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**Subject: Final Letter Report**  
**Ironwood Manufactured Gas Plant (MGP) Site - Removal Action**  
**Ironwood, Gogebic County, Michigan**  
**Technical Direction Document No. S05-0001-1207-020**  
**Document Control No. 1917-2A-BITO**  
**Contract No. EP-S5-06-04**

Ms. Halbur:

Under Technical Direction Document (TDD) S05-0001-1207-020, the U.S. Environmental Protection Agency tasked the Weston Solutions, Inc. (WESTON®), Superfund Technical Assistance and Response Team (START) to provide oversight of removal action activities at the Ironwood MGP Site in Ironwood, Gogebic County, Michigan (the Site). Specifically, WESTON START was requested to conduct the following:

- Perform general project oversight
- Track costs related to oversight activities
- Develop and implement an Air Monitoring Plan, Emergency Contingency Plan, and Site Security Plan
- Conduct air monitoring, soil screening, and sample collection
- Record written and photographic documentation of Site activities
- Track the disposition of wastes generated at the Site
- Develop and implement a Soil Screening and Post-Excavation Sampling Plan
- Prepare an Environmental Activities and Impact Report
- Assist in the development of a permanent marker and institutional controls for the Site



Ms. Kathy Halbur  
EPA, Region 5

- 2 -

Ironwood MGP Site  
January 22, 2014

Seasonal restrictions required that the removal action activities be conducted in phases at the Site during several mobilization events. Generally, these mobilization events implemented a significant phase of work as summarized below.

- **August 20 through October 25, 2012:** Conducted Site preparation, contaminated soil excavation and disposal, backfilling, and rough grading.
- **June 10 through 14, 2013:** Implemented monitoring well installation, topsoil placement and seeding, and final grading.
- **July 15 through 17, 2013:** Conducted groundwater sampling, property surveying, supplemental seeding, and temporary fence removal.
- **September 19 through 27, 2013:** Institutional controls for the Site were recorded, and a permanent marker was established at the Site.

This letter report discusses the Site description, Site background, removal action activities, and resources committed as of November 2013. **Attachment A** provides the figures for this letter report. **Attachment B** provides photographic documentation of Site conditions and removal action activities. **Attachment C** provides the pollution reports (POLREP) for the removal. **Attachment D** provides the tables for this letter report. **Attachment E** provides laboratory analytical reports for samples collected during the removal action. **Attachment F** provides the final survey of the Site property, including areas defined by the institutional controls established at the property. **Attachment G** provides the Restrictive Covenant signed and recorded by the City of Ironwood. **Attachment H** provides the Operation and Maintenance Plan agreed to by the City of Ironwood.

## **SITE DESCRIPTION**

The Site does not have a physical address and is located on the northwest corner of Hemlock and West Ayer Streets in Ironwood, Gogebic County, Michigan (**Figure 1** in **Attachment A**). The Site's coordinates are 46.4517 North latitude and 90.1778 West longitude. The Site lies in the southern portion of Section 21, Township 47 North, and Range 47 West. The Site's Gogebic County Property Tax Identification Numbers are 2752-21-477-010 (northern portion) and 2752-21-478-010 (southwestern portion).

The City of Ironwood presently owns the Site, and historical records identify the City of Ironwood as the owner and operator of the former Ironwood Gas Works. The Site is accessible from Hemlock and Ayer Streets and is bounded to the west by the Montreal River; to the north by the former Chicago and Northwestern Railroad grade right-of-way (ROW), which is now an off-road vehicle (ORV) trail; to the south by residential properties and Fahrner Excavating, which occupies a historical building associated with electric trolley car operations; and to the east by residential properties.



Ms. Kathy Halbur  
EPA, Region 5

- 3 -

Ironwood MGP Site  
January 22, 2014

Prior to the removal activities, the northern parcel of the Site was partially vegetated and littered with rock and soil piles and household debris. **Figure 2 in Attachment A** shows the Site layout and relevant Site features before removal activities began at the Site. The Site is relatively flat. A steep-sloping grade is present along the northern Site boundary, rising up to the former railroad grade. Similarly, along the western Site boundary, the grade slopes gradually down to the Montreal River. The depth to bedrock ranged from 10 to 12 feet below ground surface (bgs) following the topography at the Site. During the removal action, the elevation of the Montreal River was approximately 10 feet lower than the ground surface in the northern portion of the Site. The Montreal River flows from south to north toward Lake Superior.

Groundwater flow in the Site area is presumed to flow west-northwest toward the Montreal River. During the removal action, the depth to groundwater beneath the Site ranged from 8 to 10 feet bgs.

## **SITE BACKGROUND**

The Site is the location of a former coal gasification plant. Reportedly, the plant was constructed in 1911 and continued operating and distributing manufactured gas until approximately the late 1950s, when natural gas pipelines and service became more readily available in the area. Based on historical accounts, surface structures at the Site were demolished and removed during the 1970s and 1980s. In October 2010, a site assessment (SA) conducted by the Michigan Department of Environmental Quality (MDEQ) and Wisconsin Department of Natural Resources (WDNR) confirmed the presence of contaminants of concern (COC), including volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and inorganic constituents, at concentrations exceeding relevant criteria at the Site and in sediment along the Montreal River.

In April 2011, WESTON START prepared a draft SA report based only on the findings of MDEQ's investigation. Subsequent evaluation of the SA report and review of the WDNR's data indicated that additional investigation and delineation of the COCs at the Site were required, prompting the implementation of a supplemental SA in April 2012. The supplemental SA results are presented in the document titled, "Addendum 1 to the Site Assessment Report, Ironwood Manufactured Gas Plant Site," prepared by WESTON START in July 2012. The observation of process wastes and free product in soil borings and test pit excavations at the Site confirmed that gross contamination was present and leaching contaminants into groundwater and nearby surface-water.

EPA determined that response actions were necessary to mitigate threats posed by the presence of uncontrolled hazardous substances in surface and subsurface soil at the Site, including coal tar, MGP process wastes, and free product, which contain high levels of polycyclic aromatic hydrocarbons (PAHs), VOCs, SVOCs, and inorganic constituents. On August 9, 2012, EPA approved and signed an Action Memorandum documenting the threats and providing funding to further characterize the Site and begin a Time-Critical Removal.



Ms. Kathy Halbur  
EPA, Region 5

- 4 -

Ironwood MGP Site  
January 22, 2014

## **REMOVAL ACTION ACTIVITIES**

On August 20, 2012, EPA and WESTON START mobilized to the Site to begin removal action activities. EPA On-Scene Coordinators (OSC) Halbur and Hassan were present at the Site to direct cleanup operations on behalf of the EPA. The Emergency and Rapid Response Services (ERRS) contractor, LATA-Kemron, and its subcontractor, CMC, Inc., mobilized to the Site on August 22, 2012.

Planning documents, including a Site-specific Health and Safety Plan, Soil Screening Protocol, Air Monitoring Plan, Emergency Contingency Plan, and Site Security Plan were developed for the Site to establish baseline protocols for Site operations and emergency preparedness.

Removal action activities were conducted under the direction of the EPA. EPA, in consultation with the WDNr and MDEQ, decided on a removal approach to mitigate gross contamination caused by MGP process waste, coal tar, free product, and visibly contaminated soils present in the subsurface at the Site.

Daily Site activities were recorded by EPA and WESTON START personnel. **Attachment B** presents representative photographs taken over the course of the removal action. **Attachment C** provides the POLREPs prepared for the removal action.

The following subsections discuss the public relations; temporary facilities; utility clearance; clearing, grubbing, and solid waste disposal; air monitoring and sampling; soil excavation and disposal; Site restoration; monitoring well installation and sampling; and institutional controls and the permanent marker at the Site.

### **Public Relations**

On August 23, 2012, EPA held an open house for the communities of Ironwood, Michigan, and Hurley, Wisconsin. The event was attended by 15 to 20 residents and representatives from the City of Ironwood, MDEQ, WDNr, Western Upper Peninsula Health Department, and the Gogebic County Soil and Erosion Control District. EPA discussed the cleanup plans, including details related to truck routes and air monitoring during Site operations.

For the duration of the removal action activities, the EPA also held weekly public office hours at the City of Ironwood's Memorial Building located at 213 South Marquette Street in Ironwood Michigan, to allow community members to ask questions and receive information about the progress of the removal action efforts.

Throughout the project, the EPA also maintained two public websites: <http://www.epa.gov/region5/cleanup/ironwood> and [www.epaosoc.org](http://www.epaosoc.org). The websites were



Ms. Kathy Halbur  
EPA, Region 5

- 5 -

Ironwood MGP Site  
January 22, 2014

routinely updated with photographs and POLREPs documenting the progress of the removal action at the Site.

Activities at the Site were also routinely communicated to the public through media reports including television coverage of the open house event and regular project updates in the local newspaper. A reporter from the newspaper, The Daily Globe, regularly sought updates from the EPA and accessed the aforementioned websites to provide written updates in the newspaper. Coverage by local media provided an additional outlet for the public to obtain updates on the work being completed at the Site.

### **Temporary Facilities**

The ERRS contractor completed initial activities at the Site that included the installation of temporary fencing around the Site perimeter to limit access to authorized personnel. **Figure 3 in Attachment A** shows the Site layout and temporary facilities installed during the removal action. The work area was bordered to the east by an access road to the ORV trail that borders the Site to the north. Boulders 2 to 3 feet in diameter at the Site were relocated to the southern boundary of the ORV trail to prevent ORV traffic from using the access road.

The command post was established on a neighboring property east of the Site in position that allowed for the observation of work activities and vehicles entering and exiting the Site. The command post was a mobile office trailer, approximately 720 square feet in area. The mobile office trailer had two offices on opposite ends of the trailer and a central common area between the offices for meetings. EPA and START utilized the office on the south end of the trailer and the ERRS contractor utilized the office on the north end of the trailer. The command post was outfitted with temporary electrical service and a portable satellite unit for Internet access. Site personnel parked at the command post to minimize interference with construction traffic.

Site security was coordinated through the City of Ironwood. During all non-work hours, City of Ironwood security personnel monitored the Site and provided activity logs documenting observed and perceived security concerns.

Construction traffic, including haul trucks and vendors, accessed the Site from a primary access point established in the southeast corner of the active work area. A temporary haul road was established at the Site (see **Figure 3 in Attachment A**) using gravel to provide stable access for haul trucks. The temporary haul road created a one-way loop, allowing trucks to enter at the primary access point, get loaded, and then exit southbound along the western boundary of the Fahrner Excavating property. The temporary haul road was altered during the course of construction to accommodate changes in the extent of excavation as well as off-site construction activities near the Site.



Ms. Kathy Halbur  
EPA, Region 5

- 6 -

Ironwood MGP Site  
January 22, 2014

Soil erosion and sedimentation control measures were established at the Site and maintained throughout all phases of the removal action. Best management practices and erosion and sediment control measures were implemented at the Site after consultation with the Gogebic County Conservation District. A silt fence was established along the western Site boundary. In addition, coconut coir logs and sand bags were placed along the bank of the Montreal River to stabilize the shoreline (see **Figure 3** in **Attachment A**). The daily haul truck traffic through the work area required that regular street sweeping, up to several times a day, be conducted to prevent the migration of soil from the Site. In addition, sediment filter bags were installed in storm sewers next to the Site. The sediment filter bags allowed collection of sediment generated during street cleaning operations, preventing discharge to the Montreal River, the receiving water body of the storm sewers.

### **Utility Clearance**

Before removal activities began at the Site, the ERRS contractor coordinated the location of utilities using Michigan's one-call utility locating service, MISS Dig System, Inc. During the course of the removal activities at the Site, water, sewer, and road replacement were conducted on the streets surrounding the Site, including Hemlock, West Ayer, and Cedar Streets. Removal activities were coordinated with the nearby utility and road work to ensure that operations on both projects were not hindered by one another.

### **Clearing, Grubbing, and Solid Waste Disposal**

Before contaminated soil excavation could begin, surface debris at the Site (including soil and waste piles) required removal. Soil stockpiles of boulders and non-contaminated debris and fill required removal to access underlying contaminated media. Fahrner Excavating and the City of Ironwood assisted with removal of the surface debris and site preparation. Boulders were used to establish temporary access restrictions along the ORV trail. The ERRS contractor completed the segregation, characterization, and disposal of solid waste that had been dumped on the site, including household rubbish, construction debris, and building materials.

In addition to surface debris, vegetation along the northern and western property boundaries required removal. The removal of trees was limited to areas of the Site scheduled for excavation in order to minimize the disturbance of established vegetation. The ERRS contractor conducted the clearing activities, which included cutting and clearing trees, removing fallen trees, and excavating stumps and subsurface vegetative debris. Cleared vegetative debris was collected and chipped on the site. The City of Ironwood transported the chipped vegetative debris to its composting operation. Stumps and subsurface vegetative debris were disposed of as contaminated media.





Ms. Kathy Halbur  
EPA, Region 5

- 7 -

Ironwood MGP Site  
January 22, 2014

### **Air Monitoring and Sampling**

Before removal efforts began, the EPA implemented an air monitoring program to ensure that workers were protected and that fugitive emissions and particulates resulting from removal action activities did not adversely affect neighboring residential and commercial properties. Protocols associated with performance of air monitoring and sampling at the Site are detailed in the planning document titled, "Air Monitoring Plan, Ironwood MGP Site," dated August 20, 2012. Air monitoring and sampling activities implemented during the removal action are summarized below.

On August 24, 2012, before excavation activities began, WESTON START collected a background air sample to establish background concentrations of contaminants before intrusive work in the Site area. **Table 1** in **Attachment D** summarizes the detected laboratory results. **Attachment E** provides the laboratory analytical report for the sample. The background sample did not contain compounds associated with MGP waste at concentrations above the laboratory detection limits.

The background sample results were to be used as a comparative baseline if additional future sampling was required. Contingencies for additional air sampling are outlined in the Air Monitoring Plan and could be triggered by public complaints related to nuisance odors, sustained elevated concentrations of contaminants, or similar conditions. These conditions were not encountered during the removal action. Therefore, additional air sampling was not required during the removal action.

EPA conducted real-time perimeter air monitoring during the removal action to document particulate concentrations at the Site perimeter. The air monitoring was conducted using four DataRAM 4TM Model DR-4000 (DR4) units (see **Figure 3** in **Attachment A**). The DR4 units were linked using a wireless, network-based communication system called VIPER, which allowed real-time transmission of data from field sensors to a local computer, remote computer, and/or enterprise server for data management, analysis, and visualization. One DR4 unit was deployed around the northwest, northeast, southwest, and southeast sides of the Site near sensitive receptors. Real-time data from the DR4 units was transmitted to the Site command post, where it was monitored continuously.

During the removal action, visible dust was minimized and the perimeter action level for particulates was established at 500 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ). When a DR4 unit detected sustained particulate concentrations exceeding half the action level ( $250 \mu\text{g}/\text{m}^3$ ), an e-mail notification was sent to EPA and WESTON START and administrative or engineering controls were initiated to reduce the particulate emissions. Such controls included watering the haul road or soil piles and sweeping the street. **Table 2** in **Attachment D** summarizes perimeter air monitoring particulate results exceeding the action level.



Ms. Kathy Halbur  
EPA, Region 5

- 8 -

Ironwood MGP Site  
January 22, 2014

WESTON START also performed routine perimeter and Site air monitoring for carbon monoxide (CO), hydrogen sulfide (H<sub>2</sub>S), VOCs, lower explosive limit (LEL), and percent oxygen (%O<sub>2</sub>) in ambient air around the Site perimeter and in the excavation area. The monitoring was performed using a RAE Systems, Inc., MultiRAE multi-gas monitor. During the removal action, the perimeter action levels were as follows:

- CO = 100 parts per million (ppm)
- H<sub>2</sub>S = 5 ppm
- VOCs = 5 ppm
- LEL = more than 25 percent above background

The MultiRAE unit was equipped with alarms to notify Site personnel when action levels were exceeded. WESTON START used the MultiRAE unit to routinely check the working limits of the excavation area and the Site perimeter. When the MultiRAE unit detected sustained VOC concentrations approaching the action levels, engineering controls were initiated to reduce emissions, including mixing highly impacted soil with less impacted soil and immediate backfilling of the excavation. In addition, a water-soluble, odor-controlling solution was maintained at the Site to suppress nuisance odors.

WESTON START monitored and logged daily meteorological data for the Ironwood area using the National Weather Service website, which provided current weather conditions at the Gogebic-Iron County Airport (Airport Code: KIWD). The DR4 units were not deployed during rain or snow events.

### **Soil Excavation and Disposal**

Removal action activities focused on the excavation and disposal of grossly contaminated soil in the former operating areas of the Site. The excavation of MGP process wastes, coal tar, free product, and visibly contaminated soils extended vertically to groundwater or bedrock to remove visible contamination. Excavation of contaminated soil at the Site extended vertically until the material could no longer be effectively removed from the subsurface. Excavation into the saturated zone was limited to the upper portion to remove wastes and coal tar while minimizing the infiltration of groundwater.

The following subsections discuss the excavation of process wastes, coal tar, and visibly contaminated soil; excavation of foundations and subsurface structures; soil screening and excavation limits; and groundwater management.

### **Excavation of Process Wastes, Coal Tar, and Visibly Contaminated Soil**

On September 4, 2012, the ERRS contractor began excavation activities in the northwest corner of the Site, where surface tar deposits were observed during the SA. The excavation extended





Ms. Kathy Halbur  
EPA, Region 5

- 9 -

Ironwood MGP Site  
January 22, 2014

vertically 10 to 12 feet bgs, removing the slope and river bank on the east side of the Montreal River. A 6-inch-diameter clay pipe oriented east to west was encountered in the excavation. Oily, visibly contaminated water was draining from the broken pipe toward the river. Sand bags and oil absorbent booms were placed along the east bank of the Montreal River next to the Site to prevent contaminant migration (see **Figure 3** in **Attachment A**). An earthen dam was constructed approximately 5 feet east of the river to contain liquids draining from the broken piping. Additional sections of absorbent boom were placed downstream of the excavation across the river to provide secondary containment.

With these containment systems in-place, excavation activities resumed in the northwestern portion of the Site, generally proceeding east along the toe of the ORV trail. Contaminated water collecting behind the earthen dam was mixed with dry, contaminated overburden and transferred to the contaminated soil staging area established next to the temporary haul road. The excavation continued east along the northern Site boundary toward the locations of former Site buildings and operational areas. As the excavation progressed, it generally extended vertically to bedrock, which was present at 10 to 12 feet bgs. Bedrock generally followed the natural Site grade, sloping toward the Montreal River. The excavation generally extended 1 to 2 feet into the water table located at approximately 8 to 10 feet bgs, and coal tar was regularly observed seeping from the excavation sidewalls into the lower portions of the excavations. Overall, groundwater infiltration was minimal during excavation.

In the north-central and northeastern portions of the Site, subsurface concrete structures and foundations were encountered. At the same time, clearing and grubbing had been completed in the southeastern portion of the proposed excavation area. As a plan was developed to manage the concrete structures, excavation activities resumed at the bank of the Montreal River. Excavation progressed south and east by completely removing contaminated soil and debris from the east slope and river bank of the river. Similar to the excavation work completed during the week of September 3, 2012, buried piping leaking contaminated groundwater was encountered in the excavation. Infiltrating groundwater was contained and managed using earthen dams and mixing the water with dry contaminated soil. Absorbent boom, sand bags, and silt fencing remained in place along the river bank throughout all removal action activities. As the excavation progressed east, the configuration of the temporary access road and the locations of contaminated soil stockpiles varied slightly to accommodate changing work conditions.

Excavation and disposal activities were completed on October 16, 2012. **Table 3** in **Attachment D** summarizes the daily manifest and waste ticket tracking, including daily disposal quantities. A total of 15,190.71 tons of solid wastes, MGP process wastes, coal tar, and visibly contaminated soil was excavated from the Site and transported to K&W Landfill in Ontonagon County, Michigan, for disposal. K&W Landfill is a licensed, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)-approved disposal facility.



Ms. Kathy Halbur  
EPA, Region 5

- 10 -

Ironwood MGP Site  
January 22, 2014

After the western portion of the Site was excavated, removal activities again focused on the excavation of the former Site operating area, where buried concrete and foundations comprised most of the subsurface material as discussed below.

### **Excavation of Foundations and Subsurface Structures**

During excavation activities in the central and eastern portions of the Site, buried concrete structures were encountered, including pipe cradles, foundation walls, and coal tar vats. Concrete structures unearthed during excavation were visually inspected for staining and contaminated media adhering to the concrete surface. If staining or contaminated media was observed, the material was staged for disposal. If no evidence of contamination was observed, the concrete was staged for beneficial use as backfill in the excavations.

Most of the concrete excavated at the Site was not contaminated. However, three subsurface concrete vessels were unearthed in the north-central portion of the former plant, west of the former Retort Room. Two of the vessels were tar wells filled with tar and tar-saturated soil, and historical maps indicate that the wells each measured approximately 4 by 8 feet and were 6 feet deep. The third vessel was a vat also containing tar and tar-saturated soil near the tar wells and measuring 5 by 5 feet and 5 feet deep. In total, the two tar wells and the vat contained approximately 500 cubic feet or 3,000 gallons of tar-saturated soil and coal tar. The liquid coal tar was stabilized using Portland cement, characterized, excavated, and staged for disposal. The concrete walls of the tar wells and vats were contaminated and therefore also excavated and staged for disposal.

Subsurface concrete structures and foundations were encountered in the footprints of the former Site buildings. Except for walls that once housed the tar wells, most of the structures were not contaminated. Uncontaminated, inert concrete was broken into manageable pieces approximately 2 feet in diameter and placed in the floor of the excavation as backfill. Clean imported sand was placed and compacted over the concrete fill.

The most notable structures remaining at the Site are the round, 40- to 50-foot-diameter, concrete foundations for the former aboveground gasometer tanks (see **Figure 3** in **Attachment A**). The gasometer tanks stored manufactured gas before discharge to the distribution system. Condensation of the stored gas could result in the formation of tar and residuals within the tanks. The large concrete structures generally were clean, but some staining was present over the surface of the structures. Ultimately, the excavation and disposal of the gasometer tank foundations was found to be cost-prohibitive, and encapsulation was determined to be the most cost-effective means of mitigating potential exposure risks at the Site. The abovegrade portions of the structures were scraped using heavy equipment and power-washed to remove staining. Several coats of opaque sealant then were applied to the surface of the structures.



Ms. Kathy Halbur  
EPA, Region 5

- 11 -

Ironwood MGP Site  
January 22, 2014

### **Soil Screening and Excavation Limits**

During excavation activities at the Site, WESTON START conducted soil screening to verify the removal of contaminated soil from the excavation. Detailed descriptions of the soil screening rationale and methodology are presented in the WESTON START document titled, "Soil Screening and Post-Excavation Sampling Plan, Revision 1, Ironwood MGP Site," dated October 15, 2012. **Figure 4** in **Attachment A** shows the final extent of the excavation.

WESTON START screened the excavation floor and sidewall areas soil using a photoionization detector (PID) to document conditions in the subsurface before the placement of backfill. When the excavation was appropriately sloped and safe to enter, WESTON START collected soil samples from the floor or sidewall of the excavation for headspace screening. When the excavation was not accessible, the excavator bucket was used to collect samples. Soil samples were placed in re-sealable plastic bags and allowed to volatilize before the headspace measurement was collected. Soil screening results were documented in the field logbook through sketches and notes.

### **Groundwater Management**

Groundwater infiltrating the excavation was collected and disposed of using hoses, pumps, and similar equipment. In addition, on August 31, 2012, a fractionation (frac) tank was delivered to the Site to allow for the storage and characterization of collected groundwater (see **Figure 3** in **Attachment A**).

Minimal quantities of contaminated groundwater and coal tar were recovered during the removal action. Infiltrating groundwater generally was encountered in subsurface voids and buried structures. In addition, coal tar typically was observed seeping from excavation sidewalls. Overall, large volumes of infiltrating water and free product were not encountered. Therefore, groundwater management through pumping and recovery ultimately was not necessary.

### **Site Restoration**

Excavation and disposal activities were completed at the Site by October 25, 2012. The disturbed Site areas were backfilled and rough-graded to promote positive drainage. Removal activities were suspended due to seasonal restrictions related to the placement of seed and mulch. On June 11, 2013, crews returned to the Site to conduct Site restoration activities

The ERRS contractor conducted backfilling operations simultaneously with excavation, transportation, and disposal activities to minimize the potential for nuisance odors and to prevent the accumulation of groundwater within the excavation requiring management and handling. As the excavation progressed, the ERRS contractor backfilled the excavation with non-contaminated overburden and concrete stockpiled at the Site.



Ms. Kathy Halbur  
EPA, Region 5

- 12 -

Ironwood MGP Site  
January 22, 2014

In support of the City of Ironwood's water and sewer project, EPA accepted excess soil generated by the City's work for use as backfill at the Site. The soil was screened and evaluated before use as backfill. Soil suspected of containing contaminants based on screening results was staged for disposal. Screened soil acceptable for use as backfill was staged separately and used as backfill, similar to the non-contaminated overburden.

The upper portions of the excavation least likely to contact the fluctuating groundwater table were backfilled with clean imported fill. Backfill was placed and compacted in the excavation using heavy equipment in a manner that ensured that in-place contaminated soil that had not been excavated did not commingle with the backfill. The project had no compaction or density testing requirements because any future Site development would likely result in the disturbance of the fill. The backfill in the excavation was compacted by repeatedly rolling over the material with heavy equipment.

The final Site grade was established through consultations with local stakeholders, including the City of Ironwood, property owners, and the Gogebic County Conservation District. The Site is located in the flood plain of the Montreal River. Before removal activities began at the Site, the ground surface had been artificially built up 6 to 8 feet above surrounding lines and grades.

Restoration and establishment of the final Site grade included restoring the flood plain to a more native and natural condition by creating positive drainage from the Site while blending with the existing land contours around the Site. The excavation was graded so that a swale was created in the north half of the excavated area. The swale blended with the existing grade channeling runoff from the uphill properties to the east. The final Site grade was documented in a survey completed on July 25, 2013, by Coleman Engineering Company (Coleman) of Ironwood, Michigan. **Attachment F** provides the final survey map.

The disturbed areas of the Site were leveled and graded to promote positive drainage and allow for the establishment of vegetation at the Site. The cleared and grubbed areas of the Site (including areas from which rubble and debris had been removed) were scarified and graded. Topsoil and seed were placed within the excavation footprint and other Site areas disturbed by removal action activities. Seed applied at the Site was selected based on consultations with local stakeholders and was composed of a mix of 40 percent LS1100 Tall Fescue, 40 percent Traverse Tall Fescue, and 20 percent Rhambler Tall Fescue.

In addition to seeding, local stakeholders also provided input related to the re-establishment of trees at the Site. Multiple tree specimens located on other properties owned by the City of Ironwood were identified for transplant at the Site. EPA harvested the trees and transplanted them along the Site perimeter. The U.S. Forest Service also provided more than three dozen seedlings of several varieties, including oak and red maple. These seedlings were planted along the Site perimeter and shoreline of the Montreal River.



Ms. Kathy Halbur  
EPA, Region 5

- 13 -

Ironwood MGP Site  
January 22, 2014

Portions of the temporary haul road established at the Site were left in place. Graveled portions of the temporary haul road on the north and west sides of the Fahrner Excavating property also were left in place. Further, road gravel was placed along the eastern Site boundary to restore access to the ORV trail through the Hemlock Street ROW. The haul road and ORV access roads were graded and leveled at the end of construction.

### **Monitoring Well Installation and Sampling**

Monitoring wells installed by the MDEQ in 2007 located within the footprint of the excavation were completely over-excavated during the removal action. The excavated debris from the monitoring wells was included with contaminated waste and transported to an off-site landfill for disposal. After the establishment of the final Site grade, EPA installed four groundwater monitoring wells within the excavation footprint.

On June 11 and 12, 2013, four borings were advanced using hollow-stem auger drilling techniques and replacement monitoring wells were constructed in each boring. The survey map in **Attachment F** shows the replacement monitoring wells as Monitoring Wells 2 through 5. Coleman constructed the replacement monitoring wells using Schedule 40 polyvinyl chloride (PVC) riser material and a 5-foot-long, Schedule 40 PVC slotted screen. Coleman developed the replacement monitoring wells the next day using disposable bailers, alternately surging and purging the wells until the extracted groundwater appeared sediment-free. Monitoring well 1 installed by the MDEQ in 2010 was not disturbed by the removal action activities.

On July 16, 2013, WESTON START collected groundwater samples from Monitoring Wells 1 through 4. Monitoring Well 5 was not sampled because of the suspected presence of coal tar in the well. The MDEQ Environmental Laboratory in Lansing, Michigan, analyzed the groundwater samples. **Attachment E** provides the laboratory analytical report for the groundwater samples.

### **Institutional Controls and Permanent Marker**

Institutional controls were implemented at the Site to reduce exposure to residual contamination by limiting land use and the resources at the Site property. A copy of the Restrictive Covenant for the Site is included in **Attachment G**. Land-use restrictions incorporated into the institutional controls for the Site are summarized below.

- Residential use is prohibited at the Site property.
- Indoor use is prohibited at the Site property.
- Recreational use of the Site property is acceptable as long as the activities are in compliance with all of restrictions contained in the recorded deed document.



Ms. Kathy Halbur  
EPA, Region 5

- 14 -

Ironwood MGP Site  
January 22, 2014

Similar to land-use restrictions, specific activities at the Site also are restricted to prevent unacceptable exposure to residual contaminants in the subsurface. The survey map in **Attachment F** shows the "Restricted Use Boundary."

Restricted activities at the Site are summarized below.

- Activities at the Site property must not (1) cause existing contamination to migrate beyond the boundaries of the Site property, (2) increase the cost of response activities, or (3) otherwise exacerbate the existing contamination located at the Site property.
- The Site property cannot be used in a manner that may interfere with response activities at the Site property, including interim response, removal action, remedial action, operation and maintenance, monitoring, and other activities necessary to ensure the effectiveness and integrity of the response action.
- The clean soil cover ("Restricted Use Boundary" in the survey map in **Attachment F**) cannot be excavated, removed, damaged, or otherwise interfered with unless conducted pursuant to an EPA- or MDEQ-approved plan. The clean soil cover extends vertically to 3 feet bgs.
- Elevations and contours of the Site property cannot be altered from those depicted in the survey map included in **Attachment F**.
- The shoreline along the Site property boundary along the Montreal River cannot be excavated or modified unless conducted pursuant to an EPA- or MDEQ-approved plan.
- Excavation and other activities disturbing soil or other materials below 1,472 feet above mean sea level are prohibited at the Site property unless conducted pursuant to an EPA- or MDEQ-approved plan.
- The construction and use of wells or other devices at the Site property to extract groundwater for consumption, irrigation, or any other use is prohibited except for wells or devices necessary for response activities or testing and monitoring groundwater contamination levels.
- The construction of buildings and enclosed structures and the use of such buildings and structures are prohibited at the Site property. This restriction does not prohibit the construction or use of open-air structures;
- Any activity that disturbs the concrete pads shown in the survey map included in **Attachment F** is prohibited unless such activity is conducted in association with appropriate soil characterization requirements and in compliance with applicable state and federal environmental, health, and safety laws and regulations, including, but not necessarily limited to, the use of appropriate personal protective equipment.





Ms. Kathy Halbur  
EPA, Region 5

- 15 -

Ironwood MGP Site  
January 22, 2014

- The excavation, removal, damage, or other interference with the existing on-site monitoring wells (Monitoring Wells 1 through 5 in **Attachment F**) is prohibited.

A permanent marker was established at the Site boundary. The marker depicts the Site survey and describes removal actions completed at the Site. As set forth in the institutional controls for the Site, the marker must remain at the Site and not be covered, obscured, or otherwise altered. The permanent marker must be kept free of vegetation and other materials to ensure that the permanent marker is easily visible. **Attachment B** includes photographs of the permanent marker.

The marker was mounted to a boulder in the southeast corner of the Site property. The boulder is approximately 4 feet in diameter and in line with other boulders placed along the limits of the "Restricted Use Boundary" in the survey map in **Attachment F**. The boulders serve as an engineering control that prevents vehicular access to the restricted area of the Site. **Attachment H** includes the Operation and Maintenance Plan that outlines the City's long-term stewardship obligations for the Site.

This letter report serves as the final TDD deliverable for the Ironwood MGP Site Removal Action. All tasks pertaining to this TDD have been completed. If you have any questions or comments regarding this report, please contact Dan Liebau at (906) 523-5569.

Very truly yours,  
Weston Solutions, Inc.

A handwritten signature in black ink, appearing to read "C. Tufts".

Christine Tufts  
WESTON START Associate Geoscientist  
906-482-6462

A handwritten signature in black ink, appearing to read "Dan Liebau".

Daniel Liebau  
WESTON START Project Manager  
906-523-5569

Attachments:

A – Figures	E – Laboratory Analytical Reports
B – Photographic Log	F – Final Survey
C – POLREPs	G – Restrictive Covenant
D – Tables	H – Operation and Maintenance Plan

cc: WESTON START TDD File

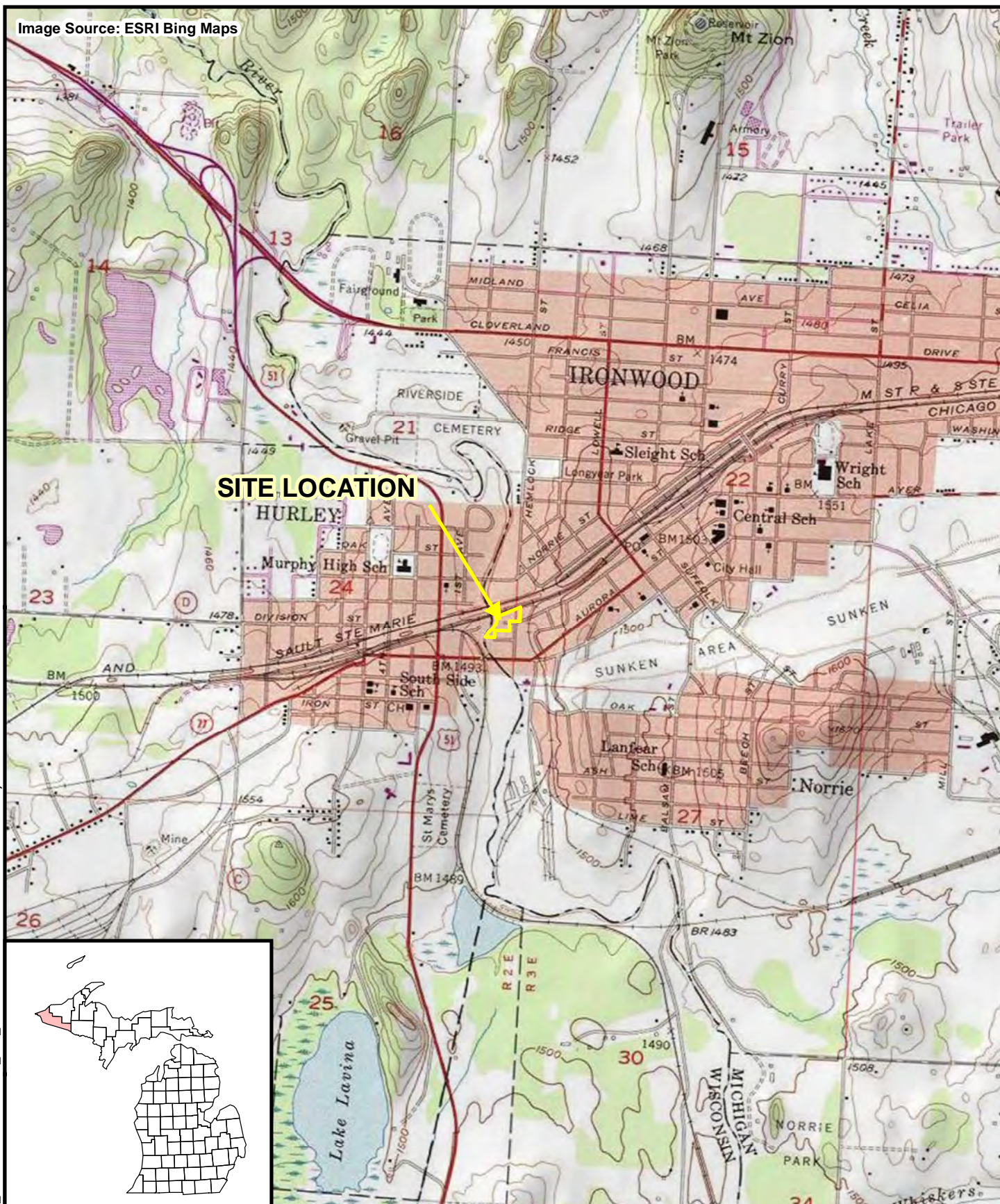
---

**ATTACHMENT A**  
**FIGURES**

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Image Source: ESRI Bing Maps



