SITE INVESTIGATION WORK PLAN

FORMER ROBLIN STEEL SITE

Tonawanda, New York

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1 INTRODUCTION

This Site Investigation Work Plan (Work Plan) was prepared by Natural Resource Group, Inc. for NRG Thermal, LLC (NRG) and is designed to support NRG's potential development of the Roblin Steel Site which is currently owned by River World, Inc. The Roblin Steel Site is located at 4000 River Road in the town of Tonawanda, Erie County, New York (the "site"). The site is currently listed in the New York State Department of Enivronmental Conservation (NYSDEC) Registry of Inactive Hazardous Waste Disposal Sites in New York State as a Class 2 Site. This plan provides the technologies and objectives that will create sufficient data to allow the site to be reclassified for industrial development. The location of the site is shown on **Figure 1-1**.

1.1 Previous Site Studies

Numerous documents relating to the site have been developed by private parties and state and federal agencies. These documents assess the site setting, contaminant types and source(s), pathways of contaminant migration, potential human health risks, and engineering methods screened as remediation options. The following summarizes two of the most relevant studies and their critical findings. **Figure 1-2** provides a general layout of the facility, including the locations of many, but not all, of the existing sampling points.

1. **Remedial Investigation/Feasibility Study Envirotec II Site (BBL, March 1999):** Envirotec II is a 2.5-acre portion of the Roblin Steel Site that was used as a chemical waste treatment, storage and disposal facility during the 1980's. Its operation resulted in contamination of underlying fill, soils and groundwater at the site. This document details the site history and setting, and includes the site investigation technologies and objectives utilized to characterize these contaminated media; and
2. **Site Evaluation Report, Roblin Steel Site, Tonawanda, Erie County, New York, Site Number 9-15-056 (NYSDEC, December 2006):** This summary report, developed by the lead state regulatory agency (NYSDEC) provides a comprehensive overview of the site and its history, summarizes work completed to date and recommends that three site areas (the warehouse area, the boiler house area and the northwestern portion of the site) be investigated prior to consideration of site reclassification.

1.2 Site Setting

Portions of the site have undergone extensive investigation. These studies have described a site stratigraphy of fill overlying glaciolacustrine silty clays, alluvial sands, glacial till and shale. Fill material is described as consisting predominantly of slag and cinders. Fill deposits range in thickness to a maximum of approximately 19 feet. The glaciolacustrine unit is found between 14 and 19 feet below the ground surface (bgs); the alluvial sands between 15 and 28.5 feet bgs; the glacial till between 30 to 49.5 feet bgs; and the shale is found at approximately 42 to 54 feet bgs.

The NYSDEC notes that the glaciolacustrine deposits effectively prevent migration of surficial contaminants to depth at the site and all contaminated groundwater resides in highly heterogeneous fill materials as a perched groundwater unit. The historic water table elevation in the shallow groundwater system ranged between approximately 6 and 12 feet below ground surface (bgs). Perched groundwater flows generally east to west with discharge to the Niagara River. The mean hydraulic conductivity for the shallow groundwater was reported in the 10^{-2} to 10^{-3} cm/sec range.

1.3 Current Land and Groundwater Use

Current land use in the vicinity of the site is industrial. The site is bordered by River Road to the east, the Niagara River to the west, Tonawanda Coke and Marathon/Ashland Petroleum to the south, and the Lafarge ready mix plant and vacant land is to the north. The majority of the site is vacant. River World, Inc. operates warehousing operations largely in the southeastern portion of the site. Groundwater is not used at the site for domestic or industrial use.

1.4 Site Contaminant Assessment Summary

The results of sampling and analyses presented in site documents conclude that fill, soil and groundwater at the site are contaminated largely by volatile organic compounds (VOCs), semi volatile organic compounds (SVOCs), cyanide and metals (contaminants of concern or "COCs"). The chlorinated VOCs are likely the result of the Envirotec II operations, while the remaining compounds, including nonchlorinated VOCs, appear to be attributable to prior steel making at the site, the underlying fill, and/or neighboring industrial operations.

1.5 Objectives of the Work Plan

Site studies and recent communication with state regulators has indicated that additional site studies need to focus on three areas of concern (AOCs) that remain at the site; the warehouse area, the boiler house area and the northwestern portion of the site. Site sampling will focus on collecting sufficient fill/soil samples and groundwater samples to determine if contaminants remaining on the Roblin Steel Site are representative of operations largely attributable to the former steel making operation or the underlying fill. In combination with data collected during previous studies by others, the collective data set will be utilized to determine if contaminants found at the site are consistent with those found generally at former steel mill properties, and if the site can be reclassified and developed for industrial use. Specific objectives follow:

1. Determine the presence and extent of COCs in subsurface fill/soil in proximity of the AOCs:

   This objective will be addressed by excavating pits to a depth of 10 feet or to the water table, whichever is shallower, at select locations. It is anticipated that a minimum of ten (10) pits will be excavated using a backhoe or excavator so that the underlying stratigraphy can be described. Additional test pits will be added if time allows. Select subsurface samples will be collected and analyzed for one or more of the following: TCL VOCs, TCL SVOCs, RCRA metals and cyanide; and

2. Evaluate the Roblin Steel Site groundwater quality:

   This objective will be addressed by installing up to two new site monitoring wells in each of the AOCs and potentially replacing and/or repairing select existing site wells, as warranted. These wells, along with select existing monitoring wells at the site, will be developed and stabilized and sampled for the following: TCL VOCs, TCL SVOCs, RCRA metals (total and dissolved) and cyanide. Table 1 provides a summary of the proposed wells that will be monitored for water quality and groundwater elevation. The monitoring wells are located on **Figure 1-4**.

Table 1

Proposed Groundwater Sampling/Elevation Monitoring Locations

Monitoring Well #	Status	G.W. Quality	G.W. Elevation
ENV-1	Existing	No	Yes
ENV-5	Existing	Yes	Yes
ENV-7	Existing	Yes	Yes
GW-1	Existing	Yes	Yes
GW-2	Existing	Yes	Yes
GW-3	Existing	Yes	Yes
GW-4	Existing	Yes	Yes
GW-5	Existing	Yes	Yes
GW-6	Existing	Yes	Yes
GW-7	Existing	Yes	Yes
NRG-1	Proposed	Yes	Yes
NRG-2	Proposed	Yes	Yes
NRG-3	Proposed	Yes	Yes
NRG-4	Proposed	Yes	Yes
NRG-5	Proposed	Yes	Yes
NRG-6	Proposed	Yes	Yes
NW-1	Existing (Needs Repair)	Yes	Yes
NW-2	Existing	Yes	Yes
NW-3	Existing (Needs Repair)	Yes	Yes
NW-5	Existing	No	Yes

2 SAMPLING AND ANALYSIS PLAN

This Sampling and Analysis Plan (SAP) contains information concerning the sampling protocol, techniques, data quality objectives, procedures, and equipment to conduct soil/fill and groundwater sampling at the site. Soil/fill and groundwater beneath portions of the facility has been found to contain VOCs, SVOCs, cyanide and metals.

