REMEDIAL ACTION PLAN

FORMER MANUFACTURED GAS PLANT
FIRST AVE. NORTH & THIRD AVE. WEST
WATERTOWN, SOUTH DAKOTA

January 11, 2007

GEOTEK PROJECT #04-136

Approved: _____ **Date:** _____
Watertown Municipal Utilities

Approved: _____ **Date:** _____
City of Watertown

Approved: _____ **Date:** _____
Watertown Development Corporation

Approved: _____ **Date:** _____
South Dakota DENR Project Officer

Approved: _____ **Date:** _____
Project Manager, Geotek Engineering & Testing Services, Inc

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 General

The Watertown Development Company, concerned with economic development for the Watertown community, would like to address contaminants associated with the Former Manufactured Gas Plant (FMGP) located at the intersection of 1st Avenue North and 3rd Street West, as part of efforts to further revitalize the Uptown District of Watertown (Figure 1) .

The goal of this Remedial Action Plan (RAP) is to provide one of the mechanisms necessary to move revitalization of the area forward. Specifically the purpose of this RAP is to develop a scope of work that will be undertaken to allow redevelopment to proceed.

1.2 Overview of Proposed Remedial Actions and/or Controls

The remedial actions and/or controls proposed have taken into account the anticipated future use of the site and surrounding properties where contaminants associated with the FMGP have been identified. In addition to the FMGP site, properties where contaminants have been identified include the commercial bakery property adjacent to the west, vacant City owned land to the southwest and the right-of-way bordering these properties (Figure 2).

The properties are all zoned for industrial use and future use is expected to remain industrial with one exception. A portion of the vacant land to the southwest may be developed as a public access to the city bike path. The bike path is located on a former railroad grade paralleling the south property line of the vacant land. The public access is expected to be developed with parking, picnic tables and benches to complement the adjacent bike path. The closest residential property is located to the south of the bike path.

A Targeted Brownfields Assessment (TBA) was conducted in 2004 and 2005 to characterize contaminates associated with the FMGP. The TBA included a determination of possible contaminant source areas along with actual and potential human exposure pathways. The results of the TBA are summarized in Section 2.4 and are documented in the Sampling and Analysis Report (GeoTek, 2006). The following remedial actions and/or controls are proposed for the primary and secondary sources (contaminated media) identified at the site.

1.2.1 Primary Sources

Two primary sources associated with the FMGP were identified. The first source includes the subsurface gas holder, oil trap, wash boxes and purifiers associated with the FMGP. The second source is a tar disposal well located on the vacant land to the southwest. Excavation and off-site disposal of contaminated media located above the groundwater table in these source areas is planned.

1.2.2 Surface Soil

Surface soils with contaminants above projects benchmarks were limited to areas on the FMGP site and vacant land to the southwest. Capping of surface soils is the proposed action to control exposures on the vacant land. Excavation and offsite disposal or relocation below a depth of 2' (within the source area remedial excavation) is proposed to control exposures to surface soils on the FMGP site.

1.2.3 Subsurface Soil

Subsurface soils with contaminants above project benchmarks have been identified below the FMGP site, bakery property adjacent to the west, vacant land to the southwest, and adjoining right-of-ways. Potential future exposures to subsurface soils include construction and utility workers during new construction or repair activities. A Contaminated Media Management Plan (CMMP) is proposed to control potential exposures to remaining soil contamination and ensure that remaining subsurface contamination is properly handled during future construction and repair activities.

1.2.4 Groundwater

Groundwater with concentrations exceeding project benchmarks has been documented or is expected to be present below the FMGP site, the bakery property, vacant land and adjoining right-of-ways. Potential exposures to groundwater by construction and utility workers during new construction or repair activities is considered limited due to the groundwater depth (15'-20' below grade) in the area. Measures to control future construction/utility worker exposure to contaminated groundwater are will be included in the CMMP.

No groundwater wells are known to exist on the FMGP site, bakery property or vacant land. The closest known groundwater use is via private wells for residential lawn and garden watering to the south and west. Additional groundwater monitoring and/or assessment is planned to further evaluate the risk to private wells. Should the additional monitoring/assessment indicate a complete exposure pathway or if protection of the aquifer for future use is deemed necessary, additional actions or controls will need to be pursued.

2.0 PROJECT INFORMATION AND BACKGROUND

2.1 Site History

The site was developed in about 1906 by a group of local investors as the Watertown Gas Company, a coal gasification plant. The plant manufactured gas for lighting and heating using a "carbureted water gas" process. The plant operated under various owners until it was purchased by the City of Watertown in 1943. The City converted the plant to butane-propane in 1945. The use of butane-propane was discontinued after a natural gas pipeline to the City was completed in 1957.

Surface features associated with the coal gasification plant were mostly removed prior to 1970. The site has been used as a gravel parking and drive area for the adjacent commercial bakery since that time.

2.2 Previous Assessment Activities

A Preliminary Assessment of the FMGP was conducted by URS Consultants, Inc. (URS) for the Environmental Protection Agency in March 1993. The Preliminary Assessment determined the site was operated as a coal gasification plant from about 1906 to 1945. It was estimated that 56,000 gallons of coal tar were generated during operation of the plant.

Coteau Environmental, Watertown, SD, conducted Tier 2 RBCA Assessment activities at the adjacent Sara Lee commercial bakery (former Metz Baking Company), 301 1st Ave. NW, Watertown, SD, DENR #98.161 in 1999. The purpose of the work was to assess petroleum contaminated soil that was encountered during excavation for new footings for the west wall of the building. The assessments concluded that two separate contaminant plumes exist; one from the UST basin at Sara Lee Bakery and one that extends from the area of the FMGP, located east of Sara Lee. The South Dakota Department of Environment and Natural Resources (DENR) named the City of Watertown the responsible party for the contamination associated with the FMGP, and required the City to conduct an assessment of the FMGP.

Maxim Technologies, Inc., Sioux Falls, SD, conducted Site Assessment activities of the FMGP site and adjacent properties during 2001 through 2003. The location of the gasholder (gasometer) was identified based on the ground-penetrating radar profiles and confirmed by evidence of coal tar contamination encountered in soil borings. Evidence of coal tar contamination was also encountered at other sample locations.

2.3 Recently Completed Assessment Activities

In early 2004, the Watertown Development Company applied to the South Dakota Department of Environment and Natural Resources (DENR) Brownfields Program for assistance in addressing the FMGP contaminants. The DENR utilized Brownfields Section 128(a) funds to perform additional assessment and characterization activities outlined below. A Phase I Environmental Site Assessment was completed June 2004 (GeoTek).

A Targeted Brownfields Assessment (TBA) Field Sampling Plan (FSP) for the project was approved on May 28, 2004. The following tasks were completed by the Brownfields Contractor (GeoTek) as part of the Targeted Brownfields Assessment Field Activities:

- 3Dgeophysics, Mendota Heights, MN, was subcontracted to conduct a geophysical investigation of the FMGP site to map the electrical properties of the near surface sediments. Field work was completed on December 17, 2004.

- Dakota Technologies, Inc., Fargo, ND, was subcontracted to conduct a Tar-specific Green Optical Screening Tool (TarGOST™) Laser Induced Fluorescence (LIF) assessment using direct-push technique on February 8 – 10, 2005.

- Surface soil sampling (0 – 2') was conducted using split barrel sampling methods. Twelve sample locations (SS01 – SS12) on and off-site were sampled on April 25, 2005.

- Subsurface soil sampling (0 – 37') was conducted using split barrel sampling methods. On April 25 – 29, 2005, sixteen soil boring (SB6 – SB14 and MW12, MW13, MW14, MW15, MW16, MW17, MW8S) locations on and off-site were sampled to further evaluate subsurface conditions related to the results of the Geophysical Survey and the LIF assessment and to further define subsurface conditions.

- Nine monitor wells (MW12 – MW17, MW8S, MW13S, & MW15S) were installed to further define the groundwater contaminant plume. Shallow groundwater monitor wells, MW8S, MW13S, and MW15S were installed adjacent to MW8, MW13, and MW15.

- On May 23, 2005, groundwater samples were collected and water level measurements were taken from the twenty monitor wells located on and off-site (MW1 – MW7, MW8 & MW8S, MW9 – MW12, MW13 & MW13S, MW14**,** MW15 & MW15S, MW16, & MW17).

2.4 Results of Assessment Activities

The results of the TBA were provided in a Sampling and Analysis Report dated June 15, 2006. With regards to this FMGP site the contaminants of concern for soil and groundwater are TPH as diesel/fuel oil, benzene, and Polynuclear Aromatic Hydrocarbons (PAHs). The EPA considers the PAH benzo(a)pyrene as the most highly toxic and persistent compound – recalcitrant to degradation. A summary of the soil sample analytical data for the site is provided in Table 1.

The results indicated two primary (main) source areas, the FMGP (gas holder, oil trap, wash boxes, etc.) and an apparent tar disposal well located on vacant land to the southwest of the FMGP site. TarGost™ LIF assessment activities also indicated the presence of NAPL at various depths on the FMGP site and at or below the groundwater table on the adjacent bakery property, the vacant land to the southwest and the adjoining right of ways.

Impacted surface soil was identified as a completed exposure pathway both on the FMGP property and on vacant land to the southwest. Benzo(a)pyrene concentrations above the Residential Soil, Direct Contact Benchmark (0.062 mg/kg) were detected in surface soil samples from the vacant land to the southwest. Benzo(a)pyrene concentrations above the Industrial Soil, Direct Contact Benchmark (0.21 mg/kg) were detected in surface soil samples collected from the FMGP site.

