

DRAFT REMEDIAL ACTION PLAN



**Former Rome-Turney Site
NYSDEC Petroleum Spill No. 8802056
109 Canal Street
City of Rome, New York**

**Prepared for: City of Rome
198 North Washington Street
Rome, New York**

**Prepared by: Bergmann Associates
28 East Main Street
Rochester, New York**

**Submitted To: New York State Department of Environmental Conservation
Region 6, Utica Office
207 Genesee Street**

Issuance Date: December 15, 2015

Bergmann Job No: 010118.00

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1.0 INTRODUCTION

Bergmann Associates, Inc. (Bergmann) has been retained by the City of Rome to prepare this Remedial Action Plan (RAP) which details the methods and procedures for remediation of petroleum source areas at the former Rome-Turney Radiator Company (Rome-Turney Site) located at 109 Canal Street, City of Rome, New York (Site). Two petroleum source areas have been identified in the spill area based on the results of the Site Investigations completed in October and November 2015 and presented in the Draft Site Investigation report, December 10, 2015. The scope of work completed during the Site Investigation was completed in accordance with our letter to New York State Department of Environmental Conservation (NYSDEC) project manager for this spill on September 22, 2015. The spill reference number assigned to the petroleum spill area of the Site by NYSDEC is Spill No. 8802056.

The remedial alternative selected to address the remediation objective is source area petroleum soil removal with off-site disposal. This remedial alternative was selected based on the analysis of alternatives evaluated in the analysis of Brownfields Cleanup Alternatives (ABCA) report. The proposed remediation will also include a limited groundwater extraction from the source area excavations during the active remediation field work. The scope of work for this project is detailed in Section 7 of this RAP. This RAP has been prepared in accordance with NYSDEC CP-51 Soil Cleanup Guidance Policy, DER-10 Technical guidance for Investigation and Remediation. Information from Bergmann's Draft Site Investigation report was used for the estimated extent and quantity of impacted source area soil and groundwater.

2.0 BACKGROUND

Bergmann performed a Site Investigation at the Site in response to the active petroleum spill identified as a recognized environmental condition (REC) in Bergmann's Phase I Environmental Site Assessment (ESA) for the Site, dated August 24, 2015. The Phase I ESA recommended a subsurface investigation to address the petroleum spill area that was discovered in June of 1988, when petroleum underground storage tanks (USTs) were removed from the Site. Bergmann implemented the Site Investigation after NYSDEC reviewed and approved the proposed scope of work presented in Bergmann's letter dated September 22, 2015. The vicinity of the Site is shown on Figure 1 – Site Location Map. A summary of our conclusions and our recommendations from the Draft Site Investigation Report (SIR) are presented below.

Bergmann's Draft SIR concluded that soil and groundwater at the Site has been impacted by a release of petroleum fuel oil/diesel and gasoline from former USTs bulk petroleum storage and releases. The petroleum soil in two source areas within the Spill area exceed NYSDEC SP-51 soil clean up objectives at levels that required remediation.

3.0 PREVIOUS INVESTIGATIONS

Subsurface Investigation Report – May 1996

NYSDEC issued spill no. 8802056 after tank tightness tests failed for two 5,000 gallon #2 fuel oil underground storage tanks. Rome-Turney Radiator Co. retained Theal Environmental Services (Theal Inc.), to perform a Subsurface Investigation. The results of this investigation revealed floating petroleum #2 fuel oil in monitoring wells in the UST area with impacted soil / groundwater.



Gasoline chemical compounds were also detected in the subsurface during the investigation. Documentation for this investigation is presented in the Subsurface Investigation Report for Rome-Turney Radiator Co. NYSDEC spill No. 8802056 prepared by Theal, May 1996.

