POST-CLOSURE ENVIRONMENTAL MONITORING PLAN

NYSDEC SITE NO. 8-62-006
TORREY, NY

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Prepared for:

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Hammondsport, New York

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URBANA LANDFILL

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1.0 INTRODUCTION

1.1 Site Description & Location

The former Mercury Aircraft-Dresden Facility (the Site) is a single building located within a 55-acre industrial park in the Town of Torrey, New York, one mile southeast of the Village of Dresden. The building and a portion of the surrounding property were formerly owned by Mercury Aircraft and used for the manufacture of stamped metal computer chassis. A site vicinity and location map is included as Figure 1. Seneca Lake is located approximately 800 feet east of the facility. The lake is a source of water for several residences in the area and is widely used for recreational purposes. The Site gently slopes to the east toward a 50-foot cliff overlooking the lake. Perry Point stream is located to the south, approximately 2,000 feet from the Site. A site plan is presented as Figure 2.

1.2 Background

In February 1985, a trichloroethene (TCE) spill from a vapor-degreasing unit occurred in the Mercury Aircraft building. Cleanup operations recovered much of the TCE, however, an undetermined quantity migrated into the soil and bedrock beneath the building. Subsequent investigations revealed that chlorinated volatile organic compounds (VOCs) were present in the groundwater. In February 1991, the New York State Department of Environmental Conservation (NYSDEC) listed the Site as a Class 2 site in the New York State Registry of Inactive Hazardous Waste Disposal Sites. An Interim Remedial Measure (IRM) was constructed in the spring of 1993 and began operation in June 1993 consisting of a groundwater treatment system designed to mitigate potential risk to human health and the environment by preventing off-site migration of contaminated groundwater in the bedrock. The 1993 IRM initially collected groundwater by a single pumping well, identified as PW-1, installed in an artificially created bedrock fracture zone, 65 feet below grade. Advanced oxidation followed by air stripping treated the collected groundwater. The

IRM has been operational for over ten years without failure and performance monitoring indicates that it is highly effective in removing and destroying VOCs in the groundwater.

A Remedial Investigation/Feasibility Study was submitted to the NYSDEC and approved in 1998 and a preferred remedial approach was agreed upon including:

- Continued operation of the existing IRM to control off-site migration of VOCs in the groundwater.
- Installation of a deep groundwater extraction well in the area of the 1985 spill and treatment of the extracted groundwater to supplement the IRM with additional source area control.
- Removal of impacted sediments from storm sewer manholes MH-1 and MH-2.

In April 2002, Benchmark personnel removed and properly disposed of impacted sediments from manholes MH-1 and MH-2. In addition, a second deep groundwater extraction well, identified as PW-2, was advanced within the source area immediately adjacent to MW-11 (see Figure 2). On-site network monitoring wells will be sampled during 2003 to assess the effectiveness of the ground water collection system as described in detail in this EMP.

1.3 General Site Conditions

The industrial complex that includes the former Mercury Aircraft-Dresden Facility is located in a rural area that has been industrialized by the presence of the New York State Electric and Gas (NYSEG) Greenidge power plant facility to the north and Ferro Corporation, Transelco Division's (FCTD) office and production buildings. The former Mercury Aircraft-Dresden Facility was housed within a single building, which is currently owned and operated by FCTD as a warehouse (see Figure 2). FCTD manufactures high precision polishing compounds from cerium mineral and dielectric materials from barium minerals and titanium dioxide.

All of the property west of the former Mercury Aircraft-Dresden Facility is owned by FDTC and NYSEG owns the property along the complex's northern boundary. A residential area is located approximately 1000 feet south of the industrial complex on the south side of Perry Point Road and Seneca Lake is located immediately east of the complex.

1.3.1 Topography & Drainage

The site is located on the lower lying Till Plain of the Great Lakes section of the Central Lowland physiographic province. This province is an undulating plain with a maximum elevation of 1,100 feet at Benton Center in Yates County.

Major topographic features in the vicinity of the site are glacially-derived landforms including rolling uplands and a series of narrow steep-walled parallel valleys running north and south. In Yates County, these valleys contain Canandaigua, Keuka, and Seneca Lakes. The western and eastern boundaries of Yates County are located on Canandaigua and Seneca Lakes, respectively.

A topographic map of the site is presented in Figure 3. The site is located approximately 800-feet from the western shore of Seneca Lake. The ground surface elevations range from approximately 540 feet mean sea level (fmsl) on the western property boundary to 520 fmsl on the eastern property boundary. East of the site, the land surface slopes to 500 fmsl above a 50-foot cliff above Seneca Lake with an elevation of 445 fmsl.

All surface water at the site drains toward Seneca Lake. A stream, located approximately 2,000 feet south of the site near Perry Point Road, receives runoff from the south perimeter of the industrial complex. The stream discharges into Seneca Lake.

1.3.2 Hydrology

There are two surface water features in the vicinity of the site: Seneca Lake, due west of the site; and an unnamed stream near Perry Point Road located south of the site. Both features are described in the sections below.

1.3.2.1 Seneca Lake

Seneca Lake is the largest Finger Lake, measuring 35.1 miles long, 3.2 miles wide and 618 feet deep. Lake uses include residential and industrial water supply and recreational activity including fishing, swimming and boating. Seneca Lake is the raw water source for several municipal communities including the City of Geneva, Village of Waterloo, Seneca Army Depot, Hamlet of Romulus, Willard Psychiatric Center, Village of Ovid and the Village of Watkins Glen. An estimated 70,000 persons are served with water treated from Seneca Lake. Many municipal and non-municipal communities around Seneca Lake are served by wells including the Village of Odessa, Hector Water District No. 1, Montour Falls, Village of Inerlaken and several trailer parks. Although the Town of Dresden is located on Seneca Lake and is the closest municipality to the site, it is supplied with treated water from Keuka Lake.