Impacted subsurface soil and groundwater pathways were identified as potentially completed for construction and utility workers. Further evaluation of the groundwater ingestion pathway via additional monitoring/assessment was recommended.

3.0 REMEDIAL ACTION SCOPE AND DESIGN

3.1 General

The scope of the remedial actions will be limited to those necessary to address the identified source materials and surface soil exposure pathway. Since the source materials and surface soils exceeding project benchmarks are limited to the FMGP site and vacant land to the southwest the planned corrective actions will also be limited to these areas.

The remedial actions selected are based on the available assessment data and take into account the current and anticipated future use of the sites. The FMGP site is currently used as a truck parking and drive area for the adjacent bakery. Future use of the site as a parking and drive area for the adjacent building (bakery or other use) is considered the most likely use but development with an industrial or commercial building is also considered possible. The vacant land to the southwest may be developed as an access point for the bike path. However, future development with a commercial building is also considered possible. It is assumed that future and/or further development at either site would include slab-on-grade construction with associated paved parking/driveway and landscape areas.

3.2 Source Materials

Source area remedial activities will focus on tar that remains in subsurface structures along with tar saturated rubble, debris and soil. The removal of these source materials is expected to reduce the impact to groundwater and enhance the potential for natural attenuation of the remaining contaminants in the future. Source area remedial activities will not be controlled by a particular contaminant or achieving contaminant concentration benchmarks.

The available assessment data indicates that source materials are present in the former gasholder (SB1 & SB2) and near the oil trap (SB4 & TG-7). The results of TG-6 advanced near the crude oil tanks suggests some source area material may be present below a depth of 8'. Evidence of source material was also encountered below a depth of about 15' in SB13 and TG19 advanced in the area of a well identified on an old railroad map. This well is suspected to have been used to dispose of wastes from the FMGP. It should be noted that evidence of tar saturated soils were detected below the elevation of the groundwater table at several of the other test locations on the FMGP site, bakery property, vacant land and adjoining right of ways.

Three alternatives were considered for remedial action of the identified source materials. These include 1) No Action, 2) Excavation and On-site Thermal Desorption, and 3) Excavation and Off-site Disposal. A discussion of the alternatives is presented below.

3.2.1 No Action

Site conditions and risk levels would remain as they currently exist. This alternative would allow tar saturated structures, rubble, debris and soil to remain a source for continued contamination to the subsurface soil and groundwater. The presence of subsurface remnants of the FMGP and rubble fill used to backfill the gasholder and former disposal well would also prevent and/or complicate future development of the site with structures.

3.2.2 Excavation and On-site Thermal Desorption

The excavation of contaminated materials and on-site thermal desorption would allow the material to be reused as backfill. On-site thermal desorption of contaminated materials would require the use of specialized equipment and may require off gas treatment and permitting. Thermal desorption would require material for processing to be stockpiled on-site and prepared for treatment. Soil preparation may include; 1) crushing large debris, 2) drying if soil is wet, 3) blending with sand if soil is too contaminated, and 4) removal of large objects and debris. Assessment data indicates that the gasholder and tar well may be filled with rubble and former building debris, which is not conducive to thermal desorption.

The costs associated with thermal treatment of contaminated materials and reuse as backfill are estimated to be $50.00 per ton or more. Due to the volume of debris and rubble that will likely be encountered additional costs should be anticipated.

3.2.3 Excavation and Off-Site Disposal

This alternative would include the excavation and off-site disposal of the contaminated materials and replacement with an on-site borrow or imported fill material. Off-site disposal of contaminated soil, debris and rubble at a Subtitle D Facility could be conducted continuous with excavation activities and with minimal on-site stockpiling or soil storage. Rubble and former building debris could also be landfilled with out special handling and/or processing.

The costs associated with excavation, off-site disposal of contaminated materials and importing clean backfill are estimated to be $44.00 per ton.

3.2.4 Alternative Selection

Due to the presence of subsurface structures, rubble and debris, excavation and off-site disposal is considered the most effective means of addressing the source area materials. Excavation will result in a high degree of confidence that accessible contaminated material has been removed. Off-site disposal is expected to reduce the time for completion of the work and to reduce generation of odors resulting in reduced costs for odor control and air monitoring as compared to the thermal desorption alternative.

The planned excavation areas are illustrated on Figures 3, 4 & 5. Modifications of the extent and depth of excavation should be anticipated based on the actual conditions encountered during excavation. We estimate the work will require the off-site disposal of approximately 3,500 to 4,000 tons of contaminated soil/debris from the FMGP source area and approximately 800 tons of contaminated soil/debris from the disposal well source area.

3.3 Surface Soils

Surface soil remedial activities are necessary to control exposure to benzo(a)pyrene, contaminant of concern for on-site and off-site receptors by Direct Contact, Surface Water Runoff to Big Sioux River, and the Dust/Volatilization to Air pathways. Surface soil remedial activities will be completed to reduce the potential for exposures to contaminant concentrations above project benchmarks.

Elevated benzo(a)pyrene and other PAH concentrations, and TPH as fuel oil concentrations above the soil benchmark (500 mg/kg) were detected in four of the surface soil samples collected on the FMGP site, SS5, SS6, SS7, & SS8 and two surface soil samples, SS1 and SS3, collected on the vacant land to the southwest of the FMGP site. Benzene concentrations above the Soil Migration to Groundwater Benchmark (0.2 mg/kg) were also detected in SS6 and SS7.

Three alternatives were considered to control exposures to contaminated surface soil. These include the following; 1) No Action, 2) Placement of a Cap over the Contaminated Soil, and 3) Excavation and Off-site Disposal. A discussion of the alternatives is presented below.

3.3.1 No Action

Site conditions and risk levels would remain as they currently exist. This alternative would allow for the surface soil to remain as a source for Direct Contact, Surface Water Runoff to Big Sioux River, and Dust/Volatilization to Air pathways resulting in potential exposures to on-site Commercial, Trespasser, and Construction/Utility worker receptors and off-site Recreational, Residential, Commercial, and Construction/Utility worker receptors.

3.3.2 Capping of Contaminated Soils

Placement of an uncontaminated layer of fill (cap) over the contaminated soils would prevent exposures. The development plans for the vacant land southwest of the FMGP site are conducive to placement of a cap. The existing grades on the vacant land will likely require the placement of fill to raise the grade as part of redevelopment. The use of a cap on the FMGP site is problematic since the current grade elevations will need to be maintained for truck access to the existing bakery building loading docks.

3.3.3 Excavation and Off-site Disposal

This alternative would consist of the removal of the top 2' of contaminated soil exceeding project benchmarks, off-site disposal and backfilling with uncontaminated material to act as a cap. This alternative could be used on either the FMGP site or the vacant land to the southwest. This would address the completed pathways on and off-site and prevent future contact with surface soils exceeding project benchmarks. This approach appears to be the most practical for the FMGP site since the existing grade elevations will need to be maintained for truck use of the bakery building loading dock.

An option to off-site disposal would include relocating the contaminated surface soils below a depth of 2' in the source area excavations. This option would result in a significant cost saving without a significant increase in risk of exposure on the FMGP site. Transportation and disposal costs associated with off-site disposal would be reduced along with the costs for importing replacement material. The risk of exposure would be limited to construction and utility works that excavate below a depth of 2' during new construction and repair activities. This same risk will remain and require management for the majority (areas outside of source excavation) of the FMGP site following remedial excavation.

Relocating surface soils from the FMGP site to the disposal well source excavation could also be considered, however, this may introduce an increased risk. The contaminant concentrations of surface and shallow (<15') subsurface soils on the majority of the disposal well site (vacant land) are lower than those found on the FMGP site. For this reason, the use of contaminated surface soils from the FMGP site for backfill of the disposal well source will not be undertaken since it may result in additional management requirements for this area.

It should be noted that although the average concentrations of the contaminants of concern in the on-site surface soils are above the project benchmark for soil leaching to groundwater, they are significantly less than the contaminant concentrations of the subsurface soils that will be excavated from the source areas. In addition, the clay cap that will be placed from 0-2' will reduce the potential for surface water infiltration.

3.3.4 Alternative Selection

Excavation and off-site disposal or relocation of the material on-site (below a depth of 2') appears to be the most practical approach for the FMGP site. The placement of a cap over the impacted surface soil area of concern appears to be the most practical approach for the vacant land to the southwest.

The planned surface soil excavation area on the FMGP site is illustrated on Figure 6. We estimate the excavation will require the removal of approximately 2,000 in-place cubic yards of contaminated soil. The bulk of the material is expected to be reused as backfill in the source excavations on the FMGP site, with the balance being disposed of at a Subtitle D landfill (≈ 250 tons). Approximately 4,000 tons of imported material would be necessary to re-establish the existing grades.

Development plans for the vacant lot to the southwest should be integrated into the placement of a cap over the impacted surface soils. As illustrated on Figure 7, the cap contours will be designed to result in leveling the property near the bike trail and allow for proper drainage. This will provide for better use of this area as an access location to the bike trail. To aid with site grading and placement of the soil, removal of the vegetation and highly organic soils for disposal at a Subtitle D landfill (≈ 250 tons) is recommended. Some general site grading will then be necessary to assure a 2' cap is placed over the area of concern. We estimate capping the area of concern will require importing approximately 3,400 tons of material.

A cap thickness of 2' should be used to prevent exposures of underlying contaminated soil. For lawn and landscape areas the cap should consist of ½' of topsoil overlying 1½' of uncontaminated, imported lean clay. For parking and drive areas, 1 to 1½' lean clay is recommended below the aggregate and/or pavement section. In lawn and landscape areas only shallow rooted trees and shrubs should be used.