Phase I Environmental Site Assessment – August 2015

Bergmann prepared a Phase I Environmental Site Assessment (ESA) report, dated August 24, 2015, for the Site on behalf of the City of Rome. The purpose of the Phase I ESA report is to document the investigative activities conducted and to identify Recognized Environmental Conditions (RECs) at the subject property identified as the Former Rome-Turney Radiator Company, 109 Canal Street in the City of Rome, Oneida County, New York 13440 (the subject property). This Phase I ESA was conducted as part of an evaluation for the sale of the building at the subject property. The general location of the subject property is shown on Figure 1. The Phase I ESA was conducted in accordance with ASTM Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process E-1527-13, published November 2013, and was conducted in accordance with the U.S. Environmental Protection Agency (EPA) All Appropriate Inquiry (AAI). The primary objective of this Phase I ESA is to identify and document RECs at the subject property, in accordance with the ASTM standard.

The Phase I ESA recommended subsurface investigations at REC locations which included the petroleum spill area.

Investigation Scope of Work – September 2015

Bergmann prepare the scope of work in a letter to NYSDEC dated September 22, 2015. The scope of work (work plan) provided detail for subsurface investigation at suspected petroleum sources at the former #2 fuel oil USTs locations and other RECs. This proposed scope of work included:

- Geophysical Survey;
- Test Pit Explorations;
- Soil Borings & Groundwater Monitoring Wells; and
- Laboratory test methods for soil / groundwater samples.

The scope of work was reviewed and approved by NYSDEC prior to implementation of the Site Investigation by Bergmann.

Draft Site Investigation Report – December 2015

Bergmann's Site Investigation (SI) focused on confirming the existing condition of the subsurface, petroleum impacted soils near former USTs locations in the spill area and at other suspected REC locations based on historical information, the results of the geophysical survey (EM-61 survey) and 8 test pit explorations initially completed to assist with locating 8 soil borings completed as monitoring wells within the Site for an further evaluation of soil and groundwater quality, see Figure 2- Soil Borings and Monitoring Well Location Plan. The soil borings/monitoring wells were



also installed at locations that are up-gradient and down-gradient to regional groundwater flow. Our scope of work was discussed with the NYSDEC spill manager and approved prior to performing the SI. Bergmann performed the SI during October through December 2015, in accordance with the scope of work. Soil and groundwater is impacted with levels of petroleum chemical compounds that exceed NYSDEC CP-51 SCOs and require remediation, see Figure 3 – SVOC Soil Contaminant Distribution – Test Pits and Figure 4 – SVOC Soil Contaminant Distribution – Soil Borings. The SI project is documented in the Draft Site Investigation Report, December 2015.

Conclusions

The conclusions and recommendations in the Draft Site Investigation Report were based on the field observations, field soil screen measurements, and laboratory analytical results for Site soil and groundwater samples. The conclusions are based on Bergmann's opinions with respect to the Site environmental data obtained, conditions observed during the project work as noted below:

The suspected sources of petroleum impacted soils are the former underground storage tanks and suspected UST that released to the subsurface and former bulk storage of petroleum products on Site. Two petroleum source areas have been identified as Areas of Concern (AOC). Petroleum AOC #1 is a suspected UST area located in the vicinity of SB-1/MW-1 and TP-6. Petroleum AOC #2 is the former fuel oil UST area near TP-1, TP-2, and SB-5/MW-5.

The suspected sources of petroleum impacted groundwater is the former underground fuel oil storage tanks (AOC#2) that released to the subsurface and suspected former bulk storage of petroleum products in USTs on Site (AOC#1).

The source of Metals is likely from the use of these metals on the Site. Background concentrations of metals should be evaluated to confirm the elevated detections. Monitoring wells should be resampled due to very turbid samples that were analyzed during the site Investigation. Background concentrations of metals should also be evaluated to confirm the elevated detections.

Recommendations

Remediation of petroleum impacted soil and groundwater associated with the release of petroleum from the underground storage tanks is required. Other investigations maybe required to address other impacts to the sub-surface. All future investigation and remediation work should be coordinated with NYSDEC.

Bergmann also recommends another groundwater sampling event to continue to evaluate groundwater levels.

Planning for petroleum source are soil and groundwater remediation by evaluating remedial alternatives in an Analysis of Brownfield Cleanup Alternatives (ABCA) report for selection of a proven remedial alternative that can be implemented to meet the remedial objectives and is protective of human health and the environment.

