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# RBCA RECEPTOR EVALUATION AND SITE ASSESSMENT WORK PLAN

Flying J Travel Plaza
4200 N Interstate 90 Service Road
Rapid City, South Dakota

**AET Project No. P-0048949**
**SDDANR Spill No. 2025.152**
**SDDANR Tank Facility ID 02-00136**
**SDPRCF No. 8791**

**Date:**
March 13, 2026

**Prepared for:**
M.G. Oil Company
1180 Creek Drive
Rapid City, South Dakota

Geotechnical • Materials
Forensic • Environmental
Building Technology
Petrography/Chemistry

**American Engineering Testing**
1745 Samco Road
Rapid City, SD 57702
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March 13, 2026

M.G. Oil Company
1180 Creek Drive
Rapid City, South Dakota 57703

Attn: Mr. Dave Kulish
Email: dkulish@mgoil.com

RE: RBCA Receptor Evaluation and Site Assessment Work Plan
Flying J Travel Plaza
4200 North Interstate 90 Service Road
Rapid City, SD 57701
AET Project No. P-0048949
SDDANR Spill No. 2025.152; SDDANR Tank Facility ID 02-00136; SDPRCF No. 8791

Dear Mr. Kulish:

American Engineering Testing, Incorporated (AET) has completed the Risk Based Corrective Action Receptor Evaluation and Site Assessment Work Plan at the above-referenced site as per AET's proposal dated November 25, 2025, and signed authorization received on December 2, 2025.

After you have reviewed our report, please sign and date the attached "Approval for Release" form. Upon receiving the signed "Approval for Release", we will be forwarding copies of the report to the South Dakota Department of Agriculture and Natural Resources and the Petroleum Release Compensation Fund for their review.

If you have any questions, comments or need additional information, please feel welcome to contact us. AET appreciates the opportunity to have been of service to you on this project.

Sincerely,
**American Engineering Testing**

Jeremy J. Huot, CPRR
**Environmental Project Manager**
jhuot@teamaet.com
Office: (605) 388-0029


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## APPROVAL FOR RELEASE

Project: RBCA Receptor Evaluation and Site Assessment Work Plan
Flying J Travel Plaza
4200 North Interstate 90 Service Road
Rapid City, SD 57701
AET Project No. P-0048949
SDDANR Spill No. 2025.152
SDDANR Tank Facility ID 02-00136
SDPRCF No. 8791

Report: AET Report No. P-0048949.1

Date: March 13, 2026

As the addressee of the above referenced report and the client of record for the project, I hereby give my permission for the release of the report to the agencies referenced in the subject report.

Client: _____

Authorized Signature: _____

Typed Name: _____

Title: _____

Date: _____

## Site Summary

Site Name **Flying J Travel Plaza** Department File No. **2025.152** Date **March 13, 2026**

Location (address) **4200 North I-90 Service Road** City **Rapid City**

State **South Dakota** County **Pennington**

Latitude/Longitude **44.103538°, -103.149554°** Method (map, GPS, etc.) **Google Earth Pro Software**

Contamination Source **Underground Storage Tank and Distribution System**

Responsible Person (RP) **M.G. Oil Company** Consultant **American Engineering Testing, Inc.**

RP Mailing Addresses **1180 Creek Drive** City/State **Rapid City, South Dakota** Zip **57503**

Land Use: Residential, Industrial, Rural, Other **Commercial**

Distance to and Name of Closest Surface Water **0.75-mile northeast, Box Elder Creek.**

Depth/Distance to and Name of Closest Aquifer **1,624 feet to Dakota Aquifer.**

Distance/Depth to and Name of Closest Water Well **Review of DANR well log records indicate that one commercial water well may be located on the site. According to the well log, the well was drilled to an approximate depth of 1,920 feet below ground surface and is completed in the Dakota Aquifer (Inyan Kara Group), which first occurs at approximately 1,624 feet below ground surface. The log further documents the presence of thick intervals of clay and shale between the ground surface and the Dakota Aquifer, which would likely limit downward migration of water and petroleum contaminants to the aquifer.**

Distance to/Name of Well head or Source Water Protection Area **Approximately one mile north of Zone A Source Water Protection Area.**

Environmental Media Impacted: **Surface Soil <3.2' below ground surface, Subsurface Soil >3.2' below ground surface.**

Groundwater, Surface Water, Indoor Air, Utilities, Outdoor Air, Other: **To be evaluated further in Tier 2 Assessment.**

Was Free Phase Product Present? **To be evaluated further in Tier 2 Assessment.**

Utilities to be Investigated: Water, Sewer (Storm/Sanitary), Electrical, other: **Water, Sanitary Sewer, and Storm Sewer.**

Off Site Migration of Contamination (Yes/No) Direction **To be evaluated further in Tier 2 Assessment.**

Sensitive Receptors Within 500 feet of Plume (schools, homes, water bodies) **None identified in Receptor Evaluation.**

Type of Corrective Action: Excavation, Soil Vapor Extraction, Air Sparging, Bio-Venting, Monitoring, Engineering Control (Specify type): **Impacted soils encountered during the most recent UST system removal were excavated and disposed of. Additional remedial action to be determined, as necessary, based on results of the Tier 2 Assessment.**

## Additional Information

Cubic Yards of soil Excavated/treated **1710.11 tons.**

Name of Landfarm/Landfill **Rapid City Landfill.**

Number of Monitoring Wells Installed **0** Number of Monitoring Wells Properly Closed **0**

Proposed Action: Closure/Inactive, Remediation, Eliminate Exposure Route, Monitoring **Eliminate/determine exposure route(s). Recommend subsurface investigation to determine petroleum impacts and extents to soil and groundwater.**