3.4 Subsurface Soils

Potential exposures to surface soils will be controlled by the use of a Contaminated Media Management Plan (CMMP). The plan will be developed following remedial activities and take into account data and information collected during remedial activities. The plan will include procedures that should be followed during future subsurface excavation activities and requirements for disposal of contaminated media generated during the work.

3.5 Groundwater

The potential for exposures to groundwater via ingestion will be evaluated based on additional monitoring/assessment activities at the site. Groundwater contaminant concentrations above benchmarks and indicative of coal gasification contamination were detected in groundwater samples collected from several monitor wells associated with the FMGP, indicating soil leaching to groundwater and groundwater migration has occurred.

Depending upon development plans for the FMGP site and adjacent properties, Groundwater and Soil Leaching to Groundwater may be complete pathways for construction and utility workers and anyone who comes into direct contact with the contaminated groundwater. Potential exposures to contaminated groundwater will also be controlled by the use of the CMMP. The plan may include an institutional control prohibiting the installation and use of groundwater supply/geothermal wells within the shallow Big Sioux Aquifer in the area.

Based on a well survey of the area surrounding the FMGP site conducted as part of the TBA, two private, shallow, sand point wells accessing the Big Sioux Aquifer were identified within a 1,000' radius of the site. It is our understanding that these wells are only for non potable use. Additional groundwater monitoring and/or assessment is planned to further evaluate the risk to private wells. Should the additional monitoring/assessment indicate a complete exposure pathway or if protection of the aquifer for future use is deemed necessary, additional actions or controls will need to be pursued.

Should groundwater cleanup be necessary in the future, effective alternatives are limited. One alternative that could be considered for in-situ remediation of coal tar above and below the groundwater table is Dynamic Underground Stripping (DUS) which utilizes steam injection into subsurface contaminants to volatilize and mobilize the contaminants. Mobilized contaminants (vapor, contaminated groundwater, and free phase coal tar) would then be removed from the subsurface via extraction wells. The cost of this technology is approximately $150.00 per cubic yard and approximately 50% of the cost of cleanup is associated with treating recovered groundwater and disposing of contaminants.

4.0 REMEDIAL ACTION IMPLEMENTATION

4.1 General

The Watertown Development Company will implement the necessary remedial actions with assistance from the South Dakota Brownfields Program, the Watertown Municipal Utilities and the City of Watertown. The State Brownfield contractor will facilitate the bidding process by preparing bid documents and completing contract administration. The Brownfield contractor will also oversee the work and perform the necessary sampling and analysis of media.

The stakeholders, including the Watertown Development Company, the Watertown Municipal Utilities and the City of Watertown and the SD DENR will be informed of the progress and will be consulted should changes to the work be necessary.

4.2 Public Notification

Public notification will be undertaken through the local media and project handouts. The purpose of the notification will be to educate the public on the planned remedial activities including the odors that will be generated during the work.

4.3 Pre Excavation Activities

The following activities will be completed prior to performing excavation activities:

- The excavation contractor will provide documentation of appropriate OSHA training and medical monitoring for site personnel.
- Communication with surrounding property owners concerning excavation activities, schedule of work activities, duration of activities, air monitoring, etc.
- Site/Access Control – A security fence will be erected around the FMGP site and temporary fencing will be used on the vacant land to the southwest. During on-site activities, personnel will provide surveillance and alert the State Brownfield contractor of any issues.
- Baseline Ambient Air Quality Monitoring – Background ambient air quality measurements of VOCs, benzene, and inhalable particles will be conducted.

- Utility Location and Protection – The excavation contractor will notify South Dakota One Call to have utilities marked prior to performing excavation.

- Erosion/Sediment Control – The excavation contractor will be required to obtain coverage under South Dakota DENR Storm Water Permit for Construction Activities under the General Permit.

- A tailgate operations and safety meeting will be held prior to initiation of excavation activities to review planned site operations and the project Site Health and Safety Plan.

4.4 Proposed Remediation and Sequence of Activities

Based upon the proposed corrective actions the following sequence of work has been established. Estimated costs for Remediation Activities as outlined below are provided on Table 2.

4.4.1 Task 1 – Disposal Well Source Excavation

Initial excavation will be conducted in the area of the disposal well, located on the vacant land to the southwest of the FMGP site. Figure 4 illustrates the proposed area of excavation and the depth will extend to the groundwater table. Based upon the depth to groundwater in this area, an excavation to a depth of approximately 17' – 17 ½' below grade is proposed. Information from soil boring SB13 and TarGOST point TG19 indicates that several feet of uncontaminated soil (or with low levels of contaminants) will be encountered in the upper portion of the excavation. Therefore, it is proposed that these soils, approximately 400 yd^3, be stockpiled on-site for reuse as backfill in the completed excavation. Excavation of approximately 750 tons of contaminated soil/debris/rubble is proposed.

Following completion of excavation activities, six (6) soil samples will be collected from the base and/or sidewalls to document the concentrations remaining in the subsurface. Soil samples would be analyzed for BTEX, TPH as diesel/fuel oil, and SVOCs.

An imported select granular fill will then be placed in the bottom of the excavation to an elevation of 2' above the groundwater table. The select granular fill shall be readily compactable in a saturated condition. Imported pit run sand and gravel or lean clay and the stockpiled soils will then be used to backfill the balance of the excavation. We estimated approximately 800 cubic yards of imported fill in addition to the 400 yd^3 of stockpiled soil will be necessary.

4.4.2 Task 2 – Gas Plant Source Excavation

Excavation of source materials in this area will include the gas holder, oil trap, wash boxes and tar saturated soils above the water table. Figure 5 illustrates the proposed area of excavation. Based upon the depth to groundwater in this area and information from soil borings and TarGOST points, an excavation to a depth of approximately 20' below grade is proposed.

Information from soil borings SB4 and MW29, and TarGOST points TG4 and TG24 indicate that several feet of uncontaminated soils (or with low levels of contaminants) will be encountered in areas of the excavation. These soils will be stockpiled on-site for later reuse as backfill in the excavation. Contaminated debris, rubble and soil excavated for off-site disposal is anticipated to be loaded directly into trucks and transported to the disposal facility. Off-site disposal of approximately 4,000 tons of contaminated soil/debris/rubble is proposed.

Following completion of excavation activities, ten (10) soil samples will be collected from the base and/or sidewalls to document the concentrations remaining in the subsurface. Soil samples would be analyzed for BTEX, TPH as diesel/fuel oil, and SVOCs.

A select granular fill will be placed in the bottom of the excavation to an elevation of 2' above the groundwater table. The select granular fill shall be readily compactable in a saturated condition. Soils salvaged and stockpiled on-site and soils generated during completion of Task 3 will be used for backfill to within 2' of final grade. The top two feet of the source area excavation will then be backfilled and compacted as part of Task 3.

4.4.3 Task 3 – Gas Plant Surface Soil Excavation

The surface soils on the FMGP site will be excavated to a depth of 2' to prevent exposures and replaced with an uncontaminated backfill material. Figure 6 illustrates that proposed area of surface soil excavation. The eastern quarter of the proposed excavation area is covered with grass. Due to the organic nature of this material it is recommended that the top ½' of the soil in this area (≈ 350 tons) be removed and disposed of at a State permitted Subtitle D landfill facility. The balance of the excavated soil will be reused as backfill in the FMGP source excavation completed as part of Task 2.

Following completion of excavation activities, twelve (12) equally spaced soil samples will be collected within the right-of-way to document contaminant concentration remaining at the 2' depth. Soil samples would be analyzed for BTEX, TPH as diesel/fuel oil, and SVOCs. The sample results will be used to determine appropriate controls for utility workers in the CMMP.

After soil samples are collected, approximately 2600 cubic yards of uncontaminated material will be imported and compacted to reach the final grade. For lawn and landscape areas the cap should consist of ½' of topsoil overlying 1½' of uncontaminated, imported lean clay. For parking and drive areas, the lean clay is recommended below the aggregate and/or pavement section. To comply with storm water requirements aggregated surfaced area will require the use of asphalt milling and all topsoil areas will need to be seeded, fertilized and mulched.

4.4.4 Task 4 – Capping of Vacant Land Surface Soils

A 2' cap will be placed on a portion of the vacant land located to the southwest of the FMGP site to prevent exposures. Figure 7 illustrates the proposed land contouring changes of the cap area. Prior to placement of the cap, the vegetation and highly organic portion of the topsoil layer (0.3' ≈ 600 tons) will be excavated and transported to a Subtitle D facility for disposal. The area will then be graded (cut/fill) to assure at least a 2' cap is placed over the exposed soils.

Approximately 3,800 cubic yards of uncontaminated material will be imported and compacted to reach the final grade. For lawn and landscape areas the cap should consist of ½' of topsoil overlying 1½' of uncontaminated, imported lean clay. For parking and drive areas, lean clay is recommended below the aggregate and/or pavement section. To comply with storm water requirements aggregated surfaced area will require the use of asphalt milling and all topsoil areas will need to be seeded, fertilized and mulched.

4.5 Excavation Procedures

Several measures and controls will be implemented to manage exposures during the remedial excavation project.

4.5.1 On-Site Personnel

Personnel performing on-site activities will be required to have the 40 hour OSHA Hazardous Waste Training and updated 8 hour refresher courses.

4.5.2 Material Handling and Staging

Excavated contaminated material shall be placed directly into trucks, tarped and transported to the disposal facility. Surface soil and uncontaminated soil will be staged for later use as backfill or placed in the FMGP source area excavation. Contaminated material stockpiles will be protected (tarp, commercial stabilizers, etc.) to prevent dust or sediment migration due to wind

or precipitation.