1.3.2.2 Unnamed Stream

The unnamed stream, located approximately 2000 feet south of the site near Perry Point Road, discharges into Seneca Lake (see Figure 3).

1.3.3 Geology

The site is located on the western edge of the glaciated valley of Seneca Lake, which slopes moderately toward the lake. The geologic materials encountered during the remedial investigations include the following:

- Till overburden consisting of silt, clay and gravel
- Shale of the Moscow and Ludlowville Formations

In general, a veneer of till (approximately 3 to 4-feet in thickness) mantles shale bedrock at the site. The bedrock underlying the till is the Moscow Formation of the Hamilton Group shales. At a depth of approximately 150 to 160 feet below grade, the Ludlowville Formation shale was encountered during borehole advancement of deep monitoring wells. The shale formations are uniformly fractured with horizontal fracture spacings of approximately 1-foot and vertical joint set spacings ranging from 4-feet to 2-inches. The regional bedrock stratigraphy of the area is conceptualized in Figure 4. Detailed core descriptions including rock type and quality are presented in the borehole logs presented in Appendix A.

1.3.4 Hydrogeology

The overburden soils are non-water bearing at the site. The first water bearing zone occurs within the bedrock approximately four to eight feet below ground surface (fbgs) outside of the hydraulic influence of the ground water collection system. The direction of ground water flow has been substantially impacted by the operation of the ground water collection system at the site. The flow directions have been reversed from eastward toward the former FCTD process lagoons (located approximately 150-feet east of the collection trench) to westward, back toward the collection system.

Evaluations of the hydraulic influence of the collection system have shown that the hydraulic effects from ground water withdrawal extend laterally west to the former Mercury Aircraft building, north to the property line with NYSEG, east to the former location of FCTD process lagoon service road (located approximately 150-feet east of the collection trench) and south beneath the FCTD office building. Downward vertical hydraulic gradients have been substantially reduced and seasonally reversed to upward hydraulic gradients within the area of influence of the collection system. Below the influence of the collection system (below depths of 65 feet), vertical hydraulic gradients are reversed from downward within the lower Moscow Formation to upward within the Ludlowville Formation.

1.3.5 Hydrochemistry

Hydrochemical facies studies using water chemistry data and isotopically derived ground water age data indicate that ground water in the Moscow Formation is distinctly different from the ground water in the Ludlowville Formationand mixing of the two ground waters does not occur. A flownet model was prepared in support of the RI to conceptualize the ground water flow conditions at the site. The model indicates that as shallow ground water flows beneath the site, it will migrate toward the ground water collection system. Deeper ground water will flow with both a horizontal flow component toward Seneca Lake and a vertical component downward toward the base of the Moscow Formation. The model also indicates that ground water present within this active flow zone will not migrate deeper than 160 feet below ground surface.

1.4 Purpose and Objectives

The purpose of this Environmental Monitoring Plan (EMP) is to identify and document the methods that will be employed to monitor and maintain the effectiveness of the Dresden site remediation, including inspections, repairs, sampling locations, collection procedures, and analytical parameters.

1.5 Plan Organization

This Plan is organized into eight sections as follows:

- **Section 1.0** provides background information on the former Dresden Facility and a description of the general site conditions.
- **Section 2.0** provides a description of the field and laboratory data quality objectives.
- **Section 3.0** provides a description of the site-monitoring network.
- **Section 4.0** provides a summary of the monitoring strategy, a description of the facility and environmental monitoring plans and a discussion of how the results of the monitoring will be evaluated.

- **Section 5.0** provides a summary of ground water and ground water collection system sampling procedures.

- **Section 6.0** describes the sample analytical program.

- **Section 7.0** describes field and laboratory corrective actions, if applicable.

- **Section 8.0** describes field and laboratory data quality assessment.

- **Section 9.0** describes the evaluation of the monitoring results and the elements of the annual monitoring reports.

- **Section 10.0** lists the references cited in the EMP.

2.0 DATA QUALITY OBJECTIVES

Analytical data generated by the environmental monitoring program at the Former Dresden Facility will be used to:

- Monitor the effectiveness of the groundwater collection system in achieving the desired objective of mitigating off-site release of constituents of concern in groundwater.
- Monitor the contaminant destruction efficiency through the groundwater treatment system and verify conformance with treated effluent discharge limits.

Data Quality Objectives (DQOs) have been identified in support of the intended uses of the analytical data. These DQOs include:

- Sampling in accordance with written field procedures.
- Compliance with the accuracy, precision and comparability criteria specified in a particular analytical methodology. These criteria are evaluated in terms of adherence to the published method protocols and the analysis of a specified frequency of quality control samples.
- Target method detection limits equal to or less than the NYSDEC Class GA Groundwater Quality Standards.
- Compliance with project specified reporting and deliverable requirements.

