and filling an on-site septic tank with cement.
- Operation and maintenance of the remedy.
- Groundwater monitoring.
- Site-specific cleanup goals for cadmium, chromium and lead as listed below:

	SOIL	GROUNDWATER
Cadmium	10 ppm	10 ppb
Chromium	50 ppm	50 ppb
Lead	250 ppm to 12” 500 ppm below 12”	25 ppb

The landfill closure was completed in 1997.

Asbestos-containing materials in piles of debris and in a building structure were identified at the site and removed in 2001.

In July 2008, additional groundwater monitoring and a subsurface soil investigation was initiated to evaluate if groundwater and/or subsurface soil contained concentration of VOCs, polychlorinated biphenyls (PCBs), or metals at concentrations greater than the respective NYSDEC Standards or site-specific cleanup criteria. Sub-slab soil vapor samples were also collected from beneath the former foundry building slab to evaluate potential soil vapor intrusion pathways. In addition, three new groundwater monitoring wells were installed to provide additional information on groundwater quality.

Based on the results of the July 2008 investigation, soil samples from two soil borings advanced into the landfill cell contained concentration of chromium greater that the site-specific cleanup criteria. Three soil borings contained concentrations of lead greater than the designated site-specific cleanup value and or 6NYCRR Part 375 Commercial SCO for lead. Arsenic, manganese, or copper exceeded the 6NYCRR Part 375 Commercial SCOs in at least one subsurface soil sample collected from the site. One sub-slab soil vapor sample contained concentrations of VOCs slightly greater than the NYSDOH Guidance value for mitigation. Although groundwater samples were not collected from the three new wells installed at the site during the investigation, none of the groundwater samples collected from the existing monitoring network contained concentrations of VOCs or metals greater than the respective NYSDEC Class GA Standards or site-specific cleanup goals (Malcolm Pirnie, 2008).

In April 2009, NYSDEC collected groundwater samples from all new and existing groundwater monitoring wells at the site for analysis of VOCs, SVOCs, and metals. Based on the results provided by NYSDEC, none of the samples contained concentrations of VOCs or SVOCs greater than corresponding NYSDEC Class GA Standards. Sodium was detected in samples from four wells at concentrations greater than the NYSDEC Class GA Standard. One sample contained lead at a concentration greater than the respective site-specific cleanup goal and NYSDEC Class GA Standard.

In July 2009, surface soil samples were collected from the site to evaluate the potential for surface soil to be an exposure route to site related contaminants. Six surface soil samples were collected from the site in areas known to have contained piles of debris, coal, or concentrations of metals in subsurface soil or groundwater greater than the respective 6NYCRR Part 375, NYSDEC Class GA, or site-specific cleanup goals. None of the surface soil samples contained concentrations of metals greater than the

corresponding 6NYCRR Part 375 Commercial SCOs; however, one surface soil sample contained lead at a concentration greater than the applicable site-specific clean up goal.

In October 2010, groundwater samples were collected from all groundwater monitoring wells and analyzed for VOCs, SVOCs, and metals. None of the samples contained concentrations of VOCs or SVOCs greater than corresponding NYSDEC Class GA Standards. Sodium was detected in samples from four wells at concentrations greater than the NYSDEC Class GA Standard.

In December 2010, a limited soil vapor intrusion (SVI) investigation was performed to evaluate potential sources of VOCs identified in sub-slab air samples collected in 2008. None of the sub-slab soil vapor samples collected during the 2010 SVI investigation contained concentrations of VOCs greater than the respective NYSDOH Guidance values.

In January 2011, groundwater monitoring well MW-6 was installed at an adjacent property north of the landfill cell to provide additional information on water quality and groundwater flow direction in the vicinity of the site. Sub-surface soil samples collected from the soil boring were analyzed for VOCs, SVOCs and metals. No VOC, SVOCs or metals were detected in the soil samples at concentrations greater than the applicable 6NYCRR Part 375 Commercial SCOs.

In February 2011, groundwater samples were collected from groundwater monitoring well MW-6 and analyzed for VOCs, SVOCs, and metals. Groundwater samples collected from the remainder of the wells were analyzed for metals only. The samples collected from MW-6 did not contain any VOCs, SVOCs or metals at concentrations greater than corresponding NYSDEC Class GA Standards. Sodium was detected in samples from five on-site wells and iron was detected in samples from two on-site wells at concentrations greater than the applicable NYSDEC Class GA Standards. Groundwater level measurements from the wells indicate that the direction of groundwater flow is generally toward the east in the vicinity of the landfill (the western portion of the site) and toward the northeast on the eastern portion of the site.

Appendix A contains summaries tables with historic groundwater, soil, SVI sampling data from 2007 through 2011.

3. Operation and Maintenance Plan

The O&M Plan will be implemented to provide guidance for maintenance of the site.

3.1. Operation and Maintenance

Operation and Maintenance activities will be conducted on a semi-annual basis. A site-specific O&M inspection checklist (Appendix B) will be used to provide on-site personnel a guideline for proper O&M procedures, including landfill security and landfill cap maintenance. A list of site contacts is provided in Appendix C.

3.1.1. Landfill Security

The landfill perimeter fence, entry gate, and locks will be inspected for proper operation and signs of deterioration. A warning sign will be maintained at the Foundry Street entrance gate that provides a warning indicating the area within the fence contains hazardous waste and unauthorized entry is forbidden.

3.1.2. Landfill Cap Maintenance

The landfill cover will be mowed on an annual basis to reduce the potential for large, woody vegetation from compromising the integrity of the landfill cap system. The landfill cap is currently mowed by the NYSDEC Operations Department. A visual inspection of the landfill cover will be performed on a semi-annual basis (late spring and fall) to assess the site for burrowing rodents, erosion, woody vegetation, and settlement.

4. Long-term Monitoring Plan

4.1. Groundwater Monitoring

Groundwater samples will be collected from all existing groundwater monitoring wells. Figure 2 shows the locations of the wells to be included in LTM sampling events. Groundwater samples will be collected from wells MW-1R, MW-2, MW-3, MW-3D, MW-4, MW-5, MW-6, MW-7, and MW-8 on a five-quarter basis to provide information on seasonal groundwater quality over time.

4.1.1. Groundwater Sampling and Analysis

Groundwater samples will be collected from existing monitoring wells every 15 months in accordance with the USEPA Low Flow-Low Purge Sampling Protocol (1998). A peristaltic pump will be used to collect the groundwater samples. Prior to sampling, the water level will be measured using an electronic water level probe. Field parameters including pH, specific conductivity, temperature, turbidity, oxidation-reduction potential (ORP), and dissolved oxygen will be measured during well purging using a flow-through cell system. Purged groundwater will be visually assessed for the potential presence of LNAPL.

Groundwater samples will be sent to a NYSDOH ELAP and NYSDEC ASP-approved analytical laboratory under chain-of-custody procedures for analysis of Target Analyte List (TAL) metals by USEPA Method 6010B, including:

- Aluminum
- Antimony
- Arsenic
- Barium
- Beryllium
- Cadmium
- Calcium
- Chromium
- Cobalt
- Copper
- Iron
- Lead
- Magnesium
- Manganese
- Mercury
- Molybdenum
- Nickel
- Potassium
- Selenium
- Silver
- Sodium
- Thallium
- Tin
- Titanium
- Vanadium
- Zinc

If the turbidity of the groundwater samples is greater than 50 Nephelometric Turbidity Units (NTUs) at the conclusion of well purging, total (unfiltered) and dissolved (filtered) fraction groundwater samples will be collected. The dissolved fraction groundwater samples will be filtered using a .45 micron in-line disposable filter.

5. Institutional and Engineering Control Plan

5.1. Institutional Controls

Institutional controls are non-engineering measures and usually, but not always, are legal controls intended to affect human activities in such a way as to prevent or reduce exposure to contamination. The ROD specified that deed restrictions should be implemented; however, no deed restrictions are currently established for the site. In lieu of deed restrictions, the NYSDEC has imposed the following ICs:

- Notification - The NYSDEC must be notified and approve intrusive activities to be performed at the site which will extend below the cover system and possibly disturb contaminated soil. In addition, Local officials, school districts, and adjacent property owners will be notified of any potential hazards associated with on-site activities. A Site Notification List is provided in Appendix D.
- Ground Intrusive Activities Restriction - Excavation and/or removal of soil from the site will be restricted. Excavated soil/material will require the appropriate characterization for the intended use or off-site disposal. No excavations will be conducted that could interfere with the performance of the remedy.
- Groundwater Monitoring – Monitor groundwater quality at each of the existing site monitoring wells to document contaminant concentrations and distribution. This program will evaluate if the selected remedy (landfill) is effective at reducing groundwater infiltration through the contaminated materials to an amount that does not have adverse impacts to groundwater.
- Periodic Review Report - The site owner will periodically (at the direction of the NYSDEC) certify that the required institutional and engineering controls are in place and remain effective for the protection of public health and the environment.

As recommended by the ROD, deed restrictions for the site should also consider the following ICs:

- Site Use Restrictions - Prohibit the site from being used for purposes other than commercial use, including passive recreational use, and industrial use consistent with local zoning. Environmental easements should be binding on all future owners of the site.
- Groundwater Use Restriction - The use of groundwater underlying the site as a source of potable or process water should be prohibited without necessary water quality treatment as determined by the NYSDOH. This should be performed until groundwater quality is deemed acceptable by the NYSDEC based on long-term monitoring.

5.2. Engineering Controls

Engineering controls are physical barriers intended to reduce the potential for human contact with site-related contamination. The engineering controls at the Tioga Casting site include a landfill cap and cover system and perimeter fence. The engineering controls are inspected and maintained in accordance with the O&M Plan.

5.2.1. Landfill

The Tioga Casting Site landfill was constructed in 1997 in accordance with the ROD. The landfill was constructed by consolidating on and off-site wastes and placing them in the existing on-site landfill. According the Tioga Castings Remediation Summary Report (NYSDEC, 1998), a "foundation layer" was placed over the consolidated landfill wastes. The remainder of the landfill cover system (from bottom to top) consists of a 60-mil HDPE liner, geo-composite drainage material, approximately two feet of compacted barrier protection soil, and six inches of topsoil.

5.2.2. Fencing

The Tioga Casting Site landfill has a perimeter fence with locking gate to limit access to the site. A warning sign is present on the perimeter fence access gate indicating the area within the fence contains hazardous waste and that unauthorized entry is forbidden.

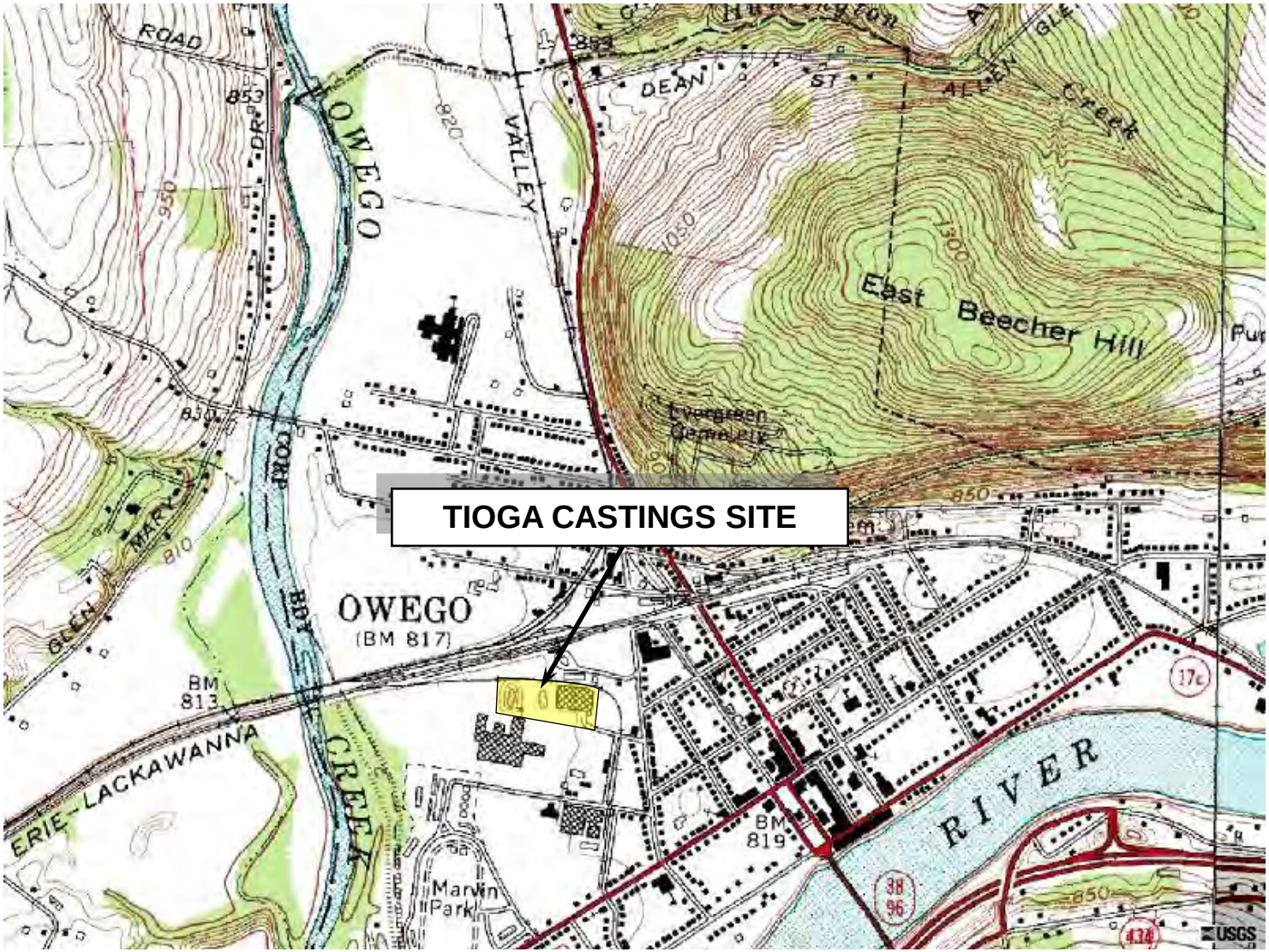
6. Health and Safety Plan

A site-specific HASP for the Tioga Castings Site is presented on the following page.

7. References

Malcolm Pirnie, Inc., 2008, Investigation Report - Tioga Castings Site, Oswego New York New.

NYSDEC, 1998, Remediation Summary Report, Tioga Castings Site, Village of Owego, Tioga County, New York, Site No. 7-54-012, New York State Department of Environmental Conservation.



SCALE IN FEET

0 500 1000 2000

SOURCE: U.S.G.S 7.5 MIN. OWEGO QUAD, 1990

F:\PROJECT\0266352\File\SMP\Site Map

MALCOLM PIRNIE

NYSDEC STANDBY CONTRACT NO. D004443
TIOGA CASTING FACILITIES
OWEGO, NEW YORK

TIOGA CASTINGS SITE LOCATION

FIGURE 1

RAILROAD TRACKS

MW-6

MW-4

LANDFILL AREA

MW-3

MW-3D

MW-8

LEVELED FOUNDRY SITE

MW-1 (ABANDONED)

MW-1R

MCMASTER ST.

PARKING AREA

MW-5

MW-2

MW-7

FOUNDRY ST.

ARMSTRONG PL.

FORMER OWEGO APALACHIN MIDDLE SCHOOL

LEGEND

MW-3 MONITORING WELL LOCATION

RAILROAD TRACKS

ROADWAY/DRIVEWAY

BUILDING

FENCE

PROPERTY LINE

50 0 50 100

SCALE: 1" = 100'

MALCOLM PIRNIE

NYSDEC STANDBY CONTRACT NO. D004443-8
NYSDEC SITE NO. 7-54-012
TIOGA CASTING FACILITY
OWEGO, NEW YORK

SAMPLING LOCATIONS

SCALE: 1" = 100'

MALCOLM PIRNIE, INC.