4.5.3 Material Disposal

The majority of the contaminated soil/debris and rubble removed during the excavation activities will be disposed of at a State permitted Subtitle D Landfill facility. Trucks hauling the material will be required to be tarped before leaving the site. Tar removed from subsurface structures will be containerized for disposal at a Subtitle C facility. Contaminated water from equipment decontamination will be containerized, tested and disposed of at a permitted facility.

4.5.4 Water in the Excavations

The excavation will extend only to the groundwater table. If groundwater accumulates in the base of excavations dewatering will not be conducted. The excavation will be backfilled with a select granular material readily compactable in a saturated condition to at least 2' above the elevation of the water.

4.5.5 Dust Suppression and Control

The generation of airborne dust during excavation activities will be controlled using water spray or commercial stabilization products. On excessive windy days excavation activities may be discontinued.

4.5.6 On-site Worker Personal Protective Equipment

On-site worker exposure to coal tar pitch and associated vapors should be limited. Skin contact with Coal Tar Pitch should be avoided. Protective clothing (solvent resistant suits and gloves, footwear, headgear) should be worn by on-site works handling coal tar pitch to protect against skin exposure/contact. To protect eyes from coal tar pitch volatiles, non-vented, impact resistant goggles should be worn. Excavation air emission monitoring will determine use of respiratory protection by site workers and/or modifications in excavation site activities.

4.5.7 Air Emission Monitoring

Ambient air monitoring will be conducted prior to, during and post excavation activities at selected perimeter monitoring locations and at the excavation location (worker breathing zone) during excavation activities. The objectives of air emissions monitoring is to: 1) be protective of worker breathing zone, 2) to be protective of public health, and 3) to determine compliance with Occupational Safety and Health Administration (OSHA) permissible exposure limits (PELs). Two types of air monitoring will be conducted; 1) Real-time air monitoring with direct reading units to evaluate short term exposure with comparison to action levels, and 2) Continuous time-integrated air monitoring to document air concentrations over a period of time for comparison to long term exposure limits.

4.5.7.1 Contaminants of Concern

Release of hydrocarbons to air has the greatest potential to affect the general public. Contaminants associated with FMGP sites may become airborne during excavation/removal by volatilization or dispersed as soil dust. The work will be performed to minimize impact to the public. Complaints received will be evaluated, addressed and if necessary appropriate action will be taken including the use of controls or stopping the work.

With regards to volatilization, the contaminants of concern for FMGP sites, PAHs and VOCs, are best represented in airborne releases from excavation activities by benzene. Benzene is the compound that typically drives public health concerns and the exposure limit of benzene is low enough to solely define regulated toxicity of FMGP related VOC and SVOC mixtures. Management of air emissions and decisions concerning an off-site release of FMGP contaminants will focus on the benzene action level at perimeter monitoring locations.

Particulate matter from an FMGP site is regarded as a chemical mixture that may have toxicological effects when inhaled. Of particular concern are high concentrations of PAHs in the dirt and dust that may be dispersed during excavation and stock piling activities. A number of PAHs are toxic following oxidation to a corresponding reactive structure, such as skin, or ingestion and inhalation. To be protective of public health an action level for particulates at perimeter monitoring locations will be established and monitored.

4.5.7.2 Proposed Air Monitoring

Daily perimeter and excavation/worker breathing zone air monitoring will be performed. To be protective of excavation site workers, breathing zone VOC exposure action levels will be established with appropriate responses in the Site Health and Safety Plan. To be protective of public health, excavation activities will be discontinued should monitoring indicate the established limits are exceeded at perimeter monitoring locations. The excavation activities will only resume once levels fall below the limits. Complaints received will be evaluated, addressed and if necessary appropriate action will be taken including the use of controls or stopping the work. Therefore it is necessary to have real-time monitoring of worker breathing zone and perimeter action levels for effective air emission control response.

The following air monitoring methods will be used for real-time monitoring: 1) Photoionization Detector (PID) monitoring of Volatile Organic Contaminants (VOCs), 2) benzene specific monitor, and 3) mass concentration aerosol monitor.

- PID Monitoring

During the excavation of contaminated soils and when contaminated soils are exposed, PID readings will be taken several times a day near the excavation (excavation site worker breathing zone) and at property boundary locations. A PID unit may also be placed in the cab of the excavator during contaminated soil excavation to monitor operator workspace levels.

- Benzene Specific Monitor

A benzene specific monitor provides low concentration field screening for benzene, public health exposure chemical of concern, thus providing an early warning system for site emission control purposes. During excavation of contaminated soils, benzene concentrations at selected site perimeter locations (upwind and downwind) and near the excavation will be monitored several times a day.

- Mass Concentration Aerosol Monitor

A mass concentration aerosol monitor provides for measurement of the mass concentration of particulate matter below PM-10 (10 microns). Based on a literature review, the action level for inhalable particulates that is generally used at FMGP sites for perimeter monitoring is 1 mg/m^3. This is considered an appropriate air quality monitoring goal that is protective of public health for FMGP site perimeters as per National Ambient Air Quality Standards (NAAQS).

Fixed station monitoring with air pumps and 3M Personal Organic Vapor Monitor Badges (POVMB) will be used for continuous time-integrated monitoring.

- Fixed Station Air Monitoring

Continuous air emissions monitoring at fixed upwind and downwind perimeter locations will initially be conducted daily during excavation activities. The frequency may be reduced based on the initial results and/or correlation with real-time monitoring data. Fixed station air monitoring will utilize Gilian 5.0 (w/low flow module) pumps and activated carbon tubes to monitor Organic Air emissions over an 8-hour period or the length of the working day, whichever is longer.

- 3M Personal Organic Vapor Monitor Badges (POVMB)

During contaminated soil excavation activities, worker breathing zone organic vapor monitoring will initially be conducted daily utilizing 3M POVMBs. The frequency may be reduced based on the initial results and/or correlation with real-time monitoring data. The initial badges will be analyzed within 48-hours to monitor compliance with OSHA Eight-hour Time Weighted Average (TWA) PELs and document correlation with real-time instrumentation. The maximum TWA exposure limit for benzene is 1 ppm for an 8-hour workday.

4.5.8 Equipment Decontamination

Equipment that comes in to contact with contaminated soil shall be decontaminated unless tested otherwise before it leave the site. Trucks hauling contaminated soil shall be dedicated to the project and not used on other projects until they have been decontaminated or tested clean.

4.6 Documentation and Reporting

Daily field notes will be collected during remediation activities. The notes will include a summary of the activities conducted, weather conditions, observations made and any sampling activities completed. Periodic photographs will also be taken to document conditions.

A Remedial Implementation report will be prepared for the project summarizing the remedial activities completed. The report will include the areas excavated, volume of material removed and final disposal location, and volume of material used for backfill and site capping activities. The report will include the results of the air monitoring and the soil sampling and analysis. The report will discuss potential exposure pathways that remain.

5.0 SCHEDULE FOR REMEDIAL ACTIONS

The project is anticipated to be bid in early 2007, with substantial completion during Spring/Summer 2007 and final completion by September 1, 2007.

The Remedial Implementation Report for the project will be prepared upon completion of remediation activities.

The CMMP will be completed by the end of 2007. The additional groundwater monitoring is expected to continue for the next 3-5 years.

TABLE 1
SUMMARY OF SOIL SAMPLE DATA
TARGETED BROWNFIELDS ASSESSMENT
FORMER MANUFACTURED GAS PLANT, WATERTOWN, SOUTH DAKOTA
GEOTEK #04-136

Sample ID	Sample Date	Sample Depth	Concentrations (mg/kg)										
			Benzene	Toluene	Ethyl benzene	Total Xylenes	Naph-thalene	TPH as Fuel Oil	Benzo(a) anthracene	Benzo(a) pyrene	Benzo(b) fluoranthene	Dibenzo(a,h) anthracene	Indeno(1,2,3-cd) pyrene
B-2	1/16/1999	20' - 25'	0.15	0.2	0.8	1.2	0.2	**793**					
B-5	1/18/1999	20' - 22½'	<0.005	<0.005	<0.005	<0.005	<0.2	<10					
MW-1	1/16/1999	3' - 5'	**7.9**	1.9	16	94.5	8	**38,106**					
MW-1	1/16/1999	20' - 25'	0.2	0.2	4	3.1	2.5	**1,631**					
MW-2	1/16/1999	22½' - 25'	<0.005	<0.005	<0.005	<0.005	<0.2	15					
MW-3	1/18/1999	20' - 25'	0.22	0.2	1.3	1.4	<0.2	26					
MW-4	8/16/1999	20' - 22½'	0.19	0.6	4	3.9	0.8	261					
MW-5	8/16/1999	17½' - 20'	<0.005	<0.005	<0.005	<0.005	<0.2	<10					
MW-6	8/17/1999	22½' - 25'	**6**	11.6	9.2	27.2	3	268					
MW-7	8/17/1999	20' - 25'	<0.005	<0.005	<0.005	<0.005	<0.2	<10					
MW-8	10/11/1999	20' - 25'	<0.1	0.4	2	8.2	66	**3,139**					
MW-9	10/11/1999	27½' - 30'	**17**	35	24	112	**135**	**2,211**					
SB-1	1/15/2003	9½' - 14½'	**5.8**	95	-	-	-	-					
SB-2[1]	1/15/2003	12' - 16½'	-	-	-	-	-	-					
SB-3	1/16/2003	12' - 14'	-	-	-	-	**2,400**	-	**240**	**190**	**82**	**5.6**	**44**
SB-4	1/16/2003	7' - 9'	<0.001	<0.001	<0.001	<0.001	<0.001	69*					
SB-5	1/16/2003	2' - 4'	0.002	0.006	0.002	0.006	<0.001	390*					
MW-6R	1/14/2003	19½' - 20'	**87**	160	91	200	**1,300**	**15,200***					
MW-10	1/14/2003	14½' - 15'	<0.001	<0.001	<0.001	<0.001	0.005	<4					
MW-11	1/16/2003	22' - 24'	0.4	1.3	15	24	**240**	**1,960***					