2.1 Project Organization

The SAP has been developed to ensure that the collection and analysis of any data requires that procedures be implemented to assure that the precision, accuracy, completeness, and representativeness of the data are known and documented. This SAP presents the data collection objectives, the sampling analysis procedures, and the quality assurance and quality control (QA/QC) activities.

2.1.1 Data Quality Objectives

The overall objective of this SAP is to obtain quality data representative of conditions to adequately monitor the extent and nature of chemical constituents in soil/fill and groundwater at the site. To achieve these goals, Standard Operating Procedures (SOPs) have been developed to conduct the field testing. These SOPs are presented in Section 2.2, below.

The following issues were considered during the design of the sampling program to ensure that the data accurately represents the site conditions.

Representativeness of Selected Analytical Parameters - The analytical parameters selected for monitoring are sufficient to comply with recommendations by state regulators.

Representative of Selected Media - The three medium selected for sampling (fill, soil and groundwater) are appropriate to determine the potential for reclassifying the site.

Comparability - Expressed as the confidence with which the historic data set can be compared to the recent data set. Comparability of data sets is dependent on a set of independent and dependent variables, including laboratory errors and biases, the representativeness of samples, and natural variances within data sets.

Number and Location of Sampling Points - The number and location of monitoring wells selected for groundwater quality analyses and test pits for soil/fill analysis are adequate to monitor the site.

Environmental Conditions - Efforts will be made to eliminate or minimize the effects of environmental conditions on sample collection efforts. For example, field organic vapor screening will be isolated from field contamination so that the organic vapor screening data will accurately reflect sample location conditions.

2.1.2 Selection of Analytical Parameters

Various media, including fill/soils and groundwater, will be sampled at the site and analyzed for select inorganic and organic constituents. Historic testing of these media has demonstrated they are appropriate to evaluate the extent of contamination that has resulted from prior use and development of the site.

Several VOCs, SVOCs, cyanide and metals have been detected in samples collected at various locations throughout the site. Specific COCs selected for analysis are represented by those chemicals cited in the TAL VOC, TAL SVOC and RCRA metals (total and dissolved components) lists. Total and dissolved cyanide will also be analyzed. Analytical methodologies are provided in Severn Trent's attached New York Laboratory Certification and Laboratory Quality Manual.

2.1.3 Selection of Sampling Locations

It is anticipated that a minimum of 10 test pits will be excavated at key locations near the three AOCs. These pits are located near the three AOCs and are located on **Figure 1-3**. Up to 20 more pits may be added based on the results of the initial 10 test pits. This will be a field decision based on observations by the Natural Resource Group, Inc. Project Manager and state representatives. A three day window has been assumed for completion of the test pits. Site areas previously evaluated during the Envirotec II investigation(s) were not considered for additional investigation.

It is anticipated that up to twenty 18 monitoring wells will be sampled at the site. This well array will consist of existing site wells, repaired wells and new wells, all finished in the shallow groundwater system (see **Figure 1-4**); however, wells may be added or deleted from the sampling program as more site information becomes available.

Surface water levels will be obtained from a staff gauge previously established in the Niagara River (see **Figure 1-2**).

2.1.4 Sampling Frequency

Groundwater samples will be collected from the monitoring well array on a one-time basis. This data will augment groundwater quality data collected by others during prior site-wide investigations. The data set will be reported in the Site Investigation Report (see Section 4, below). A synoptic set of water level measurements will be taken from the entire monitoring well network prior to collection of water quality samples (see **Figure 1-4**). The resulting chemical analysis and water level measurements will be reported in tables and as elevation data plotted on contour maps.

2.2 Field Methods Standard Operating Procedures

This section of standard operating procedures (SOP) provides a discussion of the sample collection and data acquisition program that will be utilized at the site.

2.2.1 Water Levels Procedures

Groundwater level measurements are collected from monitoring wells to assist in defining site hydrogeologic conditions. This data is critical to assist in the evaluation of groundwater flow direction, velocity estimates, hydraulic gradient, and determination of key aquifer parameters. Accurate groundwater elevation measurements are an important element of a successful hydrogeologic investigation, and will be obtained from all monitoring wells within a 24-hour period in order to compare potentiometric surfaces.

Equipment

- Water level indicator (Electric Line Measure - ELM, Slope Indicator, or Solonist)
- Accurate short measuring tape calibrated in 0.01-foot increments
- Decontamination equipment (tri-sodium phosphate TSP, distilled water, and clean paper towels)
- Notebook & Water Level Data Sheet
- Monitoring well key(s)
- Facility map with well locations and numbers
- Well construction information including depth, screen interval, and contamination levels
- Indelible marker
- Channel locks or large pliers
- Screw driver

Procedures

The procedure for obtaining a water level measurement in a monitoring well contains six specific steps.

1. Review Site Map and Well Data

This review should include contaminant levels, expected water level and well reference elevation. The ELM should be long enough to reach the expected water level. Wells should be measured from suspected cleanest (upgradient) to the most contaminated based on the most recent sampling event. Equipment should be inspected, calibrated if needed, and tested prior to leaving for the field.

2. Enter the Well

Unlock or open monitoring well, bail out standing water in flush grade well manholes to below the riser. If applicable, note on the field form the level of water in manhole and if it appears contaminated.

3. Establish a Measuring Point for the Well

This should be the north side of the inner riser or a consistent point marked with an indelible marker, or physically noted with a notch. A mark should be made if one is not present. The top of a protective casing or manhole should never be used as a reference point due to settling and frost heave. Note on the Ground Water Level Data Form and Well Construction Log if any other reference points are used in the measurement.

4. Obtain the Measurement

Lower the decontaminated indicator probe into the well. The same instrument should be used in all site wells. For the ELM, use a consistent sensitivity control setting in each well. A mid-range setting of five is usually used. Different sensitivity settings between wells should be noted. Care must be taken to assure that the probe hangs freely and straight in the well, especially in cold weather where the cord may kink. The ELM probe should be lowered until an audible sound or red light is detected from the indicator. The probe should be repeatedly raised and lowered to obtain an exact measurement. The measurement should be repeated three times.

Only ELMs with a calibration to the 0.01' should be used. However, if an older 1.0' calibrated Slope Indicator is used, it should be obtained up from the lower white ring below the foot marker. The measurement should be recorded to the nearest 0.01-foot. For example, 21 ft. + 0.73 = 21.73 below measuring point. Check the foot marker number above and below if the number is difficult to read. Correct reading using any applicable calibration instrument factors. Calibration of each Slope Indicator (distance between 1-foot mark and probe/water contact) should be conducted in the office. Slope Indicators should be calibrated to each other if more than one instrument is used on a site.

5. Decontamination

The measuring device shall be decontaminated immediately after each use. The basic decontamination procedure should be:

- Rinse with clean water
- Wipe probe and exposed line with clean paper towel
- Wipe with tri-sodium phosphate or methanol wash
- Rinse with clean water (distilled or de-ionized water if possible)
- Dry with clean paper towel

Decontamination fluids are most easily applied by using a marked spray bottle. The decontamination procedures may vary based on specific project requirements. Appropriate health and safety protection and disposal of decontamination materials should be applied as specified in the site health and safety plan or by the project manager.

