# Seagull Environmental Technologies, Inc.

121 NE 72nd Street
Gladstone, Missouri 64118
www.seagullenvirotech.com


March 2, 2017

Ms. Kristin Allan Tipton
Development Director
Environmental Improvement and Energy Resources Authority
425 Madison Street
Jefferson City, Missouri 65102

**Subject:** **Analysis of Brownfields Cleanup Alternatives**
**TJTR – Woody's Grocery Store Site, Agency, Missouri**
**Missouri Brownfields Revolving Loan Fund Support Contract**

Dear Ms. Allan Tipton:

Seagull Environmental Technologies, Inc. (Seagull) is submitting the attached Analysis of Brownfields Cleanup Alternatives (ABCA) report for the TJTR – Woody's Grocery Store site in Agency, Missouri. If you have any questions or comments, please contact the project manager at (720) 666-3803.

Sincerely,

Ryan M Lunt

Ryan M. Lunt, CHMM
Environmental Scientist

Enclosures

# ANALYSIS OF BROWNFIELDS CLEANUP ALTERNATIVES

# TJTR-WOODY'S GROCERY STORE SITE, AGENCY, MISSOURI

**Missouri Brownfields Revolving Loan Fund Support Contract**

Prepared For:

Environmental Improvement and Energy Resources Authority
425 Madison Street
Jefferson City, Missouri 65102

March 2, 2017

Prepared By:

Seagull Environmental Technologies, Inc.
121 NE 72nd Street
Gladstone, Missouri 64118

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## 1.0 INTRODUCTION

Seagull Environmental Technologies, Inc. (Seagull) was tasked by the Environmental Improvement and Energy Resources Authority (EIERA), under the Missouri Brownfields Revolving Loan Support Contract, to complete an Analysis of Brownfields Cleanup Alternatives (ABCA) report for the TJTR – Woody's Grocery Store site in Agency, Missouri. This ABCA examines alternatives to address removal/closure of three underground storage tanks (UST) (two 8,000-gallon tanks and one 6,000-gallon tank) and its ancillary components, including preliminary cost estimates.

## 2.0 SITE LOCATION AND DESCRIPTION

The subject property's address is 11301 SE State Road FF in Agency, Buchannan County, Missouri. The 2.5-acre site is currently vacant and contains a canopy with fueling pumps and a concrete pad. Additionally, the northern and eastern portions of the site are utilized as agricultural land. Historical documents indicate the site was agricultural land until 2004. In 2004, the site was developed into Woody's Grocery Store (a convenience store and gasoline station). Woody's Grocery Store included a canopy with fueling pumps to dispense petroleum products stored in two 8,000-gallon USTs and one 6,000-gallon UST. In 2011, the convenience store burned down, and the USTs were emptied and have not been in use since. During an interview with Mr. Earl Huskamp (site contact) on February 21, 2017, he noted that water is currently in the USTs. According to Mr. Huskamp, one UST is full and the other two USTs are a quarter full (of water); however, Mr. Huskamp did not know which UST was full. In 2012, the Village of Agency purchased the subject property and is still the current property owner.

The site is bounded to the north by an agricultural and residential property, to the east by agricultural land and Main Street with residential properties beyond, to the south by Miller Road and the Agency Community Center, and to the west by State Route FF and agricultural land. The site is included on the Agency, Missouri, U.S. Geological Survey (USGS) 7.5-minute topographic series map (USGS 1973) (See Appendix A, Figure 1). The site is located in Section 20, Township 56 North, Range 34 West. Coordinates for the approximate center of the site are 39.647526 degrees north latitude and 94.744599 degrees west longitude.

## 3.0 POTENTIAL CLEANUP ALTERNATIVES

The overall goal of any Brownfields cleanup action is to address any environmental conditions preventing or impeding the preferred type of site redevelopment, and to do so in a manner protective of human health and the environment. Planned future development and site use are to build a city hall for the Village of Agency.