MARCH 2011

FIGURE 2

Appendix A

Analytical Data Summary

Groundwater

MALCOLM PIRNIE

Appendix A
Groundwater Sample Results - VOCs
Tioga Casting Site
NYSDEC Site Number 7-54-012

Well Date Units	NYSDEC Class GA Standards	MW-1R 4/2/2009 ug/L	MW-1R 10/28/2010 ug/L	MW-2 7/17/2008 ug/L	MW-2 4/2/2009 ug/L	MW-2 10/28/2010 ug/L
1,1,1-Trichloroethane	5	10 U	0.4 U	10 U	10 U	0.4 U
1,1,2,2,-Tetrachloroethane	5	10 U	0.31 U	10 U	10 U	0.31 U
1,1,2-Trichloro-1,2,2-trifluoroethane	5	NA	0.38 U	10 U	NA	0.38 U
1,1,2-Trichloroethane	1	10 U	0.45 U	10 U	10 U	0.45 U
1,1-Dichloroethane	5	10 U	0.36 U	10 U	10 U	0.36 U
1,1-Dichloroethene	5	10 U	0.47 U	10 U	10 U	0.47 U
1,2-Dichloropropane	1	10 U	0.46 U	10 U	10 U	0.46 U
2-Hexanone	50*	10 U	1.9 U	10 U	10 U	1.9 U
Acetone		15 U	0.5 U	10 U	15 U	0.5 U
Benzene	1	10 U	0.32 U	10 U	10 U	0.32 U
Bromodichloromethane	50	10 U	0.36 U	10 U	10 U	0.36 U
Bromoform	50*	10 U	0.47 U	10 U	10 U	0.47 U
Bromomethane	5	10 U	0.2 U	10 U	10 U	0.2 U
Carbon Disulfide	60	10 U	0.2 U	10 U	10 U	0.2 U
Carbon Tetrachloride	5	10 U	0.2 U	10 U	10 U	0.2 U
Chlorobenzene	5	10 U	0.49 U	10 U	10 U	0.49 U
Chloroethane	5	10 U	0.2 U	10 U	10 U	0.2 U
Chloroform	7	10 U	0.34 U	10 U	10 U	0.34 U
Chloromethane		10 U	0.2 U	10 U	10 U	0.2 U
cis 1,2-Dichloroethene	5	10 U	0.35 U	10 U	10 U	0.35 U
cis-1,3-Dichloropropene	0.4	10 U	0.31 U	10 U	10 U	0.31 U
Dibromochloromethane	5	10 U	0.2 U	10 U	10 U	0.2 U
Ethylbenzene	5	10 U	0.2 U	10 U	10 U	0.2 U
Methyl Ethyl Ketone	50	10 U	1.3 U	10 U	10 U	1.3 U
Methyl isobutyl ketone		10 U	2.1 U	10 U	10 U	2.1 U
Methylene Chloride	5	10 U	0.41 U	10 U	10 U	0.41 U
Methyl-tert butyl ether	10	10 U	0.35 U	10 U	10 U	0.35 U
o-Xylene	5	10 U	0.43 U	NA	10 U	0.43 U
Styrene	5	10 U	0.36 U	10 U	10 U	0.36 U
Tetrachloroethene	5	10 U	0.27 U	10 U	10 U	0.27 U
Toluene	5	10 U	0.37 U	10 U	10 U	0.37 U
trans 1,2-Dichloroethene	5	10 U	0.41 U	10 U	10 U	0.41 U
trans-1,3-Dichloropropene	0.4	10 U	0.29 U	10 U	10 U	0.29 U
Trichloroethene	5	10 U	0.28 U	10 U	10 U	0.28 U
Vinyl Chloride	2	10 U	0.34 U	10 U	10 U	0.34 U
Xylenes, Total		NA	NA	10 U	NA	NA

U - Analyte not detected at indicated quantitation limit.
J - Estimated.
NA - Not Analyzed

Appendix A
Groundwater Sample Results - VOCs
Tioga Casting Site
NYSDEC Site Number 7-54-012

Well Date Units	NYSDEC Class GA Standards	MW-3 4/2/2009 ug/L	MW-3 10/28/2010 ug/L	MW-3D 4/2/2009 ug/L	MW-3D 10/28/2010 ug/L	MW-4 7/17/2008 ug/L
1,1,1-Trichloroethane	5	10 U	0.4 U	10 U	0.4 U	10 U
1,1,2,2,-Tetrachloroethane	5	10 U	0.31 U	10 U	0.31 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane	5	NA	0.38 U	NA	0.38 U	10 U
1,1,2-Trichloroethane	1	10 U	0.45 U	10 U	0.45 U	10 U
1,1-Dichloroethane	5	10 U	0.36 U	10 U	0.36 U	10 U
1,1-Dichloroethene	5	10 U	0.47 U	10 U	0.47 U	10 U
1,2-Dichloropropane	1	10 U	0.46 U	10 U	0.46 U	10 U
2-Hexanone	50*	10 U	1.9 U	10 U	1.9 U	10 U
Acetone		15 U	0.5 U	15 U	0.5 U	10 U
Benzene	1	10 U	0.32 U	10 U	0.32 U	10 U
Bromodichloromethane	50	10 U	0.36 U	10 U	0.36 U	10 U
Bromoform	50*	10 U	0.47 U	10 U	0.47 U	10 U
Bromomethane	5	10 U	0.2 U	10 U	0.2 U	10 U
Carbon Disulfide	60	10 U	0.2 U	10 U	0.2 U	10 U
Carbon Tetrachloride	5	10 U	0.2 U	10 U	0.2 U	10 U
Chlorobenzene	5	10 U	0.49 U	10 U	0.49 U	10 U
Chloroethane	5	10 U	0.2 U	10 U	0.2 U	10 U
Chloroform	7	10 U	0.34 U	10 U	0.34 U	10 U
Chloromethane		10 U	0.2 U	10 U	0.2 U	10 U
cis 1,2-Dichloroethene	5	10 U	0.35 U	10 U	0.35 U	10 U
cis-1,3-Dichloropropene	0.4	10 U	0.31 U	10 U	0.31 U	10 U
Dibromochloromethane	5	10 U	0.2 U	10 U	0.2 U	10 U
Ethylbenzene	5	10 U	0.2 U	10 U	0.2 U	10 U
Methyl Ethyl Ketone	50	10 U	1.3 U	10 U	1.3 U	10 U
Methyl isobutyl ketone		10 U	2.1 U	10 U	2.1 U	10 U
Methylene Chloride	5	10 U	0.41 U	10 U	0.41 U	10 U
Methyl-tert butyl ether	10	10 U	0.35 U	10 U	0.35 U	10 U
o-Xylene	5	10 U	0.43 U	10 U	0.43 U	NA
Styrene	5	10 U	0.36 U	10 U	0.36 U	10 U
Tetrachloroethene	5	10 U	0.27 U	10 U	0.27 U	10 U
Toluene	5	10 U	0.37 U	10 U	0.37 U	10 U
trans 1,2-Dichloroethene	5	10 U	0.41 U	10 U	0.41 U	10 U
trans-1,3-Dichloropropene	0.4	10 U	0.29 U	10 U	0.29 U	10 U
Trichloroethene	5	10 U	0.28 U	10 U	0.28 U	10 U
Vinyl Chloride	2	10 U	0.34 U	10 U	0.34 U	10 U
Xylenes, Total		NA	NA	NA	NA	10 U

U - Analyte not detected at indicated quantitation limit.
J - Estimated.
NA - Not Analyzed

Appendix A
Groundwater Sample Results - VOCs
Tioga Casting Site
NYSDEC Site Number 7-54-012

Well Date Units	NYSDEC Class GA Standards	MW-4 4/2/2009 ug/L	MW-4 10/28/2010 ug/L	MW-5 7/17/2008 ug/L	MW-5 4/2/2009 ug/L	MW-5 10/28/2010 ug/L
1,1,1-Trichloroethane	5	10 U	0.4 U	10 U	10 U	0.4 U
1,1,2,2,-Tetrachloroethane	5	10 U	0.31 U	10 U	10 U	0.31 U
1,1,2-Trichloro-1,2,2-trifluoroethane	5	NA	0.38 U	10 U	NA	0.38 U
1,1,2-Trichloroethane	1	10 U	0.45 U	10 U	10 U	0.45 U
1,1-Dichloroethane	5	10 U	0.36 U	10 U	10 U	0.36 U
1,1-Dichloroethene	5	10 U	0.47 U	10 U	10 U	0.47 U
1,2-Dichloropropane	1	10 U	0.46 U	10 U	10 U	0.46 U
2-Hexanone	50*	10 U	1.9 U	10 U	10 U	1.9 U
Acetone		15 U	0.5 U	10 U	15 U	0.5 U
Benzene	1	10 U	0.32 U	10 U	10 U	0.32 U
Bromodichloromethane	50	10 U	0.36 U	10 U	10 U	0.36 U
Bromoform	50*	10 U	0.47 U	10 U	10 U	0.47 U
Bromomethane	5	10 U	0.2 U	10 U	10 U	0.2 U
Carbon Disulfide	60	10 U	0.2 U	10 U	10 U	0.2 U
Carbon Tetrachloride	5	10 U	0.2 U	10 U	10 U	0.2 U
Chlorobenzene	5	10 U	0.49 U	10 U	10 U	0.49 U
Chloroethane	5	10 U	0.2 U	10 U	10 U	0.2 U
Chloroform	7	10 U	0.34 U	10 U	10 U	0.34 U
Chloromethane		10 U	0.2 U	10 U	10 U	0.2 U
cis 1,2-Dichloroethene	5	10 U	0.35 U	10 U	10 U	0.35 U
cis-1,3-Dichloropropene	0.4	10 U	0.31 U	10 U	10 U	0.31 U
Dibromochloromethane	5	10 U	0.2 U	10 U	10 U	0.2 U
Ethylbenzene	5	10 U	0.2 U	10 U	10 U	0.2 U
Methyl Ethyl Ketone	50	10 U	1.3 U	10 U	10 U	1.3 U
Methyl isobutyl ketone		10 U	2.1 U	10 U	10 U	2.1 U
Methylene Chloride	5	10 U	0.41 U	10 U	10 U	0.41 U
Methyl-tert butyl ether	10	10 U	0.35 U	10 U	10 U	0.35 U
o-Xylene	5	10 U	0.43 U	NA	10 U	0.43 U
Styrene	5	10 U	0.36 U	10 U	10 U	0.36 U
Tetrachloroethene	5	10 U	0.27 U	10 U	10 U	0.27 U
Toluene	5	10 U	0.37 U	10 U	10 U	0.37 U
trans 1,2-Dichloroethene	5	10 U	0.41 U	10 U	10 U	0.41 U
trans-1,3-Dichloropropene	0.4	10 U	0.29 U	10 U	10 U	0.29 U
Trichloroethene	5	10 U	0.28 U	10 U	10 U	0.28 U
Vinyl Chloride	2	10 U	0.34 U	10 U	10 U	0.34 U
Xylenes, Total		NA	NA	10 U	NA	NA

U - Analyte not detected at indicated quantitation limit.
J - Estimated.
NA - Not Analyzed

Appendix A
Groundwater Sample Results - VOCs
Tioga Casting Site
NYSDEC Site Number 7-54-012

Well Date Units	NYSDEC Class GA Standards	MW-6 2/28/2011 ug/L	MW-7 4/2/2009 ug/L	MW-7 10/28/2010 ug/L	MW-8 4/2/2009 ug/L	MW-8 10/28/2010 ug/L
1,1,1-Trichloroethane	5	0.5 U	10 U	0.4 U	10 U	0.4 U
1,1,2,2,-Tetrachloroethane	5	0.5 U	10 U	0.31 U	10 U	0.31 U
1,1,2-Trichloro-1,2,2-trifluoroethane	5	0.5 U	NA	0.38 U	NA	0.38 U
1,1,2-Trichloroethane	1	0.5 U	10 U	0.45 U	10 U	0.45 U
1,1-Dichloroethane	5	0.5 U	10 U	0.36 U	10 U	0.36 U
1,1-Dichloroethene	5	0.5 U	10 U	0.47 U	10 U	0.47 U
1,2-Dichloropropane	1	0.5 U	10 U	0.46 U	10 U	0.46 U
2-Hexanone	50*	2 U	10 U	1.9 U	10 U	1.9 U
Acetone		0.92 J B	15 U	0.5 U	15 U	0.5 U
Benzene	1	0.5 U	10 U	0.32 U	10 U	0.32 U
Bromodichloromethane	50	0.5 U	10 U	0.36 U	10 U	0.36 U
Bromoform	50*	0.5 U	10 U	0.47 U	10 U	0.47 U
Bromomethane	5	1 U	10 U	0.2 U	10 U	0.2 U
Carbon Disulfide	60	0.5 U	10 U	0.2 U	10 U	0.2 U
Carbon Tetrachloride	5	0.5 U	10 U	0.2 U	10 U	0.2 U
Chlorobenzene	5	0.5 U	10 U	0.49 U	10 U	0.49 U
Chloroethane	5	1 U	10 U	0.2 U	10 U	0.2 U
Chloroform	7	0.5 U	10 U	0.34 U	10 U	0.34 U
Chloromethane		0.5 U	10 U	0.2 U	10 U	0.2 U
cis 1,2-Dichloroethene	5	0.5 U	10 U	0.35 U	10 U	0.35 U
cis-1,3-Dichloropropene	0.4	0.5 U	10 U	0.31 U	10 U	0.31 U
Dibromochloromethane	5	0.5 U	10 U	0.2 U	10 U	0.2 U
Ethylbenzene	5	0.5 U	10 U	0.2 U	10 U	0.2 U
Methyl Ethyl Ketone	50	2 U	10 U	1.3 U	10 U	1.3 U
Methyl isobutyl ketone		2 U	10 U	2.1 U	10 U	2.1 U
Methylene Chloride	5	0.15 J B	10 U	0.41 U	10 U	0.41 U
Methyl-tert butyl ether	10	NA	10 U	0.35 U	10 U	0.35 U
o-Xylene	5	NA	10 U	0.43 U	10 U	0.43 U
Styrene	5	0.5 U	10 U	0.36 U	10 U	0.36 U
Tetrachloroethene	5	0.5 U	10 U	0.27 U	10 U	0.27 U
Toluene	5	0.5 U	4 J	0.37 U	10 U	0.37 U
trans 1,2-Dichloroethene	5	0.5 U	10 U	0.41 U	10 U	0.41 U
trans-1,3-Dichloropropene	0.4	0.5 U	10 U	0.29 U	10 U	0.29 U
Trichloroethene	5	0.5 U	10 U	0.28 U	10 U	0.28 U
Vinyl Chloride	2	0.5 U	10 U	0.34 U	10 U	0.34 U
Xylenes, Total		1 U	NA	NA	NA	NA

U - Analyte not detected at indicated quantitation limit.
J - Estimated.
NA - Not Analyzed

Appendix A
Groundwater Sample Results - SVOCs
Tioga Casting Site
NYSDEC Site Number 7-54-012