Preparation of a Remedial Action Plan (RAP) that details the proposed soil and groundwater remediation to clean up the source of the petroleum spill on Site.



Analysis of Brownfield Cleanup Alternatives (ABCA) Report – December 2015

A Draft Analysis of Brownfield Cleanup Alternatives (ABCA), considering site characteristics, the surrounding environment, land-use restrictions, potential future uses, and cleanup goals have been completed by Bergmann on behalf of the City of Rome.

Three proven remedial alternatives were evaluated in the ABCA for the implementation of these technologies and the resources required. Based on the results of the analysis, Alternative 2 is considered the most technically feasible and cost effective alternative, which achieves cleanup of the petroleum source areas, protection of human health and the environment with ease of long-term maintenance. Alternative 2 includes: excavation and off-Site disposal of petroleum impacted soils from two source areas with long term ECs and ICs.

This proposed remedial program will reduce potential short term and long-term exposures to the on-Site contaminants by removing the petroleum soil source areas from the Site and limit the impacted groundwater during the active remediation. This will significantly eliminated potential exposure to pathways. The removal of the petroleum source soils also reduces the volume and toxicity of the most contaminated soils and coupled with ECs and ICs provides a high degree of reduction of both potential migration and reduction of contaminants.

While low level contaminants will remain at the Site, the remedial objectives will be met to the extent practicable in a cost effective manner through the implementation of Alternative 2 and this alternative will be protective of human health and the environment.

4.0 ENVIRONMENTAL SETTING

Descriptions of the Site subsurface conditions and potential receptors are discussed in this section. The re-use for the spill area will be restricted to residential or commercial. The Site is located in a mixed residential, commercial and industrial use area in the City of Rome, see Figure 1.

4.1 Overburden and Bedrock Geology

Two overburden soil deposits were encountered in the subsurface explorations that include: a Fill deposit and a Lacustrine deposit.

The Fill deposit was described as Dark brown SAND, some gravel, trace concrete to Gray CLAY, some gravel, trace concrete. The Fill deposit is approximately 4 feet in thickness at the soil boring locations and overlies the native Lacustrine deposit. The Lacustrine deposit was described as Gray CLAY, trace brown silt to Dark brown SILT, trace clay. The bottom of each subsurface exploration was terminated in the Lacustrine deposit.

The Bedrock units of Middle Silurian to Middle Devonian age are approximately 450 million years old and underlie the region. The younger Devonian bedrock formations are in the southernmost part of the county. Bedrock investigation was not completed at the Site.

5.0 POTENTIAL RECEPTORS AND COMMUNITY AIR MONITORING



Human receptor issues related to this petroleum spill are possible at residential properties that adjoin the Site. Future re-use of this Site may include restricted residential or commercial. It is our understanding that the City of Rome is planning on the remediation of this spill area to better position this Site for sale and re-development. Potential vapor intrusion issues, additional investigations, and management of potential remaining residual petroleum impacted soil / groundwater would be addressed post-remediation in an environmental management plan. The types of petroleum chemical compounds detected in the soil and groundwater in the spill area are presented in the Draft Site Investigation Report.

Community Air Monitoring

Remediation activities and future earthwork construction at the Site may result in potential exposures to Site contaminants by remediation contractors and future contractors. An excavation work plan will be required in areas of residual contamination as part of a site management plan to prevent this exposure pathway in the future. The proposed activities include; excavation and removal of the most impacted soil and limited groundwater removal during the active soil removal. Therefore, the potential exists for exposure of petroleum soil Contaminants of Concern (COCs) to construction workers via dermal absorption, ingestion, and inhalation. A Community Air Monitoring Plan (CAMP) will be implemented and actions will be taken to provide a measure of protection for the surrounding community from potential airborne contaminant releases as a direct result of remedial work activities.