#### Legend

Site Boundary

0 2,000 Feet



Prepared for:  
**U.S. EPA REGION V**

Contract No: EP-S5-06-04  
TDD: S05-0001-1207-020  
DCN: 1917-2A-BITO



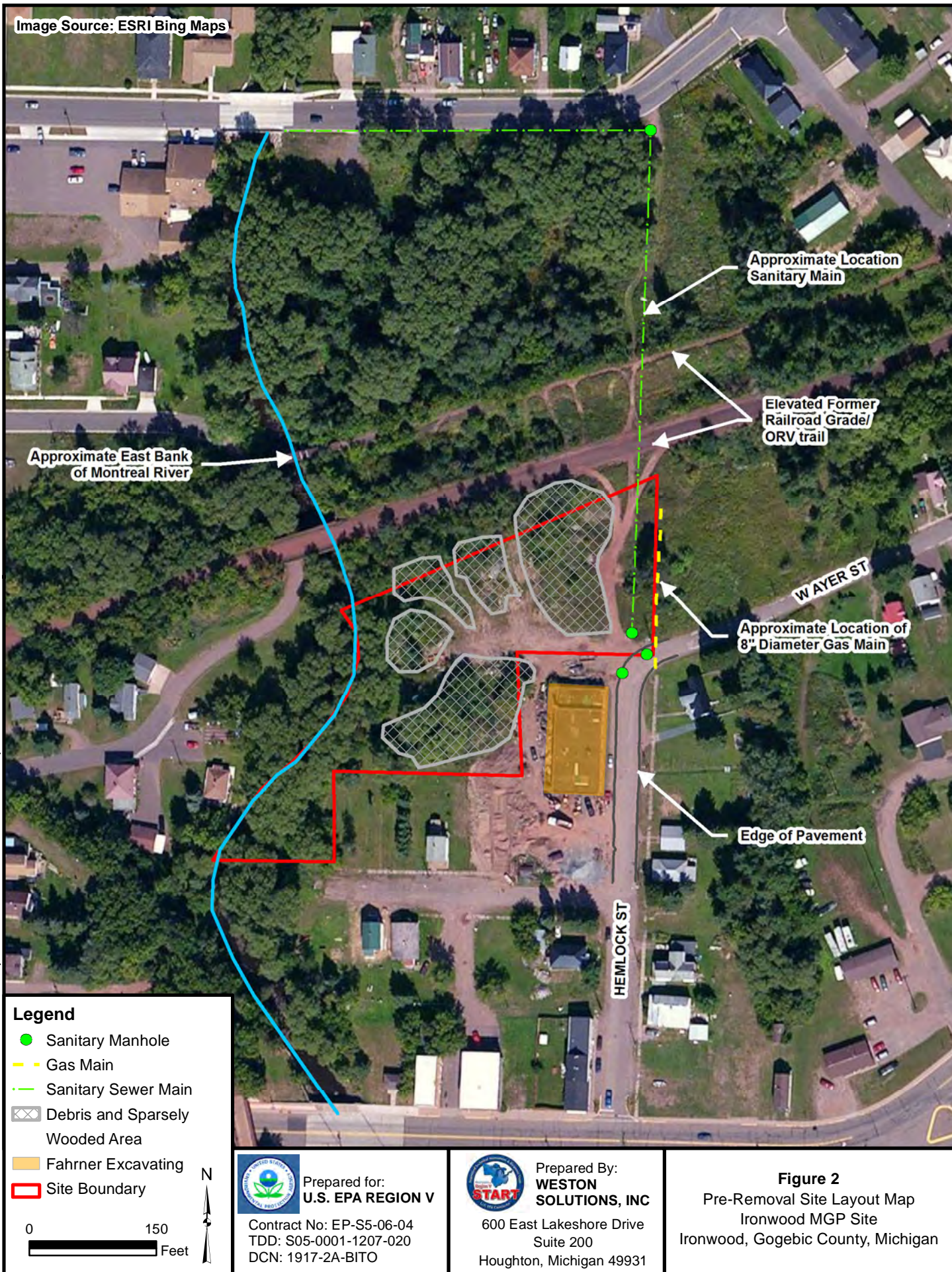
Prepared By:  
**WESTON SOLUTIONS, INC**

600 East Lakeshore Drive  
Suite 200  
Houghton, Michigan 49931

#### Figure 1

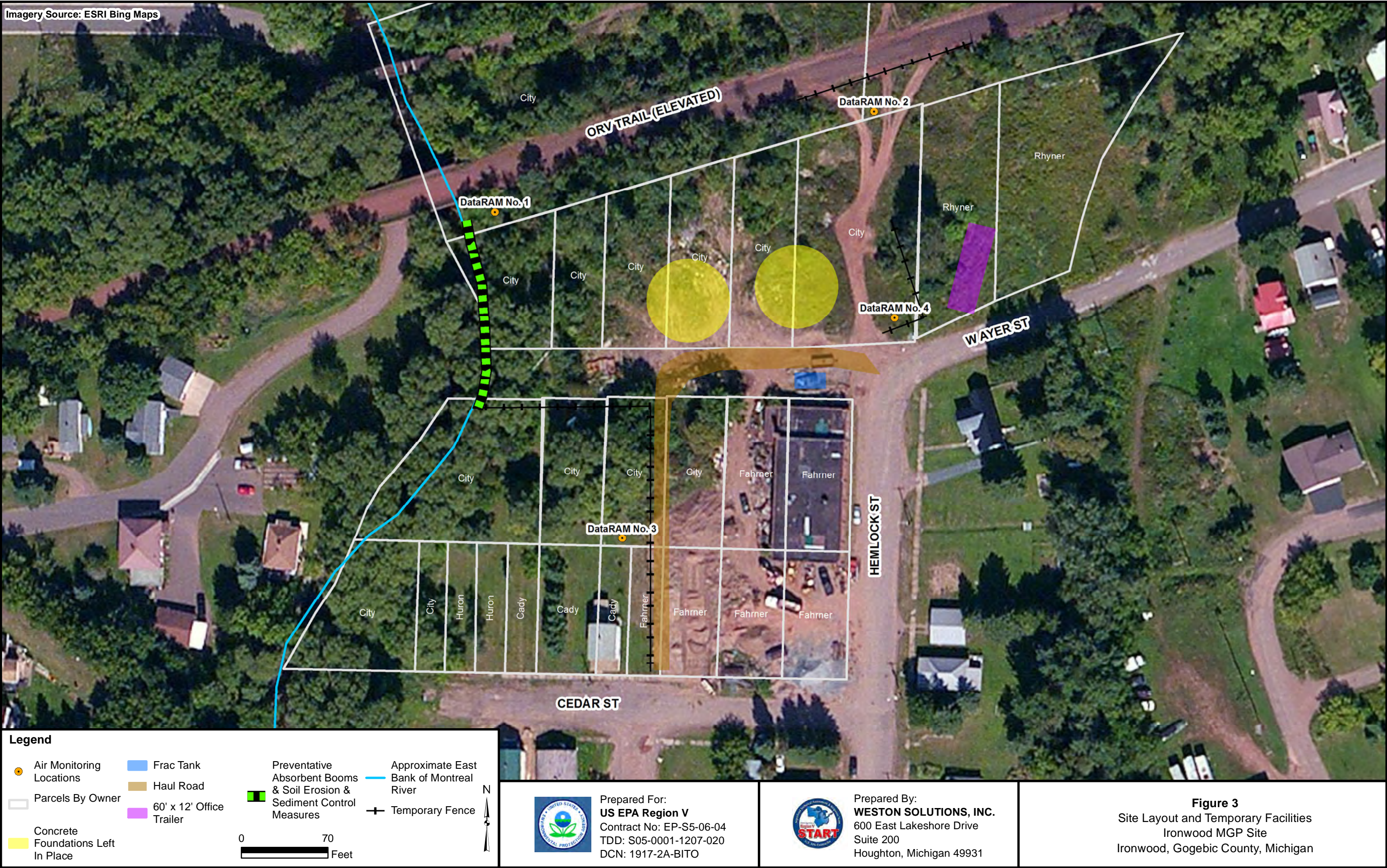
Site Location Map  
Ironwood MGP Site  
Ironwood, Gogebic County, Michigan







FILE: D:\Ironwood\_MPG\mxd\Removal\F3\_Site\_Layout\_Temp\_Fac.mxd 10/24/2013 9:58:38 AM wojdakon







■ Extent of Excavation

— Approximate East Bank of Montreal River

## Parcels By Owner



Prepared For:  
**US EPA Region V**  
Contract No: EP-S5-06-04  
TDD: S05-0001-1207-020  
DCN: 1917-2A-BITO



Prepared By:  
**WESTON SOLUTIONS, INC.**  
600 East Lakeshore Drive  
Suite 200  
Houghton, Michigan 49931

**Figure 4**  
Extent of Excavation  
Ironwood MGP Site  
Ironwood, Gogebic County, Michigan



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**ATTACHMENT B**  
**PHOTOGRAPHIC LOG**

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**Site:** Ironwood MGP Site

**Photograph No.:** 1

**Direction:** Southwest

**Subject:** Construction trailer located on property east of Site

**Date:** 8/31/12

**Photographer:** D. Liebau



**Site:** Ironwood MGP Site

**Photograph No.:** 2

**Direction:** East

**Subject:** Boulders and orange safety fencing along ORV trail at northern boundary of Site to temporarily limit access to Site during construction

**Date:** 8/31/12

**Photographer:** D. Liebau



**Site:** Ironwood MGP Site

**Photograph No.:** 3

**Date:** 8/31/12

**Direction:** North

**Photographer:** D. Liebau

**Subject:** Removal of trees, shrubs, and debris from surface of the Site



**Site:** Ironwood MGP Site

**Photograph No.:** 4

**Date:** 8/31/12

**Direction:** West

**Photographer:** D. Liebau

**Subject:** Removal of trees and shrubs along northern Site boundary



**Site:** Ironwood MGP Site

**Photograph No.:** 5

**Date:** 9/1/12

**Direction:** East

**Photographer:** D. Liebau

**Subject:** Wood chipping of trees and shrubs requiring removal and transport to City of Ironwood's compost yard



**Site:** Ironwood MGP Site

**Photograph No.:** 6

**Date:** 8/31/12

**Direction:** South

**Photographer:** D. Liebau

**Subject:** Soil hauled in by City of Ironwood for use as backfill; pink flagging in foreground demarcates air monitoring equipment (DataRAM No. 2) deployed in northeast corner of Site





**Site:** Ironwood MGP Site

**Photograph No.:** 7

**Direction:** South

**Date:** 8/31/12

**Photographer:** D. Liebau

**Subject:** City of Ironwood road and sewer construction project on Hemlock and Ayer Streets; haul road located near center of photograph; sandbags ready for use along river located near red pickup truck



**Site:** Ironwood MGP Site

**Photograph No.:** 8

**Direction:** East

**Date:** 8/31/12

**Photographer:** D. Liebau

**Subject:** City of Ironwood delivering gravel for haul road construction



**Site:** Ironwood MGP Site

**Photograph No.:** 9

**Date:** 9/1/12

**Direction:** North

**Photographer:** D. Liebau

**Subject:** Montreal River before excavation activities; fallen trees and branches removed from river as a preventative measure for springtime flooding



**Site:** Ironwood MGP Site

**Photograph No.:** 10

**Date:** 9/1/12

**Direction:** East

**Photographer:** D. Liebau

**Subject:** Watering for dust control; water obtained from City of Ironwood's municipal water supply





**Site:** Ironwood MGP Site

**Photograph No.:** 11

**Direction:** South

**Subject:** Completed haul road exiting Site to the south

**Date:** 8/31/12

**Photographer:** D. Liebau



**Site:** Ironwood MGP Site

**Photograph No.:** 12

**Direction:** Southwest

**Subject:** Air monitoring station (DataRAM No. 3) just beyond southwest corner of Site

**Date:** 8/31/12

**Photographer:** D. Liebau



**Site:** Ironwood MGP Site

**Photograph No.:** 13

**Direction:** North

**Date:** 9/5/12

**Photographer:** D. Liebau

**Subject:** Precautionary placement of sand bags and oil absorbent booms along Montreal River before excavation begins



**Site:** Ironwood MGP Site

**Photograph No.:** 14

**Direction:** West

**Date:** 9/5/12

**Photographer:** D. Liebau

**Subject:** Free product appearing as oily puddle and staining in excavation near Montreal River



**Site:** Ironwood MGP Site

**Photograph No.:** 15

**Direction:** East

**Subject:** Excavation beginning at western Site boundary along Montreal River and progressing east

**Date:** 9/5/12

**Photographer:** D. Liebau



**Site:** Ironwood MGP Site

**Photograph No.:** 16

**Direction:** Southwest

**Subject:** Loading of contaminated soil for transport to K&D Landfill in Ontonagon, Michigan

**Date:** 9/7/12

**Photographer:** D. Liebau





**Site:** Ironwood MGP Site

**Photograph No.:** 17

**Direction:** West

**Date:** 9/6/12

**Photographer:** D. Liebau

**Subject:** One of three vats of coal tar and process waste unearthed during excavation of building foundations in eastern portion of Site



**Site:** Ironwood MGP Site

**Photograph No.:** 18

**Direction:** Northeast

**Date:** 9/6/12

**Photographer:** D. Liebau

**Subject:** Vat of coal tar and process residuals unearthed during excavation of building foundations in eastern portion of Site



**Site:** Ironwood MGP Site

**Photograph No.:** 19

**Direction:** South

**Date:** 9/10/12

**Photographer:** C. Tufts

**Subject:** Excavation beginning at western Site boundary along Montreal River and progressing east



**Site:** Ironwood MGP Site

**Photograph No.:** 20

**Direction:** North

**Date:** 9/10/12

**Photographer:** C. Tufts

**Subject:** Precautionary oil absorbent booms along bank of Montreal River as excavation progressed; coconut coir logs and geotextile fabric added to ensure slope stability and control runoff





**Site:** Ironwood MGP Site

**Photograph No.:** 21

**Direction:** East

**Subject:** Coal tar and stained soil in excavation sidewall

**Date:** 9/10/12

**Photographer:** C. Tufts



**Site:** Ironwood MGP Site

**Photograph No.:** 22

**Direction:** South

**Subject:** MGP residuals and stained soil in excavation; liquids encountered in excavation solidified with dry contaminated soil; very little groundwater encountered during excavation

**Date:** 9/11/12

**Photographer:** C. Tufts





**Site:** Ironwood MGP Site

**Photograph No.:** 23

**Date:** 9/11/12

**Direction:** Southwest

**Photographer:** C. Tufts

**Subject:** MGP residuals in and around clay tile pipe oriented west toward Montreal River



**Site:** Ironwood MGP Site

**Photograph No.:** 24

**Date:** 9/12/12

**Direction:** South

**Photographer:** C. Tufts

**Subject:** Buried MGP residuals and stained soil in excavation sidewall



**Site:** Ironwood MGP Site

**Photograph No.:** 25

**Direction:** North

**Subject:** Backfilled excavation along Montreal River, with geotextile fabric placement to minimize erosion

**Date:** 9/15/12

**Photographer:** C. Tufts



**Site:** Ironwood MGP Site

**Photograph No.:** 26

**Direction:** Southwest

**Subject:** Coal tar and process waste in buried tar wells stabilized using Portland cement, excavated, and staged for disposal with excavated contaminated soil

**Date:** 9/17/12

**Photographer:** D. Liebau



**Site:** Ironwood MGP Site

**Photograph No.:** 27

**Direction:** West

**Date:** 9/17/12

**Photographer:** D. Liebau

**Subject:** Two tar wells containing coal tar and process waste after contents had been excavated



**Site:** Ironwood MGP Site

**Photograph No.:** 28

**Direction:** Southwest

**Date:** 9/27/12

**Photographer:** D. Liebau

**Subject:** Excavation along western-most gasometer well foundation; soil stockpile and truck loading operations visible in background





**Site:** Ironwood MGP Site

**Photograph No.:** 29

**Direction:** South

**Subject:** Excavation around western gasometer tank foundation

**Date:** 10/2/12

**Photographer:** D. Liebau



**Site:** Ironwood MGP Site

**Photograph No.:** 30

**Direction:** Down

**Subject:** Voids in western gasometer well foundation after removal of MGP residuals

**Date:** 10/6/12

**Photographer:** C. Tufts



**Site:** Ironwood MGP Site

**Photograph No.:** 31

**Direction:** South

**Subject:** Excavation along eastern building foundation in former Site operating area

**Date:** 10/4/12

**Photographer:** C. Tufts



**Site:** Ironwood MGP Site

**Photograph No.:** 32

**Direction:** West

**Subject:** Stained concrete removal from gasometer pads before sealant application

**Date:** 10/06/12

**Photographer:** C. Tufts





**Site:** Ironwood MGP Site

**Photograph No.:** 33

**Date:** 10/11/12

**Direction:** North

**Photographer:** D. Liebau

**Subject:** Placement and grading of backfill along ORV access trail



**Site:** Ironwood MGP Site

**Photograph No.:** 34

**Date:** 10/12/12

**Direction:** Northeast

**Photographer:** D. Liebau

**Subject:** Steam cleaning and power-washing of exposed gasometer well foundation surface





**Site:** Ironwood MGP Site

**Photograph No.:** 35

**Date:** 10/22/12

**Direction:** Northwest

**Photographer:** D. Liebau

**Subject:** Application of sealant on eastern gasometer well foundation surface



**Site:** Ironwood MGP Site

**Photograph No.:** 36

**Date:** 10/23/12

**Direction:** North

**Photographer:** D. Liebau

**Subject:** Graded ORV access trail with boulders along eastern edge of excavation area. Restoration plans were coordinated with the City of Ironwood.



**Site:** Ironwood MGP Site

**Photograph No.:** 37

**Direction:** Northwest

**Subject:** Boulders along southern Site boundary to limit vehicular access to the Site

**Date:** 10/23/12

**Photographer:** D. Liebau



**Site:** Ironwood MGP Site

**Photograph No.:** 38

**Direction:** Southeast

**Subject:** At the end of the construction season, Site rough-graded to promote positive drainage; soil erosion and sedimentation controls installed to ensure that backfill was stabilized during spring runoff

**Date:** 10/23/12

**Photographer:** D. Liebau



**Site:** Ironwood MGP Site

**Photograph No.:** 39

**Date:** 5/8/13

**Direction:** Northwest

**Photographer:** D. Liebau

**Subject:** Site upon completion of work in Fall 2012; Site rough-graded to promote positive drainage; ditch line below temporary fencing allowed drainage of runoff across the Site



**Site:** Ironwood MGP Site

**Photograph No.:** 40

**Date:** 5/8/13

**Direction:** Southeast

**Photographer:** D. Liebau

**Subject:** Water in Montreal River rose nearly 5 feet during spring runoff; shoreline and erosion controls remained intact during annual flooding event





**Site:** Ironwood MGP Site

**Photograph No.:** 41

**Date:** 6/12/13

**Direction:** North

**Photographer:** D. Liebau

**Subject:** Final shaping and grading of shoreline of Montreal River



**Site:** Ironwood MGP Site

**Photograph No.:** 42

**Date:** 6/12/13

**Direction:** Southeast

**Photographer:** D. Liebau

**Subject:** Site restoration activities, including grading and installation of Monitoring Well 5 performed concurrently



**Site:** Ironwood MGP Site

**Photograph No.:** 43

**Date:** 6/12/13

**Direction:** East-southeast

**Photographer:** D. Liebau

**Subject:** After final grading, topsoil placed over imported backfill to provide organic base for seed cultivation



**Site:** Ironwood MGP Site

**Photograph No.:** 44

**Date:** 6/14/13

**Direction:** South-southeast

**Photographer:** D. Liebau

**Subject:** Eastern shoreline of Montreal River after restoration activities





**Site:** Ironwood MGP Site

**Photograph No.:** 45

**Direction:** South

**Subject:** Eastern limits of Site after restoration activities

**Date:** 6/14/13

**Photographer:** D. Liebau



**Site:** Ironwood MGP Site

**Photograph No.:** 46

**Direction:** West

**Subject:** Low-flow groundwater sampling at Monitoring Well 4

**Date:** 7/16/13

**Photographer:** D. Liebau



**Site:** Ironwood MGP Site

**Photograph No.:** 47

**Date:** 7/16/13

**Direction:** East

**Photographer:** D. Liebau

**Subject:** Restored excavated area of Site approximately 1 month after restoration work completed



**Site:** Ironwood MGP Site

**Photograph No.:** 48

**Date:** 7/16/13

**Direction:** South

**Photographer:** D. Liebau

**Subject:** Shoreline of Montreal River 1 month after restoration activities completed





**Site:** Ironwood MGP Site

**Photograph No.:** 49

**Direction:** Northwest

**Subject:** Permanent monument in southeast corner of Site mounted on granite boulder

**Date:** 9/27/13

**Photographer:** W. Haynes



**Site:** Ironwood MGP Site

**Photograph No.:** 50

**Direction:** Northwest and down

**Subject:** Permanent monument in southeast corner of the Site; text provides brief history of operations and cleanup at the Site and defines restricted areas of the property

**Date:** 9/27/13

**Photographer:** W. Haynes

---

**ATTACHMENT C**  
**POLREPs**

---



U.S. ENVIRONMENTAL PROTECTION AGENCY  
 POLLUTION/SITUATION REPORT  
 Ironwood Manufactured Gas Plant Site - Removal Polrep  
 Initial Removal Polrep



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**  
**Region V**

**Subject:** POLREP #1  
 Initial  
 Ironwood Manufactured Gas Plant Site  
 B5ZC  
 Ironwood, MI  
 Latitude: 46.4516240 Longitude: -90.1780130

**To:**  
**From:** Kathy Halbur & Jacob Hassan, OSC  
**Date:** 8/28/2012  
**Reporting Period:** 8/20/12 - 8/27/12

## 1. Introduction

### 1.1 Background

<b>Site Number:</b>	B5ZC	<b>Contract Number:</b>	EP-S5-08-04
<b>D.O. Number:</b>	0051	<b>Action Memo Date:</b>	8/9/2012
<b>Response Authority:</b>	CERCLA	<b>Response Type:</b>	Time-Critical
<b>Response Lead:</b>	EPA	<b>Incident Category:</b>	Removal Action
<b>NPL Status:</b>	Non NPL	<b>Operable Unit:</b>	
<b>Mobilization Date:</b>	8/20/2012	<b>Start Date:</b>	8/22/2012
<b>Demob Date:</b>		<b>Completion Date:</b>	
<b>CERCLIS ID:</b>	MIN000510500	<b>RCRIS ID:</b>	
<b>ERNS No.:</b>		<b>State Notification:</b>	
<b>FPN#:</b>		<b>Reimbursable Account #:</b>	

#### 1.1.1 Incident Category

Time-Critical

#### 1.1.2 Site Description

The Ironwood Manufactured Gas Plant (MGP) Site is the location of a former coal gasification plant. Reportedly, the plant was constructed in 1911 and operated using a carbureted water gas (CWG) process. A review of Sanborn maps indicates that the processes at the Site were consistent with typical CWG processes for the era. These processes generally included a first step in which coke or coal was heated in a closed vessel or retort into which steam was injected. A flammable gas mixture of methane and carbon monoxide was produced. In some cases petroleum products may have been applied to the heated mixture increasing the flammability of the resultant gas mixture. During these processes, a dense, oily liquid known as coal tar would condense out of the gas at various stages during its production, purification and distribution, and the coal tar would need to be either recycled in the process, sold, or otherwise disposed of.

The plant continued operations and distribution of manufactured gas until the late 1950's when natural gas pipelines and service became more readily available in the area. By 1956 the plant was for sale and based on accounts of the Wisconsin Public Service Commission, by 1961 had discontinued service to Hurley, including the removal of meters following abandonment.

Interviews conducted by the Michigan Department of Environmental Quality (MDEQ) with local residents indicate that the buildings at the Site were removed prior to the gasometers (gas storage tanks). Based on the historical accounts, the surface structures at the Site were demolished and removed during the 1970's and the 1980's. Following removal of the surface structures, the Site was reportedly used by the City of Ironwood for the storage of inoperable equipment

and debris.

#### **1.1.2.1 Location**

The Site does not have a physical address but is located on the northwest corner of Hemlock Street and West Ayer Street in Ironwood, Gogebic County, Michigan

#### **1.1.2.2 Description of Threat**

The Site contains MGP waste material, such as coal tar and other process waste, that are the source of hazardous substances that have migrated and are migrating into soil, groundwater, surface water, and sediments of the Montreal River. Contaminants of concern identified in soil, groundwater, surface water, and sediment include volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polyaromatic hydrocarbons (PAHs) and inorganic contaminants.

#### **1.1.3 Preliminary Removal Assessment/Removal Site Inspection Results**

During bridge construction at West Norrie Street in 2010, construction crews identified visually contaminated soils suspected to be from the former Ironwood Manufactured Gas Plant site located approximately 700' upstream. MDEQ developed a Site Inspection Work Plan in 2010 to characterize conditions in the subsurface at the Site as well as in the surface water and sediment in the adjacent Montreal River. The Site Inspection activities performed by the MDEQ were implemented with the intent of evaluating groundwater, surface water, and soil exposure pathways.

The results of the MDEQ's Site Inspection indicated the presence of uncontrolled hazardous substances at the Site. Gross tar and MGP process waste contamination was discovered in the surface and subsurface soil primarily located in the historical operating area of the Site, which contained VOC's, SVOC's, and inorganic contaminant concentrations exceeding the MDEQ Part 201 Residential Direct Contact Criteria (RDCC) and Groundwater Surface-water Interface (GSI). Based on these findings, MDEQ requested assistance from USEPA.

USEPA conducted a site reconnaissance visit on November 19, 2010 to evaluate site conditions and to gather logistical information to assist in the development of a supplement site assessment plan.

A Supplemental Site Assessment was conducted during the week of April 9, 2012. The Supplemental Site Assessment demonstrated that coal tar and other MGP waste remain buried at the Site in a visually discreet layer and that contaminants from this buried waste (volatile and semi-volatile organic compounds and inorganic compounds) are migrating into the groundwater and surface water (Montreal River).

## **2. Current Activities**

### **2.1 Operations Section**

#### **2.1.1 Response Actions to Date**

Activities at the Ironwood Manufactured Gas Plant during this reporting period (8/20/12 - 8/27/12):

- USEPA and its START (Weston) and ERRS (LATA-Kemron & CMD) contractors mobilized to the Site and began preparing the Site for the removal of the coal tar and other MGP process wastes. EPA and START began operations on the Site on August 21, 2012 and ERRS began work on August 22, 2012.
- EPA, START, and ERRS conducted the following activities during this reporting period:
  - established an on-site office trailer (with utilities, porta-potties, etc)
  - conducted a site elevation survey
  - collected background air monitoring samples
  - field screened backfill material provided by the City of Ironwood from nearby water/sewer construction project
  - closed the south Hemlock Street all-terrain vehicle (ATV) trail access point
  - began constructing a haul road
  - began clearing and grubbing vegetation from the excavation area
- On August 23, 2012, USEPA held an open house for the communities of Ironwood, MI and Hurley, WI. The meeting was held at the City of Ironwood's Memorial Building located at 213 S. Marquette St. The event was attended by 15 to 20 residents and representatives from the City of Ironwood, Michigan Department of Environmental Quality, Wisconsin Department of Natural Resources, Western Upper Peninsula Health Department, and the Gogebic County Soil and Erosion Control District. USEPA discussed plans for the clean-up.

#### **2.1.2 Enforcement Activities, Identity of Potentially Responsible Parties (PRPs)**

The City of Ironwood is the former owner and operator of the Ironwood Gas Works and is the only PRP for this Site. The City does not have the ability to conduct the clean-up, but is assisting by contributing in-kind services.

### 2.1.3 Progress Metrics

<i>Waste Stream</i>	<i>Medium</i>	<i>Quantity</i>	<i>Manifest #</i>	<i>Treatment</i>	<i>Disposal</i>

## 2.2 Planning Section

### 2.2.1 Anticipated Activities

USEPA will hold community office hours every Thursday evening from 5pm to 6 pm in the Engineering Room on the second floor of the City of Ironwood's Memorial Building, 213 S. Marquette Street

USEPA will give a presentation on the removal efforts to the Ironwood Rotary Club August 29, 2012.

#### 2.2.1.1 Planned Response Activities

The following activities are planned for the next reporting period:

- Complete construction of the haul road
- Complete Site fencing
- Continue air monitoring efforts
- Continue vegetation removal efforts
- Install coffer dam in Montreal River near the excavation area
- Begin excavation activities
- Haul contaminated material to the landfill
- Collect and temporarily store wastewater/groundwater generated from the excavation activities

#### 2.2.1.2 Next Steps

- Work with the City of Ironwood and the MDEQ to gain approval to discharge groundwater to sanitary system
- Institute dust control measures
- Develop a final grading and restoration plan

### 2.2.2 Issues

The future use of the Site and the adjacent property is still under discussion by the respective property owners, MDEQ, and EPA. Uncertainty related to future use has resulted in access restrictions on the neighboring property (340 W. Ayer Street) and delays in restoration planning.

## 2.3 Logistics Section

The following equipment was used during the reporting period:

- 1 - 1/2 ton pickup truck
- 3 - 3/4 ton pickup trucks
- 2 - excavators
- 1 - Front end loader
- 1 - 12' x 60' office trailer
- 1 - 10' cargo trailer
- 1 - portable satellite unit
- 4 - DataRams with Viper
- 1 - Multi-Rae
- 1 - Summa Canister
- 1 - Gillian Pump

Additional equipment, including a water truck, will be mobilized to the Site during the next reporting period.

## 2.4 Finance Section

No information available at this time.

## 2.5 Other Command Staff

### 2.5.1 Safety Officer



Kathy Halbur, OSC  
Jacob Hassan, OSC

### 3. Participating Entities

#### 3.2 Cooperating Agencies

City of Ironwood  
Gogebic County Soil and Erosion Control District  
Michigan Department of Community Health  
Michigan Department of Environmental Quality  
Western Upper Peninsula Health Department  
Wisconsin Department of Health Services  
Wisconsin Department of Natural Resources

### 4. Personnel On Site

During this reporting period:

U.S. EPA: 4 (Halbur, Hassan, Cooper, Borseth)  
START (Weston): 1  
ERRS (LATA-Kemron & CMC): 8

### 5. Definition of Terms

ATV - All terrain vehicle  
CWG - carburated water gas  
ERRS - Emergency and Rapid Response Services  
GSI - groundwater surface-water interface  
MDEQ - Michigan Department of Environmental Quality  
MDNR - Michigan Department of Natural Resources  
MGP - Manufactured Gas Plant  
OSC - On Scene Coordinator  
PAH - polyaromatic hydrocarbons  
PRP - Potentially Responsible Party  
RDCC - Residential Direct Contact Criteria  
START - Superfund Technical Assessment and Response Team  
SVOC - semivolatile organic compounds  
USCG - United States Coast Guard  
USEPA - United States Environmental Protection Agency  
VOC - volatile organic compounds  
WDNR - Wisconsin Department of Natural Resources  
WUPHD - Western Upper Peninsula Health Department

### 6. Additional sources of information

#### 6.1 Internet location of additional information/report

Please see the following websites for project updates:

[www.epa.gov/region5/cleanup/ironwood](http://www.epa.gov/region5/cleanup/ironwood)  
[www.epaosc.org/ironwoodmgp](http://www.epaosc.org/ironwoodmgp)

#### 6.2 Reporting Schedule

Please see the following websites for project updates:

[www.epa.gov/region5/cleanup/ironwood](http://www.epa.gov/region5/cleanup/ironwood)  
[www.epaosc.org/ironwoodmgp](http://www.epaosc.org/ironwoodmgp)

Progress Polreps will be issued as significant activities occur.

### 7. Situational Reference Materials

R5 Priorities Summary		
This is an Integrated River	Miles of river systems cleaned and/or restored	<1
	Cubic yards of contaminated sediments removed and/or capped	TBD

numbers should overlap.	Gallons of oil/water recovered	0
	Acres of soil/sediment cleaned up in floodplains and riverbanks	2
Stand Alone Assessment	Acres Protected	4
	Number of contaminated residential yards cleaned up	0
	Human Health Exposures Avoided	100
	Number of workers on site	11
Contaminant(s) of Concern		
Contaminant(s) of Concern	Coal tar, VOCs, SVOCs, inorganic materials, PM	



U.S. ENVIRONMENTAL PROTECTION AGENCY  
POLLUTION/SITUATION REPORT  
Ironwood Manufactured Gas Plant Site - Removal Polrep



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
Region V**

**Subject:** POLREP #2  
Progress  
Ironwood Manufactured Gas Plant Site  
B5ZC  
Ironwood, MI  
Latitude: 46.4516240 Longitude: -90.1780130

**To:**  
**From:** Kathy Halbur & Jacob Hassan, OSC  
**Date:** 9/8/2012  
**Reporting Period:** 8/28/12 to 9/7/12

## 1. Introduction

### 1.1 Background

<b>Site Number:</b>	B5ZC	<b>Contract Number:</b>	EP-S5-08-04
<b>D.O. Number:</b>	0051	<b>Action Memo Date:</b>	8/9/2012
<b>Response Authority:</b>	CERCLA	<b>Response Type:</b>	Time-Critical
<b>Response Lead:</b>	EPA	<b>Incident Category:</b>	Removal Action
<b>NPL Status:</b>	Non NPL	<b>Operable Unit:</b>	
<b>Mobilization Date:</b>	8/20/2012	<b>Start Date:</b>	8/22/2012
<b>Demob Date:</b>		<b>Completion Date:</b>	
<b>CERCLIS ID:</b>	MIN000510500	<b>RCRIS ID:</b>	
<b>ERNS No.:</b>		<b>State Notification:</b>	
<b>FPN#:</b>		<b>Reimbursable Account #:</b>	

#### 1.1.1 Incident Category

Time-Critical

#### 1.1.2 Site Description

The Ironwood Manufactured Gas Plant (MGP) Site is the location of a former coal gasification plant. Reportedly, the plant was constructed in 1911 and operated using a carbureted water gas (CWG) process. A review of Sanborn maps indicates that the processes at the Site were consistent with typical CWG processes for the era. These processes generally included a first step in which coke or coal was heated in a closed vessel or retort into which steam was injected. A flammable gas mixture of methane and carbon monoxide was produced. In some cases petroleum products may have been applied to the heated mixture increasing the flammability of the resultant gas mixture. During these processes, a dense, oily liquid known as coal tar would condense out of the gas at various stages during its production, purification and distribution, and the coal tar would need to be either recycled in the process, sold, or otherwise disposed of.

The plant continued operations and distribution of manufactured gas until the late 1950's when natural gas pipelines and service became more readily available in the area. By 1956 the plant was for sale and based on accounts of the Wisconsin Public Service Commission, by 1961 had discontinued service to Hurley, including the removal of meters following abandonment.

Interviews conducted by the Michigan Department of Environmental Quality (MDEQ) with local residents indicate that the buildings at the Site were removed prior to the gasometers (gas storage tanks). Based on the historical accounts, the surface structures at the Site were demolished and removed during the 1970's and the 1980's. Following removal of the surface structures, the Site was reportedly used by the City of Ironwood for the storage of inoperable equipment and debris.

### 1.1.2.1 Location

The Site does not have a physical address but is located on the northwest corner of Hemlock Street and West Ayer Street in Ironwood, Gogebic County, Michigan

### 1.1.2.2 Description of Threat

The Site contains MGP waste material, such as coal tar and other process waste, that are the source of hazardous substances that have migrated and are migrating into soil, groundwater, surface water, and sediments of the Montreal River. Contaminants of concern identified in soil, groundwater, surface water, and sediment include volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polyaromatic hydrocarbons (PAHs) and inorganic contaminants.

### 1.1.3 Preliminary Removal Assessment/Removal Site Inspection Results

During bridge construction at West Norrie Street in 2010, construction crews identified visually contaminated soils suspected to be from the former Ironwood Manufactured Gas Plant site located approximately 700' upstream. MDEQ developed a Site Inspection Work Plan in 2010 to characterize conditions in the subsurface at the Site as well as in the surface water and sediment in the adjacent Montreal River. The Site Inspection activities performed by the MDEQ were implemented with the intent of evaluating groundwater, surface water, and soil exposure pathways.

The results of the MDEQ's Site Inspection indicated the presence of uncontrolled hazardous substances at the Site. Gross tar and MGP process waste contamination was discovered in the surface and subsurface soil primarily located in the historical operating area of the Site, which contained VOC's, SVOC's, and inorganic contaminant concentrations exceeding the MDEQ Part 201 Residential Direct Contact Criteria (RDCC) and Groundwater Surface-water Interface (GSI). Based on these findings, MDEQ requested assistance from USEPA.

USEPA conducted a site reconnaissance visit on November 19, 2010 to evaluate site conditions and to gather logistical information to assist in the development of a supplement site assessment plan.

A Supplemental Site Assessment was conducted during the week of April 9, 2012. The Supplemental Site Assessment demonstrated that coal tar and other MGP waste remain buried at the Site in a visually discreet layer and that contaminants from this buried waste (volatile and semi-volatile organic compounds and inorganic compounds) are migrating into the groundwater and surface water (Montreal River).

## 2. Current Activities

### 2.1 Operations Section

#### 2.1.1 Response Actions to Date

See Initial Polrep for details regarding activities during previous reporting periods.

Significant Site Activities for this reporting period:

- On August 30th, 2012, EPA and START began field screening suspected contaminated soil generated from the City of Ironwood's road construction project immediately adjacent to the site. The soil piles had a slight odor to them, however, they had no visual contamination and the average PID head space samples were below the threshold established in the Soil Screening and Post Excavation plan for the site. This material will be used on site as backfill or a solidifying agent for the disposal of coal tar material found during the excavation.
- On September 4th, 2012, Excavation activities began on the northwest corner of the site near the Montreal River. Absorbent boom was deployed along the shoreline of the excavation area and downstream as a protective measure in the event of an accidental release of waste material to the river. Excavation activities focused on removing the visual coal tar material found at the surface and removing any underlying coal tar material and distribution/drainage pipes found in the area. In the excavation area, two 6" clay pipes were uncovered that contained a significant amount coal tar material. In total, the coal tar was found at depths ranging from 5 to 10'.
- On September 5th, 2012, excavation activities continued in the northwest corner of the site. The contaminated coal tar soil is about 5 feet below ground surface (bgs) and extends to about 10 feet bgs. EPA attended the City of Ironwood's planning commission meeting to discuss potential restoration plans. The City will provide EPA with comments on the post-removal surface restoration plan by September 21.
- On September 6th, 2012, trucking and disposal operations commenced. An estimated 100 tons of contaminated coal tar soil was transported to the K&W landfill in Ontonagan, MI for disposal. Excavation activities moved to the northeast corner of the site near the location of the MGP processing building. Crews were able to identify the foundation of the building and determined that there is little soil contamination north of the MGP processing building foundation. While removing the building's foundation, crews uncovered a 2,000 gallon vat of coal tar residuals underneath the building. Samples of the coal tar material were taken and sent to a laboratory for analysis.



### 2.1.2 Enforcement Activities, Identity of Potentially Responsible Parties (PRPs)

The City of Ironwood is the former owner and operator of the Ironwood Gas Works and is the only PRP for this Site. The City does not have the ability to conduct the clean-up, but is assisting by contributing in-kind services.

### 2.1.3 Progress Metrics

<i>Waste Stream</i>	<i>Medium</i>	<i>Quantity</i>	<i>Manifest #</i>	<i>Treatment</i>	<i>Disposal</i>
Coal Tar Soil	Soil	300 tons	T75386 T75387 T75388 T75389 T75390 T75391	Landfill	K&W Landfill, Ontonagon, MI

## 2.2 Planning Section

### 2.2.1 Anticipated Activities

USEPA will hold community office hours every Thursday evening from 5pm to 6 pm in the Engineering Room on the second floor of the City of Ironwood's Memorial Building, 213 S. Marquette Street

#### 2.2.1.1 Planned Response Activities & Next Steps

The following activities are planned for the next reporting period:

- Continue air monitoring efforts and dust control measures
- Continue vegetation removal efforts
- Continue community office hours
- Continue to evaluate discovered coal tar vat
- Continue excavation activities and finalize Site excavation plan
- Continue to haul contaminated material to the landfill
- Collect and temporarily store wasted/groundwater generated from the excavation activities
- Finalize final grading and restoration plan

### 2.2.2 Issues

The future use of the Site and the adjacent property is still under discussion by the respective property owners, MDEQ, and EPA. Uncertainty related to future use has resulted in access restrictions on the neighboring property (340 W. Ayer Street) and delays in restoration planning. EPA and MDEQ met with impacted property owners and attended the City's Planning Commission meeting this reporting period to facilitate resolution of this issue.