Well Date Units	NYSDEC Class GA Standard	MW-1R 4/2/2009 ug/L	MW-1R 10/28/2010 ug/L	MW-2 4/2/2009 ug/L	MW-2 10/28/2010 ug/L	MW-3 4/2/2009 ug/L	MW-3 10/28/2010 ug/L
2,4,5-trichlorophenol	1	11 U	0.4 U	12 U	0.4 U	11 U	0.39 U
2,4,6-trichlorophenol	1	11 U	0.55 U	12 U	0.55 U	11 U	0.55 U
2,4-dichlorophenol	5	11 U	0.65 U	12 U	0.65 U	11 U	0.65 U
2,4-dimethylphenol	1	11 U	0.7 U	12 U	0.7 U	11 U	0.7 U
2,4-Dinitrotoluene	5	11 U	1 U	12 U	1 U	11 U	1 U
2,6-Dinitrotoluene	5	11 U	0.32 U	12 U	0.32 U	11 U	0.31 U
2-chloronaphthalene	10*	11 U	0.16 U	12 U	0.16 U	11 U	0.16 U
2-chlorophenol		11 U	0.53 U	12 U	0.53 U	11 U	0.53 U
2-Methylnaphthalene		11 U	0.32 U	12 U	0.32 U	11 U	0.31 U
2-methylphenol		11 U	0.24 U	12 U	0.24 U	11 U	0.24 U
2-nitroaniline	5	23 U	0.49 U	24 U	0.49 U	22 U	0.48 U
2-nitrophenol		11 U	0.51 U	12 U	0.51 U	11 U	0.51 U
3,3'-dichlorobenzidine	5	11 U	2 U	12 U	2 U	11 U	2 U
3-nitroaniline	5	23 U	1.1 U	24 U	1.1 U	22 U	1.1 U
4,6-dinitro-2-methylphenol		23 U	0.73 U	24 U	0.73 U	22 U	0.73 U
4-bromophenyl phenyl ether		11 U	0.23 U	12 U	0.23 U	11 U	0.23 U
4-chloro-3-methylphenol		11 U	0.4 U	12 U	0.4 U	11 U	0.39 U
4-chloroaniline	5	11 U	2.8 U	12 U	2.8 U	11 U	2.8 U
4-chlorophenyl phenyl ether		11 U	0.21 U	12 U	0.21 U	11 U	0.21 U
4-nitroaniline	5	23 U	1.3 U	24 U	1.3 U	22 U	1.3 U
4-nitrophenol		23 U	2 U	24 U	2 U	22 U	2 U
acenaphthene	20*	11 U	0.21 U	12 U	0.21 U	11 U	0.21 U
acenaphthylene		11 U	0.69 U	12 U	0.69 U	11 U	0.69 U
anthracene	50*	11 U	0.16 U	12 U	0.16 U	11 U	0.16 U
benzo(a)anthracene	0.002*	11 U	0.16 U	12 U	0.16 U	11 U	0.16 U
benzo(a)pyrene	ND	11 U	0.14 U	12 U	0.14 U	11 U	0.14 U
benzo(b)fluoranthene	0.002*	11 U	0.29 U	12 U	0.29 U	11 U	0.28 U
benzo(g,h,i)perylene		11 U	0.29 U	12 U	0.29 U	11 U	0.28 U
benzo(k)fluoranthene	0.002*	11 U	0.18 U	12 U	0.18 U	11 U	0.18 U
bis(2-chloroethoxy)methane	5	11 U	0.54 U	12 U	0.54 U	11 U	0.54 U
bis(2-chloroethyl)ether	1	11 U	0.54 U	12 U	0.54 U	11 U	0.54 U
bis(2-ethylhexyl)phthalate	5	11 U	0.16 U	12 U	0.16 U	11 U	0.16 U
butyl benzyl phthalate	50*	11 U	0.19 U	12 U	0.19 U	11 U	0.19 U
carbazole		11 U	0.22 U	12 U	0.22 U	11 U	0.22 U
chrysene	0.002*	11 U	0.18 U	12 U	0.18 U	11 U	0.18 U
dibenzo(a,h)anthracene		11 U	0.42 U	12 U	0.42 U	11 U	0.41 U
Dibenzofuran		11 U	0.24 U	12 U	0.24 U	11 U	0.24 U
Diethyl phthalate	50*	11 U	0.38 U	12 U	0.38 U	11 U	0.37 U
dimethylphthalate	50*	11 U	0.22 U	12 U	0.22 U	11 U	0.22 U
di-n-butyl phthalate	50	11 U	2 U	12 U	2 U	11 U	2 U
di-n-octyl phthalate	50*	11 U	0.5 U	12 U	0.5 U	11 U	0.5 U
fluoranthene	50*	11 U	0.4 U	12 U	0.4 U	11 U	0.39 U
fluorene	50*	11 U	0.31 U	12 U	0.31 U	11 U	0.3 U
Hexachlorobenzene	0.04	11 U	0.18 U	12 U	0.18 U	11 U	0.18 U
Hexachlorobutadiene	0.5	11 U	0.25 U	12 U	0.25 U	11 U	0.25 U
Hexachlorocyclopentadiene	5	11 U	0.24 U	12 U	0.24 U	11 U	0.24 U
Hexachloroethane	5	11 U	0.25 U	12 U	0.25 U	11 U	0.25 U
indeno(1,2,3-cd)pyrene	0.002*	11 U	0.15 U	12 U	0.15 U	11 U	0.15 U
Isophorone	50*	11 U	0.3 U	12 U	0.3 U	11 U	0.29 U
Naphthalene	10*	11 U	0.12 U	12 U	0.12 U	11 U	0.12 U
Nitrobenzene	0.4	11 U	0.67 U	12 U	0.67 U	11 U	0.67 U
N-nitros-di-n-propylamine		11 U	0.2 U	12 U	0.2 U	11 U	0.2 U
N-nitrosodiphenylamine	50*	11 U	0.59 U	12 U	0.59 U	11 U	0.59 U
pentachlorophenol	1	23 U	1.7 U	24 U	1.7 U	22 U	1.7 U
phenanthrene	50	11 U	0.26 U	12 U	0.26 U	11 U	0.25 U
phenol	1	11 U	0.21 U	12 U	0.21 U	11 U	0.21 U
pyrene	50	11 U	0.2 U	12 U	0.2 U	11 U	0.2 U

* - Guidance Value.
U - Analyte not detected at indicated quantitation limit.
ND - Non-detect.

Appendix A
Groundwater Sample Results - SVOCs
Tioga Casting Site
NYSDEC Site Number 7-54-012

Well Date Units	NYSDEC Class GA Standard	MW-3D 4/2/2009 ug/L	MW-3D 10/28/2010 ug/L	MW-4 4/2/2009 ug/L	MW-4 10/28/2010 ug/L	MW-5 4/2/2009 ug/L	MW-5 10/28/2010 ug/L
2,4,5-trichlorophenol	1	12 U	0.4 U	12 U	0.39 U	11 U	0.39 U
2,4,6-trichlorophenol	1	12 U	0.56 U	12 U	0.54 U	11 U	0.54 U
2,4-dichlorophenol	5	12 U	0.66 U	12 U	0.64 U	11 U	0.64 U
2,4-dimethylphenol	1	12 U	0.71 U	12 U	0.69 U	11 U	0.69 U
2,4-Dinitrotoluene	5	12 U	1 U	12 U	1 U	11 U	1 U
2,6-Dinitrotoluene	5	12 U	0.32 U	12 U	0.31 U	11 U	0.31 U
2-chloronaphthalene	10*	12 U	0.16 U	12 U	0.16 U	11 U	0.16 U
2-chlorophenol		12 U	0.54 U	12 U	0.52 U	11 U	0.52 U
2-Methylnaphthalene		12 U	0.32 U	12 U	0.31 U	11 U	0.31 U
2-methylphenol		12 U	0.24 U	12 U	0.23 U	11 U	0.23 U
2-nitroaniline	5	24 U	0.49 U	24 U	0.48 U	23 U	0.48 U
2-nitrophenol		12 U	0.52 U	12 U	0.5 U	11 U	0.5 U
3,3'-dichlorobenzidine	5	12 U	2 U	12 U	1.9 U	11 U	1.9 U
3-nitroaniline	5	24 U	1.1 U	24 U	1.1 U	23 U	1.1 U
4,6-dinitro-2-methylphenol		24 U	0.74 U	24 U	0.72 U	23 U	0.72 U
4-bromophenyl phenyl ether		12 U	0.23 U	12 U	0.22 U	11 U	0.22 U
4-chloro-3-methylphenol		12 U	0.4 U	12 U	0.39 U	11 U	0.39 U
4-chloroaniline	5	12 U	2.9 U	12 U	2.8 U	11 U	2.8 U
4-chlorophenyl phenyl ether		12 U	0.21 U	12 U	0.2 U	11 U	0.2 U
4-nitroaniline	5	24 U	1.4 U	24 U	1.3 U	23 U	1.3 U
4-nitrophenol		24 U	2 U	24 U	1.9 U	23 U	1.9 U
acenaphthene	20*	12 U	0.21 U	12 U	0.2 U	11 U	0.2 U
acenaphthylene		12 U	0.7 U	12 U	0.68 U	11 U	0.68 U
anthracene	50*	12 U	0.16 U	12 U	0.16 U	11 U	0.16 U
benzo(a)anthracene	0.002*	12 U	0.16 U	12 U	0.16 U	11 U	0.16 U
benzo(a)pyrene	ND	12 U	0.14 U	12 U	0.14 U	11 U	0.14 U
benzo(b)fluoranthene	0.002*	12 U	0.29 U	12 U	0.28 U	11 U	0.28 U
benzo(g,h,i)perylene		12 U	0.29 U	12 U	0.28 U	11 U	0.28 U
benzo(k)fluoranthene	0.002*	12 U	0.18 U	12 U	0.17 U	11 U	0.17 U
bis(2-chloroethoxy)methane	5	12 U	0.55 U	12 U	0.53 U	11 U	0.53 U
bis(2-chloroethyl)ether	1	12 U	0.55 U	12 U	0.53 U	11 U	0.53 U
bis(2-ethylhexyl)phthalate	5	12 U	0.16 U	12 U	0.16 U	11 U	0.16 U
butyl benzyl phthalate	50*	12 U	0.19 U	12 U	0.18 U	11 U	0.18 U
carbazole		12 U	0.22 U	12 U	0.21 U	11 U	0.21 U
chrysene	0.002*	12 U	0.18 U	12 U	0.17 U	11 U	0.17 U
dibenzo(a,h)anthracene		12 U	0.42 U	12 U	0.41 U	11 U	0.41 U
Dibenzofuran		12 U	0.24 U	12 U	0.23 U	11 U	0.23 U
Diethyl phthalate	50*	12 U	0.38 U	12 U	0.37 U	11 U	0.37 U
dimethylphthalate	50*	12 U	0.22 U	12 U	0.21 U	11 U	0.21 U
di-n-butyl phthalate	50	12 U	2 U	12 U	1.9 U	11 U	1.9 U
di-n-octyl phthalate	50*	12 U	0.51 U	12 U	0.5 U	11 U	0.5 U
fluoranthene	50*	12 U	0.4 U	12 U	0.39 U	11 U	0.39 U
fluorene	50*	12 U	0.31 U	12 U	0.3 U	11 U	0.3 U
Hexachlorobenzene	0.04	12 U	0.18 U	12 U	0.17 U	11 U	0.17 U
Hexachlorobutadiene	0.5	12 U	0.25 U	12 U	0.24 U	11 U	0.24 U
Hexachlorocyclopentadiene	5	12 U	0.24 U	12 U	0.23 U	11 U	0.23 U
Hexachloroethane	5	12 U	0.25 U	12 U	0.24 U	11 U	0.24 U
indeno(1,2,3-cd)pyrene	0.002*	12 U	0.15 U	12 U	0.15 U	11 U	0.15 U
Isophorone	50*	12 U	0.3 U	12 U	0.29 U	11 U	0.29 U
Naphthalene	10*	12 U	0.12 U	12 U	0.12 U	11 U	0.12 U
Nitrobenzene	0.4	12 U	0.68 U	12 U	0.66 U	11 U	0.66 U
N-nitros-di-n-propylamine		12 U	0.2 U	12 U	0.19 U	11 U	0.19 U
N-nitrosodiphenylamine	50*	12 U	0.6 U	12 U	0.58 U	11 U	0.58 U
pentachlorophenol	1	24 U	1.7 U	24 U	1.7 U	23 U	1.7 U
phenanthrene	50	12 U	0.26 U	12 U	0.25 U	11 U	0.25 U
phenol	1	12 U	0.21 U	12 U	0.2 U	11 U	0.2 U
pyrene	50	12 U	0.2 U	12 U	0.19 U	11 U	0.19 U

* - Guidance Value.
U - Analyte not detected at indicated quantitation limit.
ND - Non-detect.

Appendix A
Groundwater Sample Results - SVOCs
Tioga Casting Site
NYSDEC Site Number 7-54-012

Well Date Units	NYSDEC Class GA Standard	MW-6 2/28/2011 ug/L	MW-7 4/2/2009 ug/L	MW-7 10/28/2010 ug/L	MW-8 4/2/2009 ug/L	MW-8 10/28/2010 ug/L
2,4,5-trichlorophenol	1	11 U	11 U	0.39 U	11 U	0.39 U
2,4,6-trichlorophenol	1	4.3 U	11 U	0.55 U	11 U	0.55 U
2,4-dichlorophenol	5	4.3 U	11 U	0.65 U	11 U	0.65 U
2,4-dimethylphenol	1	4.3 U	11 U	0.7 U	11 U	0.7 U
2,4-Dinitrotoluene	5	4.3 U	11 U	1 U	11 U	1 U
2,6-Dinitrotoluene	5	4.3 U	11 U	0.31 U	11 U	0.31 U
2-chloronaphthalene	10*	4.3 U	11 U	0.16 U	11 U	0.16 U
2-chlorophenol		4.3 U	11 U	0.53 U	11 U	0.53 U
2-Methylnaphthalene		4.3 U	11 U	0.31 U	11 U	0.31 U
2-methylphenol		4.3 U	11 U	0.24 U	11 U	0.24 U
2-nitroaniline	5	4.3 U	23 U	0.48 U	22 U	0.48 U
2-nitrophenol		4.3 U	11 U	0.51 U	11 U	0.51 U
3,3'-dichlorobenzidine	5	4.3 U	11 U	2 U	11 U	2 U
3-nitroaniline	5	4.3 U	23 U	1.1 U	22 U	1.1 U
4,6-dinitro-2-methylphenol		27 U	23 U	0.73 U	22 U	0.73 U
4-bromophenyl phenyl ether		4.3 U	11 U	0.23 U	11 U	0.23 U
4-chloro-3-methylphenol		5.4 U	11 U	0.39 U	11 U	0.39 U
4-chloroaniline	5	4.3 U	11 U	2.8 U	11 U	2.8 U
4-chlorophenyl phenyl ether		4.3 U	11 U	0.21 U	11 U	0.21 U
4-nitroaniline	5	4.3 U	23 U	1.3 U	22 U	1.3 U
4-nitrophenol		11 U	23 U	2 U	22 U	2 U
acenaphthene	20*	4.3 U	11 U	0.21 U	11 U	0.21 U
acenaphthylene		4.3 U	11 U	0.69 U	11 U	0.69 U
anthracene	50*	4.3 U	11 U	0.16 U	11 U	0.16 U
benzo(a)anthracene	0.002*	4.3 U	11 U	0.16 U	11 U	0.16 U
benzo(a)pyrene	ND	4.3 U	11 U	0.14 U	11 U	0.14 U
benzo(b)fluoranthene	0.002*	4.3 U	11 U	0.28 U	11 U	0.28 U
benzo(g,h,i)perylene		4.3 U	11 U	0.28 U	11 U	0.28 U
benzo(k)fluoranthene	0.002*	4.3 U	11 U	0.18 U	11 U	0.18 U
bis(2-chloroethoxy)methane	5	4.3 U	11 U	0.54 U	11 U	0.54 U
bis(2-chloroethyl)ether	1	4.3 U	11 U	0.54 U	11 U	0.54 U
bis(2-ethylhexyl)phthalate	5	2.6 J B	11 U	0.16 U	11 U	0.16 U
butyl benzyl phthalate	50*	4.3 U	11 U	0.19 U	11 U	0.19 U
carbazole		4.3 U	11 U	0.22 U	11 U	0.22 U
chrysene	0.002*	4.3 U	11 U	0.18 U	11 U	0.18 U
dibenzo(a,h)anthracene		4.3 U	11 U	0.41 U	11 U	0.41 U
Dibenzofuran		4.3 U	11 U	0.24 U	11 U	0.24 U
Diethyl phthalate	50*	4.3 U	11 U	0.37 U	11 U	0.37 U
dimethylphthalate	50*	4.3 U	11 U	0.22 U	11 U	0.22 U
di-n-butyl phthalate	50	4.3 U	11 U	2 U	11 U	2 U
di-n-octyl phthalate	50*	4.3 U	11 U	0.5 U	11 U	0.5 U
fluoranthene	50*	4.3 U	11 U	0.39 U	11 U	0.39 U
fluorene	50*	4.3 U	11 U	0.3 U	11 U	0.3 U
Hexachlorobenzene	0.04	4.3 U	11 U	0.18 U	11 U	0.18 U
Hexachlorobutadiene	0.5	4.3 U	11 U	0.25 U	11 U	0.25 U
Hexachlorocyclopentadiene	5	4.3 U	11 U	0.24 U	11 U	0.24 U
Hexachloroethane	5	4.3 U	11 U	0.25 U	11 U	0.25 U
indeno(1,2,3-cd)pyrene	0.002*	4.3 U	11 U	0.15 U	11 U	0.15 U
Isophorone	50*	4.3 U	11 U	0.29 U	11 U	0.29 U
Naphthalene	10*	4.3 U	11 U	0.12 U	11 U	0.12 U
Nitrobenzene	0.4	4.3 U	11 U	0.67 U	11 U	0.67 U
N-nitros-di-n-propylamine		4.3 U	11 U	0.2 U	11 U	0.2 U
N-nitrosodiphenylamine	50*	4.3 U	11 U	0.59 U	11 U	0.59 U
pentachlorophenol	1	27 U	23 U	1.7 U	22 U	1.7 U
phenanthrene	50	4.3 U	11 U	0.25 U	11 U	0.25 U
phenol	1	4.3 U	11 U	0.21 U	11 U	0.21 U
pyrene	50	4.3 U	11 U	0.2 U	11 U	0.2 U

* - Guidance Value.
U - Analyte not detected at indicated quantitation limit.
ND - Non-detect.