6. Complete Documentation

Complete the Ground Water Level Data forms and include weather conditions or other observed phenomenon which you believe may have influenced ground water levels. Record the ELM used and the serial number of the ELM if more than one measuring device is used. For dry wells, record the depth to the bottom of the well (e.g., 19.8 feet - dry). Field forms should include the following information:

- Identity of well/location
- Date and time of measurement
- Location and elevation of reference point - is it referenced to an arbitrary site datum or an established bench mark
- Ground water depth or bottom of well and note if dry (19.8 ft. - dry), top and thickness of product (see measuring product thickness section of manual) note any odor present; if possible, distinguish between gas, diesel, organic, etc.
- Calculate ground water elevation
- Note if well nest (deep well or shallow)
- Note weather conditions, pumping wells, or other special conditions
- Enter data onto project hydrograph or project data base (if applicable)
- Place original field data sheet and copy of field notes in project file.

2.2.2 Well Sampling Procedures

Monitoring well sampling plays a key role in groundwater projects. The primary objective of sampling is to obtain and transport for analysis a groundwater sample which is representative of the aquifer or unit being monitored. Results of the sampling and subsequent chemical analysis are used to evaluate the concentration and extent of contamination, and baseline groundwater chemistry. The importance of sampling requires that all measurements be performed in a technically sound and legally defensible manner. The groundwater sampling will be conducted as summarized in the “procedures” subsection, below.

Equipment

- Laboratory cleaned bailers or dedicated disposable polyethylene bailers
- Pumps, drop pipe, power source (if applicable)
- Bucket & Plastic sheeting
- Water level indicator
- Neoprene or Latex Surgical gloves
- New nylon rope and knife
- Monitoring well keys
- Plastic sheeting for ground cover
- Thermometer or temperature probe
- pH/conductivity, & Turbidity meter

- Peristaltic pump (optional - if collecting filtered samples)
- Filtration apparatus (optional - if collecting filtered samples)
- Preservatives (optional)
- Transfer bottles (optional)

Sample Transport Equipment

- Sample bottles/labels
- Shipping container
- Storage bags
- Ice pack

Decontamination Equipment

- Clean barrel or drums for pump decontamination
- De-ionized water
- Tri-sodium phosphate or methanol solution
- Spray bottle
- Paper towels

Documentation

- Field Notebook
- Sampling forms
- Chain of custody form
- Indelible marker

- SAP with QA/QC procedures

Procedures

The purpose of a groundwater sampling program is to collect samples which are representative of the hydrogeologic unit. Every activity should be performed in a manner which minimizes the potential for cross contamination and maintains sample integrity.

The procedures for collecting ground water samples from monitoring wells contain specific steps, described in subsections 1 through 7 below.

1. Plan Sampling Event

- Identify location of all wells and keys required
- Evaluate well and previous sampling data to determine sampling order from cleanest to most contaminated
- Estimate purge volumes
- Plan number and type of samples to be obtained including blanks and duplicates
- Check laboratory bottles for number, condition, and proper type
- Verify if special sampling, bottle, filtering, or preservation procedures are required
- Verify proper operation and decontamination of all bailers and special equipment to be used during sampling
- Plan storage and shipping requirements for samples
- Verify that copies of all required forms will be taken into the field - follow the specifications of the SAP
- Review sampling plan with project manager including any special health and safety considerations

2. Measure Water Levels

With a decontaminated water level indicator, measure the depth to water from the top of casing and the depth to the bottom of the well. Subtract these measurements to get the total saturated screened length and the water column depth. Record the water level on a sample data sheet. Calculate the volume of water of one, three, and five borehole volumes based on the following table:

Well Casing Volumes in Gallons per Foot		
2" = 0.16	4" = 0.63	8" = 2.61
3" = 0.37	6" = 1.46	10" = 4.08

3. Purge Well

Purging the well is critical to remove stagnant water in the well casing to allow a sample which is representative of the unit to be obtained.

<u>To purge a well with a bailer</u>:

Set up at the well with bailer, bailing rope, bucket, field notebook, sample bottle(s) and labels, knife, and new sampling gloves. Glove hands and expose the bailer. Tie the bailing rope to the top of the bailer securely and lower the bailer very slowly down the well casing. You should feel the bailer enter the ground water by the "heavy feel" on the end of the rope. Lower the bailer into the water at least two bailer lengths, or if the well recharges slowly, to the bottom of the well. Pull off one to two more feet and cut the rope from the spool and tie the above ground end to your wrist (the protective well casing or bumper post). To extract water from the well, lift the rope slowly winding it in the palm of your hand (between thumb and index finger) with a "windmill" or hand-over-hand motion. When the bailer reaches the surface, empty the contents into the bucket and then slowly lower the bailer down the well bore with the same hand-over-hand motion, until the bailer submerse below the water table surface. It is very important not to let the bailer "free fall" into the water. Repeat purging until desired bore volumes are extracted, usually three to five. Again, record purged water level and time of sample collection on the sample data sheet.

<u>To purge a well with a pump</u>:

Utilizing a submersible or peristaltic pump, or a pump which does not produce turbulent flow in the well. Measure the water level in the well and determine the length of water column in the well. Insert the pump at least one-half way into the water column, or 5-feet from the bottom of the well. Set the valve to initially begin purging the well at low flow conditions, and monitor the volume of water removed from the well. At each borehole volume measure the stabilization parameters outlined below.

After each well bore volume of water is removed from the well, a water sample will be analyzed for pH, specific conductance, temperature, and turbidity. The stabilization test will continue until three successive measurements for each analysis is within the following ranges:

pH: ± 0.1 pH unit
Specific conductance (temperature - corrected): ± 10 umhos/cm
Turbidity 1 NTU
Temperature ± 0.5 C

Stabilization test results will be recorded on the sample information form. A monitoring well is considered to be properly purged when three to five well volumes have been removed and stabilization is reached. Low recharge wells should be purged of a least one well volume and a sample collected as soon as the well has recharged enough to obtain a sample volume.

4. Sample Collection

Groundwater samples are collected after sufficient water is purged. Samples will be collected using a dedicated disposable polyethylene bailer. The bailer can be the same one used for purging. Samples should be collected near the top of the water surface in water table wells. This will help reduce the amount of fines in the sample, a frequently encountered problem when sampling from the bottom of the well.

The bailer must be lowered into the well slowly to prevent splashing of the water. Water should be extracted carefully from the monitoring well to prevent agitation or aeration of the samples. Generally, freshly bailed water can be poured directly into the sample containers. The bailer should not touch the sample container. The sample container should not be rinsed out in case preservatives are present in the container.