The City streets adjacent to the Site (Hemlock & Ayer Streets) are still under construction as part of the City's sewer and water line replacement project. The condition of these roads and the material used for the on-site haul road (local mine rock provided by the City) resulted in a tracking problem on neighborhood streets. Attempts made by the EPA and City to address the tracking problem resulted in an unanticipated sediment release to the Montreal River. The on-site haul roads are being re-engineered and the City streets are scheduled to be paved during the next reporting period to address the tracking issue.

## 2.3 Logistics Section

The following equipment was used during the reporting period:

- 1 - 1/2 ton pickup truck
- 3 - 3/4 ton pickup trucks
- 2 - excavators
- 1 - front end loader
- 1 - bull dozer
- 1 - wood chipper
- 1 - water truck (dust control)
- 1 - 21,000 gallon frac tank
- 1 - 12' x 60' office trailer
- 1 - 10' cargo trailer
- 1 - portable satellite unit
- 4 - DataRams with Viper
- 1 - Multi-Rae
- 1 - Summa Canister
- 1 - Gillian Pump

No additional equipment is anticipated at this time.

## **2.4 Finance Section**

No information available at this time.

## **2.5 Other Command Staff**

### **2.5.1 Safety Officer**

Kathy Halbur, OSC  
Jacob Hassan, OSC

## **3. Participating Entities**

### **3.2 Cooperating Agencies**

City of Ironwood  
Gogebic County Soil and Erosion Control District  
Michigan Department of Community Health  
Michigan Department of Environmental Quality  
Western Upper Peninsula Health Department  
Wisconsin Department of Health Services  
Wisconsin Department of Natural Resources

## **4. Personnel On Site**

During this reporting period:

U.S. EPA: 2 (Halbur, Hassan)  
START (Weston): 2  
ERRS (LATA-Kemron & CMC): 8

## **5. Definition of Terms**

ATV - All terrain vehicle  
BGS - Below Ground Surface  
CWG - carburated water gas  
ERRS - Emergency and Rapid Response Services  
GSI - groundwater surface-water interface  
MDEQ - Michigan Department of Environmental Quality  
MDNR - Michigan Department of Natural Resources  
MGP - Manufactured Gas Plant  
OSC - On Scene Coordinator  
PAH - polyaromatic hydrocarbons  
PRP - Potentially Responsible Party  
RDCC - Residential Direct Contact Criteria  
START - Superfund Technical Assessment and Response Team  
SVOC - semivolatile organic compounds  
USCG - United States Coast Guard  
USEPA - United States Environmental Protection Agency  
VOC - volatile organic compounds  
WDNR - Wisconsin Department of Natural Resources  
WUPHD - Western Upper Peninsula Health Department

## **6. Additional sources of information**

### **6.1 Internet location of additional information/report**

Please see the following websites for project updates:

[www.epa.gov/region5/cleanup/ironwood](http://www.epa.gov/region5/cleanup/ironwood)  
[www.epaosc.org/ironwoodmgp](http://www.epaosc.org/ironwoodmgp)

### **6.2 Reporting Schedule**

Please see the following websites for project updates:

[www.epa.gov/region5/cleanup/ironwood](http://www.epa.gov/region5/cleanup/ironwood)  
[www.epaosc.org/ironwoodmgp](http://www.epaosc.org/ironwoodmgp)

Progress Polreps will be issued as significant activities occur.

## 7. Situational Reference Materials

R5 Priorities Summary		
This is an Integrated River Assessment. The numbers should overlap.	Miles of river systems cleaned and/or restored	<1
	Cubic yards of contaminated sediments removed and/or capped	TBD
	Gallons of oil/water recovered	0
	Acres of soil/sediment cleaned up in floodplains and riverbanks	2
Stand Alone Assessment	Acres Protected	4
	Number of contaminated residential yards cleaned up	0
	Human Health Exposures Avoided	100
	Number of workers on site	11
Contaminant(s) of Concern		
Contaminant(s) of Concern	Coal tar, VOCs, SVOCs, inorganic materials, PM	



U.S. ENVIRONMENTAL PROTECTION AGENCY  
POLLUTION/SITUATION REPORT  
Ironwood Manufactured Gas Plant Site - Removal Polrep



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
Region V**

**Subject:** POLREP #3  
Progress  
Ironwood Manufactured Gas Plant Site  
B5ZC  
Ironwood, MI  
Latitude: 46.4516240 Longitude: -90.1780130

**To:**  
**From:** Kathy Halbur & Jacob Hassan, OSC  
**Date:** 9/20/2012  
**Reporting Period:** 9/10/2012-9/2012

## 1. Introduction

### 1.1 Background

<b>Site Number:</b>	B5ZC	<b>Contract Number:</b>	EP-S5-08-04
<b>D.O. Number:</b>	0051	<b>Action Memo Date:</b>	8/9/2012
<b>Response Authority:</b>	CERCLA	<b>Response Type:</b>	Time-Critical
<b>Response Lead:</b>	EPA	<b>Incident Category:</b>	Removal Action
<b>NPL Status:</b>	Non NPL	<b>Operable Unit:</b>	
<b>Mobilization Date:</b>	8/20/2012	<b>Start Date:</b>	8/22/2012
<b>Demob Date:</b>		<b>Completion Date:</b>	
<b>CERCLIS ID:</b>	MIN000510500	<b>RCRIS ID:</b>	
<b>ERNS No.:</b>		<b>State Notification:</b>	
<b>FPN#:</b>		<b>Reimbursable Account #:</b>	

#### 1.1.1 Incident Category

Time-Critical

#### 1.1.2 Site Description

The Ironwood Manufactured Gas Plant (MGP) Site is the location of a former coal gasification plant. Reportedly, the plant was constructed in 1911 and operated using a carbureted water gas (CWG) process. A review of Sanborn maps indicates that the processes at the Site were consistent with typical CWG processes for the era. These processes generally included a first step in which coke or coal was heated in a closed vessel or retort into which steam was injected. A flammable gas mixture of methane and carbon monoxide was produced. In some cases petroleum products may have been applied to the heated mixture increasing the flammability of the resultant gas mixture. During these processes, a dense, oily liquid known as coal tar would condense out of the gas at various stages during its production, purification and distribution, and the coal tar would need to be either recycled in the process, sold, or otherwise disposed of.

The plant continued operations and distribution of manufactured gas until the late 1950's when natural gas pipelines and service became more readily available in the area. By 1956 the plant was for sale and based on accounts of the Wisconsin Public Service Commission, by 1961 had discontinued service to Hurley, including the removal of meters following abandonment.

Interviews conducted by the Michigan Department of Environmental Quality (MDEQ) with local residents indicate that the buildings at the Site were removed prior to the gasometers (gas storage tanks). Based on the historical accounts, the surface structures at the Site were demolished and removed during the 1970's and the 1980's. Following removal of the surface structures, the Site was reportedly used by the City of Ironwood for the storage of inoperable equipment and debris.

### 1.1.2.1 Location

The Site does not have a physical address but is located on the northwest corner of Hemlock Street and West Ayer Street in Ironwood, Gogebic County, Michigan

### 1.1.2.2 Description of Threat

The Site contains MGP waste material, such as coal tar and other process waste, that are the source of hazardous substances that have migrated and are migrating into soil, groundwater, surface water, and sediments of the Montreal River. Contaminants of concern identified in soil, groundwater, surface water, and sediment include volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polyaromatic hydrocarbons (PAHs) and inorganic contaminants.

### 1.1.3 Preliminary Removal Assessment/Removal Site Inspection Results

During bridge construction at West Norrie Street in 2010, construction crews identified visually contaminated soils suspected to be from the former Ironwood Manufactured Gas Plant site located approximately 700' upstream. MDEQ developed a Site Inspection Work Plan in 2010 to characterize conditions in the subsurface at the Site as well as in the surface water and sediment in the adjacent Montreal River. The Site Inspection activities performed by the MDEQ were implemented with the intent of evaluating groundwater, surface water, and soil exposure pathways.

The results of the MDEQ's Site Inspection indicated the presence of uncontrolled hazardous substances at the Site. Gross tar and MGP process waste contamination was discovered in the surface and subsurface soil primarily located in the historical operating area of the Site, which contained VOC's, SVOC's, and inorganic contaminant concentrations exceeding the MDEQ Part 201 Residential Direct Contact Criteria (RDCC) and Groundwater Surface-water Interface (GSI). Based on these findings, MDEQ requested assistance from USEPA.

USEPA conducted a site reconnaissance visit on November 19, 2010 to evaluate site conditions and to gather logistical information to assist in the development of a supplement site assessment plan.

A Supplemental Site Assessment was conducted during the week of April 9, 2012. The Supplemental Site Assessment demonstrated that coal tar and other MGP waste remain buried at the Site in a visually discreet layer and that contaminants from this buried waste (volatile and semi-volatile organic compounds and inorganic compounds) are migrating into the groundwater and surface water (Montreal River).

## 2. Current Activities

### 2.1 Operations Section

#### 2.1.1 Response Actions to Date

See Previous Polreps for details regarding activities during previous reporting periods.

Significant Site Activities for this reporting period (9/10/12 - 9/20/12):

- Completed vegetation removal and chipping
- Completed excavation of contaminated material along river bank
- Commenced excavation in former process areas and continued backfilling excavated areas
- Discovered two additional buried vats of waste (three identified to date)
- Completed stabilization and removal of material in coal tar vats
- Continued to haul MGP waste to the landfill (7,250 Tons to date)
- Continued air monitoring efforts and dust control measures
- Continued to work with the City of Ironwood on Restoration Plan
- Continued community office hours

#### 2.1.2 Enforcement Activities, Identity of Potentially Responsible Parties (PRPs)

The City of Ironwood is the former owner and operator of the Ironwood Gas Works and is the only PRP for this Site. The City does not have the ability to conduct the clean-up, but is assisting by contributing in-kind services.

#### 2.1.3 Progress Metrics

<b>Waste Stream</b>	<b>Medium</b>	<b>Quantity</b>	<b>Manifest #</b>	<b>Treatment</b>	<b>Disposal</b>
Coal Tar Soil	Soil	7,250 tons (145	T75386 - T75531	Landfill	K&W Landfill, Ontonagon, MI

		loads)			
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## 2.2 Planning Section

### 2.2.1 Anticipated Activities

USEPA will hold community office hours every Thursday evening from 5pm to 6 pm in the Engineering Room on the second floor of the City of Ironwood's Memorial Building, 213 S. Marquette Street

#### 2.2.1.1 Planned Response Activities & Next Steps

The following activities are planned for the next reporting period:

- Continue excavation of contaminated material and backfilling
- Continue to transport and dispose of MGP waste
- Relocate the on-site haul road
- Continue air monitoring efforts and dust control measures
- Finalize the Site Restoration Plan
- Begin Site restoration (grading of excavated areas)
- Continue community office hours

Site activities will be shut down from September 21-25, 2012 to allow the City to pave Ayer and Hemlock Streets and to provide the crew a short break. Security will be on-site around the clock while operations are shut down.

### 2.2.2 Issues

The City streets adjacent to the Site (Hemlock & Ayer Streets) are still under construction as part of the City's sewer and water line replacement project. Paving is scheduled during the Site shut down period. If paving does not occur as scheduled, delays associated with transportation and disposal, as well as additional cost will be realized.

Inclement weather has resulted in some down time.

## 2.3 Logistics Section

The following equipment was used during the reporting period:

- 1 - 1/2 ton pickup truck
- 3 - 3/4 ton pickup trucks
- 2 - excavators (including HoRam attachment)
- 1 - front end loader
- 1 - bull dozer
- 1 - wood chipper
- 1 - water truck (dust control)
- 1 - skid steer with broom attachment (street sweeper)
- 1 - 21,000 gallon frac tank
- 1 - 12' x 60' office trailer
- 1 - 10' cargo trailer
- 1 - portable satellite unit
- 4 - DataRams with Viper
- 1 - Multi-Rae

The chipper was demobilized during this reporting period. The frac tank will be demobilized during the next reporting period (river bank excavation completed and no groundwater recharging occurring).

## 2.4 Finance Section

No information available at this time.

## 2.5 Other Command Staff

### 2.5.1 Safety Officer

Kathy Halbur, OSC  
Jacob Hassan, OSC

## 3. Participating Entities

### 3.2 Cooperating Agencies

City of Ironwood



Gogebic County Soil and Erosion Control District  
 Michigan Department of Community Health  
 Michigan Department of Environmental Quality  
 Western Upper Peninsula Health Department  
 Wisconsin Department of Health Services  
 Wisconsin Department of Natural Resources

#### 4. Personnel On Site

During this reporting period:

U.S. EPA: 2 (Halbur, Hassan)  
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Progress Polreps will be issued as significant activities occur.

#### 7. Situational Reference Materials

R5 Priorities Summary		
This is an Integrated River Assessment. The numbers should overlap.	Miles of river systems cleaned and/or restored	<1
	Cubic yards of contaminated sediments removed and/or capped	150
	Gallons of oil/water recovered	0
	Acres of soil/sediment cleaned up in floodplains and riverbanks	2

Stand Alone Assessment	Acres Protected	4
	Number of contaminated residential yards cleaned up	0
	Human Health Exposures Avoided	100
	Number of workers on site	11
Contaminant(s) of Concern		
Contaminant(s) of Concern	Coal tar, VOCs, SVOCs, inorganic materials, PM	

U.S. ENVIRONMENTAL PROTECTION AGENCY  
POLLUTION/SITUATION REPORT  
Ironwood Manufactured Gas Plant Site - Removal Polrep



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
Region V**

**Subject:** POLREP #4  
Progress  
Ironwood Manufactured Gas Plant Site  
B5ZC  
Ironwood, MI  
Latitude: 46.4516240 Longitude: -90.1780130

**To:**  
**From:** Kathy Halbur & Jacob Hassan, OSC  
**Date:** 10/25/2012  
**Reporting Period:** 9/21/12 - 10/25/12

## 1. Introduction

### 1.1 Background

<b>Site Number:</b>	B5ZC	<b>Contract Number:</b>	EP-S5-08-04
<b>D.O. Number:</b>	0051	<b>Action Memo Date:</b>	8/9/2012
<b>Response Authority:</b>	CERCLA	<b>Response Type:</b>	Time-Critical
<b>Response Lead:</b>	EPA	<b>Incident Category:</b>	Removal Action
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#### 1.1.1 Incident Category

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##### 1.1.2.1 Location



The Site does not have a physical address but is located on the northwest corner of Hemlock Street and West Ayer Street in Ironwood, Gogebic County, Michigan.

#### 1.1.2.2 Description of Threat

The Site contained MGP waste material, such as coal tar and other process waste, that were the source of hazardous substances that migrated into soil, groundwater, surface water, and sediments of the Montreal River. Contaminants of concern identified in soil, groundwater, surface water, and sediment include volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polycyclicaromatic hydrocarbons (PAHs) and inorganic contaminants.

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A Supplemental Site Assessment was conducted during the week of April 9, 2012. The Supplemental Site Assessment demonstrated that coal tar and other MGP waste remain buried at the Site in a visually discreet layer and that contaminants from this buried waste (volatile and semi-volatile organic compounds and inorganic compounds) are migrating into the groundwater and surface water (Montreal River).

## 2. Current Activities

### 2.1 Operations Section

#### 2.1.1 Response Actions to Date

See Previous Polreps for details regarding activities during previous reporting periods.

Significant Site Activities for this reporting period (9/21/12 – 10/25/12):

- Completed excavation of contaminated soil and MGP waste buried at the Site
- Completed hauling of contaminated soil and MGP waste (15,190 Tons) to landfill for disposal
- Completed extent of contamination trenching and clearance sampling along the perimeter of the site
- Finalized restoration plan with the City of Ironwood
- Identified source for clean backfill and topsoil
- Completed backfilling activities
- Completed grading survey and staking for final grading elevations
- Commenced final grading
- Completed cleaning and sealing of gasometer foundations
- Removed sandbags and absorbent boom from the Montreal River
- Completed riprap placement along the shoreline of the Montreal River
- Installed silt fencing and other erosion control measures (e.g., COIR logs) along the Montreal River
- Completed boulder placement along the ATV access trail and along the southern edge of the Site (access control measure)
- Installed temporary perimeter fencing (additional access control measure)
- Seeded the Site with winter wheat and fescue
- Installed restoration matting along banks
- Planted trees at shoreline and on trail bank
- Completed air monitoring efforts and dust control measures
- Ended community office hours for this mobilization
- De-contaminated equipment for demobilization
- De-mobilized frac tank, skid steer, excavator, and crew (except RM) from the Site

#### 2.1.2 Enforcement Activities, Identity of Potentially Responsible Parties (PRPs)

The City of Ironwood is the former owner and operator of the Ironwood Gas Works and is the only PRP for this Site. The City does not have the ability to conduct the clean-up, but is assisting by contributing in-kind services.

### 2.1.3 Progress Metrics

<i><b>Waste Stream</b></i>	<i><b>Medium</b></i>	<i><b>Quantity</b></i>	<i><b>Manifest #</b></i>	<i><b>Treatment</b></i>	<i><b>Disposal</b></i>
Coal Tar Soil	Soil	15,190 tons (336 loads)	T75384 - T75584 01358131 - 01358265	Landfill	K&W Landfill, Ontonagon, MI

## 2.2 Planning Section

### 2.2.1 Anticipated Activities

Remaining heavy equipment will be demobilized on October 29, 2012. Office trailer will be demobilized as soon as conditions dry up enough to pull the trailer (anticipated to be on October 30, 2012). ERRS RM will complete restoration in the area surrounding the trailer once the trailer is demobilized. The City of Ironwood and ERRS RM will repair the gravel at the entrance to the Site once conditions dry up. Security will remain on site until equipment is demobilized.

USEPA will remobilize to the site to finish final grading and restoration activities in the spring of 2013

#### 2.2.1.1 Planned Response Activities & Next Steps

With the exception of the above noted demobilization and restoration touch-up activities, all removal and restoration efforts are suspended until Spring 2013. The Spring activities will include:

- Repairing any damage to site grade or erosion control devices
- Assessing the need for topsoil and acquiring/placing as needed
- Re-seeding and additional tree planting
- Removing construction fencing once Site is re-vegetated

### 2.2.2 Issues

Inclement weather conditions greatly hampered the final grading and restoration efforts. Site restoration will be finalized in the spring when weather conditions are more suitable for these activities. Extremely wet conditions also delayed demobilization of the office trailer.

## 2.3 Logistics Section

The following equipment was used during the reporting period:

- 1 - 1/2 ton pickup truck
- 3 - 3/4 ton pickup trucks
- 2 - excavators (including Hoe-Ram attachment)
- 1 - front end loader
- 1 - bull dozer
- 1 - water truck (dust control)
- 1 - skid steer with broom attachment (street sweeper)
- 1 - 12' x 60' office trailer
- 1 - 10' cargo trailer
- 1 - portable satellite unit
- 4 - DataRams with Viper
- 1 - Multi-Rae
- 1 - Power washer

An excavator and two operators demobilized from the site on 10/17/12. All other equipment demobilized gradually throughout the week of 10/22/12. A smaller remobilization will occur in the spring of 2013.

## 2.4 Finance Section

No information available at this time.

## 2.5 Other Command Staff

### 2.5.1 Safety Officer

Kathy Halbur, OSC  
Jacob Hassan, OSC

## 3. Participating Entities

### 3.2 Cooperating Agencies

City of Ironwood  
Gogebic County Soil and Erosion Control District  
Michigan Department of Community Health  
Michigan Department of Environmental Quality  
Western Upper Peninsula Health Department  
Wisconsin Department of Health Services  
Wisconsin Department of Natural Resources

## 4. Personnel On Site

During this reporting period:

U.S. EPA: 2 (Halbur, Hassan)  
START (Weston): 3  
ERRS (LATA-Kemron & CMC): 8

## 5. Definition of Terms

ATV - All terrain vehicle  
BGS - Below Ground Surface  
CWG - carburated water gas  
ERRS - Emergency and Rapid Response Services  
GSI - groundwater surface-water interface  
MDEQ - Michigan Department of Environmental Quality  
MDNR - Michigan Department of Natural Resources  
MGP - Manufactured Gas Plant  
OSC - On Scene Coordinator  
PAH - polyaromatic hydrocarbons  
PRP - Potentially Responsible Party  
RDCC - Residential Direct Contact Criteria  
RM - Response Manager  
START - Superfund Technical Assessment and Response Team  
SVOC - semivolatile organic compounds  
USCG - United States Coast Guard  
USEPA - United States Environmental Protection Agency  
VOC - volatile organic compounds  
WDNR - Wisconsin Department of Natural Resources  
WUPHD - Western Upper Peninsula Health Department

## 6. Additional sources of information

### 6.1 Internet location of additional information/report

Please see the following websites for project updates:

[www.epa.gov/region5/cleanup/ironwood](http://www.epa.gov/region5/cleanup/ironwood)  
[www.epaosc.org/ironwoodmgp](http://www.epaosc.org/ironwoodmgp)

### 6.2 Reporting Schedule

Please see the following websites for project updates:

[www.epa.gov/region5/cleanup/ironwood](http://www.epa.gov/region5/cleanup/ironwood)  
[www.epaosc.org/ironwoodmgp](http://www.epaosc.org/ironwoodmgp)

Progress Polreps will be issued as significant activities occur.

## 7. Situational Reference Materials

R5 Priorities Summary		



This is an Integrated River Assessment. The numbers should overlap.	Miles of river systems cleaned and/or restored	<1
	Cubic yards of contaminated sediments removed and/or capped	150
	Gallons of oil/water recovered	0
	Acres of soil/sediment cleaned up in floodplains and riverbanks	2
Stand Alone Assessment	Acres Protected	4
	Number of contaminated residential yards cleaned up	0
	Human Health Exposures Avoided	100
	Number of workers on site	11
Contaminant(s) of Concern		
Contaminant(s) of Concern	Coal tar, VOCs, SVOCs, inorganic materials, PM	

U.S. ENVIRONMENTAL PROTECTION AGENCY  
POLLUTION/SITUATION REPORT  
Ironwood Manufactured Gas Plant Site - Removal Polrep



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
Region V**

**Subject:** POLREP #5  
Progress  
Ironwood Manufactured Gas Plant Site  
B5ZC  
Ironwood, MI  
Latitude: 46.4516240 Longitude: -90.1780130

**To:**  
**From:** Kathy Halbur, OSC  
**Date:** 6/17/2013  
**Reporting Period:** 10/26/12-6/17/13

## 1. Introduction

### 1.1 Background

<b>Site Number:</b>	B5ZC	<b>Contract Number:</b>	EP-S5-08-04
<b>D.O. Number:</b>	0051	<b>Action Memo Date:</b>	8/9/2012
<b>Response Authority:</b>	CERCLA	<b>Response Type:</b>	Time-Critical
<b>Response Lead:</b>	EPA	<b>Incident Category:</b>	Removal Action
<b>NPL Status:</b>	Non NPL	<b>Operable Unit:</b>	
<b>Mobilization Date:</b>	8/20/2012	<b>Start Date:</b>	8/22/2012
<b>Demob Date:</b>	6/14/2013	<b>Completion Date:</b>	
<b>CERCLIS ID:</b>	MIN000510500	<b>RCRIS ID:</b>	
<b>ERNS No.:</b>		<b>State Notification:</b>	
<b>FPN#:</b>		<b>Reimbursable Account #:</b>	

#### 1.1.1 Incident Category

#### 1.1.2 Site Description

The Ironwood Manufactured Gas Plant (MGP) Site is the location of a former coal gasification plant. Reportedly, the plant was constructed in 1911 and operated using a carbureted water gas (CWG) process. A review of Sanborn maps indicates that the processes at the Site were consistent with typical CWG processes for the era. These processes generally included a first step in which coke or coal was heated in a closed vessel or retort into which steam was injected. A flammable gas mixture of methane and carbon monoxide was produced. In some cases petroleum products may have been applied to the heated mixture increasing the flammability of the resultant gas mixture. During these processes, a dense, oily liquid known as coal tar would condense out of the gas at various stages during its production, purification and distribution, and the coal tar would need to be either recycled in the process, sold, or otherwise disposed of.

The plant continued operations and distribution of manufactured gas until the late 1950's when natural gas pipelines and service became more readily available in the area. By 1956 the plant was for sale and based on accounts of the Wisconsin Public Service Commission, by 1961 had discontinued service to Hurley, including the removal of meters following abandonment.

Interviews conducted by the Michigan Department of Environmental Quality (MDEQ) with local residents indicate that the buildings at the Site were removed prior to the gasometers (gas storage tanks). Based on the historical accounts, the surface structures at the Site were demolished and removed during the 1970's and the 1980's. Following removal of the surface structures, the Site was reportedly used by the City of Ironwood for the storage of inoperable equipment and debris.

##### 1.1.2.1 Location

The Site does not have a physical address but is located on the northwest corner of Hemlock Street and West Ayer Street in Ironwood, Gogebic County, Michigan.

#### 1.1.2.2 Description of Threat

The Site contained MGP waste material, such as coal tar and other process waste, that were the source of hazardous substances that migrated into soil, groundwater, surface water, and sediments of the Montreal River. Contaminants of concern identified in soil, groundwater, surface water, and sediment include volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polycyclicaromatic hydrocarbons (PAHs) and inorganic contaminants.

#### 1.1.3 Preliminary Removal Assessment/Removal Site Inspection Results

During bridge construction at West Norrie Street in 2010, construction crews identified visually contaminated soils suspected to be from the former Ironwood Manufactured Gas Plant site located approximately 700' upstream. MDEQ developed a Site Inspection Work Plan in 2010 to characterize conditions in the subsurface at the Site as well as in the surface water and sediment in the adjacent Montreal River. The Site Inspection activities performed by the MDEQ were implemented with the intent of evaluating groundwater, surface water, and soil exposure pathways.

The results of the MDEQ's Site Inspection indicated the presence of uncontrolled hazardous substances at the Site. Gross tar and MGP process waste contamination was discovered in the surface and subsurface soil primarily located in the historical operating area of the Site, which contained VOC's, SVOC's, and inorganic contaminant concentrations exceeding the MDEQ Part 201 Residential Direct Contact Criteria (RDCC) and Groundwater Surface-water Interface (GSI). Based on these findings, MDEQ requested assistance from USEPA.

USEPA conducted a site reconnaissance visit on November 19, 2010 to evaluate site conditions and to gather logistical information to assist in the development of a supplement site assessment plan.

A Supplemental Site Assessment was conducted during the week of April 9, 2012. The Supplemental Site Assessment demonstrated that coal tar and other MGP waste remain buried at the Site in a visually discreet layer and that contaminants from this buried waste (volatile and semi-volatile organic compounds and inorganic compounds) are migrating into the groundwater and surface water (Montreal River).

## 2. Current Activities

### 2.1 Operations Section

#### 2.1.1 Response Actions to Date

The majority of removal activities, including excavation and disposal of the buried MGP waste, were conducted during the initial mobilization, 8/20/12-10/25/12. See previous POLREPS for details.

The Site was dormant over the winter. According to local officials and Site neighbors, Site security measures put in place prior to fall demobilization successfully kept trespassers off the Site. There was significant flooding on the Site in May as a result of a late and rapid snow melt, and spring rains. The erosion control measures (i.e., silt fence, COIR logs, straw restoration matting on the bank) were effective at minimizing soil loss and flood damage to the Site.

USEPA, START, and ERRS remobilized to the Site on June 10, 2013 and completed the following activities over course of the week:

- Installed and developed four on-Site groundwater monitoring wells
- Recovered COIR logs misplaced by flood
- Added boulders and additional riprap to bank of Montreal River
- Completed final grading of the Site, including two drainage swales
- Received and spread topsoil to cover Site
- Seeded Site with fescue blend (per City's requested Restoration Plan) and covered with straw
- Installed restoration matting along bank and drainage swales
- Replaced silt fence
- Planted native trees donated by US Forest Service
- Repaired temporary perimeter fencing
- Conducted perimeter air monitoring and implemented dust control measures
- Conducted part-time overnight security
- Demobilized equipment and personnel from Site

#### 2.1.2 Enforcement Activities, Identity of Potentially Responsible Parties (PRPs)

The City of Ironwood is the former owner and operator of the Ironwood Gas Works and is the only PRP for this Site. The City does not have the ability to conduct the clean-up, but is assisting by contributing in-kind services.



### 2.1.3 Progress Metrics

See previous POLREPS for summary of waste generated during initial mobilization. During this mobilization, only a small amount of IDW (soil and water) was generated during installation of the groundwater monitoring wells. Two drums of coal tar impacted soil was transported to K&W Landfill in Ontonagon, MI for disposal. The water was accepted by the Ironwood POTW.

## 2.2 Planning Section

### 2.2.1 Planned Response Activities & Next Steps

USEPA, START, and ERRS plan to remobilize to the Site in mid-July to assist MDEQ with groundwater sampling and complete Site restoration. If a grassy cover is in place across the Site, the July mobilization will complete the removal action.

### 2.2.2 Issues

The Site experienced significant flooding during this reporting period, as described earlier in this POLREP. There was an attempted break-in of the equipment the first night of the mobilization. The City responded with additional police patrols and EPA initiated part-time overnight security.

## 2.3 Logistics Section

The following equipment was used during the reporting period:

- 2 - pickup trucks
- 1 - bull dozer
- 1 - skid steer
- 1 - water tank (dust control)
- 1 - drill rig
- 3 - DataRams with Viper

CMC driver and delivery equipment stayed on Site due to short mobilization time.

## 2.4 Finance Section

No information available at this time.

## 2.5 Other Command Staff

### 2.5.1 Safety Officer

Kathy Halbur, OSC

## 3. Participating Entities

### 3.2 Cooperating Agencies

City of Ironwood  
 Gogebic County Soil and Erosion Control District  
 Gogebic-Iron Wastewater Plant  
 Michigan Department of Community Health  
 Michigan Department of Environmental Quality  
 Western Upper Peninsula Health Department  
 Wisconsin Department of Health Services  
 Wisconsin Department of Natural Resources

## 4. Personnel On Site

During this reporting period:

USEPA: 1 (Halbur)  
 START (Weston): 1  
 ERRS (LATA-Kemron & CMC): 5

## 5. Definition of Terms

ATV - All terrain vehicle  
 BGS - Below Ground Surface  
 CWG - carburated water gas  
 ERRS - Emergency and Rapid Response Services  
 IDW - Investigation Derived Waste  
 GSI - groundwater surface-water interface  
 MDEQ - Michigan Department of Environmental Quality  
 MDNR - Michigan Department of Natural Resources

MGP - Manufactured Gas Plant  
 OSC - On Scene Coordinator  
 PAH - polyaromatic hydrocarbons  
 POTW - publicly owned wastewater treatment works (local wastewater treatment plant)  
 PRP - Potentially Responsible Party  
 RDCC - Residential Direct Contact Criteria  
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 START - Superfund Technical Assessment and Response Team  
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### 6.2 Reporting Schedule

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## 7. Situational Reference Materials

R5 Priorities Summary		
This is an Integrated River Assessment. The numbers should overlap.	Miles of river systems cleaned and/or restored	<1
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	Number of workers on site	11
Contaminant(s) of Concern		
Contaminant(s) of Concern	Coal tar, VOCs, SVOCs, inorganic materials, PM	

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**ATTACHMENT D**  
**TABLES**

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**Table 1**  
**Background Air Sample Detected Analytical Results**  
**Ironwood MGP Site**  
**Ironwood, Gogebic County, Michigan**

<b>Field Sample ID No.</b>	<b>IWMGP-B-D01-082412</b>
<b>Sampling Date</b>	<b>8/24/2012</b>
<b>Chemical Name</b>	<b>Result (<math>\mu\text{g}/\text{m}^3</math>)</b>
<b>VOCs (TO-15)</b>	
Acetone	7.2
2-Butanone (MEK)	2.2
Chloromethane	0.78
Dichlorodifluoromethane	2.7

Notes:

$\mu\text{g}/\text{m}^3$  = Microgram per cubic meter

ID = Identification

VOC = Volatile organic compound

**Table 2**  
**Perimeter Air Monitoring Particulate Results Exceeding the Action Level**  
**Ironwood MGP Site**  
**Ironwood, Gogebic County, Michigan**

Date	DataRAM Unit No.	DataRAM Location	Particulate Concentration ( $\mu\text{g}/\text{m}^3$ )	Time
8/27/2012	2	Northeast corner	504.6	7:59 a.m.
	4	Southeast corner	539.8	8:36 a.m.
	2	Northeast corner	537.9	9:18 a.m.
	4	Southeast corner	617.4	10:39 a.m.
	4	Southeast corner	554.4	12:00 p.m.
	4	Southeast corner	593.2	1:03 p.m.
	4	Southeast corner	518.3	1:55 p.m.
	4	Southeast corner	609.8	4:34 p.m.
	2	Northeast corner	568.5	5:30 p.m.
8/28/2012	4	Southeast corner	550.0	1:33 p.m.
	2	Northeast corner	532.0	1:56 p.m.
	2	Northeast corner	543.5	5:24 p.m.
8/29/2012	4	Southeast corner	510.6	12:48 p.m.
	4	Southeast corner	598.4	2:00 p.m.
8/30/2012	4	Southeast corner	566.8	9:10 a.m.
	4	Southeast corner	558.6	10:45 a.m.
9/1/2012	2	Northeast corner	561.5	8:57 a.m.
	2	Northeast corner	516.5	11:47 a.m.
9/6/2012	1	Northwest corner	540.5	12:53 p.m.
	1	Northwest corner	791.9	1:51 p.m.
	1	Northwest corner	512.3	3:28 p.m.
	1	Northwest corner	728.6	4:14 p.m.
9/11/2012	3	Southwest corner	606.5	4:17 p.m.
	4	Southeast corner	535.2	9:30 a.m.
	4	Southeast corner	583.9	10:09 a.m.
	4	Southeast corner	600.5	10:42 a.m.
	4	Southeast corner	777.3	12:14 p.m.
	4	Southeast corner	603.4	3:31 p.m.
	4	Southeast corner	668.3	4:03 p.m.
	4	Southeast corner	515.3	4:55 p.m.
	4	Southeast corner	504.2	5:45 p.m.

Date	DataRAM Unit No.	DataRAM Location	Particulate Concentration ( $\mu\text{g}/\text{m}^3$ )	Time
9/28/2012	2	Northeast corner	518.4	11:34 a.m.
9/29/2012	1	Northwest corner	1,703	10:49 a.m.
	1	Northwest corner	621.0	8:18 a.m.
	1	Northwest corner	688.9	9:30 a.m.
	2	Northeast corner	509.0	10:13 a.m.
	2	Northeast corner	634.8	1:27 p.m.
10/1/2013	1	Northwest corner	502.6	4:09 p.m.
	2	Northeast corner	575.6	2:48 p.m.
	2	Northeast corner	525.9	4:07 p.m.
	4	Southeast corner	581.7	10:54 a.m.
	4	Southeast corner	576.8	9:34 a.m.
10/2/2013	3	Southwest corner	515	10:19 a.m.
10/3/2013	1	Northwest corner	551.4	3:20 p.m.
	1	Northwest corner	506.3	2:32 p.m.
	2	Northeast corner	565.3	3:20 p.m.
	2	Northeast corner	608	1:00 p.m.
	3	Southwest corner	513.5	1:39 p.m.
	4	Southeast corner	725.7	4:11 p.m.
	4	Southeast corner	545.8	10:49 a.m.
	4	Southeast corner	924.2	10:02 a.m.
	4	Southeast corner	616.9	1:25 p.m.
	4	Southeast corner	521.1	2:00 p.m.
10/4/2013	3	Southwest corner	544.4	8:47 a.m.
	4	Southeast corner	746.4	10:59 a.m.
6/11/2013	1	Northwest corner	520.4	5:44 p.m.
	2	Northeast corner	699.8	4:30 p.m.
	3	Southwest corner	569.8	3:07 p.m.

**Table 2**  
**Perimeter Air Monitoring Particulate Results Exceeding the Action Level**  
**Ironwood MGP Site**  
**Ironwood, Gogebic County, Michigan**

Date	DataRAM Unit No.	DataRAM Location	Particulate Concentration ( $\mu\text{g}/\text{m}^3$ )	Time
6/12/2013	2	Northeast corner	531.2	2:33 p.m.
	1	Northwest corner	504.8	1:49 p.m.
	1	Northwest corner	511	5:13 p.m.
	1	Northwest corner	670.7	3:11 p.m.
	2	Northeast corner	509.9	10:18 a.m.
	2	Northeast corner	516.9	9:39 a.m.
	2	Northeast corner	541.4	8:27 a.m.
	2	Northeast corner	571.8	2:56 p.m.
	2	Northeast corner	505.4	11:10 a.m.
	3	Southwest corner	599.5	8:37 a.m.
6/13/2013	1	Northwest corner	672.2	9:49 a.m.
	3	Southwest corner	530.7	10:29 a.m.