TABLE 1
SUMMARY OF SOIL SAMPLE DATA
TARGETED BROWNFIELDS ASSESSMENT
FORMER MANUFACTURED GAS PLANT, WATERTOWN, SOUTH DAKOTA
GEOTEK #04-136

Sample ID	Sample Date	Sample Depth	Concentrations (mg/kg)										
			Benzene	Toluene	Ethyl benzene	Total Xylenes	Naph-thalene	TPH as Fuel Oil	Benzo(a) anthracene	Benzo(a) pyrene	Benzo(b) fluoranthene	Dibenzo(a,h) anthracene	Indeno(1,2,3-cd) pyrene
SS1	4/25/2005	0 - 2'	<0.2	<0.2	<0.2	<0.2	0.05	69	0.4	**0.4**	0.6	**0.1**	0.3
SS2	4/25/2005	0 - 2'	<0.2	<0.2	<0.2	<0.2	<0.2	33	0.2	0.1	0.3	<0.67	0.1
SS3	4/25/2005	0 - 2'	<0.2	<0.2	<0.2	0.09	<0.2	**587**	**2.1**	**4.2**	**4.0**	**0.2**	**1.6**
SS4	4/25/2005	0 - 2'	<0.2	<0.2	<0.2	<0.2	0.04	36	0.1	**0.3**	0.3	<0.67	0.2
SS5	4/25/2005	0 - 2'	0.04	<0.2	<0.2	0.05	0.24	**768**	**19**	**51**	**39**	**2**	**11**
SS6	4/25/2005	0 - 2'	***0.46***	0.06	0.64	1.1	0.63	**2,160**	**13**	**43**	**33**	**3**	**20**
SS7	4/25/2005	0 - 2'	***0.37***	0.05	0.56	0.48	0.77	**764**	**15**	**32**	**29**	**1**	**6.6**
SS8	4/25/2005	0 - 2'	0.14	0.08	0.48	1	0.97	**576**	**11**	**27**	**22**	**1**	**5.3**
SS9	4/25/2005	0 - 2'	<0.2	<0.2	<0.2	<0.2	0.11	<10	0.4	0.07	0.9	<0.67	<0.33
SS10	4/25/2005	0 - 2'	<0.2	<0.2	<0.2	<0.2	<0.2	<10	<0.33	<0.33	<0.33	<0.33	<0.33
SS11	4/25/2005	0 - 2'	<0.2	<0.2	<0.2	<0.2	<0.2	24	0.08	0.2	0.1	<0.33	<0.33
SS12	4/25/2005	0 - 2'	<0.2	<0.2	<0.2	<0.2	<0.2	160	0.1	0.1	0.09	<0.33	<0.33
SS13	4/25/2005	0 - 2'	***0.2***	0.1	0.71	1.1	0.61	345	**3.0**	**3.8**	**3.1**	**0.6**	**3.3**
MW #12	4/25/2005	19½' - 22'	<0.2	<0.2	<0.2	<0.2	0.06	<10	<0.33	<0.33	<0.33	<0.33	<0.33
MW #13	4/26/2005	29½' - 32'	<0.2	<0.2	<0.2	<0.2	<0.2	<10	<0.33	<0.33	<0.33	<0.33	<0.33
MW #14	4/27/2005	27 - 29½'	<0.2	<0.2	<0.2	<0.2	<0.2	<10	<0.33	<0.33	<0.33	<0.33	<0.33
MW #15	4/28/2005	29½' - 32'	<0.2	<0.2	<0.2	<0.2	<0.2	<10	<0.33	<0.33	<0.33	<0.33	<0.33
MW #16	4/28/2005	17' - 19½'	<0.2	<0.2	0.64	1.3	25	**5,420**	<0.33	<0.33	<0.33	<0.33	<0.33
MW #17	4/29/2005	32' - 34½'	<0.2	<0.2	<0.2	<0.2	<0.2	<10	<0.33	<0.33	<0.33	<0.33	<0.33

TABLE 1
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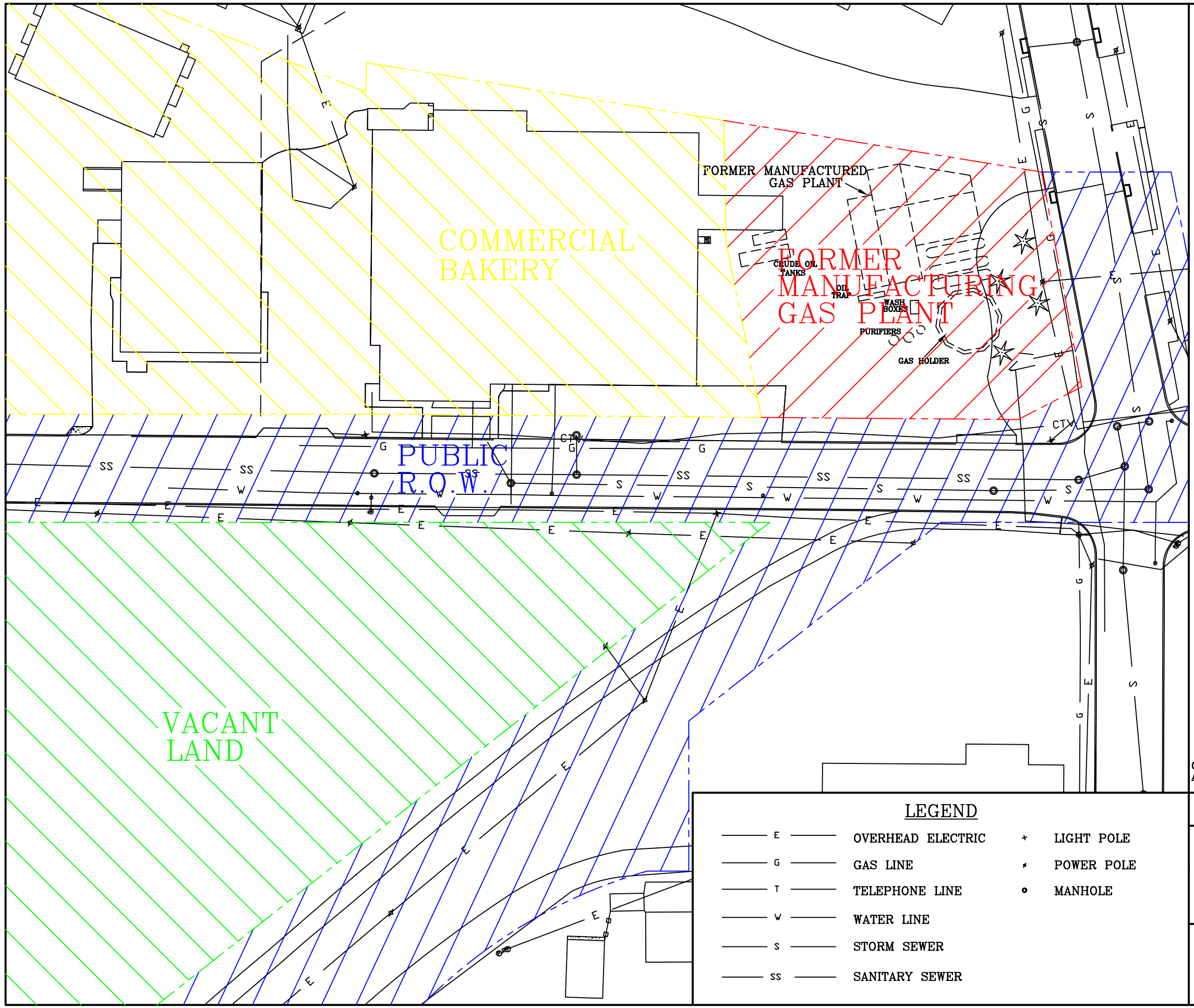
FORMER MANUFACTURED GAS PLANT, WATERTOWN, SOUTH DAKOTA
GEOTEK #04-136

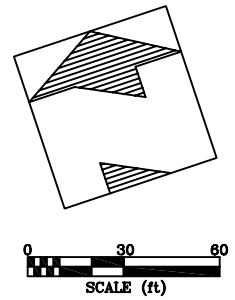
Sample ID	Sample Date	Sample Depth	Concentrations (mg/kg)										
			Benzene	Toluene	Ethyl benzene	Total Xylenes	Naph-thalene	TPH as Fuel Oil	Benzo(a) anthracene	Benzo(a) pyrene	Benzo(b) fluoranthene	Dibenzo(a,h) anthracene	Indeno(1,2,3-cd) pyrene
SB7	4/26/2005	19½' - 22'	<0.2	<0.2	<0.2	<0.2	<0.2	<10	<0.33	<0.33	<0.33	<0.33	<0.33
SB8	4/27/2005	22' - 24½'	<0.2	0.07	<0.2	<0.2	0.06	<10	<0.33	<0.33	<0.33	<0.33	<0.33
SB9	4/27/2005	22' - 24½'	<0.2	<0.2	<0.2	<0.2	<0.2	<10	<0.33	<0.33	<0.33	<0.33	<0.33
SB10	4/27/2005	22' - 24½'	<0.2	<0.2	<0.2	<0.2	<0.2	<10	<0.33	<0.33	<0.33	<0.33	<0.33
SB11	4/27/2005	17' - 19½'	<0.2	<0.2	<0.2	<0.2	<0.2	<10	<0.33	<0.33	<0.33	<0.33	<0.33
SB12	4/28/2005	17' - 19½'	<0.2	<0.2	<0.2	<0.2	<0.2	<10	<0.33	<0.33	<0.33	<0.33	<0.33
SB13	4/28/2005	14½' - 17'	**1.1**	4.4	2	6.5	**222**	**3,910**	**44**	**36**	**39**	**2**	**17**
SB14	4/28/2005	29½' - 32'	<0.2	<0.2	<0.2	<0.2	0.1	29	**12**	**12**	**12**	**0.79**	**5**