3.0 MONITORING SYSTEM DESCRIPTION AND LOCATIONS

3.1 Ground Water Recovery and Treatment System

The ground water collection and treatment system at the site involves recovery of contaminated ground water from two pumping wells, designated as PW-1 and PW-2 (see Figure 2), with concurrent treatment of the recovered groundwater via an advanced oxidation process (AOP) followed by air stripping. AOP is a destructive process incorporating ultraviolet light and hydrogen peroxide to form hydroxyl radicals, which are powerful oxidizers that convert chlorinated organics to carbon dioxide, water and chloride salts. The ground water treatment process also incorporates an influent day tank to temporarily store groundwater and facilitate batch process treatment. Ground water is pumped from the day tank through the AOP unit. A hydrogen peroxide storage tank and metering pump delivers hydrogen peroxide to the untreated water. Bag filters installed ahead of the day tank mitigate solids build-up in the tank and increase AOP efficiency.

Treated ground water (effluent) is discharged to Seneca Lake via a buried 6-inch diameter polyvinyl chloride (PVC) outfall pipe. Treated ground water quality is monitored via sample collection from a tap located on the discharge side of the air stripper unit prior to effluent discharge. Influent ground water quality is monitored via sample collection from a tap located on the upstream (influent) side of the AOP unit.

3.2 Ground Water Monitoring Network

The monitoring well network for the 30-year groundwater monitoring program as presented in the ROD will include all bedrock horizons: shallow (S), intermediate (I) and deep (D) bedrock. The monitoring network will include 19 monitoring wells associated with the following well clusters:

- Monitoring wells adjacent to the collection trench

Well I.D.	Total Depth (feet)
MW-3S	26.0
MW-3I	40.0
MW-3D	65.0
MW-3D2	90.0
MW-5S	22.0
MW-5I	48.0
MW-5D	85.0
MW-5D2	200.0
MW-6S	23.0
MW-6D	177.0

- Downgradient monitoring wells

Well I.D.	Total Depth (feet)
MW-7	25.0
MW-8	24.0
MW-9	25.0

- Further downgradient nested monitoring wells

Well I.D.	Total Depth (feet)
NW-A	50.0
NW-B	100.0
NW-C	140.0
NW-D	180.0
NW-E	238.0
NW-F	300.0

The groundwater monitoring network is intended to assess the effectiveness of the groundwater collection system downgradient of the collection trench. If volatile organic impacts in well clusters MW-5 and MW-6 do not indicate a decreasing concentration versus time trend or if downgradient wells MW-7, MW-8, MW-9 and nested wells NW-A, B, C and NW-D, E, F show an increasing concentration versus time trend, contingency measures, such as more frequent monitoring and additional plume control, will be evaluated and implemented, as necessary. In addition, if VOC concentrations in downgradient monitoring well MW-9 exceed NYS Groundwater Quality Standards for two consecutive sampling events, a residential well sampling program as well as a focused monitoring program will be evaluated and developed to effectively monitor the potential migration of the impacted groundwater plume toward the eastern edge of the site.

In addition to the above listed wells, the following locations will be monitored for water elevation information to facilitate preparation of potentiometric surface maps:

- Monitoring well cluster MW-1S, MW-4 (S, I), MW-10, MW-11;
- Piezometers OW-1, OW-2, OW-3; and
- Pumping wells PW-1 and PW-2.

Borehole logs for all on-site ground water monitoring wells are included in Appendix A. Table 1 presents construction data for each of the above-referenced wells and piezometers.

4.0 MONITORING PROGRAM

As described in Section 3, environmental monitoring will be conducted at specific monitoring wells upgradient and downgradient of the ground water treatment system. Details concerning the planned monitoring frequency, parameters and analytical methods are described below. A summary of the monitoring program requirements is presented in Table 2.

4.1 Groundwater Treatment System Monitoring

Samples will be collected from the treated groundwater effluent monitoring point within the treatment system building on a monthly basis. During each sampling event, effluent groundwater will be analyzed for Target Compound List (TCL) volatile organic compounds (VOCs) (halogenated aliphatic hydrocarbons only, including cis-1,2-Dichloroethene) via USEPA Method 8021 to confirm that the AOP unit and air stripper are operating as intended and to confirm the integrity of groundwater discharged from the facility to the infiltration gallery. Effluent pH and temperature will also be measured at the time of sample collection using field instruments. In addition, samples will be collected from the treatment system influent to assist in the collection and treatment system performance evaluation (see Section 9). Influent samples will be collected at a frequency of once per year to coincide with the ground water monitoring program and will be analyzed for TCL VOCs (halogenated aliphatic hydrocarbons only) via USEPA Method 8021.

Effluent groundwater analytical results will be reviewed annually to determine whether modifications to the analytical requirements are appropriate. Recommendations for changes to the monitoring program will be submitted to the NYSDEC for review and approval in the annual monitoring report or separate letter report.

4.2 Groundwater Monitoring

Groundwater monitoring will include both water quality and water level monitoring. Water level monitoring is intended to detect seasonal changes in the groundwater flow direction and to illustrate hydraulic capture by the groundwater collection system. Groundwater elevation monitoring will be performed at all well and piezometer locations identified on Table 1.

Groundwater samples will be collected at the network well locations identified in Section 3.2 and summarized in Table 2. Procedures for well sampling are discussed in Section 5. Groundwater levels will be recorded prior to well purging. Groundwater samples will be analyzed for TCL VOCs (halogenated aliphatic fraction only, including cis-1,2-Dichloroethene) via USEPA Method 8021, as well as field parameters including pH, temperature, specific conductivity and turbidity. As part of this EMP, groundwater monitoring of network wells will be conducted at the site in accordance with the following schedule established in the ROD:

Year(s) No.	Frequency of Monitoring
1 – 2	Quarterly
3 – 6	Semi-Annually
7 – 30	Annually

5.0 FIELD SAMPLING PROCEDURES

This section describes the sampling procedures that will be implemented at the Former Dresden Facility during routine environmental monitoring events.