Note:

$\mu\text{g}/\text{m}^3$  = Microgram per cubic meter

**Table 3**  
**Daily Manifest and Weight Ticket Tracking**  
**Ironwood MGP Site**  
**Ironwood, Gogebic County, Michigan**

Shipping Date	Manifest No.	Ticket No.	Shipped By	Disposal Facility	Contaminated Material Gross (lbs)	Contaminated Material Tare (lbs)	Contaminated Material Net (lbs)	Contaminated Material (Tons)	Signed By	Truck No.
09/06/12	T 75384	1243083	Smily's Excavating	K&W Landfill	145,280	50,660	94,620	47.31	J. Hassan	252
	T 75385	1243039	Smily's Excavating	K&W Landfill	153,580	55,180	98,400	49.20	J. Hassan	15
	T 75386	1243062	Smily's Excavating	K&W Landfill	148,160	55,420	92,740	46.37	J. Hassan	15
	T 75387	1243063	Smily's Excavating	K&W Landfill	147,740	51,040	96,700	48.35	J. Hassan	252
						Daily Total (Tons) =		191.23		
09/07/12	T 75388	1243067	Smily's Excavating	K&W Landfill	156,300	53,360	102,940	51.47	J. Hassan	04
	T 75389	1243085	Smily's Excavating	K&W Landfill	151,660	55,160	96,500	48.25	J. Hassan	15
	T 75390	1243081	Smily's Excavating	K&W Landfill	159,480	50,780	108,700	54.35	J. Hassan	252
	T 75391	1243088	Smily's Excavating	K&W Landfill	147,100	52,960	94,140	47.07	J. Hassan	04
						Daily Total (Tons) =		201.14		
09/10/12	T 75392	1243111	Smily's Excavating	K&W Landfill	137,400	55,280	82,120	41.06	J. Hassan	15
	T 75393	1243114	Smily's Excavating	K&W Landfill	134,600	53,400	81,200	40.60	J. Hassan	7
	T 75394	1243115	Smily's Excavating	K&W Landfill	125,640	53,700	71,940	35.97	J. Hassan	17
	T 75395	1243117	Smily's Excavating	K&W Landfill	135,640	53,640	82,000	41.00	J. Hassan	19
	T 75396	1243118	Superior Sand & Gravel	K&W Landfill	127,200	46,640	80,560	40.28	J. Hassan	T354
	T 75397	1243119	Smily's Excavating	K&W Landfill	134,940	50,940	84,000	42.00	J. Hassan	252
	T 75398	1243131	Smily's Excavating	K&W Landfill	147,620	55,140	92,480	46.24	J. Hassan	15
	T 75399	1243124	Wender & Sons	K&W Landfill	137,460	51,760	85,700	42.85	J. Hassan	750
	T 75400	1243137	Smily's Excavating	K&W Landfill	149,740	53,160	96,580	48.29	J. Hassan	04
	T 75401	1243141	Smily's Excavating	K&W Landfill	153,780	53,340	100,440	50.22	J. Hassan	17
	T 75402	1243147	Superior Sand & Gravel	K&W Landfill	148,260	53,400	94,860	47.43	J. Hassan	19
	T 75403	1243146	Superior Sand & Gravel	K&W Landfill	129,780	46,460	83,320	41.66	J. Hassan	T354
	T 75404	1243150	Smily's Excavating	K&W Landfill	153,580	50,720	102,860	51.43	J. Hassan	252
	T 75405	1243149	Smily's Excavating	K&W Landfill	148,980	55,640	93,340	46.67	J. Hassan	15
T 75406	1243144	Smily's Excavating	K&W Landfill	147,780	53,920	93,860	46.93	J. Hassan	04	
T 75407	1243145	Smily's Excavating	K&W Landfill	128,900	53,700	75,200	37.60	J. Hassan	17	
						Daily Total (Tons) =		700.23		
09/11/12	T 75408	1243155	Wender & Sons	K&W Landfill	163,740	51,580	112,160	56.08	J. Hassan	750
	T 75409	1243159	Smily's Excavating	K&W Landfill	148,860	53,560	95,300	47.65	J. Hassan	04
	T 75410	1243161	Smily's Excavating	K&W Landfill	149,460	53,380	96,080	48.04	J. Hassan	17
	T 75411	1243162	Superior Sand & Gravel	K&W Landfill	133,220	46,680	86,540	43.27	J. Hassan	T354
	T 75412	1243166	Superior Sand & Gravel	K&W Landfill	140,300	53,680	86,620	43.31	J. Hassan	19
	T 75413	1243164	Smily's Excavating	K&W Landfill	154,720	55,340	99,380	49.69	J. Hassan	15
	T 75414	1243168	Smily's Excavating	K&W Landfill	154,680	50,400	104,280	52.14	J. Hassan	252
	T 75415	1243173	Wender & Sons	K&W Landfill	164,580	51,480	113,100	56.55	J. Hassan	750
	T 75416	1243179	Smily's Excavating	K&W Landfill	148,620	53,780	94,840	47.42	J. Hassan	04
	T 75417	1243181	Superior Sand & Gravel	K&W Landfill	136,100	46,420	89,680	44.84	J. Hassan	T354
	T 75418	1243183	Smily's Excavating	K&W Landfill	157,540	53,740	103,800	51.90	J. Hassan	17
	T 75419	1243184	Smily's Excavating	K&W Landfill	157,860	55,680	102,180	51.09	J. Hassan	15
	T 75420	1243188	Superior Sand & Gravel	K&W Landfill	140,440	53,480	86,960	43.48	J. Hassan	19
	T 75421	1243186	Smily's Excavating	K&W Landfill	155,260	51,020	104,240	52.12	J. Hassan	252
	T 75422	1243185	Wender & Sons	K&W Landfill	156,760	52,100	104,660	52.33	J. Hassan	750
	T 75423	1243182	Smily's Excavating	K&W Landfill	152,980	54,220	98,760	49.38	J. Hassan	04
	T 75424	1243189	Superior Sand & Gravel	K&W Landfill	130,960	46,700	84,260	42.13	J. Hassan	T354



**Table 3**  
**Daily Manifest and Weight Ticket Tracking**  
**Ironwood MGP Site**  
**Ironwood, Gogebic County, Michigan**

Shipping Date	Manifest No.	Ticket No.	Shipped By	Disposal Facility	Contaminated Material Gross (lbs)	Contaminated Material Tare (lbs)	Contaminated Material Net (lbs)	Contaminated Material (Tons)	Signed By	Truck No.
<b>Daily Total (Tons) =</b>								<b>831.42</b>		
09/12/12	T 75425	1243198	Smily's Excavating	K&W Landfill	152,700	54,400	98,300	49.15	J. Hassan	04
	T 75426	1243199	Smily's Excavating	K&W Landfill	143,060	55,980	87,080	43.54	J. Hassan	17
	T 75427	1243202	Smily's Excavating	K&W Landfill	144,180	55,420	88,760	44.38	J. Hassan	15
	T 75428	1243203	Wender & Sons	K&W Landfill	155,140	51,480	103,660	51.83	J. Hassan	750
	T 75429	1243208	Smily's Excavating	K&W Landfill	142,620	50,740	91,880	45.94	J. Hassan	252
	T 75430	1243209	Superior Sand & Gravel	K&W Landfill	124,220	46,480	77,740	38.87	J. Hassan	T354
	T 75431	1243210	Superior Sand & Gravel	K&W Landfill	137,000	53,660	83,340	41.67	J. Hassan	19
	T 75432	1243221	Smily's Excavating	K&W Landfill	154,720	54,780	99,940	49.97	J. Hassan	04
	T 75433	1243225	Smily's Excavating	K&W Landfill	152,400	55,660	96,740	48.37	J. Hassan	15
	T 75434	1243222	Wender & Sons	K&W Landfill	152,640	51,020	101,620	50.81	J. Hassan	750
	T 75435	1243224	Smily's Excavating	K&W Landfill	145,360	53,780	91,580	45.79	J. Hassan	17
	T 75436	1243226	Smily's Excavating	K&W Landfill	137,480	51,060	86,420	43.21	J. Hassan	252
	T 75437	1243230	Superior Sand & Gravel	K&W Landfill	131,900	46,820	85,080	42.54	J. Hassan	T354
<b>Daily Total (Tons) =</b>								<b>689.05</b>		
09/13/12	T 75440	1243243	Wender & Sons	K&W Landfill	166,980	51,480	115,500	57.75	J. Hassan	750
	T 75441	1243249	Smily's Excavating	K&W Landfill	155,920	53,000	102,920	51.46	J. Hassan	04
	T 75442	1243251	Smily's Excavating	K&W Landfill	146,660	53,500	93,160	46.58	J. Hassan	17
	T 75443	1243253	Smily's Excavating	K&W Landfill	145,740	55,340	90,400	45.20	J. Hassan	15
	T 75444	1243255	Smily's Excavating	K&W Landfill	153,820	50,680	103,140	51.57	J. Hassan	252
	T 75445	1243262	Superior Sand & Gravel	K&W Landfill	138,600	53,220	85,380	42.69	J. Hassan	19
	T 75446	1243265	Superior Sand & Gravel	K&W Landfill	132,520	46,560	85,960	42.98	J. Hassan	T354
	T 75447	1243269	Wender & Sons	K&W Landfill	146,660	51,460	95,200	47.60	J. Hassan	750
	T 75448	1243275	Smily's Excavating	K&W Landfill	135,680	53,140	82,540	41.27	J. Hassan	04
	T 75449	1243282	Smily's Excavating	K&W Landfill	143,920	53,860	90,060	45.03	J. Hassan	17
	T 75450	1243286	Smily's Excavating	K&W Landfill	146,660	51,000	95,660	47.83	J. Hassan	252
	T 75451	1243285	Smily's Excavating	K&W Landfill	143,260	55,660	87,600	43.80	J. Hassan	15
	T 75452	1243284	Superior Sand & Gravel	K&W Landfill	140,900	53,760	87,140	43.57	J. Hassan	19
	T 75453	1243283	Superior Sand & Gravel	K&W Landfill	122,040	46,380	75,660	37.83	J. Hassan	T354
<b>Daily Total (Tons) =</b>								<b>696.32</b>		
09/14/12	T 75455	1243293	Wender & Sons	K&W Landfill	147,860	51,220	96,640	48.32	K. Halbur	750
	T 75456	1243302	Smily's Excavating	K&W Landfill	137,940	55,440	82,500	41.25	K. Halbur	92
	T 75457	1243305	Smily's Excavating	K&W Landfill	143,140	53,580	89,560	44.78	K. Halbur	17
	T 75458	1243308	Superior Sand & Gravel	K&W Landfill	115,200	46,640	68,560	34.28	K. Halbur	T354
	T 75459	1243314	Superior Sand & Gravel	K&W Landfill	144,700	53,400	91,300	45.65	K. Halbur	19
	T 75460	1243317	Smily's Excavating	K&W Landfill	149,340	55,400	93,940	46.97	K. Halbur	15
	T 75461	1243326	Smily's Excavating	K&W Landfill	145,360	50,740	94,620	47.31	K. Halbur	252
<b>Daily Total (Tons) =</b>								<b>357.01</b>		

**Table 3**  
**Daily Manifest and Weight Ticket Tracking**  
**Ironwood MGP Site**  
**Ironwood, Gogebic County, Michigan**

Shipping Date	Manifest No.	Ticket No.	Shipped By	Disposal Facility	Contaminated Material Gross (lbs)	Contaminated Material Tare (lbs)	Contaminated Material Net (lbs)	Contaminated Material (Tons)	Signed By	Truck No.
09/17/12	T 75463	1243378	Smily's Excavating	K&W Landfill	146,140	51,240	94,900	47.45	K. Halbur	252
	T 75464	1243361	Superior Sand & Gravel	K&W Landfill	137,660	54,020	83,640	41.82	K. Halbur	19
	T 75465	1243365	Superior Sand & Gravel	K&W Landfill	121,980	47,180	74,800	37.40	K. Halbur	T354
	T 75466	1243371	Smily's Excavating	K&W Landfill	146,020	56,540	89,480	44.74	K. Halbur	15
	T 75467	1243377	Smily's Excavating	K&W Landfill	146,860	53,960	92,900	46.45	K. Halbur	17
	T 75468	1243385	Wender & Sons	K&W Landfill	141,220	51,180	90,040	45.02	K. Halbur	750
	T 75469	1243399	Superior Sand & Gravel	K&W Landfill	139,220	54,120	85,100	42.55	K. Halbur	19
	T 75470	1243403	Superior Sand & Gravel	K&W Landfill	107,680	47,320	60,360	30.18	K. Halbur	T354
	T 75471	1243405	Smily's Excavating	K&W Landfill	133,900	56,380	77,520	38.76	K. Halbur	15
<b>Daily Total (Tons) =</b>								<b>374.37</b>		
09/18/12	T 75472	1243407	Smily's Excavating	K&W Landfill	128,080	54,420	73,660	36.83	K. Halbur	17
	T 75473	1243410	Smily's Excavating	K&W Landfill	132,740	51,420	81,320	40.66	K. Halbur	252
	T 75474	1243406	Smily's Excavating	K&W Landfill	147,240	53,680	93,560	46.78	K. Halbur	04
	T 75475	1243414	Superior Sand & Gravel	K&W Landfill	140,580	54,440	86,140	43.07	K. Halbur	19
	T 75476	1243416	Superior Sand & Gravel	K&W Landfill	128,480	47,780	80,700	40.35	K. Halbur	T354
	T 75477	1243408	Smily's Excavating	K&W Landfill	149,380	56,860	92,520	46.26	K. Halbur	15
	T 75478	1243423	Wender & Sons	K&W Landfill	162,180	51,640	110,540	55.27	K. Halbur	750
	T 75479	1243426	Wender & Sons	K&W Landfill	151,860	53,320	98,540	49.27	K. Halbur	748
	T 75480	1243427	Smily's Excavating	K&W Landfill	155,420	53,840	101,580	50.79	K. Halbur	04
	T 75481	1243431	Smily's Excavating	K&W Landfill	139,780	55,500	84,280	42.14	K. Halbur	17
	T 75482	1243434	Smily's Excavating	K&W Landfill	139,700	56,540	83,160	41.58	K. Halbur	15
	T 75483	1243439	Smily's Excavating	K&W Landfill	136,680	51,580	85,100	42.55	K. Halbur	252
	T 75484	1243442	Superior Sand & Gravel	K&W Landfill	135,620	54,440	81,180	40.59	K. Halbur	19
	T 75485	1243445	Superior Sand & Gravel	K&W Landfill	124,060	47,620	76,440	38.22	K. Halbur	T354
	T 75486	1243448	Superior Sand & Gravel	K&W Landfill	147,740	55,620	92,120	46.06	K. Halbur	21
	T 75487	1243449	Superior Sand & Gravel	K&W Landfill	135,000	52,620	82,380	41.19	K. Halbur	20/349
	T 75488	1243452	Wender & Sons	K&W Landfill	134,600	52,840	81,760	40.88	K. Halbur	750
	T 75489	1243453	Wender & Sons	K&W Landfill	135,120	52,920	82,200	41.10	K. Halbur	748
	T 75490	1243455	Smily's Excavating	K&W Landfill	152,240	53,740	98,500	49.25	K. Halbur	04
	T 75491	1243459	Smily's Excavating	K&W Landfill	139,080	56,680	82,400	41.20	K. Halbur	17
<b>Daily Total (Tons) =</b>								<b>874.04</b>		
09/19/12	T 75492	1243462	Smily's Excavating	K&W Landfill	142,060	57,080	84,980	42.49	K. Halbur	15
	T 75493	1243461	Smily's Excavating	K&W Landfill	147,140	51,960	95,180	47.59	K. Halbur	252
	T 75494	1243463	Superior Sand & Gravel	K&W Landfill	146,100	54,820	91,280	45.64	K. Halbur	19
	T 75495	1243464	Superior Sand & Gravel	K&W Landfill	133,580	47,900	85,680	42.84	K. Halbur	T354
	T 75496	1243469	Superior Sand & Gravel	K&W Landfill	151,660	52,980	98,680	49.34	K. Halbur	20/349
	T 75497	1243471	Superior Sand & Gravel	K&W Landfill	146,540	55,840	90,700	45.35	K. Halbur	21
	T 75498	1243465	Smily's Excavating	K&W Landfill	158,840	53,300	105,540	52.77	K. Halbur	04
	T 75499	1243467	Smily's Excavating	K&W Landfill	143,640	57,620	86,020	43.01	K. Halbur	17
	T 75500	1243473	MD Contracting	K&W Landfill	150,600	69,040	81,560	40.78	K. Halbur	122
	T 75501	1243474	Wender & Sons	K&W Landfill	143,040	53,440	89,600	44.80	K. Halbur	748
	T 75502	1243475	Wender & Sons	K&W Landfill	149,300	52,820	96,480	48.24	K. Halbur	750
	T 75503	1243479	Smily's Excavating	K&W Landfill	141,380	51,980	89,400	44.70	K. Halbur	252

**Table 3**  
**Daily Manifest and Weight Ticket Tracking**  
**Ironwood MGP Site**  
**Ironwood, Gogebic County, Michigan**

Shipping Date	Manifest No.	Ticket No.	Shipped By	Disposal Facility	Contaminated Material Gross (lbs)	Contaminated Material Tare (lbs)	Contaminated Material Net (lbs)	Contaminated Material (Tons)	Signed By	Truck No.
09/19/12 (Cont.)	T 75504	1243480	Smily's Excavating	K&W Landfill	143,320	57,140	86,180	43.09	K. Halbur	15
	T 75505	1243481	Superior Sand & Gravel	K&W Landfill	143,420	54,540	88,880	44.44	K. Halbur	19
	T 75506	1243482	Superior Sand & Gravel	K&W Landfill	129,940	47,860	82,080	41.04	K. Halbur	T354
	T 75507	1243486	Smily's Excavating	K&W Landfill	151,480	53,260	98,220	49.11	K. Halbur	04
	T 75508	1243487	Smily's Excavating	K&W Landfill	145,360	57,560	87,800	43.90	K. Halbur	17
	T 75509	1243490	Superior Sand & Gravel	K&W Landfill	129,580	52,780	76,800	38.40	K. Halbur	20/349
	T 75510	1243492	Superior Sand & Gravel	K&W Landfill	148,800	55,700	93,100	46.55	K. Halbur	21
	T 75511	1243494	MD Contracting	K&W Landfill	162,620	68,880	93,740	46.87	K. Halbur	122
	T 75512	1243496	Wender & Sons	K&W Landfill	151,300	53,240	98,060	49.03	K. Halbur	748
	T 75513	1243499	Smily's Excavating	K&W Landfill	122,460	51,660	70,800	35.40	K. Halbur	252
	T 75516	7160903	Wender & Sons	K&W Landfill	160,640	53,180	107,460	53.73	K. Halbur	750
	T 75517	7160907	Superior Sand & Gravel	K&W Landfill	131,100	48,080	83,020	41.51	K. Halbur	T354
	T 75518	1243500	Smily's Excavating	K&W Landfill	146,900	53,760	93,140	46.57	K. Halbur	04
	T 75519	7160902	Smily's Excavating	K&W Landfill	147,200	58,380	88,820	44.41	K. Halbur	17
	T 75520	7160908	Superior Sand & Gravel	K&W Landfill	149,780	55,940	93,840	46.92	K. Halbur	21
	T 75521	7160911	Superior Sand & Gravel	K&W Landfill	140,800	53,100	87,700	43.85	K. Halbur	20
	T 75522	7160901	Smily's Excavating	K&W Landfill	148,340	52,160	96,180	48.09	K. Halbur	252
<b>Daily Total (Tons) =</b>								<b>1310.46</b>		
09/20/12	T 75514	7160900	Smily's Excavating	K&W Landfill	132,360	57,500	74,860	37.43	K. Halbur	15
	T 75515	7160904	Superior Sand & Gravel	K&W Landfill	146,160	54,180	91,980	45.99	K. Halbur	19
	T 75523	7160912	Wender & Sons	K&W Landfill	142,040	53,820	88,220	44.11	K. Halbur	748
	T 75524	7160917	MD Contracting	K&W Landfill	167,680	69,240	98,440	49.22	K. Halbur	122
	T 75525	7160920	Smily's Excavating	K&W Landfill	154,400	53,920	100,480	50.24	K. Halbur	04
	T 75526	7160923	Smily's Excavating	K&W Landfill	144,100	57,740	86,360	43.18	K. Halbur	15
	T 75527	7160926	Smily's Excavating	K&W Landfill	139,560	52,080	87,480	43.74	K. Halbur	252
	T 75528	7160929	Smily's Excavating	K&W Landfill	143,220	57,920	85,300	42.65	K. Halbur	17
	T 75529	7160930	Wender & Sons	K&W Landfill	142,440	52,960	89,480	44.74	K. Halbur	750
	T 75530	7160933	Superior Sand & Gravel	K&W Landfill	138,760	54,240	84,520	42.26	K. Halbur	19
	T 75531	7160935	Superior Sand & Gravel	K&W Landfill	126,960	47,980	78,980	39.49	K. Halbur	T354
	T 75532	7160936	Superior Sand & Gravel	K&W Landfill	143,840	55,780	88,060	44.03	K. Halbur	21
	T 75533	7160938	Superior Sand & Gravel	K&W Landfill	134,600	53,060	81,540	40.77	K. Halbur	20/349
	T 75534	7160940	Wender & Sons	K&W Landfill	146,900	53,380	93,520	46.76	K. Halbur	748
	T 75535	7160942	MD Contracting	K&W Landfill	165,180	66,720	98,460	49.23	K. Halbur	03
	T 75536	7160943	Smily's Excavating	K&W Landfill	153,980	53,740	100,240	50.12	K. Halbur	04
<b>Daily Total (Tons) =</b>								<b>713.96</b>		
09/21/12	T 75537	7160946	Smily's Excavating	K&W Landfill	140,640	58,160	82,480	41.24	K. Halbur	15
	T 75538	7160947	Smily's Excavating	K&W Landfill	141,260	52,360	88,900	44.45	K. Halbur	252
	T 75539	7160948	Smily's Excavating	K&W Landfill	144,160	58,280	85,880	42.94	K. Halbur	17
	T 75540	7160950	Wender & Sons	K&W Landfill	147,320	52,180	95,140	47.57	K. Halbur	750
	T 75541	7160951	Wender & Sons	K&W Landfill	152,620	53,060	99,560	49.78	K. Halbur	748
	T 75542	7160945	Smily's Excavating	K&W Landfill	160,980	54,080	106,900	53.45	K. Halbur	04
<b>Daily Total (Tons) =</b>								<b>279.43</b>		

**Table 3**  
**Daily Manifest and Weight Ticket Tracking**  
**Ironwood MGP Site**  
**Ironwood, Gogebic County, Michigan**

Shipping Date	Manifest No.	Ticket No.	Shipped By	Disposal Facility	Contaminated Material Gross (lbs)	Contaminated Material Tare (lbs)	Contaminated Material Net (lbs)	Contaminated Material (Tons)	Signed By	Truck No.
09/26/12	T 75543	7161049	Wender & Sons	K&W Landfill	152,860	51,440	101,420	50.71	K. Halbur	750
	T 75544	7161053	Smily's Excavating	K&W Landfill	166,120	53,660	112,460	56.23	K. Halbur	04
	T 75545	7161054	Smily's Excavating	K&W Landfill	156,140	56,260	99,880	49.94	K. Halbur	15
	T 75546	7161055	Smily's Excavating	K&W Landfill	145,340	53,800	91,540	45.77	K. Halbur	17
	T 75547	7161061	Smily's Excavating	K&W Landfill	147,380	52,340	95,040	47.52	K. Halbur	252
	T 75548	7161058	Superior Sand & Gravel	K&W Landfill	126,400	46,940	79,460	39.73	K. Halbur	T354
	T 75549	7161060	Wender & Sons	K&W Landfill	145,900	53,760	92,140	46.07	K. Halbur	19
	T 75550	7161062	Superior Sand & Gravel	K&W Landfill	159,120	56,160	102,960	51.48	K. Halbur	21
	T 75551	7161063	Wender & Sons	K&W Landfill	150,900	53,400	97,500	48.75	K. Halbur	748
	T 75552	7161064	Superior Sand & Gravel	K&W Landfill	145,560	52,660	92,900	46.45	K. Halbur	20
	T 75553	7161069	Wender & Sons	K&W Landfill	148,340	50,780	97,560	48.78	K. Halbur	750
	T 75554	7161073	Smily's Excavating	K&W Landfill	153,540	53,540	100,000	50.00	K. Halbur	04
	T 75555	7161076	Smily's Excavating	K&W Landfill	127,920	56,180	71,740	35.87	K. Halbur	15
	T 75556	7161079	Smily's Excavating	K&W Landfill	129,220	53,440	75,780	37.89	K. Halbur	17
	T 75557	7161080	Superior Sand & Gravel	K&W Landfill	126,140	46,680	79,460	39.73	K. Halbur	T354
	T 75558	7161081	Superior Sand & Gravel	K&W Landfill	140,260	53,540	86,720	43.36	K. Halbur	19
	T 75559	7161082	Smily's Excavating	K&W Landfill	133,480	51,880	81,600	40.80	K. Halbur	252
	T 75560	7161083	Superior Sand & Gravel	K&W Landfill	138,200	55,700	82,500	41.25	K. Halbur	21
<b>Daily Total (Tons) =</b>								<b>820.33</b>		
09/27/12	T 75561	7161084	Wender & Sons	K&W Landfill	136,200	53,320	82,880	41.44	K. Halbur	748
	T 75562	7161098	Superior Sand & Gravel	K&W Landfill	129,760	52,580	77,180	38.59	K. Halbur	20
	T 75563	7161086	Smily's Excavating	K&W Landfill	151,280	54,020	97,260	48.63	K. Halbur	04
	T 75564	7161087	Smily's Excavating	K&W Landfill	141,960	56,620	85,340	42.67	K. Halbur	15
	T 75565	7161089	Smily's Excavating	K&W Landfill	138,140	53,780	84,360	42.18	K. Halbur	17
	T 75566	7161093	Superior Sand & Gravel	K&W Landfill	124,840	46,960	77,880	38.94	K. Halbur	T354
	T 75567	7161094	Superior Sand & Gravel	K&W Landfill	143,160	53,860	89,300	44.65	K. Halbur	19
	T 75568	7161091	Smily's Excavating	K&W Landfill	138,760	52,200	86,560	43.28	K. Halbur	252
	T 75569	7161096	Superior Sand & Gravel	K&W Landfill	138,240	56,160	82,080	41.04	K. Halbur	21
	T 75570	7161101	Wender & Sons	K&W Landfill	136,220	52,020	84,200	42.10	K. Halbur	750
	T 75571	7161105	MD Contracting	K&W Landfill	157,540	69,280	88,260	44.13	K. Halbur	122
	T 75572	7161107	Wender & Sons	K&W Landfill	133,260	53,120	80,140	40.07	K. Halbur	748
	T 75573	7161108	Smily's Excavating	K&W Landfill	150,000	53,240	96,760	48.38	K. Halbur	04
	T 75574	7161109	Smily's Excavating	K&W Landfill	142,640	56,560	86,080	43.04	K. Halbur	15
	T 75575	7161114	Smily's Excavating	K&W Landfill	140,000	53,480	86,520	43.26	K. Halbur	17
	T 75576	7161117	Smily's Excavating	K&W Landfill	146,100	51,940	94,160	47.08	K. Halbur	252
	T 75577	7161124	Superior Sand & Gravel	K&W Landfill	126,260	46,740	79,520	39.76	K. Halbur	T354
	T 75578	7161123	Superior Sand & Gravel	K&W Landfill	142,460	53,680	88,780	44.39	K. Halbur	19
	T 75579	7161122	Wender & Sons	K&W Landfill	145,800	51,340	94,460	47.23	K. Halbur	750
	T 75580	7161127	Superior Sand & Gravel	K&W Landfill	146,620	55,920	90,700	45.35	K. Halbur	21
	T 75581	7161128	Superior Sand & Gravel	K&W Landfill	129,800	52,360	77,440	38.72	K. Halbur	20
	T 75582	7161129	MD Contracting	K&W Landfill	159,740	68,260	91,480	45.74	K. Halbur	122
	T 75583	7161131	Wender & Sons	K&W Landfill	148,680	52,760	95,920	47.96	K. Halbur	748
	T 75584	7161132	Smily's Excavating	K&W Landfill	152,820	53,940	98,880	49.44	K. Halbur	04
<b>Daily Total (Tons) =</b>								<b>1048.07</b>		



**Table 3**  
**Daily Manifest and Weight Ticket Tracking**  
**Ironwood MGP Site**  
**Ironwood, Gogebic County, Michigan**

Shipping Date	Manifest No.	Ticket No.	Shipped By	Disposal Facility	Contaminated Material Gross (lbs)	Contaminated Material Tare (lbs)	Contaminated Material Net (lbs)	Contaminated Material (Tons)	Signed By	Truck No.
09/28/12	01358131	7161137	Smily's Excavating	K&W Landfill	139,260	56,700	82,560	41.28	K. Halbur	15
	01358132	7161145	Smily's Excavating	K&W Landfill	143,400	53,700	89,700	44.85	K. Halbur	17
	01358133	7161138	Smily's Excavating	K&W Landfill	145,640	52,140	93,500	46.75	K. Halbur	252
	01358134	7161136	Wender & Sons	K&W Landfill	145,700	51,980	93,720	46.86	K. Halbur	750
	01358135	7161142	Smily's Excavating	K&W Landfill	149,780	53,620	96,160	48.08	K. Halbur	04
<b>Daily Total (Tons) =</b>								<b>227.82</b>		
10/1/2012	01358136	7161188	Wender & Sons	K&W Landfill	138,300	51,740	86,560	43.28	K. Halbur	750
	01358137	7161190	Wender & Sons	K&W Landfill	140,780	53,120	87,660	43.83	K. Halbur	748
	01358138	61194,716119	Wender & Sons	K&W Landfill	145,280	51,340	93,940	46.97	K. Halbur	751
	01358139	7161195	Superior Sand & Gravel	K&W Landfill	138,920	53,500	85,420	42.71	K. Halbur	19
	01358140	7161198	Superior Sand & Gravel	K&W Landfill	128,700	46,760	81,940	40.97	K. Halbur	T354
	01358141	7161200	Smily's Excavating	K&W Landfill	147,460	56,560	90,900	45.45	K. Halbur	15
	01358142	7161203	Smily's Excavating	K&W Landfill	154,520	55,360	99,160	49.58	K. Halbur	17
	01358143	7161204	Smily's Excavating	K&W Landfill	151,820	52,080	99,740	49.87	K. Halbur	252
	01358144	7161206	Smily's Excavating	K&W Landfill	161,900	52,300	109,600	54.80	K. Halbur	04
	01358145	7161207	Superior Sand & Gravel	K&W Landfill	158,540	56,120	102,420	51.21	K. Halbur	21
	01358146	7161208	Superior Sand & Gravel	K&W Landfill	130,280	52,140	78,140	39.07	K. Halbur	20
	01358147	7161214	Smily's Excavating	K&W Landfill	152,660	53,780	98,880	49.44	K. Halbur	92
	01358148	7161212	Wender & Sons	K&W Landfill	144,860	51,000	93,860	46.93	K. Halbur	750
	01358149	7161216	Wender & Sons	K&W Landfill	147,940	52,660	95,280	47.64	K. Halbur	748
	01358150	61219,716122	Wender & Sons	K&W Landfill	145,280	51,220	94,060	47.03	K. Halbur	751
	01358151	7161224	Superior Sand & Gravel	K&W Landfill	142,060	53,240	88,820	44.41	K. Halbur	19
	01358152	7161228	Superior Sand & Gravel	K&W Landfill	135,560	46,540	89,020	44.51	K. Halbur	T354
	01358153	7161233	Smily's Excavating	K&W Landfill	150,440	56,320	94,120	47.06	K. Halbur	15
	01358154	7161235	Smily's Excavating	K&W Landfill	149,980	55,120	94,860	47.43	K. Halbur	17
	01358155	7161236	Smily's Excavating	K&W Landfill	144,980	51,840	93,140	46.57	K. Halbur	252
	01358156	7161237	Smily's Excavating	K&W Landfill	153,840	52,420	101,420	50.71	K. Halbur	04
	01358157	7161238	Superior Sand & Gravel	K&W Landfill	146,480	55,740	90,740	45.37	K. Halbur	21
	01358158	7161239	Superior Sand & Gravel	K&W Landfill	145,060	51,860	93,200	46.60	K. Halbur	20
	01358159	7161271	Smily's Excavating	K&W Landfill	138,760	54,100	84,660	42.33	K. Halbur	92
	01358160	7161242	Superior Sand & Gravel	K&W Landfill	141,280	53,740	87,540	43.77	K. Halbur	19
	01358161	7161243	Superior Sand & Gravel	K&W Landfill	137,380	46,920	90,460	45.23	K. Halbur	T354
	01358162	7161241	Smily's Excavating	K&W Landfill	147,320	56,720	90,600	45.30	K. Halbur	15
	01358163	7161252	Smily's Excavating	K&W Landfill	153,320	55,620	97,700	48.85	K. Halbur	17
	01358164	7161245	Smily's Excavating	K&W Landfill	149,940	52,220	97,720	48.86	K. Halbur	252
	01358165	7161240	Smily's Excavating	K&W Landfill	160,560	52,720	107,840	53.92	K. Halbur	04
	01358166	7161250	Superior Sand & Gravel	K&W Landfill	144,440	56,320	88,120	44.06	K. Halbur	21
	01358167	7161248	Superior Sand & Gravel	K&W Landfill	132,300	52,300	80,000	40.00	K. Halbur	20
<b>Daily Total (Tons) =</b>								<b>1483.76</b>		

**Table 3**  
**Daily Manifest and Weight Ticket Tracking**  
**Ironwood MGP Site**  
**Ironwood, Gogebic County, Michigan**

Shipping Date	Manifest No.	Ticket No.	Shipped By	Disposal Facility	Contaminated Material Gross (lbs)	Contaminated Material Tare (lbs)	Contaminated Material Net (lbs)	Contaminated Material (Tons)	Signed By	Truck No.
10/2/2012	01358168	7161260	Wender & Sons	K&W Landfill	154,420	51,940	102,480	51.24	K. Halbur	750
	01358169	7161265	Smily's Excavating	K&W Landfill	142,960	52,920	90,040	45.02	K. Halbur	04
	01358170	7161267	Smily's Excavating	K&W Landfill	150,540	56,500	94,040	47.02	K. Halbur	15
	01358171	7161268	Superior Sand & Gravel	K&W Landfill	144,960	53,420	91,540	45.77	K. Halbur	19
	01358172	7161272	Superior Sand & Gravel	K&W Landfill	131,060	46,620	84,440	42.22	K. Halbur	T354
	01358173	7161276	Smily's Excavating	K&W Landfill	147,240	51,940	95,300	47.65	K. Halbur	252
	01358174	7161280	Superior Sand & Gravel	K&W Landfill	130,980	52,000	78,980	39.49	K. Halbur	20
	01358175	7161288	Wender & Sons	K&W Landfill	145,120	52,740	92,380	46.19	K. Halbur	748
	01358176	7161283	Wender & Sons	K&W Landfill	145,540	51,120	94,420	47.21	K. Halbur	751
	01358177	7161289	Wender & Sons	K&W Landfill	147,520	51,500	96,020	48.01	K. Halbur	750
	01358178	7161295	Smily's Excavating	K&W Landfill	153,160	55,540	97,620	48.81	K. Halbur	17
	01358179	7161296	Smily's Excavating	K&W Landfill	157,680	53,240	104,440	52.22	K. Halbur	04
	01358180	7161299	Smily's Excavating	K&W Landfill	147,800	56,260	91,540	45.77	K. Halbur	15
	01358181	7161302	Superior Sand & Gravel	K&W Landfill	143,660	53,800	89,860	44.93	K. Halbur	19
	01358182	7161304	Superior Sand & Gravel	K&W Landfill	133,220	47,020	86,200	43.10	K. Halbur	T354
	01358183	7161314	Smily's Excavating	K&W Landfill	139,160	53,860	85,300	42.65	K. Halbur	92
	01358184	7161305	Smily's Excavating	K&W Landfill	144,420	52,320	92,100	46.05	K. Halbur	252
	01358185	7161306	Superior Sand & Gravel	K&W Landfill	149,020	56,380	92,640	46.32	K. Halbur	21
	01358186	7161311	Smily's Excavating	K&W Landfill	141,060	55,500	85,560	42.78	K. Halbur	17
	01358187	7161308	Superior Sand & Gravel	K&W Landfill	136,980	52,300	84,680	42.34	K. Halbur	20
	01358188	7161300	Smily's Excavating	K&W Landfill	133,280	53,440	79,840	39.92	K. Halbur	04
	01358189	7161301	Smily's Excavating	K&W Landfill	135,460	56,980	78,480	39.24	K. Halbur	15
<b>Daily Total (Tons) =</b>								<b>993.95</b>		
10/3/2012	01358190	7161315	Wender & Sons	K&W Landfill	147,500	51,300	96,200	48.10	K. Halbur	751
	01358191	7161319	Wender & Sons	K&W Landfill	144,460	51,800	92,660	46.33	K. Halbur	750
	01358192	7161320	Wender & Sons	K&W Landfill	146,380	52,940	93,440	46.72	K. Halbur	748
	01358193	7161326	Smily's Excavating	K&W Landfill	157,980	53,240	104,740	52.37	K. Halbur	04
	01358194	7161328	Smily's Excavating	K&W Landfill	146,980	56,660	90,320	45.16	K. Halbur	15
	01358195	7161333	Smily's Excavating	K&W Landfill	145,940	51,840	94,100	47.05	K. Halbur	252
	01358196	7161334	Superior Sand & Gravel	K&W Landfill	145,120	53,400	91,720	45.86	K. Halbur	19
	01358197	7161337	Superior Sand & Gravel	K&W Landfill	133,100	46,660	86,440	43.22	K. Halbur	T354
	01358198	7161340	Superior Sand & Gravel	K&W Landfill	152,320	56,040	96,280	48.14	K. Halbur	21
	01358199	7161343	Superior Sand & Gravel	K&W Landfill	139,280	52,020	87,260	43.63	K. Halbur	20
	01358200	7161341	Wender & Sons	K&W Landfill	142,460	50,980	91,480	45.74	K. Halbur	751
	01358201	7161345	Wender & Sons	K&W Landfill	141,600	51,360	90,240	45.12	K. Halbur	750
	01358202	7161349	Smily's Excavating	K&W Landfill	150,060	55,080	94,980	47.49	K. Halbur	17
	01358203	7161350	Wender & Sons	K&W Landfill	150,560	52,620	97,940	48.97	K. Halbur	748
	01358204	7161354	Smily's Excavating	K&W Landfill	141,680	53,180	88,500	44.25	K. Halbur	04
	01358205	7161356	Smily's Excavating	K&W Landfill	143,640	56,400	87,240	43.62	K. Halbur	15
	01358206	7161364	Smily's Excavating	K&W Landfill	151,540	52,440	99,100	49.55	K. Halbur	252
	01358207	7161361	Wender & Sons	K&W Landfill	145,220	51,520	93,700	46.85	K. Halbur	751
	01358208	7161367	Smily's Excavating	K&W Landfill	144,600	55,600	89,000	44.50	K. Halbur	17
	01358209	7161379	Smily's Excavating	K&W Landfill	137,060	53,880	83,180	41.59	K. Halbur	92
	01358210	7161359	Smily's Excavating	K&W Landfill	144,560	53,520	91,040	45.52	K. Halbur	04
	01358211	7161360	Smily's Excavating	K&W Landfill	142,940	56,980	85,960	42.98	K. Halbur	15
<b>Daily Total (Tons) =</b>								<b>1012.76</b>		

**Table 3**  
**Daily Manifest and Weight Ticket Tracking**  
**Ironwood MGP Site**  
**Ironwood, Gogebic County, Michigan**