Appendix A
Summary of Groundwater Sample Results - Metals
Tioga Castings Site
Owego, New York
NYSDEC Site Number 7-54-012

Well Date Units	NYSDEC Class GA Standards	MW-1R 4/13/2009 ug/L		MW-1R 3/18/2010 ug/L		MW-1R 10/28/2010 ug/L		MW-1R 2/28/2011 ug/L		MW-2 8/2/2007 ug/L		MW-2 7/17/2008 ug/L		MW-2 4/13/2009 ug/L	
Aluminum		1050		41.0	BE	20.8	J	37.7	J	60.2	B	23.6	U	632	
Antimony	3	6.7	U	6.8	U	8.0	U	15.0	U	5.6	U	5.5	U	6.7	U
Arsenic	25	3.0	U	5.6	U	4.2	U	15.0	U	4.2	U	3.7	U	3.0	U
Barium	1000	59.8	B	51.9	BE	50.7		48.7		61.6	B	54.3	B	102	
Beryllium	3*	0.5	U	0.2	BE	0.7	U	5.0	U	0.40	B	0.3	U	0.5	U
Cadmium	5 [10]	0.3	U	0.6	BE	0.5	U	5.0	U	0.36	U	0.3	U	0.3	U
Calcium		61200		63700		58900		58700		54500	E	48800		50900	
Chromium	50 [50]	10.4	B	0.9	U	1.1	U	5.0	U	0.84	U	0.9	U	5.8	B
Cobalt		3.8	U	0.6	U	5.8	U	5.0	U	1.1	B	1.1	U	3.8	U
Copper	200	181		1.3	U	2.3	J	10.0	U	1.3	U	1.3	U	105	
Iron	300	**1410**		48.9	BE	43.7	J	86.4	J	19.3	U	19	U	**532**	
Lead	25 [25]	1.4	U	3.0	U	4.4	J	15.0	U	2.9	U	2.9	U	1.4	U
Magnesium		11500		12100		10900		11500		8650	E	7670		8320	
Manganese	300	106		16.5		3.9	J	11.3		2.8	B	8.2	B	211	
Mercury	0.7	NA		0.1	U	0.1	U	0.2	U	0.12	U	0.1	U	NA	
Nickel	100	6.9	B	1.4	BE	4.2	U	5.0	U	1.2	U	1.0	U	7.3	B
Potassium		2070	B	1640	BE	1640		1570		4710	BE	3900	B	4550	
Selenium	10	11.4	U	8.7	U	4.8	U	38.0	U	6.1	U	6.1	U	11.4	U
Silver	50	2.2	U	1.2	U	1.5	U	5.0	U	1.7	B	1.3	U	2.2	U
Sodium	20000	**25600**		**25100**		**23300**		**23300**		**36100**	**E**	18700		**25200**	
Thallium	0.5*	3.0	U	10.2	U	2.4	U	15.0	U	7.0	U	5.9	U	3.0	U
Titanium		8.8	B	NA		NA		NA		NA		NA		5.0	U
Vanadium		4.7	U	1.1	U	6.1	U	5.0	U	0.80	B	1.0	U	4.7	U
Zinc	2000*	13.5	U	4.1	BE	21.1		25.0	U	3.6	U	3.6	U	13.5	U

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1 - duplicate sample from MW-6
NA - Not analyzed.
U - Analyte not detected.
B - Greater than MDL but less than RL.
MDL - Method detection limit.
RL - Reporting limit.
E - Estimated value.
[25] - Site-specific cleanup goal.

Appendix A
Summary of Groundwater Sample Results - Metals
Tioga Castings Site
Owego, New York
NYSDEC Site Number 7-54-012

Well Date Units	NYSDEC Class GA Standards	MW-2 3/19/2010 ug/L		MW-2 10/28/2010 ug/L		MW-2 2/28/2011 ug/L		MW-3 4/13/2009 ug/L		MW-3 3/19/2010 ug/L		MW-3 10/28/2010 ug/L		MW-3 2/28/2011 ug/L	
Aluminum		57.8	BE	9.2	J	250.0	U	195.0		39.8	U	17.7	J	250.0	U
Antimony	3	6.8	U	8.0	U	15.0	U	6.7	U	6.8	U	8.0	U	15.0	U
Arsenic	25	5.6	U	4.2	U	15.0	U	3.0	U	5.6	U	4.2	U	15.0	U
Barium	1000	48.8	BE	78.9		45.5		38.3	B	46.5	BE	57.1		44.6	
Beryllium	3*	0.2	U	0.7	U	5.0	U	0.5	U	0.2	U	0.7	U	5.0	U
Cadmium	5 [10]	0.3	BE	0.5	U	5.0	U	0.3	U	0.3	U	0.5	U	5.0	U
Calcium		51400		62900		42400		42900		51300		54400		49800	
Chromium	50 [50]	0.9	U	1.1	U	5.0	U	3.5	B	0.9	U	1.1	U	5.0	U
Cobalt		0.6	U	5.8	U	5.0	U	3.8	U	0.6	U	5.8	U	5.0	U
Copper	200	1.3	U	2.0	U	10.0	U	71.3		1.3	U	2.0	U	10.0	U
Iron	300	28.6	BE	29.4	J	125.0	U	144	B	19.3	U	55.6		125.0	U
Lead	25 [25]	3.0	U	3.3	J	15.0	U	1.5	B	3.0	U	5.1	J	15.0	U
Magnesium		8290		10100		6960		7450		9270		9550		9300	
Manganese	300	54.2		5.0	J	3.9	J	14.0	B	0.3	BE	3.0	J	8.0	U
Mercury	0.7	0.1	U	0.1	U	0.2	U	NA		0.1	U	0.1	U	0.2	U
Nickel	100	1.3	U	4.2	U	5.0	U	4.2	B	1.3	U	4.2	U	5.0	U
Potassium		4550	BE	5830		4450		1430	B	1890	BE	1480		1230	
Selenium	10	8.7	U	4.8	U	38.0	U	11.4	U	8.7	U	4.8	U	38.0	U
Silver	50	1.2	U	1.5	U	5.0	U	2.2	U	1.2	U	1.5	U	5.0	U
Sodium	20000	**24000**		**35000**		**22000**		17000		16900		17000		15200	
Thallium	0.5*	10.2	U	2.4	U	15.0	U	3.0	U	10.2	U	2.4	U	15.0	U
Titanium		NA		NA		NA		5.0	U	NA		NA		NA	
Vanadium		1.1	U	6.1	U	5.0	U	4.7	U	1.1	U	6.1	U	5.0	U
Zinc	2000*	2.3	BE	12.9	J	25.0	U	13.5	U	1.5	U	44.3		25.0	U

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RL - Reporting limit.
E - Estimated value.
[25] - Site-specific cleanup goal.

Appendix A
Summary of Groundwater Sample Results - Metals
Tioga Castings Site
Owego, New York
NYSDEC Site Number 7-54-012

Well Date Units	NYSDEC Class GA Standards	MW-3D 4/13/2009 ug/L		MW-3D 3/18/2010 ug/L		MW-3D 10/28/2010 ug/L		MW-3D 2/28/2011 ug/L		MW-4 8/2/2007 ug/L		MW-4 7/17/2008 ug/L		MW-4 4/13/2009 ug/L	
Aluminum		668		39.8	U	11.7	J	250.0	U	40.0	U	32.6	B	754	
Antimony	3	6.7	U	6.8	U	8.0	U	15.0	U	5.6	U	5.5	U	6.7	U
Arsenic	25	3.0	U	5.6	U	4.2	U	15.0	U	4.2	U	3.7	U	3.0	U
Barium	1000	39.2	B	45.3	BE	56.7		43.6		40.0	B	38.3	B	60.9	B
Beryllium	3*	0.5	U	0.2	U	0.7	U	5.0	U	0.27	U	0.3	U	0.5	U
Cadmium	5 [10]	0.3	U	0.3	U	0.5	U	5.0	U	0.36	U	0.7	B	0.3	U
Calcium		42300		50000		54000		48600		42700	E	42400		40500	
Chromium	50 [50]	3.8	B	0.9	U	1.1	U	5.0	U	0.84	U	0.9	U	3.4	B
Cobalt		3.8	U	0.6	U	5.8	U	5.0	U	0.89	U	1.1	U	3.8	U
Copper	200	56.6		1.3	U	2.3	J	10.0	U	1.4	B	1.3	U	49.7	
Iron	300	**558**		19.3	U	52.9		24.4	J	47.6	B	34	B	**667**	
Lead	25 [25]	1.4	U	3.0	U	4.6	J	15.0	U	2.9	U	2.9	U	1.4	U
Magnesium		7490		9120		9680		9120		8190	E	7830		7080	
Manganese	300	40.3	B	0.9	BE	2.2	J	1.2	J	0.79	B	1.2	B	79.4	
Mercury	0.7	NA		0.1	U	0.1	U	0.2	U	0.12	U	0.1	U	NA	
Nickel	100	3.9	B	1.3	U	4.2	U	5.0	U	1.2	U	1.0	U	4.5	B
Potassium		1550	B	1610	BE	1490		1260		1020	BE	1860	B	1190	B
Selenium	10	11.4	U	8.7	U	4.8	U	38.0	U	6.1	U	6.1	U	11.4	U
Silver	50	2.2	U	1.2	U	1.5	U	5.0	U	1.0	U	1.3	U	2.2	U
Sodium	20000	17300		16900		17400		15600		12000	E	12800		15200	
Thallium	0.5*	3.0	U	10.2	U	2.4	U	15.0	U	7.0	U	5.9	U	3.0	U
Titanium		5.0	U	NA		NA		NA		NA		NA		5.0	U
Vanadium		4.7	U	1.1	U	6.1	U	5.0	U	0.78	U	1.0	U	4.7	U
Zinc	2000*	13.5	U	1.5	U	14.5	J	25.0	U	3.6	U	3.6	U	13.5	U

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Appendix A
Summary of Groundwater Sample Results - Metals
Tioga Castings Site
Owego, New York
NYSDEC Site Number 7-54-012

Well Date Units	NYSDEC Class GA Standards	MW-4 3/18/2010 ug/L		MW-4 10/28/2010 ug/L		MW-4 2/28/2011 ug/L		MW-5 8/2/2007 ug/L		MW-5 7/17/2008 ug/L		MW-5 4/13/2009 ug/L		MW-5 3/18/2010 ug/L	
Aluminum		39.8	U	10.6	J	26.6	J	79.0	B	28.9	B	102	B	39.8	U
Antimony	3	6.8	U	8.0	U	15.0	U	5.6	U	5.5	U	6.7	U	6.8	U
Arsenic	25	5.6	U	4.2	U	15.0	U	4.2	U	3.7	U	3.0	U	5.6	U
Barium	1000	42.6	BE	50.3		40.8		56.4	B	55.7	B	47.1	B	47.4	BE
Beryllium	3*	0.2	U	0.7	U	5.0	U	0.51	B	0.3	U	0.5	U	0.2	U
Cadmium	5 [10]	0.5	BE	0.5	U	1.7	J	0.36	U	0.3	U	0.3	U	0.3	U
Calcium		48000		47900		43100		44400	E	45200		44000		45100	
Chromium	50 [50]	0.9	U	1.1	U	5.0	U	0.84	U	0.9	U	3.9	B	0.9	U
Cobalt		0.6	U	5.8	U	5.0	U	0.89	U	1.1	U	3.8	U	0.6	U
Copper	200	1.3	U	2.0	U	10.0	U	1.3	U	1.3	U	89.3		1.3	U
Iron	300	22.2	BE	33.4	J	57.3	J	19.3	U	19	U	246		19.3	U
Lead	25 [25]	3.0	U	2.6	U	15.0	U	2.9	U	2.9	U	6.0	B	3.0	U
Magnesium		8820		8390		8140		7600	E	7570		7440		7330	
Manganese	300	1.5	BE	2.0	J	2.2	J	0.90	B	0.7	B	10.1	B	0.8	BE
Mercury	0.7	0.1	U	0.1	U	0.2	U	0.12	U	0.1	U	NA		0.1	U
Nickel	100	1.3	U	4.2	U	1.5	J	1.2	U	1.4	B	5.0	B	1.3	U
Potassium		1130	BE	1230		1330		3330	BE	3340	B	2880	B	3530	BE
Selenium	10	8.7	U	4.8	U	38.0	U	6.1	U	6.1	U	11.4	U	8.7	U
Silver	50	1.2	U	1.5	U	5.0	U	1.6	B	1.3	U	2.2	U	1.2	U
Sodium	20000	16100		15000		13900		14200	E	15400		13300		8320	
Thallium	0.5*	10.2	U	2.4	U	15.0	U	7.0	U	5.9	U	3.0	U	10.2	U
Titanium		NA		NA		NA		NA		NA		5.0	U	NA	
Vanadium		1.1	U	6.1	U	5.0	U	0.80	B	1.0	U	4.7	U	1.1	U
Zinc	2000*	1.5	U	6.5	U	25.0	U	3.6	U	3.6	U	13.5	U	3.6	BE

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E - Estimated value.
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Appendix A
Summary of Groundwater Sample Results - Metals
Tioga Castings Site
Owego, New York
NYSDEC Site Number 7-54-012

Well Date Units	NYSDEC Class GA Standards	MW-5 10/28/2010 ug/L		MW-5 2/28/2011 ug/L		MW-6 2/28/2011 ug/L		MW-X[(1)] 2/28/2011 ug/L		MW-7 4/13/2009 ug/L		MW-7 3/18/2010 ug/L		MW-7 10/28/2010 ug/L	
Aluminum		22.4	J	250.0	U	49.5	J	46.0	J	1810		140	BE	28.2	J
Antimony	3	8.0	U	15.0	U	15.0	U	15.0	U	6.7	U	6.8	U	8.0	U
Arsenic	25	4.2	U	15.0	U	15.0	U	15.0	U	3.0	U	5.6	U	4.2	U
Barium	1000	67.3		52.0		53.1		52.5		165		133	BE	96.0	
Beryllium	3*	0.7	U	5.0	U	5.0	U	5.0	U	0.5	U	0.2	U	0.7	U
Cadmium	5 [10]	0.5	U	5.0	U	5.0	U	5.0	U	0.3	U	0.4	BE	0.5	U
Calcium		49500		43900		54200		53500		64300		85600		60300	
Chromium	50 [50]	1.1	U	5.0	U	5.0	U	5.0	U	10.4	B	0.9	U	1.1	U
Cobalt		5.8	U	5.0	U	5.0	U	5.0	U	5.8	B	0.6	U	5.8	U
Copper	200	2.0	U	10.0	U	10.0	U	10.0	U	178		3.1	BE	3.6	J
Iron	300	94.1		52.9	J	98.8	J	95.1	J	**2880**		192		297.0	
Lead	25 [25]	7.2		15.0	U	15.0	U	15.0	U	**30.2**	**B**	3.0	U	3.1	J
Magnesium		7980		7500		9280		9240		10000		13600		9230	
Manganese	300	5.6	J	1.8	J	7.5	J	5.6	J	**989**		115		474.0	
Mercury	0.7	0.1	U	0.2	U	0.2	U	0.2	U	NA		0.1	U	0.1	U
Nickel	100	4.2	U	5.0	U	5.0	U	1.1	J	10.6	B	2.8	BE	4.2	U
Potassium		3620		3210		2090.0		1960.0		4510		5190		4170	
Selenium	10	4.8	U	38.0	U	38.0	U	38.0	U	11.4	U	8.7	U	4.8	U
Silver	50	1.5	U	5.0	U	5	U	5	U	2.2	U	1.2	U	1.5	U
Sodium	20000	13600		9080		**21900**		**23500**		**57500**		**58900**		**20700**	
Thallium	0.5*	2.4	U	15.0	U	15.0	U	15.0	U	3.0	U	10.2	U	2.4	U
Titanium		NA		NA		NA		NA		5.0	U	NA		NA	
Vanadium		6.1	U	5.0	U	5	U	5.0	U	7.2	B	1.1	U	6.1	U
Zinc	2000*	15.3	J	25.0	U	25.0	U	25.0	U	40.4	B	10.4	BE	18.0	J

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Appendix A
Summary of Groundwater Sample Results - Metals
Tioga Castings Site
Owego, New York
NYSDEC Site Number 7-54-012

Well Date Units	NYSDEC Class GA Standards	MW-7 2/28/2011 ug/L		MW-8 4/13/2009 ug/L		MW-8 3/18/2010 ug/L		MW-8 10/28/2010 ug/L		MW-8 2/28/2011 ug/L	
Aluminum		162.0	J	6190		39.8	U	45.5	J	324.0	
Antimony	3	15.0	U	6.7	U	6.8	U	8.0	U	15.0	U
Arsenic	25	15.0	U	3.0	U	5.6	U	4.2	U	15.0	U
Barium	1000	66.8		219		64.6	BE	71.6		67.0	
Beryllium	3*	5.0	U	0.5	U	0.2	U	0.7	U	5.0	U
Cadmium	5 [10]	5.0	U	0.3	U	0.3	BE	0.5	U	5.0	U
Calcium		45200		52400		52600		52800		50300	
Chromium	50 [50]	0.8	J	8.9	B	0.9	U	1.9	J	5.0	U
Cobalt		5.0	U	3.8	U	0.6	U	5.8	U	5.0	U
Copper	200	4.5	J	66.3		1.3	U	2.3	J	1.6	J
Iron	300	**457.0**		**4530**		40.2	BE	104.0		**560.0**	
Lead	25 [25]	2.9	J	17.3	B	3.0	U	2.6	U	15.0	U
Magnesium		7030		8740		8870		8300		8430	
Manganese	300	130.0		**524**		2.7	BE	5.0	J	28.9	
Mercury	0.7	0.2	U	NA		0.1	U	0.1	U	0.2	U
Nickel	100	1.1	J	9.5	B	1.3	U	4.2	U	5.0	U
Potassium		3270		3770		2440	BE	2630		2630	
Selenium	10	38.0	U	11.4	U	8.7	U	4.8	U	38.0	U
Silver	50	5.0	U	2.2	U	1.2	U	1.5	U	5.0	U
Sodium	20000	**32700**		**26700**		**23300**		**21300**		**21900**	
Thallium	0.5*	15.0	U	3.0	U	10.2	U	2.4	U	15.0	U
Titanium		NA		34.4	B	NA		NA		NA	
Vanadium		5.0	U	9.8	B	1.1	U	6.1	U	5.0	U
Zinc	2000*	18.3	J	40.2	B	3.0	BE	23.8		25.0	U

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[25] - Site-specific cleanup goal.