[1]Soil sample analyzed for Corrosivity, Flash Point, Sulfide, and Cyanide
* - Nontypical of #2 fuel oil
Values in bold exceed Soil benchmarks based on EPA Region 9 Preliminary Remediation Goals
Values in **bold** and ***italics*** exceed Soil benchmarks based on DAF=20 migration to groundwater

Table 2
Corrective Action Estimated Project Costs
Former Manufactured Gas Plant, Watertown, South Dakota
GeoTek #04-136

Description	Unit Cost	Task 1 Disposal Well Exc.			Task 2 Gas Plant Source Exc.			Task 3 Gas Plant Surface Exc.			Task 4 Vacant Land Cap			Estimated Total		
Mobilization	LS	LS	each	2,882.25	LS	each	8,100.00	LS	each	5,159.63	LS	each	4,805.63	LS	each	20,947.50
Clearing	$ 18.00	0	tons	-	0	tons	-	350	tons	6,300.00	600	tons	10,800.00	950	tons	17,100.00
Unclassified Excavation-Contaminated	$ 16.00	750	tons	12,000.00	4000	tons	64,000.00	0	tons	-	0	tons	-	4750	tons	76,000.00
Unclassified Excavation	$ 4.50	900	yd	4,050.00	3000	yd	13,500.00	3750	yd	16,875.00	750	yd	3,375.00	8400	yd	37,800.00
Contractor Furnished Borrow-Clay	$ 7.50	800	yd	6,000.00	1400	yd	10,500.00	2600	yd	19,500.00	3800	yd	28,500.00	8600	yd	64,500.00
Contractor Furnished Borrow-Topsoil	$ 16.00	0	yd	-	0	yd	-	800	yd	12,800.00	900	yd	14,400.00	1700	yd	27,200.00
Inlet Sediment Protection	$ 100.00	4	each	400.00	0	each	-	0	each	-	0	each	-	4	each	400.00
Silt Fence	$ 5.00	1080	ft	5,400.00	360	ft	1,800.00	0	ft	-	0	ft	-	1440	ft	7,200.00
Vehicle Tracking Control	$1,000.00	1	each	1,000.00	0	each	-	0	each	-	0	each	-	1	each	1,000.00
Aggregate Base Course	$ 14.00	0	tons	-	0	tons	-	260	tons	3,640.00	0	tons	-	260	tons	3,640.00
Asphalt Millings	$ 18.00	0	tons	-	0	tons	-	260	tons	4,680.00	0	tons	-	260	tons	4,680.00
Select Granular Backfill	$ 14.00	90	tons	1,260.00	600	tons	8,400.00	0	tons	-	0	tons	-	690	tons	9,660.00
Seed, Fertilize & Multch	$ 5.00	LS	each		LS	each		LS	each	1,000.00	LS	each	3,000.00	LS	each	4,000.00
Security Fence	$ 4.00	1080	ft	4,320.00	1450	ft	5,800.00	0	ft	-	0	ft	-	2530	ft	10,120.00
Health and Safety	LS	LS	each	4,000.00	LS	each	4,000.00	LS	each	4,000.00	LS	each	4,000.00	LS	each	16,000.00
Equimpment Decontamination	LS	LS	each	1,000.00	LS	each	1,000.00	LS	each	1,000.00	LS	each	1,000.00	LS	each	4,000.00
														Bid sub total		**300,247.50**
Non Bid Items																
Miscellanous (10%)	LS	LS	each	4,131.23	LS	each	11,610.00	LS	each	7,395.46	LS	each	6,888.06	LS	each	30,024.75
Tar and Liquid Disposal	LS	LS	each		LS	each	20,000.00	LS	each		LS	each		LS	each	20,000.00
Engineering & Testing	LS	LS	each	12,000.00	LS	each	30,000.00	LS	each	30,000.00	LS	each	28,000.00	LS	each	100,000.00
Landfill Fees	$ 18.50	750	tons	13,875.00	4000	tons	74,000.00	350	tons	6,475.00	600	tons	11,100.00	5700	tons	105,450.00
		item total		72,318.48	item total		252,710.00	item total		118,825.09	item total		115,868.69	**Project Total**		**559,722.25**





NOTES:

LEGEND

E	OVERHEAD ELECTRIC	✦	LIGHT POLE
G	GAS LINE	⚡	POWER POLE
T	TELEPHONE LINE	○	MANHOLE
W	WATER LINE		
S	STORM SEWER		
SS	SANITARY SEWER		

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FIGURE 2
SITE AND ADJACENT PROPERTIES
FORMER MANUFACTURED GAS PLANT
1ST AVE. N. & 3RD ST. W.
WATERTOWN, SD

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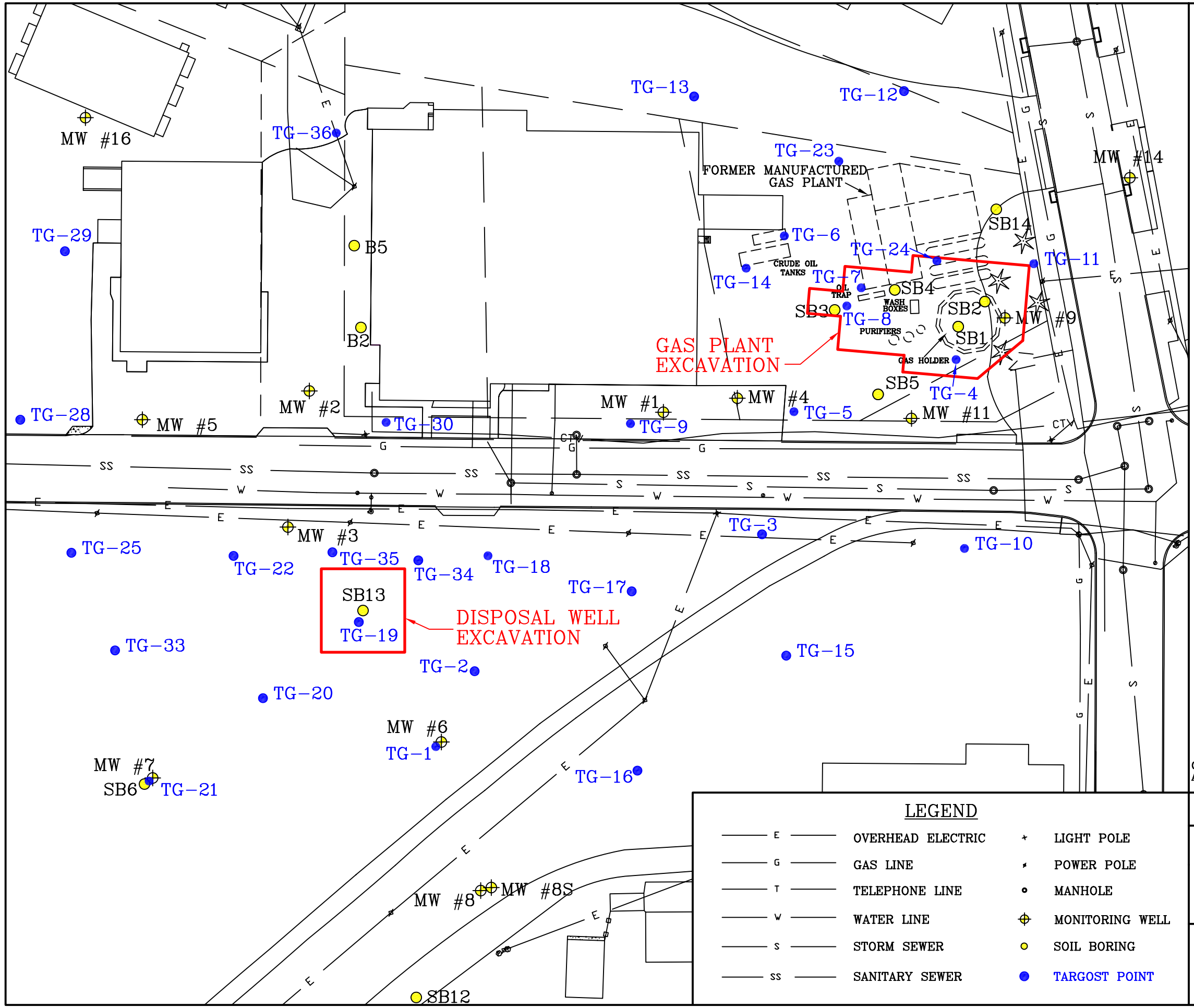


NOTES:

LEGEND

E	OVERHEAD ELECTRIC		LIGHT POLE
G	GAS LINE		POWER POLE
T	TELEPHONE LINE		MANHOLE
W	WATER LINE		MONITORING WELL
S	STORM SEWER		SOIL BORING
SS	SANITARY SEWER		TARGOST POINT