Filling sample containers is different for different parameters. Make sure the correct container is used for the desired sample parameter. Extreme care must be taken in collecting samples for volatile organics. The vial must be slightly overfilled to obtain a positive meniscus and the cap placed on the bottle so that absolutely no air bubbles are present. Invert and tap the vial bottle to see if there are trapped air bubbles present. If air bubbles are present, empty and refill the bottle. Collect groundwater samples in the following order: VOCs, SVOCs, cyanide and metals. Extra bottles should be carried to the site in case the bottle caps are defective. Review sample protocol with project manager prior to going into the field.

5. Filtration and Preservation

Filtering samples eliminates metals adsorbed or absorbed on suspended particles larger than 0.45 micron. This gives a dissolved concentration. A non-filtered sample gives a total concentration. Groundwater samples will be collected for both total and dissolved metal parameters.

Some water samples (such as total metals) have to be fixed or preserved by adding a particular chemical or taking handling precautions. This is necessary so that the representative sample collected in the field remains representative when it is received by the laboratory. Check the laboratory or district quality assurance coordinator for proper sample preservation.

6. Documentation/Chain of Custody

To document sample collection, fill in the sample information form including sampling point, project, location, well order number, well depth, water level, depth to water, casing diameter, bore volumes purged, bailer type, sample appearance, samples collected, sample transportation for completed and sampled by. Fill in the identical applicable information on the field Chain of Custody form (see Chain of Custody procedure).

7. Transportation to Laboratory

Samples should be bubble packed in a cooler and stored with ice to prevent damage. Used bailers must be transported in a separate cooler, and disposable bailers discarded. Sample data sheets, appropriate Chain of Custody form, and field notes are given to the project manager for the project file.

2.2.3 New Well Development Procedures

The objective of well development is to provide a monitoring location which yields formation water as closely as it exists within the formation. Properly developed wells will produce water which is not turbid, does not contain fines, and represents the water quality conditions in the formation.

After a well is completed, the well will be pumped and the purge water collected. The well development will occur through a 1 3/4-inch submersible pump. Monitoring well development will be accomplished through alternating cycles of over-pumping and surging. Over-pumping will be accomplished using a portable impeller pump. The pump will be of the type capable of pumping fluids containing suspended solids (i.e., "trash" pump, or a submersible pump) so that it may remove fines drawn into the well during development.

Surging will be accomplished using a surge block designed for two-inch monitoring wells. The surge block will consist of a stainless steel pipe with attached stainless steel disc and flexible rings composed of an inert material. Due to the fragile nature of the wells, the surge block will be slightly less in diameter than the inside diameter of the well, and the surging action will be gentle. During surging, the location of the surge block within the well will be carefully measured and monitored to avoid the possibility of damaging the well by striking the bottom of the well with the surge block.

Well development will involve several alternating cycles of pumping and surging. Well development will be considered complete when: three times the volume of water added during drilling has been removed (as applicable); the field parameters of temperature, specific conductivity, pH, and turbidity have stabilized; and water produced shortly after initiating a pumping cycle exhibits acceptable turbidity, as determined by a portable turbidity meter. All fluids removed during development will be wasted at the site.

Turbidity of water removed from the wells during development will be measured using a properly calibrated field nephelometer (turbidity meter) reading out in nephelometric turbidity units (NTUs). A goal of less than five (5) NTUs will be used; however, in some cases this level cannot be achieved due to the nature of the formation within which the well is screened. In this case, an alternate turbidity standard will be proposed during the field work.

2.2.4 Well Surveying

The location of all wells shall be surveyed by a licensed surveyor to determine their horizontal and vertical locations. The vertical elevations of the ground surface will be determined to within 0.1-foot, and the top of casing will be determined within 0.01-foot, referenced to mean sea level, which is established National Geodetic Vertical Datum. The horizontal location will be determined to within 1-foot, and tied to the state coordinates system. The surveyed reference mark shall be placed on the top of the well casing, not the protective casing or the well apron, for use as a measuring point because the lip of the riser pipe is not always flat. Another measuring reference shall be located on the grout apron. The survey shall also note the coordinates of any temporary benchmarks.

2.2.5 Chain of Custody

A chain-of-custody record will be initiated by the collector of the samples. The collector will record the project number, the date and time of collection, the location, the type and number of each sample, the analyses and preservation status of each sample, and the number of containers. At that time the sampler will assign a unique number to each sample, and affix to the sample an indelibly marked label identifying the sample.

Each time the samples are transferred from the custody of one person to another, both persons will sign the custody record and the date and time of transfer will be recorded. By that signature the sample custodian attests that he/she has inspected the sample containers and documents, has identified each sample by its unique number, and is assured of each sample's integrity at the time custody was transferred.

If the samples must be shipped to the laboratory, the sample containers will be sealed with evidence tape. The shipping container will also be sealed or locked and the chain-of-custody record will accompany the shipment.

Upon receiving samples in the laboratory, the laboratory will accept custody of the samples, assign laboratory numbers and log the samples in and store them in a locked sample refrigerator. The sample custodian will transfer the samples to the laboratory personnel responsible for the analysis. Each analyst receiving a sample will inspect the sample for integrity and sign the custody record. He\she must be able to testify in court, if necessary, that from the moment of receipt until the final analysis the sample was in his view and possession, secured in locked storage, or sealed with evidence tape.

The custody of unused portions of the sample will be transferred back to the sample custodian, who will maintain them in secure, locked storage until instructed by the laboratory manager to discard them to the client. If at any transfer of custody a breach of the integrity of a sample is discovered, the laboratory supervisor will be notified immediately. At that time he/she will then take appropriate action. Chain-of-custody records for each project will be retained by the laboratory supervisor, filed by date or project name in secure storage area.

2.2.6 Soil/Fill Sampling for Chemical Analysis

Soil/fill samples will be collected for field identification and for chemical contaminant analysis. Soil/fill sample stratigraphy and contaminant results will be compiled with the other soil/fill sample information to define the nature of the contaminant and the extent and magnitude of contamination within the stratigraphic column.

All pits will be excavated under the supervision of an experienced geologist/engineer. Prior to arriving at the site, the contractor will certify that the excavator/backhoe, tools, and any components or materials have been steamed cleaned since their last use. An on-site controlled decontamination area will be selected for cleaning equipment between pit locations. The bucket will be decontaminated before the excavation is started. All wash and rinse water from the decontamination activities will be wasted on site.

Equipment
Excavator or backhoe (Maybe both with a hydro hammer attached to the backhoe) attachment)
Photoionization detector (hNu, OVM, or TIP)
Latex or neoprene gloves
Sample vials
10 mil polyethylene
Sample cooler
Tri-sodium phosphate
Distilled or de-ionized water
Sample data sheets
Chain of Custody documentation

Procedures
Samples will be collected in accordance with the following protocol during pit advancement.

Samples will be retrieved from the pit directly from the side wall or from the equipment bucket. The test pit will be advanced to a depth of either 10 feet or to the water table, whichever is shallowest. Soil/fill be examined for obvious staining, odor and will be scanned with a PID. Only those samples exhibiting signs of contaminant impact will be selected for potential laboratory analysis. Samples for laboratory analysis will be placed in laboratory-supplied sampling containers for the following analysis:

- VOCs
- SVOCs
- Metals and cyanide (samples collected for metals may be used for headspace analysis, described below).