5.1 Pre-Sampling Preparation

Prior to a scheduled sampling event, the following steps will be performed by personnel responsible for sampling:

- Review the sampling procedures;
- Assemble and inspect all field equipment necessary for sample collection;
- Verify that equipment is clean and in proper working order;
- Note and replace any items that are in short supply or that are showing indications of wear; maintain an adequate supply of spare parts for all sampling equipment;
- Calibrate all equipment to manufacturer's specifications;
- Examine shuttles, bottles, labels and preservatives; contact laboratory immediately if any problems are discovered;
- Confirm sample delivery time and method of shipment with the laboratory;
- Establish a sampling team of at least two people; and
- Establish monitoring well evacuation and sampling schedule for the activities of each day.

5.2 Groundwater Treatment System Sample Collection

Groundwater treatment system sampling will be performed by direct-filling VOC vials from the appropriate sample taps during active (batch) treatment system operation. Prior to sample collection, the taps will be opened and the lines will be allowed to run for a few seconds to assure a representative sample is collected. VOC vials will be filled to assure no headspace is present. Following collection, the samples will be labeled per the Field Operating Procedures (FOPs) included in Appendix B and transported to a National Environmental Laboratory Approval Program (NELAP)-certified laboratory for analysis.

5.3 Monitoring Well Inspection and Evaluation

The integrity of all ground water monitoring wells will be evaluated as part of routine groundwater monitoring events. Monitoring well integrity, including, but not limited to, sediment intrusion, working locks, adequate surface seals and protective casings, will be evaluated. In addition, the well riser will be inspected for cracks and damage. Well repair, if necessary, will be performed to restore the well to original construction conditions. Recommendations for installation of replacement monitoring wells, if required, will be discussed and presented to the NYSDEC for approval before installation.

If it is determined that a well no longer provides adequate information pertinent to long-term monitoring or a monitoring well requires replacement, a well decommissioning request will be drafted, submitted to the NYSDEC for approval and implemented in accordance with Benchmark's field operating procedures presented in Appendix B. Existing monitoring wells that are not proposed to be included in the post-closure monitoring will be maintained until the NYSDEC and Mercury Aircraft agree that the wells can be abandoned.

5.4 Groundwater Sampling

Applicable guidelines to be employed for collecting representative groundwater samples from monitoring wells are provided in Appendix B. Applicable guidelines include:

- Groundwater Level Measurement
- Low Flow (Minimal Drawdown) Groundwater Purging & Sampling Procedures
- Management of Investigation-Derived Waste

- Non-Disposable and Non-Dedicated Sampling Equipment Decontamination
- Sample Labeling, Storage, and Shipment Procedures

Sample collection equipment will consist of a non-dedicated submersible pump designed to obtain samples with minimal agitation and contact with the atmosphere via low-flow (minimal drawdown) sampling techniques. The pump will be protected during transport to and from the sampling destination to avoid contamination and will be checked for integrity before use.

The types and frequencies of field QA/QC samples to be collected are discussed in Section 6. To ensure sample integrity, a low-flow/minimal drawdown method of purging and sampling, also referred to as micro-purging, will be followed at each monitoring well location in order to obtain a representative ground water sample from the water-bearing zone. This low-flow method of purging is used to minimize the turbidity of the produced water as well as reduce the volume of water purged, thus reducing the quantity of water to contain and treat. Low-flow purge and sample methods will allow the collection of ground water samples more representative of formation water at the site.

Low-flow well purging will be performed immediately preceding ground water sample collection. The representative ground water sample will be collected as soon as the parameters measured in the field (i.e., pH, specific conductance, temperature, and turbidity) have stabilized. Stabilization of indicator parameters should be used to determine when formation water is first encountered during purging. In general, the order of stabilization is pH, temperature, and specific conductance, followed by turbidity. Performance criteria for determination of stabilization should be based on water-level drawdown, pumping rate and equipment specifications for measuring indicator parameters. Stabilization is achieved after all field parameters have stabilized for three successive readings. Three successive readings should be within ± 0.2 units for pH, ± 10% for specific conductance, and ± 10% for turbidity. Data on pumping rate, drawdown and volume required for parameter stabilization will be used as a guide for conducting subsequent sampling activities. Well evacuation procedures will be conducted in accordance with the applicable guideline for well purging (see Appendix B).

Samples intended for volatile organic compound analysis will be collected immediately after well evacuation. In addition, the following guidelines shall apply to monitoring well sampling:

- Field measurements will be performed on a sample collected from the well after the sample for volatile organic analysis has been collected.
- Field test equipment will be calibrated at the beginning of each sampling day, and will be checked and recalibrated according to manufacturer's specifications. Field instrumentation will be maintained and operated according to the applicable guidelines presented in Appendix B.
- Samples will be collected in laboratory-preserved sample bottles, cooled to 4°C and transported to a NELAP-certified laboratory for analysis within proper holding times (see Section 6.2) and with proper chain-of-custody documentation. A chain-of-custody form (see Figure 5) will be completed for each sample delivery group of collected samples (i.e., one chain of custody per day). The chain-of-custody form will be signed and dated by the person who performed sample collection, the person the samples were relinquished to for transport to the laboratory (if applicable) and the laboratory sample custodian who receives the samples. The applicable guideline for sample labeling, storage and shipment is presented in Appendix B.