Shipping Date	Manifest No.	Ticket No.	Shipped By	Disposal Facility	Contaminated Material Gross (lbs)	Contaminated Material Tare (lbs)	Contaminated Material Net (lbs)	Contaminated Material (Tons)	Signed By	Truck No.
10/4/2012	01358212	7161372	Wender & Sons	K&W Landfill	139,800	53,080	86,720	43.36	K. Halbur	748
	01358213	7161375	Wender & Sons	K&W Landfill	140,100	51,840	88,260	44.13	K. Halbur	750
	01358214	7161385	Smily's Excavating	K&W Landfill	151,900	53,200	98,700	49.35	K. Halbur	04
	01358215	7161388	Smily's Excavating	K&W Landfill	142,200	56,680	85,520	42.76	K. Halbur	15
	01358216	7161391	Wender & Sons	K&W Landfill	142,860	51,180	91,680	45.84	K. Halbur	751
	01358217	7161395	Smily's Excavating	K&W Landfill	139,800	51,840	87,960	43.98	K. Halbur	252
	01358218	7161404	Smily's Excavating	K&W Landfill	145,880	55,220	90,660	45.33	K. Halbur	17
	01358219	7161407	Wender & Sons	K&W Landfill	151,640	52,680	98,960	49.48	K. Halbur	748
	01358220	7161410	Wender & Sons	K&W Landfill	137,680	51,480	86,200	43.10	K. Halbur	750
	01358221	7161418	Smily's Excavating	K&W Landfill	159,780	53,260	106,520	53.26	K. Halbur	04
	01358222	7161421	Smily's Excavating	K&W Landfill	141,680	56,360	85,320	42.66	K. Halbur	15
	01358223	7161422	Wender & Sons	K&W Landfill	127,260	51,100	76,160	38.08	K. Halbur	751
	01358224	7161426	Smily's Excavating	K&W Landfill	133,100	52,140	80,960	40.48	K. Halbur	252
	01358225	7161434	Smily's Excavating	K&W Landfill	132,720	55,380	77,340	38.67	K. Halbur	17
	01358226	7161424	Smily's Excavating	K&W Landfill	126,880	53,660	73,220	36.61	K. Halbur	04
	01358227	7161425	Smily's Excavating	K&W Landfill	120,840	57,060	63,780	31.89	K. Halbur	15
<b>Daily Total (Tons) =</b>								<b>688.98</b>		
10/5/2012	01358228	7161445	Smily's Excavating	K&W Landfill	140,860	52,360	88,500	44.25	K. Halbur	04
	01358229	7161449	Smily's Excavating	K&W Landfill	134,840	56,580	78,260	39.13	K. Halbur	15
	01358230	7161451	Smily's Excavating	K&W Landfill	129,620	51,880	77,740	38.87	K. Halbur	252
	01358231	7161640	Smily's Excavating	K&W Landfill	130,880	55,140	75,740	37.87	K. Halbur	17
<b>Daily Total (Tons) =</b>								<b>160.12</b>		
10/8/2012	01358232	7161478	Smily's Excavating	K&W Landfill	140,200	50,980	89,220	44.61	K. Halbur	252
	01358233	7161483	Smily's Excavating	K&W Landfill	133,800	55,400	78,400	39.20	K. Halbur	15
	01358234	7161496	Smily's Excavating	K&W Landfill	133,460	50,660	82,800	41.40	K. Halbur	252
<b>Daily Total (Tons) =</b>								<b>125.21</b>		
10/9/2012	01358235	7161502	Smily's Excavating	K&W Landfill	128,460	55,820	72,640	36.32	K. Halbur	15
	01358236	7161503	Smily's Excavating	K&W Landfill	133,700	51,300	82,400	41.20	K. Halbur	15
	01358237	7161514	Smily's Excavating	K&W Landfill	139,220	54,900	84,320	42.16	K. Halbur	92
	01358238	7161512	Smily's Excavating	K&W Landfill	140,220	55,880	84,340	42.17	J. Hassan	15
	01358239	7161515	Smily's Excavating	K&W Landfill	135,160	50,880	84,280	42.14	J. Hassan	252
	01358240	7161528	Smily's Excavating	K&W Landfill	151,360	56,740	94,620	47.31	J. Hassan	15
	01358241	7161532	Smily's Excavating	K&W Landfill	149,020	50,780	98,240	49.12	J. Hassan	252
<b>Daily Total (Tons) =</b>								<b>300.42</b>		
10/10/2012	01358242	7161541	Smily's Excavating	K&W Landfill	145,220	55,000	90,220	45.11	J. Hassan	92
	01358243	7161536	Smily's Excavating	K&W Landfill	144,380	54,400	89,980	44.99	J. Hassan	15
	01358244	7161533	Smily's Excavating	K&W Landfill	144,000	51,220	92,780	46.39	J. Hassan	252
	01358245	7161554	Smily's Excavating	K&W Landfill	150,640	51,060	99,580	49.79	J. Hassan	252
	01358246	7161564	Smily's Excavating	K&W Landfill	133,220	55,100	78,120	39.06	J. Hassan	92
<b>Daily Total (Tons) =</b>								<b>225.34</b>		
10/11/2012	01358247	7161572	Smily's Excavating	K&W Landfill	148,200	51,300	96,900	48.45	J. Hassan	252
	01358248	7161576	Smily's Excavating	K&W Landfill	156,520	55,700	100,820	50.41	J. Hassan	92
	01358249	7161581	Smily's Excavating	K&W Landfill	147,000	52,980	94,020	47.01	J. Hassan	04
	01358250	7161586	Smily's Excavating	K&W Landfill	151,060	55,280	95,780	47.89	J. Hassan	17
	01358251	7161603	Smily's Excavating	K&W Landfill	144,820	54,500	90,320	45.16	J. Hassan	92
	01358252	7161594	Smily's Excavating	K&W Landfill	156,120	51,360	104,760	52.38	J. Hassan	252
<b>Daily Total (Tons) =</b>								<b>291.30</b>		

**Table 3**  
**Daily Manifest and Weight Ticket Tracking**  
**Ironwood MGP Site**  
**Ironwood, Gogebic County, Michigan**

Shipping Date	Manifest No.	Ticket No.	Shipped By	Disposal Facility	Contaminated Material Gross (lbs)	Contaminated Material Tare (lbs)	Contaminated Material Net (lbs)	Contaminated Material (Tons)	Signed By	Truck No.
10/12/2012	01358253	7161617	Smily's Excavating	K&W Landfill	138,840	51,520	87,320	43.66	J. Hassan	252
	01358254	7161630	Smily's Excavating	K&W Landfill	131,740	55,920	75,820	37.91	J. Hassan	92
	01358255	7161635	Smily's Excavating	K&W Landfill	142,540	51,520	91,020	45.51	J. Hassan	252
	01358256	7161655	Smily's Excavating	K&W Landfill	149,840	55,900	93,940	46.97	J. Hassan	92
<b>Daily Total (Tons) =</b>								<b>174.05</b>		
10/15/2012	01358257	7161664	Smily's Excavating	K&W Landfill	152,700	52,120	100,580	50.29	J. Hassan	252
	01358258	7161682	Smily's Excavating	K&W Landfill	141,720	51,840	89,880	44.94	J. Hassan	252
	01358259	7161685	Smily's Excavating	K&W Landfill	141,340	57,540	83,800	41.90	J. Hassan	92
	01358260	7161687	Smily's Excavating	K&W Landfill	140,100	52,840	87,260	43.63	J. Hassan	04
<b>Daily Total (Tons) =</b>								<b>180.76</b>		
10/16/2012	01358261	7161693	Smily's Excavating	K&W Landfill	148,840	52,300	96,540	48.27	J. Hassan	252
	01358262	7161695	Smily's Excavating	K&W Landfill	147,660	57,360	90,300	45.15	J. Hassan	92
	01358263	7161690	Smily's Excavating	K&W Landfill	147,500	52,980	94,520	47.26	J. Hassan	04
	01358264	7161710	Smily's Excavating	K&W Landfill	148,280	51,120	97,160	48.58	J. Hassan	252
	01358265	7161714	Smily's Excavating	K&W Landfill	158,360	58,520	99,840	49.92	J. Hassan	92
<b>Daily Total (Tons) =</b>								<b>239.18</b>		
<b>Total Contaminated Soil (Tons) =</b>								<b>15,190.71</b>		

Note:

lbs = Pounds



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**ATTACHMENT E**  
**LABORATORY ANALYTICAL REPORTS**

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September 12, 2012

Daniel Liebau  
Weston Solutions, Inc.  
600 E Lakeshore Drive  
Suite 200  
Houghton, MI 49931

RE: Project: Ironwood MGP  
Pace Project No.: 10203643

Dear Daniel Liebau:

Enclosed are the analytical results for sample(s) received by the laboratory on August 28, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Aaron Fredrikson

aaron.fredrikson@pacelabs.com  
Project Manager

Enclosures

cc: Ms. Lisa Graczyk, Weston Solutions, Inc.



## REPORT OF LABORATORY ANALYSIS

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Page 1 of 12

## CERTIFICATIONS

Project: Ironwood MGP

Pace Project No.: 10203643

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### Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414

A2LA Certification #: 2926.01

Alaska Certification #: UST-078

Alaska Certification #MN00064

Arizona Certification #: AZ-0014

Arkansas Certification #: 88-0680

California Certification #: 01155CA

Colorado Certification #Pace

Connecticut Certification #: PH-0256

EPA Region 8 Certification #: Pace

Florida/NELAP Certification #: E87605

Georgia Certification #: 959

Hawaii Certification #Pace

Idaho Certification #: MN00064

Illinois Certification #: 200011

Kansas Certification #: E-10167

Louisiana Certification #: 03086

Louisiana Certification #: LA080009

Maine Certification #: 2007029

Maryland Certification #: 322

Michigan DEQ Certification #: 9909

Minnesota Certification #: 027-053-137

Mississippi Certification #: Pace

Montana Certification #: MT CERT0092

Nebraska Certification #: Pace

Nevada Certification #: MN\_00064

New Jersey Certification #: MN-002

New York Certification #: 11647

North Carolina Certification #: 530

North Dakota Certification #: R-036

North Dakota Certification #: R-036A

Ohio VAP Certification #: CL101

Oklahoma Certification #: 9507

Oregon Certification #: MN200001

Oregon Certification #: MN300001

Pennsylvania Certification #: 68-00563

Puerto Rico Certification

Tennessee Certification #: 02818

Texas Certification #: T104704192

Utah Certification #: MN00064

Virginia/DCLS Certification #: 002521

Virginia/VELAP Certification #: 460163

Washington Certification #: C754

West Virginia Certification #: 382

Wisconsin Certification #: 999407970

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## REPORT OF LABORATORY ANALYSIS

Page 2 of 12

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## SAMPLE SUMMARY

Project: Ironwood MGP

Pace Project No.: 10203643

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10203643001	IWMGP-B-D01-082412	Air	08/24/12 16:30	08/28/12 10:20

## REPORT OF LABORATORY ANALYSIS

Page 3 of 12

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## SAMPLE ANALYTE COUNT

Project: Ironwood MGP

Pace Project No.: 10203643

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10203643001	IWMGP-B-D01-082412	TO-15	DR1	57

## REPORT OF LABORATORY ANALYSIS

Page 4 of 12

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## ANALYTICAL RESULTS

Project: Ironwood MGP

Pace Project No.: 10203643

Sample: IWMGP-B-D01-082412		Lab ID: 10203643001	Collected: 08/24/12 16:30	Received: 08/28/12 10:20	Matrix: Air			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>TO15 MSV AIR</b>		Analytical Method: TO-15						
Acetone	7.2	ug/m3	0.77	1.61		09/06/12 13:00	67-64-1	
Benzene	ND	ug/m3	0.52	1.61		09/06/12 13:00	71-43-2	
Bromodichloromethane	ND	ug/m3	2.2	1.61		09/06/12 13:00	75-27-4	
Bromoform	ND	ug/m3	3.4	1.61		09/06/12 13:00	75-25-2	
Bromomethane	ND	ug/m3	1.3	1.61		09/06/12 13:00	74-83-9	
1,3-Butadiene	ND	ug/m3	0.72	1.61		09/06/12 13:00	106-99-0	
2-Butanone (MEK)	2.2	ug/m3	0.97	1.61		09/06/12 13:00	78-93-3	
Carbon disulfide	ND	ug/m3	1.0	1.61		09/06/12 13:00	75-15-0	
Carbon tetrachloride	ND	ug/m3	1.0	1.61		09/06/12 13:00	56-23-5	
Chlorobenzene	ND	ug/m3	1.5	1.61		09/06/12 13:00	108-90-7	
Chloroethane	ND	ug/m3	0.87	1.61		09/06/12 13:00	75-00-3	
Chloroform	ND	ug/m3	1.6	1.61		09/06/12 13:00	67-66-3	
Chloromethane	0.78	ug/m3	0.68	1.61		09/06/12 13:00	74-87-3	
Cyclohexane	ND	ug/m3	1.1	1.61		09/06/12 13:00	110-82-7	
Dibromochloromethane	ND	ug/m3	2.8	1.61		09/06/12 13:00	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/m3	2.5	1.61		09/06/12 13:00	106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	2.0	1.61		09/06/12 13:00	95-50-1	
1,3-Dichlorobenzene	ND	ug/m3	2.0	1.61		09/06/12 13:00	541-73-1	
1,4-Dichlorobenzene	ND	ug/m3	2.0	1.61		09/06/12 13:00	106-46-7	
Dichlorodifluoromethane	2.7	ug/m3	1.6	1.61		09/06/12 13:00	75-71-8	
1,1-Dichloroethane	ND	ug/m3	1.3	1.61		09/06/12 13:00	75-34-3	
1,2-Dichloroethane	ND	ug/m3	0.66	1.61		09/06/12 13:00	107-06-2	
1,1-Dichloroethene	ND	ug/m3	1.3	1.61		09/06/12 13:00	75-35-4	
cis-1,2-Dichloroethene	ND	ug/m3	1.3	1.61		09/06/12 13:00	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	1.3	1.61		09/06/12 13:00	156-60-5	
1,2-Dichloropropane	ND	ug/m3	1.5	1.61		09/06/12 13:00	78-87-5	
cis-1,3-Dichloropropene	ND	ug/m3	1.5	1.61		09/06/12 13:00	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/m3	1.5	1.61		09/06/12 13:00	10061-02-6	
Dichlorotetrafluoroethane	ND	ug/m3	2.3	1.61		09/06/12 13:00	76-14-2	
Ethyl acetate	ND	ug/m3	1.2	1.61		09/06/12 13:00	141-78-6	
Ethylbenzene	ND	ug/m3	1.4	1.61		09/06/12 13:00	100-41-4	
4-Ethyltoluene	ND	ug/m3	1.6	1.61		09/06/12 13:00	622-96-8	
n-Heptane	ND	ug/m3	1.3	1.61		09/06/12 13:00	142-82-5	
Hexachloro-1,3-butadiene	ND	ug/m3	3.5	1.61		09/06/12 13:00	87-68-3	
n-Hexane	ND	ug/m3	1.2	1.61		09/06/12 13:00	110-54-3	
2-Hexanone	ND	ug/m3	1.3	1.61		09/06/12 13:00	591-78-6	
Methylene Chloride	ND	ug/m3	1.1	1.61		09/06/12 13:00	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/m3	1.3	1.61		09/06/12 13:00	108-10-1	
Methyl-tert-butyl ether	ND	ug/m3	1.2	1.61		09/06/12 13:00	1634-04-4	
Propylene	ND	ug/m3	0.56	1.61		09/06/12 13:00	115-07-1	
Styrene	ND	ug/m3	1.4	1.61		09/06/12 13:00	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/m3	1.1	1.61		09/06/12 13:00	79-34-5	
Tetrachloroethene	ND	ug/m3	1.1	1.61		09/06/12 13:00	127-18-4	
Tetrahydrofuran	ND	ug/m3	0.97	1.61		09/06/12 13:00	109-99-9	
Toluene	ND	ug/m3	1.2	1.61		09/06/12 13:00	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	2.4	1.61		09/06/12 13:00	120-82-1	
1,1,1-Trichloroethane	ND	ug/m3	1.8	1.61		09/06/12 13:00	71-55-6	

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## REPORT OF LABORATORY ANALYSIS

Page 5 of 12

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## ANALYTICAL RESULTS

Project: Ironwood MGP

Pace Project No.: 10203643

Sample: IWMGP-B-D01-082412		Lab ID: 10203643001		Collected: 08/24/12 16:30		Received: 08/28/12 10:20		Matrix: Air	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR		Analytical Method: TO-15							
1,1,2-Trichloroethane		ND	ug/m3	0.89	1.61		09/06/12 13:00	79-00-5	
Trichloroethene		ND	ug/m3	0.89	1.61		09/06/12 13:00	79-01-6	
Trichlorofluoromethane		ND	ug/m3	1.8	1.61		09/06/12 13:00	75-69-4	
1,1,2-Trichlorotrifluoroethane		ND	ug/m3	2.6	1.61		09/06/12 13:00	76-13-1	
1,2,4-Trimethylbenzene		ND	ug/m3	1.6	1.61		09/06/12 13:00	95-63-6	
1,3,5-Trimethylbenzene		ND	ug/m3	1.6	1.61		09/06/12 13:00	108-67-8	
Vinyl acetate		ND	ug/m3	1.2	1.61		09/06/12 13:00	108-05-4	
Vinyl chloride		ND	ug/m3	0.42	1.61		09/06/12 13:00	75-01-4	
m&p-Xylene		ND	ug/m3	2.8	1.61		09/06/12 13:00	179601-23-1	
o-Xylene		ND	ug/m3	1.4	1.61		09/06/12 13:00	95-47-6	

## QUALITY CONTROL DATA

Project: Ironwood MGP

Pace Project No.: 10203643

QC Batch: AIR/15675

Analysis Method: TO-15

QC Batch Method: TO-15

Analysis Description: TO15 MSV AIR Low Level

Associated Lab Samples: 10203643001

METHOD BLANK: 1282110

Matrix: Air

Associated Lab Samples: 10203643001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/m3	ND	1.1	09/06/12 11:34	
1,1,2,2-Tetrachloroethane	ug/m3	ND	0.70	09/06/12 11:34	
1,1,2-Trichloroethane	ug/m3	ND	0.55	09/06/12 11:34	
1,1,2-Trichlorotrifluoroethane	ug/m3	ND	1.6	09/06/12 11:34	
1,1-Dichloroethane	ug/m3	ND	0.82	09/06/12 11:34	
1,1-Dichloroethene	ug/m3	ND	0.81	09/06/12 11:34	
1,2,4-Trichlorobenzene	ug/m3	ND	1.5	09/06/12 11:34	
1,2,4-Trimethylbenzene	ug/m3	ND	1.0	09/06/12 11:34	
1,2-Dibromoethane (EDB)	ug/m3	ND	1.6	09/06/12 11:34	
1,2-Dichlorobenzene	ug/m3	ND	1.2	09/06/12 11:34	
1,2-Dichloroethane	ug/m3	ND	0.41	09/06/12 11:34	
1,2-Dichloropropane	ug/m3	ND	0.94	09/06/12 11:34	
1,3,5-Trimethylbenzene	ug/m3	ND	1.0	09/06/12 11:34	
1,3-Butadiene	ug/m3	ND	0.45	09/06/12 11:34	
1,3-Dichlorobenzene	ug/m3	ND	1.2	09/06/12 11:34	
1,4-Dichlorobenzene	ug/m3	ND	1.2	09/06/12 11:34	
2-Butanone (MEK)	ug/m3	ND	0.60	09/06/12 11:34	
2-Hexanone	ug/m3	ND	0.83	09/06/12 11:34	
4-Ethyltoluene	ug/m3	ND	1.0	09/06/12 11:34	
4-Methyl-2-pentanone (MIBK)	ug/m3	ND	0.83	09/06/12 11:34	
Acetone	ug/m3	ND	0.48	09/06/12 11:34	
Benzene	ug/m3	ND	0.32	09/06/12 11:34	
Bromodichloromethane	ug/m3	ND	1.4	09/06/12 11:34	
Bromoform	ug/m3	ND	2.1	09/06/12 11:34	
Bromomethane	ug/m3	ND	0.79	09/06/12 11:34	
Carbon disulfide	ug/m3	ND	0.63	09/06/12 11:34	
Carbon tetrachloride	ug/m3	ND	0.64	09/06/12 11:34	
Chlorobenzene	ug/m3	ND	0.94	09/06/12 11:34	
Chloroethane	ug/m3	ND	0.54	09/06/12 11:34	
Chloroform	ug/m3	ND	0.99	09/06/12 11:34	
Chloromethane	ug/m3	ND	0.42	09/06/12 11:34	
cis-1,2-Dichloroethene	ug/m3	ND	0.81	09/06/12 11:34	
cis-1,3-Dichloropropene	ug/m3	ND	0.92	09/06/12 11:34	
Cyclohexane	ug/m3	ND	0.70	09/06/12 11:34	
Dibromochloromethane	ug/m3	ND	1.7	09/06/12 11:34	
Dichlorodifluoromethane	ug/m3	ND	1.0	09/06/12 11:34	
Dichlorotetrafluoroethane	ug/m3	ND	1.4	09/06/12 11:34	
Ethyl acetate	ug/m3	ND	0.73	09/06/12 11:34	
Ethylbenzene	ug/m3	ND	0.88	09/06/12 11:34	
Hexachloro-1,3-butadiene	ug/m3	ND	2.2	09/06/12 11:34	
m&p-Xylene	ug/m3	ND	1.8	09/06/12 11:34	
Methyl-tert-butyl ether	ug/m3	ND	0.73	09/06/12 11:34	
Methylene Chloride	ug/m3	ND	0.71	09/06/12 11:34	

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## REPORT OF LABORATORY ANALYSIS

Page 7 of 12

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## QUALITY CONTROL DATA

Project: Ironwood MGP

Pace Project No.: 10203643

METHOD BLANK: 1282110

Matrix: Air

Associated Lab Samples: 10203643001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
n-Heptane	ug/m3	ND	0.83	09/06/12 11:34	
n-Hexane	ug/m3	ND	0.72	09/06/12 11:34	
o-Xylene	ug/m3	ND	0.88	09/06/12 11:34	
Propylene	ug/m3	ND	0.35	09/06/12 11:34	
Styrene	ug/m3	ND	0.87	09/06/12 11:34	
Tetrachloroethene	ug/m3	ND	0.69	09/06/12 11:34	
Tetrahydrofuran	ug/m3	ND	0.60	09/06/12 11:34	
Toluene	ug/m3	ND	0.77	09/06/12 11:34	
trans-1,2-Dichloroethene	ug/m3	ND	0.81	09/06/12 11:34	
trans-1,3-Dichloropropene	ug/m3	ND	0.92	09/06/12 11:34	
Trichloroethene	ug/m3	ND	0.55	09/06/12 11:34	
Trichlorofluoromethane	ug/m3	ND	1.1	09/06/12 11:34	
Vinyl acetate	ug/m3	ND	0.72	09/06/12 11:34	
Vinyl chloride	ug/m3	ND	0.26	09/06/12 11:34	

LABORATORY CONTROL SAMPLE: 1282111

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/m3	55.5	57.8	104	72-129	
1,1,2,2-Tetrachloroethane	ug/m3	69.8	69.6	100	73-131	
1,1,2-Trichloroethane	ug/m3	55.5	52.2	94	71-128	
1,1,2-Trichlorotrifluoroethane	ug/m3	77.9	60.9	78	65-132	
1,1-Dichloroethane	ug/m3	41.2	31.3	76	67-132	
1,1-Dichloroethene	ug/m3	40.3	33.1	82	68-134	
1,2,4-Trichlorobenzene	ug/m3	75.5	94.2	125	48-150	SS
1,2,4-Trimethylbenzene	ug/m3	50	53.1	106	72-127	
1,2-Dibromoethane (EDB)	ug/m3	78.1	86.7	111	75-130	
1,2-Dichlorobenzene	ug/m3	61.2	67.2	110	71-132	
1,2-Dichloroethane	ug/m3	41.2	42.6	104	70-131	
1,2-Dichloropropane	ug/m3	47	48.2	102	73-130	
1,3,5-Trimethylbenzene	ug/m3	50	53.6	107	70-133	
1,3-Butadiene	ug/m3	22.5	20.6	92	69-132	
1,3-Dichlorobenzene	ug/m3	61.2	64.8	106	71-128	
1,4-Dichlorobenzene	ug/m3	61.2	59.7	98	72-131	
2-Butanone (MEK)	ug/m3	30	30.2	101	69-131	
2-Hexanone	ug/m3	41.7	42.2	101	71-134	
4-Ethyltoluene	ug/m3	50	51.9	104	71-129	
4-Methyl-2-pentanone (MIBK)	ug/m3	41.7	42.4	102	69-135	
Acetone	ug/m3	24.2	17.1	71	61-139	
Benzene	ug/m3	32.5	40.5	125	69-134	
Bromodichloromethane	ug/m3	68.2	68.6	101	71-130	
Bromoform	ug/m3	105	118	112	70-130	
Bromomethane	ug/m3	39.5	32.5	82	69-125	
Carbon disulfide	ug/m3	31.7	24.9	79	66-131	SS
Carbon tetrachloride	ug/m3	64	60.0	94	68-128	

Date: 09/12/2012 04:41 PM

## REPORT OF LABORATORY ANALYSIS

Page 8 of 12

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## QUALITY CONTROL DATA

Project: Ironwood MGP

Pace Project No.: 10203643

LABORATORY CONTROL SAMPLE: 1282111

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chlorobenzene	ug/m3	46.8	48.9	105	75-128	
Chloroethane	ug/m3	26.8	19.7	73	66-131	
Chloroform	ug/m3	49.7	47.8	96	68-132	
Chloromethane	ug/m3	21	16.5	79	60-139	
cis-1,2-Dichloroethene	ug/m3	40.3	43.6	108	73-130	
cis-1,3-Dichloropropene	ug/m3	46.2	48.7	106	74-134	
Cyclohexane	ug/m3	35	34.4	98	67-136	
Dibromochloromethane	ug/m3	86.6	97.6	113	69-131	
Dichlorodifluoromethane	ug/m3	50.3	45.6	91	67-131	
Dichlorotetrafluoroethane	ug/m3	71.1	58.9	83	66-130	
Ethyl acetate	ug/m3	36.6	39.1	107	71-131	
Ethylbenzene	ug/m3	44.2	50.4	114	69-139	
Hexachloro-1,3-butadiene	ug/m3	108	163	150	41-150	CH,L3,SS
m&p-Xylene	ug/m3	88.3	84.6	96	66-137	
Methyl-tert-butyl ether	ug/m3	36.7	32.5	89	70-132	
Methylene Chloride	ug/m3	35.3	25.9	73	73-134	
n-Heptane	ug/m3	41.7	46.0	110	70-134	
n-Hexane	ug/m3	35.8	33.6	94	65-133	
o-Xylene	ug/m3	44.2	47.5	108	69-138	
Propylene	ug/m3	17.5	19.4	111	70-134	
Styrene	ug/m3	43.3	47.0	109	72-132	
Tetrachloroethene	ug/m3	69	75.2	109	70-130	
Tetrahydrofuran	ug/m3	30	31.6	105	74-128	
Toluene	ug/m3	38.3	43.7	114	71-132	
trans-1,2-Dichloroethene	ug/m3	40.3	36.8	91	72-128	
trans-1,3-Dichloropropene	ug/m3	46.2	46.7	101	73-130	
Trichloroethene	ug/m3	54.6	61.1	112	72-131	
Trichlorofluoromethane	ug/m3	57.1	41.5	73	66-129	
Vinyl acetate	ug/m3	35.8	31.4	88	71-131	
Vinyl chloride	ug/m3	26	22.4	86	70-131	

SAMPLE DUPLICATE: 1282797

Parameter	Units	10204246001 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1-Trichloroethane	ug/m3	ND	ND		25	
1,1,2,2-Tetrachloroethane	ug/m3	ND	ND		25	
1,1,2-Trichloroethane	ug/m3	ND	ND		25	
1,1,2-Trichlorotrifluoroethane	ug/m3	ND	ND		25	
1,1-Dichloroethane	ug/m3	ND	ND		25	
1,1-Dichloroethene	ug/m3	ND	ND		25	
1,2,4-Trichlorobenzene	ug/m3	ND	ND		25	
1,2,4-Trimethylbenzene	ug/m3	ND	ND		25	
1,2-Dibromoethane (EDB)	ug/m3	ND	ND		25	
1,2-Dichlorobenzene	ug/m3	ND	ND		25	
1,2-Dichloroethane	ug/m3	ND	ND		25	
1,2-Dichloropropane	ug/m3	ND	ND		25	
1,3,5-Trimethylbenzene	ug/m3	ND	ND		25	

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## REPORT OF LABORATORY ANALYSIS

Page 9 of 12

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## QUALITY CONTROL DATA

Project: Ironwood MGP

Pace Project No.: 10203643

SAMPLE DUPLICATE: 1282797

Parameter	Units	10204246001 Result	Dup Result	RPD	Max RPD	Qualifiers
1,3-Butadiene	ug/m3	ND	ND		25	
1,3-Dichlorobenzene	ug/m3	ND	ND		25	
1,4-Dichlorobenzene	ug/m3	ND	ND		25	
2-Butanone (MEK)	ug/m3	2.4	2.3	5	25	
2-Hexanone	ug/m3	ND	ND		25	
4-Ethyltoluene	ug/m3	ND	ND		25	
4-Methyl-2-pentanone (MIBK)	ug/m3	ND	ND		25	
Acetone	ug/m3	8.3	8.3	.2	25	
Benzene	ug/m3	0.57	0.60	4	25	
Bromodichloromethane	ug/m3	ND	ND		25	
Bromoform	ug/m3	ND	ND		25	
Bromomethane	ug/m3	ND	ND		25	
Carbon disulfide	ug/m3	2.5	2.5	3	25	SS
Carbon tetrachloride	ug/m3	ND	ND		25	
Chlorobenzene	ug/m3	ND	ND		25	
Chloroethane	ug/m3	ND	ND		25	
Chloroform	ug/m3	ND	ND		25	
Chloromethane	ug/m3	0.79	0.80	2	25	
cis-1,2-Dichloroethene	ug/m3	ND	ND		25	
cis-1,3-Dichloropropene	ug/m3	ND	ND		25	
Cyclohexane	ug/m3	ND	ND		25	
Dibromochloromethane	ug/m3	ND	ND		25	
Dichlorodifluoromethane	ug/m3	2.7	2.7	3	25	
Dichlorotetrafluoroethane	ug/m3	ND	ND		25	
Ethyl acetate	ug/m3	ND	ND		25	
Ethylbenzene	ug/m3	ND	ND		25	
Hexachloro-1,3-butadiene	ug/m3	ND	ND		25	
m&p-Xylene	ug/m3	1.5	1.5J		25	
Methyl-tert-butyl ether	ug/m3	ND	ND		25	
Methylene Chloride	ug/m3	0.46	.38J		25	
n-Heptane	ug/m3	ND	ND		25	
n-Hexane	ug/m3	1.0	1.0	2	25	
o-Xylene	ug/m3	ND	ND		25	
Propylene	ug/m3	ND	1.0		25	
Styrene	ug/m3	ND	ND		25	
Tetrachloroethene	ug/m3	0.99	0.93	6	25	
Tetrahydrofuran	ug/m3	ND	ND		25	
Toluene	ug/m3	3.1	3.1	1	25	
trans-1,2-Dichloroethene	ug/m3	ND	ND		25	
trans-1,3-Dichloropropene	ug/m3	ND	ND		25	
Trichloroethene	ug/m3	ND	ND		25	
Trichlorofluoromethane	ug/m3	1.2	1.2	2	25	
Vinyl acetate	ug/m3	ND	ND		25	
Vinyl chloride	ug/m3	ND	ND		25	

## QUALIFIERS

Project: Ironwood MGP  
Pace Project No.: 10203643

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### ANALYTE QUALIFIERS

CH	The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased high.
L3	Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples. Results unaffected by high bias.
SS	This analyte did not meet the secondary source verification criteria for the initial calibration. The reported result should be considered an estimated value.



## QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ironwood MGP

Pace Project No.: 10203643

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10203643001	IWMGP-B-D01-082412	TO-15	AIR/15675		



**AIR: CHAIN-OF-CUSTODY / Analytical Request Document** 1003843


The Chain-of-Custody is a **LEGAL DOCUMENT**. All relevant fields must be completed accurately.

[illegible]

ORIGINAL

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414 Air Technical Phone: 612.607.6386

FC046Rev.01, 03Feb2010

	Document Name: Air Sample Condition Upon Receipt	Document Revised: 19Jun2012 Page 1 of 1
	Document No.: F-MN-A-106-rev.04	Issuing Authority: Pace Minnesota Quality Office

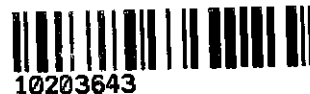
**Air Sample Condition  
Upon Receipt**

**Client Name:**

Weston

**Project #:**

**WO#: 10203643**



**Courier:** ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client  
☐ Commercial ☐ Pace ☐ Other: \_\_\_\_\_

**Tracking Number:** 9557 3845 7179

**Custody Seal on Cooler/Box Present?** ☐ Yes ☒ No **Seals Intact?** ☐ Yes ☒ No

Optional: Proj. Due Date: Proj. Name:

**Packing Material:** ☐ Bubble Wrap ☐ Bubble Bags ☒ Foam ☐ None ☐ Other: \_\_\_\_\_

**Temperature (TO17 and TO13 samples only):** amb

Temp should be above freezing to 6°C

**Thermometer Used:** ☐ 80344042 ☐ 80512447

**Date & Initials of Person Examining Contents:** 8/28/12

**Comments:**

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Media: <u>1 can</u>		11.
Sample Labels Match COC?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	12. <u>tag is blank</u>

**Samples Received:**

Canisters		Flow Controllers		Stand Alone G	
Sample Number	Can ID	Sample Number	Can ID	Sample Number	Can ID
<u>Iw M68-8-301</u>	<u>Pace 1734</u>		<u>FC 0101</u>		

**CLIENT NOTIFICATION/RESOLUTION**

**Field Data Required?** ☐ Yes ☐ No

**Person Contacted:** \_\_\_\_\_

**Date/Time:** \_\_\_\_\_

**Comments/Resolution:** \_\_\_\_\_

**Project Manager Review:** AF

**Date:** 8/28/12

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
ENVIRONMENTAL LABORATORY**

P.O. Box 30270  
Lansing, MI 48909  
TEL: (517) 335-9800  
FAX: (517) 335-9600

09 August 2013

Work Order: 1307264

Price: \$1,355.00

Steve Harrington  
MDEQ-RRD-UP  
420 5th Street  
Gwinn, MI 49841  
RE: IRONWOOD MGP

I certify that the analyses performed by the MDEQ Environmental Laboratory were conducted by methods approved by the U.S. Environmental Protection Agency and other appropriate regulatory agencies.