After samples are exposed within the pit, the PID detector should immediately scan the sample for vapors. The maximum and minimum soil vapor reading should be recorded on the soil boring log, along with the matrix type or any physical characteristic or anomaly noted at the highest reading.

VOCs will not be analyzed unless a reading of greater than 100 ppm, based on the field PID, is detected. Using latex or neoprene gloves, soil from the zone of highest deflection indicated from the PID screening will be hand packed as quickly as possible into sample bottles in the following order:

- VOCs
- SVOCs
- metals and cyanide

VOC sample bottles will be labeled in accordance with protocol documented in the SAP. Sampling information will be documented at the time of sample collection and chain of custody initiated. Following collection of the soil sample for analysis, sample bottles for will be labeled. Sampling information will be documented at the time of sample collection, and chain of custody initiated. All samples will be packed in a cooler maintained at 4 Celsius.

To reduce the possibility of cross contamination, all sampling equipment will be thoroughly cleaned between each test pit location. Decontamination procedures will include, at a minimum:

- Tri-sodium phosphate or methane rinse
- Water rinse

All fluids collected from decontamination procedures will be wasted on site. All remaining excavated soils/fill will be replaced in the test pit in the general order as it was removed.

2.2.7 Equipment Maintenance and Calibration

An inventory of all laboratory and field equipment subject to calibration will be maintained which records the manufacturer, model, serial number, location and inventory number. Copies of the instruction manual for each piece of equipment will be kept with the instrument. The original manual will be maintained in a central file accessible to all users.

Preventive maintenance will be performed in accordance with the manufacturer's instructions for each piece of equipment. If routine calibration or operation reveals malfunctioning equipment, the laboratory supervisor will be notified and appropriate troubleshooting procedures will be taken to identify the problem. If proper operation and calibration cannot be restored, the equipment will be tagged **"OUT OF SERVICE"** and removed from use until fixed. A record of all maintenance and corrective actions will be recorded in the equipment logbook.

Equipment subject to calibration will be calibrated in accordance with the manufacturer's instructions or as in the accepted analytical method. Calibrations will be documented in the analyst's notebook or in the equipment logbook.

2.2.8 Monitoring Well Installation

Installation of a limited number of groundwater monitoring wells are proposed to characterize the horizontal groundwater quality conditions and evaluate the hydrogeologic characteristics at the site. The wells will be strategically placed in the AOCs and will supplement the existing monitoring well array at the site. The well locations will consist of a single well with a ten foot long screen that straddles the water table.

Well Locations

Up to six shallow wells will be installed at the proposed locations near each of the three AOCs. Shallow wells refer to wells that will be installed with screens that straddle the water table present in the fill material below the site and are completed above the glaciolacustrine horizon. Each well will have 3 to 4 feet of screen set above the water table surface. Historical groundwater elevations will be reviewed with respect to the time of year that installation is occurring to determine the length of screen above and below the water table. Groundwater is encountered at the site from 6 to 12 feet bgs in the perched groundwater system.

Preparatory Activities

The drilling contractor will review this document prior to any bid specifications, and will understand the scope of work prior to initiation of the site work. The scope of work will be based on existing knowledge of the site hydrogeology and the previous drilling activities. All permits, licenses, approvals, certificates, and authorizations required by the Sate of New York will be obtained prior to initiation of field activities. Natural Resource Group, Inc and NYSDEC personnel will locate and stake/GPS the locations of the wells prior to any field activities associated with the drilling. The proposed new monitoring well locations are shown on **Figure 1-4**.

Field Equipment

Field equipment used by the drilling contractor and/or the site geologist for the drilling and installation of the monitoring wells will include some or all of the following:

- Stainless-steel knife, trowel, bowl, and spatula.
- PID detector and/or organic vapor analyzer.
- Boring logs, sampling record data sheets, and pens with indelible ink.
- Decontamination detergents such as tri-sodium phosphate.
- Potable water and deionized water.
- Sample bottles.
- Stakes or making flags.
- Stainless steel tape and depth sounding tapes.
- Required health and safety equipment.
- Brushes.
- Receptacles for personnel protective clothing, debris, etc.
- Electronic water level indictors.
- Water/product interface probe.
- Disposable dedicated polyethylene bailer and rope.
- Measuring tape.
- Aluminum foil and plastic bags for headspace determination.

General Monitoring well Installation Procedures

All monitoring wells will be drilled and installed under the supervision of an experienced geologist/engineer and drilled by a licensed well driller. Prior to arriving at the site, the drilling contractor will certify that the drill rig, tools, and any down hole components or materials have been steamed cleaned since their last use. An on-site controlled decontamination area will be selected for cleaning equipment between well locations. The back and lower portion of the drilling rig and all equipment associated with drilling and well installation will be decontaminated before drilling is started. All wash and rinse water from the decontamination activities will be wasted on site.

Prior to drilling activities, an inventory of drilling supplies, well completion materials, and monitoring well supplies will be completed by the driller and the on-site geologist/engineer. A stock of sufficient supplies and materials and/or quick access to a supplier will be essential for a successful drilling program. During drilling, the cuttings and air space around the rig will be screened with a PID detector. All soil cuttings will be spread on the ground in the area of investigation.

Drilling will be completed using a hollow stem auger. The auger flights used for the monitoring wells will have an 8 1/4-inch outside diameter and a 4 1/4-inch inside diameter. Each flight will be 5-feet in length. Soil/fill samples will not be collected for laboratory analysis during the drilling; however cuttings will be logged and screened using a PID. This drilling method will also allow the monitoring wells to be constructed inside of the augers.

The wells will be installed according to State of New York well code requirements. Well casings will consist of 2-inch PVC casing with threaded couplings. The well screen will be attached to the riser also using a threaded coupler. The top of the riser pipe will have a temporary cap in place prior to constructing the wells to prevent any debris from falling into the well.

After the well casing and screen is set to the bottom of the open borehole, the well will be constructed by placing the filter pack and sealant in the annular space between the well screen, casing, and borehole wall. Where the top of the screen is submerged the filter pack will be placed via tremie pipe between the well screen and the borehole wall to minimize formation materials from passing into the well screen. The filter pack will be placed by carefully placing pack material via gravity drop pipe to the proper depths. The filter pack material will be chemically inert washed silica sand that is 90 % by weight larger than the screen size, with a uniformity coefficient of 2.5 or less. This will prevent more than 10 % of the sand pack material from passing into the screen. Where the top of the screen is less than 10-feet bgs, the filter pack material will be slowly poured into the annular space. The volume of filter material required will be calculated and depth of the filter pack will be periodically checked with a stainless steel tape to assure no bridging has occurred. The filter pack will extend at least two feet above the top of the screen.