5.5 Field Equipment Cleaning

Non-dedicated purging equipment (i.e., submersible pump) and water level monitoring probes will be cleaned before each use in accordance with the procedure for Non-Disposable and Non-Dedicated Sampling Equipment Decontamination presented in Appendix B. Pump tubing will be dedicated to each monitoring well and will not require cleaning other than that provided by the manufacturer. Dedicated equipment must be maintained within the sealed original manufacturer's packaging prior to installation.

5.6 Documentation of Field Activities

The results of all field measurements and associated calculations will be recorded on standard forms included with the guidelines presented in Appendix B. During all field activities, the following general information, at a minimum, will be recorded on appropriate data sheets:

- Date
- Field sampling crew members
- Meteorological conditions
- Brief description of field activities planned for date indicated
- Tailgate Health and Safety meeting topics
- Location where work is performed
- Problems encountered and corrective actions taken
- All field measurements or descriptions made
- Any modifications made to sampling procedures

In addition, the following information will be recorded by the Field Team Leader during the collection of all environmental samples:

- Sample Locations and summary of the samples collected
- Completeness of the sampling effort
- Sample descriptions
- Results of all field measurements
- Results of field instrument calibrations
- Sample preservation used (if applicable)
- Chain-of-custody information.

All original forms and field notebooks will be placed in the project record file that will be maintained at the Benchmark Environmental Engineering & Science, PLLC Buffalo, NY office location.

6.0 SAMPLE ANALYTICAL PROGRAM

6.1 Parameters for Physical/Chemical Analysis

The analytical parameters that will be analyzed in the monitoring programs discussed in this EMP are listed in Tables 2 and 3.

6.2 Analytical Methods/Protocols

The methods that will be used for chemical analysis of all samples collected during this monitoring program are presented in Table 3. The sampling holding times, preservation and container requirements are also presented.

6.3 Groundwater Monitoring Program Field Quality Control Samples

The following field quality control samples will be analyzed in support of the ground water monitoring program at the landfill:

- **Equipment Blank** – One equipment blank will be prepared daily by pouring ASTM Type I water through any non-dedicated sampling devices and filling a complete set of sample bottles. If the equipment is dedicated, no equipment blank will be prepared. The results of the equipment blank(s) will be reviewed to monitor the effectiveness of the equipment decontamination procedures.

- **Trip Blanks** - A sufficient number of trip blanks for volatile organic compound analysis will be prepared by the laboratory and delivered to the sampling team prior to a sampling event. One sealed blank will be carried into the field per day along with the sample containers for each day that volatile organic samples are collected. Trip blanks will be transported and handled in the same manner as the actual samples. The results of the trip blank analysis will be reviewed to evaluate if the potential for sample contamination during transportation and handling exists.

- **Blind Duplicate** - One blind duplicate will be collected and analyzed per 20 samples collected during each ground water sampling event. The field sample containers will be returned to the laboratory identified only as the "blind duplicate". The well or sample location will be recorded in the Project Field Book and on the respective Water Sample Collection Log (see Appendix B) and the results will be compared to review analytical precision.

- **Matrix Spike/Matrix Spike Duplicate (MS/MSD)** – A sufficient volume of sample will be collected at one sampling location per sampling event for MS/MSD analysis. The laboratory will report the results of the MS/MSD analysis, which will be reviewed for sampling and analysis precision and accuracy.

6.4 Laboratory Quality Control/Reporting Requirements

Laboratory quality control and reporting requirements will be as identified in the sections below.

6.4.1 General

- The laboratory will perform all standard in-house QA/QC necessary to control the introduction of contamination in the lab and to insure the accuracy and precision of the data.

- The laboratory will strictly adhere to the quality control requirements specified in the analytical method references presented in Table 3.

- All laboratories involved in the monitoring program must be certified in the New York State Department of Health (NYSDOH) National Environmental Laboratory Approval Program (NELAP) for the parameters being analyzed.

6.4.2 Laboratory Quality Control Analyses

The laboratory will analyze the following quality control samples in addition to the field quality control samples described above:

- **Method Blanks** – Method Blanks will be analyzed at least once per batch. If a particular reagent or piece of analytical equipment used is changed during preparation of a sample batch, additional testing will be required.

- **Surrogates** – For volatile organic analyses, surrogate standards are added to each sample and recoveries are calculated for method performance accuracy. Surrogate standard recoveries will be reported according to USEPA SW-846 reporting and deliverable requirements.

6.4.3 Reporting and Deliverable Requirements

The analytical laboratory(ies) must adhere to USEPA SW-846 reporting and deliverable requirements unless otherwise directed by Mercury Aircraft. The laboratory will submit the analytical report within 30 business days of receipt of the last batch of samples. The analytical report will also include for each sample:

- Sample location/sample number
- Date collected
- Date extracted or digested
- Date analyzed
- Analytical methodology (including preparation methodology)
- Method detection limits
- Sample dilution factor (if applicable)
- Chain-of-Custody forms

The analytical report also must contain a case narrative that will describe all QA/QC problems encountered during sample analysis. For each sample for which QA/QC problems are encountered, the following specific information will be reported in the case narrative:

- Sample identification number
- Sample matrix
- Parameters analyzed
- Data acceptance criteria exceeded
- Specific analytical problems that occurred
- Corrective action taken or attempted to resolve the problem(s)

6.5 Custody Procedures

Sample custody is controlled and maintained throughout the sample collection and analysis process. These procedures track and control the possession of sample from their source, in the field, to their final disposition, the laboratory. Laboratory chain-of-custody procedures further track the custody of samples during their tenure at the laboratory. A sample is in custody if it is:

- In someone's physical possession;
- In someone's view after being in physical possession;
- In a designated secure area; or
- Placed in a locked container by an authorized individual.