Appendix A

Analytical Data Summary

Soil

MALCOLM PIRNIE

Appendix A
Summary of Soil Sampling Results - VOCs
Tioga Castings
Owego, New York
NYSDEC Site No. 7-54-012

Soil Boring Sample Interval (feet bgs) Date Units	Commercial Soil Cleanup Objective ppm	SB-01 12-13 7/15/2008 mg/kg		SB-02 17-17.5 7/15/2008 mg/kg		SB-03 19-19.5 7/15/2008 mg/kg		SB-04 14.5-15 7/15/2008 mg/kg	
VOCs									
1,1,1-Trichloroethane	500	0.011	U	0.012	U	0.012	U	0.011	U
1,1,2,2-Tetrachloroethane	NS	0.011	U	0.012	U	0.012	U	0.011	U
1,1,2-Trichloroethane	NS	0.011	U	0.012	U	0.012	U	0.011	U
1,1-Dichloroethane	240	0.011	U	0.012	U	0.012	U	0.011	U
1,1-Dichloroethene	500	0.011	U	0.012	U	0.012	U	0.011	U
1,2-Dichloroethane	30	0.011	U	0.012	U	0.012	U	0.011	U
1,2-Dichloropropane	NS	0.011	U	0.012	U	0.012	U	0.011	U
2-Hexanone	NS	0.011	U	0.012	U	0.012	U	0.011	U
Acetone	500	0.008	J B	0.021	B	0.014	B	0.016	B
Benzene	44	0.001	J	0.002	J	0.001	J	0.005	J
Bromodichloromethane	NS	0.011	U	0.012	U	0.012	U	0.011	U
Bromoform	NS	0.011	U	0.012	U	0.012	U	0.011	U
Bromomethane	NS	0.011	U	0.012	U	0.012	U	0.011	U
Carbon disulfide	NS	0.011	U	0.001	J	0.012	U	0.011	U
Carbon tetrachloride	22	0.011	U	0.012	U	0.012	U	0.011	U
Chlorobenzene	500	0.011	U	0.012	U	0.012	U	0.011	U
Chloroethane	NS	0.011	U	0.012	U	0.012	U	0.011	U
Chloroform	350	0.011	U	0.012	U	0.012	U	0.011	U
Chloromethane	NS	0.011	U	0.012	U	0.012	U	0.011	U
cis-1,2-Dichloroethene	500	0.011	U	0.012	U	0.012	U	0.011	U
cis-1,3-Dichloropropene	NS	0.011	U	0.012	U	0.012	U	0.011	U
Dibromochloromethane	NS	0.011	U	0.012	U	0.012	U	0.011	U
Ethylbenzene	390	0.001	J	0.002	J	0.001	J	0.004	J
Isopropylbenzene	NS	0.011	U	0.012	U	0.012	U	0.011	U
Methyl Ethyl Ketone	500	0.011	U	0.012	U	0.012	U	0.011	U
Methyl isobutyl ketone	NS	0.011	U	0.012	U	0.012	U	0.011	U
Methylene Chloride	500	0.009	J B	0.010	J B	0.002	J B	0.016	B
Styrene	NS	0.011	U	0.012	U	0.012	U	0.011	U
Tetrachloroethene	150	0.011	U	0.012	U	0.012	U	0.011	U
Toluene	500	0.002	J B	0.003	J B	0.003	J B	0.005	J B
trans-1,2-Dichloroethene	500	0.011	U	0.012	U	0.012	U	0.011	U
trans-1,3-Dichloropropene	NS	0.011	U	0.012	U	0.012	U	0.011	U
Trichloroethene	200	0.022		0.023		0.070		0.080	
Vinyl chloride	13	0.011	U	0.012	U	0.012	U	0.011	U
Xylenes, Total	500	0.004	J	0.005	J	0.003	J	0.009	J

Notes
U - Analyte not detected at indicated quantitation limit
J - Estimated value
B - Analyte detected in blank and sample
NS - Not specified.
ppm - Parts per million / mg/kg - milligrams per kilogram

Appendix A
Summary of Soil Sampling Results - VOCs
Tioga Castings
Owego, New York
NYSDEC Site No. 7-54-012

Soil Boring Sample Interval (feet bgs) Date Units	Commercial Soil Cleanup Objective ppm	SB-05 14.5-15 7/15/2008 mg/kg		SB-06 7.5-8.5 7/15/2008 mg/kg		SB-06 14-15 7/15/2008 mg/kg		SB-07 14.5-15.5 7/15/2008 mg/kg	
VOCs									
1,1,1-Trichloroethane	500	0.012	U	0.023	U	0.011	U	0.011	U
1,1,2,2-Tetrachloroethane	NS	0.012	U	0.023	U	0.011	U	0.011	U
1,1,2-Trichloroethane	NS	0.012	U	0.023	U	0.011	U	0.011	U
1,1-Dichloroethane	240	0.012	U	0.023	U	0.011	U	0.011	U
1,1-Dichloroethene	500	0.012	U	0.023	U	0.011	U	0.011	U
1,2-Dichloroethane	30	0.012	U	0.023	U	0.011	U	0.011	U
1,2-Dichloropropane	NS	0.012	U	0.023	U	0.011	U	0.011	U
2-Hexanone	NS	0.012	U	0.023	U	0.011	U	0.011	U
Acetone	500	0.075	B	0.250	B	0.006	J B	0.011	U
Benzene	44	0.000	J	0.001	J	0.0003	J	0.011	U
Bromodichloromethane	NS	0.012	U	0.023	U	0.011	U	0.011	U
Bromoform	NS	0.012	U	0.023	U	0.011	U	0.011	U
Bromomethane	NS	0.012	U	0.023	U	0.011	U	0.011	U
Carbon disulfide	NS	0.012	U	0.023	U	0.011	U	0.011	U
Carbon tetrachloride	22	0.012	U	0.023	U	0.011	U	0.011	U
Chlorobenzene	500	0.012	U	0.023	U	0.011	U	0.011	U
Chloroethane	NS	0.012	U	0.023	U	0.011	U	0.011	U
Chloroform	350	0.012	U	0.023	U	0.011	U	0.011	U
Chloromethane	NS	0.012	U	0.023	U	0.011	U	0.011	U
cis-1,2-Dichloroethene	500	0.012	U	0.023	U	0.011	U	0.011	U
cis-1,3-Dichloropropene	NS	0.012	U	0.023	U	0.011	U	0.011	U
Dibromochloromethane	NS	0.012	U	0.023	U	0.011	U	0.011	U
Ethylbenzene	390	0.012	U	0.002	J	0.0003	J	0.011	U
Isopropylbenzene	NS	0.012	U	0.004	J	0.011	U	0.011	U
Methyl Ethyl Ketone	500	0.018		0.023	U	0.011	U	0.011	U
Methyl isobutyl ketone	NS	0.012	U	0.023	U	0.011	U	0.011	U
Methylene Chloride	500	0.007	J B	0.005	J B	0.007	J B	0.003	J B
Styrene	NS	0.012	U	0.023	U	0.011	U	0.011	U
Tetrachloroethene	150	0.012	U	0.023	U	0.011	U	0.011	U
Toluene	500	0.001	J B	0.006	J B	0.001	J B	0.011	U
trans-1,2-Dichloroethene	500	0.012	U	0.023	U	0.011	U	0.011	U
trans-1,3-Dichloropropene	NS	0.012	U	0.023	U	0.011	U	0.011	U
Trichloroethene	200	0.003	J	0.012	J	0.009	J	0.011	U
Vinyl chloride	13	0.012	U	0.023	U	0.011	U	0.011	U
Xylenes, Total	500	0.012	U	0.011	J	0.001	J	0.011	U

Notes
U - Analyte not detected at indicated quantitation limit
J - Estimated value
B - Analyte detected in blank and sample
NS - Not specified.
ppm - Parts per million / mg/kg - milligrams per kilogram

Appendix A
Summary of Soil Sampling Results - VOCs
Tioga Castings
Owego, New York
NYSDEC Site No. 7-54-012

Soil Boring Sample Interval (feet bgs) Date Units	Commercial Soil Cleanup Objective ppm	SB-08 9.5-10 7/15/2008 mg/kg		SB-09 7.5-8.5 7/16/2008 mg/kg		SGB-11 14-15 7/16/2008 mg/kg		SB-13 4-5 7/16/2008 mg/kg	
VOCs									
1,1,1-Trichloroethane	500	0.012	U	0.012	U	0.012	U	0.012	U
1,1,2,2-Tetrachloroethane	NS	0.012	U	0.012	U	0.012	U	0.012	U
1,1,2-Trichloroethane	NS	0.012	U	0.012	U	0.012	U	0.012	U
1,1-Dichloroethane	240	0.012	U	0.012	U	0.012	U	0.012	U
1,1-Dichloroethene	500	0.012	U	0.012	U	0.012	U	0.012	U
1,2-Dichloroethane	30	0.012	U	0.012	U	0.012	U	0.012	U
1,2-Dichloropropane	NS	0.012	U	0.012	U	0.012	U	0.012	U
2-Hexanone	NS	0.012	U	0.012	U	0.012	U	0.012	U
Acetone	500	0.043	B	0.015	B	0.012	U	0.012	U
Benzene	44	0.002	J	0.012	U	0.012	U	0.012	U
Bromodichloromethane	NS	0.012	U	0.012	U	0.012	U	0.012	U
Bromoform	NS	0.012	U	0.012	U	0.012	U	0.012	U
Bromomethane	NS	0.012	U	0.012	U	0.012	U	0.012	U
Carbon disulfide	NS	0.012	U	0.012	U	0.012	U	0.012	U
Carbon tetrachloride	22	0.012	U	0.012	U	0.012	U	0.012	U
Chlorobenzene	500	0.012	U	0.012	U	0.012	U	0.012	U
Chloroethane	NS	0.012	U	0.012	U	0.012	U	0.012	U
Chloroform	350	0.012	U	0.012	U	0.012	U	0.012	U
Chloromethane	NS	0.012	U	0.012	U	0.012	U	0.012	U
cis-1,2-Dichloroethene	500	0.012	U	0.012	U	0.012	U	0.012	U
cis-1,3-Dichloropropene	NS	0.012	U	0.012	U	0.012	U	0.012	U
Dibromochloromethane	NS	0.012	U	0.012	U	0.012	U	0.012	U
Ethylbenzene	390	0.003	J	0.012	U	0.012	U	0.012	U
Isopropylbenzene	NS	0.012	U	0.012	U	0.012	U	0.012	U
Methyl Ethyl Ketone	500	0.012	U	0.012	U	0.012	U	0.012	U
Methyl isobutyl ketone	NS	0.012	U	0.012	U	0.012	U	0.012	U
Methylene Chloride	500	0.007	J B	0.005	J B	0.005	J B	0.002	J B
Styrene	NS	0.012	U	0.012	U	0.012	U	0.012	U
Tetrachloroethene	150	0.012	U	0.012	U	0.012	U	0.012	U
Toluene	500	0.005	J B	0.012	U	0.001	J B	0.012	U
trans-1,2-Dichloroethene	500	0.012	U	0.012	U	0.012	U	0.012	U
trans-1,3-Dichloropropene	NS	0.012	U	0.012	U	0.012	U	0.012	U
Trichloroethene	200	0.008	J	0.001	J	0.010	J	0.012	U
Vinyl chloride	13	0.012	U	0.012	U	0.012	U	0.012	U
Xylenes, Total	500	0.009	J	0.012	U	0.001	J	0.012	U

Notes
U - Analyte not detected at indicated quantitation limit
J - Estimated value
B - Analyte detected in blank and sample
NS - Not specified.
ppm - Parts per million / mg/kg - milligrams per kilogram

Appendix A
Summary of Soil Sampling Results - VOCs
Tioga Castings
Owego, New York
NYSDEC Site No. 7-54-012

Soil Boring Sample Interval (feet bgs) Date Units	Commercial Soil Cleanup Objective ppm	SB-14 7-8 7/16/2008 mg/kg		SB-24 12-16 10/29/2008 mg/kg		SB-25 6-8 10/29/2008 mg/kg		SB-25 18-20 10/29/2008 mg/kg	
VOCs									
1,1,1-Trichloroethane	500	0.012	U	0.012	U	0.012	U	0.011	U
1,1,2,2-Tetrachloroethane	NS	0.012	U	0.012	U	0.012	U	0.011	U
1,1,2-Trichloroethane	NS	0.012	U	0.012	U	0.012	U	0.011	U
1,1-Dichloroethane	240	0.012	U	0.012	U	0.012	U	0.011	U
1,1-Dichloroethene	500	0.012	U	0.012	U	0.012	U	0.011	U
1,2-Dichloroethane	30	0.012	U	0.012	U	0.012	U	0.011	U
1,2-Dichloropropane	NS	0.012	U	0.012	U	0.012	U	0.011	U
2-Hexanone	NS	0.012	U	0.012	U	0.012	U	0.011	U
Acetone	500	0.012	U	0.012	U	0.012	U	0.011	U
Benzene	44	0.001	J	0.012	U	0.012	U	0.011	U
Bromodichloromethane	NS	0.012	U	0.012	U	0.012	U	0.011	U
Bromoform	NS	0.012	U	0.012	U	0.012	U	0.011	U
Bromomethane	NS	0.012	U	0.012	U	0.012	U	0.011	U
Carbon disulfide	NS	0.012	U	0.012	U	0.012	U	0.011	U
Carbon tetrachloride	22	0.012	U	0.012	U	0.012	U	0.011	U
Chlorobenzene	500	0.012	U	0.012	U	0.012	U	0.011	U
Chloroethane	NS	0.012	U	0.012	U	0.012	U	0.011	U
Chloroform	350	0.012	U	0.012	U	0.012	U	0.011	U
Chloromethane	NS	0.012	U	0.012	U	0.012	U	0.011	U
cis-1,2-Dichloroethene	500	0.012	U	0.012	U	0.012	U	0.011	U
cis-1,3-Dichloropropene	NS	0.012	U	0.012	U	0.012	U	0.011	U
Dibromochloromethane	NS	0.012	U	0.012	U	0.012	U	0.011	U
Ethylbenzene	390	0.001	J	0.012	U	0.012	U	0.011	U
Isopropylbenzene	NS	0.001	J	0.012	U	0.012	U	0.011	U
Methyl Ethyl Ketone	500	0.012	U	0.012	U	0.012	U	0.011	U
Methyl isobutyl ketone	NS	0.012	U	0.012	U	0.012	U	0.011	U
Methylene Chloride	500	0.003	J B	0.003	J B	0.003	J B	0.003	J B
Styrene	NS	0.012	U	0.012	U	0.012	U	0.011	U
Tetrachloroethene	150	0.012	U	0.012	U	0.012	U	0.011	U
Toluene	500	0.002	J B	0.012	U	0.012	U	0.011	U
trans-1,2-Dichloroethene	500	0.012	U	0.012	U	0.012	U	0.011	U
trans-1,3-Dichloropropene	NS	0.012	U	0.012	U	0.012	U	0.011	U
Trichloroethene	200	0.012	U	0.012	U	0.012	U	0.011	U
Vinyl chloride	13	0.012	U	0.012	U	0.012	U	0.011	U
Xylenes, Total	500	0.001	J	0.012	U	0.012	U	0.011	U