Product **Not applicable** Tank Bottoms **8 Petroleum USTs** Contaminated Water **Not applicable**

*If gas or used oil tanks, document if hazardous waste generated: **No hazardous waste.**

Disposal of waste liquid(s): **Not Applicable** Disposal of tank bottoms: **Disposed of by system removal contractor**

Signature of Responsible Person or Authorized Agent

# TABLE OF CONTENTS

1.0 INTRODUCTION ..... 1
1.1 Site Description ..... 1
1.2 Background Information ..... 1
1.3 Site Topography ..... 3
1.4 Geology and Hydrology ..... 3
1.5 Purpose of Work ..... 4
1.6 Scope of Work ..... 4
2.0 DISCUSSION ..... 5
2.1 RBCA Tier 2 Receptor Evaluation Site Information ..... 5
2.2 RBCA Tier 2 Receptor Evaluation ..... 5
2.2.1 Primary Sources ..... 5
2.2.2 Secondary Sources and Transport Mechanisms ..... 6
2.3 Exposure Pathway Screening ..... 8
2.3.1 Underground Utilities ..... 8
2.3.2 Indoor Air ..... 10
2.3.3 Aquifer Usage ..... 11
2.3.4 Surface Water and Soil Inhalation, Ingestion, and Dermal Contact ..... 11
3.0 CONCLUSIONS ..... 12
4.0 RECOMMENDATIONS ..... 12
5.0 STANDARD OF CARE ..... 15

## APPENDICES

A. Figures
1. Site Location Topographic Map
2. Site Sketch with Utilities, Proposed Soil Boring/Monitoring Well Locations, and Former UST System Locations

B. SD DANR RBCA Site Conceptual Model

# RBCA RECEPTOR EVALUATION
# AND SITE ASSESSMENT WORK PLAN
# FLYING J TRAVEL PLAZA
# 4200 NORTH INTERSTATE 90 SERVICE ROAD, RAPID CITY, SD
# AET No. P-0048949

## 1.0 INTRODUCTION

### 1.1 Site Description

The physical location of the Flying J Travel Plaza (site) is 4200 North Interstate 90 (I-90) Service Road, Rapid City, South Dakota (SD). The approximate township/range location of the site is described as NW¼ of the SW¼ of Section 27, Township 2 North, Range 8 East, Black Hills Principal Meridian, Pennington County, SD. The latitude/longitude of the site is 44.102905°, -103.149818° as determined using Google Earth Pro software. A topographic site location map and site sketch are presented as Figure 1 and Figure 2, Appendix A, respectively.

### 1.2 Background Information

Based on information provided by M.G. Oil Company (MG Oil) and records maintained by the South Dakota Department of Agriculture and Natural Resources (DANR), the site formerly contained a large underground storage tank (UST) system consisting of multiple gasoline and diesel fuel tanks, including one 4,000-gallon E-85 gasoline UST, three gasoline USTs ranging from 12,000 to 20,000 gallons, four diesel fuel USTs ranging from 12,000 to 20,000 gallons, and a diesel exhaust fluid (DEF) UST. The facility is registered with DANR under Facility No. 02-00136.

The site has a documented history of petroleum releases and environmental investigations. Prior to this report, the most recent Risk-Based Corrective Action (RBCA) activities were performed at the site subsequent to a release associated with a failed gasoline product distribution line that was identified in September 2015 (DANR Spill Case No. 2015.191). As a result of the identified release, a RBCA Tier 2 Site Assessment was conducted between 2018 and 2020. That assessment included soil borings and groundwater sampling, which identified petroleum hydrocarbons in soil and groundwater at concentrations below applicable Tier 1 Trigger and Action Levels and SD Groundwater

Quality Standards (SDGWQS). Based on those findings, DANR issued a No Further Action (NFA) determination for the spill case on June 15, 2020.

More recently, extensive site redevelopment activities were undertaken, including removal of the petroleum and DEF UST systems. During UST system removal and associated excavation activities conducted in 2025, petroleum-impacted soils were encountered in multiple areas, including the former petroleum UST basin, DEF UST basin, distribution pump island locations, and distribution line trenches. In addition, free-phase petroleum product (free product) was observed on perched groundwater within both the DEF UST basin and the petroleum UST basin excavations. Although immediate mitigation measures were implemented at the site including removal of the recoverable free product observed within the UST basins and excavation/off-site disposal of approximately 1,710.11 tons of petroleum-impacted soil, laboratory analytical results confirmed that petroleum hydrocarbon concentrations exceeding DANR Tier 1 Trigger and/or Action Levels remain in subsurface soils at the site.

Following completion of the UST system removal activities, a UST System Removal Report documenting field observations, soil screening, laboratory results, and disposal activities was submitted to DANR (AET Report No. P-0043683 – September 15, 2025). Upon review of this report, DANR requested that additional RBCA evaluation be conducted. Specifically, DANR directed that a RBCA Tier 2 Assessment be completed to further evaluate remaining contamination, potential exposure pathways, and receptors that may be affected under current site conditions.

This RBCA Receptor Survey has been prepared in response to that request and is intended to support the Tier 2 Assessment by identifying and evaluating potential human and environmental receptors in the vicinity of the site, considering updated site conditions, remaining petroleum impacts, and potential exposure pathways not previously assessed.

## 1.3 Site Topography

A review of the United States Geological Survey (USGS) topographic map for the Rapid City West Quadrangle (Figure 1) indicates that the site elevation is approximately 3,150 feet (ft) above mean sea level (AMSL). The site is primarily covered with concrete pavement. Based on interpretation of the topographic contours, surface water drainage in the vicinity of the site is anticipated to flow north/northeast toward Box Elder Creek which is located approximately 0.75 miles north of the site (and flowing east) at its nearest point. This assumption is derived from regional topography and does not account for potential alterations due to site grading or stormwater infrastructure.