6.0 RATIONALE

The rationale for the proposed remedial action is based on the objectives of the remedial action, results of previous investigations and Bergmann's project limitations, see Appendix A – Limitations for Remediation for Project Work. The following sections present the rationale for each phase of the proposed remedial action. The primary remedial action is petroleum source area soil removal with off-site disposal of impacted soil. In addition, a limited groundwater extraction from the soil excavation area will be performed during the excavation of impacted soils and from temporary groundwater extraction wells. The groundwater that may be extracted will be discharged to the County Sewer System or disposed of at an off-site recycling facility. Completion of the source area soil removal action will reduce the low level groundwater impacts since impacted soils below the water table will be removed as part of the overall soil cleanup.

7.0 SCOPE AND OBJECTIVES OF THE PROPOSED REMEDIAL ACTION

The main objective of the proposed remedial action is to reduce the petroleum compounds (gasoline and fuel oil) concentrations in soil and groundwater at the 2 identified source areas (AOC#1 and AOC#2) at the Site in order to meet NYSDEC CP-51 Soil Cleanup Objectives for commercial properties and Petroleum Site Spill Inactivation criteria for commercial use. Based on an evaluation of available proven remedial alternatives in the Draft ABCA report, the primary remedial alternative selected is excavation of source area petroleum impacted soil with off-site disposal. Limited groundwater extraction will be implemented during active soil excavation. The extracted petroleum impacted groundwater will be disposed of off-site at a recycling facility or discharged to the County sewer system. The scope of work to accomplish the selected remedial alternative for the source area soil removal will include:



- Excavation of petroleum contaminated soils from source areas excavation A (AOC#1) and excavation B (AOC#2) within the spill area.
- Extraction of petroleum impacted groundwater by means of pumping, containerization, and disposal. Groundwater may be pumped from three temporary groundwater extraction wells and the open excavations. However, we anticipate that the concentrations of petroleum compounds in the groundwater may be reduced when the impacted soils are removed. Pumping impacted groundwater from the temporary extraction wells would be implemented to facilitate backfilling the excavations and in the event that levels in the groundwater remain elevated after the soil remediation is completed. Extracted groundwater will be discharge to the municipal sanitary sewer system at levels to meet County Sewer Use Law Limits. Off-site disposal would be required at a recycling facility in the event levels exceed the sewer code discharge limits.
- Confirmatory soil samples will be collected from the bottom of the source area excavations prior to backfilling. We anticipate that approximately 12 soil samples from the sidewalls and 12 soil samples from the bottom of each excavation area will be required.
- The three temporary extraction wells will also serve as groundwater monitoring wells within the soil removal areas to allow for the collection of confirmatory groundwater samples.
- Two quarterly groundwater sampling events for post-remediation groundwater monitoring will be completed from the temporary extraction wells to monitor post remediation groundwater quality for the evaluation of the effectiveness of the soil and groundwater removal action.
- Preparation of a remediation report that includes confirmatory soil and groundwater sample results for documentation of the work completed for this spill.

7.1 Soil Removal Excavation and Off-Site Disposal

An evaluation of the petroleum contaminant distribution at the site indicates 2 source areas of soil impacted with petroleum above NYSDEC CP-51 Soil Cleanup Objectives (SCO). The approximate quantity of soil to be excavated from Excavation Area A (AOC#1 – gasoline impacted) is 960 tons and the approximate dimensions of this proposed excavation is 45 feet X 25 feet X 15 feet Excavation Area A has an average depth of impacted soils from the ground surface to a depth of approximately 12 feet to 15 feet. The approximate quantity of soil to be excavated from Excavation Area B (AOC#2 - #2 fuel oil) is 1,040 tons and the approximate dimensions of this proposed excavation is 50 feet X 30 feet X 12 feet. Non-impacted soils that overly impacted soil may be excavated and stockpiled for re-uses as potential backfill. The location of the proposed excavation areas is shown on Figure 5 - Proposed Excavation Plan.