Brownfields cleanup alternatives were evaluated for the site to address specific environmental impacts identified in previous environmental assessments for the site. In 2012, a Phase I Environmental Site Assessment (ESA) and a Phase II ESA were completed by Sierra Delta Consultants (Sierra Delta). The Phase I ESA did not identify any recognized environmental conditions (RECs), but noted three USTs were on the subject property and concluded that annual testing of the lines, tank tightness, and line leak detectors was overdue and would be required if the facility were to re-open (Sierra Delta 2012).

In October 2012, Sierra Delta conducted a limited subsurface investigation. The investigation included six boring locations (GP1, GP2, GP3, GP4, GP5, and GP6) using a direct push technology (DPT) rig around and downgradient of the USTs (see Appendix A, Figure 2 and 3). At each boring location, two soil samples were collected at depths ranging from 4 to 20 feet below ground surface (bgs). Twelve soil samples were analyzed for total petroleum hydrocarbons (TPH)-gasoline range organics (GRO); TPH-diesel range organics (DRO); methyl tert-butyl ether (MTBE); and benzene, toluene, ethylbenzene, and xylene (BTEX). TPH-GRO, TPH-DRO, and MTBE were not detected in any of the 12 soil samples. Of the BTEX compounds, only toluene was detected, at concentrations ranging up to 0.0022 milligram per kilogram (mg/kg). Those detected concentrations of toluene did not exceed its Missouri Risked-Based Corrective Action (MRBCA) Default Target Level (DTL) of 29.8 mg/kg (Sierra Delta 2012). Table 1 below provides the toluene concentrations.

**TABLE 1**

**PHASE II ESA**
**TOLUENE CONCENTRATIONS**
**TJTR-WOODY'S GROCERY STORE SITE**
**AGENCY, MISSOURI**

| **Sample ID** | **GP-1A 15'** | **GP-1B 20'** | **GP-2A 15'** | **GP-2B 20'** | **GP-3A 15'** | **GP-3B 20'** |
|---|---|---|---|---|---|---|
| **Toluene** | 0.0019 mg/kg | ND | 0.0016 mg/kg | ND | 0.0017 mg/kg | ND |
| **Sample ID** | **GP-4A 15'** | **GP-4B 20'** | **GP-5A 4'** | **GP-5B 8'** | **GP-6A 4'** | **GP-6B 8'** |
| **Toluene** | 0.0017 mg/kg | 0.0016 mg/kg | 0.0018 mg/kg | 0.0022 mg/kg | ND | ND |

Notes:

| | |
|---|---|
| ' | Feet |
| ID | Identification |
| mg/kg | Milligram per kilogram |
| ND | Non-detect |

In September 2016, Seagull completed an updated Phase I ESA for the site (Seagull 2016). The updated Phase I ESA did not identify any RECs, but noted the three USTs remained at the site. The Phase I ESA concluded the removal or closure-in-place of the three USTs should be conducted in accordance with applicable local, state, and federal regulations (Seagull 2016).

The following sections describe Brownfields cleanup alternatives for addressing the identified environmental concerns, including a "No Action" alternative. Following the description, each alternative is evaluated in terms of its effectiveness, implementability, and cost.

The effectiveness of an alternative refers to its ability to meet the objectives of the Brownfields cleanup. Specific criteria used to assess the effectiveness of an alternative include the following:

- Overall protection of public health and the environment
- Compliance with applicable or relevant and appropriate requirements (ARAR) and other criteria, advisories, and guidance
- Long-term effectiveness
- Reduction of toxicity, mobility, or volume through removal and disposal or closure-in-place
- Short-term effectiveness.

The implementability criteria address the technical and administrative feasibility of implementing an alternative, and the availability of various services and materials required during its implementation. Specific criteria used to assess implementability of an alternative are:

- Technical feasibility
- Administrative feasibility
- Availability of services and materials
- State acceptance
- Community acceptance.

Each alternative is evaluated to determine its estimated cost. The evaluations compare each alternative's direct capital costs, which include equipment, services, and contingency allowances. The purpose of evaluating each alternative is to determine its advantages and disadvantages relative to the other alternatives in order to identify key tradeoffs that would affect selection of the preferred alternative.