Prior to sealing the annular space with grout one to two feet of fine silica sand will be layered on top of the filter pack material. This will prevent intrusion of the grout material into the filter pack and well screen. A 2- to 3-foot bentonite seal will be placed above the fine sand. At locations were the water table is 5 feet or less bgs, less than 2 feet of fine sand will be placed atop the filter pack due to grouting and well casing depth restrictions. The sealant used may consist of bentonite pellets or a bentonite slurry. The former will be used in shallow wells only and will be poured in slowly and measured with a tape to assure no bridging has occurred. The slurry will be tremied by gravity or pressure. The seal will sit for approximately one hour prior to grouting the remaining annular space.

The annular seal will consist of a grout material tremied into place by gravity or pressure. The grout will consist of a neat cement mixture that includes approximately 96% Portland cement with 4% bentonite. The tremie pipe will be placed at least 2 feet above the top of the bentonite slurry seal that overlies the filter pack. The grout will be pumped into the annular space until it comes to within two feet of the surface. Additional grout may be added to compensate for settling.

After the grout has settled for several hours, the final two feet of annular space will be sealed with concrete and a 6-inch diameter protective steel casing will be placed in the hole. The casing will extend three feet into the ground and will have a locking cap. Well construction diagrams will be completed after the well is installed.

2.2.9 Surface Water Levels

The objective of the surface water level monitoring is to better characterize the interaction of the hydrologic system at the site. Surface water level data is most useful when used in conjunction with groundwater level data collected at the same time. Groundwater level data is collected from wells strategically placed so water levels can be collected and compared to the data collected from the river's staff gauge.

Equipment
The following equipment will be used by the field personnel for collecting surface water level measurements:

- Electronic water level indicator.
- Existing staff gages or established benchmarks referenced to other data collection points on the site.
- Notebook or water level measurement data sheets and pens with indelible ink.

Procedures
Water level measurements for surface waters will be collected (assuming water is not frozen) visually from staff gages placed in the water or by measuring the distance to the water's surface from a surveyed benchmark. The latter is measured using a water level indicator tape. The bench mark or staff gage are stationary points that have been surveyed to AMSL and correspond to other data collection points at the site such as monitoring wells. The elevation of the surface water body is determined by subtracting the staff gage reading or distance to water from a benchmark from the known elevation.

2.3 Quality Control Samples

Quality Control (QC) of data will involve the collection of field replicates and the use of field and trip blanks. The role of replicate sampling, along with the preparation and analysis of trip and field blanks, are identified and discussed in the following.

2.3.1 Replicate Samples

Replicates of groundwater samples will be collected and used to assess field sampling procedures and the laboratory's precision. Information on the collection of replicate samples will be noted on a Sampling Information Sheet. A replicate sample is collected at the same time, in the same manner, in the same type of container, preserved in the same way, and analyzed by the same laboratory and for the same constituents as the primary sample. A replicate sample will be analyzed for the same parameters for all environmental samples in all media. At least 10% of the total number of locations sampled will be replicated for each sampling event.

2.3.2 Trip Blanks

To assess possible contamination of the samples during shipment, trip blanks for VOC analyses will be shipped with the field samples and will be analyzed at the same time as the field samples. A trip blank is a sample container filled with organic constituent-free water in the laboratory that travels unopened with the same empty sample containers to the site, and is returned with field samples from the site back to the laboratory. The trip blank is analyzed for the same volatile organic constituents as the field samples. One trip blank will be included in each shipping container, which includes samples for VOC analysis shipped by the laboratory.

2.3.3 Field Blanks

Equipment field blanks will be prepared by rinsing the sampling equipment after decontamination and collecting a sample of the rinsate. These samples will be analyzed for the same organic and inorganic parameters as field samples to evaluate equipment decontamination procedures. One equipment field blank will be collected for each sampling event, or one-sample per 20 samples, whichever is more frequent. The equipment used and the sampling location prior to and after the procedure will be noted on the Sampling Information Sheet.

2.4 Sample Custody and Shipping

The primary purpose of sample custody procedures is to create a written record that documents a sample from the moment of collection through analysis. The resulting information aids in data interpretation and serves as legal evidence of sample handling.

All samples will remain in the custody of sampling personnel from the time of collection until transfer to a representative of the courier service for delivery to the laboratory. Stringent chain-of-custody procedures will be followed to maintain and document sample possession and transfer.

2.4.1 Field Custody

The Natural Resource Group, Inc. Project Manager or other appropriate project staff will be responsible for the care and custody of the collected samples until they are shipped to the laboratory.

Chain-of-Custody Records will be completed to the fullest extent possible prior to sample shipment. They will include the following information: project number, sample number, date collected, type of sample, name of responsible party, analyses to be performed, preservative used, bottle description, and total number of bottles. These forms will be filled out in a legible manner using indelible ink and will be signed by the sampler. Similar information provided on the sample label and the Sampling Information Sheet will be compared to that on the Chain-of-Custody Record.

2.4.2 Sample Shipment Procedures

The following procedures will be followed when shipping samples for laboratory analysis:

- Samples requiring refrigeration will be promptly chilled to a temperature approaching 4 degree C and packaged in a rigid, insulated shipping container or cooler for transport to the laboratory.
- Only shipping containers which meet all applicable state and federal Department of Transportation standards for safe shipment will be used.
- The shipping containers will be sealed with a Chain-of-Custody Seal that will allow the laboratory receiver to quickly identify any tampering which may occur during transport to the laboratory.
- The Chain-of-Custody Record will be placed inside the shipping container in a sealed plastic envelope.
- Shipment will be by courier service and receipt of shipment will be retained with Chain-of-Custody Record.

2.4.3 Laboratory Custody

Upon receipt of the samples at the laboratory, the sample custodian will note the condition of the shipping containers and each sample, and log in the samples. The accompanying original Chain-of-Custody Record will be signed and dated and returned to Natural Resource Group, Inc. The laboratory maintains a tracking record that documents the sample from receipt through analysis and storage or final disposition.

2.4.4 Documentation Responsibilities

It will be the responsibility of the Natural Resource Group, Inc. Project Manager to arrange for securing all documents produced in the field at the end of each day's work. In addition, all project-related documents, information, communications, and reports will be stored and filed by Natural Resource Group, Inc. Field activities will be recorded on forms and in designed bound hardback field notebooks to ensure clear and complete records are maintained.

3 LABORATORY PROCEDURES

Natural Resource Group, Inc., on behalf of NRG thermal, LLC, is in the process of contracting with Severn Trent Laboratories, Inc. (STL), a laboratory certified under the New York State Department of Health Environmental Laboratory Approval Program to mange chemical analysis for the project. In addition, the laboratory may also be contracted to aid or manage the collection of samples at the site. A copy of STL's New York laboratory certification and Laboratory Quality Manual is attached.

4 REPORTING

Data collection activities to be completed during the sampling program include soil/fill and groundwater quality sampling at select excavation pits, monitoring wells, and water level measurements. Additional applicable chemistry data and water level data will be compiled from prior site investigation reports and compiled with data collected by Natural Resource Group, Inc. The composite data will be presented in a Site Investigation Report. The report will include the following:

1. Description of field activities:
   - Status and integrity of the monitoring well network.
   - Discussion of any variation in sampling protocol.
2. Summary of sampling data:
   - Analytical data summary tables.
   - Discussion of data validation results.
   - Evaluation of variations in upgradient and/or downgradient groundwater quality.
3. Summary of water level data:
   - Water level data summary tables.
   - Preparation of potentiometric maps.