7.2 Soil Excavation Monitoring

Prior to excavation activities at the Site, an underground utility location service will be contacted by the remediation contractor in order to obtain utility clearances. Based on the results of the previous site assessments, Bergmann estimates that approximately 2,000 tons of Petroleum Contaminated Soil (PCS) will be excavated from proposed excavation areas A and B (Figure 5) and transported off-site for disposal at an approved landfill facility. This estimate assumes that gasoline and fuel oil / diesel PCS with contaminant concentrations above the NYSDEC CP-51 SCO levels will be excavated to an average depth of approximately 12 to 15 feet below ground surface. The bottom of the excavation (depth) should be within the Lacustrine deposit. The soil should be removed with an excavator and a soil monitor technician. Bergmann anticipates that an excavator will be used to remove PCS and load PCS onto NYSDEC Part 364 permitted trucks for transfer to the off-site landfill disposal facility.



The actual quantity of soil to be excavated will depend on the results of field observation and soil monitoring during the excavation. The majority of the estimated quantities of soil requiring excavation is PCS. However, field screening with a PID will be conducted to separate potentially non-impacted soil from the PCS. PID readings less than 10 ppm will be designated as impacted soils that may remain in the subsurface. Clean fill identified through the PID screening process of 10 ppm or less may be stockpiled on site on 6-mil plastic sheeting pending EPA 8260 and 8270 STARS soil sample analytical results in accordance with NYSDEC CP-51 / DER-10 requirements for soil backfill / soil re-use. Potentially non-impacted soil for backfill may be stockpiled, and covered with plastic sheeting.

7.3 Confirmatory Soil Sampling

Confirmatory soil samples will be collected from the excavation bottom and sidewalls. As previously discussed, the vertical extent of PCS is approximately 12 to 15 feet below ground surface. The vertical and lateral extent of impacted soils was not completely defined (between each soil boring / test pit) during previous site assessments. The objectives of confirmation soil sampling are to confirm that PCS has been excavated where the extent is already known, evaluate the concentrations of remaining residual petroleum compounds in the spill area soils, and to supplement the evaluation at locations along the lateral extent of the spill area.

Samples will be collected with decontaminated, stainless steel trowels from the excavator bucket and transferred to four-ounce glass jars supplied by the laboratory. Sampling protocols consistent with the NYSDEC DER-10 Sampling Guidelines and Protocols will be followed during sample collection, identification, labeling, and storing. Soil samples will be transferred, following collection, to a certified laboratory under proper chain-of-custody documentation.

Approximately 12 confirmatory soil samples will be collected from the sidewalls and bottom of each source area excavation. Additional soil samples may be required based on field conditions encountered. These soil samples will be analyzed by the laboratory in accordance with EPA Method 8260 (VOC -Gasoline Chemical Compounds) and 8270 STARS (SVOC – heating oil and diesel chemical compounds) .

Each excavation will be considered complete when field screen PID measurements are approximately 10 ppm or less and confirmatory soil sample analytical results are below the NYSDEC CP-51 SCOs levels. Samples will also be collected from stockpiled soils identified through field screening with a PID as being potentially non-impacted backfill material. A sufficient number of stockpile soil samples will be collected and analyzed in accordance with EPA Method 8260 STARS and 8270 STARS to confirm to NYSDEC STARS Memo #1 guidance values. The excavation will be backfilled with soils that meet NYSDEC DER-10 requirements for backfill criteria and or imported granular fill soils. The backfill soils will be compacted to prevent settling of soil backfill.

7.4 Limited Groundwater Removal with Off-Site Disposal

The groundwater is approximately 4 to 8 feet below ground surface (bgs) across the Site. Bergmann anticipates that groundwater will be encountered throughout the excavation process. Based on the known low level petroleum impact to groundwater, the remediation contractor will institute the necessary measures to collect and contain groundwater as excavation proceeds.



Pumps will be utilized to capture groundwater and transfer the water to a holding tank as water is generated from the excavation. The water will be discharged to the County Sanitary Sewer System or disposed of at an approved off-site recycling facility.