This section discusses procedures to be used to adequately control and document sample custody.

6.5.1 Chain-of-Custody (COC) Forms

Chain-of-custody (COC) forms will be used to document the possession and transfer of custody of all samples. Typical information that will be supplied on the forms includes, but is not limited to:

- Field sample identification;
- Sample date and time of collection;
- Type of sample container;
- Sample location and depth (if applicable);
- Size and number of containers; and
- Analyses required.

Figure 5 presents a typical COC form.

The COC form will be initiated and signed by the field sampling team. The method of shipment, name of the courier and any other pertinent information should be entered in the "remarks" section. The original copy accompanies the sample shipment and a copy is retained by the Field Team Leader. The completed COC form will be placed in a resealable plastic bag and taped to the underside of the lid of the cooler containing the samples designated on the form. A copy of the carrier air-bill (if applicable) will be retained as part of the permanent COC documentation.

When relinquishing custody, the transferor and transferee must sign, date and time the COC form. Each person accepting custody of sample(s) will note their condition on the form. This record documents transfer of custody of samples from the sampler to another person, to the laboratory or to/from a secure storage area.

6.5.2 Custody Seals

Custody seals are preprinted adhesive-backed seals with security slots designed to break if the seals are disturbed. Custody seals should be placed on sample shipping containers as necessary to detect tampering. Seals must be signed and dated prior to using. Clear strapping tape should be placed over the seals to ensure that the seals are not accidentally broken during shipment, while maintaining an accurate assessment of the shipment integrity.

6.5.3 Field Custody Procedures

The sample packaging and shipment procedures summarized below will ensure that the samples will arrive at the laboratory with the COC intact. The procedures for sample numbering are included in the field operating procedures presented in Appendix B. The basic COC sequence is as follows:

1. Use laboratory supplied sample containers.
2. Collect and preserve sample (if not pre-preserved) and seal container.
3. Complete sample label and place on container.
4. Document the sampling procedures and related information in the Project Field Book and on a Water Sample Collection Log form.
5. Complete COC record form.
6. Custody transfers from field sampling personnel to anyone else documented with signatures, date and time on COC record form.
7. Pack sample containers for shipment with proper preservatives and custody forms into cooler.

The Field Team Leader is personally responsible for the care and custody of the samples until they are transferred or properly dispatched. All bottles will be identified by the use sample labels with unique sample numbers. The sample numbering system is presented in the FOP for sample labeling, storage and shipment (see Appendix B). The Field Team Leader is also responsible for the following:

- Ensuring only precleaned sample containers will be used and the coolers and/or boxes containing the empty sample containers are sealed with a custody tape seal during transportation to the field and while in storage prior to use. In the field, the precleaned sample containers will be stored in a secure location.

- Maintaining custody to so that as few individuals as possible handle the samples.

- Accurate recording and maintenance of all sample data in the Project Field Book and ensuring all appropriate forms are completed.

- Determine whether proper custody procedures were followed during the sampling event and decide if additional samples are required.

- Ensure proper completion of COC for each cooler in which samples are shipped. The samples must be shipped to the laboratory as soon as practical and must arrive within 24 hours of shipping.

6.5.4 Laboratory Custody Procedures

Laboratory custody procedures for sample receiving and log-in; sample storage and numbering; tracking during sample preparation and analysis; and storage of data will be performed in accordance with the analytical laboratory's quality assurance/quality control (QA/QC) procedures.

7.0 CORRECTIVE ACTION

Corrective action is the process of identifying, recommending, approving, and implementing measures to counter unacceptable procedures or performance that can affect data quality. Corrective action can occur during field activities, laboratory analyses, data validation (if applicable) and data assessment. All corrective action proposed and implemented will be documented on a Corrective Measures Report (see sample report in Appendix C). Corrective action should be implemented only after approval by the Project Manager, or his or her designee. If immediate corrective action is required, approvals should be secured by telephone from the Project Manager. Phone calls pertaining to corrective measures or changes to this EMP will be recorded on a Record of Telecom Meeting form presented in Appendix D.

It shall be the responsibility of the project team, sampling team and laboratory staff to ensure that all measurement and sampling procedures are followed as specified and that measurement data meet the prescribed acceptance criteria. If problems are discovered, prompt corrective action will be taken.

7.1 Field Corrective Action

If errors in field procedures are found during the observation or review of field activities by project staff, corrective action will be initiated. Nonconformance to the QA/QC requirements of the field procedures will be identified immediately by project staff that know or suspect that a procedure is not being performed in accordance with the requirements. The Benchmark Project Manager or his/her designee will be informed immediately upon discovery of all deficiencies. Timely action will be taken if corrective action is necessary.

Corrective actions in the field may be required when the sample network is changed or when sampling procedures and/or field analytical procedures require modification, due to unexpected conditions. In general, the Field Team Leader and Project Manager may identify the need for corrective action. The Project Manager will approve the corrective measure that will be that will be implemented by the field team and it will be the responsibility of the Project Manager to ensure that corrective action has been implemented.

Corrective actions will be documented in the Project Field Book and on a Corrective Measures Report (see sample report in Appendix C). No staff member will initiate corrective action without prior communication of findings to the Project Manager. If corrective actions are insufficient, work may be stopped by the Project Manager. Once a corrective action is implemented, the effectiveness of the action will be verified by the Project Manger.