**Alternative 1: No Action**

Alternative 1 (no action) would consist of leaving the three USTs in place at the site. There would be no direct cleanup costs associated with this alternative.

Effectiveness

This alternative may not be effective regarding redevelopment of the site because construction activities could potentially be hindered by presence of the tanks. If this were the case, proposed redevelopment could be restricted.

Implementation

Implementation of this alternative is straightforward – the USTs are left in place. Redevelopment would have to consider the location and condition of the area surrounding the USTs to ensure the tanks are not disturbed or accessible to site users/occupants.

Cost

This alternative would not involve any direct costs.

**Alternative 2: Proper Removal/Disposal**

Alternative 2 includes conventional excavation/removal of the three USTs and other ancillary components (if present) that remain below ground. The water inside the USTs would likely be pumped into 55-gallon drums, portable tanks or other containers for proper off-site disposal. A water sample will be collected and delivery for laboratory analysis to help determine proper disposal (e.g., hazardous vs non-hazardous waste). The USTs would then be excavated, cut open, and cleaned prior to disposal/recycling off site. An ambient air blower or other inert gas system would provide continuous ventilation to mitigate combustion hazards and inhalation risks posed to workers during the excavation and tank removal activities. UST removal would be conducted in accordance with applicable local, state, and federal regulations. Cleaning of the USTs would require special attention to worker health and safety. Air monitoring would be required to ensure safe working conditions. Interior tank cleaning may require Level B or modified Level C personal protective equipment (PPE). Once removed and cleaned, the USTs could be disposed of as non-hazardous waste or salvaged for metal.

## 3.1 EVALUATED CONTAMINATION

The environmental issue evaluated for this ABCA pertains to the three USTs on the subject property. The sections below discuss the identified USTs during the Phase I ESAs completed for the site. Site photographs are included as Appendix B.

### 3.1.1 Underground Storage Tanks

In 2004, the property was developed into Woody's Grocery Store (a convenience store and filling station), which included a canopy with fueling pumps and three diesel USTs (two 8,000-gallon tanks and one 6,000-gallon tank). In 2011, the convenience store burned down, and the three diesel USTs were emptied and have not been in use since. During an interview with Mr. Earl Huskamp on February 21, 2017, he noted that water is currently in the USTs. According to Mr. Huskamp, one UST is full and the other two USTs are a quarter full (of water); however, Mr. Huskamp did not know which UST was full. Based on the November 2012 Phase II ESA, analytical results for soil and groundwater samples collected around the USTs did not indicate a release of petroleum products from the USTs had occurred.

## 3.2 EVALUATION OF CLEANUP ALTERNATIVES

Evaluations have been developed with specific consideration to the Missouri Department of Natural Resources (MDNR) Brownfields/Voluntary Cleanup Program (BVCP) procedural requirements and MRBCA technical guidance. This consideration was made because cleanup projects implemented with EPA Brownfields Cleanup funding generally require participation in a state voluntary cleanup program (or equivalent). For reference, fees associated with enrollment into the MDNR BVCP include a $200 application fee and refundable oversight deposit of $5,000.

### 3.2.1 Underground Storage Tanks

Three options were evaluated for the USTs: (1) no action, (2) tank removal/disposal, and (3) tank closure-in-place. As previously discussed, the three USTs were emptied and have not been in use since 2011; the USTs currently contain water. Based on the Phase II ESA, analytical results for the samples collected around the USTs did not indicate a release of petroleum products had occurred. The following section provide further analysis of these cleanup alternatives.

Effectiveness

The USTs are permanently removed. This alternative would allow for redevelopment of the site without restrictions.