Notes
U - Analyte not detected at indicated quantitation limit
J - Estimated value
B - Analyte detected in blank and sample
NS - Not specified.
ppm - Parts per million / mg/kg - milligrams per kilogram

Appendix A
Summary of Soil Sampling Results - VOCs
Tioga Castings
Owego, New York
NYSDEC Site No. 7-54-012

Soil Boring Sample Interval (feet bgs) Date Units	Commercial Soil Cleanup Objective ppm	SB-26 14-18 10/30/2008 mg/kg		SB-27 4-6 1/6/2011 mg/kg	
VOCs					
1,1,1-Trichloroethane	500	0.011	U	0.006	U
1,1,2,2-Tetrachloroethane	NS	0.011	U	0.006	U
1,1,2-Trichloroethane	NS	0.011	U	0.006	U
1,1-Dichloroethane	240	0.011	U	0.006	U
1,1-Dichloroethene	500	0.011	U	0.006	U
1,2-Dichloroethane	30	0.011	U	0.006	U
1,2-Dichloropropane	NS	0.011	U	0.006	U
2-Hexanone	NS	0.011	U	0.012	U
Acetone	500	0.011	U	0.027	*
Benzene	44	0.011	U	0.006	U
Bromodichloromethane	NS	0.011	U	0.006	U
Bromoform	NS	0.011	U	0.006	U
Bromomethane	NS	0.011	U	0.006	U
Carbon disulfide	NS	0.011	U	0.006	U
Carbon tetrachloride	22	0.011	U	0.006	U
Chlorobenzene	500	0.011	U	0.006	U
Chloroethane	NS	0.011	U	0.006	U
Chloroform	350	0.011	U	0.006	U
Chloromethane	NS	0.011	U	0.006	U
cis-1,2-Dichloroethene	500	0.011	U	0.006	U
cis-1,3-Dichloropropene	NS	0.011	U	0.006	U
Dibromochloromethane	NS	0.011	U	0.006	U
Ethylbenzene	390	0.011	U	0.006	U
Isopropylbenzene	NS	0.011	U	-	
Methyl Ethyl Ketone	500	0.011	U	0.012	U
Methyl isobutyl ketone	NS	0.011	U	0.006	U
Methylene Chloride	500	0.004	J B	0.005	J B
Styrene	NS	0.011	U	0.006	U
Tetrachloroethene	150	0.011	U	0.006	U
Toluene	500	0.011	U	0.001	J
trans-1,2-Dichloroethene	500	0.011	U	0.006	U
trans-1,3-Dichloropropene	NS	0.011	U	0.006	U
Trichloroethene	200	0.011	U	0.006	U
Vinyl chloride	13	0.011	U	0.006	U
Xylenes, Total	500	0.011	U	0.003	J

Notes
U - Analyte not detected at indicated quantitation limit
J - Estimated value
B - Analyte detected in blank and sample
NS - Not specified.
ppm - Parts per million / mg/kg - milligrams per kilogram

Appendix A
Summary of Soil Sampling Results - SVOCs
Tioga Castings
Owego, New York
NYSDEC Site No. 7-54-012

Soil Boring Sample Interval (feet bgs) Date Units	Commercial Soil Cleanup Objective ppm (mg/kg)	SB-24 12-16 10/29/2008 mg/kg	SB-25 6-8 10/29/2008 mg/kg	SB-25 18-20 10/29/2008 mg/kg	SB-26 14-18 10/30/2008 mg/kg	SB-27 4-6 1/6/2011 mg/kg
SVOCs						
2,2-oxybis(1-Chloropropane)		0.200 U	0.220 U	0.200 U	0.200 U	0.320 U
2,4,5-Trichlorophenol		0.200 U	0.220 U	0.200 U	0.200 U	2.000 U
2,4,6-Trichlorophenol		0.200 U	0.220 U	0.200 U	0.200 U	0.320 U
2,4-Dichlorophenol		0.200 U	0.220 U	0.200 U	0.200 U	0.320 U
2,4-Dimethylphenol		0.200 U	0.220 U	0.200 U	0.200 U	0.320 U
2,4-Dinitrophenol		0.380 U	0.430 U	0.380 U	0.390 U	2.000 U
2,4-Dinitrotoluene		0.200 U	0.220 U	0.200 U	0.200 U	0.320 U
2,6-Dinitrotoluene		0.200 U	0.220 U	0.200 U	0.200 U	0.320 U
2-Chloronaphthalene		0.200 U	0.220 U	0.200 U	0.200 U	0.320 U
2-Chlorophenol		0.200 U	0.220 U	0.200 U	0.200 U	0.320 U
2-Methylnaphthalene		0.009 J	0.220 U	0.200 U	0.200 U	0.290 J
2-Methylphenol		0.200 U	0.220 U	0.200 U	0.025 J	0.042 J
2-Nitroaniline		0.380 U	0.430 U	0.380 U	0.390 U	0.790 U
2-Nitrophenol		0.200 U	0.220 U	0.200 U	0.200 U	0.320 U
3,3-Dichlorobenzidine		0.200 U	0.220 U	0.200 U	0.200 U	0.390 U
3-Nitroaniline		0.380 U	0.430 U	0.380 U	0.390 U	0.790 U
4,6-Dinitro-2-methylphenol		0.380 U	0.430 U	0.380 U	0.390 U	2.000 U
4-Bromophenyl-phenylether		0.200 U	0.220 U	0.200 U	0.200 U	0.320 U
4-Chloro-3-methylphenol		0.200 U	0.220 U	0.200 U	0.200 U	0.320 U
4-Chloroaniline		0.200 U	0.220 U	0.200 U	0.200 U	0.320 U
4-Chlorophenyl-phenylether		0.200 U	0.220 U	0.200 U	0.200 U	0.320 U
4-Nitroaniline		0.380 U	0.430 U	0.380 U	0.390 U	0.320 U
4-Nitrophenol		0.380 U	0.430 U	0.380 U	0.390 U	2.000 U
Acenaphthene	500	0.008 J	0.012 J	0.200 U	0.200 U	0.320 U
Acenaphthylene	500	0.024 J	0.220 U	0.200 U	0.200 U	0.017 J
Anthracene	500	0.028 J	0.016 J	0.200 U	0.200 U	0.018 J
Benzo(a)anthracene	5.6	0.150 J	0.076 J	0.014 J	0.200 U	0.015 J
Benzo(a)pyrene	1.0	0.120 J	0.063 J	0.200 U	0.200 U	0.320 U
Benzo(b)fluoranthene	5.6	0.160 J	0.072 J	0.008 J	0.200 U	0.016 J
Benzo(g,h,i)perylene	500	0.110 J	0.052 J	0.200 U	0.200 U	0.320 U
Benzo(k)fluoranthene	56	0.081 J	0.049 J	0.200 U	0.200 U	0.320 U
Biphenyl		0.200 U	0.220 U	0.200 U	0.200 U	0.320 U
bis(2-Chloroethoxy)methane		0.200 U	0.220 U	0.200 U	0.200 U	0.320 U
bis(2-Chloroethyl)ether		0.200 U	0.220 U	0.200 U	0.200 U	0.320 U
bis(2-Ethylhexyl)phthalate		0.110 J	0.160 J	0.088 J	0.200 U	0.190 J
Butylbenzylphthalate		0.200 U	0.220 U	0.200 U	0.200 U	0.320 U
Carbazole		0.044 J	0.009 J	0.200 U	0.200 U	0.320 U
Chrysene	56	0.150 J	0.080 J	0.008 J	0.200 U	0.025 J
Dibenz(a,h)anthracene	0.56	0.200 U	0.220 U	0.200 U	0.200 U	0.320 U
Dibenzofuran		0.021 J	0.220 U	0.200 U	0.200 U	0.059 J
Diethylphthalate		0.200 U	0.220 U	0.200 U	0.016 J	0.320 U
Dimethylphthalate		0.200 U	0.220 U	0.200 U	0.200 U	0.320 U
Di-n-butylphthalate		0.200 U	0.220 U	0.200 U	0.200 U	0.320 U
Di-n-octyl phthalate		0.200 U	0.220 U	0.200 U	0.200 U	0.320 U
Fluoranthene	500	0.320	0.140 J	0.024 J	0.200 U	0.057 J
Fluorene	500	0.200 U	0.220 U	0.200 U	0.200 U	0.043 J
Hexachlorobenzene		0.200 U	0.220 U	0.200 U	0.200 U	0.320 U
Hexachlorobutadiene		0.200 U	0.220 U	0.200 U	0.200 U	0.320 U
Hexachlorocyclopentadiene		0.200 U	0.220 U	0.200 U	0.200 U	0.790 U
Hexachloroethane		0.200 U	0.220 U	0.200 U	0.200 U	0.320 U
Indeno(1,2,3-cd)pyrene	5.6	0.087 J	0.040 J	0.200 U	0.200 U	0.320 U
Isophorone		0.200 U	0.220 U	0.200 U	0.200 U	0.320 U
Naphthalene	500	0.015 J	0.220 U	0.200 U	0.200 U	0.330
Nitrobenzene		0.200 U	0.220 U	0.200 U	0.200 U	0.320 U
N-Nitroso-di-n-propylamine		0.200 U	0.220 U	0.200 U	0.200 U	0.320 U
N-Nitrosodiphenylamine		0.200 U	0.220 U	0.200 U	0.200 U	0.320 U
Pentachlorophenol	6.7	0.380 U	0.430 U	0.380 U	0.390 U	0.790 U
Phenanthrene	500	0.320	0.085 J	0.013 J	0.200 U	0.160 J
Phenol	0.5	0.200 U	0.220 U	0.200 U	0.200 U	0.320 U
Pyrene	500	0.270	0.130 J	0.020 J	0.200 U	0.050 J

Notes
U - Analyte not detected at indicated quantitation limit
J - Estimated value
B - Analyte detected in blank and sample
ppm - Parts per million / mg/kg - milligrams per kilogram

Appendix A
Summary of Soil Sampling Results - Metals/PCBs
Tioga Castings
Owego, New York
NYSDEC Site No. 7-54-012

Soil Boring **Sample Interval (feet bgs)** **Date** **Units**	**Commercial Soil Cleanup Objective** **ppm**	**SB-01** **3.8-18** **7/15/2008** **mg/kg**		**SB-02** **3.5-17.5** **7/15/2008** **mg/kg**		**SB-03** **4.5-20** **7/15/2008** **mg/kg**	
Metals -Total							
Aluminum		5830		4550		4840	
Antimony		0.69	B	0.80	B	1.10	B
Arsenic	16	4.9		3.5		4.8	
Barium	400	47.8		62.6		53.1	
Beryllium	590	0.44	B	0.36	B	0.29	B
Cadmium	9.3 [10]	0.50	B	0.80		0.80	
Calcium		19500		15000		11900	
Chromium (hexavalent/trivalent)	400**/1500** [50]	**60.1**		47.6		**50.3**	
Cobalt		4.0	B	3.0	B	4.5	B
Copper	270	83.5		43.9		50.0	
Iron		27200		28100		37700	
Lead	1000 [500]	142		168		273	
Magnesium		1840		1570		1620	
Manganese	10,000	985		1180		890	
Mercury	2.8	0.018	B	0.014	B	0.068	B
Nickel	310	51.6		30.4		49.7	
Potassium		543	B	394	B	534	B
Selenium	1,500	0.59	U	0.59	U	0.59	U
Silver	1,500	0.14	B	0.18	B	0.23	B
Sodium		283	B	189	B	176	B
Thallium		0.30	U	0.30	U	0.30	U
Vanadium		7.3		5.3		7.1	
Zinc	10,000	84.6		86.1		126.0	
PCBs							
PCB-1016		0.019	U	0.019	U	0.019	U
PCB-1221		0.037	U	0.036	U	0.037	U
PCB-1232		0.019	U	0.019	U	0.019	U
PCB-1242		0.019	U	0.019	U	0.019	U
PCB-1248		0.019	U	0.019	U	0.019	U
PCB-1254		0.019	U	0.021		0.016	J
PCB-1260		0.019	U	0.018	J	0.009	J
Total PCBs	1			0.021		0.025	

Notes
J/B - value greater than or equal to the instrument detection limit, but less than the quanitation limit
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Appendix A
Summary of Soil Sampling Results - Metals/PCBs
Tioga Castings
Owego, New York
NYSDEC Site No. 7-54-012

Soil Boring **Sample Interval (feet bgs)** **Date** **Units**	**Commercial Soil Cleanup Objective ppm**	**SB-04** **3.5-15** **7/15/2008** **mg/kg**		**SB-05** **4-15** **7/15/2008** **mg/kg**		**SB-06** **7.5-8.5** **7/15/2008** **mg/kg**	
Metals -Total							
Aluminum		5560		5020		21600	
Antimony		0.54	U	1.30	B	0.54	U
Arsenic	16	2.9		4.4		2.4	
Barium	400	42.4		47.6		266.0	
Beryllium	590	0.52	B	0.34	B	1.40	
Cadmium	9.3 [10]	0.50	B	1.20		0.04	U
Calcium		18200		17600		80800	
Chromium (hexavalent/trivalent)	400**/1500** [50]	49.3		43.7		32.3	
Cobalt		2.8	B	3.8	B	6.9	
Copper	270	32.6		56.8		13.2	
Iron		23100		28800		11900	
Lead	1000 [500]	196		264		6	
Magnesium		1680		1880		4100	
Manganese	10,000	1660		1160		5250	
Mercury	2.8	0.013	B	0.046	B	0.014	B
Nickel	310	23.2		22.7		5.7	
Potassium		555	B	500	B	2970	
Selenium	1,500	0.59	U	0.59	U	0.59	U
Silver	1,500	0.18	B	0.25	B	0.10	B
Sodium		202	B	124	B	640	
Thallium		0.51	B	0.30	U	1.30	B
Vanadium		7.0		8.1		35.8	
Zinc	10,000	92.5		128.0		14.5	
PCBs							
PCB-1016		0.019	U	0.019	U	0.019	U
PCB-1221		0.036	U	0.036	U	0.037	U
PCB-1232		0.019	U	0.019	U	0.019	U
PCB-1242		0.019	U	0.019	U	0.019	U
PCB-1248		0.019	U	0.019	U	0.019	U
PCB-1254		0.019	U	0.016	J	0.012	J
PCB-1260		0.019	U	0.011	J	0.034	
Total PCBs	1			0.027		0.046	

Notes
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Appendix A
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Tioga Castings
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Soil Boring **Sample Interval (feet bgs)** **Date** **Units**	**Commercial Soil Cleanup Objective** **ppm**	**SB-07** **4-5** **7/15/2008** **mg/kg**		**SB-07** **14.5-15.5** **7/15/2008** **mg/kg**		**SB-08** **9.5-10** **7/15/2008** **mg/kg**	
Metals -Total							
Aluminum		7250		8150		9390	
Antimony		0.54	U	0.54	U	0.54	U
Arsenic	16	2.9		4.0		2.7	
Barium	400	74.2		74.3		62.1	
Beryllium	590	0.50	B	0.25	B	0.42	B
Cadmium	9.3 [10]	0.04	U	0.04	U	0.05	B
Calcium		30300		1640		1640	
Chromium (hexavalent/trivalent)	400**/1500** [50]	19.5		8.8		18.9	
Cobalt		2.9	B	6.4		8.4	
Copper	270	56.2		11.0		24.6	
Iron		25100		18200		21500	
Lead	1000 [500]	12		5		14	
Magnesium		1760		2140		2810	
Manganese	10,000	1500		385		246	
Mercury	2.8	0.025	B	0.008	U	0.017	B
Nickel	310	15.8		15.3		27.1	
Potassium		620		562	B	704	
Selenium	1,500	0.59	U	0.59	U	0.59	U
Silver	1,500	0.07	U	0.07	U	0.07	U
Sodium		427	B	70	B	155	B
Thallium		0.30	U	0.30	U	0.30	U
Vanadium		9.5		9.5		12.7	
Zinc	10,000	37.2		46.0		59.3	
PCBs							
PCB-1016		0.019	U	0.019	U	0.020	U
PCB-1221		0.036	U	0.037	U	0.039	U
PCB-1232		0.019	U	0.019	U	0.020	U
PCB-1242		0.019	U	0.019	U	0.020	U
PCB-1248		0.019	U	0.019	U	0.020	U
PCB-1254		0.004	J	0.019	U	0.033	
PCB-1260		0.013	J	0.019	U	0.023	
Total PCBs	1	0.017				0.056	