7.2 Laboratory Corrective Action

Corrective actions may be initiated if the quality assurance goals of the project are not achieved. The initial step in a corrective action is to instruct the analytical laboratory to examine its procedures to assess whether analytical or computational errors caused the anomalous result. Sample collection and handling procedures will be concurrently reviewed to assess whether they could have contributed to the anomalous result. If no error in laboratory procedures or sample collection and handling procedures can be identified, then the laboratory Project Director will assess whether reanalysis or resampling is required, or whether any protocol should be modified for future sampling events.

7.3 Corrective Action During Data Assessment

The need for corrective action may be identified during the data assessment process. Potential types of corrective action may include resampling by the field team or reinjection/reanalysis of samples by the laboratory. These actions are dependent upon the ability to mobilize the field team, and whether the data to be collected is necessary to meet the QA objectives (e.g., the holding times for samples is not exceeded, etc.). All required corrective actions will be documented by the Project Manager and/or the laboratory.

8.0 DATA QUALITY ASSESSMENT

In addition to the case narrative provided by the laboratory, a data quality assessment will be performed by Mercury Aircraft or it's designated consultant upon receipt of the sample data. The data quality assessment will be included with the report of results from each sampling event. The assessment will involve:

- Determining if the data quality objectives were met;
- Comparing the current monitoring events analytical data with historical analytical results for consistency;
- Evaluation of field (blind) duplicate results to indicate sample precision;
- Comparison of the results of all field blanks, trip blanks, equipment rinsate blanks and method blanks with full data sets to provide information concerning contaminants that may have been introduced during sampling, shipping or analysis.
- Evaluation of matrix effects to assess the performance of the analytical method with respect to the sample matrix and determination of whether the data have been biased high or low due to matrix effects.
- Integration of the field and laboratory data with geological, hydrogeological and meteorological data to provide information about the extent of environmental impacts, if applicable, and comparison and defensibility of the data generated with that required to meet the data quality objectives established in the Plan (see Section 2.0).

9.0 DATA EVALUATION AND REPORTING

9.1 Groundwater Treatment System

The results of groundwater treatment system effluent sampling will be reported to NYSDEC on a monthly basis following receipt and review of the data. A letter report will be prepared that will identify the date and location of the sampling, and will compare the results to NYSDEC Class GA groundwater quality standards. A summary of measured total flow through the treatment system and through the individual pumping wells will also be provided. If the data indicate breakthrough of constituents of concern significantly above groundwater quality standards or increasing concentration trends, a plan to correct the problem will be developed.

Annual influent sample results will be tabulated and presented with the effluent data letter reports for informational purposes. As described in Section 9.2, a remedial measures performance evaluation will be undertaken to demonstrate the effectiveness of the collection/treatment system in mitigating off-site contaminant migration in the groundwater.

9.2 Ground Water Monitoring Network

Ground water monitoring data generated in support of the Former Dresden Facility Monitoring program will be entered into a computer spreadsheet. The spreadsheet will be used for generating graphs showing the status and history in individual sampling points and compounds. The graphs and spreadsheets will also be used for historical trend analysis and to track environmental conditions upgradient, crossgradient and downgradient of the collection system, as well as to assess performance of the remedial measures. An annual report will be prepared following the annual sampling event. The annual report will include the following:

- Sample collection date
- Ground water elevation data

- Analytical results as compared to Class GA ground water quality standards

- Upgradient well designation

- Sample location number

- QA/QC values

- Method detection limits

- Field sampling notes

- Chain-of-custody forms

- A ground water potentiometric surface map for shallow and deep bedrock groundwater.

- A discussion of sample analytical results including elevations of parameters above background concentrations and historical trends evident from the data.

- A discussion of changes in water quality that has occurred from the previous year.

- A discussion of any proposed changes to this EMP.

9.2.1 Remedial Measures Performance Evaluation

As part of the ground water monitoring network sampling, a performance evaluation will be undertaken to qualitatively assess the performance of the ground water collection and treatment system in mitigating off-site migration of contaminants in ground water. The evaluation will discuss the following:

- Apparent capture zone of the groundwater recovery wells based on the potentiometric surface map for shallow and deep bedrock groundwater;

- Changes in the quality of onsite and off-site groundwater as indicated by historic concentration trends; and

- The amount of contaminant destroyed based on differences between average influent concentrations versus average effluent concentrations (if detected) times the amount of groundwater processed through the treatment system.

The performance evaluation will serve as a benchmark for determining the need to implement supplemental remedial measures.

9.3 Distribution

Reports described in this section will be submitted to the following:

Mr. Robert Smith
Health and Safety Manager
Mercury Aircraft Inc
17 Wheeler Ave.
Hammondsport, New York 14840

Mr. M.D. Mehta
NYSDEC –Region 8
Div. of Solid/Hazardous Waste
6274 E. Avon-Lima Road
Avon, New York 14414-9519

10.0 REFERENCES

1. Malcolm Pirnie, Inc., November 1995. *Remedial Investigation Report, Mercury Aircraft Site – Dresden Facility. Volumes I and II.*

2. Benchmark Environmental Engineering and Science, PLLC, November 2003. *Operation and Maintenance Plan for the Former Mercury Aircraft Dresden Site.*

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ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