Implementation

Cleanup activities would be conducted in accordance with applicable local, state, and federal regulations. For this alternative, the USTs would be removed from the ground for proper off-site disposal. The tanks currently contain water. A water sample will be collected and delivery for laboratory analysis to help determine proper disposal (e.g., hazardous vs non-hazardous waste). After the water has been pumped from the tanks, the interior of the USTs would be cleaned to ensure no waste remains. Proper disposal of the USTs would involve their transport to a landfill or metal recycling facility. Following removal, soil samples would be collected at the former tank locations to ensure contaminants of concern are at concentrations below applicable MRBCA standards. If necessary, additional soil excavation maybe required to achieve cleanup goals. The excavated area would be subsequently restored to pre-cleanup conditions (backfilled with clean fill). Dependent on analytical results, it is likely that the soil could be placed in a roll-off dumpster for bulk disposal. The removal and associated sampling would be conducted in accordance with MRBCA Process for Petroleum Storage Tanks (Technical Guidance) (MDNR 2013).

Cost

Estimated labor, equipment, and disposal costs were gathered from local vendors. Remediation costs include disposal of the water inside the USTs, and removal, cleaning, and disposal of the three USTs along with site restoration (backfilling). UST closure sampling of soils would be conducted to ensure MRBCA Tier 1 RBTLs for residential land use are achieved. This cost estimate assumes that overburden soil would be stockpiled and used as backfill following excavation. Sampling of the overburden would be required to ensure it is suitable as backfill. Table 1 below summarizes the costs to excavate and properly dispose of the USTs.

**TABLE 2**

**UST REMOVAL COSTS**
**TJTR-WOODY'S GROCERY STORE SITE**
**AGENCY, MISSOURI**

| Activity | Total Cost |
|---|---|
| Mobilization and Site Setup | $3,000 |
| Excavation/Removal/Cleaning/Disposal of USTs (includes disposal of tank contents [water] residual waste, contaminated soil [if any], tank pit dewatering [if any], and the three USTs) | $38,125 |
| Backfilling and Site Restoration (includes 100 cubic yards of backfill soil) | $2,500 |
| UST Closure and Final Report for MDNR Review and Approval | $3,500 |
| Field Sampling Program | $3,500 |
| **Total UST Removal Costs:** | **$50,625** |

Notes:

MDNR Missouri Department of Natural Resources
UST Underground storage tank

Total cost to remove and properly dispose of the three USTs including mobilization and site setup and backfilling and site restoration, is $43,625. Additional costs to be considered include technical reports (UST Closure and Final Cleanup Report) and the collection of clearance samples. Estimated costs for the technical plans/reports are $3,500 per plan/report (cost of plans includes consideration of all environmental issues to be addressed by cleanup activities), and $3,500 for sampling activities. Sampling includes disposal profile sampling, closure sampling, and other tasks required if the site were enrolled in the MDNR VCP.

## Alternative 3: Storage Tank Closure-In-Place

Alternative 3 includes closure-in-place of the existing USTs and other ancillary components (if present) that remain below ground. The closure-in-place alternative would not disturb or remove the buried tanks. Efforts to uncover and access the interior of the tanks would still be required to remove any residual waste for off-site disposal. UST access and necessary monitoring would still be the same as described for Alternative 2.

### Effectiveness

The USTs are permanently closed in place. This alternative would allow for redevelopment of the site, but restrictions due to the presence of the USTs would apply to the site.

Implementation

For this alternative, closure-in-place of the three USTs and other ancillary components (if present) that remain below ground would occur. Similar to Alternative 2, water inside the USTs would be pumped into containers for proper off-site disposal. A water sample will be collected and delivered for laboratory analysis to help determine proper disposal (e.g., hazardous vs non-hazardous waste). Additionally, the interior of the USTs would be cleaned to ensure no residual waste remains. This alternative entails application of an inert, flowable material to fill and seal the buried USTs at their existing locations. The inert, flowable material can include concrete slurries, sand, ash, granular mixtures, and foaming agents. The chosen material would be applied using a ready-mix truck with a flow chute or pump system. Since the closure-in-place would not produce an open excavation for confirmation soil sampling, a DPT rig could be used to collect soil and groundwater (if present) samples along the sides and downgradient of the USTs following MRBCA guidance. These analytical results would determine whether additional soil excavation and/or assessment is required to achieve. MRBCA Tier 1 RBTLs for residential land use.

Cost

Estimated labor, equipment, and costs were gathered from local vendors. Remediation costs include disposal of the water inside the USTs, and closure-in-place of the three USTs and ancillary components (if any). UST closure sampling of soils would be conducted to ensure MRBCA Tier 1 RBTLs for residential land use are achieved. Table 3 below summarizes the costs for closure-in-place of the USTs.

**TABLE 3**

**UST CLOSURE-IN-PLACE COSTS**
**TJTR-WOODY'S GROCERY STORE SITE**
**AGENCY, MISSOURI**

| Activity | Total Cost |
|---|---|
| Mobilization and Site Setup | $3,000 |
| Contain and Disposal of Tank Contents and Residual Waste | $15,000 |
| Fill Underground Storage Tank with Appropriate Material | $21,250 |
| Backfilling and Site Restoration | $500 |
| Georprobe® Sampling Investigation | $8,500 |
| USTs Closure and Final Report for MDNR Review and Approval | $3,500 |
| **Total UST Removal Costs:** | **$51,750** |

Notes:

MDNR Missouri Department of Natural Resources
UST Underground storage tank

Total cost for closure-in-place of the USTs, including mobilization and site setup and backfilling and site restoration, is $39,750. Additional costs to be considered include the technical reports (UST Closure and Final Cleanup Report) and collection of clearance samples. Estimated costs for technical plans/reports are $3,500 per plan/report (cost of plans includes consideration of all environmental issues to be addressed by cleanup activities) and $8,500 for sampling activities. Sampling cost include confirmation soil sampling using a direct-push Georprobe®. The soil samples would be collected along the sides of the USTs to ensure MRBCA Tier 1 RBTLs for residential land use are achieved.

## 3.3 RECOMMENDED CLEANUP ALTERNATIVES

Alternative 2 – removal and disposal – is the recommended cleanup alternative for the USTs currently at the site. Future plans at the site include the development of a city hall for the Village of Agency. This alternative would allow for redevelopment of the site without restrictions that apply to the USTs.

### 3.3.1 Total Cleanup Cost

Based on the recommended cleanup alternatives, the estimated total cleanup cost is $55,825, which includes site enrollment in the MDNR BVCP, fees associated with preparation of required technical plans/reports, and all cleanup-related sampling. Specifically, removal and disposal of the three USTs at the site is estimated at $43,625. Site enrollment fees into the MDNR BVCP program are $5,200, while fees associated with preparation of technical reports would be $3,500 ($3,500 for UST Closure and Final Cleanup Report). Additionally, cost for sampling activities associated with removal of the USTs is estimated at $3,500. Clearance sampling cost includes labor and analytical fees. Table 4 summarizes the discussed costs.

**TABLE 4**

**SUMMARY OF COSTS**
**TJTR-WOODY'S GROCERY STORE SITE**
**AGENCY, MISSOURI**

| Contaminant/Material | Recommended Alternative | Action – Cost | Total Cost |
|---|---|---|---|
| USTs | Alternative 2 – Removal/Disposal | Removal/Disposal – $43,625 | $43,625 |
| MDNR Brownfields/Voluntary Cleanup Program Fees | | | $5,200 |
| Technical Plan Preparation (UST Closure and Final Cleanup Report) and Clearance/Closure Sampling | | | $7,000 |
| | | **TOTAL CLEANUP COST = $55,825** | |

Notes:

MDNR Missouri Department of Natural Resources
UST Underground storage tank

## 4.0 REFERENCES

Missouri Department of Natural Resources (MDNR). 2013. Missouri-Risk Based Corrective Action Process for Petroleum Storage Tanks. October 17.

Seagull Environmental Technologies Inc. (Seagull). 2016. Phase I Environmental Site Assessment for the TJTR-Woody's Grocery Site. September.

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