In addition, three temporary groundwater extraction wells will be installed in the source area soil removal excavation during backfilling activities to allow for limited extraction of petroleum impacted groundwater from the subsurface. The casing for the temporary groundwater extraction wells may be approximately 8 to 10 - inch inside diameter (metal or PVC) and should be slotted from 2 feet below the ground surface to approximately 13 feet below ground surface. The bottom of the well casing should be capped. The temporary extraction wells may be installed with a backhoe by excavating to approximately 13 feet below ground surface and backfilling the well casing with washed pea stone. These extraction wells may be pumped during the active excavation project work and may also be pumped after the excavation is backfilled. Bergmann anticipates the use of one holding tanks for the temporary containment of petroleum impacted groundwater. The goal of the limited groundwater extraction is to remove petroleum impacted groundwater as required to maintain a relatively water free excavation during placement of backfill. These extraction wells / temporary monitoring wells should be capped at the ground surface for safety reasons when not in use.

9.0 Quarterly Groundwater Sampling/Monitoring:

Post - remediation groundwater sampling on a quarterly basis will be conducted for 2 quarterly sample events to evaluate effectiveness of the source area removal action. Each temporary groundwater monitoring well will be purged and sampled in accordance with NYSDEC DER-10 Sampling Guidelines and Protocols. Samples will be analyzed for petroleum chemical compounds (VOCs and SVOCs) in accordance with USEPA Method 8260 / 8270 (STARS).

Groundwater sampling will include: depth to water measurements, visual observations for floating petroleum product, removal of approximately three well volumes of well water, and collection of a representative groundwater sample. The temporary extraction wells (monitoring wells) will be sampled as part of a quarterly groundwater monitoring event, as described above. Following receipt of analytical data from each quarterly sampling event, a quarterly sampling report will be prepared in general accordance with NYSDEC DER-10 requirements summarizing activities completed at the site during the previous quarter. The report will include tabulated analytical data, system and operating data, maps showing conditions at the site, laboratory reports, and original chain-of-custody documentation.

10.0 TEMPORARY EXTRACTION WELL INSTALLATION

Three temporary extraction wells named MW-C1, MW-C2, and MW-C3 will be installed within the soil excavation areas so that post remediation groundwater samples may be collected. These wells will be installed to approximately 13 feet below the ground surface. These wells may be installed by backfilling well casing as the excavation areas are backfilled or by excavating / rotary drilling methods after the excavation is backfilled.

10.1 TEMPORARY EXTRACTION WELL CONSTRUCTION

Soil samples will not be collected from the borehole prior to well installation. A 10 foot well screen will be installed to the bottom of the borehole with a depth of approximately 13 feet and connected



to solid casing that will extend 3 feet above ground surface. The borehole annulus around the well screen intake will be backfilled with pea gravel to approximately two feet above the well screen and the remaining borehole annulus will be backfilled with Bentonite to ground surface.

10.2 Development

Each of the temporary extraction wells will be developed a minimum of 24 hours after installation. The purpose of well development is to enhance natural hydraulic conditions after drilling to enhance yield and remove finer materials to enable groundwater that is representative of the aquifer to move into the well screen zone to be monitored. Development will be accomplished using bailing procedures. Purged water from the development process will be containerized or discharged to the ground surface at the well location in accordance with NYSDEC DER-10.

11.0 SCHEDULE AND REPORTING

The anticipated proposed remedial action schedule is presented below. Scheduling estimates are subject to modification due to subcontractor availability, weather conditions, the rate of petroleum compound bio-degradation, and access restrictions and other factors not evident at this time.

ACTIVITY	WEEKS FOLLOWING APPROVAL OF THE REMEDIAL ACTION PLAN
Underground Utility Clearance Survey	2
Excavation, Backfilling, Confirmatory Soil Sampling	3
Installation and Development of Replacement Groundwater Monitoring Well	3
Initial Sampling of Wells	5
Receipt of Groundwater Analytical Results	7
Quarterly Sampling of Monitoring Wells MW-C1, MW-C2, and MW-C3	19
Quarterly Sampling of Monitoring wells MW-C1, MW-C2, and MW-C3	31
Remediation Report	45

12.0 REFERENCES

New York State Department of Environmental Conservation, 1992. STARS Memo #1, Petroleum-Contaminated Soil Guidance Policy, Spill Technology and Remediation Series, August.

New York State Department of Environmental Conservation, 2010. CP-51 / Soil cleanup Guidance Policy, October.

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