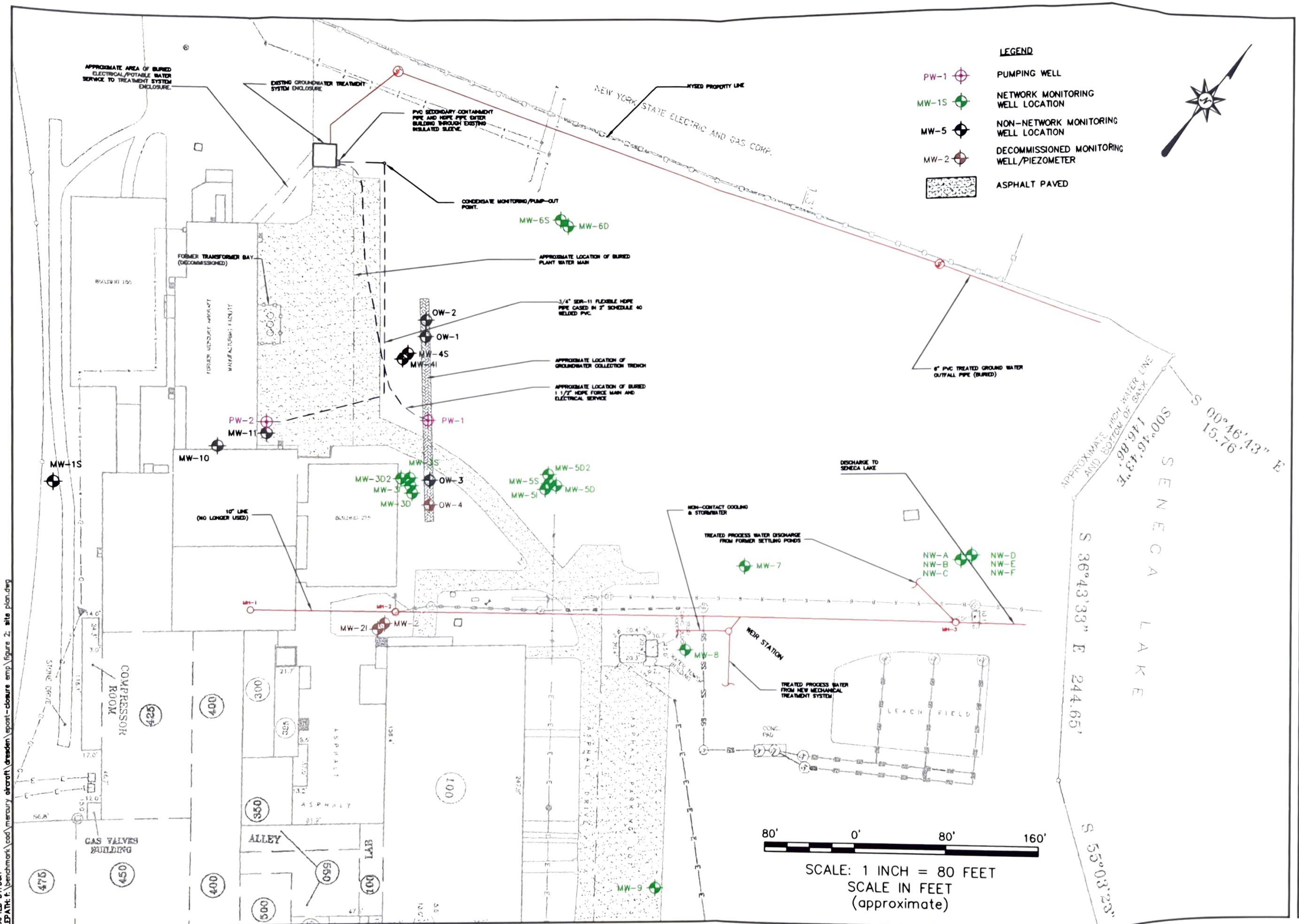
TABLE 2

POST-REMEDIAL MONITORING REQUIREMENTS

MERCURY AIRCRAFT, INC.
FORMER DRESDEN FACILITY
TORREY, NEW YORK

Sample Description	Sample Locations	QA/QC Samples	Estimated Number of Samples Per Event	Parameters	Schedule	
					Year(s) No.	Frequency
Groundwater Level and Quality	MW-3S, MW-3I, MW-3D, MW-3D2, MW-5S, MW-5I, MW-5D, MW-5D2, MW-6S, MW-6D, MW-7, MW-8, MW-9, NW-A, NW-B, NW-C, NW-D, NW-E, NW-F	Trip Blank(s) Blind Duplicate MS/MSD As necessary: Equipment Blank	22	TCL VOCs pH temperature specific conductivity turbidity	1 - 2 3 - 6 7 - 30	quarterly semi-annually annually
Groundwater Level	MW-1S, MW-4S, MW-4I, MW-10, MW-11, OW-1, OW-2, OW-3, PW-1, PW-2	-	-	Groundwater Elevation	as above	as above
Groundwater Treatment	Effluent Sample from Treatment System	-	1	TCL VOCs pH temperature	Monthly	Monthly
Groundwater Treatment	Influent Sample from Treatment System	-	1	TCL VOCs pH temperature	Annually	Annually

Acronyms:
TCL Target Compound List
VOCs Volatile Organic Compounds - purgeable halocarbons, including cis-1,2-DCE per USEPA Method 8021.



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JOB NO.: 0001-003-100

SITE PLAN

POST-CLOSURE ENVIRONMENTAL MONITORING PLAN

FORMER DRESDEN FACILITY
TORREY, NEW YORK
PREPARED FOR
MERCURY AIRCRAFT, INC.

FIGURE 2

DATE: NOVEMBER 2003
DRAFTED BY: BCH
FILEPATH: f:\benchmark\cad\mercury aircraft\dresden\post-closure emp\figure 2: site plan.dwg