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Appendix A
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Tioga Castings
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Soil Boring **Sample Interval (feet bgs)** **Date** **Units**	**Commercial Soil Cleanup Objective ppm**	**SB-08 14.5-15 7/16/2008 mg/kg**		**SB-09 4-5 7/16/2008 mg/kg**		**SB-09 7.5-8.5 7/16/2008 mg/kg**	
Metals -Total							
Aluminum		3930		40700		14600	
Antimony		1.30	B	0.54	N,U	0.54	N,U
Arsenic	16	6.4		1.9		7.7	
Barium	400	189.0		214.0		202.0	
Beryllium	590	0.14	B	3.20		0.73	
Cadmium	9.3 [10]	0.20	B	0.04	U	0.30	B
Calcium		2190		94800		2820	
Chromium (hexavalent/trivalent)	400**/1500** [50]	46.9		32.0		19.3	
Cobalt		4.3	B	5.4		10.9	
Copper	270	92.3		28.3		19.6	
Iron		59600		15900		27600	
Lead	1000 [500]	64		6		28	
Magnesium		912		2070		3320	
Manganese	10,000	727		**12700**	**E,***	1630	E,*
Mercury	2.8	0.033	B	0.008	U	0.052	B
Nickel	310	173.0		3.6	B	25.1	
Potassium		667		2570		961	
Selenium	1,500	0.59	U	0.59	U	0.59	U
Silver	1,500	0.08	B	0.33	B	0.07	U
Sodium		624		528		67	B
Thallium		0.30	U	0.30	U	0.30	U
Vanadium		9.5		29.9		17.5	
Zinc	10,000	80.1		6.1	B	80.0	
PCBs							
PCB-1016		0.020	U	0.018	U	0.021	U
PCB-1221		0.039	U	0.036	U	0.041	U
PCB-1232		0.020	U	0.018	U	0.021	U
PCB-1242		0.020	U	0.018	U	0.021	U
PCB-1248		0.020	U	0.018	U	0.021	U
PCB-1254		0.020	U	0.018	U	0.021	U
PCB-1260		0.020	U	0.018	U	0.021	U
Total PCBs	1						

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Summary of Soil Sampling Results - Metals/PCBs
Tioga Castings
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Soil Boring **Sample Interval (feet bgs)** **Date** **Units**	**Commercial Soil Cleanup Objective** **ppm**	**SB-10** **17-18** **7/16/2008** **mg/kg**		**SB-11** **4-5** **7/16/2008** **mg/kg**		**SB-12** **14-15** **7/16/2008** **mg/kg**	
Metals -Total							
Aluminum		8330		5350		8790	
Antimony		0.54	N,U	0.54	N,U	0.54	N,U
Arsenic	16	3.7		2.3		5.3	
Barium	400	54.9		17.6	B	72.4	
Beryllium	590	0.33	B	0.22	B	0.34	B
Cadmium	9.3 [10]	0.10	B	0.10	B	0.10	B
Calcium		7570		1560		1320	
Chromium (hexavalent/trivalent)	400**/1500** [50]	16.7		7.6		13.0	
Cobalt		6.7		1.1	B	6.5	
Copper	270	26.2		14.1		12.4	
Iron		19900		18100		19400	
Lead	1000 [500]	10		42		5	
Magnesium		2960		795		2420	
Manganese	10,000	343	E,*	105	E,*	500	E,*
Mercury	2.8	0.008	U	0.008	U	0.020	B
Nickel	310	17.5		3.1	B	16.9	
Potassium		676		688		620	
Selenium	1,500	0.59	U	0.59	U	0.59	U
Silver	1,500	0.07	U	0.07	U	0.07	U
Sodium		59	B	351	B	60	B
Thallium		0.30	U	0.30	U	0.30	U
Vanadium		11.4		5.9		11.3	
Zinc	10,000	51.4		18.5		46.5	
PCBs							
PCB-1016		0.019	U	0.021	U	0.019	U
PCB-1221		0.037	U	0.040	U	0.036	U
PCB-1232		0.019	U	0.021	U	0.019	U
PCB-1242		0.019	U	0.021	U	0.019	U
PCB-1248		0.019	U	0.021	U	0.019	U
PCB-1254		0.019	U	0.021	U	0.019	U
PCB-1260		0.019	U	0.021	U	0.019	U
Total PCBs	1						

Notes
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Appendix A
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Tioga Castings
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Soil Boring **Sample Interval (feet bgs)** **Date** **Units**	**Commercial Soil Cleanup Objective** **ppm**	**SB-13** **4-5** **7/16/2008** **mg/kg**		**SB-14** **7-8** **7/16/2008** **mg/kg**		**SB-15** **3-4** **7/16/2008** **mg/kg**	
Metals -Total							
Aluminum		10300		11800		5130	
Antimony		0.54	N,U	0.54	N,U	0.85	B,N
Arsenic	16	4.3		4.1		9.1	
Barium	400	71.5		101.0		179.0	
Beryllium	590	0.54	B	0.62		0.47	B
Cadmium	9.3 [10]	0.40	B	0.30	B	0.60	
Calcium		16700		11600		4560	
Chromium (hexavalent/trivalent)	400**/1500** [50]	18.0		21.7		12.0	
Cobalt		4.9	B	7.0		7.3	
Copper	270	83.1		**528**		37.8	
Iron		27600		39600		42900	
Lead	1000 [500]	18		140		**592**	
Magnesium		1450		4490		1040	
Manganese	10,000	1010	E,*	745	E,*	543	E,*
Mercury	2.8	0.030	B	0.248		0.271	
Nickel	310	14.5		21.2		14.2	
Potassium		1050		926		808	
Selenium	1,500	0.59	U	0.59	U	0.59	U
Silver	1,500	0.07	U	0.07	U	0.22	B
Sodium		197	B	148	B	133	B
Thallium		0.30	U	0.30	U	0.30	U
Vanadium		17.5		18.3		23.0	
Zinc	10,000	34.1		93.9		197.0	
PCBs							
PCB-1016		0.020	U	0.019	U	0.021	U
PCB-1221		0.039	U	0.037	U	0.041	U
PCB-1232		0.020	U	0.019	U	0.021	U
PCB-1242		0.020	U	0.019	U	0.021	U
PCB-1248		0.020	U	0.019	U	0.021	U
PCB-1254		0.020	U	0.019	U	0.021	U
PCB-1260		0.020	U	0.019	U	0.021	U
Total PCBs	1						

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Appendix A
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Tioga Castings
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Soil Boring **Sample Interval (feet bgs)** **Date** **Units**	**Commercial Soil Cleanup Objective** **ppm**	**SB-16** **4-5** **7/16/2008** **mg/kg**		**SB-17** **14-15** **7/16/2008** **mg/kg**		**SB-18** **14-15** **7/16/2008** **mg/kg**	
Metals -Total							
Aluminum		4730		8160		9660	
Antimony		1.10	B,N	0.54	N,U	0.54	N,U
Arsenic	16	7.8		4.2		3.9	
Barium	400	48.9		57.9		22.3	
Beryllium	590	0.30	B	0.25	B	0.44	B
Cadmium	9.3 [10]	3.00		0.08	B	0.10	B
Calcium		2540		3610		2780	
Chromium (hexavalent/trivalent)	400**/1500** [50]	22.5		11.6		11.6	
Cobalt		5.2	B	6.2		8.6	
Copper	270	96.3		17.7		14.4	
Iron		60900		18600		19700	
Lead	1000 [500]	96		11		11	
Magnesium		828		2530		3100	
Manganese	10,000	3100	E,*	409	E,*	269	E,*
Mercury	2.8	0.198		0.008	U	0.018	B
Nickel	310	21.5		16.0		18.4	
Potassium		732		611		619	
Selenium	1,500	0.59	U	0.59	U	0.59	U
Silver	1,500	0.24	B	0.07	U	0.07	U
Sodium		125	B	98	B	42	B
Thallium		0.30	U	0.30	U	0.30	U
Vanadium		22.1		10.3		11.9	
Zinc	10,000	256.0		48.8		46.6	
PCBs							
PCB-1016		0.019	U	0.018	U	0.018	U
PCB-1221		0.037	U	0.034	U	0.035	U
PCB-1232		0.019	U	0.018	U	0.018	U
PCB-1242		0.019	U	0.018	U	0.018	U
PCB-1248		0.019	U	0.018	U	0.018	U
PCB-1254		0.019	U	0.018	U	0.018	U
PCB-1260		0.019	U	0.018	U	0.008	J
Total PCBs	1					0.008	

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Soil Boring **Sample Interval (feet bgs)** **Date** **Units**	**Commercial Soil Cleanup Objective** **ppm**	**SB-19** **3.5-4.5** **7/16/2008** **mg/kg**		**SB-20** **14-15** **7/16/2008** **mg/kg**		**SB-24** **12-16** **10/29/2008** **mg/kg**	
Metals -Total							
Aluminum		6040		10800		9740	E
Antimony		1.80	B,N	0.54	N,U	7.2	NU
Arsenic	16	6.8		5.6		6.3	
Barium	400	89.0		99.9		69.4	E
Beryllium	590	0.41	B	0.43	B	0.35	B
Cadmium	9.3 [10]	1.30		0.20	B	0.1	B
Calcium		12300		1210		4800	
Chromium (hexavalent/trivalent)	400**/1500** [50]	17.5		14.0		13.4	
Cobalt		5.1	B	8.8		7.6	
Copper	270	166.0		23.4		68.4	
Iron		38900		24500		21800	
Lead	1000 [500]	**2330**		11		40.8	*
Magnesium		1380		3170		3550	
Manganese	10,000	975	E,*	948	E,*	340	*
Mercury	2.8	0.163		0.014	B	0.022	B
Nickel	310	16.1		22.4		17.6	
Potassium		547	B	670		774	E
Selenium	1,500	0.59	U	0.59	U	4.2	U
Silver	1,500	0.33	B	0.07	U	1.2	U
Sodium		206	B	55	B	75.3	B
Thallium		0.30	U	0.30	U	3.0	NU
Vanadium		16.2		14.2		14.7	
Zinc	10,000	401.0		80.8		103	
PCBs							
PCB-1016		0.019	U	0.017	U	0.020	U
PCB-1221		0.037	U	0.033	U	0.039	U
PCB-1232		0.019	U	0.017	U	0.020	U
PCB-1242		0.019	U	0.017	U	0.020	U
PCB-1248		0.019	U	0.017	U	0.020	U
PCB-1254		0.019	U	0.017	U	0.020	U
PCB-1260		0.016	J	0.017	U	0.020	U
Total PCBs	1	0.016					

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Soil Boring **Sample Interval (feet bgs)** **Date** **Units**	**Commercial Soil Cleanup Objective** **ppm**	**SB-25** **6-8** **10/29/2008** **mg/kg**		**SB-25** **18-20** **10/29/2008** **mg/kg**		**SB-26** **14-18** **10/30/2008** **mg/kg**	
Metals -Total							
Aluminum		5460	E	10900		9410	E
Antimony		30.5	N	6.9	NU	7.0	NU
Arsenic	16	**19.5**		6.8	N*	6.3	
Barium	400	111	E	65.8		77.9	E
Beryllium	590	0.40	B	0.39	B	0.38	B
Cadmium	9.3 [10]	5.1		0.6	U	0.2	B
Calcium		4750		5580	*	2230	
Chromium (hexavalent/trivalent)	400**/1500** [50]	15.9		16.3		13.9	
Cobalt		8.5		8.1		7.7	
Copper	270	**1290**		20.8	*	21.8	
Iron		56900		24800		20900	
Lead	1000 [500]	**897**	*	13.8	N	18.0	*
Magnesium		1090		3520		2810	
Manganese	10,000	393	*	530		796	*
Mercury	2.8	0.162		0.176	N*	0.028	B
Nickel	310	18.7		20.8		20.1	
Potassium		703	E	645		685	E
Selenium	1,500	4.9		4.0	U	4.1	U
Silver	1,500	0.66	B	1.1	U	1.2	U
Sodium		268	B	572	U	43.7	B
Thallium		3.2	NU	2.9	NU	2.9	NU
Vanadium		27.7		13.0		12.1	
Zinc	10,000	1750		68.8	*	60.3	
PCBs							
PCB-1016		0.020	U	NA		0.019	U
PCB-1221		0.040	U	NA		0.037	U
PCB-1232		0.020	U	NA		0.019	U
PCB-1242		0.020	U	NA		0.019	U
PCB-1248		0.020	U	NA		0.019	U
PCB-1254		0.020	U	NA		0.019	U
PCB-1260		0.020	U	NA		0.019	U
Total PCBs	1						

Notes
J/B - value greater than or equal to the instrument detection limit, but less than the quanitation limit
E - value estimated or not reported due to the presence of interferences
ppm - parts per million / mg/kg - milligrams per kilogram
NA - Not Analyzed
* - Spike or duplicate analysis is not within the control limits
**- Total species concentration must be below each SCO
[10] - Site-specific cleanup goal shown in brackets

Appendix A
Summary of Soil Sampling Results - Metals/PCBs
Tioga Castings
Owego, New York
NYSDEC Site No. 7-54-012

Soil Boring **Sample Interval (feet bgs)** **Date** **Units**	**Commercial Soil Cleanup Objective** **ppm**	**SB-27** **6-Apr** **1/6/2011** **mg/kg**
Metals -Total		
Aluminum		4690
Antimony		4.7 U
Arsenic	16	3.3 J
Barium	400	26.7
Beryllium	590	0.2 J
Cadmium	9.3 [10]	1.4 U
Calcium		3850
Chromium (hexavalent/trivalent)	400**/1500** [50]	31.6
Cobalt		3
Copper	270	46.2
Iron		24800
Lead	1000 [500]	42.6
Magnesium		1100
Manganese	10,000	357
Mercury	2.8	0.034 J
Nickel	310	22
Potassium		605
Selenium	1,500	10.8 U
Silver	1,500	0.34 J
Sodium		509
Thallium		4.3 U
Vanadium		7.5
Zinc	10,000	73.7
PCBs		
PCB-1016		NA
PCB-1221		NA
PCB-1232		NA
PCB-1242		NA
PCB-1248		NA
PCB-1254		NA
PCB-1260		NA
Total PCBs	1	

Notes
J/B - value greater than or equal to the instrument detection limit, but less than the quanitation limit
E - value estimated or not reported due to the presence of interferences
ppm - parts per million / mg/kg - milligrams per kilogram
NA - Not Analyzed
* - Spike or duplicate analysis is not within the control limits
**- Total species concentration must be below each SCO
[10] - Site-specific cleanup goal shown in brackets

Appendix A

Analytical Data Summary

Soil Vapor Intrusion

MALCOLM PIRNIE

Appendix A
Summary of Air Sampling Results - VOCs
Tioga Castings Site
Owego, New York
NYSDEC Site No: 7-54-012

Sample ID Date Matrix	Units	NYSDOH DECISION MATRIX	SV-1 7/18/08 Air	SV-2 7/18/08 Air	SV-3 7/18/08 Air	SV-4 7/18/08 Air	SV-5 7/18/08 Air
Acetone	µg/m³		20	240	29	20	160
Benzene	µg/m³		6.5	19	8.8	8.1	12
Benzyl chloride	µg/m³		0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
Bromodichloromethane	µg/m³		0.33 U	0.33 U	0.33 U	0.33 U	0.33 U
Bromoform	µg/m³		0.51 U	0.51 U	0.51 U	0.51 U	0.51 U
Bromomethane	µg/m³		0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
1,3-Butadiene	µg/m³		0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
2-Butanone (MEK)	µg/m³		6.3	31	14	4.2	17
Carbon Disulfide	µg/m³		14	71	19	2.7	28
Carbon Tetrachloride	µg/m³	Matrix 1	0.31 U	0.31 U	0.82	0.31 U	0.31 U
Chlorobenzene	µg/m³		0.23 U	0.23 U	0.23 U	0.23 U	0.23 U
Chloroethane	µg/m³		0.13 U	0.13 U	0.13 U	0.13 U	0.13 U
Chloroform	µg/m³		0.24 U	0.24 U	0.24 U	0.24 U	0.79
Chloromethane	µg/m³		0.19	0.5	0.11	0.1 U	0.1 U
Cyclohexane	µg/m³		2.6	8	0.17 U	8.6	0.17 U
Dibromochloromethane	µg/m³						
1,2-Dibromoethane	µg/m³		0.27 U	0.38 U	0.38 U	0.38 U	0.38 U
1,2-Dichlorobenzene	µg/m³		0.21 U	0.3 U	0.3 U	0.3 U	0.3 U
1,3-Dichlorobenzene	µg/m³		0.21 U	0.3 U	0.3 U	0.3 U	0.3 U
1,4-Dichlorobenzene	µg/m³		0.21 U	0.42	0.3 U	1	1.2
Dichlorodifluoromethane	µg/m³		3	7.1	5	4.1	3.8
1,1-Dichloroethane	µg/m³		0.14 U	0.2 U	20	0.2 U	0.2 U
1,2-Dichloroethane	µg/m³		0.14 U	U	0.2 U	0.2 U	0.2 U
1,1-Dichloroethylene	µg/m³	Matrix 2	0.14 U	0.2 U	0.2 U	0.2 U	0.2 U
cis-1,2-Dichloroethylene	µg/m³	Matrix 2	0.14 U	0.2 U	0.2 U	0.2 U	0.2 U
trans-1,2-Dichloroethylene	µg/m³		0.14 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloropropane	µg/m³		0.17 U	0.23 U	0.23 U	0.23 U	0.23 U
cis-1,3-Dichloropropene	µg/m³		0.16 U	0.22 U	0.22 U	0.22 U	0.22 U
trans-1,3-Dichloropropene	µg/m³		0.16 U	0.22 U	0.22 U	0.22 U	0.22 U
1,2-Dichloro-1,1,2,2-tetrafluoroethane	µg/m³		0.25 U	0.35 U	0.35 U	0.35 U	0.35 U
Ethanol	µg/m³		14	30	30	14	14
Ethyl Acetate	µg/m³		0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
Ethylbenzene	µg/m³		5.4	16	8.6	2.9	6
4-Ethyltoluene	µg/m³		3.1	5.2	3.3	0.88	1.6
Heptane	µg/m³		48	140	300	13	47

Summary of Air Sampling Results - VOCs
Tioga Castings Site
Owego, New York
NYSDEC Site No: 7-54-012

Sample ID Date Matrix	Units	NYSDOH DECISION MATRIX	SV-1 7/18/08 Air	SV-2 7/18/08 Air	SV-3 7/18/08 Air	SV-4 7/18/08 Air	SV-5 7/18/08 Air
Hexachlorobutadiene	µg/m³		1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
Hexane	µg/m³		90	290	380	14	60
2-Hexanone (MBK)	µg/m³		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Isopropanol	µg/m³		1.8	5.3	1.8	0.75	2.7
Methyl tert-Butyl Ether (MTBE)	µg/m³		0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
Methylene Chloride	µg/m³		2.6	2.4	2.1	2.3	4.9
4-Methyl-2-pentanone (MIBK)	µg/m³		0.2 U	0.2 U	0.2 U	0.2 U	1.1
Propene	µg/m³		0.18 U	0.18 U	0.18 U	16	0.18 U
Styrene	µg/m³		0.41	0.79	0.54	0.28	0.45
1,1,2,2-Tetrachloroethane	µg/m³		0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
Tetrachloroethylene	µg/m³	Matrix 2	2.7	5.7	0.84	1.3	4.6
Tetrahydrofuran	µg/m³		0.15 U	0.15 U	0.15 U	0.15 U	0.15 U
Toluene	µg/m³		23	350	41	80	130
1,2,4-Trichlorobenzene	µg/m³		0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
1,1,1-Trichloroethane	µg/m³	Matrix 2	1.1	**1100**	54	13	5
1,1,2-Trichloroethane	µg/m³		0.27 U	0.27 U	0.27 U	0.27 U	0.27 U
Trichloroethylene	µg/m³	Matrix 1	0.88	0.4	0.27 U	0.27 U	0.27 U
Trichlorofluoromethane	µg/m³		2.3	1.9	15	11	21
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/m³		1.2	0.87	2	1.7	1.4
1,2,4-Trimethylbenzene	µg/m³		12	17	10	5.1	6.1
1,3,5-Trimethylbenzene	µg/m³		3.2	5.4	3.6	1.9	2.5
Vinyl Acetate	µg/m³		0.71 U	0.71 U	0.71 U	0.71 U	0.71 U
Vinyl Chloride	µg/m³	Matrix 1	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U
m&p-Xylene	µg/m³		17	48	18	13	22
o-Xylene	µg/m³		8.5	21	8.6	7.9	9.7

Notes:
U - Analyte not detected at indicated concentration
J - Estimated concentration
UJ - Analyte not detected - Reporting limit estimated
NJ - Tentatively identified compound - Estimated concentration

Appendix A
Summary of Air Sampling Results - VOCs
Tioga Castings Site
Owego, New York
NYSDEC Site No: 7-54-012

Sample ID Date Matrix	Units	NYSDOH DECISION MATRIX	SV-6 12/9/10 Air	SV-7 12/9/10 Air	SV-8 12/9/10 Air	AA-1 7/18/08 Air	AA-2 12/9/10 Air
Acetone	µg/m³		0.95 U	0.95 U	12 U	22	6.7 U
Benzene	µg/m³		1.6	1 U	0.33	2.9	0.34
Benzyl chloride	µg/m³		0.52 U	0.52 U	0.52 U	0.19	0.18 U
Bromodichloromethane	µg/m³		0.67 U	0.67 U	0.67 U	0.24	0.24 U
Bromoform	µg/m³		1 U	1 U	1 U	0.36	0.36 U
Bromomethane	µg/m³		0.39 U	0.39 U	0.39 U	0.14	0.14 U
1,3-Butadiene	µg/m³		0.22 U	0.22 U	0.22 U	0.08	0.078 U
2-Butanone (MEK)	µg/m³		4.5 U	1.8 U	1.4 U	4.1	1.6 U
Carbon Disulfide	µg/m³		1.1	1.8	0.31 U	0.12	0.11 U
Carbon Tetrachloride	µg/m³	Matrix 1	0.63 U	0.63 U	0.63 U	0.56	0.46
Chlorobenzene	µg/m³		0.46 U	0.46 U	0.46 U	0.17	0.16 U
Chloroethane	µg/m³		0.26 U	0.26 U	0.26 U	0.1 U	0.093 U
Chloroform	µg/m³		0.49 U	0.49 U	0.49 U	0.17 U	0.17 U
Chloromethane	µg/m³		0.21 U	0.21 U	0.21 U	1	1.1
Cyclohexane	µg/m³		1.2	1.1	0.78	0.99	0.12 U
Dibromochloromethane	µg/m³		0.85 U	0.85 U	0.85 U		0.3 U
1,2-Dibromoethane	µg/m³		0.38 U	0.77 U	0.77 U	0.27 U	0.27 U
1,2-Dichlorobenzene	µg/m³		0.3 U	0.6 U	0.6 U	0.21 U	0.21 U
1,3-Dichlorobenzene	µg/m³		0.3 U	0.6 U	0.6 U	0.21 U	0.21 U
1,4-Dichlorobenzene	µg/m³		1.2	0.6 U	0.6 U	0.21 U	0.21 U
Dichlorodifluoromethane	µg/m³		21	1.1 NJ	2.6	3	1.1
1,1-Dichloroethane	µg/m³		0.2 U	0.4 U	0.4 U	0.14 U	0.14 U
1,2-Dichloroethane	µg/m³		0.2 U	0.4 U	0.4 U	0.14 U	0.14 U
1,1-Dichloroethylene	µg/m³	Matrix 2	0.2 U	0.4 U	0.4 U	0.14 U	0.14 U
cis-1,2-Dichloroethylene	µg/m³	Matrix 2	0.2 U	0.4 U	0.4 U	0.14 U	0.14 U
trans-1,2-Dichloroethylene	µg/m³		0.2 U	0.4 U	0.4 U	0.14 U	0.14 U
1,2-Dichloropropane	µg/m³		0.23 U	0.46 U	0.46 U	0.17 U	0.16 U
cis-1,3-Dichloropropene	µg/m³		0.22 U	0.45 U	0.45 U	0.16 U	0.16 U
trans-1,3-Dichloropropene	µg/m³		0.22 U	0.45 U	0.45 U	0.16 U	0.16 U
1,2-Dichloro-1,1,2,2-tetrafluoroethane	µg/m³		0.35 U	0.7 U	0.7 U	0.25 U	0.25 U
Ethanol	µg/m³		3.1 UJ	1.9 UJ	2.5 UJ	80	1.6 UJ
Ethyl Acetate	µg/m³		0.36 U	0.36 U	0.36 U	0.26 U	0.13 U
Ethylbenzene	µg/m³		2.2 NJ	0.43 U	0.43 U	3.7	0.15 U
4-Ethyltoluene	µg/m³		0.49 U	0.49 U	0.49 U	2.4	0.17 U
Heptane	µg/m³		230	28	4.2	2.1	0.14 U

Summary of Air Sampling Results - VOCs
Tioga Castings Site
Owego, New York
NYSDEC Site No: 7-54-012

Sample ID Date Matrix	Units	NYSDOH DECISION MATRIX	SV-6 12/9/10 Air	SV-7 12/9/10 Air	SV-8 12/9/10 Air	AA-1 7/18/08 Air	AA-2 12/9/10 Air
Hexachlorobutadiene	µg/m³		1.1 U	1.1 U	1.1 U	0.75 U	0.37 U
Hexane	µg/m³		360	63	5	8.3	0.12 U
2-Hexanone (MBK)	µg/m³		0.41 U	0.41 U	0.41 U	0.14 U	0.43
Isopropanol	µg/m³		0.25 UJ	0.25 UJ	0.9 UJ	1.8	0.29 J
Methyl tert-Butyl Ether (MTBE)	µg/m³		0.36 U	0.36 U	0.36 U	0.13 U	0.13 U
Methylene Chloride	µg/m³		1.4 U	1.4 U	2.6	3.6	0.52
4-Methyl-2-pentanone (MIBK)	µg/m³		0.41 U	0.41 U	0.41 U	0.44	0.14 U
Propene	µg/m³		0.69 U	0.69 U	0.69 U	0.13 U	0.24 U
Styrene	µg/m³		0.43 U	0.43 U	0.43 U	0.15 U	0.15 U
1,1,2,2-Tetrachloroethane	µg/m³		0.69 U	0.69 U	0.69 U	0.24 U	0.24 U
Tetrachloroethylene	µg/m³	Matrix 2	0.68 U	0.68 U	0.68 U	0.24 U	0.24 U
Tetrahydrofuran	µg/m³		0.29 U	0.29 U	0.29 U	0.23	0.1 U
Toluene	µg/m³		2.9	1.5	0.75	13	0.19
1,2,4-Trichlorobenzene	µg/m³		0.74 U	0.74 U	0.74 U	0.26 U	0.26 U
1,1,1-Trichloroethane	µg/m³	Matrix 2	3.6	1.7	1.8	0.19 U	0.19 U
1,1,2-Trichloroethane	µg/m³		0.55 U	0.55 U	0.55 U	0.19 U	0.19 U
Trichloroethylene	µg/m³	Matrix 1	0.54 U	0.54 U	0.54 U	0.19 U	0.19 U
Trichlorofluoromethane	µg/m³		0.56 U	0.56 U	0.99	2.2	1
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/m³		0.84	0.77 U	0.77 U	0.71	0.46
1,2,4-Trimethylbenzene	µg/m³		0.49 U	0.49 U	0.49 U	9	0.17 U
1,3,5-Trimethylbenzene	µg/m³		0.49 U	0.49 U	0.49 U	2.6	0.17 U
Vinyl Acetate	µg/m³		0.35 U	0.35 U	0.35 U	0.5 U	0.12 U
Vinyl Chloride	µg/m³	Matrix 1	0.26 U	0.26 U	0.26 U	0.1 U	0.09 U
m&p-Xylene	µg/m³		1.7 U	0.87 U	0.87 U	13	0.3 U
o-Xylene	µg/m³		1.1 U	0.43 U	0.43 U	5.5	0.15 U

Notes:
U - Analyte not detected at indicated concentration
J - Estimated concentration
UJ - Analyte not detected - Reporting limit estimated
NJ - Tentatively identified compound - Estimated concentration

Appendix B

Operation and Maintenance Checklist

MALCOLM PIRNIE

TIOGA CASTINGS SITE LANDFILL

Post-Closure Operation and Maintenance Checklist

Inspected by: _____

Date: _____ Time: _____

Weather Conditions: _____

LANDFILL COVER SYSTEM

Erosion	_____	YES	_____	NO
Holes or Cracks in Cover	_____	YES	_____	NO
Cap Settlement	_____	YES	_____	NO
Ponded Water or Wet Areas	_____	YES	_____	NO
Burrowing Rodents	_____	YES	_____	NO
Sparse Vegetation/Bare Soil	_____	YES	_____	NO
Brush or Other Woody Vegetation,	_____	YES	_____	NO
Excessive Weeds in Grass	_____	YES	_____	NO
Grass Mowed	_____	YES	_____	NO

DRAINAGE DITCHES

Erosion	_____	YES	_____	NO
Obstructions	_____	YES	_____	NO
Sediment Accumulation	_____	YES	_____	NO
Evidence of Surcharging	_____	YES	_____	NO
Presence of Brush	_____	YES	_____	NO

Comments: _____

_____

Continued

FENCING

Gates and Locks	_____	OK	_____	OTHER
Posts	_____	OK	_____	OTHER
Top Tension Wire	_____	OK	_____	OTHER
Barbed Wire	_____	OK	_____	OTHER

Comments: _____

_____

MONITORING WELLS

Capped and Locked	_____	YES	_____	NO
Casing Damage	_____	YES	_____	NO

Comments: _____

_____

INSPECTOR' SIGNATURE _____ DATE _____

REPORT REVIEWED BY _____ DATE _____

REPORT FORWARED TO NYSDEC _____ DATE _____

Appendix C

Site Contact List

MALCOLM PIRNIE

Appendix C

Site Contact List

Tioga Casting Site - NYSDEC Site Number 7-54-012

Property Owner (from Tioga County Real Property Web site)

Tioga Foundry Corp
2065 Carmichael
Owego, NY 13827

New York State Department of Environmental Conservation

Payson Long
Environmental Engineer 1
Remedial Bureau E, Section D
Division of Environmental Remediation
625 Broadway
Albany, NY 12233-7013
(518) 402-9814

Malcolm Pirnie, Inc.

Jeremy Wyckoff
Project Hydrogeologist
855 Route 146, Suite 210
Clifton Park, New York 12605
(518) 250-7300

New York State Department of Environmental Conservation
Site Management Plan - Tioga Castings Site

Appendix D

Notification List

MALCOLM PIRNIE

Appendix D
Notification List
Tioga Casting Site
NYSDEC Site Number 7-54-012

Site Property Owner

John Sweet III
2065 Carmichael
Owego, NY 13827

NYSDEC

Payson Long - Environmental Engineer 1
Division of Environmental Remediation
Remedial Bureau E, Section D
625 Broadway
Albany, NY 12233-7013
(518) 402-9814

Local Officials

Mayor
Edward Arrington
178 Main Street, Owego
Owego, New York 13827

Tioga Count Legislature
Dale N. Weston - Chair
56 Main Street
Owego, New York 13827

Village Clerk
Rodney M. Marchewka
178 Main Street, Owego
Owego, New York 13827

Director of Utilities
Michael Trivisonno
2354 State Route 434
Apalachin, New York 13732

Town Supervisor
Donald Castellucci Jr.
2354 State Route 434
Apalachin, New York 13732

Chairman Planning Board
Stewart Howard
178 Main Street, Owego
Owego, New York 13827

Schools

Owego-Apalachin Central School
1 Sheldon Guile Blvd.
Owego, New York 13827
607-687-6230

Owego Elementary School
1 Christa Mcauliffe Dr.
Owego, New York 13827
607-687-6261

Owego-Apalachin Central School District
Dr. William C. Russell - Superintendent
36 Talcott Street
Owego, NY 13827

Owego-Apalachin School District 1
100 Elm Street
Owego, New York 13827

Appendix D
Notification List
Tioga Casting Site
NYSDEC Site Number 7-54-012

Adjacent Property Owners [1]

128.07-2-1
Pinnacle Towers Inc.
P.O. Box PMB353
4017 Washington Rd
McMurray PA 15317

128.07-2-6
Thomas Clark
9-11 Lake St
Owego NY 13827

128.07-2-3
Village of Owego and
Owego Fire Department
178 Main St
Owego NY 13827

128.07-2-15
Owego-Apalachin Central School
1 Sheldon Guile Blvd.
Owego, New York 13827
607-687-6230

128.07-2-5.2
Roger Patterson
159A McMaster Street
Owego NY 13827

128.07-2-5.1
Scott A Smith Family Llc
8 Delphine St
Owego NY 13827

128.07-2-13
Stakmore Co Inc
30 Elm St
Owego NY 13827

128.07-2-8
Village Of Owego
178 Main St
Owego NY 13827

Village of Owego
20 Elm Street
Owego, New York 13827

1 - Parcel and Property owner information from Tioga County Real Property web site.