Sincerely,

George Krisztian  
Laboratory Director





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MDEQ-RRD-UP  
420 5th Street  
Gwinn MI, 49841

Project: IRONWOOD MGP  
Site Code: 27000066  
Project Manager: Steve Harrington

**Reported:**  
08/09/2013

**Analytical Report for Samples**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received	Qualifier
IWMGP-TMW1-W01-071613	1307264-01	Water	07/16/2013	07/19/2013	
IWMGP-MW3-W02-071613	1307264-02	Water	07/16/2013	07/19/2013	
IWMGP-MW2-W03-071613	1307264-03	Water	07/16/2013	07/19/2013	
IWMGP-MW4-W04-071613	1307264-04	Water	07/16/2013	07/19/2013	
IWMGP-TB1	1307264-05	Water	07/02/2013	07/19/2013	

**Notes and Definitions**

Y20	Reporting Limits (RL) raised due to matrix.
Y11	Unidentified peaks present in sample.
Y09	Sample was received and extracted/analyzed past USEPA maximum allowable holding time. Data is estimated.
X	Methods 8260 & 624 are used to analyze volatile organics that have boiling points below 200 °C. 2-Methylnaphthalene & naphthalene have boiling points above 200 °C and are better suited to analysis by methods 8270 & 625 as semivolatile organics.
A08	Result(s) and reporting limits(s) are estimated due to low recovery of batch QC.
A05	Result and reporting limit are estimated due to low continuing calibration standard criteria failure.
A03	Result(s) and reporting limit(s) are estimated due to low matrix spike recovery.
ND	Indicates compound analyzed for but not detected
RL	Reporting Limit
NA	Not Applicable



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**Client ID: IWMGP-TMW1-W01-071613**

**Lab ID: 1307264-01**

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
<b>Organics-Volatiles</b>									
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
96-18-4	1,2,3-Trichloropropane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
526-73-8	1,2,3-Trimethylbenzene	ND	1.0	ug/L	1	07/25/13	B3G2406	8260	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/L	1	07/25/13	B3G2406	8260	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
106-93-4	1,2-Dibromoethane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
591-78-6	2-Hexanone	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
91-57-6	2-Methylnaphthalene	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	A05, A08, X
67-64-1	2-Propanone (acetone)	ND	20	ug/L	1	07/24/13	B3G2406	8260	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
107-13-1	Acrylonitrile	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
71-43-2	Benzene	ND	1.0	ug/L	1	07/25/13	B3G2406	8260	
108-86-1	Bromobenzene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
74-97-5	Bromochloromethane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
75-27-4	Bromodichloromethane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
75-25-2	Bromoform	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
74-83-9	Bromomethane	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	A05
75-15-0	Carbon disulfide	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
56-23-5	Carbon tetrachloride	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
108-90-7	Chlorobenzene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
75-00-3	Chloroethane	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
67-66-3	Chloroform	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
74-87-3	Chloromethane	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	A05, A08
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
10061-01-5	cis-1,3-Dichloropropylene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
110-82-7	Cyclohexane	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	



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**Client ID: IWMGP-TMW1-W01-071613**

**Lab ID: 1307264-01**

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
<b>Organics-Volatiles</b>									
124-48-1	Dibromochloromethane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
74-95-3	Dibromomethane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
75-71-8	Dichlorodifluoromethane	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
60-29-7	Diethyl ether	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
108-20-3	Diisopropyl Ether	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
100-41-4	Ethylbenzene	ND	1.0	ug/L	1	07/25/13	B3G2406	8260	
637-92-3	Ethyltertiarybutylether	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
67-72-1	Hexachloroethane	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
98-82-8	Isopropylbenzene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
1330-20-7	m & p - Xylene	ND	2.0	ug/L	1	07/25/13	B3G2406	8260	
74-88-4	Methyl iodide	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	A05, A08
75-09-2	Methylene chloride	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
1634-04-4	Methyltertiarybutylether	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
91-20-3	Naphthalene	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	X
104-51-8	n-Butylbenzene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
103-65-1	n-Propylbenzene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
95-47-6	o-Xylene	ND	1.0	ug/L	1	07/25/13	B3G2406	8260	
99-87-6	p-Isopropyl toluene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
135-98-8	sec-Butylbenzene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
100-42-5	Styrene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
98-06-6	tert-Butylbenzene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
75-65-0	tertiary Butyl Alcohol	ND	50	ug/L	1	07/24/13	B3G2406	8260	
994-05-8	tertiaryAmylmethylether	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
127-18-4	Tetrachloroethylene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
109-99-9	Tetrahydrofuran	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
108-88-3	Toluene	ND	1.0	ug/L	1	07/25/13	B3G2406	8260	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
10061-02-6	trans-1,3-Dichloropropylene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
110-57-6	trans-1,4-Dichloro-2-butene	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	A05, A08
79-01-6	Trichloroethylene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
75-69-4	Trichlorofluoromethane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
75-01-4	Vinyl chloride	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
Surrogate: Bromofluorobenzene			111 %	85-115		07/24/13	B3G2406	8260	
Surrogate: Dibromofluoromethane			97.4 %	82.7-115		07/24/13	B3G2406	8260	
Surrogate: Toluene-d8			100 %	85-115		07/24/13	B3G2406	8260	



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**Client ID: IWMGP-TMW1-W01-071613**

**Lab ID: 1307264-01**

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
<b>Organics-Semivolatiles</b>									
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	ug/L	1	07/24/13	B3G1924	8270	
95-95-4	2,4,5-Trichlorophenol	ND	5.1	ug/L	1	07/24/13	B3G1924	8270	
88-06-2	2,4,6-Trichlorophenol	ND	4.0	ug/L	1	07/24/13	B3G1924	8270	
120-83-2	2,4-Dichlorophenol	ND	10	ug/L	1	07/24/13	B3G1924	8270	
105-67-9	2,4-Dimethylphenol	ND	5.1	ug/L	1	07/24/13	B3G1924	8270	
51-28-5	2,4-Dinitrophenol	ND	25	ug/L	1	07/24/13	B3G1924	8270	
121-14-2	2,4-Dinitrotoluene	ND	5.1	ug/L	1	07/24/13	B3G1924	8270	
606-20-2	2,6-Dinitrotoluene	ND	5.1	ug/L	1	07/24/13	B3G1924	8270	
95-51-2	2-Chloroaniline	ND	5.1	ug/L	1	07/24/13	B3G1924	8270	
91-58-7	2-Chloronaphthalene	ND	2.0	ug/L	1	07/24/13	B3G1924	8270	
95-57-8	2-Chlorophenol	ND	10	ug/L	1	07/24/13	B3G1924	8270	
534-52-1	2-Methyl-4,6-dinitrophenol	ND	20	ug/L	1	07/24/13	B3G1924	8270	
91-57-6	2-Methylnaphthalene	ND	5.1	ug/L	1	07/24/13	B3G1924	8270	
95-48-7	2-Methylphenol (o-Cresol)	ND	10	ug/L	1	07/24/13	B3G1924	8270	
88-74-4	2-Nitroaniline	ND	20	ug/L	1	07/24/13	B3G1924	8270	
88-75-5	2-Nitrophenol	ND	5.1	ug/L	1	07/24/13	B3G1924	8270	
108394,106445	3 & 4-Methylphenol	ND	20	ug/L	1	07/24/13	B3G1924	8270	
99-09-2	3-Nitroaniline	ND	20	ug/L	1	07/24/13	B3G1924	8270	
101-55-3	4-Bromophenyl phenyl ether	ND	2.0	ug/L	1	07/24/13	B3G1924	8270	
59-50-7	4-Chloro-3-methyl-phenol	ND	5.1	ug/L	1	07/24/13	B3G1924	8270	
106-47-8	4-Chloroaniline	ND	10	ug/L	1	07/24/13	B3G1924	8270	
7005-72-3	4-Chlorodiphenylether	ND	1.0	ug/L	1	07/24/13	B3G1924	8270	
100-01-6	4-Nitroaniline	ND	20	ug/L	1	07/24/13	B3G1924	8270	
100-02-7	4-Nitrophenol	ND	25	ug/L	1	07/24/13	B3G1924	8270	
83-32-9	Acenaphthene	ND	1.0	ug/L	1	07/24/13	B3G1924	8270	
208-96-8	Acenaphthylene	ND	1.0	ug/L	1	07/24/13	B3G1924	8270	
62-53-3	Aniline	ND	4.0	ug/L	1	07/24/13	B3G1924	8270	
120-12-7	Anthracene	ND	1.0	ug/L	1	07/24/13	B3G1924	8270	
103-33-3	Azobenzene	ND	2.0	ug/L	1	07/24/13	B3G1924	8270	
56-55-3	Benz[a]anthracene	ND	1.0	ug/L	1	07/24/13	B3G1924	8270	
50-32-8	Benzo[a]pyrene	ND	1.0	ug/L	1	07/24/13	B3G1924	8270	
205-99-2	Benzo[b]fluoranthene	ND	1.0	ug/L	1	07/24/13	B3G1924	8270	
191-24-2	Benzo[g,h,i]perylene	ND	1.0	ug/L	1	07/24/13	B3G1924	8270	
207-08-9	Benzo[k]fluoranthene	ND	1.0	ug/L	1	07/24/13	B3G1924	8270	
100-51-6	Benzyl Alcohol	ND	51	ug/L	1	07/24/13	B3G1924	8270	
111-91-1	Bis(2-chloroethoxy)methane	ND	2.0	ug/L	1	07/24/13	B3G1924	8270	
111-44-4	Bis(2-chloroethyl)ether	ND	1.0	ug/L	1	07/24/13	B3G1924	8270	
108-60-1	Bis(2-chloroisopropyl)ether	ND	1.0	ug/L	1	07/24/13	B3G1924	8270	
117-81-7	Bis(2-ethylhexyl)phthalate	ND	5.1	ug/L	1	07/24/13	B3G1924	8270	
85-68-7	Butyl benzyl phthalate	ND	5.1	ug/L	1	07/24/13	B3G1924	8270	
86-74-8	Carbazole	ND	5.1	ug/L	1	07/24/13	B3G1924	8270	





**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
ENVIRONMENTAL LABORATORY**

P.O. Box 30270  
Lansing, MI 48909  
TEL: (517) 335-9800  
FAX: (517) 335-9600

**Client ID: IWMGP-TMW1-W01-071613**

**Lab ID: 1307264-01**

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
<b>Organics-Semivolatiles</b>									
218-01-9	Chrysene	ND	1.0	ug/L	1	07/24/13	B3G1924	8270	
53-70-3	Dibenz[a,h]anthracene	ND	2.0	ug/L	1	07/24/13	B3G1924	8270	
132-64-9	Dibenzofuran	ND	4.0	ug/L	1	07/24/13	B3G1924	8270	
84-66-2	Diethylphthalate	ND	5.1	ug/L	1	07/24/13	B3G1924	8270	
131-11-3	Dimethyl phthalate	ND	5.1	ug/L	1	07/24/13	B3G1924	8270	
84-74-2	Di-n-butyl phthalate	ND	5.1	ug/L	1	07/24/13	B3G1924	8270	
117-84-0	Di-n-octyl phthalate	ND	5.1	ug/L	1	07/24/13	B3G1924	8270	
206-44-0	Fluoranthene	ND	1.0	ug/L	1	07/24/13	B3G1924	8270	
86-73-7	Fluorene	ND	1.0	ug/L	1	07/24/13	B3G1924	8270	
118-74-1	Hexachlorobenzene	ND	1.0	ug/L	1	07/24/13	B3G1924	8270	
87-68-3	Hexachlorobutadiene	ND	1.0	ug/L	1	07/24/13	B3G1924	8270	
77-47-4	Hexachlorocyclopentadiene	ND	10	ug/L	1	07/24/13	B3G1924	8270	
67-72-1	Hexachloroethane	ND	1.0	ug/L	1	07/24/13	B3G1924	8270	
193-39-5	Indeno(1,2,3-c,d)pyrene	ND	2.0	ug/L	1	07/24/13	B3G1924	8270	
78-59-1	Isophorone	ND	1.0	ug/L	1	07/24/13	B3G1924	8270	
121-69-7	N,N-dimethylaniline	ND	5.1	ug/L	1	07/24/13	B3G1924	8270	
91-20-3	Naphthalene	ND	1.0	ug/L	1	07/24/13	B3G1924	8270	
98-95-3	Nitrobenzene	ND	2.0	ug/L	1	07/24/13	B3G1924	8270	
100-61-8	N-methylaniline	ND	1.0	ug/L	1	07/24/13	B3G1924	8270	
67-75-9	N-Nitrosodimethylamine	ND	5.1	ug/L	1	07/24/13	B3G1924	8270	
621-64-7	N-Nitrosodi-n-propylamine	ND	2.0	ug/L	1	07/24/13	B3G1924	8270	
86-30-6	N-Nitrosodiphenylamine	ND	2.0	ug/L	1	07/24/13	B3G1924	8270	
87-86-5	Pentachlorophenol	ND	20	ug/L	1	07/24/13	B3G1924	8270	
85-01-8	Phenanthrene	ND	1.0	ug/L	1	07/24/13	B3G1924	8270	
108-95-2	Phenol	ND	5.1	ug/L	1	07/24/13	B3G1924	8270	
129-00-0	<b>Pyrene</b>	<b>1.1</b>	1.0	ug/L	1	07/24/13	B3G1924	8270	
110-86-1	Pyridine	ND	20	ug/L	1	07/24/13	B3G1924	8270	
632-22-4	Tetramethylurea	ND	1.0	ug/L	1	07/24/13	B3G1924	8270	
<i>Surrogate: 2,4,6-Tribromophenol</i>			97.0 %	33.8-115		07/24/13	B3G1924	8270	
<i>Surrogate: 2-Fluorobiphenyl</i>			53.2 %	24.1-115		07/24/13	B3G1924	8270	
<i>Surrogate: 2-Fluorophenol</i>			18.9 %	10-115		07/24/13	B3G1924	8270	
<i>Surrogate: Nitrobenzene-d5</i>			52.1 %	17.8-115		07/24/13	B3G1924	8270	
<i>Surrogate: Phenol-d6</i>			11.6 %	10-115		07/24/13	B3G1924	8270	
<i>Surrogate: p-Terphenyl-d14</i>			91.1 %	41.8-115		07/24/13	B3G1924	8270	



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FAX: (517) 335-9600

**Client ID: IWMGP-MW3-W02-071613**

**Lab ID: 1307264-02**

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
<b>Organics-Volatiles</b>									<b>See note Y11</b>
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
96-18-4	1,2,3-Trichloropropane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
526-73-8	<b>1,2,3-Trimethylbenzene</b>	<b>220</b>	50	ug/L	50	07/25/13	B3G2406	8260	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
95-63-6	<b>1,2,4-Trimethylbenzene</b>	<b>590</b>	50	ug/L	50	07/25/13	B3G2406	8260	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
106-93-4	1,2-Dibromoethane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
108-67-8	<b>1,3,5-Trimethylbenzene</b>	<b>180</b>	1.0	ug/L	1	07/24/13	B3G2406	8260	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
591-78-6	2-Hexanone	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
91-57-6	<b>2-Methylnaphthalene</b>	<b>620</b>	250	ug/L	50	07/25/13	B3G2406	8260	A05, A08, X
67-64-1	2-Propanone (acetone)	ND	20	ug/L	1	07/24/13	B3G2406	8260	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
107-13-1	Acrylonitrile	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
71-43-2	<b>Benzene</b>	<b>470</b>	50	ug/L	50	07/25/13	B3G2406	8260	
108-86-1	Bromobenzene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
74-97-5	Bromochloromethane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
75-27-4	Bromodichloromethane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
75-25-2	Bromoform	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
74-83-9	Bromomethane	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	A05
75-15-0	Carbon disulfide	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
56-23-5	Carbon tetrachloride	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
108-90-7	Chlorobenzene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
75-00-3	Chloroethane	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
67-66-3	Chloroform	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
74-87-3	Chloromethane	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	A05, A08
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
10061-01-5	cis-1,3-Dichloropropylene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
110-82-7	Cyclohexane	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	



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**Client ID: IWMGP-MW3-W02-071613**

**Lab ID: 1307264-02**

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
<b>Organics-Volatiles</b>									<b>See note Y11</b>
124-48-1	Dibromochloromethane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
74-95-3	Dibromomethane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
75-71-8	Dichlorodifluoromethane	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
60-29-7	Diethyl ether	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
108-20-3	Diisopropyl Ether	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
100-41-4	<b>Ethylbenzene</b>	<b>2900</b>	50	ug/L	50	07/25/13	B3G2406	8260	
637-92-3	Ethyltertiarybutylether	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
67-72-1	Hexachloroethane	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
98-82-8	<b>Isopropylbenzene</b>	<b>150</b>	1.0	ug/L	1	07/24/13	B3G2406	8260	
1330-20-7	<b>m &amp; p - Xylene</b>	<b>1300</b>	100	ug/L	50	07/25/13	B3G2406	8260	
74-88-4	Methyl iodide	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	A05, A08
75-09-2	Methylene chloride	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
1634-04-4	Methyltertiarybutylether	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
91-20-3	<b>Naphthalene</b>	<b>9400</b>	250	ug/L	50	07/25/13	B3G2406	8260	X
104-51-8	n-Butylbenzene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
103-65-1	<b>n-Propylbenzene</b>	<b>50</b>	1.0	ug/L	1	07/24/13	B3G2406	8260	
95-47-6	<b>o-Xylene</b>	<b>1000</b>	50	ug/L	50	07/25/13	B3G2406	8260	
99-87-6	<b>p-Isopropyl toluene</b>	<b>19</b>	1.0	ug/L	1	07/24/13	B3G2406	8260	
135-98-8	sec-Butylbenzene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
100-42-5	Styrene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
98-06-6	tert-Butylbenzene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
75-65-0	tertiary Butyl Alcohol	ND	50	ug/L	1	07/24/13	B3G2406	8260	
994-05-8	tertiaryAmylmethylether	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
127-18-4	Tetrachloroethylene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
109-99-9	Tetrahydrofuran	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
108-88-3	<b>Toluene</b>	<b>230</b>	50	ug/L	50	07/25/13	B3G2406	8260	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
10061-02-6	trans-1,3-Dichloropropylene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
110-57-6	trans-1,4-Dichloro-2-butene	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	A05, A08
79-01-6	Trichloroethylene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
75-69-4	Trichlorofluoromethane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
75-01-4	Vinyl chloride	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
<i>Surrogate: Bromofluorobenzene</i>			104 %	85-115		07/24/13	B3G2406	8260	
<i>Surrogate: Dibromofluoromethane</i>			94.9 %	82.7-115		07/24/13	B3G2406	8260	
<i>Surrogate: Toluene-d8</i>			98.4 %	85-115		07/24/13	B3G2406	8260	



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**Client ID: IWMGP-MW3-W02-071613**

**Lab ID: 1307264-02**

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
<b>Organics-Semivolatiles</b>									<b>See note Y20</b>
120-82-1	1,2,4-Trichlorobenzene	ND	20	ug/L	10	07/26/13	B3G1924	8270	
95-95-4	2,4,5-Trichlorophenol	ND	50	ug/L	10	07/26/13	B3G1924	8270	
88-06-2	2,4,6-Trichlorophenol	ND	40	ug/L	10	07/26/13	B3G1924	8270	
120-83-2	2,4-Dichlorophenol	ND	100	ug/L	10	07/26/13	B3G1924	8270	
105-67-9	2,4-Dimethylphenol	ND	50	ug/L	10	07/26/13	B3G1924	8270	
51-28-5	2,4-Dinitrophenol	ND	250	ug/L	10	07/26/13	B3G1924	8270	
121-14-2	2,4-Dinitrotoluene	ND	50	ug/L	10	07/26/13	B3G1924	8270	
606-20-2	2,6-Dinitrotoluene	ND	50	ug/L	10	07/26/13	B3G1924	8270	
95-51-2	2-Chloroaniline	ND	50	ug/L	10	07/26/13	B3G1924	8270	
91-58-7	2-Chloronaphthalene	ND	20	ug/L	10	07/26/13	B3G1924	8270	
95-57-8	2-Chlorophenol	ND	100	ug/L	10	07/26/13	B3G1924	8270	
534-52-1	2-Methyl-4,6-dinitrophenol	ND	200	ug/L	10	07/26/13	B3G1924	8270	
91-57-6	<b>2-Methylnaphthalene</b>	<b>1100</b>	500	ug/L	100	07/29/13	B3G1924	8270	
95-48-7	2-Methylphenol (o-Cresol)	ND	100	ug/L	10	07/26/13	B3G1924	8270	
88-74-4	2-Nitroaniline	ND	200	ug/L	10	07/26/13	B3G1924	8270	
88-75-5	2-Nitrophenol	ND	50	ug/L	10	07/26/13	B3G1924	8270	
108394,106445	3 & 4-Methylphenol	ND	200	ug/L	10	07/26/13	B3G1924	8270	
99-09-2	3-Nitroaniline	ND	200	ug/L	10	07/26/13	B3G1924	8270	
101-55-3	4-Bromophenyl phenyl ether	ND	20	ug/L	10	07/26/13	B3G1924	8270	
59-50-7	4-Chloro-3-methyl-phenol	ND	50	ug/L	10	07/26/13	B3G1924	8270	
106-47-8	4-Chloroaniline	ND	100	ug/L	10	07/26/13	B3G1924	8270	
7005-72-3	4-Chlorodiphenylether	ND	10	ug/L	10	07/26/13	B3G1924	8270	
100-01-6	4-Nitroaniline	ND	200	ug/L	10	07/26/13	B3G1924	8270	
100-02-7	4-Nitrophenol	ND	250	ug/L	10	07/26/13	B3G1924	8270	
83-32-9	<b>Acenaphthene</b>	<b>45</b>	10	ug/L	10	07/26/13	B3G1924	8270	
208-96-8	<b>Acenaphthylene</b>	<b>160</b>	10	ug/L	10	07/26/13	B3G1924	8270	
62-53-3	Aniline	ND	40	ug/L	10	07/26/13	B3G1924	8270	
120-12-7	Anthracene	ND	10	ug/L	10	07/26/13	B3G1924	8270	
103-33-3	Azobenzene	ND	20	ug/L	10	07/26/13	B3G1924	8270	
56-55-3	Benz[a]anthracene	ND	10	ug/L	10	07/26/13	B3G1924	8270	
50-32-8	Benzo[a]pyrene	ND	10	ug/L	10	07/26/13	B3G1924	8270	
205-99-2	Benzo[b]fluoranthene	ND	10	ug/L	10	07/26/13	B3G1924	8270	
191-24-2	Benzo[g,h,i]perylene	ND	10	ug/L	10	07/26/13	B3G1924	8270	
207-08-9	Benzo[k]fluoranthene	ND	10	ug/L	10	07/26/13	B3G1924	8270	
100-51-6	Benzyl Alcohol	ND	500	ug/L	10	07/26/13	B3G1924	8270	
111-91-1	Bis(2-chloroethoxy)methane	ND	20	ug/L	10	07/26/13	B3G1924	8270	
111-44-4	Bis(2-chloroethyl)ether	ND	10	ug/L	10	07/26/13	B3G1924	8270	
108-60-1	Bis(2-chloroisopropyl)ether	ND	10	ug/L	10	07/26/13	B3G1924	8270	
117-81-7	Bis(2-ethylhexyl)phthalate	ND	50	ug/L	10	07/26/13	B3G1924	8270	
85-68-7	Butyl benzyl phthalate	ND	50	ug/L	10	07/26/13	B3G1924	8270	
86-74-8	Carbazole	ND	50	ug/L	10	07/26/13	B3G1924	8270	



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**Client ID: IWMGP-MW3-W02-071613**

**Lab ID: 1307264-02**

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
<b>Organics-Semivolatiles</b>									<b>See note Y20</b>
218-01-9	Chrysene	ND	10	ug/L	10	07/26/13	B3G1924	8270	
53-70-3	Dibenz[a,h]anthracene	ND	20	ug/L	10	07/26/13	B3G1924	8270	
132-64-9	Dibenzofuran	ND	40	ug/L	10	07/26/13	B3G1924	8270	
84-66-2	Diethylphthalate	ND	50	ug/L	10	07/26/13	B3G1924	8270	
131-11-3	Dimethyl phthalate	ND	50	ug/L	10	07/26/13	B3G1924	8270	
84-74-2	Di-n-butyl phthalate	ND	50	ug/L	10	07/26/13	B3G1924	8270	
117-84-0	Di-n-octyl phthalate	ND	50	ug/L	10	07/26/13	B3G1924	8270	
206-44-0	Fluoranthene	ND	10	ug/L	10	07/26/13	B3G1924	8270	
86-73-7	<b>Fluorene</b>	<b>33</b>	10	ug/L	10	07/26/13	B3G1924	8270	
118-74-1	Hexachlorobenzene	ND	10	ug/L	10	07/26/13	B3G1924	8270	
87-68-3	Hexachlorobutadiene	ND	10	ug/L	10	07/26/13	B3G1924	8270	
77-47-4	Hexachlorocyclopentadiene	ND	100	ug/L	10	07/26/13	B3G1924	8270	
67-72-1	Hexachloroethane	ND	10	ug/L	10	07/26/13	B3G1924	8270	
193-39-5	Indeno(1,2,3-c,d)pyrene	ND	20	ug/L	10	07/26/13	B3G1924	8270	
78-59-1	Isophorone	ND	10	ug/L	10	07/26/13	B3G1924	8270	
121-69-7	N,N-dimethylaniline	ND	50	ug/L	10	07/26/13	B3G1924	8270	
91-20-3	<b>Naphthalene</b>	<b>6800</b>	100	ug/L	100	07/29/13	B3G1924	8270	
98-95-3	Nitrobenzene	ND	20	ug/L	10	07/26/13	B3G1924	8270	
100-61-8	N-methylaniline	ND	10	ug/L	10	07/26/13	B3G1924	8270	
67-75-9	N-Nitrosodimethylamine	ND	50	ug/L	10	07/26/13	B3G1924	8270	
621-64-7	N-Nitrosodi-n-propylamine	ND	20	ug/L	10	07/26/13	B3G1924	8270	
86-30-6	N-Nitrosodiphenylamine	ND	20	ug/L	10	07/26/13	B3G1924	8270	
87-86-5	Pentachlorophenol	ND	200	ug/L	10	07/26/13	B3G1924	8270	
85-01-8	<b>Phenanthrene</b>	<b>38</b>	10	ug/L	10	07/26/13	B3G1924	8270	
108-95-2	Phenol	ND	50	ug/L	10	07/26/13	B3G1924	8270	
129-00-0	Pyrene	ND	10	ug/L	10	07/26/13	B3G1924	8270	
110-86-1	Pyridine	ND	200	ug/L	10	07/26/13	B3G1924	8270	
632-22-4	Tetramethylurea	ND	10	ug/L	10	07/26/13	B3G1924	8270	
<i>Surrogate: 2,4,6-Tribromophenol</i>			54.6 %	33.8-115		07/26/13	B3G1924	8270	
<i>Surrogate: 2-Fluorobiphenyl</i>			66.7 %	24.1-115		07/26/13	B3G1924	8270	
<i>Surrogate: 2-Fluorophenol</i>			16.8 %	10-115		07/26/13	B3G1924	8270	
<i>Surrogate: Nitrobenzene-d5</i>			62.7 %	17.8-115		07/26/13	B3G1924	8270	
<i>Surrogate: Phenol-d6</i>			15.5 %	10-115		07/26/13	B3G1924	8270	
<i>Surrogate: p-Terphenyl-d14</i>			70.1 %	41.8-115		07/26/13	B3G1924	8270	





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FAX: (517) 335-9600

**Client ID: IWMGP-MW2-W03-071613**

**Lab ID: 1307264-03**

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
<b>Organics-Volatiles</b>									
630-20-6	1,1,1,2-Tetrachloroethane	ND	50	ug/L	50	07/24/13	B3G2406	8260	
71-55-6	1,1,1-Trichloroethane	ND	50	ug/L	50	07/24/13	B3G2406	8260	
79-34-5	1,1,2,2-Tetrachloroethane	ND	50	ug/L	50	07/24/13	B3G2406	8260	
79-00-5	1,1,2-Trichloroethane	ND	50	ug/L	50	07/24/13	B3G2406	8260	
75-34-3	1,1-Dichloroethane	ND	50	ug/L	50	07/24/13	B3G2406	8260	
75-35-4	1,1-Dichloroethylene	ND	50	ug/L	50	07/24/13	B3G2406	8260	
87-61-6	1,2,3-Trichlorobenzene	ND	250	ug/L	50	07/24/13	B3G2406	8260	
96-18-4	1,2,3-Trichloropropane	ND	50	ug/L	50	07/24/13	B3G2406	8260	
526-73-8	<b>1,2,3-Trimethylbenzene</b>	<b>180</b>	50	ug/L	50	07/24/13	B3G2406	8260	
120-82-1	1,2,4-Trichlorobenzene	ND	250	ug/L	50	07/24/13	B3G2406	8260	
95-63-6	<b>1,2,4-Trimethylbenzene</b>	<b>430</b>	50	ug/L	50	07/24/13	B3G2406	8260	
96-12-8	1,2-Dibromo-3-chloropropane	ND	250	ug/L	50	07/24/13	B3G2406	8260	
106-93-4	1,2-Dibromoethane	ND	50	ug/L	50	07/24/13	B3G2406	8260	
95-50-1	1,2-Dichlorobenzene	ND	50	ug/L	50	07/24/13	B3G2406	8260	
107-06-2	1,2-Dichloroethane	ND	50	ug/L	50	07/24/13	B3G2406	8260	
78-87-5	1,2-Dichloropropane	ND	50	ug/L	50	07/24/13	B3G2406	8260	
108-67-8	<b>1,3,5-Trimethylbenzene</b>	<b>120</b>	50	ug/L	50	07/24/13	B3G2406	8260	
541-73-1	1,3-Dichlorobenzene	ND	50	ug/L	50	07/24/13	B3G2406	8260	
106-46-7	1,4-Dichlorobenzene	ND	50	ug/L	50	07/24/13	B3G2406	8260	
78-93-3	2-Butanone (MEK)	ND	250	ug/L	50	07/24/13	B3G2406	8260	
591-78-6	2-Hexanone	ND	250	ug/L	50	07/24/13	B3G2406	8260	
91-57-6	<b>2-Methylnaphthalene</b>	<b>2700</b>	250	ug/L	50	07/24/13	B3G2406	8260	A05, A08, X
67-64-1	2-Propanone (acetone)	ND	1000	ug/L	50	07/24/13	B3G2406	8260	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	250	ug/L	50	07/24/13	B3G2406	8260	
107-13-1	Acrylonitrile	ND	250	ug/L	50	07/24/13	B3G2406	8260	
71-43-2	<b>Benzene</b>	<b>520</b>	500	ug/L	500	07/25/13	B3G2406	8260	
108-86-1	Bromobenzene	ND	50	ug/L	50	07/24/13	B3G2406	8260	
74-97-5	Bromochloromethane	ND	50	ug/L	50	07/24/13	B3G2406	8260	
75-27-4	Bromodichloromethane	ND	50	ug/L	50	07/24/13	B3G2406	8260	
75-25-2	Bromoform	ND	50	ug/L	50	07/24/13	B3G2406	8260	
74-83-9	Bromomethane	ND	250	ug/L	50	07/24/13	B3G2406	8260	A05
75-15-0	Carbon disulfide	ND	50	ug/L	50	07/24/13	B3G2406	8260	
56-23-5	Carbon tetrachloride	ND	50	ug/L	50	07/24/13	B3G2406	8260	
108-90-7	Chlorobenzene	ND	50	ug/L	50	07/24/13	B3G2406	8260	
75-00-3	Chloroethane	ND	250	ug/L	50	07/24/13	B3G2406	8260	
67-66-3	Chloroform	ND	50	ug/L	50	07/24/13	B3G2406	8260	
74-87-3	Chloromethane	ND	250	ug/L	50	07/24/13	B3G2406	8260	A05, A08
156-59-2	cis-1,2-Dichloroethylene	ND	50	ug/L	50	07/24/13	B3G2406	8260	
10061-01-5	cis-1,3-Dichloropropylene	ND	50	ug/L	50	07/24/13	B3G2406	8260	
110-82-7	Cyclohexane	ND	250	ug/L	50	07/24/13	B3G2406	8260	



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**Client ID: IWMGP-MW2-W03-071613**

**Lab ID: 1307264-03**

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
<b>Organics-Volatiles</b>									
124-48-1	Dibromochloromethane	ND	50	ug/L	50	07/24/13	B3G2406	8260	
74-95-3	Dibromomethane	ND	50	ug/L	50	07/24/13	B3G2406	8260	
75-71-8	Dichlorodifluoromethane	ND	250	ug/L	50	07/24/13	B3G2406	8260	
60-29-7	Diethyl ether	ND	250	ug/L	50	07/24/13	B3G2406	8260	
108-20-3	Diisopropyl Ether	ND	250	ug/L	50	07/24/13	B3G2406	8260	
100-41-4	<b>Ethylbenzene</b>	<b>680</b>	500	ug/L	500	07/25/13	B3G2406	8260	
637-92-3	Ethyltertiarybutylether	ND	250	ug/L	50	07/24/13	B3G2406	8260	
67-72-1	Hexachloroethane	ND	250	ug/L	50	07/24/13	B3G2406	8260	
98-82-8	<b>Isopropylbenzene</b>	<b>58</b>	50	ug/L	50	07/24/13	B3G2406	8260	
1330-20-7	<b>m &amp; p - Xylene</b>	<b>430</b>	100	ug/L	50	07/24/13	B3G2406	8260	
74-88-4	Methyl iodide	ND	50	ug/L	50	07/24/13	B3G2406	8260	A05, A08
75-09-2	Methylene chloride	ND	250	ug/L	50	07/24/13	B3G2406	8260	
1634-04-4	Methyltertiarybutylether	ND	50	ug/L	50	07/24/13	B3G2406	8260	
91-20-3	<b>Naphthalene</b>	<b>6300</b>	2500	ug/L	500	07/25/13	B3G2406	8260	X
104-51-8	n-Butylbenzene	ND	50	ug/L	50	07/24/13	B3G2406	8260	
103-65-1	n-Propylbenzene	ND	50	ug/L	50	07/24/13	B3G2406	8260	
95-47-6	<b>o-Xylene</b>	<b>380</b>	50	ug/L	50	07/24/13	B3G2406	8260	
99-87-6	p-Isopropyl toluene	ND	50	ug/L	50	07/24/13	B3G2406	8260	
135-98-8	sec-Butylbenzene	ND	50	ug/L	50	07/24/13	B3G2406	8260	
100-42-5	Styrene	ND	50	ug/L	50	07/24/13	B3G2406	8260	
98-06-6	tert-Butylbenzene	ND	50	ug/L	50	07/24/13	B3G2406	8260	
75-65-0	tertiary Butyl Alcohol	ND	2500	ug/L	50	07/24/13	B3G2406	8260	
994-05-8	tertiaryAmylmethylether	ND	250	ug/L	50	07/24/13	B3G2406	8260	
127-18-4	Tetrachloroethylene	ND	50	ug/L	50	07/24/13	B3G2406	8260	
109-99-9	Tetrahydrofuran	ND	250	ug/L	50	07/24/13	B3G2406	8260	
108-88-3	<b>Toluene</b>	<b>150</b>	50	ug/L	50	07/24/13	B3G2406	8260	
156-60-5	trans-1,2-Dichloroethylene	ND	50	ug/L	50	07/24/13	B3G2406	8260	
10061-02-6	trans-1,3-Dichloropropylene	ND	50	ug/L	50	07/24/13	B3G2406	8260	
110-57-6	trans-1,4-Dichloro-2-butene	ND	250	ug/L	50	07/24/13	B3G2406	8260	A05, A08
79-01-6	Trichloroethylene	ND	50	ug/L	50	07/24/13	B3G2406	8260	
75-69-4	Trichlorofluoromethane	ND	50	ug/L	50	07/24/13	B3G2406	8260	
75-01-4	Vinyl chloride	ND	50	ug/L	50	07/24/13	B3G2406	8260	
Surrogate: Bromofluorobenzene			110 %	85-115		07/24/13	B3G2406	8260	
Surrogate: Dibromofluoromethane			97.4 %	82.7-115		07/24/13	B3G2406	8260	
Surrogate: Toluene-d8			99.4 %	85-115		07/24/13	B3G2406	8260	



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**Client ID: IWMGP-MW2-W03-071613**

**Lab ID: 1307264-03**

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
<b>Organics-Semivolatiles</b>									<b>See note Y20</b>
120-82-1	1,2,4-Trichlorobenzene	ND	20	ug/L	10	07/26/13	B3G1924	8270	
95-95-4	2,4,5-Trichlorophenol	ND	50	ug/L	10	07/26/13	B3G1924	8270	
88-06-2	2,4,6-Trichlorophenol	ND	40	ug/L	10	07/26/13	B3G1924	8270	
120-83-2	2,4-Dichlorophenol	ND	100	ug/L	10	07/26/13	B3G1924	8270	
105-67-9	2,4-Dimethylphenol	ND	50	ug/L	10	07/26/13	B3G1924	8270	
51-28-5	2,4-Dinitrophenol	ND	250	ug/L	10	07/26/13	B3G1924	8270	
121-14-2	2,4-Dinitrotoluene	ND	50	ug/L	10	07/26/13	B3G1924	8270	
606-20-2	2,6-Dinitrotoluene	ND	50	ug/L	10	07/26/13	B3G1924	8270	
95-51-2	2-Chloroaniline	ND	50	ug/L	10	07/26/13	B3G1924	8270	
91-58-7	2-Chloronaphthalene	ND	20	ug/L	10	07/26/13	B3G1924	8270	
95-57-8	2-Chlorophenol	ND	100	ug/L	10	07/26/13	B3G1924	8270	
534-52-1	2-Methyl-4,6-dinitrophenol	ND	200	ug/L	10	07/26/13	B3G1924	8270	
91-57-6	<b>2-Methylnaphthalene</b>	<b>110</b>	50	ug/L	10	07/26/13	B3G1924	8270	
95-48-7	2-Methylphenol (o-Cresol)	ND	100	ug/L	10	07/26/13	B3G1924	8270	
88-74-4	2-Nitroaniline	ND	200	ug/L	10	07/26/13	B3G1924	8270	
88-75-5	2-Nitrophenol	ND	50	ug/L	10	07/26/13	B3G1924	8270	
108394,106445	3 & 4-Methylphenol	ND	200	ug/L	10	07/26/13	B3G1924	8270	
99-09-2	3-Nitroaniline	ND	200	ug/L	10	07/26/13	B3G1924	8270	
101-55-3	4-Bromophenyl phenyl ether	ND	20	ug/L	10	07/26/13	B3G1924	8270	
59-50-7	4-Chloro-3-methyl-phenol	ND	50	ug/L	10	07/26/13	B3G1924	8270	
106-47-8	4-Chloroaniline	ND	100	ug/L	10	07/26/13	B3G1924	8270	
7005-72-3	4-Chlorodiphenylether	ND	10	ug/L	10	07/26/13	B3G1924	8270	
100-01-6	4-Nitroaniline	ND	200	ug/L	10	07/26/13	B3G1924	8270	
100-02-7	4-Nitrophenol	ND	250	ug/L	10	07/26/13	B3G1924	8270	
83-32-9	<b>Acenaphthene</b>	<b>160</b>	10	ug/L	10	07/26/13	B3G1924	8270	
208-96-8	<b>Acenaphthylene</b>	<b>59</b>	10	ug/L	10	07/26/13	B3G1924	8270	
62-53-3	Aniline	ND	40	ug/L	10	07/26/13	B3G1924	8270	
120-12-7	Anthracene	ND	10	ug/L	10	07/26/13	B3G1924	8270	
103-33-3	Azobenzene	ND	20	ug/L	10	07/26/13	B3G1924	8270	
56-55-3	Benz[a]anthracene	ND	10	ug/L	10	07/26/13	B3G1924	8270	
50-32-8	Benzo[a]pyrene	ND	10	ug/L	10	07/26/13	B3G1924	8270	
205-99-2	Benzo[b]fluoranthene	ND	10	ug/L	10	07/26/13	B3G1924	8270	
191-24-2	Benzo[g,h,i]perylene	ND	10	ug/L	10	07/26/13	B3G1924	8270	
207-08-9	Benzo[k]fluoranthene	ND	10	ug/L	10	07/26/13	B3G1924	8270	
100-51-6	Benzyl Alcohol	ND	500	ug/L	10	07/26/13	B3G1924	8270	
111-91-1	Bis(2-chloroethoxy)methane	ND	20	ug/L	10	07/26/13	B3G1924	8270	
111-44-4	Bis(2-chloroethyl)ether	ND	10	ug/L	10	07/26/13	B3G1924	8270	
108-60-1	Bis(2-chloroisopropyl)ether	ND	10	ug/L	10	07/26/13	B3G1924	8270	
117-81-7	Bis(2-ethylhexyl)phthalate	ND	50	ug/L	10	07/26/13	B3G1924	8270	
85-68-7	Butyl benzyl phthalate	ND	50	ug/L	10	07/26/13	B3G1924	8270	
86-74-8	Carbazole	ND	50	ug/L	10	07/26/13	B3G1924	8270	



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**Client ID: IWMGP-MW2-W03-071613**

**Lab ID: 1307264-03**

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
<b>Organics-Semivolatiles</b>									<b>See note Y20</b>
218-01-9	Chrysene	ND	10	ug/L	10	07/26/13	B3G1924	8270	
53-70-3	Dibenz[a,h]anthracene	ND	20	ug/L	10	07/26/13	B3G1924	8270	
132-64-9	Dibenzofuran	ND	40	ug/L	10	07/26/13	B3G1924	8270	
84-66-2	Diethylphthalate	ND	50	ug/L	10	07/26/13	B3G1924	8270	
131-11-3	Dimethyl phthalate	ND	50	ug/L	10	07/26/13	B3G1924	8270	
84-74-2	Di-n-butyl phthalate	ND	50	ug/L	10	07/26/13	B3G1924	8270	
117-84-0	Di-n-octyl phthalate	ND	50	ug/L	10	07/26/13	B3G1924	8270	
206-44-0	Fluoranthene	ND	10	ug/L	10	07/26/13	B3G1924	8270	
86-73-7	<b>Fluorene</b>	<b>38</b>	10	ug/L	10	07/26/13	B3G1924	8270	
118-74-1	Hexachlorobenzene	ND	10	ug/L	10	07/26/13	B3G1924	8270	
87-68-3	Hexachlorobutadiene	ND	10	ug/L	10	07/26/13	B3G1924	8270	
77-47-4	Hexachlorocyclopentadiene	ND	100	ug/L	10	07/26/13	B3G1924	8270	
67-72-1	Hexachloroethane	ND	10	ug/L	10	07/26/13	B3G1924	8270	
193-39-5	Indeno(1,2,3-c,d)pyrene	ND	20	ug/L	10	07/26/13	B3G1924	8270	
78-59-1	Isophorone	ND	10	ug/L	10	07/26/13	B3G1924	8270	
121-69-7	N,N-dimethylaniline	ND	50	ug/L	10	07/26/13	B3G1924	8270	
91-20-3	<b>Naphthalene</b>	<b>2800</b>	100	ug/L	100	07/29/13	B3G1924	8270	
98-95-3	Nitrobenzene	ND	20	ug/L	10	07/26/13	B3G1924	8270	
100-61-8	N-methylaniline	ND	10	ug/L	10	07/26/13	B3G1924	8270	
67-75-9	N-Nitrosodimethylamine	ND	50	ug/L	10	07/26/13	B3G1924	8270	
621-64-7	N-Nitrosodi-n-propylamine	ND	20	ug/L	10	07/26/13	B3G1924	8270	
86-30-6	N-Nitrosodiphenylamine	ND	20	ug/L	10	07/26/13	B3G1924	8270	
87-86-5	Pentachlorophenol	ND	200	ug/L	10	07/26/13	B3G1924	8270	
85-01-8	<b>Phenanthrene</b>	<b>41</b>	10	ug/L	10	07/26/13	B3G1924	8270	
108-95-2	Phenol	ND	50	ug/L	10	07/26/13	B3G1924	8270	
129-00-0	Pyrene	ND	10	ug/L	10	07/26/13	B3G1924	8270	
110-86-1	Pyridine	ND	200	ug/L	10	07/26/13	B3G1924	8270	
632-22-4	Tetramethylurea	ND	10	ug/L	10	07/26/13	B3G1924	8270	
<i>Surrogate: 2,4,6-Tribromophenol</i>			82.6 %	33.8-115		07/26/13	B3G1924	8270	
<i>Surrogate: 2-Fluorobiphenyl</i>			69.8 %	24.1-115		07/26/13	B3G1924	8270	
<i>Surrogate: 2-Fluorophenol</i>			15.4 %	10-115		07/26/13	B3G1924	8270	
<i>Surrogate: Nitrobenzene-d5</i>			54.9 %	17.8-115		07/26/13	B3G1924	8270	
<i>Surrogate: Phenol-d6</i>			11.3 %	10-115		07/26/13	B3G1924	8270	
<i>Surrogate: p-Terphenyl-d14</i>			69.2 %	41.8-115		07/26/13	B3G1924	8270	