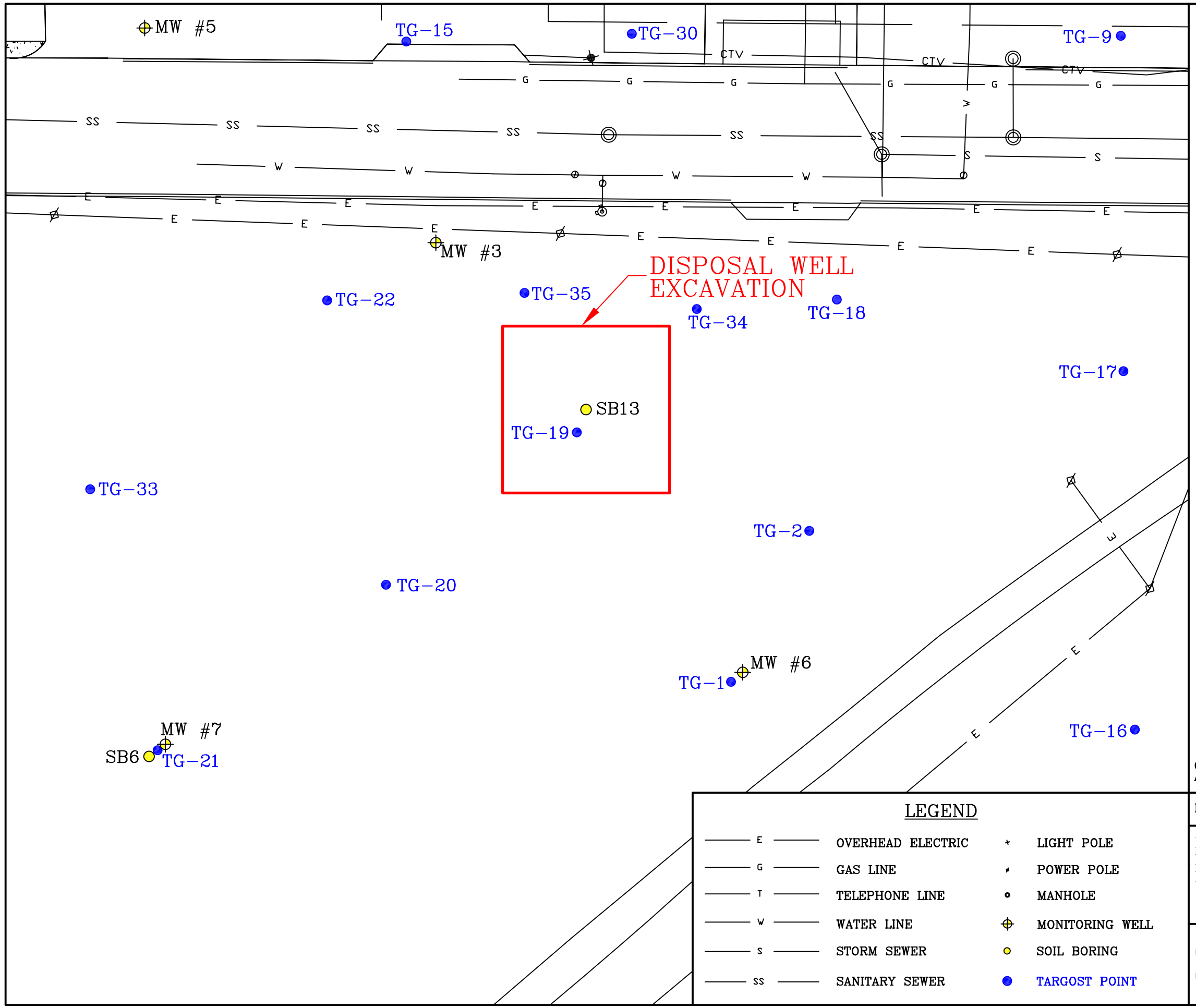
ORIGINAL DRAWING FURNISHED BY AASON ENGINEERING COMPANY, INC.

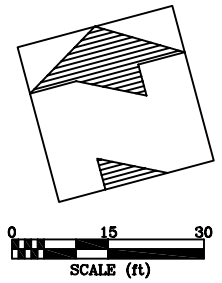
PROJECT #: 04-136 | DRAWN BY: MRS

FIGURE 3
SOURCE AREA EXCAVATION LOCATION
FORMER MANUFACTURED GAS PLANT
1ST AVE. N. & 3RD ST. W.
WATERTOWN, SD

ACAD\GEOTEK\DAN\04-136-RAP

GEOTEK ENGINEERING & TESTING SERVICES, INC.





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LEGEND

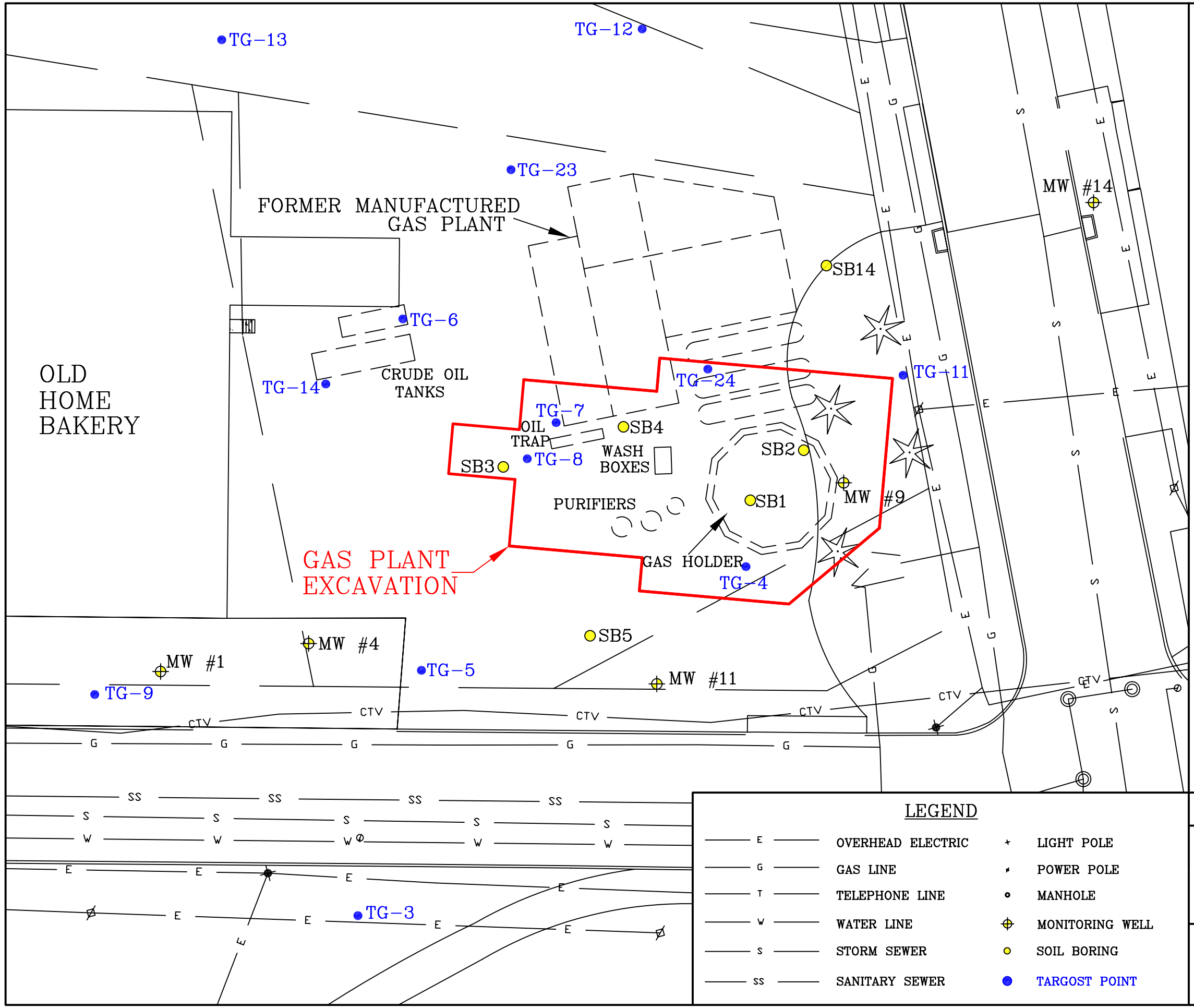
E	OVERHEAD ELECTRIC		LIGHT POLE
G	GAS LINE		POWER POLE
T	TELEPHONE LINE		MANHOLE
W	WATER LINE		MONITORING WELL
S	STORM SEWER		SOIL BORING
SS	SANITARY SEWER		TARGOST POINT

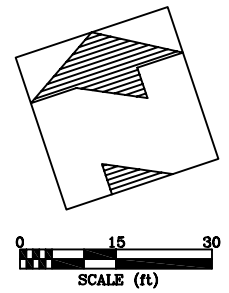
PROJECT #: 04-136 | DRAWN BY: MRS

FIGURE 4
DISPOSAL WELL SOURCE AREA EXCAVATION
FORMER MANUFACTURED GAS PLANT
1ST AVE. N. & 3RD ST. W.
WATERTOWN, SD

ACAD\GEOTEK\DAN\04-136-RAP

GEOTEK ENGINEERING & TESTING SERVICES, INC.