Groundwater level data generated from monitoring will be tabulated and used to generate groundwater potentiometric contour maps for selected intervals. Contouring and evaluation of the data will be performed under the direction of a qualified scientist/engineer. Soil/fill and groundwater quality data will be tabulated for each sampling event. The data tables will be used to summarize the constituents analyzed, concentrations detected, units of the concentration, detection limits, sample location, and date of sampling. A separate table may be prepared for the QA/QC samples and will include similar information.

The QA information for the sampling program will be presented, as required, and will include the following:

1. Field and laboratory QA activities/results.
2. Data validation results.
3. Precision and accuracy of data. Completeness of data.
4. Usability of data.

Based on the data compiled, Natural Resource Group, Inc. will provide a recommendation to the State of New York regarding reclassification of the Roblin Steel Site.

5 HEALTH AND SAFETY

A Health and Safety Plan will be prepared for the site investigation. All work is to be performed in accordance with the health and safety requirements described in that plan and a copy will be kept at the site during the subsurface investigation. Based on the results of previous investigations at the site, it is anticipated that Level E safety procedures (including the use of a work uniform, reflective vest, hard hats, safety glasses, hearing protection, protective gloves, and steel-toed safety boots will be sufficient to protect workers at the site. If air quality monitoring with a PID indicates elevated levels of VOCs in the breathing zone, work will be stopped until conditions clear and the site safety officer and project manager approve additional work at the site. A copy of NRG's Site Safety Plan is attached.

FIGURES

NRG Thermal

Figure 1-1
Site Location
Tonawanda, NY

DATE: 10/12/06
REVISED: 02/06/07
SCALE: 1:12,000
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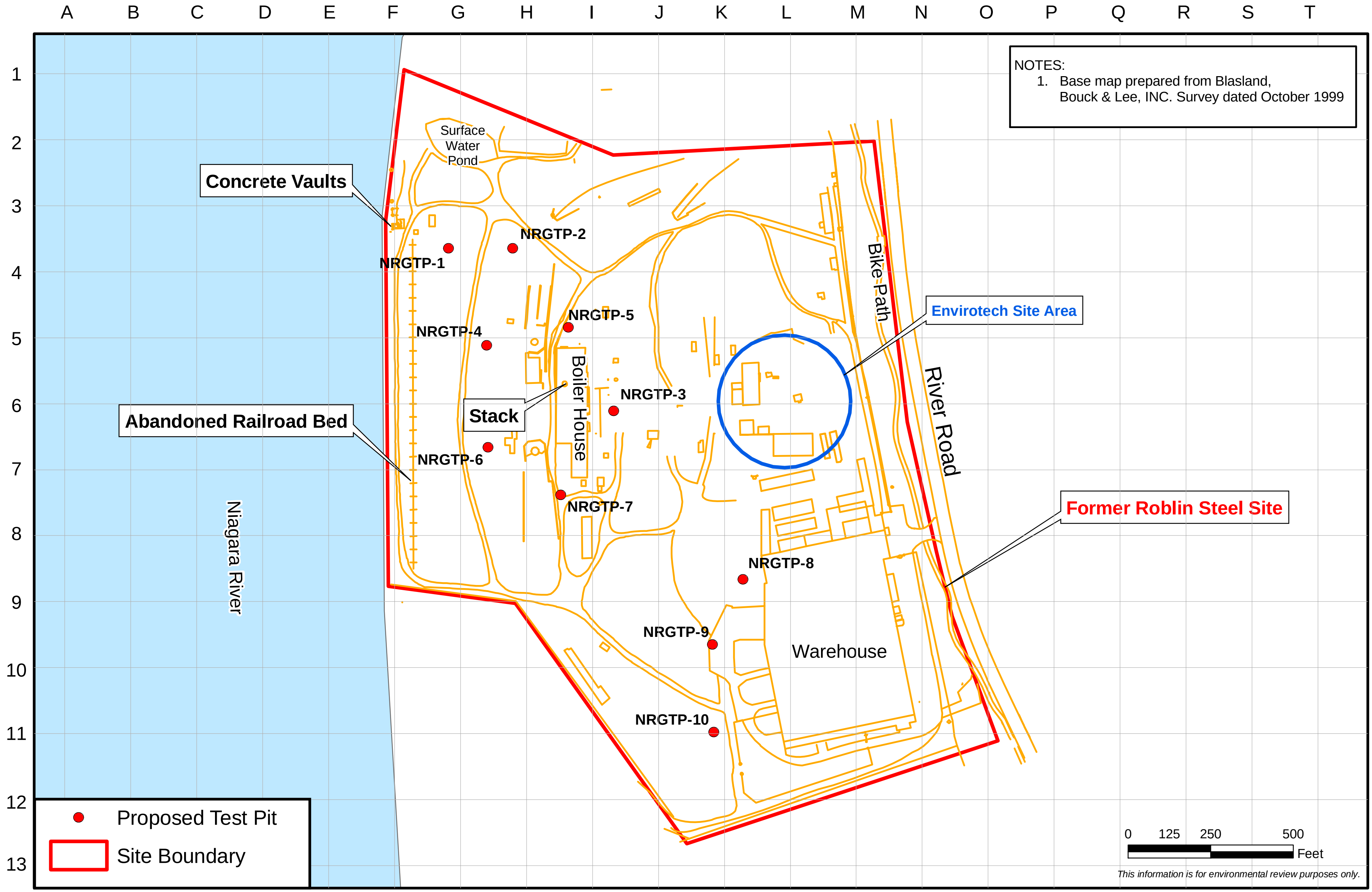
NATURAL RESOURCE GROUP, INC.



NRG Thermal

Figure 1-3
Proposed Test Pit Locations
Tonawanda, NY

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REVISED: 02/06/07
SCALE: 1:4,900
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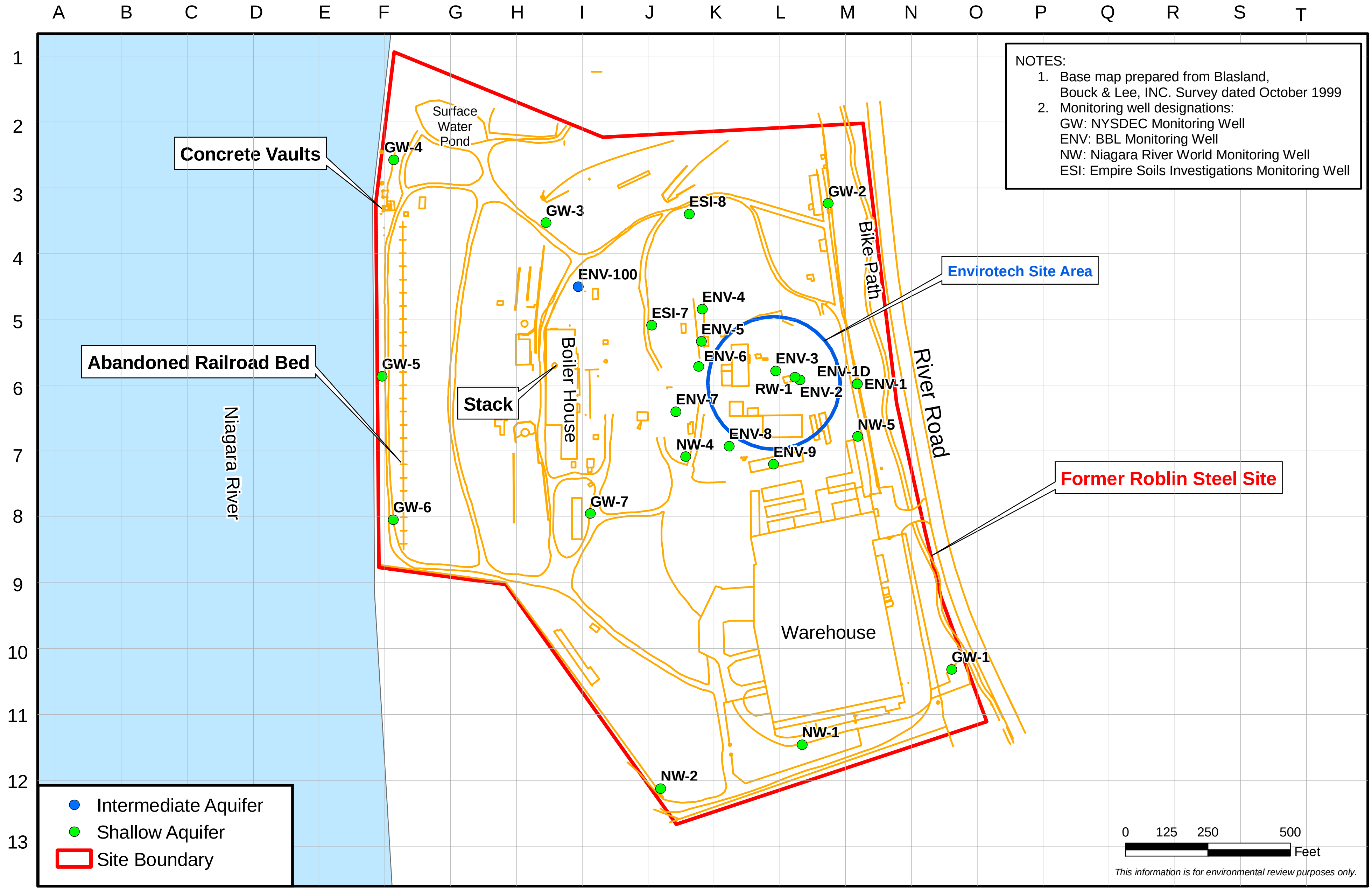
NATURAL RESOURCE GROUP, INC.



NRG Thermal

Figure 1-2
Existing Site Sample Points
Tonawanda, NY

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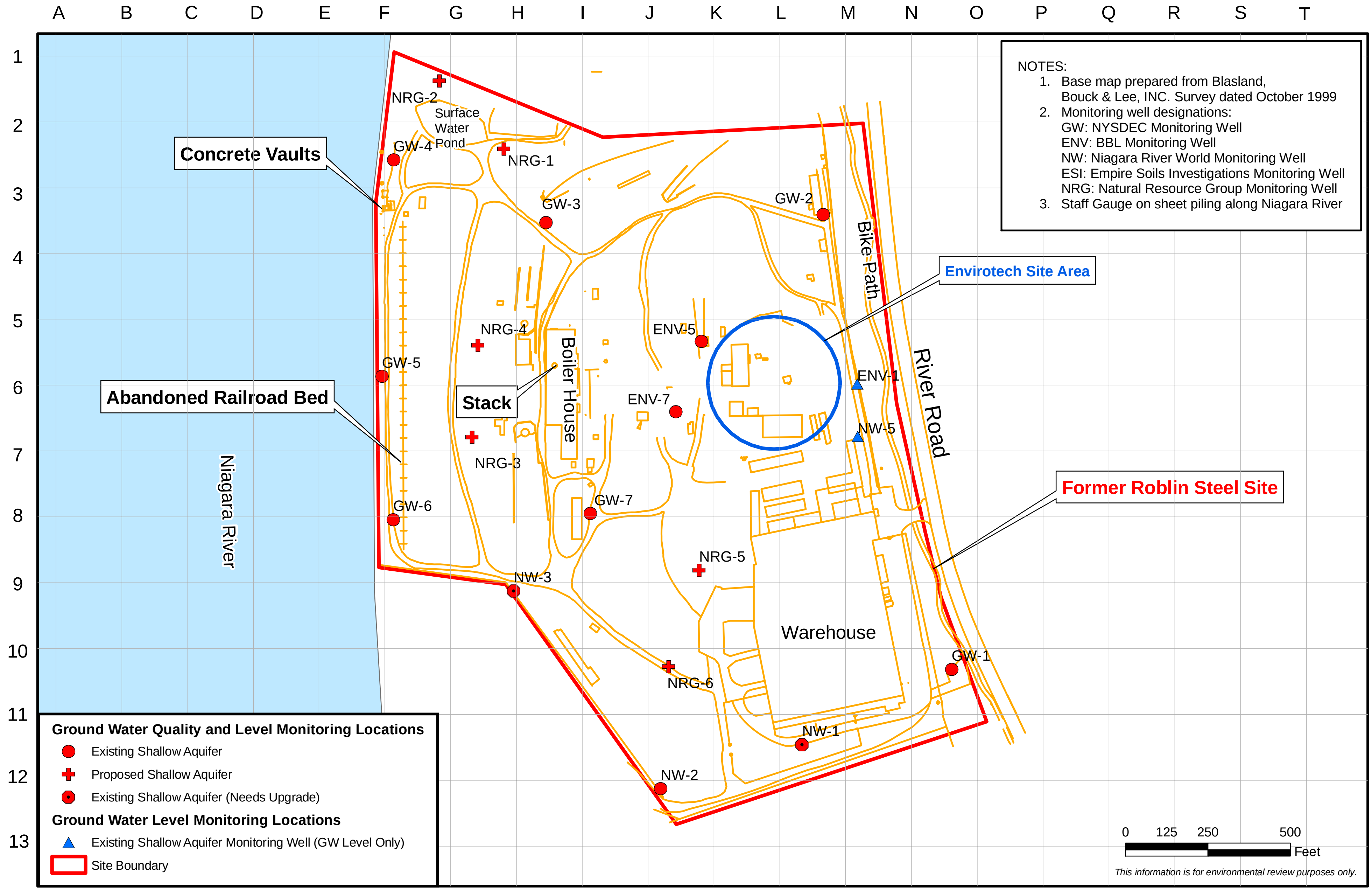
NATURAL RESOURCE GROUP, INC.



NRG Thermal

Figure 1-4
Proposed Monitoring Well Sample Array
Tonawanda, NY

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