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**Client ID: IWMGP-MW4-W04-071613**

**Lab ID: 1307264-04**

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
<b>Organics-Volatiles</b>									
630-20-6	1,1,1,2-Tetrachloroethane	ND	50	ug/L	50	07/24/13	B3G2406	8260	
71-55-6	1,1,1-Trichloroethane	ND	50	ug/L	50	07/24/13	B3G2406	8260	
79-34-5	1,1,2,2-Tetrachloroethane	ND	50	ug/L	50	07/24/13	B3G2406	8260	
79-00-5	1,1,2-Trichloroethane	ND	50	ug/L	50	07/24/13	B3G2406	8260	
75-34-3	1,1-Dichloroethane	ND	50	ug/L	50	07/24/13	B3G2406	8260	
75-35-4	1,1-Dichloroethylene	ND	50	ug/L	50	07/24/13	B3G2406	8260	
87-61-6	1,2,3-Trichlorobenzene	ND	250	ug/L	50	07/24/13	B3G2406	8260	
96-18-4	1,2,3-Trichloropropane	ND	50	ug/L	50	07/24/13	B3G2406	8260	
526-73-8	<b>1,2,3-Trimethylbenzene</b>	<b>82</b>	50	ug/L	50	07/24/13	B3G2406	8260	
120-82-1	1,2,4-Trichlorobenzene	ND	250	ug/L	50	07/24/13	B3G2406	8260	
95-63-6	<b>1,2,4-Trimethylbenzene</b>	<b>200</b>	50	ug/L	50	07/24/13	B3G2406	8260	
96-12-8	1,2-Dibromo-3-chloropropane	ND	250	ug/L	50	07/24/13	B3G2406	8260	
106-93-4	1,2-Dibromoethane	ND	50	ug/L	50	07/24/13	B3G2406	8260	
95-50-1	1,2-Dichlorobenzene	ND	50	ug/L	50	07/24/13	B3G2406	8260	
107-06-2	1,2-Dichloroethane	ND	50	ug/L	50	07/24/13	B3G2406	8260	
78-87-5	1,2-Dichloropropane	ND	50	ug/L	50	07/24/13	B3G2406	8260	
108-67-8	<b>1,3,5-Trimethylbenzene</b>	<b>52</b>	50	ug/L	50	07/24/13	B3G2406	8260	
541-73-1	1,3-Dichlorobenzene	ND	50	ug/L	50	07/24/13	B3G2406	8260	
106-46-7	1,4-Dichlorobenzene	ND	50	ug/L	50	07/24/13	B3G2406	8260	
78-93-3	2-Butanone (MEK)	ND	250	ug/L	50	07/24/13	B3G2406	8260	
591-78-6	2-Hexanone	ND	250	ug/L	50	07/24/13	B3G2406	8260	
91-57-6	<b>2-Methylnaphthalene</b>	<b>710</b>	250	ug/L	50	07/24/13	B3G2406	8260	A05, A08, X
67-64-1	2-Propanone (acetone)	ND	1000	ug/L	50	07/24/13	B3G2406	8260	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	250	ug/L	50	07/24/13	B3G2406	8260	
107-13-1	Acrylonitrile	ND	250	ug/L	50	07/24/13	B3G2406	8260	
71-43-2	<b>Benzene</b>	<b>290</b>	50	ug/L	50	07/24/13	B3G2406	8260	
108-86-1	Bromobenzene	ND	50	ug/L	50	07/24/13	B3G2406	8260	
74-97-5	Bromochloromethane	ND	50	ug/L	50	07/24/13	B3G2406	8260	
75-27-4	Bromodichloromethane	ND	50	ug/L	50	07/24/13	B3G2406	8260	
75-25-2	Bromoform	ND	50	ug/L	50	07/24/13	B3G2406	8260	
74-83-9	Bromomethane	ND	250	ug/L	50	07/24/13	B3G2406	8260	A05
75-15-0	Carbon disulfide	ND	50	ug/L	50	07/24/13	B3G2406	8260	
56-23-5	Carbon tetrachloride	ND	50	ug/L	50	07/24/13	B3G2406	8260	
108-90-7	Chlorobenzene	ND	50	ug/L	50	07/24/13	B3G2406	8260	
75-00-3	Chloroethane	ND	250	ug/L	50	07/24/13	B3G2406	8260	
67-66-3	Chloroform	ND	50	ug/L	50	07/24/13	B3G2406	8260	
74-87-3	Chloromethane	ND	250	ug/L	50	07/24/13	B3G2406	8260	A05, A08
156-59-2	cis-1,2-Dichloroethylene	ND	50	ug/L	50	07/24/13	B3G2406	8260	
10061-01-5	cis-1,3-Dichloropropylene	ND	50	ug/L	50	07/24/13	B3G2406	8260	
110-82-7	Cyclohexane	ND	250	ug/L	50	07/24/13	B3G2406	8260	





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**Client ID: IWMGP-MW4-W04-071613**

**Lab ID: 1307264-04**

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
<b>Organics-Volatiles</b>									
124-48-1	Dibromochloromethane	ND	50	ug/L	50	07/24/13	B3G2406	8260	
74-95-3	Dibromomethane	ND	50	ug/L	50	07/24/13	B3G2406	8260	
75-71-8	Dichlorodifluoromethane	ND	250	ug/L	50	07/24/13	B3G2406	8260	
60-29-7	Diethyl ether	ND	250	ug/L	50	07/24/13	B3G2406	8260	
108-20-3	Diisopropyl Ether	ND	250	ug/L	50	07/24/13	B3G2406	8260	
100-41-4	<b>Ethylbenzene</b>	<b>630</b>	50	ug/L	50	07/24/13	B3G2406	8260	
637-92-3	Ethyltertiarybutylether	ND	250	ug/L	50	07/24/13	B3G2406	8260	
67-72-1	Hexachloroethane	ND	250	ug/L	50	07/24/13	B3G2406	8260	
98-82-8	Isopropylbenzene	ND	50	ug/L	50	07/24/13	B3G2406	8260	
1330-20-7	<b>m &amp; p - Xylene</b>	<b>170</b>	100	ug/L	50	07/24/13	B3G2406	8260	
74-88-4	Methyl iodide	ND	50	ug/L	50	07/24/13	B3G2406	8260	A05, A08
75-09-2	Methylene chloride	ND	250	ug/L	50	07/24/13	B3G2406	8260	
1634-04-4	Methyltertiarybutylether	ND	50	ug/L	50	07/24/13	B3G2406	8260	
91-20-3	<b>Naphthalene</b>	<b>1500</b>	250	ug/L	50	07/26/13	B3G2406	8260	X
104-51-8	n-Butylbenzene	ND	50	ug/L	50	07/24/13	B3G2406	8260	
103-65-1	n-Propylbenzene	ND	50	ug/L	50	07/24/13	B3G2406	8260	
95-47-6	<b>o-Xylene</b>	<b>290</b>	50	ug/L	50	07/24/13	B3G2406	8260	
99-87-6	p-Isopropyl toluene	ND	50	ug/L	50	07/24/13	B3G2406	8260	
135-98-8	sec-Butylbenzene	ND	50	ug/L	50	07/24/13	B3G2406	8260	
100-42-5	Styrene	ND	50	ug/L	50	07/24/13	B3G2406	8260	
98-06-6	tert-Butylbenzene	ND	50	ug/L	50	07/24/13	B3G2406	8260	
75-65-0	tertiary Butyl Alcohol	ND	2500	ug/L	50	07/24/13	B3G2406	8260	
994-05-8	tertiaryAmylmethylether	ND	250	ug/L	50	07/24/13	B3G2406	8260	
127-18-4	Tetrachloroethylene	ND	50	ug/L	50	07/24/13	B3G2406	8260	
109-99-9	Tetrahydrofuran	ND	250	ug/L	50	07/24/13	B3G2406	8260	
108-88-3	<b>Toluene</b>	<b>84</b>	50	ug/L	50	07/24/13	B3G2406	8260	
156-60-5	trans-1,2-Dichloroethylene	ND	50	ug/L	50	07/24/13	B3G2406	8260	
10061-02-6	trans-1,3-Dichloropropylene	ND	50	ug/L	50	07/24/13	B3G2406	8260	
110-57-6	trans-1,4-Dichloro-2-butene	ND	250	ug/L	50	07/24/13	B3G2406	8260	A05, A08
79-01-6	Trichloroethylene	ND	50	ug/L	50	07/24/13	B3G2406	8260	
75-69-4	Trichlorofluoromethane	ND	50	ug/L	50	07/24/13	B3G2406	8260	
75-01-4	Vinyl chloride	ND	50	ug/L	50	07/24/13	B3G2406	8260	
Surrogate: Bromofluorobenzene			110 %	85-115		07/24/13	B3G2406	8260	
Surrogate: Dibromofluoromethane			95.4 %	82.7-115		07/24/13	B3G2406	8260	
Surrogate: Toluene-d8			99.2 %	85-115		07/24/13	B3G2406	8260	



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**Client ID: IWMGP-MW4-W04-071613**

**Lab ID: 1307264-04**

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
<b>Organics-Semivolatiles</b>									<b>See note Y20</b>
120-82-1	1,2,4-Trichlorobenzene	ND	20	ug/L	10	07/26/13	B3G1924	8270	
95-95-4	2,4,5-Trichlorophenol	ND	51	ug/L	10	07/26/13	B3G1924	8270	
88-06-2	2,4,6-Trichlorophenol	ND	40	ug/L	10	07/26/13	B3G1924	8270	
120-83-2	2,4-Dichlorophenol	ND	100	ug/L	10	07/26/13	B3G1924	8270	
105-67-9	2,4-Dimethylphenol	ND	51	ug/L	10	07/26/13	B3G1924	8270	
51-28-5	2,4-Dinitrophenol	ND	250	ug/L	10	07/26/13	B3G1924	8270	
121-14-2	2,4-Dinitrotoluene	ND	51	ug/L	10	07/26/13	B3G1924	8270	
606-20-2	2,6-Dinitrotoluene	ND	51	ug/L	10	07/26/13	B3G1924	8270	
95-51-2	2-Chloroaniline	ND	51	ug/L	10	07/26/13	B3G1924	8270	
91-58-7	2-Chloronaphthalene	ND	20	ug/L	10	07/26/13	B3G1924	8270	
95-57-8	2-Chlorophenol	ND	100	ug/L	10	07/26/13	B3G1924	8270	
534-52-1	2-Methyl-4,6-dinitrophenol	ND	200	ug/L	10	07/26/13	B3G1924	8270	
91-57-6	<b>2-Methylnaphthalene</b>	<b>130</b>	51	ug/L	10	07/26/13	B3G1924	8270	
95-48-7	2-Methylphenol (o-Cresol)	ND	100	ug/L	10	07/26/13	B3G1924	8270	
88-74-4	2-Nitroaniline	ND	200	ug/L	10	07/26/13	B3G1924	8270	
88-75-5	2-Nitrophenol	ND	51	ug/L	10	07/26/13	B3G1924	8270	
108394,106445	3 & 4-Methylphenol	ND	200	ug/L	10	07/26/13	B3G1924	8270	
99-09-2	3-Nitroaniline	ND	200	ug/L	10	07/26/13	B3G1924	8270	
101-55-3	4-Bromophenyl phenyl ether	ND	20	ug/L	10	07/26/13	B3G1924	8270	
59-50-7	4-Chloro-3-methyl-phenol	ND	51	ug/L	10	07/26/13	B3G1924	8270	
106-47-8	4-Chloroaniline	ND	100	ug/L	10	07/26/13	B3G1924	8270	
7005-72-3	4-Chlorodiphenylether	ND	10	ug/L	10	07/26/13	B3G1924	8270	
100-01-6	4-Nitroaniline	ND	200	ug/L	10	07/26/13	B3G1924	8270	
100-02-7	4-Nitrophenol	ND	250	ug/L	10	07/26/13	B3G1924	8270	
83-32-9	<b>Acenaphthene</b>	<b>80</b>	10	ug/L	10	07/26/13	B3G1924	8270	
208-96-8	<b>Acenaphthylene</b>	<b>89</b>	10	ug/L	10	07/26/13	B3G1924	8270	
62-53-3	Aniline	ND	40	ug/L	10	07/26/13	B3G1924	8270	
120-12-7	<b>Anthracene</b>	<b>14</b>	10	ug/L	10	07/26/13	B3G1924	8270	
103-33-3	Azobenzene	ND	20	ug/L	10	07/26/13	B3G1924	8270	
56-55-3	Benz[a]anthracene	ND	10	ug/L	10	07/26/13	B3G1924	8270	
50-32-8	Benzo[a]pyrene	ND	10	ug/L	10	07/26/13	B3G1924	8270	
205-99-2	Benzo[b]fluoranthene	ND	10	ug/L	10	07/26/13	B3G1924	8270	
191-24-2	Benzo[g,h,i]perylene	ND	10	ug/L	10	07/26/13	B3G1924	8270	
207-08-9	Benzo[k]fluoranthene	ND	10	ug/L	10	07/26/13	B3G1924	8270	
100-51-6	Benzyl Alcohol	ND	510	ug/L	10	07/26/13	B3G1924	8270	
111-91-1	Bis(2-chloroethoxy)methane	ND	20	ug/L	10	07/26/13	B3G1924	8270	
111-44-4	Bis(2-chloroethyl)ether	ND	10	ug/L	10	07/26/13	B3G1924	8270	
108-60-1	Bis(2-chloroisopropyl)ether	ND	10	ug/L	10	07/26/13	B3G1924	8270	
117-81-7	Bis(2-ethylhexyl)phthalate	ND	51	ug/L	10	07/26/13	B3G1924	8270	
85-68-7	Butyl benzyl phthalate	ND	51	ug/L	10	07/26/13	B3G1924	8270	
86-74-8	Carbazole	ND	51	ug/L	10	07/26/13	B3G1924	8270	



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**Client ID: IWMGP-MW4-W04-071613**

**Lab ID: 1307264-04**

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
<b>Organics-Semivolatiles</b>									<b>See note Y20</b>
218-01-9	Chrysene	ND	10	ug/L	10	07/26/13	B3G1924	8270	
53-70-3	Dibenz[a,h]anthracene	ND	20	ug/L	10	07/26/13	B3G1924	8270	
132-64-9	Dibenzofuran	ND	40	ug/L	10	07/26/13	B3G1924	8270	
84-66-2	Diethylphthalate	ND	51	ug/L	10	07/26/13	B3G1924	8270	
131-11-3	Dimethyl phthalate	ND	51	ug/L	10	07/26/13	B3G1924	8270	
84-74-2	Di-n-butyl phthalate	ND	51	ug/L	10	07/26/13	B3G1924	8270	
117-84-0	Di-n-octyl phthalate	ND	51	ug/L	10	07/26/13	B3G1924	8270	
206-44-0	Fluoranthene	ND	10	ug/L	10	07/26/13	B3G1924	8270	
86-73-7	<b>Fluorene</b>	<b>48</b>	10	ug/L	10	07/26/13	B3G1924	8270	
118-74-1	Hexachlorobenzene	ND	10	ug/L	10	07/26/13	B3G1924	8270	
87-68-3	Hexachlorobutadiene	ND	10	ug/L	10	07/26/13	B3G1924	8270	
77-47-4	Hexachlorocyclopentadiene	ND	100	ug/L	10	07/26/13	B3G1924	8270	
67-72-1	Hexachloroethane	ND	10	ug/L	10	07/26/13	B3G1924	8270	
193-39-5	Indeno(1,2,3-c,d)pyrene	ND	20	ug/L	10	07/26/13	B3G1924	8270	
78-59-1	Isophorone	ND	10	ug/L	10	07/26/13	B3G1924	8270	
121-69-7	N,N-dimethylaniline	ND	51	ug/L	10	07/26/13	B3G1924	8270	
91-20-3	<b>Naphthalene</b>	<b>1000</b>	100	ug/L	100	07/29/13	B3G1924	8270	
98-95-3	Nitrobenzene	ND	20	ug/L	10	07/26/13	B3G1924	8270	
100-61-8	N-methylaniline	ND	10	ug/L	10	07/26/13	B3G1924	8270	
67-75-9	N-Nitrosodimethylamine	ND	51	ug/L	10	07/26/13	B3G1924	8270	
621-64-7	N-Nitrosodi-n-propylamine	ND	20	ug/L	10	07/26/13	B3G1924	8270	
86-30-6	N-Nitrosodiphenylamine	ND	20	ug/L	10	07/26/13	B3G1924	8270	
87-86-5	Pentachlorophenol	ND	200	ug/L	10	07/26/13	B3G1924	8270	
85-01-8	<b>Phenanthrene</b>	<b>68</b>	10	ug/L	10	07/26/13	B3G1924	8270	
108-95-2	Phenol	ND	51	ug/L	10	07/26/13	B3G1924	8270	
129-00-0	<b>Pyrene</b>	<b>12</b>	10	ug/L	10	07/26/13	B3G1924	8270	
110-86-1	Pyridine	ND	200	ug/L	10	07/26/13	B3G1924	8270	
632-22-4	Tetramethylurea	ND	10	ug/L	10	07/26/13	B3G1924	8270	
<i>Surrogate: 2,4,6-Tribromophenol</i>			89.6 %	33.8-115		07/26/13	B3G1924	8270	
<i>Surrogate: 2-Fluorobiphenyl</i>			58.7 %	24.1-115		07/26/13	B3G1924	8270	
<i>Surrogate: 2-Fluorophenol</i>			11.9 %	10-115		07/26/13	B3G1924	8270	
<i>Surrogate: Nitrobenzene-d5</i>			52.9 %	17.8-115		07/26/13	B3G1924	8270	
<i>Surrogate: Phenol-d6</i>			16.1 %	10-115		07/26/13	B3G1924	8270	
<i>Surrogate: p-Terphenyl-d14</i>			71.6 %	41.8-115		07/26/13	B3G1924	8270	



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**Client ID: IWMGP-TB1**

**Lab ID: 1307264-05**

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
<b>Organics-Volatiles</b>									<b>See note Y09</b>
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
96-18-4	1,2,3-Trichloropropane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
526-73-8	1,2,3-Trimethylbenzene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
106-93-4	1,2-Dibromoethane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
591-78-6	2-Hexanone	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
91-57-6	2-Methylnaphthalene	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	A05, A08, X
67-64-1	2-Propanone (acetone)	ND	20	ug/L	1	07/24/13	B3G2406	8260	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
107-13-1	Acrylonitrile	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
71-43-2	Benzene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
108-86-1	Bromobenzene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
74-97-5	Bromochloromethane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
75-27-4	Bromodichloromethane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
75-25-2	Bromoform	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
74-83-9	Bromomethane	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	A05
75-15-0	Carbon disulfide	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
56-23-5	Carbon tetrachloride	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
108-90-7	Chlorobenzene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
75-00-3	Chloroethane	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
67-66-3	Chloroform	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
74-87-3	Chloromethane	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	A05, A08
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
10061-01-5	cis-1,3-Dichloropropylene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
110-82-7	Cyclohexane	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	



**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
ENVIRONMENTAL LABORATORY**

P.O. Box 30270  
Lansing, MI 48909  
TEL: (517) 335-9800  
FAX: (517) 335-9600

**Client ID: IWMGP-TB1**

**Lab ID: 1307264-05**

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
<b>Organics-Volatiles</b>									<b>See note Y09</b>
124-48-1	Dibromochloromethane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
74-95-3	Dibromomethane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
75-71-8	Dichlorodifluoromethane	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
60-29-7	Diethyl ether	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
108-20-3	Diisopropyl Ether	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
100-41-4	Ethylbenzene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
637-92-3	Ethyltertiarybutylether	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
67-72-1	Hexachloroethane	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
98-82-8	Isopropylbenzene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
1330-20-7	m & p - Xylene	ND	2.0	ug/L	1	07/24/13	B3G2406	8260	
74-88-4	Methyl iodide	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	A05, A08
75-09-2	Methylene chloride	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
1634-04-4	Methyltertiarybutylether	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
91-20-3	Naphthalene	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	X
104-51-8	n-Butylbenzene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
103-65-1	n-Propylbenzene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
95-47-6	o-Xylene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
99-87-6	p-Isopropyl toluene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
135-98-8	sec-Butylbenzene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
100-42-5	Styrene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
98-06-6	tert-Butylbenzene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
75-65-0	tertiary Butyl Alcohol	ND	50	ug/L	1	07/24/13	B3G2406	8260	
994-05-8	tertiaryAmylmethylether	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
127-18-4	Tetrachloroethylene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
109-99-9	Tetrahydrofuran	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	
108-88-3	Toluene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
10061-02-6	trans-1,3-Dichloropropylene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
110-57-6	trans-1,4-Dichloro-2-butene	ND	5.0	ug/L	1	07/24/13	B3G2406	8260	A05, A08
79-01-6	Trichloroethylene	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
75-69-4	Trichlorofluoromethane	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
75-01-4	Vinyl chloride	ND	1.0	ug/L	1	07/24/13	B3G2406	8260	
Surrogate: Bromofluorobenzene			107 %	85-115		07/24/13	B3G2406	8260	
Surrogate: Dibromofluoromethane			97.9 %	82.7-115		07/24/13	B3G2406	8260	
Surrogate: Toluene-d8			100 %	85-115		07/24/13	B3G2406	8260	



# MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

## ENVIRONMENTAL LABORATORY - ANALYSIS REQUEST SHEET

Page \_\_\_\_ of \_\_\_\_

Lab Work Order Number

Project Name

Matrix

1307264

IRONWOOD MAP SITE

WATER

Site Code/Project Number

AY

CC Email 1 to send additional reports to

Project TAT Days

Sample Collector

27000066

Index

daniel.liebau@westonsolutions.com

STANDARD

D. LIEBAU

Dept-Division-District

PCA

CC Email 2 to send additional reports to

Project Due Date

Sample Collector Phone

RRD - UP

44251

(906) 482-2361

State Project Manager

Phase

CC Email 3 to send additional reports to

Accept Analysis hold time codes: Yes/No

Contract Firm

S. HARRINGTON

30701

NO

WESTON SOLUTIONS

State Project Manager Email

Project

Overflow Lab Choice 1

Contract Firm Primary Contact

DAN LIEBAU

HARRINGTON.S@mi.gov

456936

TRIMATRIX

State Project Manager Phone

Phase

Overflow Lab Choice 2

Primary Contact Phone

(906) 346-8507

02

TRACE

(906) 482-2361

Lab Use Only	Field Sample Identification	Collection Date	Collection Time	Container Count	Comments
1	01 IWMGP-TNW1-W01-071613	7/16/13	1200		
2	02 IWMGP-MW3-W02-071613		1400		
3	03 IWMGP-MW2-W03-071613		1645		
4	04 IWMGP-MW4-W04-071613		1735		
5	05 IWMGP-TB1	7/2/13			
6					
7					
8					
9					
10					

ORGANIC CHEMISTRY	MAD - DISSOLVED METALS	MA - TOTAL METALS	GENERAL CHEMISTRY
<b>VOA - Volatile Organic Acidic</b> Volatiles - Full List 1 2 3 4 5 6 7 8 9 10 BTEX/MTBE/TMB only 1 2 3 4 5 6 7 8 9 10 Chlorinated only 1 2 3 4 5 6 7 8 9 10 GRO 1 2 3 4 5 6 7 8 9 10 1,4 Dioxane 1 2 3 4 5 6 7 8 9 10 <b>METH - Methane, Ethane, Ethene</b> Methane, Ethane, Ethene 1 2 3 4 5 6 7 8 9 10 <b>ON - Pesticides, PCBs</b> Pesticides & PCBs 1 2 3 4 5 6 7 8 9 10 Pesticides only 1 2 3 4 5 6 7 8 9 10 PCBs only 1 2 3 4 5 6 7 8 9 10 Toxaphene 1 2 3 4 5 6 7 8 9 10 Specialty Pesticides 1 2 3 4 5 6 7 8 9 10 <b>BNA - Base Neutral Acids</b> BNAs 1 2 3 4 5 6 7 8 9 10 Benzidines 1 2 3 4 5 6 7 8 9 10 PNAs only 1 2 3 4 5 6 7 8 9 10 BNs only 1 2 3 4 5 6 7 8 9 10 Acids only 1 2 3 4 5 6 7 8 9 10 <b>Organic Specialty Requests</b> Library search-Volatiles 1 2 3 4 5 6 7 8 9 10 Library Search-SemiVols 1 2 3 4 5 6 7 8 9 10 Finger Print 1 2 3 4 5 6 7 8 9 10 DRO / ORO 1 2 3 4 5 6 7 8 9 10	Diss - Silver - Ag 1 2 3 4 5 6 7 8 9 10 Diss - Aluminum - Al 1 2 3 4 5 6 7 8 9 10 Diss - Arsenic - As 1 2 3 4 5 6 7 8 9 10 Diss - Boron - B 1 2 3 4 5 6 7 8 9 10 Diss - Barium - Ba 1 2 3 4 5 6 7 8 9 10 Diss - Beryllium - Be 1 2 3 4 5 6 7 8 9 10 Diss - Cadmium - Cd 1 2 3 4 5 6 7 8 9 10 Diss - Cobalt - Co 1 2 3 4 5 6 7 8 9 10 Diss - Chromium - Cr 1 2 3 4 5 6 7 8 9 10 Diss - Copper - Cu 1 2 3 4 5 6 7 8 9 10 Diss - Iron - Fe 1 2 3 4 5 6 7 8 9 10 Diss - Mercury - Hg 1 2 3 4 5 6 7 8 9 10 Diss - Lithium - Li 1 2 3 4 5 6 7 8 9 10 Diss - Manganese - Mn 1 2 3 4 5 6 7 8 9 10 Diss - Molybdenum - Mo 1 2 3 4 5 6 7 8 9 10 Diss - Nickel - Ni 1 2 3 4 5 6 7 8 9 10 Diss - Lead - Pb 1 2 3 4 5 6 7 8 9 10 Diss - Antimony - Sb 1 2 3 4 5 6 7 8 9 10 Diss - Selenium - Se 1 2 3 4 5 6 7 8 9 10 Diss - Strontium - Sr 1 2 3 4 5 6 7 8 9 10 Diss - Titanium - Ti 1 2 3 4 5 6 7 8 9 10 Diss - Thallium - Tl 1 2 3 4 5 6 7 8 9 10 Diss - Vanadium - V 1 2 3 4 5 6 7 8 9 10 Diss - Zinc - Zn 1 2 3 4 5 6 7 8 9 10 Diss - Calcium - Ca 1 2 3 4 5 6 7 8 9 10 Diss - Potassium - K 1 2 3 4 5 6 7 8 9 10 Diss - Magnesium - Mg 1 2 3 4 5 6 7 8 9 10 Diss - Sodium - Na 1 2 3 4 5 6 7 8 9 10 Diss - Hardness - Ca, Mg 1 2 3 4 5 6 7 8 9 10 <b>MD - Metals Dissolved</b> Lab Filtration 1 2 3 4 5 6 7 8 9 10	Silver - Ag 1 2 3 4 5 6 7 8 9 10 Aluminum - Al 1 2 3 4 5 6 7 8 9 10 Arsenic - As 1 2 3 4 5 6 7 8 9 10 Boron - B 1 2 3 4 5 6 7 8 9 10 Barium - Ba 1 2 3 4 5 6 7 8 9 10 Beryllium - Be 1 2 3 4 5 6 7 8 9 10 Cadmium - Cd 1 2 3 4 5 6 7 8 9 10 Cobalt - Co 1 2 3 4 5 6 7 8 9 10 Chromium - Cr 1 2 3 4 5 6 7 8 9 10 Copper - Cu 1 2 3 4 5 6 7 8 9 10 Iron - Fe 1 2 3 4 5 6 7 8 9 10 Mercury - Hg 1 2 3 4 5 6 7 8 9 10 Lithium - Li 1 2 3 4 5 6 7 8 9 10 Manganese - Mn 1 2 3 4 5 6 7 8 9 10 Molybdenum - Mo 1 2 3 4 5 6 7 8 9 10 Nickel - Ni 1 2 3 4 5 6 7 8 9 10 Lead - Pb 1 2 3 4 5 6 7 8 9 10 Antimony - Sb 1 2 3 4 5 6 7 8 9 10 Selenium - Se 1 2 3 4 5 6 7 8 9 10 Strontium - Sr 1 2 3 4 5 6 7 8 9 10 Titanium - Ti 1 2 3 4 5 6 7 8 9 10 Thallium - Tl 1 2 3 4 5 6 7 8 9 10 Vanadium - V 1 2 3 4 5 6 7 8 9 10 Zinc - Zn 1 2 3 4 5 6 7 8 9 10 Calcium - Ca 1 2 3 4 5 6 7 8 9 10 Potassium - K 1 2 3 4 5 6 7 8 9 10 Magnesium - Mg 1 2 3 4 5 6 7 8 9 10 Sodium - Na 1 2 3 4 5 6 7 8 9 10 Hardness - Ca, Mg 1 2 3 4 5 6 7 8 9 10 <b>LHG - Low Level Mercury</b> Mercury Low Level - Hg 1 2 3 4 5 6 7 8 9 10	<b>GB - General Basic</b> Total Cyanide - CN 1 2 3 4 5 6 7 8 9 10 Amenable Cyanide - CN 1 2 3 4 5 6 7 8 9 10 <b>GCN - General Cyanide</b> Available Cyanide - CN 1 2 3 4 5 6 7 8 9 10 <b>CA - Chlorophyll</b> Chlorophyll 1 2 3 4 5 6 7 8 9 10 <b>GN - General Chemistry Neutral</b> Ortho Phosphate - OP 1 2 3 4 5 6 7 8 9 10 Nitrite - NO <sub>2</sub> 1 2 3 4 5 6 7 8 9 10 Nitrate - NO <sub>3</sub> (Calc.) 1 2 3 4 5 6 7 8 9 10 Suspended Solids - SS 1 2 3 4 5 6 7 8 9 10 Dissolved Solids - TDS 1 2 3 4 5 6 7 8 9 10 Turbidity 1 2 3 4 5 6 7 8 9 10 <b>MN - Inorganic Matrix Neutral</b> Total Alkalinity 1 2 3 4 5 6 7 8 9 10 Bicarb/Carb Alkalinity 1 2 3 4 5 6 7 8 9 10 (Includes Total Alkalinity) Chloride - Cl 1 2 3 4 5 6 7 8 9 10 Sulfate - SO <sub>4</sub> 1 2 3 4 5 6 7 8 9 10 Chromium 6 - Cr <sup>6+</sup> 1 2 3 4 5 6 7 8 9 10 Conductivity 1 2 3 4 5 6 7 8 9 10 pH 1 2 3 4 5 6 7 8 9 10 <b>GA - General Chemistry Acidic</b> Chem Oxyg Dem - COD 1 2 3 4 5 6 7 8 9 10 Diss Org Carbon - DOC 1 2 3 4 5 6 7 8 9 10 Total Org Carbon - TOC 1 2 3 4 5 6 7 8 9 10 Ammonia - NH <sub>3</sub> 1 2 3 4 5 6 7 8 9 10 Nitrate/Nitrite - NO <sub>3</sub> /NO <sub>2</sub> 1 2 3 4 5 6 7 8 9 10 Kjeldahl Nitrogen - KN 1 2 3 4 5 6 7 8 9 10 Total Phosphorus - TP 1 2 3 4 5 6 7 8 9 10

Chain of Custody	Relinquished by	Received By	Date / Time
Print Name & Org.	DANIEL LIEBAU/WESTON SOLUTIONS	FEDEX	7/18/13 - 1500
Signature:			
Print Name & Org.	FEDEX	DeLuss Smith	7/19/13 1055
Signature:	8667 3845 7568		
Print Name & Org.			
Signature:			

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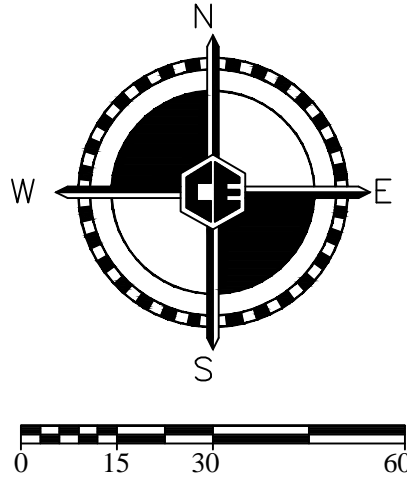
**ATTACHMENT F**  
**FINAL SURVEY**

---

PREPARED FOR:  
LATA-KEMRON Remediation, LLC  
2424 Louisiana Boulevard NE  
Suite 400  
Albuquerque, NM 87100

**PLAT OF SURVEY  
IRONWOOD MGP SITE**

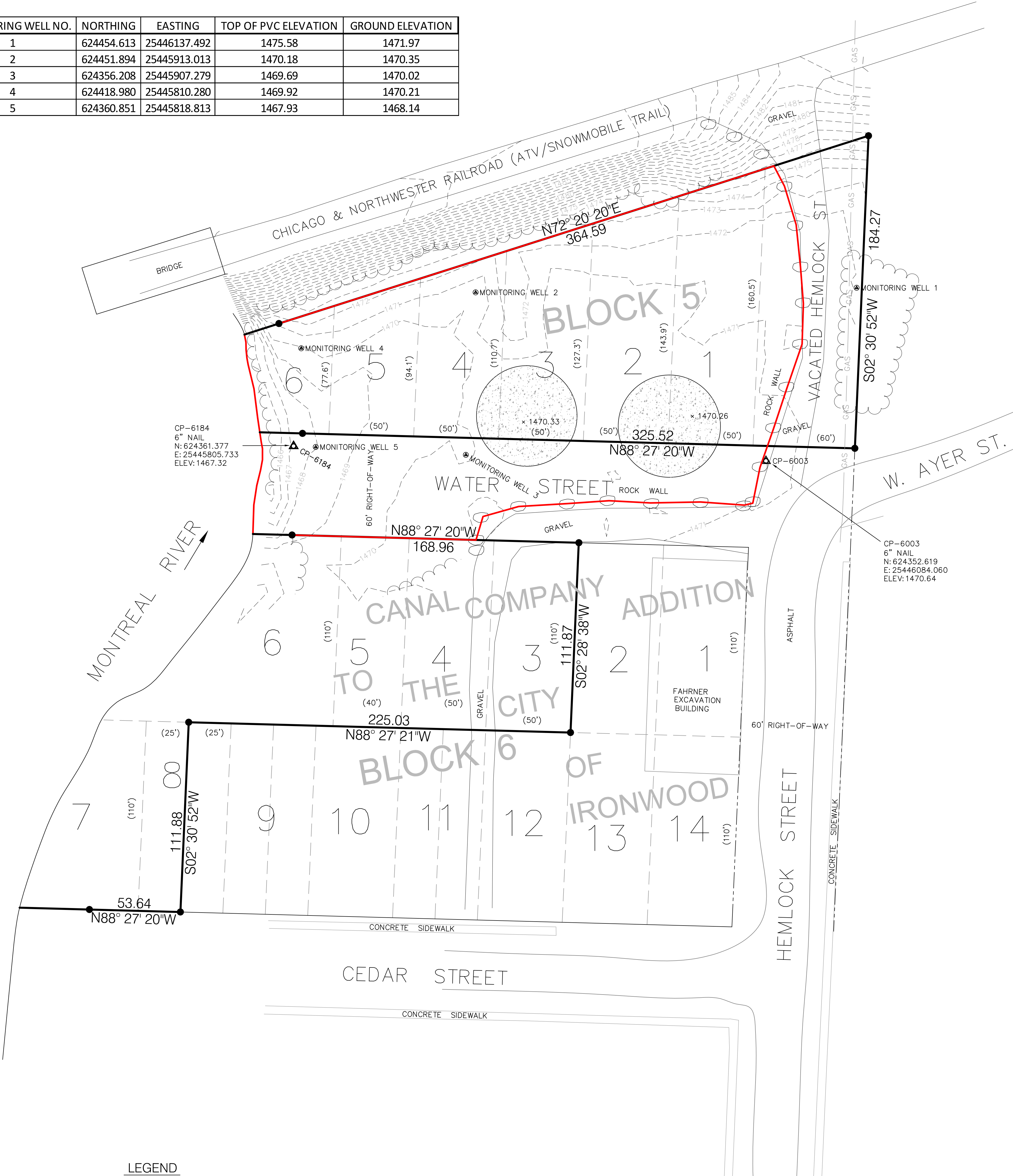
LOTS 1-6, BLOCK 5 AND LOTS 3-7 AND THE WEST  
HALF OF LOT 8, IN BLOCK 6, ALL IN THE CANAL  
COMPANY'S ADDITION TO THE CITY OF IRONWOOD,  
IN THE SE1/4-SE1/4, SECTION 21,  
TOWNSHIP 47 NORTH, RANGE 47 WEST,  
CITY OF IRONWOOD, GOGEBIC COUNTY, MICHIGAN.



-HORIZONTAL DATUM BASED ON MICHIGAN  
STATE PLANE COORDINATES, NORTH ZONE.  
-VERTICAL DATUM BASED ON NAVD88.

- NOTES:
1. RIGHT-OF-WAY OF WATER STREET HAS NOT BEEN VACATED PER CITY OF IRONWOOD.
  2. NO EASEMENT ON RECORD FOR THE GAS LINE ALONG EAST PROPERTY LINE PER XCEL ENERGY. FRANCHISE AGREEMENT TO BE LOCATED IN THE STREET RIGHT-OF-WAY (NOW VACATED).