NOTES:

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LEGEND

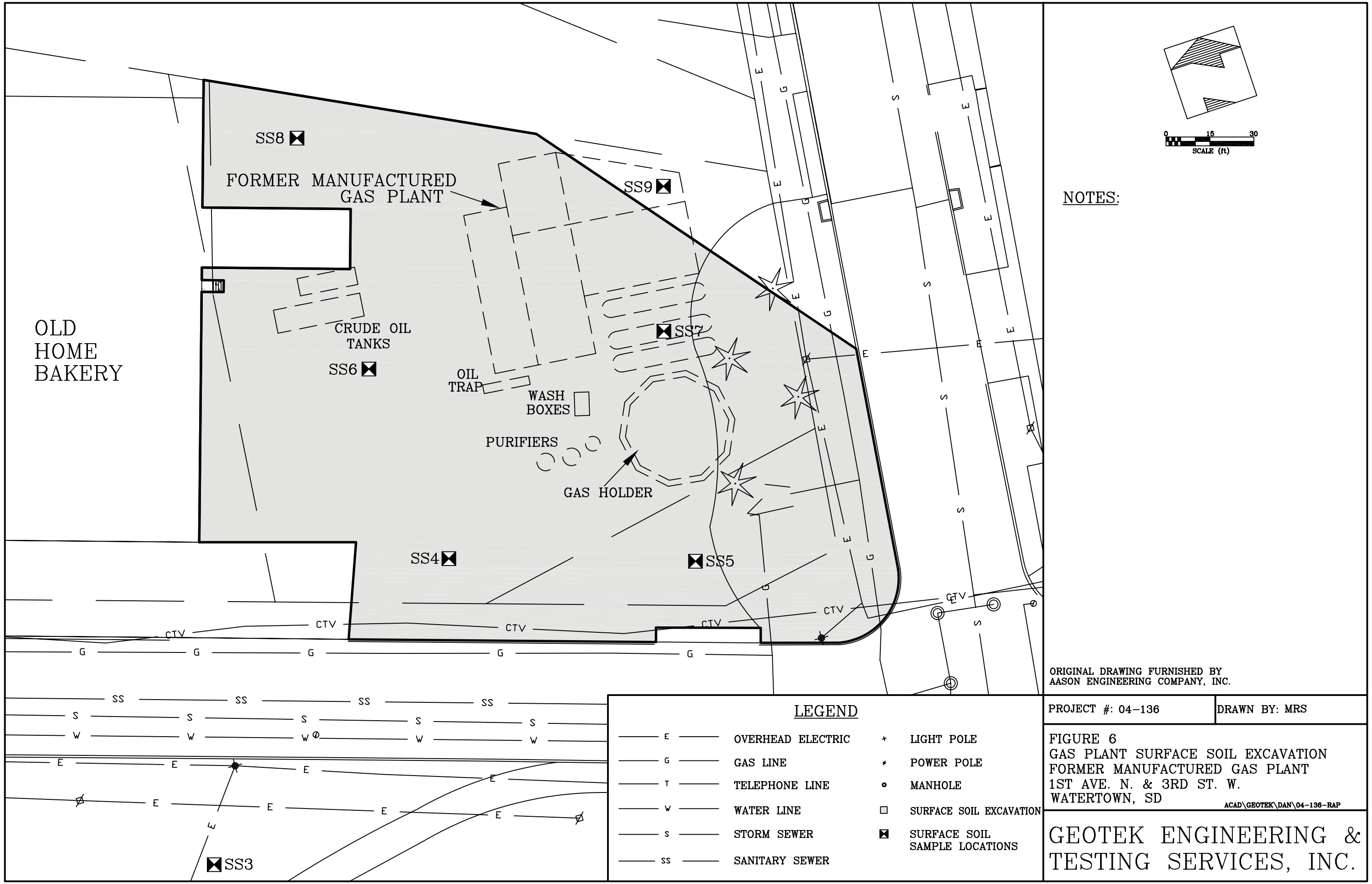
E	OVERHEAD ELECTRIC	☆	LIGHT POLE
G	GAS LINE	⚡	POWER POLE
T	TELEPHONE LINE	○	MANHOLE
W	WATER LINE	⊕	MONITORING WELL
S	STORM SEWER	○	SOIL BORING
SS	SANITARY SEWER	●	TARGOST POINT

PROJECT #: 04-136 | DRAWN BY: MRS

FIGURE 5
GAS PLANT SOURCE EXCAVATION
FORMER MANUFACTURED GAS PLANT
1ST AVE. N. & 3RD ST. W.
WATERTOWN, SD

ACAD\GEOTEK\DAN\04-136-RAP

GEOTEK ENGINEERING & TESTING SERVICES, INC.



NOTES:

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LEGEND

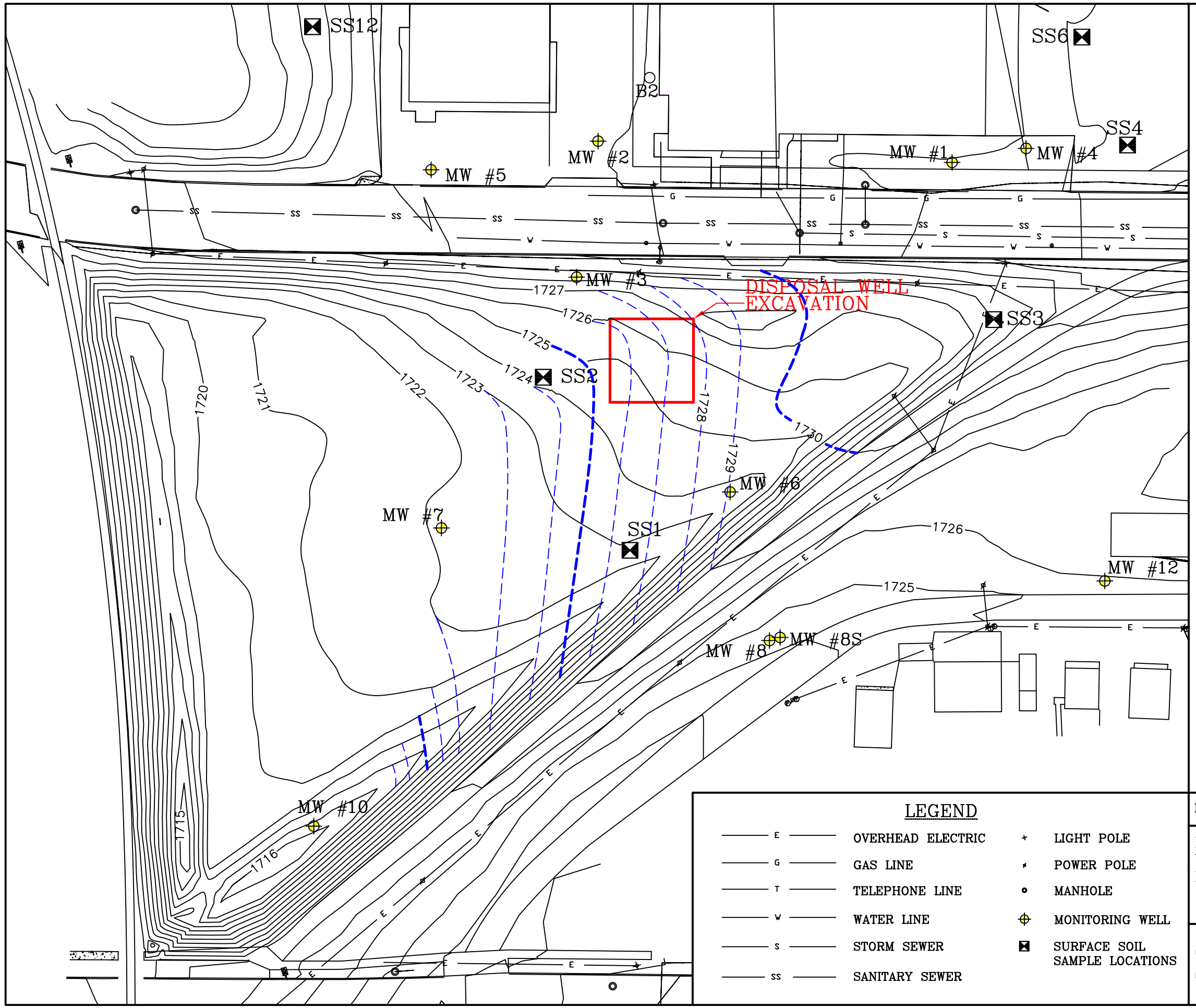
E	OVERHEAD ELECTRIC		LIGHT POLE
G	GAS LINE		POWER POLE
T	TELEPHONE LINE		MANHOLE
W	WATER LINE		SURFACE SOIL EXCAVATION
S	STORM SEWER		SURFACE SOIL SAMPLE LOCATIONS
SS	SANITARY SEWER		

PROJECT #: 04-136 | DRAWN BY: MRS

FIGURE 6
GAS PLANT SURFACE SOIL EXCAVATION
FORMER MANUFACTURED GAS PLANT
1ST AVE. N. & 3RD ST. W.
WATERTOWN, SD

ACAD\GEOTEK\DAN\04-136-RAP

GEOTEK ENGINEERING & TESTING SERVICES, INC.



0 30 60
SCALE (ft)

NOTES:

ORIGINAL DRAWING FURNISHED BY
AASON ENGINEERING COMPANY, INC.

LEGEND

E	OVERHEAD ELECTRIC		LIGHT POLE
G	GAS LINE		POWER POLE
T	TELEPHONE LINE		MANHOLE
W	WATER LINE		MONITORING WELL
S	STORM SEWER		SURFACE SOIL SAMPLE LOCATIONS
SS	SANITARY SEWER		

PROJECT #: 04-136 DRAWN BY: MRS

FIGURE 7
VACANT LAND CAP
FORMER MANUFACTURED GAS PLANT
1ST AVE. N. & 3RD ST. W.
WATERTOWN, SD

ACAD\GEOTEK\DAN\04-136-RAP-FIG7

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