## 1.4 Geology and Hydrology

Based on the SD Geological Survey's *Bedrock Geologic Map Showing Configuration of the Bedrock Surface in SD* (Tomhave and Schulz, 2004), the site is underlain by the Pierre Shale formation. This unit consists predominantly of blue-gray to dark-gray shale, ranging from fissile to blocky in texture. The formation includes persistent beds of bentonite, black organic shale, and light-brown chalky shale, with minor occurrences of sandstone and conglomerate. Carbonate and ferruginous concretions are also abundant throughout the unit, which has an estimated thickness of up to approximately 1,000 ft.

Unconfined groundwater flow generally mimics surface topography; therefore, the regional groundwater flow direction is assumed to be north to northeast toward Box Elder Creek. Previous environmental assessment data indicates that shallow groundwater at the site typically occurs at depths of approximately 20 to 30 ft below grade (bg). During previous RBCA field investigation activities conducted in 2018, groundwater was encountered within this depth range at certain boring locations; however, other borings advanced to similar depths did not consistently intersect groundwater. This variability suggests that shallow groundwater at the site is limited in extent and likely discontinuous.

The restricted occurrence of groundwater can likely be attributed to the hydrogeologic characteristics of the Pierre Shale, which is commonly described as dense, clay-rich, and

exhibiting very low permeability. Groundwater within this formation likely occurs primarily within weathered zones and fractures rather than within a laterally continuous porous aquifer. Consequently, groundwater movement is most likely highly restricted and likely fracture-controlled. Due to these poor hydraulic properties, the Pierre Shale is not utilized as a potable water source, and the primary drinking water aquifer in the site vicinity is the Dakota Aquifer (Inyan Kara Group), which occurs at depths of approximately 1,600 to 1,900 ft bg.

## 1.5 Purpose of Work

The purpose of the RBCA receptor evaluation was to identify possible receptors and exposure pathways present within the study area, and to evaluate potential risk to the receptors via exposure pathways from the petroleum hydrocarbons present at the site.

## 1.6 Scope of Work

The scope of work performed on this phase of the project consisted of:

1. contact Renner Associates, LLC (Renner) to obtain accurate information regarding the locations of utility lines within and adjacent to the site;

2. researching available public information concerning the depths and construction of any water and sewer lines identified on and in the area of the site;

3. reviewing available prior release and assessment records in the vicinity of the site;

4. identifying on-site and adjacent potential petroleum sources, potential exposure pathways (including hydrogeology), and any receptors present on and in the area of the site (including subsurface structures, water wells, surface water bodies, and residential and commercial structures); and

5. preparing and submitting an assessment work plan to include site description and history; site figures showing the potential sources, pathways and receptors to be assessed; a preliminary DANR RBCA Site Conceptual Model; and assessment methods proposed to evaluate the potential for completed pathways and risk including assessment locations, depths, and parameters to be analyzed.

# 2.0 DISCUSSION

## 2.1 RBCA Tier 2 Receptor Evaluation Site Information

During the evaluation of potential receptors and exposure pathways, relevant information was obtained from Renner, the engineering firm retained by MG Oil involved in the design and management of recent site improvements and remodeling activities. Additional data regarding public water, sanitary sewer, and stormwater utilities were compiled from the Pennington County RapidMap geographic information system. Research was also conducted using the SD DANR Water Rights database. Collectively, these sources provided information on the facility's operational history, existing building and utility infrastructure, and groundwater use in the vicinity of the site.

## 2.2 RBCA Tier 2 Receptor Evaluation

To characterize baseline exposure conditions at the site, a DANR RBCA Site Conceptual Model was prepared and is presented in Appendix B. The following sections summarize the key components and exposure pathways represented in the model.

### 2.2.1 Primary Sources

As defined by the RBCA Site Conceptual Model and the results of the soil sampling conducted in association with AET Report No. P-0043683, the following primary sources were identified.

- Petroleum-impacted soil was confirmed within the former petroleum UST basin, where both floor and sidewall samples exhibited exceedances of the DANR RBCA Tier 1 Trigger and Action Levels for TPH-G, TPH-D, BTEX, and naphthalene. Visual observations of stained soils, strong hydrocarbon odors, and the presence of free product on perched groundwater further support that the former petroleum USTs ("Storage Tanks") represent a primary source of contamination at the site.

- Petroleum-impacted soil was identified beneath the majority of the former dispenser pump islands, with TPH-D detected above the Tier 1 Trigger Level at many pump island locations, and soil from one island also exhibiting benzene above the applicable Tier 1 Action Level. In addition, soil within the distribution line trenches contained TPH-D and benzene above Tier 1 Trigger/Action Levels. These findings indicate that “Piping/Pump Island” can be considered a primary source of petroleum impacts at the site.

### 2.2.2 Secondary Sources and Transport Mechanisms

During the petroleum UST, DEF UST, dispenser island, and associated product piping removal activities documented in AET Report No. P-0043683, multiple secondary sources of petroleum contamination were identified at the site. These sources include petroleum-impacted surface soils, impacted subsurface soils, the presence of free product, and the likely presence of a dissolved-phase petroleum impacted groundwater.

Petroleum-impacted surface soils (<3.2 ft bg) were documented beneath the former pump islands and within distribution line trenches. Evidence of petroleum impacts included visible staining, elevated organic vapor readings, and laboratory analytical results showing petroleum hydrocarbons exceeding Tier 1 Trigger/Action Levels. These indicators demonstrate that surface soils have been affected by petroleum releases and represent a secondary source at the site.

Impacted subsurface soils (>3.2 ft bg) were also documented within the petroleum UST basin and portions of the former DEF UST basin. Evidence of petroleum impacts included visible staining, elevated organic vapor readings, and laboratory analytical results showing petroleum hydrocarbons exceeding Tier 1 Trigger/Action Levels. These indicators demonstrate that subsurface soils have been affected by petroleum releases and represent a secondary source at the site.

Free product was observed within both the petroleum UST basin and the former DEF UST basin. Hydrocarbon sheen and measurable free product were present floating on perched groundwater at depths of approximately 8 to 10 ft bg in both UST basins. Although absorbent materials were used to recover accessible free product during removal activities, it is likely that residual free product remains on the perched groundwater surface within the former UST basins. Accordingly, free product can be considered a secondary source at the site.

Given the presence of residual free product and petroleum constituents in soils adjacent to shallow perched groundwater, it is reasonable to conclude that a dissolved-phase petroleum groundwater plume may also be present – at least within the perched groundwater in the former UST basins. Groundwater samples were not collected during the UST removal activities; however, the magnitude and distribution of soil contamination, combined with the documented free product, indicate that dissolved hydrocarbon impacts to groundwater are likely. Accordingly, dissolved phase petroleum impacted groundwater can be considered a secondary source at the site.

Based on the identified secondary sources, including petroleum-affected surface soils, impacted subsurface soils, dissolved phase petroleum impacted groundwater, and free petroleum product, the potential contaminant transport mechanisms at the site include: (1) surface water runoff, (2) volatilization and enclosed space accumulation, (3) leaching and groundwater transport, and (4) mobile free product.

Accordingly, these associated transport mechanisms require further evaluation to determine whether they may contribute to complete exposure pathways. These considerations are discussed in the following sections of this receptor evaluation.

## 2.3 Exposure Pathway Screening

### 2.3.1 Underground Utilities

Based on the utility infrastructure present at or adjacent to the site, additional site-specific information was obtained to evaluate the potential for petroleum-impacted soil and/or groundwater to come into contact with the following utilities: a.) water lines, b.) storm sewer lines, c.) sanitary sewer lines, and d.) shallow underground utility lines. The locations of underground utility infrastructure at the site are depicted in Figure 2.

#### a. Water Lines

A review of available utility records indicates that the on-site building is supplied by the municipal water system operated by the City of Box Elder. Buried potable water service lines on the property consist of PVC piping installed at an approximate depth of 6 to 8 ft bg. Water infrastructure supplying the on-site building is situated on the north side of the site.

In addition to the on-site potable water line, an off-site municipal water line is located west of the site beyond Elk Vale Road. According to information obtained from the Pennington County RapidMap GIS database, this off-site water line is also constructed of PVC. The database does not specify the burial depth of the line; however, typical installation depths for municipal water lines in the area are approximately 6 to 8 ft bg. For the purposes of this evaluation, the off-site water line is therefore assumed to be installed within this typical depth range.

PVC water lines can exhibit limited permeability to certain petroleum hydrocarbon constituents, particularly aromatic compounds such as benzene and toluene, under certain conditions. Accordingly, the presence of both on-site and nearby off-site potable water lines represents a potential exposure pathway for groundwater and/or soil impacting a water line.

During UST removal activities, a soil sample was collected from the west sidewall of the DEF UST basin at the 6-8 ft bg interval to evaluate potential petroleum impacts at the approximate depth of the off-site municipal water line located west of the site (beyond Elk Vale Road). Analytical results indicated that TPH exceeded the applicable Tier 1 Trigger Level; however, none of the applicable Tier 1 Action Levels were exceeded. Based on these results, impacts at depths comparable to the off-site water line are not considered significant, and no further evaluation of the off-site water line is warranted. Additional evaluation should therefore focus only on the on-site potable water service lines.

**b. Storm Sewer Lines**

A review of available utility records indicates that multiple storm drain/storm sewer lines are present within the site boundaries. Available information indicates these lines are constructed of reinforced concrete pipe (RCP) and are installed at depths ranging from approximately 3 to 10 ft bg.

Reinforced concrete is generally considered resistant to permeation by petroleum hydrocarbons due to its dense composition and low material permeability. Unlike PVC, reinforced concrete does not readily allow the diffusion of volatile petroleum constituents through the pipe wall. Based on the pipe construction material, the storm sewer utilities at the site can be discounted with regard to the “vapors in underground utilities” exposure pathway and further investigation is not warranted.

**c. Sanitary Sewer System**

A review of available utility records indicates that the on-site building is supplied by the municipal sanitary sewer system operated by the City of Box Elder. Buried sanitary sewer service lines on the property consist of PVC piping installed at an approximate depth of 6 to 10 ft bg.

In addition to the on-site sanitary sewer service lines, two off-site municipal sanitary sewer lines are located in the vicinity of the site. One is situated to the south of the site and the

other is situated to the west of the site beyond Elk Vale Road. According to information obtained from the Pennington County RapidMap GIS database along with depth measurements collected at sewer manholes by AET, the off-site sanitary sewer lines are constructed at depths ranging from 30-37 ft bg.

PVC sewer lines can exhibit limited permeability to certain petroleum hydrocarbon constituents, particularly aromatic compounds such as benzene and toluene, under certain conditions. Accordingly, the presence of both on-site and off-site sanitary sewer lines represents a potential exposure pathway for “vapors in underground utilities”. Therefore, further evaluation of this potential exposure pathway is therefore warranted.

#### d. Shallow Underground Utility Lines

Information gathered during the site visit indicates that buried electrical power lines, telecommunications lines, and natural gas lines are present across the property. These utilities are typically installed at relatively shallow depths, generally on the order of approximately 2 to 3 ft bg.

Although the utilities themselves are unlikely to be directly affected by impacted soil or groundwater, the disturbed soils and granular bedding materials placed within utility trenches can create preferential pathways for vapor migration. Under certain conditions, petroleum vapors traveling along these trenches may accumulate within utility boxes.

Given the shallow installation depths of these utilities and the potential for trench backfill to facilitate vapor movement, the presence of these utilities constitutes a potential exposure pathway for “vapors in underground utilities.” Accordingly, this pathway cannot be dismissed and warrants further evaluation.

### 2.3.2 Indoor Air

The on-site building is constructed on a slab-on-grade foundation, which typically provides limited potential for indoor accumulation of petroleum vapors. Soil samples

collected from the surface soil interval at the pump islands closest to the building showed exceedances of Tier 1 criteria for TPH, with one location also containing benzene above the Tier 1 Action Level (located at the former canopy directly south of the structure). Although the benzene concentration at that location is below the DANR Soil Volatilization to Indoor Air Lookup Table value for soils less than 5 ft bg, use of that table is not appropriate if both soil and groundwater impacts are present beneath the structure. Because it is not yet known whether impacted groundwater or additional impacted soil exists between the former southern pump island canopy and the building, further investigation in this area is required to evaluate the potential vapor intrusion pathway and confirm whether DANR Tier 1 or Lookup Table screening tools are applicable.

### 2.3.3 Aquifer Usage

Review of DANR well log records indicate that one commercial water well may be located adjacent to the site. According to the well log, the well was drilled to an approximate depth of 1,920 ft bg and is completed in the Dakota Aquifer (Inyan Kara Group), which first occurs at approximately 1,624 ft bg. The log further documents the presence of thick intervals of clay and shale between the ground surface and the Dakota Aquifer, which would likely limit downward migration of petroleum contaminants to the aquifer. Because the well is completed in a deep, confined aquifer that is not hydraulically connected to any shallow groundwater potentially affected at the site, potable water use can be discounted as a potential exposure pathway and further investigation is not warranted.

### 2.3.4 Surface Water and Soil Inhalation, Ingestion, and Dermal Contact

Surface soil impacts exceeding Tier 1 criteria were documented during the UST removal activities. However, all affected areas are now covered by concrete surfacing, which provides an effective barrier that prevents petroleum migration via surface water runoff and potential for inhalation, ingestion, and dermal contact. Based on these current site conditions, the surface water exposure pathway and the inhalation, ingestion, and dermal contact exposure pathway can be eliminated, and no additional investigation is warranted at this time.

If future site work requires removal of the concrete cover, the surface soil conditions should be reevaluated to determine whether these pathways remain incomplete.

# 3.0 CONCLUSIONS

Based on the findings of the receptor evaluation, a DANR RBCA Site Conceptual Model Sheet was completed (Appendix B). According to the RBCA framework, potential exposure pathways may exist due to known and possible secondary sources present, including impacted subsurface soil, a potential dissolved-phase groundwater plume, and the potential presence of free product. Additional Tier 2 Assessment activities are necessary to determine whether these secondary sources represent viable completed exposure routes or if the potential exposure pathways can be confidently excluded.

Through the receptor survey process, four exposure pathways could not be eliminated and therefore require further investigation. These include the following:

- **Vapor Intrusion to Indoor Air**
- **Vapors In Underground Utilities**
- **Soil in Contact/Impacting a Water Line**
- **Groundwater in Contact/Impacting a Water Line**

Accordingly, further investigation addressing these pathways is recommended to refine the RBCA Site Conceptual Model and support future risk-based decision-making.

# 4.0 RECOMMENDATIONS

Based on the information presented in this evaluation, AET recommends assessment of the soil and groundwater between the primary UST basin/dispenser island sources and the potential exposure pathways. This information would be used to determine whether the exposure pathways identified in this receptor evaluation exist or not.

Specifically, AET recommends soil borings/groundwater monitoring wells at the locations shown on attached Figure 2.

- Soil boring SB-1 is recommended south of the on-site building between the structure and the former pump island canopy previously located directly south of the building. The purpose of this boring is to evaluate the presence or absence of petroleum-impacted soil and/or groundwater near the building in order to assess the potential for vapor intrusion to indoor air. In addition, this location will allow evaluation of petroleum impacts at depths corresponding to buried utilities north of the building, including the potable water service line (6-8 ft bg) and the sanitary sewer line (6-10 ft bg) associated with the building. If groundwater or saturated petroleum-impacted soils are encountered, SB-1 will be completed as monitoring well MW-1 to evaluate the potential for dissolved petroleum constituents and mobile free product. The boring will be advanced to a maximum depth of approximately 30 ft bg.

- Soil boring SB-2 is recommended on the western portion of the site, west of the former DEF UST basin. This location is intended to evaluate the vertical extent of petroleum impacts in soil and determine whether contamination extends toward the municipal sanitary sewer line located west of the site beyond Elk Vale Road. Available information indicates that this sewer line is installed at a depth of approximately 37 ft bg. If groundwater or saturated petroleum-impacted soils are encountered at this location, SB-2 will be completed as monitoring well MW-2 to evaluate the potential for dissolved petroleum constituents and mobile free product. The boring will be advanced to a maximum depth of approximately 40 ft bg.

- Soil boring SB-3 is recommended along the southern portion of the site, south of the former petroleum UST basin, to evaluate the vertical extent of petroleum impacts and confirm that impacted soils are not present at depths that could contact the municipal sanitary sewer line located south of the site. Available information indicates that this sewer line is installed at an approximate depth of 30 ft bg. If groundwater or saturated petroleum-impacted soils are encountered, SB-

3 will be completed as monitoring well MW-3 to evaluate the potential for dissolved petroleum constituents and mobile free product. The boring will be advanced to a maximum depth of approximately 32 ft bg.

- Because shallow utility trenches may act as preferential pathways for vapor migration, AET also recommends collecting field air screening data from the utility junction box located near the southwest portion of the site and also at any major junction boxes on the exterior of the building. Screening will include measurements of percent lower explosive limit (%LEL) and organic vapors using a photoionization detector (PID) to evaluate potential petroleum vapor migration through shallow buried utility conduits and trench backfill materials.

- If analytical results indicate that petroleum-impacted soil or groundwater is potentially in contact with sanitary sewer infrastructure, additional air screening of accessible sanitary sewer manholes may be conducted to evaluate potential vapor accumulation within the sanitary sewer system.

- If analytical results indicate that petroleum-impacted soil or groundwater is potentially in contact with a potable water service line, a tap water sample may be collected from the on-site building to evaluate the potential for impacts to the potable water supply.

- While the proposed soil borings and potential monitoring wells are anticipated to adequately characterize the presence, degree, and vertical extent of petroleum hydrocarbon impacts at the site, additional soil borings and monitoring wells may be necessary to define the horizontal extent of impacts in soil and groundwater. If lateral extents are not sufficiently delineated upon completion of the above-described investigation, AET will consult with DANR to determine whether additional soil borings and monitoring wells are warranted on-site or on adjacent properties.

- All groundwater and tap water samples collected will be analyzed for TPH-D, TPH-G, and BTEX. All soil samples will be collected for TPH-D, TPH-G, BTEX, and naphthalene.

In addition, AET recommends that copies of this report be filed with 1) the DANR, Office of Inspection, Compliance & Remediation, Pierre and Rapid City, SD, and 2) the PRCF in Pierre, SD for their review.

## 5.0 STANDARD OF CARE

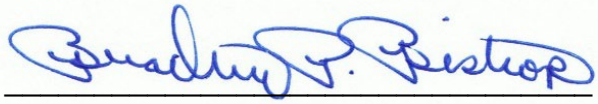
The recommendations contained in this report represent our professional opinions. These opinions were arrived at in accordance with currently accepted hydrogeologic and engineering practices at this time and location. Other than this, no warranty is implied or intended.

Report Prepared by:



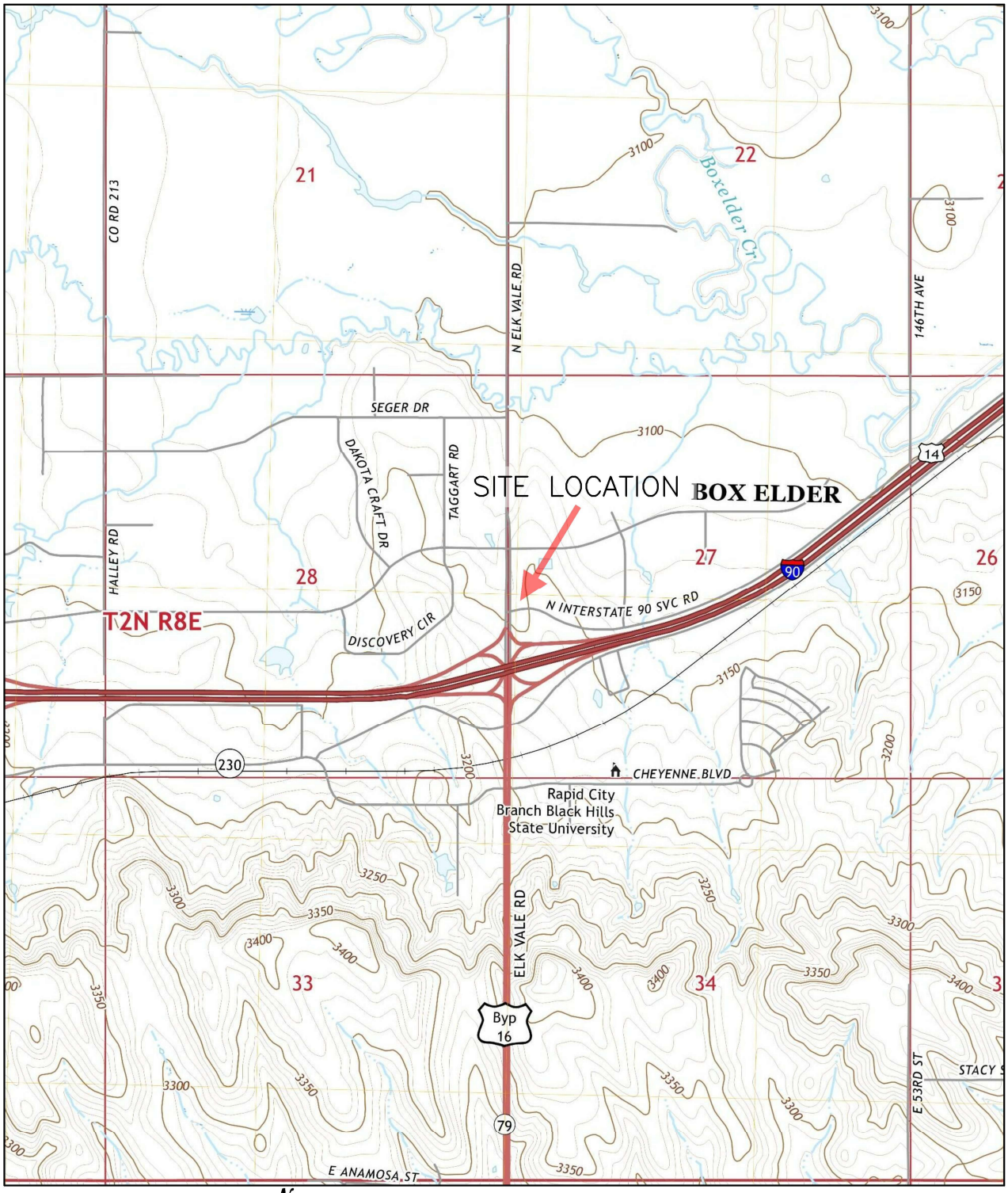
Jeremy Huot, CPRR
Environmental Project Manager

Report Reviewed by:



Bradley Bishop, CPRR
Senior Environmental Project Manage

# APPENDIX A
## Figures

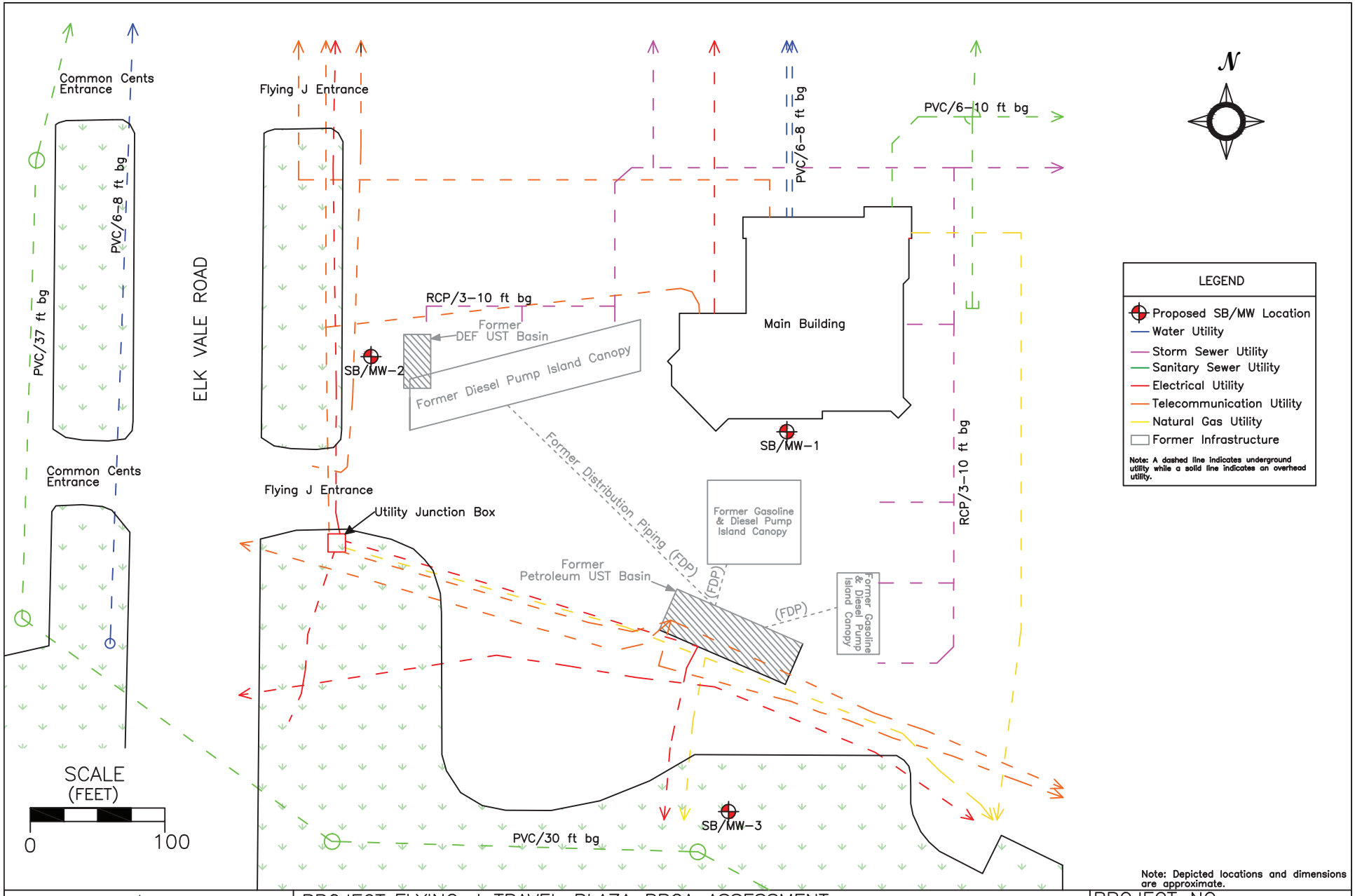



SCALE (FEET)
0 2,000

N

USGS TOPOGRAPHIC MAP
PROVIDED BY USGS DATABASE
DATED: 2021 SCALE: 1:24,000

| | | | |
|---|---|---|---|
| AET | PROJECT: FLYING J RBCA ASSESSSMENT<br>4200 N I-90 SERVICE ROAD, RAPID CITY, SD | | PROJECT NO.:<br>P-0048949 |
| | SUBJECT:<br>SITE LOCATION TOPO MAP | DRAWN BY:<br>JJH | DATE:<br>MARCH 11, 2026 |
| | SCALE:<br>1 INCH = 2,000 FEET | REVIEWED BY:<br>BPB | FIGURE:<br>1 |




| | | |
|---|---|---|
| AET | PROJECT: FLYING J TRAVEL PLAZA RBCA ASSESSMENT<br>4200 N INTERSTATE 90 SERVICE ROAD, RAPID CITY, SD | PROJECT NO.<br>P-0048949 |
| | SUBJECT: SITE SKETCH WITH UTILITIES AND PROPOSED SOIL BORING / MONITORING WELL LOCATIONS | DRAWN BY: JJH<br>DATE:<br>MARCH 10, 2026 |
| | SCALE: 1 INCH = 100 FEET | REVIEWED BY: BPB<br>FIGURE: 2 |

# APPENDIX B
## RBCA Site Conceptual Model

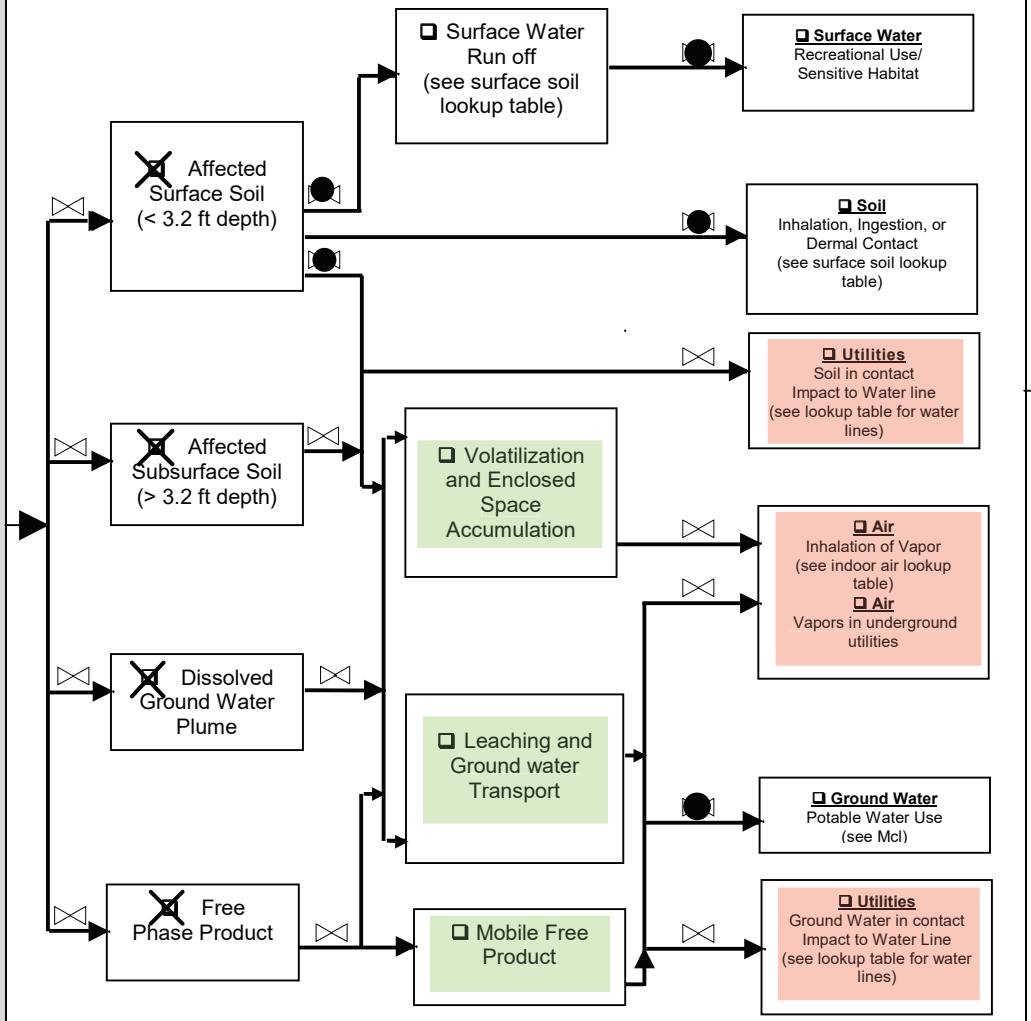
# SOUTH DAKOTA DANR
# RBCA SITE CONCEPTUAL MODEL SHEET

| | | | | |
|---|---|---|---|---|
| **SITE NAME** | Flying J Travel Plaza | **DATE COMPLETED** | March 11, 2026 | **DANR SPILL #** |
| **SITE LOCATION** | 4200 N Interstate 90 Service Road, Rapid City, SD | **COMPLETED BY** | Jeremy Huot | 2025.152 |

**Step 1 – *Baseline Exposure*: Fill in Box ( ☐ ) to identify applicable sources, transport mechanisms, and receptors.**
**Step 2 – *Remedial Measures*: Fill in shut-off valves ( ⋈ ) to indicate removal / remedial action, containment measure, or institutional controls to be used to "shut off" exposure pathway.**

**PRIMARY SOURCES**

- ☒ **Storage Tanks**
- ☒ **Piping/ Pump Island**
- ☐ **Handling**
- ☐ **Transportation Accident**
- ☐ **Vandalism**
- ☐ **Transformer**
- ☐ **Sump Waste**
- ☐ **Drums**
- ☐ **Other**




**POTENTIAL RECEPTORS**

**On-Site** ☐ Residential ☒ Commercial ☒ Construction worker

**On-Site** ☐ Residential ☒ Commercial

**Off-Site** ☐ Residential ☒ Commercial

Transport Mechanisms: Remain unknown until secondary sources can be confirmed.

Exposure Pathways: Cannot be eliminated or confirmed without further investigation, and additional information on existing transport mechanisms.