MONITORING WELL NO.	NORTHING	EASTING	TOP OF PVC ELEVATION	GROUND ELEVATION
1	624454.613	25446137.492	1475.58	1471.97
2	624451.894	25445913.013	1470.18	1470.35
3	624356.208	25445907.279	1469.69	1470.02
4	624418.980	25445810.280	1469.92	1470.21
5	624360.851	25445818.813	1467.93	1468.14



**LEGEND**


- = SET 5/8" REBAR, UNLESS OTHERWISE NOTED.
- x 1470.33 = SPOT ELEVATION
- = CONCRETE
- = ROCK WALL
- - - = LOT LINE
- - - = RIGHT-OF-WAY LINE
- ~ ~ ~ = TREE LINE
- = PROPERTY OWNERSHIP LINE
- = RESTRICTED USE BOUNDARY
- (50') = PLATTED LOT DIMENSION
- ⊙ = MONITORING WELL
- Δ = CONTROL POINT

**CERTIFICATE OF SURVEY**

I HEREBY CERTIFY THAT SAID SURVEY AND THE ABOVE MAP WERE MADE IN ACCORDANCE WITH ACCEPTABLE PROFESSIONAL STANDARDS AND THAT THE INFORMATION CONTAINED THEREON IS, TO THE BEST OF MY KNOWLEDGE, INFORMATION AND BELIEF, A TRUE AND ACCURATE REPRESENTATION THEREOF.

RONALD K. JACOBSON, P.S. NO. 46671 7/25/2013

NOTE: ALL DIMENSIONS ARE IN INTERNATIONAL FEET.

<p>DRAWN BY: A. MCRAE DATE: 7/25/2013 FB# 474 SHEET 1 OF 1</p>	<p><b>COLEMAN ENGINEERING COMPANY</b> ENGINEERING-SURVEYING-GEOTECHNICAL 200 East Ayer Street Ironwood, MI 49938 Phone: (906) 932-5048 Fax: (906) 932-3213 www.coleman-engineering.com</p>	<p> JOB # SI-13269</p>
<p>© 2013 BY COLEMAN ENGINEERING COMPANY</p>		

---

**ATTACHMENT G**  
**RESTRICTIVE COVENANT**

---



STATE OF MICHIGAN - GOGEBIC COUNTY  
RECORDED  
GERRY R. PELISSERO - REGISTER OF DEEDS  
09/23/2013 12:00:59 PM

\$56.00 RECEIPT# 6546, STATION  
EASEMENT



LIBER 561

PAGE 80

**~~DECLARATION OF RESTRICTIVE COVENANT AND~~  
GRANT OF ENVIRONMENTAL PROTECTION EASEMENT**

This transfer is exempt from County and State transfer taxes pursuant to MCL 207.505(a) and MCL 207.526(a), respectively.

**Superfund Site: Ironwood Manufactured Gas Plant Site, Gogebic County, Michigan  
MDEQ Site ID No. 27000066  
U.S. EPA Site No. B5ZC**

This Declaration of Restrictive Covenant and Grant of Environmental Protection Easement ("Restrictive Covenant and Easement") is made on 9/19/13 by the City of Ironwood, the Grantor, whose address is 213 South Marquette Street, Ironwood, Michigan 49938 for the benefit of the Grantee, the Michigan Department of Environmental Quality ("MDEQ"), whose address is P.O. Box 30473, Lansing, Michigan 48909-7926.

**RECITALS**

- i. The Grantor is the title holder of the real property located in Gogebic County, Michigan and legally described in Exhibit 1 attached hereto ("Property").
- ii. The purpose of this Restrictive Covenant and Easement is to create restrictions that run with the land in the Grantor's real property rights; to protect the public health, safety, and welfare, and the environment; to prohibit or restrict activities that could result in unacceptable exposure to environmental contamination present at the Property; and to grant access to the Grantee, the United States Environmental Protection Agency ("U.S. EPA") as a Third Party Beneficiary, and either agency's representatives to monitor and conduct Response Activities.
- iii. An Action Memorandum dated August 9, 2012, has been issued by the U.S. EPA for the purpose of carrying out the Response Activities selected to address environmental contamination at the Site. The Response Activities summarized below are more fully described in the Action Memorandum and are being implemented by the U.S. EPA.
- iv. The Property is associated with the Ironwood Manufactured Gas Plant Superfund Site (the "Site"), MDEQ Site ID No. 27000066. Hazardous substances, including volatile organic



compounds (VOCs), semivolatile organic compounds (SVOCs) including polyaromatic hydrocarbons and inorganic compounds, have been released and/or disposed of on the Property.

The Site is a facility as that term is defined in Section 101(9) of the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. Section 9601 *et seq.* ("CERCLA"); and Section 20101(1)(s) of Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, MCL 324.20101 *et seq.* ("NREPA").

v. At the time of recording this Restrictive Covenant and Easement, the U.S. EPA and the MDEQ have determined that the hazardous substances at the Property present a threat to human health through direct contact to subsurface soils and soils in the saturated zone that contain coal tar related materials with levels of inorganic, VOCs and SVOCs that exceed applicable Michigan Department of Environmental Quality's Part 201 Criteria; and that the land use and resource use restrictions set forth below are necessary to prevent unacceptable exposures.

vi. The restrictions contained in this Restrictive Covenant and Easement are based upon information available to the U.S. EPA and the MDEQ at the time the Action Memorandum was issued. Failure of the Response Activities to achieve and maintain the criteria, exposure controls, and requirements specified in the Action Memorandum; future changes in the environmental condition of the Property or changes in the applicable cleanup criteria; the discovery of environmental conditions at the Property that were not accounted for in the Action Memorandum, regardless of the date of the release of hazardous substances contributing to those environmental conditions; or the use of the Property in a manner inconsistent with the restrictions described herein, may result in this Restrictive Covenant and Easement not being protective of public health, safety, and welfare, and the environment. Information pertaining to the environmental conditions at the Property and Response Activities undertaken at the Site is on file with the U.S. EPA and the MDEQ Remediation and Redevelopment Division.

vii. The MDEQ and U.S. EPA recommend that prospective purchasers or users of the Property undertake appropriate due diligence prior to acquiring or using this Property, and undertake appropriate actions to comply with the applicable requirements of Section 20107a of the NREPA.

### **SUMMARY OF RESPONSE ACTIVITIES**

Hazardous substances including VOCs, SVOCs, arsenic, cyanide and other inorganic substances from gas manufacturing activities were released and/or disposed of on the Property. Prior to the recording of this Restrictive Covenant and Easement, EPA and the owner took response activities to excavate and remove some of the hazardous substances at the Property; however, contamination remains on the Property and is present beginning approximately three feet below ground surface (bgs). The portion of the Property known to be contaminated is set forth in the survey in Exhibit 2. A barrier consisting of at least three feet of clean soil and vegetation has been placed above the contamination, to prevent direct contact with remaining impacted soils and tar-like materials.

### **DEFINITIONS**

"Grantee" shall mean the MDEQ, its successor entities, and those persons or entities acting on its behalf;

"Grantor" shall mean the title holder of the Property at the time this Restrictive Covenant and Easement is executed or any future title holder of the Property or some relevant sub-portion



of the Property;

"MDEQ" shall mean the Michigan Department of Environmental Quality, its successor entities, and those persons or entities acting on its behalf;

"NREPA" shall mean the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, MCL 324.101 *et seq.*;

"Part 201" shall mean Part 201, Environmental Remediation, of the NREPA, MCL 324.20101 *et seq.*;

"Property" shall mean the real property legally described in Exhibit 1;

"Response Activities" shall mean, consistent with Section 101(25) of CERCLA, 42 U.S.C. Section 9601(25), such actions as have been or may be necessary to conduct any removal, remedy or remedial action, as those terms are defined in Sections 101(23) and 101(24) of CERCLA, 42 U.S.C. Sections 9601(23) and 9601(24), on the Property and/or at the Site, including enforcement activities related thereto;

"Site" shall mean the Ironwood Manufactured Gas Plant removal site;

"U.S. EPA" shall mean the United States Environmental Protection Agency, its successor entities and those persons or entities acting on its behalf; and

All other terms used in this document which are defined in Part 3, Definitions, of the NREPA; Part 201; or the Part 201 Administrative Rules ("Part 201 Rules"), 2002 Michigan Register 24, effective December 21, 2002, shall have the same meaning in this document as in Parts 3 and 201 of the NREPA and the Part 201 Rules, as of the date of execution of this Restrictive Covenant and Easement.

#### **NOW THEREFORE,**

For valuable consideration of less than \$100.00, the receipt of which is hereby acknowledged, the Grantor, on behalf of itself, its successors and assigns hereby covenants and declares that the Property shall be subject to the restrictions set forth below, for the benefit of the Grantee, and grants and conveys to the Grantee, and its assigns and representatives, the perpetual right to enforce said restrictions. The Grantor further, on behalf of itself, its successors and assigns does grant and convey to the Grantee and its representatives an environmental protection easement of the nature, character, and purposes set forth below with respect to the Property, and the right to enforce said easement.

**1. Restrictions on Land Use:** The Grantor shall

(a) Prohibit all residential uses of the Property;

(b) Prohibit indoor use on the Property;

(c) The Property may be used for recreational purposes, subject to compliance with all restrictions contained in this document that are necessary to protect the effectiveness and integrity of the Action Memorandum and to prevent unacceptable exposures to the subsurface contamination left at the Property.



2. **Restrictions on Activity:** The Grantor shall:

(a) Prohibit activities that cause existing contamination to migrate beyond the boundaries of the Property, increase the cost of Response Activities, or otherwise exacerbate the existing contamination located on the Property. The term "exacerbation" is more specifically defined in Section 20101(1)(r) of the NREPA, MCL 324.20101(1)(r);

(b) Prohibit and prevent use of the Property in a manner that may interfere with Response Activities at the Property, including interim response, removal action, remedial action, operation and maintenance, monitoring, or other measures necessary to assure the effectiveness and integrity of the response action;

(c) Prohibit excavation, removal, damage or other interference with the clean soil cover depicted in Exhibit 2, which goes to a depth of three feet bgs on the Property unless conducted pursuant to a U.S. EPA or MDEQ approved plan;

(d) Maintain the elevation and contours of the Property set forth in the survey in Exhibit 2;

(e) Prohibit excavation and modification to the shoreline along the Property boundary along the Montreal River unless conducted pursuant to an U.S. EPA or MDEQ approved plan;

(f) Prohibit any excavation or other activities involving disturbance of soil or other materials below 1472 feet Above Mean Sea Level (AMSL) on the Property unless conducted pursuant to a U.S. EPA or MDEQ approved plan;

(g) Prohibit the construction of and use of wells or other devices on the Property to extract groundwater for consumption, irrigation, or any other use, except for wells and devices that are necessary for Response Activities or testing and monitoring groundwater contamination levels;

(h) Prohibit construction of buildings and/or enclosed structures on the Property and prohibit use of any buildings and/or enclosed structures. This subparagraph does not prohibit construction or use of open air structures;

(i) Prohibit any activity that disturbs the concrete pads identified in Exhibit 2 unless such activity is conducted in association with appropriate soil characterization and in compliance with applicable state and federal environmental, health, and safety laws and regulations including, but not necessarily limited to, the use of appropriate personal protective equipment;

(j) Prohibit excavation, removal, damage or other interference with existing monitoring wells on the property identified in Exhibit 2;

3. **Permanent Marker:**

The Grantor shall allow the installation of the permanent marker that has been approved by the U.S. EPA and/or the MDEQ within the Property boundaries. The permanent marker is generally depicted in Exhibit 3. The Grantor shall not remove, cover, obscure, or otherwise alter or interfere with any permanent markers placed on the Property at the location generally depicted in Exhibit 3. The Grantor shall keep vegetation and other materials clear of any permanent markers to assure that the markers are readily visible.



4. **Management of Contaminated Soil, Media, and Debris:** The Grantor shall manage all soils, media and/or debris located on the Property in accordance with the applicable requirements of Section 20120c of Part 201, MCL 324.20120c and Part 111, Hazardous Waste Management, of the NREPA, MCL 324.11101 *et seq.*; the Resource Conservation and Recovery Act, 42 U.S.C. Section 6901 *et seq.*; the administrative rules promulgated thereunder; and all other relevant state and federal laws and regulations. The Grantor shall repair and maintain the elevation and contours of the Property set forth in the survey in Exhibit 2.

5. **Access:** The Grantor grants the MDEQ and its representatives the right to enter the Property at reasonable times for the purpose of determining and monitoring compliance with the Action Memorandum and with this Restrictive Covenant and Easement, including the right to take samples, inspect the operation of the Response Activities, and, inspect any records relating thereto; and to perform any actions necessary to maintain compliance with Part 201 and the Action Memorandum.

Nothing in this Restrictive Covenant and Easement shall limit or otherwise affect the MDEQ's right of entry and access, or authorities to take Response Activities as defined in this Restrictive Covenant and Easement, as well as in NREPA, and any successor statutory provisions, or other state or federal law.

6. **Term:** This Restrictive Covenant and Easement shall run with the land and shall be binding on the Grantor, including persons as set forth in Paragraph 13(e), Successors.

7. **Third Party Beneficiary:** The Grantor, on behalf of itself and its successors, transferees, and assigns, hereby agrees that the United States, acting by and through the U.S. EPA, its successors and assigns, shall be a third party beneficiary ("Third Party Beneficiary") of all the benefits and rights set out in the restrictions, covenants, easements, exceptions, notifications, conditions, and agreements herein, and that the Third Party Beneficiary shall have the right to enforce the restrictions described herein as if it was a party hereto. No other rights in third parties are intended by this Restrictive Covenant and Easement, and no other person or entity shall have any rights or authorities hereunder to enforce these restrictions, terms, conditions, or obligations beyond the Grantor, the MDEQ, their successors, assigns, and the Third Party Beneficiary.

8. **Enforcement:** The State of Michigan, through the MDEQ; and the United States of America, through the U.S. EPA as a Third Party Beneficiary, may enforce the restrictions and grant of easement set forth in this Restrictive Covenant and Easement by legal action in a court of competent jurisdiction.

9. **U.S. EPA Entry, Access, and Response Authority:** Nothing in this Restrictive Covenant and Easement shall limit or otherwise affect the U.S. EPA's right of entry and access, or authority to undertake Response Activities as defined in this Restrictive Covenant and Easement, as well as in CERCLA, the National Contingency Plan, 40 Code of Federal Regulations Part 300, and any successor statutory provisions, or other state or federal law. The Grantor consents to officers, employees, contractors, and authorized representatives of the U.S. EPA entering and having continued access to this Property for the purposes described in Paragraph 5, above.

10. **Modification/Release/Rescission:** The Grantor may request in writing to the U.S. EPA and the MDEQ, at the addresses provided in Paragraph 12, below, modifications to, or release or rescission of, this Restrictive Covenant and Easement. This Restrictive Covenant and Easement may be modified, released, or rescinded only with the written approval of the U.S. EPA and the MDEQ. Any approved modification to, or release or rescission of, this Restrictive Covenant and



Easement shall be filed with the appropriate county Register of Deeds by the Grantor and a certified copy shall be returned to the MDEQ and the U.S. EPA at the addresses provided in Paragraph 12, below.

11. **Transfer of Interest:** The Grantor shall provide notice at the addresses provided in this document to the MDEQ and to the U.S. EPA of the Grantor's intent to transfer any interest in the Property, or any portion thereof, at least fourteen (14) business days prior to consummating the conveyance. A conveyance of title, easement, or other interest in the Property shall not be consummated by the Grantor without adequate and complete provision for compliance with the terms and conditions of this Restrictive Covenant and Easement and the applicable provisions of Section 20116 of the NREPA. The Grantor shall include in any instrument conveying any interest in any portion of the Property, including, but not limited to, deeds, leases, and mortgages, a notice which is in substantially the following form:

**NOTICE: THE INTEREST CONVEYED HEREBY IS SUBJECT TO A DECLARATION OF RESTRICTIVE COVENANT AND ENVIRONMENTAL PROTECTION EASEMENT, DATED [month, day, year], AND RECORDED WITH THE GOGEBIC COUNTY REGISTER OF DEEDS, LIBER \_\_\_\_\_, PAGE \_\_\_\_\_.**

12. **Notices:** Any notice, demand, request, consent, approval, or communication that is required to be made or obtained under this Restrictive Covenant and Easement shall be made in writing; include a statement that the notice is being made pursuant to the requirements of this Restrictive Covenant and Easement; include the MDEQ Site ID number; and shall be served either personally, or sent via first class mail, postage prepaid, as follows:

For the U.S. EPA:

Director  
Superfund Division (SR-6J)  
U.S. Environmental Protection Agency, Region 5  
77 West Jackson Blvd.  
Chicago, IL 60604

with a copy to:

Office of Regional Counsel (C-14J)  
U.S. Environmental Protection Agency, Region 5  
77 West Jackson Blvd.  
Chicago, IL 60604

For the MDEQ:

Chief  
Remediation and Redevelopment Division  
Michigan Department of Environmental Quality  
P.O. Box 30426  
Lansing, MI 48909-7926





For the Grantor, City of Ironwood

City Manager  
Memorial Building  
213 S. Marquette St.  
Ironwood, MI 49938

13. **Miscellaneous:**

(a) **Controlling Law.** The interpretation and performance of this Restrictive Covenant and Easement shall be governed by the laws of the United States as to the obligations referred to in the Action Memorandum and by the laws and regulations of the State of Michigan for all other purposes hereunder (without reference to choice of laws and principles thereof). The right to enforce the conditions and restrictions in this Restrictive Covenant and Easement are in addition to other rights and remedies that may be available, including, but not limited to, administrative and judicial remedies under CERCLA or Part 201 of the NREPA.

(b) **Construction.** Any general rule of construction to the contrary notwithstanding, this Restrictive Covenant and Easement shall be liberally construed to achieve the purpose of this Restrictive Covenant and Easement and the policy and purpose of CERCLA and the land use restrictions and prospective use limitations required by Part 201. If any provision of this Restrictive Covenant and Easement is found to be ambiguous, an interpretation consistent with the purpose of this Restrictive Covenant and Easement that would render the provision valid shall be favored over any interpretation that would render it invalid.

(c) **Severability.** If any provision of this Restrictive Covenant and Easement is held to be invalid by any court of competent jurisdiction, the invalidity of such provision shall not affect the validity of any other provision hereof, and all other provisions shall continue unimpaired and in full force and effect.

(d) **Entire Agreement.** This Restrictive Covenant and Easement and its attachments and appendices supersedes all prior discussions, negotiations, understandings, or agreements between the undersigned relating to the matters addressed herein, all of which are merged herein.

(e) **Successors.** The covenants, terms, conditions, and restrictions of this Restrictive Covenant and Easement shall be binding upon; and inure to the benefit of, the Grantor and Grantee and their agents, successors, lessees, and assigns and any subsequent title holders, occupants or other persons acquiring an interest in the Property or a relevant sub-portion of the Property, and their respective agents, successors and assigns. The rights, but not the obligations or authorities, of the U.S. EPA are freely assignable to any public entity, subject to the notice to the Grantor, its successors and assigns, as their interests appear in the public title records kept and maintained by the Gogebic County Register of Deeds.

14. **Exhibits:** The following exhibits are incorporated into this Restrictive Covenant and Easement:

Exhibit 1 – Legal Description of the Property

Exhibit 2 – Survey of the Property



Exhibit 3 – Permanent Marker

15. **Easement Holders:** None. The Property is free and clear of encumbrances.
16. **Authority to Execute Restrictive Covenant and Easement:** The undersigned person executing this Restrictive Covenant and Easement represents and certifies that he or she is duly authorized and has been empowered to execute this Restrictive Covenant and Easement.



LIBER 561

PAGE 87

FOR THE GRANTOR:  
City of Ironwood

Dated this 9th day of September, 2013.

CITY OF IRONWOOD



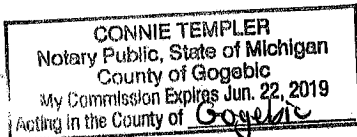
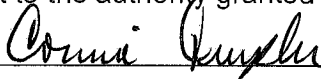
By: KIM CORCORAN, Mayor



By: KAREN M. GULLAN, City Clerk

STATE OF MICHIGAN     )  
                                      )ss  
COUNTY OF GOGEBIC    )

On this 9th day of September, 2013, before me personally appeared KIM CORCORAN, Mayor, and KAREN M. GULLAN, City Clerk, to me known to be the persons who executed the foregoing instrument and acknowledged that they executed the same as their free act and deed pursuant to the authority granted by the Ironwood City Commission.



Prepared by:  
Janet Carlson,  
Atty at Law  
77 W. Jackson Blvd  
Chicago, IL 60604



LIBER 561

PAGE 88

EXHIBIT 1

LEGAL DESCRIPTION OF PROPERTY



LIBER 561

PAGE 89

## Survey Description

### Restricted Area

Lots 1-6, Block 5, the vacated Hemlock Street, and part of Water Street, Canal Company's Addition to the City of Ironwood, in part of the Southeast Quarter of the Southeast Quarter (SE1/4-SE1/4), Section 21, Township 47 North, Range 47 West, City of Ironwood, Gogebic County, Michigan, described by metes and bounds as:

Beginning at the northeast corner of Lot 1, Block 5; thence N72°20'20"E, 5.33 feet; thence S27°47'09"E, 13.43 feet; thence S16°54'31"E, 23.72 feet; thence S05°15'11"E, 46.73 feet; thence S01°50'07"W, 23.83 feet; thence S18°52'07"W, 76.87 feet; thence S11°19'18"W, 21.38 feet; thence S77°01'08"W, 5.09 feet; thence N85°55'46"W, 25.84 feet; thence S88°53'34"W, 29.57 feet; thence N86°52'27"W, 24.45 feet; thence S86°00'53"W, 24.67 feet; thence S86°34'16"W, 28.66 feet; thence S74°16'56"W, 21.80 feet; thence S16°48'32"W, 14.42 feet to the South right-of-way of Water Street; thence N88°27'20"W along the South right-of-way of Water Street, 132 feet, more or less to the Montreal River; thence north along the Montreal River, 119 feet, more or less to the North line of Lot 6; thence N72°20'20"E along the north line of Lots 1-6, 322 feet, more or less, to the Point of Beginning.

Prepared by: Coleman Engineering Company  
200 East Ayer Street  
Ironwood, Michigan 49938

Project # : SI-13269  
Date: August 1, 2013  
amm



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LIBER 561

PAGE 90



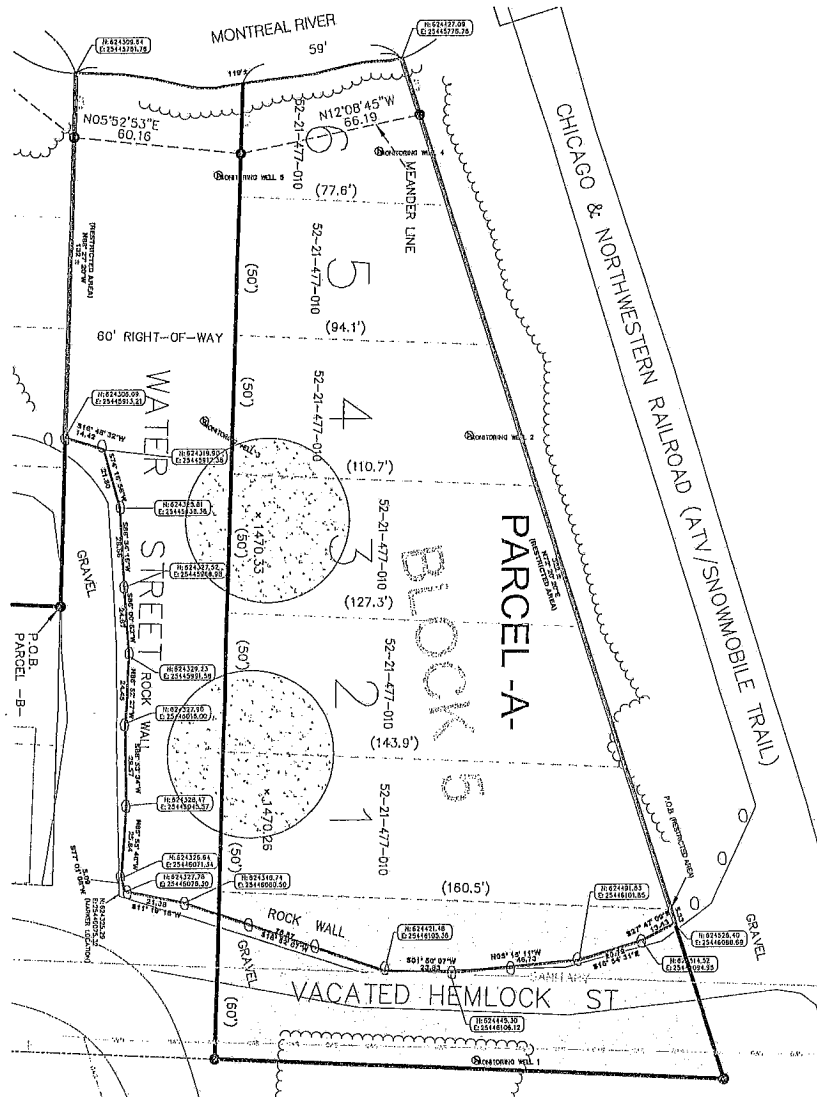
EXHIBIT 2  
SURVEY OF THE PROPERTY



LIBER 561

PAGE 91

RESTRICTED AREA DETAIL  
IRONWOOD MGP SITE



LIBER 561 PAGE 92



HORIZONTAL DATUM BASED ON NAD83  
STATE PLATE COORDINATES, NAD83 ZONE  
VERTICAL DATUM BASED ON NAVD83

NOTE: ALL DIMENSIONS ARE IN INTERNATIONAL FEET.

COLEMAN ENGINEERING COMPANY  
ENGINEERING SURVEYING GEOTECHNICAL  
10141 1st Street  
Minneapolis, MN 55412  
Phone: (612) 833-5000  
Fax: (612) 833-5001  
www.coleman-engineering.com

DRAWN BY: A. MOORE  
DATE: 08/01/13  
FBI 411  
SHEET 2 OF 2  
REVISED: 07/1/2013



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EXHIBIT 3

PERMANENT MARKER



R561 93 14

LIBER 561

PAGE 93

The photograph on this marker depicts the Ironwood Gas Works, a manufactured gas plant that operated on this property from about 1911 to 1950. The circular concrete structures seen on the property today are the foundations for the steel tanks in the photograph, which were used to store the manufactured gas. Manufactured gas, similar to natural gas, was used for cooking and heating in Ironwood and Hurley throughout the first half of the 20th Century. The photograph was taken in 1927 from the railroad bridge over the Montreal River, looking east toward Hemlock Street.

In 2012, the U.S. Environmental Protection Agency and the City of Ironwood removed and disposed of more than 15,000 tons of waste that was buried up to 10 feet below grade. Wastes removed from the property included debris, coal tar, oily residue, contaminated soil, buried piping, vats and other buried containers. Removal of these buried wastes will result in improvements to the Montreal River and groundwater quality.

The property was restored in an environmentally beneficial manner by backfilling the excavation with clean soil, restoring the flood plain, and using soil cover to establish an exposure barrier. The following activities are prohibited on the property unless they are performed in accordance with the constraints of a restrictive covenant for the property:

1. Drinking or otherwise contacting the groundwater.
2. Excavation or removal of, or damage to the 3 feet of soil cover, which establishes a barrier between the ground surface and subsurface contaminants.
3. Excavation and modification of the Montreal River shoreline along the property boundary.
4. Excavation or removal of, or damage to existing monitoring wells on the property.

The restricted property is depicted on the map to the right. Additional information related to specific restrictions for the property is available in the Restrictive Covenant recorded with Gogebic County Register of Deeds.

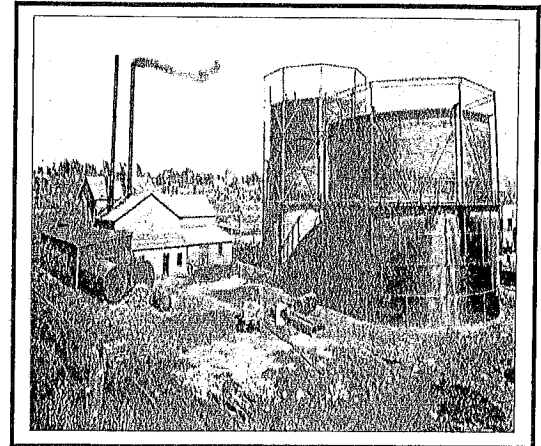
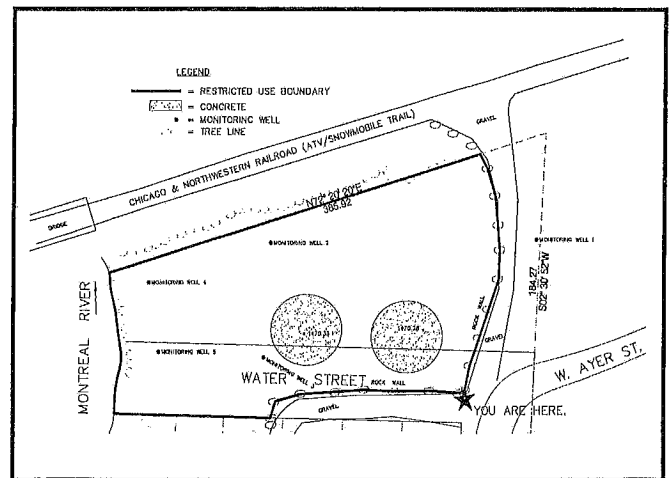


Photo courtesy of "Like It Usta Was" a historical account of the City of Ironwood written by Earle G. Sell.



LIDER 561

PAGE 94

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**ATTACHMENT H**  
**OPERATION AND MAINTENANCE PLAN**

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## UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

### REGION 5

77 W. Jackson Blvd  
Chicago, IL 60604

## ROLES AND RESPONSIBILITIES

The long-term stewardship of the Former Ironwood Gasworks Property (corner of Ayer & Hemlock Streets, Ironwood, MI) will require that regular inspection and maintenance are completed and documented. The following provides a general overview of the responsibilities of each party and contact information for communications related to the long-term stewardship of the property.

### City of Ironwood:

The City of Ironwood is responsible for ensuring that the Engineering Controls (ECs) implemented at the property by the U.S. Environmental Protection Agency (EPA) remain in good condition and protective of human health and the environment. The City of Ironwood is responsible for the ongoing maintenance and inspection of the property, including annual reporting of site conditions to MDEQ.

Communications to the City of Ironwood shall be directed to the following:

City Manager  
Memorial Building  
213 S. Marquette St.  
Ironwood, MI 49938

### MDEQ:

The State of Michigan, through the MDEQ, may enforce the restrictions and grant of easement set forth in the Restrictive Covenant and Easement for the property by legal action in a court of competent jurisdiction. The MDEQ and its representatives may enter the property at reasonable times for the purpose of determining and monitoring compliance with the Action Memorandum and with the Restrictive Covenant and Easement, including the right to take samples, inspect the premises, and examine any records associated with the routine maintenance and inspection of the property.

Communications to the MDEQ shall be directed to the following:

Chief  
Remediation and Redevelopment Division  
Michigan Department of Environmental Quality  
P.O. Box 30426  
Lansing, MI 48909-7926

## **EPA:**

The United States of America, through the EPA, may enforce the restrictions and grant of easement set forth in the Restrictive Covenant and Easement by legal action in a court of competent jurisdiction. The EPA and its representatives may enter the property at reasonable times for the purpose of determining and monitoring compliance with the Action Memorandum and with the Restrictive Covenant and Easement, including the right to take samples, inspect the premises, and examine any records associated with the routine maintenance and inspection of the property.

Communications to the EPA shall be directed to the following:

Director  
Superfund Division (SR-6J)  
U.S. Environmental Protection Agency, Region 5  
77 West Jackson Blvd.  
Chicago, IL 60604

with a copy to:

Office of Regional Counsel (C-14J)  
U.S. Environmental Protection Agency, Region 5  
77 West Jackson Blvd.  
Chicago, IL 60604

Any notice, demand, request, consent, approval, or communication that is required to be made or obtained as it relates to property transactions and the long-term stewardship of the property shall be made in writing; include the MDEQ Site ID number (27000066) and EPA Site ID number (B5ZC); and shall be served either personally, or sent via first class mail.

## **IMPLEMENTATION, INSPECTION, AND MAINTENANCE**

The following subsections outline the ECs established at the property and the routine inspection, maintenance and reporting requirements that shall be completed to ensure the protection of human health and the environment.

### **EC Implementation**

The following provides a summary of the ECs implemented at the property and their function as it relates to restrictions on the property:

- **Rock Wall** – A rock wall consisting of large diameter boulders was established around the perimeter of the excavation implemented during the removal action. The rock wall was established to prevent unauthorized access to the property by motor vehicles and to prevent the encroachment onto the property by adjacent property owners. The rock wall shall remain in place on the property to deter ingress which may result in damage to the soil cover and landscaping on the property.

- **Vegetative Cover** – Vegetative cover and trees were planted at the property to stabilize surface soils following backfilling and grading of the excavation area. The vegetative cover shall remain in place on the property to inhibit erosion of the soil cover and on the property.
- **Exposure Barrier** – The excavation completed on the property as part of the removal action was backfilled and graded with up to 10 feet of non-contaminated backfill. The non-contaminated backfill at the property establishes a buffer between residual contamination present in the subsurface at the property and humans and animals accessing the property. The soil exposure barrier shall remain in place on the property and shall not be disturbed to ensure the protection of human health and the environment.
- **Concrete Sealant** – The concrete foundations associated with the former gasometer pads at the property were left in-place and are present at the ground surface. An opaque sealant was applied to the concrete pads to prevent contact with potential residual contaminants present on the concrete surface. The sealant shall remain on the concrete to ensure the protection of human health and the environment.
- **Rip Rap** – Rip rap, or large diameter boulders were added to the existing rock along the bank of the Montreal River. The rip rap was placed along the riverbank to prevent erosion of the exposure barrier and vegetative cover near the river. The rip rap shall remain in place on the property and shall not be disturbed to ensure that the exposure barrier and vegetative cover are not damaged by the water erosion during seasonal fluctuations of the Montreal River.
- **Groundwater Monitoring Wells** – Five groundwater monitoring wells remain at the property to allow for the long-term assessment of groundwater quality beneath the property. The groundwater monitoring wells shall be protected and remain in place on the property.
- **Permanent Marker** – A permanent marker summarizing the remedial activities implemented at the property and the restricted areas of the property was established in the southeast corner of the property where it can be readily viewed by those approaching the property from Ayer and Hemlock Streets. The permanent marker shall be protected from damage and vandalism and remain at its original location on the property.

### **Inspection Requirements**

Visual inspections shall be conducted at the property by the City of Ironwood to evaluate conditions and to assess the integrity of the ECs outlined in the preceding subsection. Inspections will include documentation, in writing, of the general appearance of the property, while ensuring that unauthorized stockpiling or dumping, unauthorized excavation, and unauthorized vehicular access are not occurring. A form to be completed during the inspections to document conditions at the property is attached.

Inspections shall be completed at the property in accordance with the following frequencies:

- **Monthly Inspections** – The property shall be inspected on a monthly basis to ensure that ECs on the property remain intact and that physical alterations have not occurred at the property. Inspections shall be conducted in accordance with the attached inspection form.
- **Weather-related Inspections** – The property is located in the flood plain of the Montreal River and is subjected to the erosive forces of seasonal runoff and flooding. The property shall be inspected as seasonal conditions dictate, but not less than every two-weeks during Spring melt events. In addition, the property shall be inspected following any storm event that results in more than 1-inch of rainfall in a 24 hour period.

Prior to conducting an inspection, the inspector(s) will review previous inspection forms and maintenance records that will be maintained in the Ironwood City Clerk's office. All inspection forms shall be retained for a period of five years. During each inspection, the inspector(s) will complete a new inspection form (monthly or weather-related). Observed deficiencies shall be recorded on the inspection forms and maintenance actions shall be recommended. If maintenance actions are required, they shall be implemented within 30 days of the inspection. Typical maintenance requirements are summarized in the following subsection.

### **Maintenance Requirements**

Maintenance activities at the property shall be completed on regular basis to ensure that the property is aesthetically acceptable and to mitigate deficiencies identified during inspections. The following provides a summary of typical routine maintenance activities that shall be completed at the property.

- **Landscaping** – The vegetative cover at the property shall be mowed on a monthly basis or as warranted by seasonal conditions. Trees and shrubs shall be maintained to ensure that fallen branches or uprooted stumps do not expose contaminated soil or create dams along the river resulting in flooding and erosion of the property.
- **Seeding** – Seeding shall be completed at the property as needed to ensure that the vegetative cover at the property remains intact. Bare areas of the property resulting from erosion, recreational activities, or trespass shall be re-seeded, and watered as appropriate, to ensure that the vegetative cover is restored.
- **Rock Wall Maintenance** – The rock wall along the property limits shall be maintained to ensure that unauthorized access is not permitted. If boulders are moved or are found to be ineffective at preventing vehicular access then additional boulders, or suitable alternative, shall be placed as necessary to mitigate the deficiency.

- **Sealant Application** – Sealant application shall be applied to the concrete foundations as needed to ensure they are protected and free of exposed residual contamination. Bare areas of the foundations resulting from erosion, recreational activities, or trespass shall be sealed or painted to ensure that the integrity of the sealant is restored.
- **Burrows and Erosion** – The property is located in the flood plain of the Montreal River and is subjected to the erosive forces of seasonal runoff and flooding. In addition, burrowing animals may cause damage to the exposure barrier. In either case, the exposure barrier shall be restored with clean granular fill to ensure that residual contamination is not exposed. Restoration of eroded or damaged areas of the exposure barrier shall be completed as needed.



Date:

Ironwood Gasworks Property  
INSPECTION CHECKLIST

Visual inspections shall be conducted at the property to evaluate conditions and to assess the integrity of the engineering controls established at the property. Inspections will include documentation of the general appearance of the property, while ensuring that unauthorized stockpiling or dumping, unauthorized excavation, and vehicular access is not occurring. Checklists shall be maintained on file in the Office of the Ironwood City Clerk for at least five years from the date of inspection. Annual reports are due to MDEQ by 12/31 of each year.

Permanent Marker	YES	NO	Observations	Action(s) needed
Marker visible and in plain view?				
Marker securely attached to support structure?				
Damage or defacement of marker or support?				

Perimeter boulders

Boulder rows present?				
Boulders still spaced to prevent vehicular access?				

Soil/Vegetative Cover/Concrete Pads

Evidence of vehicle tracks on site interior?				
Low spots, gullies, washouts, or other erosion or settling features?				
Trees damaged or diseased?				
Grass cover intact?				
Mowing needed?				
Unauthorized stockpiles, dumping, excessive garbage or unknown materials present?				
Concrete pads visible, intact, and undisturbed?				

Riverbank

Rock armoring in place?				
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Soil /vegetative cover on slope intact?				
---	--	--	--	--

River Condition

Any sheen observed?				
Any obstructions in the River?				

Monitoring Wells

Wells undamaged and locked?				
-----------------------------	--	--	--	--

Followup needed prior to next inspection:

Comments (e.g. weather conditions, flooding, snow-cover):

Completed by:

Position/Title: