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0990555005
Black Brothers Co.
SR/Tech

Prepared Under Contract
to Nicor Gas
Prepared on Behalf of
Nicor Gas and Commonwealth Edison

# Black Brothers Company Site

# Site Investigation - Phase II Work Plan



Prepared April 2012

Burns & McDonnell
SINCE 1898

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0990555005

Black Brothers Co.
SR/Tech

April 17, 2012

Nicor Mendota
File C4

Mr. Jeff Guy
Illinois Environmental Protection Agency
Bureau of Land
Remedial Project Management Section
Site Remediation Program
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276

RE: 0990555005 – LaSalle County
Black Brothers Company Site

Dear Mr. Guy:

Enclosed are three final copies of each the *Black Brothers Company Site, Site Investigation-Phase II Work Plan* and *Black Brothers Company Site-City of Mendota Parkway Property, Supplemental Site Investigation Work Plan* for the Black Brothers Company Site and associated Site Remediation Program Forms (DRM-2). We are planning to start field work beginning of June and are available to set up a webcast in May to discuss the site plans and goals.

If you have any questions, please call me at (630) 724-3277.

Sincerely,

Joe Chittet
Burns & McDonnell

Enclosures.

cc: Joan Gonzalez, BMcD
Linda Josupait, Nicor Gas
Gail MacMillan, ComEd



1431 Opus Place • Suite 400 • Downers Grove, IL 60515-1164
Tel: 630 724-3200 • Fax: 630 724-3201 • www.burnsmcd.com

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Black Brothers Co.
SR/Tech

# Illinois Environmental Protection Agency

Bureau of Land • 1021 N. Grand Avenue E. • Box 19276 • Springfield • Illinois • 62794

## Site Remediation Program Form (DRM-2)
## (To be Submitted with all Plans and Reports)

**You may complete this form online, save a copy, print, sign and mail it to the address above.**

### I. Site Identification:

Site Name: Black Brothers Company
Street Address: 501 Ninth Avenue P.O. Box: 410
City: Mendota State: IL Zip Code: 61342 Phone: 630-724-3200
Illinois Inventory ID Number: 0990555005 IEMA Incident Number:

### II. Remediation Applicant:

Applicant's Name: Somali Tomczak
Company: Nicor Gas (On behalf of Nicor Gas and Commonwealth Edison
Street Address: 1844 Ferry Road P.O. Box:
City: Naperville State: IL Zip Code: 60563 Phone: 630-388-2837
Email Address: stomcza@aglresources.com

I hereby request that the Illinois EPA review and evaluate the attached project documents in accordance with the terms and conditions of the Environmental Protection Act (415 ILCS 5), implementing regulations, and the review and evaluation services agreement.

Remediation Applicant's Signature: Somali Tomczak Date: 4/12/12

### III. Contact Person for Remediation Applicant:

Contact's Name: Linda Josupait
Company: Tall Oak Associates
Street Address: 1844 Ferry Road P.O. Box:
City: Naperville State: IL Zip Code: 60563 Phone: 630-926-4093
Email Address: ljosupa@aglresources.com

### Contact Person for Consultant:

Contact's Name: Joe Chittet
Company: Burns & McDonnell
Street Address: 1431 Opus Place, Suite 400 P.O. Box:
City: Downers Grove State: IL Zip Code: 60515 Phone: 630-724-3200
Email Address: jchittet@burnsmcd.com

### IV. Review & Evaluation Licensed Professional Engineer or Geologist ("RELPEG"), if applicable:

RELPEG's Name:
Company:
Street Address: P.O. Box:
City: State: Zip Code: Phone:
Email Address:

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APR 18 2012
IEPA/BOL

IL 532-2547
LPC 566 March 2010

## V. Project Documents Being Submitted:

Document Title: Black Brothers Co Site Investigation-Phase II Work Plan
Date of Preparation of Plan or Report: April 2012
Prepared by: Burns & McDonnell Engineering Co.
Prepared For: Nicor Gas

Type of Document Submitted:

- ☐ Site Investigation Report - Comprehensive
- ☐ Site Investigation Report - Focused
- ☐ Remediation Objectives Report - Tier 1 or 2
- ☐ Remediation Objectives Report - Tier 3
- ☐ Remedial Action Plan
- ☐ Remedial Action Completion Report
- ☐ Sampling Plan
- ☐ Health and Safety Plan
- ☐ Community Relations Plan
- ☐ Risk Assessment
- ☐ Containment Fate & Transport Modeling
- ☑ Other: SI-Phase II Work Plan - Focused

Document Title: _____
Date of Preparation of Plan or Report: _____
Prepared by: _____
Prepared For: _____

Type of Document Submitted:

- ☐ Site Investigation Report - Comprehensive
- ☐ Site Investigation Report - Focused
- ☐ Remediation Objectives Report - Tier 1 or 2
- ☐ Remediation Objectives Report - Tier 3
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- ☐ Health and Safety Plan
- ☐ Community Relations Plan
- ☐ Risk Assessment
- ☐ Containment Fate & Transport Modeling
- ☐ Other: _____

Document Title: _____
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- ☐ Sampling Plan
- ☐ Health and Safety Plan
- ☐ Community Relations Plan
- ☐ Risk Assessment
- ☐ Containment Fate & Transport Modeling
- ☐ Other: _____

## VI. Professional Engineer's or Geologist's Seal or Stamp:

I attest that all site investigations or remedial activities that are subject of this plan(s) or report(s) were performed under my direction, and this document and all attachments were prepared under my direction or reviewed by e, and to the best of my knowledge and belief, the work described in the plan and report has been designed or completed in accordance with the Illinois Environmental Protection Act (415 ILCS 5), 35 Ill. Adm. Code 740, and generally accepted engineering practices or principles of professional geology, and the information presented is accurate and complete.

*Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 Felony. A second or subsequent offense after conviction is a Class 3 felony. (415 ILCS 5/44(h))*

Engineer's or Geologist's Name: Joe Chittet

Company: Burns & McDonnell Engineering Co.

Registration Number: 062-061627 Phone: 630-724-3200

License Expiration Date: 11/30/2013

Signature: _____ Date: 4/16/12

Professional Engineer's or Geologist's Seal or Stamp:

JOSEPH A. CHITTET
062-061627
LICENSED
PROFESSIONAL
ENGINEER
STATE OF ILLINOIS

**Note: The authority of a Licensed Professional Geologist to certify documents submitted to the Illinois Environmental Protection Agency for review and evaluation pursuant to Title XVII of the Environmental Protection Act is limited to Site Investigation Reports (415 ILCS 58.7(f), as amended by P.A. 92-0735, effective July 25, 2002. A Licensed Professional Geologist cannot certify Remediation Objectives Reports, Remediation Action Plans or Remedial Action Completion Reports.**

All information submitted is available to the public except when specifically designated by the Remediation Applicant to be treated confidentially as a trade secret or secret process in accordance with the Illinois Compiled Statutes, Section 7(a) of the Environmental Protection Act, applicable Rules and Regulations of the Illinois Pollution Control Board and applicable Illinois EPA rules and guidelines. The Illinois EPA is authorized to require this information under Sections 415 ILCS 5/58 - 58.12 of the Environmental Protection Act and regulations proumulgated thereunder. Disclosure of this information is required as a condition of participation in the Site Remediation Program. Failure to do so may prevent this form from being processed and could result in your plan(s) or report(s) being rejected. This form has been approved by the Forms Management Center.

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Black Brothers Co.
SR/Tech

Prepared On Behalf of
Nicor Gas and Commonwealth Edison
Prepared Under Contract to
Nicor Gas

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# Black Brothers Company Site

# Site Investigation-Phase II Work Plan

Prepared April 2012

Burns & McDonnell
1431 Opus Place, Suite 400
Downers Grove, Illinois 60515

## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| bgs | below ground surface |
| BMcD | Burns & McDonnell |
| DPS | direct push sampling |
| IAC | Illinois Administrative Code |
| Illinois DNR | Illinois Department of Natural Resources |
| Illinois EPA | Illinois Environmental Protection Agency |
| ISGS | Illinois State Geological Survey |
| ISWS | Illinois State Water Survey |
| MGP | manufactured gas plant |
| MS/MSD | matrix spike/matrix spike duplicate |
| DNAPL | dense non-aqueous phase liquid |
| QAPP | quality assurance project plan |
| QA/QC | quality assurance/quality control |
| PCBs | polychlorinated biphenyls |
| PID | photoionization detector |
| SB | soil boring |
| SI | site investigation |
| SP | soil probe |
| SVOC | semivolatile organic compound |
| TACO | Tiered Approach to Corrective Action Objectives |
| TCLP | toxicity characteristic leachate procedure |
| VOC | volatile organic compound |

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### List of Appendices

# 1.0 INTRODUCTION

This work plan summarizes tasks and procedures for conducting the second phase of a focused site investigation (SI-Phase II) at the Black Brothers property in Mendota, Illinois, located adjacent to a former manufactured gas plant (MGP) facility. This work plan outlines anticipated field activities, sampling procedures and protocols, analytical methods and quality assurance/quality control (QA/QC) methods and procedures that will be followed during the SI-Phase II.

This work plan is organized into six sections and four appendices as follows:

- **Section 1.0–Introduction**
  This section presents investigation objectives, defines project team organization, key personnel and presents the anticipated project schedule.
- **Section 2.0–General Project Information**
  This section presents background information and discusses surrounding land use.
- **Section 3.0–Field Investigation Activities**
  This section outlines investigation activities and describes the locations and rationale for sample collection.
- **Section 4.0–Field Quality Assurance/Quality Control (QA/QC)**
  This section summarizes equipment decontamination procedures, site specific QC sampling procedures, and sample numbering system.
- **Section 5.0–Field Investigation Procedures**
  This section presents procedures for soil probing, sample collection and management of field investigation-derived waste.
- **Section 6.0–References**
- **Appendix A–Sanborn Maps**
  This section provides copies of Sanborn Fire Insurance Maps for the site.
- **Appendix B–Well Survey Documentation**
  This section provides copies of all relevant well survey information.
- **Appendix C– Quality Assurance Project Plan (QAPP)**
  This section establishes consistent field and laboratory procedures and methods for field activities.
- **Appendix D– En Core Soil Sampling Procedures**
  This section presents a detailed procedure for collecting soil samples for volatile organic compound (VOC) analysis.

## 1.1 INVESTIGATION OBJECTIVES

The overall objective of the SI-Phase II is to further delineate impacts from past MGP activity observed during the initial site investigation (SI-Phase I) on the Black Brothers Company property. SI-Phase II will

further delineate to the east and south of the former MGP facility boundaries, the extent of possible impacts to soil. The objective will be accomplished by advancing soil probes, as well as collecting soil samples.

## 1.2 PROJECT TEAM ORGANIZATION AND KEY PERSONNEL

Burns and McDonnell (BMcD) key personnel for the Mendota site SI-Phase II are Joan Gonzalez, Joe Chittet and Amanda Haugen. Ms. Gonzalez is responsible for overall direction of project operations and will monitor and check overall project quality and provide technical support. Mr. Chittet will manage daily activities and be responsible for ensuring that project deliverables meet work plan and QAPP objectives. He will also be responsible for coordinating project activities with Nicor Gas and Commonwealth Edison, overseeing subcontractors, monitoring quality assurance/quality control. Ms. Haugen will be responsible for supervising field activities and coordinating field activities.

Ms. Linda Josupait of Tall Oak Associates, Ms. Somali Tomczak of Nicor Gas, and Ms. Gail MacMillan of ComEd will be the Nicor and ComEd contacts for this project, and Mr. Jeff Guy is the Illinois Environmental Protection Agency (Illinois EPA) project manager.

## 1.3 PROJECT SCHEDULE

Field activities are anticipated to be completed in approximately 3 weeks from the date of commencement.

* * * * *

# 2.0 GENERAL PROJECT INFORMATION

## 2.1 SITE LOCATION AND EXISTING INFORMATION

The Black Brothers Company Site (Site) is in the City of Mendota, LaSalle County, Township 36 North, Range 1 East, Section 33 as shown in Figure 1. The Site consists of the former MGP facility and is located at the southeast corner of 5th Street and 9th Avenue and occupies 0.65 acres. The property was purchased by the Black Brothers Company from Northern Illinois Gas in 1966.

### 2.1.1 Facility History

The structures associated with the former Mendota MGP facility were located on the Site. The MGP was constructed in about 1875 and operated until 1941. Coal carbonization was the only known process to be used at the MGP and known production levels ranged from 3,200,000 cubic feet per year to more than 22,000,000 cubic feet per year. Major features historically located on the Site consisted of the following: two gas holders, two crude oil tanks, coal piles, and a tar well in addition to other MGP apparatus and buildings. Figure 2 is a historical layout of structures that existed at the Site.

According to Sanborn Maps (Sanborn Map and Publishing Company 1885, 1891, 1897, 1902, 1929, 1949), buildings associated with the MGP facility were located on the Site from approximately 1885 to 1949. An 1885 Sanborn map shows the MGP facility on the Site and maps from 1897 and 1929 each show the MGP facility with additional structures. The addition of an oil tank is noted in the 1897 map and a gas holder of unknown capacity is introduced in the 1929 Sanborn map. Coal piles were shown in the northeast quarter of the Site on all Sanborn maps. All Sanborn maps depict railroad tracks along the eastern and southern property boundary of the Site. None of the gas plant buildings or above grade structures remain on the site and the date of demolition of those structures is not known. All Sanborn maps are presented in Appendix A.

### 2.1.2 Existing Features and Surrounding Property Use

The Black Brothers Company purchased the Site property in 1966 and it is currently covered by an asphalt parking lot as well as a one story brick building near the northwest corner of the Site. The area immediately to the west of the Site consists of residential properties as well as a small asphalt parking lot to the southwest of the Site. The Site is bound to the north by Mendota Creek approximately 10 feet from the property line followed by residential properties along side a service business district, to the east and south by a manufacturing district including the Black Brothers Company property followed by the Burlington Northern and Santa Fe railroad. The Site is currently zoned M Manufacturing District (Village of Mendota Zoning Department 2011).

### 2.1.3 Topography and Drainage

The topography of the Site is relatively flat, with an elevation approximately 737 feet above sea level. Currently the Site surface is covered by asphalt paving and a one story brick building, with landscaping and grassy areas along the west and northern boundaries as shown on Figure 3. Surface water that does not infiltrate the Site will result in runoff water that will flow north towards the Mendota Creek. Catch basins for

storm water runoff are located along the west side of the site, which grades to the north towards Mendota Creek.

### 2.1.4 Regional and Site Geology

Regional geology in northern Illinois consists primarily of alluvial deposits, glacial deposits, and bedrock underlying these units. The glacial units include silty clays of various compositions; sand and gravel deposited by streams and rivers flowing from the glaciers or by discharge from glacial lakes; and sand, silt, and clay deposited in lakes dammed by the glaciers. After glaciers retreated from the area, silty deposits accumulated; the rivers and streams deposited alluvium in their floodplains; and the modern soil developed on the deposits. Thousands of feet of Ordovician, Cambrian, and Precambrian age bedrock lie beneath these deposits (Kolata 2005). The following discussion provides additional detail on the alluvial and glacial deposits and the underlying bedrock units in northwestern LaSalle County.

The upper 20 feet or less of unconsolidated deposits is composed of modern soil and the silts of the Richland loess. Unconsolidated glacial and alluvial deposits in the Site vicinity vary in thickness from approximately 50 feet to as much as 300 feet and are composed primarily of the silty and clayey diamictons (tills) of the Wedron formation, which were deposited in multiple successions of moraines as glaciers periodically advanced and retreated through the region. Sand and gravel deposits of regionally limited extent are observed within the Wedron formation in the area (Piskin 1975, Berg and Kempton 1987, Willman et al. 1975). A map presented by Berg at al. (1984) indicates that a sand and gravel deposit of this nature may be present in close vicinity to the Site within 20 to 50 feet of the surface.

Beneath the unconsolidated glacial deposits, upper bedrock formations consist primarily of Ordovician dolomite and sandstone. The first bedrock unit encountered, the Galena dolomite, unconformably underlies the unconsolidated deposits and is generally greater than 200 feet thick in the vicinity of the Site. Beneath the Galena dolomite lie alternating beds of dolomite and sandstone from the Ordovician and Cambrian periods (Kolata 2005, Willman et al. 1975).

### 2.1.5 Regional and Site Hydrogeology

As previously described, overburden in the Mendota area consists primarily of silty and clayey glacial diamicton. The typical range of hydraulic conductivities for silt is $1 \times 10^{-6}$ to $1 \times 10^{-4}$ centimeters per second (cm/sec) and for clay is $1 \times 10^{-9}$ to $1 \times 10^{-6}$ cm/sec (Fetter 1994). As a result of this low conductivity, the glacial diamicton generally will not yield pumpable quantities of groundwater and does not function as an aquifer. Groundwater derived from infiltration of precipitation and surface water is expected to be present primarily in the form of perched water, without a well-defined potentiometric surface. Lateral flow of shallow groundwater, though limited, is expected to be generally toward Mendota Creek.

Although the diamicton is primarily composed of silt and clay, isolated sand and gravel deposits are present within the diamicton. Some of these sand and gravel deposits may be large enough to function as

an aquifer, and the water well search (described in Section 2.1.7) indicates that some wells have been installed within the overburden in the region.

The primary aquifer used for public and private water supplies in the Mendota area is known regionally as the Cambrian-Ordovician Aquifer (Visocky et al. 1985) which lies directly beneath the overburden diamicton. Sasman et al. (1974) indicate that within LaSalle County, groundwater withdrawals from the Galena dolomite are limited, and the majority of groundwater withdrawals are from the deeper Ordovician and Cambrian sandstone units.

### 2.1.6 Sensitive Habitats

The Illinois Department of Natural Resources (Illinois DNR) Division of Natural Heritage indicates that there are no known occurrences of state-listed threatened or endangered species within a one-mile radius of the Site (Illinois DNR 2011).

### 2.1.7 Location and Description of Wells

A well survey was performed to determine the presence of wells located within a 1,000-foot radius of the Site. The following agencies were contacted with requests for any public and private well information:

- City of Mendota Water Department
- Division of the LaSalle County Health Department
- Illinois State Water Survey (ISWS)
- Illinois EPA Bureau of Water
- Illinois State Geological Survey (ISGS)

The LaSalle County Environmental Health Division and the Illinois EPA Bureau of Water did not have any relevant information regarding wells in the area surrounding the Site. Information was obtained from the ISWS, City of Mendota Water Department and the ISGS. Based on information provided by the agencies, there are no wells within a 1,000 foot radius of the Site. Five public wells and three private wells were identified close to the Site but outside the 1,000 foot radius. Figure 4 presents the well survey location map including active public and private wells. Appendix B presents the well search documentation received in response to the well survey inquiries.

The first private well, ISWS well number 285656 and ISGS well number 25333, is located 2,524 feet southwest of the Site. Queries of the ISWS and ISGS water well databases show the well was drilled in 1995 to a depth of 160 feet bgs. The well is owned by Meyer's Furniture and is used for industrial/commercial purposes.

The second private well, ISWS well number 382129 and ISGS well number 898, is located 1,228 feet northeast of the Site. Both database queries show the well was drilled in 1941 and owned by Hunky Dory

Dairy, and the well depth is listed as 115 feet by the ISWS and 113 feet by the ISGS. Hunky Dory Dairy is no longer in operation and the well's current owner and status is unknown.

A third private well, ISWS well number 382130 is located in plot 4F with no known coordinates. This plot is northeast of the Site. This well was drilled in 1903, renamed in 1942 and is currently leased by Canners of Peter Pan Corn.

One of the active municipal drinking well identified by the City of Mendota Water Department is said to be approximately half a mile southwest of the Site and matches the description ISGS well number 1779 with a depth 1,330 feet and ISWS well number 407074, depth of 1,450 feet.

ISWS well number 407075 and ISGS well number 901 is located 3,640 feet northeast of the Site. Both database queries show the well was drilled in 1945 and owned by the City of Mendota, and the well depth is listed as 1,377 feet by the ISWS and 1,380 feet by the ISGS. The ISWS records show that the well was deepened in 1952 and is currently active.

Queries of the ISGS database indicate the existence of City of Mendota well number 902, located 3,334 feet to the northeast of the Site. The ISGS records show the well was drilled to a depth of 478 feet by J.P. Miller Art Well, but provide no drilling date. This is believed to match records for the ISWS database showing the existence of Mendota City water well number 407077, drilled by J.P. Miller Art Well located in plot 4F to the northeast of the Site. The well was drilled in 1889 and was sealed in 1949. The ISWS records do not provide the depth of the well.

ISWS well number 407078 was completed in 1917 and is believed to match records for ISGS well 900, although the ISGS lists a completion date of 1916. The well is located 1,035 feet northeast of the Site. The ISGS water well search lists the depth of the well as 502 feet but does not mention the well's current status. The ISWS water well database shows that the municipal well was drilled to 503 feet but was cleaned to 502 feet in 1943 and sealed in 1990. In a phone conversation with City of Mendota Water Department, there were no records of an active municipal well at that location.

ISWS well number 407076 was completed in 1896 to a depth of 490 feet and sealed in 1975. This well was located in plot 4F, northeast of the Site.

## 2.2 PREVIOUS INVESTIGATIONS

From September 2011 through November 2011, field activities were conducted at the Site. Completed SI activities included a total of 9 test pits, 31 soil borings and 53 soil probes. The site investigation also included the installation of 4 shallow monitoring wells (SMW), 2 subslab soil gas monitoring wells and 2 subsurface soil gas monitoring wells. A total of 89 soil samples, 4 groundwater samples from the shallow monitoring wells, 2 water table samples, 2 subslab soil gas samples and 2 subsurface soil gas samples were collected for the SI-Phase I and sent for environmental analysis. In addition to environmental samples, 10 soil samples were collected and sent for geotechnical testing and analyses.

Figure 5 shows the locations of soil samples collected from 0 to 3 feet bgs, and Figure 6 shows the locations of soil samples collected below 3 feet bgs during the previous investigation.

* * * * *

# 3.0 FIELD INVESTIGATION ACTIVITIES

This section describes the field activities that will be conducted during the SI-Phase II. The field investigation activities are divided into the following tasks:

- Field investigation preparation;
- Soil investigation and sampling;
- Surveying of sampling locations; and
- Ambient air monitoring.

## 3.1 FIELD INVESTIGATION PREPARATION

Before field activities begin, BMcD will accomplish the following tasks:

- Procure subcontractors to perform probing/drilling and laboratory testing.
- Locate underground utilities in the investigation area including televising the pipe found along the former rail area to clear for soil probing.

## 3.2 SOIL INVESTIGATION

Soil probes will be advanced by direct push methods and will be used to further delineate impacts observed during SI-Phase I. Initially 13 probes will be advanced, with the potential for additional probes for delineation based on field observations. All soil probes will be advanced by direct push methods to a depth of 25 feet bgs and will be continuously logged by a qualified engineer or geologist. If impacted soil is encountered, the soil probe will be advanced to delineate extent.

A soil sample will be collected at the depths where impacts were observed during SI-Phase I. An additional soil sample will be taken below the depth of the impacts and submitted for analysis. If no impacts are identified, a sample will be taken in the depth range where impacts have been indentified during previous investigations. Soil probes will be backfilled with cement-bentonite grout and the surface will be restored to match existing conditions. Figure 7 presents the potential soil probe locations.

### 3.2.1 Chemical Laboratory Analysis

Representative soil samples from soil probes will be analyzed for the following constituents: BTEX, styrene, phenols, PAHs, RCRA metals and cyanide. Additionally, select samples may be analyzed for total petroleum hydrocarbons (TPH), soil pH, polychlorinated biphenyls (PCBs), and toxicity characteristic leaching procedure (TCLP) metals for a source material evaluation.

## 3.3 SURVEYING

Following completion of field activities, each soil probe location will be surveyed using state plane coordinates to determine coordinate locations and ground surface elevations.

## 3.4 AIR MONITORING

Ambient air monitoring will be performed during intrusive investigation activities. The ambient air monitoring work plan can be found in a separately bound *Black Brothers Company Site Ambient Air*

*Monitoring Work Plan for Site Investigation Activities* (Burns & McDonnell 2011). Air monitoring during investigation activities for worker health and safety will be addressed in a separately bound *Site Health & Safety Plan* (Burns & McDonnell 2011).

## 3.5 Restoration

Once field activities are complete, the SI-Phase II areas will be restored to its original condition.

* * * * *

# 4.0 FIELD QUALITY ASSURANCE/QUALITY CONTROL

The primary objective of field QA/QC procedures is to ensure samples collected during the field investigation closely represent actual field conditions. The *Quality Assurance Project Plan* in Appendix C contains specific protocols to be followed for sampling, sample handling and storage, chain-of-custody, and laboratory analysis.

This section augments QAPP procedures with the following site-specific QA/QC information:

- Decontamination procedures.
- Sample numbering system.
- Site-specific QC procedures.
- Analytical detection limits.

## 4.1 DECONTAMINATION PROCEDURES

Equipment decontamination procedures will be implemented to avoid cross-contamination of subsurface strata and various media sampled. Reusable soil probing and sampling equipment will be thoroughly decontaminated before drilling and sampling at each location. The QAPP presents detailed procedures to be implemented. A decontamination station will be constructed; its location will be determined in the field. The station will be located away from frequently used areas. The station will have a sturdy base with raised sides to prevent accidental spraying of surrounding areas. The station will be lined with plastic sheeting to accommodate drilling tools and equipment and collected decontamination water will be pumped into appropriate storage containers for off-site disposal.

## 4.2 SAMPLE NUMBERING SYSTEM

Sample numbering for this investigation will consist of three components: a three-character alpha site identification code; a four- to five-character alpha numeric sample type code; and a three digit sample characteristic code. The rationale for this sample numbering system is described in the QAPP. For the Black Brothers Company site, the site identification code for all samples will be MEN. The following alpha-character codes may be used for this investigation: soil probe (SP), soil boring (SB) and shallow monitoring well (SMW). Typical sample characteristic code designations are:

001 primary sample;
101 duplicate samples;
201 field QC sample; and
301 physical characterization sample.

An example of a completely numbered sample, with each component identified as follows:

Example: MEN-SP01-001
Where: MEN – Black Brothers Company Site
SP01 – soil probe location No. 1,
001 – primary soil sample No.1

## 4.3 SITE SPECIFIC QC PROCEDURES

Overall precision, accuracy and comparability of laboratory analytical data will be assessed, as appropriate. Quality control samples used to evaluate field procedures will consist of trip blanks, rinsate blanks, matrix spike/matrix spike duplicates (MS/MSDs) and field duplicate samples. The following subsections describe the frequency, rationale, and collection procedures for QC samples.

### 4.3.1 Trip Blanks

Trip blanks consist of laboratory grade water prepared by the analytical laboratory and sorbent tube media. The laboratory grade water will not be opened by field personnel. A trip blank will be placed in each cooler that contains water for volatile analysis. Trip blanks will be analyzed for the same compounds as the water samples.

### 4.3.2 Rinsate Blanks

Rinsate blanks will be collected to verify the adequacy of decontamination procedures for equipment and materials; they will be analyzed for all constituents and compounds analyzed for in soil samples collected during this investigation. Rinsate blanks will be collected by pouring laboratory grade water over previously decontaminated equipment or materials and collecting the water in appropriate sample containers. It is anticipated that the frequency of rinsate blanks analyzed for this investigation will be one rinsate blank per 20 samples per soil matrix. Blanks will be performed on major pieces of equipment used for sampling.

### 4.3.3 MS/MSD Samples

The purpose of MS/MSD samples is to determine the effect of sample matrix on compound and analyte recovery. Field MS/MSDs will be collected simultaneously with each designated primary sample. One MS/MSD sample will be collected for every 20 samples submitted for each matrix (i.e., soil or water). MS/MSDs will be collected from relatively un-impacted areas to minimize the potential for matrix interference from MGP-related constituents. MS/MSDs will be analyzed for the same parameters as the primary samples. Primary samples and MS/MSDs will be placed in identical sample containers and preserved in the same manner. The location and depth of collection of each MS/MSD will be recorded in the field logbook.

### 4.3.4 Field Duplicate Samples

The purpose of field duplicate samples is to evaluate field and laboratory precision. Field duplicate samples will be collected simultaneously with each designated primary sample. One field duplicate sample will be collected for every 10 water samples collected. Field duplicates will be analyzed for the same parameters as the primary sample. Field duplicates and primary samples will be placed in identical sample containers and preserved in the same manner. Duplicate samples will be assigned a unique sample identification number. The location of collection of each field duplicate will be recorded in the field log book. Primary and duplicate samples for water and soil gas will be collected as described in Section 6.3 of the QAPP.

## 4.4 ANALYTICAL METHODS AND DETECTION LIMITS

Analytical methods and detection limits for this investigation will conform to the Tiered Approach to Corrective Action Objectives (TACO) requirements specified in Chapter 35 of the Illinois Administrative

Code (IAC) Parts 740 and 742, respectively. Detection limits will be at or below TACO Tier 1 residential screening levels for soil and the Tier 1 groundwater screening levels for the site-specific groundwater class. Data quality objectives/levels will be as discussed in the QAPP. Chemical and physical analysis methods are listed below:

Focused Analyte List

| | |
|---|---|
| • BTEX plus Styrene | SW846 624/8260B |
| • Phenols | SW846 8270C |
| • PAHs | SW846 8270C |
| • RCRA metals | SW846 6010B/6020 |
| | SW846 7470A/7471A (mercury) |
| • Cyanide (total and amenable) | SW846 9014/9010B |

Source Material Evaluation List

| | |
|---|---|
| • TPH | 8015B MOD |
| • PCBs | SW846 8082 |
| • pH | SW846 9045C |
| • TCLP extractions (Metals) | SW846 1311 |

Physical Analysis List

| | |
|---|---|
| • pH | SW846 9045C |

* * * * *

# 5.0 FIELD INVESTIGATION PROCEDURES

## 5.1 PROBING AND SOIL SAMPLING PROCEDURES

Surface and subsurface soil collected by a soil probe will use direct push sampling (DPS) equipment. Samples will be collected using a macro sampling tube lined with an acetate liner. The DPS method employs a pneumatic hammer to advance the macro sampling tube and acetate liner into the soil. The soil column at each probe location will be continuously sampled and visually characterized.

Use of grease or other lubricants on drill bits, drill rods, sampling equipment or tools required for probes will be avoided, if possible. If grease or lubricants are needed, they will be environmentally safe, certified petroleum hydrocarbon free (Well Guard by Jet-Lube or equivalent). Soil cuttings generated during soil probe advancement will be placed in 55-gallon drums and transferred to a roll-off box before activities begin at the next location, as outlined in Section 5.2 of this work plan. Groundwater encountered during drilling or probing activities will be placed in 55-gallon drums and transferred to a temporary water tank prior to beginning activities at the next location.

For soil probes, soil sampling will be performed with acetate liners. Resistance to soil penetration will be measured, in accordance with ASTM D1586 for all soil probes. The entire length of each soil sample will be screened immediately after retrieval using a PID by slicing the sample open with a clean decontaminated knife and screening on the split spoon or sleeve of the soil probe samples. If impacted soil is encountered based on either visual or PID readings, a sample from this interval will be collected. If impacted intervals were not proposed in the original grid sampling scheme , additional samples will be collected at these locations. PID readings will be recorded on soil probe log forms. The split spoon or split-barrel sampler will be decontaminated prior to use at each location according to procedures outlined in Section 5.2 of the QAPP.

Samples for laboratory analysis will be collected as follows:

**VOCs**—Soil samples for VOCs will be collected immediately after sample retrieval. Samples will be collected in accordance with SW-846 Method 5035 using the En Core 5 gram sampling method. Appendix D contains detailed En Core sampling procedures.

**SVOCs, Metals, Cyanide (TPH, PCBs, pH, and TCLP Metals in the Source Evaluation)**—Soil samples for these analytes will be collected after collecting VOCs. Samples will be collected using clean stainless steel mixing bowls, spoons, knifes, etc. Sample aliquots will be placed directly from the sample retrieval device into a stainless steel bowl. The soil will be thoroughly mixed in the bowl to homogenize the sample and then placed directly into appropriate clean sample containers. Container lids will be secured and samples will be placed in a cooler with ice.

Soil probe holes will be cement-bentonite grouted by using the tremie method, which consists of pumping the slurry down the annular space through a pipe. The bottom of the pipe will be placed near the bottom of the zone to be grouted and raised as the slurry is injected, keeping the bottom of the tremie pipe below the top of

the slurry. The top of the boreholes will be restored with asphalt patch or with topsoil to previous surface conditions depending on location of probe

## 5.2 FIELD INVESTIGATION DERIVED WASTES

Investigation-derived wastes include excavation soils, drilling cuttings, plastic sheeting, decontamination fluids, groundwater, disposable sampling equipment, and disposable health and safety materials. BMcD will assist Nicor Gas in the proper disposal of investigation-derived wastes. The following sub-sections discuss procedures for handling these wastes and labeling drums.

### 5.2.1 Solid Materials

Excavation soils, drill cuttings, plastic sheeting, and equipment that cannot be reasonably decontaminated will be placed in Department of Transportation (DOT) specified 55-gallon drums or in covered roll-off boxes lined with polyethylene. The disposal materials will be analyzed for paint filter test, open cup flashpoint, TCLP metals, TCLP VOCs, TCLP SVOCs, Total PCBs, EOX, pH, cyanide(total), sulfide(reactive), phenol (total) and BTEX. Disposal of these materials will be based on analytical results.

Disposable sampling equipment and health and safety materials not visibly contaminated will be double-bagged in plastic trash bags and disposed of at a solid waste disposal location (i.e., trash dumpster or container).

### 5.2.2 Liquid Materials

Decontamination fluids and liquid source materials will be placed in DOT specified 55-gallon drums or in a temporary storage tank. Disposal of these liquids will be based on analytical results.

### 5.2.3 Labeling

If used, the following information will be placed on both the side and top of each DOT-specification drum:

Example

- Site location — Black Brothers Company Site
- Sampling location(s) — SB001
- Waste type — Soil cuttings
- Investigation date — 08/29/11

* * * * *

## 6.0 References


Berg, R.C. and Kempton, J.P., and Cartwright, K., 1984. Potential for contamination of shallow aquifers in Illinois. Circular 532, Illinois State Geological Survey (ISGS), Champaign.

Berg, R.C. and Kempton, J.P., 1987. Stack-unit mapping of geologic materials in Illinois to a depth of 15 meters. Circular 542, ISGS, Champaign.

Burns & McDonnell, 2011. *Site Health & Safety Plan for the Nicor Gas Black Brothers Company Site in Mendota, Illinois.*

Burns & McDonnell, 2011. *Black Brothers Company Site Ambient Air Monitoring Work Plan for Site Investigation Activities.*

Fetter, C.W., 1994. *Applied Hydrogeology*, 3rd Ed. Prentice Hall, Inc., Englewood Cliffs, New Jersey.

Illinois Department of Natural Resources (Illinois DNR), 2011. Illinois Natural Heritage Database.

Illinois State Geological Survey (ISGS), 2011. Well Database Search.

Illinois State Water Survey (ISWS), 2011. Well Database Search.

Illinois Pollution Control Board, 2010. *Proposed Amendments to Tiered Approach to Corrective Action Objectives, Illinois Pollution Control Board Case No. R2010-009,* http://www.ipcb.state.il.us/documents/dsweb/Get/Document-70510/

Kolata, D.R., 2005. Bedrock Geology of Illinois (map). Scale 1:500,000. Illinois Map 14, ISGS, Champaign.

Piskin, K., 1975. Thickness of Glacial Drift in Illinois (map). Scale 1:500,000. Circular 490, ISGS, Urbana.

Sanborn Map and Publishing Company, 1885, 1891, 1897, 1902, 1929 and 1949. Sanborn Fire Insurance Maps of southeast corner of 9th Avenue and 5th Street, Mendota, Illinois.

Sasman, R.T. et al., 1974. Groundwater pumpage in northern Illinois, 1960-1970. Report of Investigation 73, ISWS, Urbana.

Village of Mendota Zoning Department, 2011. Zoning Map of Mendota, LaSalle County, Illinios http://www.mendota.il.us/images/ZONING.2009.pdf

Visocky, A.P., Sherrill, M.G., and Cartwright, K., 1985. Geology, hydrology, and water quality of the Cambrian and Ordovician systems in northern Illinois. Cooperative Groundwater Report 10, ISGS, Champaign.

Willman et al., 1975. Handbook of Illinois Stratigraphy. Bulletin 95, ISGS, Urbana.

* * * * *

**FIGURES**
**Black Brothers Company Site**

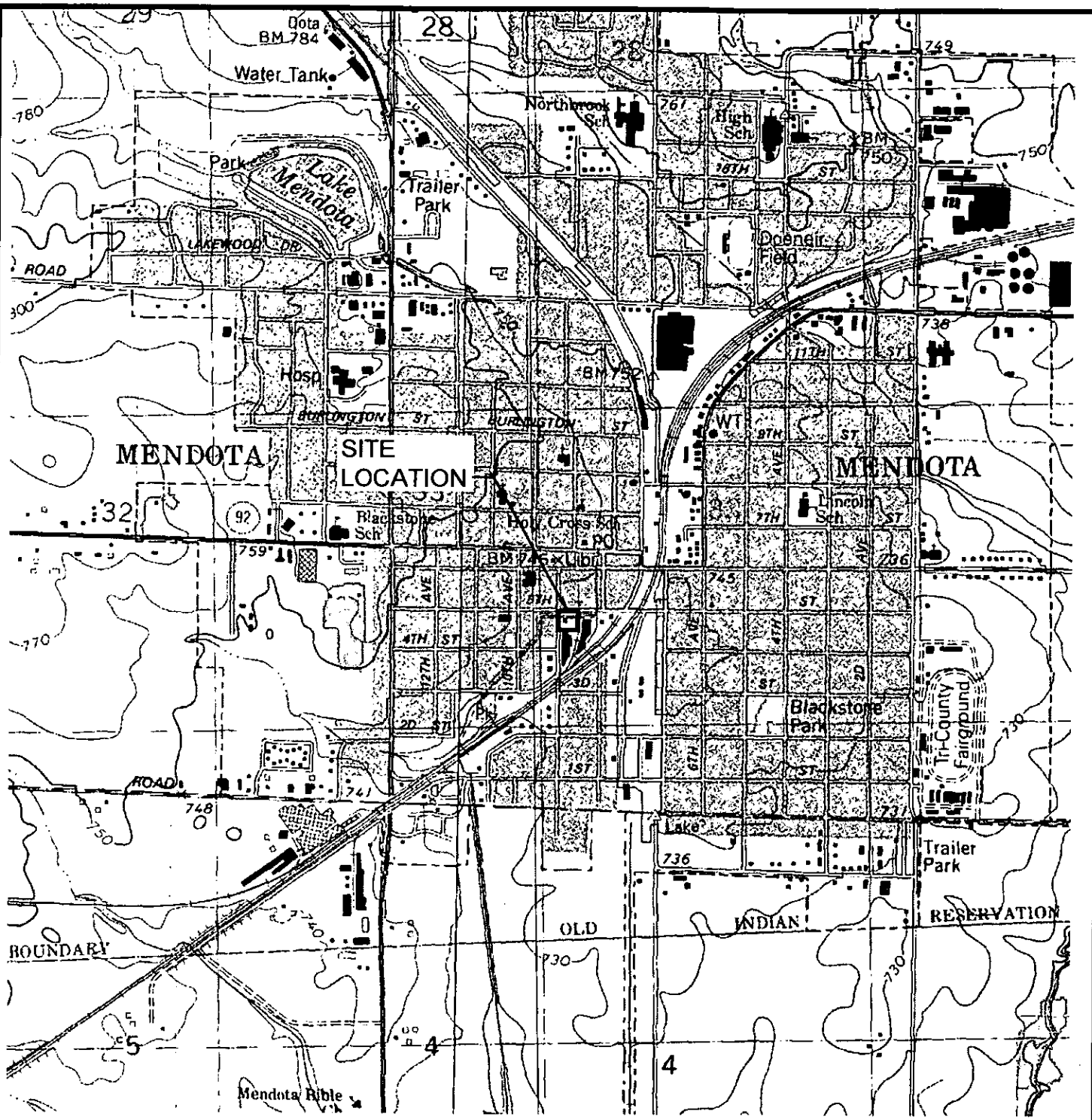


Figure 1
SITE LOCATION MAP
SITE INVESTIGATION - PHASE II WORK PLAN
BLACK BROTHERS COMPANY SITE
MENDOTA, ILLINOIS

Burns & McDonnell SINCE 1898

nicor GAS
An AGL Resources Company

I:\NICOR GAS\57618--MENDOTA\CAD\WORK PLAN PHASE 2\FIG_1_SITE_LOCATION

I:\NICOR GAS\57618--MENDOTA\CAD\WORK PLAN PHASE 2\FIG_2_MGP SITE HISTORICAL LAYOUT.DWG

5TH STREET

MENDOTA CREEK

9TH AVENUE

BLACK BROTHERS CO

BLACK BROTHERS CO

CRUDE OIL TANK

GAS HOLDER 10,000 FT³

TOOL HOUSE

TAR WELL

TAR SEPARATOR

VALVE HOUSE

GAS HOLDER

MISC. BUILDING

CRUDE OIL TANK

RETORTS

RETORTS

PURIFIERS

COAL

COAL

FORMER RAILROAD RAIL AREA

## LEGEND

- PROPERTY LINE
- HISTORICAL FEATURES
- FORMER MGP SITE
- CONCRETE
- BUILDING

N

0 30' 60'

SCALE IN FEET

Burns & McDonnell SINCE 1898

nicor GAS An AGL Resources Company

Figure 2
MGP SITE HISTORICAL LAYOUT
SITE INVESTIGATION - PHASE II WORK PLAN
BLACK BROTHERS COMPANY SITE
MENDOTA, ILLINOIS

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**LEGEND**

FORMER MGP BOUNDARY

N

0 200' 400'

SCALE IN FEET

Burns & McDonnell SINCE 1898

nicor GAS

*An AGL Resources Company*

Figure 3
AERIAL SITE LAYOUT MAP
SITE INVESTIGATION - PHASE II WORK PLAN
BLACK BROTHERS COMPANY SITE
MENDOTA, ILLINOIS

I:\NICOR_GAS\57618--MENDOTA\CAD\WORK PLAN PHASE 2\FIG_3_AERIAL SITE LAYOUT

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FILE CATEGORY 31A/SKTCH

DOCUMENT DATE 4/17/12

5TH STREET

MENDOTA CREEK

9TH AVENUE

BLACK BROTHERS CO

BLACK BROTHERS CO

SB11
SP18
SP33
SB18
SB06
SB21
SP31B
SP31
SP17
SP30
SB01
SP16
SP29
SP28
SB23
SB04
SP12
SP14
SB03
SP35

**LEGEND**

- PROPERTY LINE
- FORMER MGP SITE
- CONCRETE
- BUILDING

N

0 30' 60'

SCALE IN FEET

Figure 5
PREVIOUS SITE INVESTIGATION
SAMPLING LOCATIONS (0-3 FEET BGS)
SITE INVESTIGATION - PHASE II WORK PLAN
BLACK BROTHERS COMPANY SITE
MENDOTA, ILLINOIS

Burns & McDonnell SINCE 1898

nicor GAS
An AGL Resources Company

I:\NICOR GA...7618–MENDOTA\CAD\WORK PLAN PHASE 2\FIG_5_EXCEEDANCE_0-3

5TH STREET

MENDOTA CREEK

9TH AVENUE

BLACK BROTHERS CO

BLACK BROTHERS CO

SB11 SP42 SP18B SB17 SP33
SB10
SB09
SP02
SB16 SB14 SB15
SP03
SP47
SB21 SB20
SP31B
SP31
SP01
SP30 SB05
SB08
SB07
SB24
SP46
SB02
SP16
SP29
SP28
SB23
SB22
SB04
SP12
SB26
SP14
SB03
SP35B
SP34
SP35

## LEGEND

- PROPERTY LINE
- FORMER MGP SITE
- CONCRETE
- BUILDING

N

0 30' 60'

SCALE IN FEET

Burns & McDonnell SINCE 1898

nicor GAS An AGL Resources Company

Figure 6
PREVIOUS SITE INVESTIGATION
SAMPLING LOCATIONS (BELOW 3 FEET BGS)
SITE INVESTIGATION - PHASE II WORK PLAN
BLACK BROTHERS COMPANY SITE
MENDOTA, ILLINOIS

I:\NICOR GA\618-MENDOTA\CAD\WORK PLAN PHASE 2\FIG_6_EXCEEDANCE_BELOW 3 FE

I:\NICOR GA...618–MENDOTA\CAD\WORK PLAN PHASE 2\FIG_7_PROPOSED_SOIL PROBE LOCATION MAP

5TH STREET

MENDOTA CREEK

9TH AVENUE

BLACK BROTHERS CO

BLACK BROTHERS CO

SB11 SB30/SMW03 SP42 SP18 SP18B SP06 SP11 SP07 SP09 SB17 SB31/SMW04 SP33 SB10 SP10 SB12 SB18 SP08 SB13 SP01 SP04 SP48 SB09 SP02 SP05 SP43 SP37 SB06 SB16 SB14 SB15 SP39 SP38 SB19 SP47 SP31B SP31 SB21 SB20 SP17 SP30 SB05 SB08 SB07 SP46 SP49 SB24 SP41 SP27 SP36 SB01 SB02 SP43 SP50 SP16 SP29 SP26 SP28 SP19 SP20 SP22 SB23 SB27 SP45 SP44 SP23 SP21 SP24 SP25 SP13 SP12 SB04 SB26 SB29/SMW02 SP14 SP32 SP15 SB25 SB03 SP35B SB28/SMW01 SP34 SP40 SB27 SP35

## LEGEND

- PROPERTY LINE
- FORMER MGP SITE
- CONCRETE
- BUILDING
- PROPOSED PROBE LOCATION
- PROVISIONAL PROBE LOCATION
- PREVIOUS PHASE I SOIL BORING LOCATION
- PREVIOUS PHASE I SOIL PROBE LOCATION

N

0 20' 40' 80'

SCALE IN FEET

Burns & McDonnell SINCE 1898

nicor GAS

Figure 7
PROPOSED SOIL PROBE LOCATION MAP
SITE INVESTIGATION - PHASE II WORK PLAN
BLACK BROTHERS COMPANY SITE
MENDOTA, ILLINOIS

**APPENDIX A**
**Sanborn Maps**
**Black Brothers Company Site**

**Mendota**
SE Corner of 5th Street and 9th Ave
Mendota, IL 61342

Inquiry Number: 2886259.3
October 05, 2010

# Certified Sanborn® Map Report

EDR® Environmental Data Resources Inc

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Milford, CT 06461
800.352.0050
www.edrnet.com

# Certified Sanborn® Map Report

10/05/10

**Site Name:**
Mendota
SE Corner of 5th Street and 9th
Mendota, IL 61342

EDR Inquiry # 2886259.3

**Client Name:**
Burns & McDonnell Eng. Co Inc
1431 Opus Place
Downers Grove, IL 60515

Contact: Amanda Haugen

EDR® Environmental Data Resources Inc

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**Site Name:** Mendota
**Address:** SE Corner of 5th Street and 9th Ave
**City, State, Zip:** Mendota, IL 61342
**Cross Street:**
**P.O. #** NA
**Project:** NA
**Certification #** F36D-46D4-8007

Sanborn® Library search results
Certification # F36D-46D4-8007

**Maps Provided:**

1949 1885
1929
1909
1902
1897
1891

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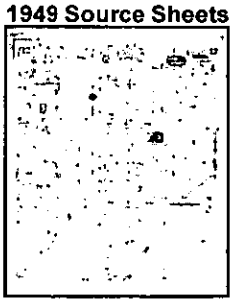

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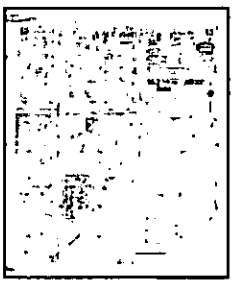

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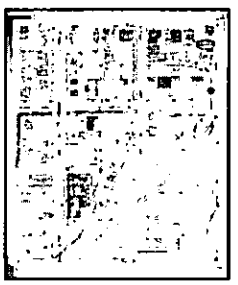

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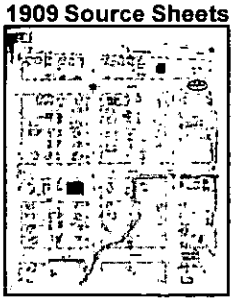

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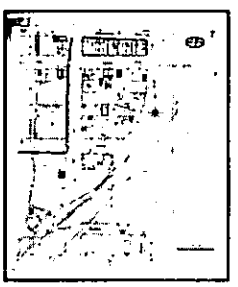

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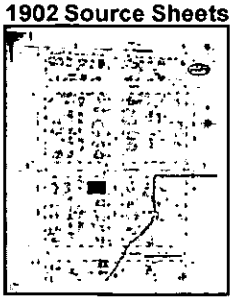

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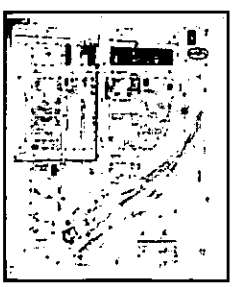

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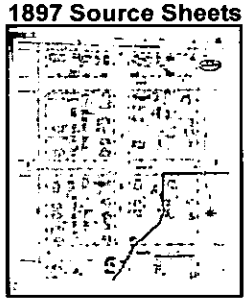

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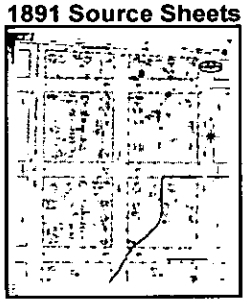

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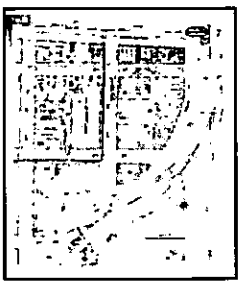

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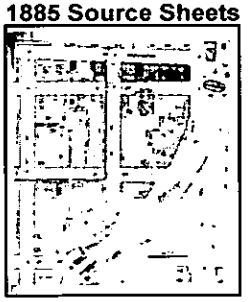

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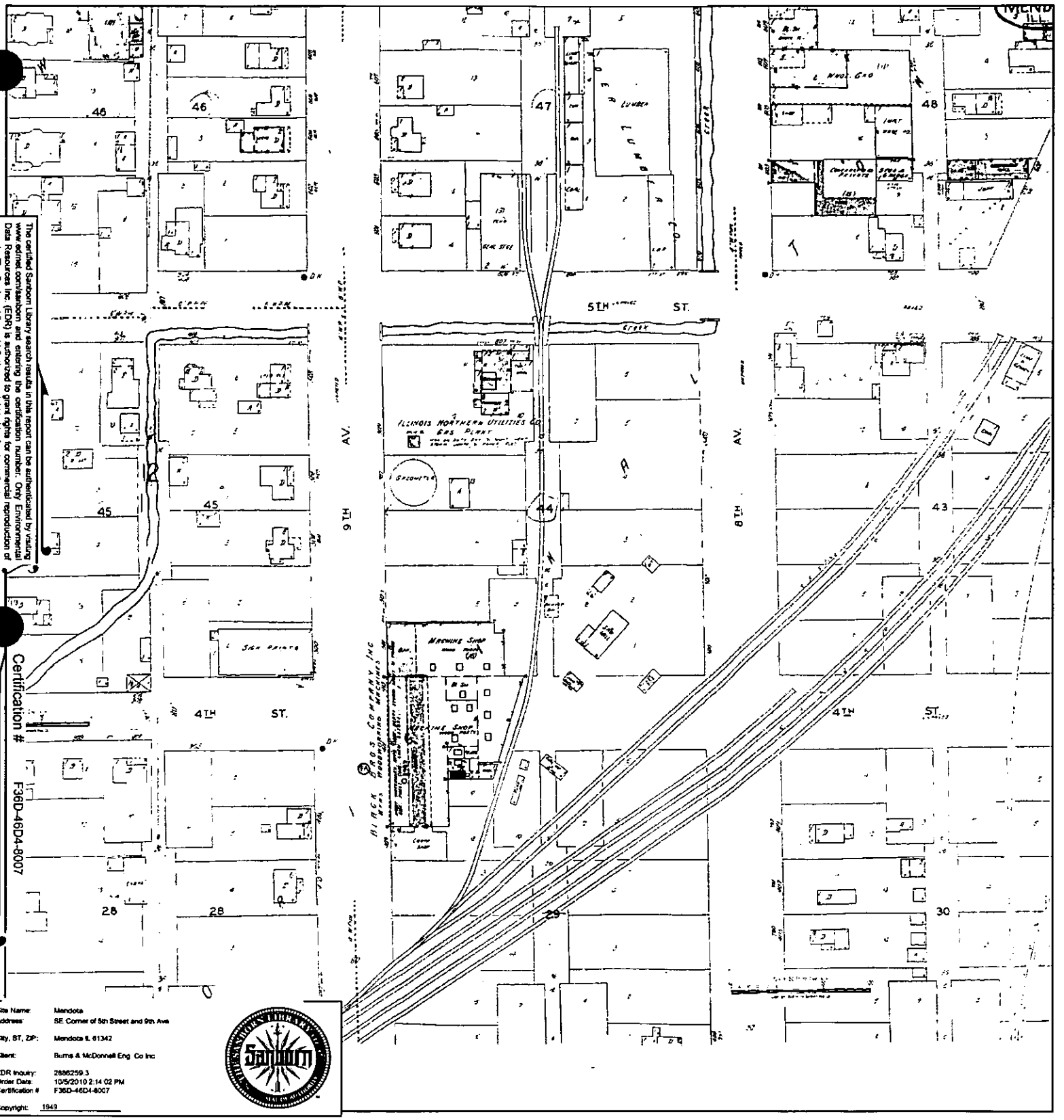




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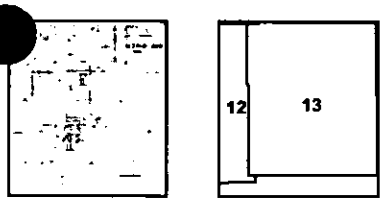


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0 Feet 150 300 600

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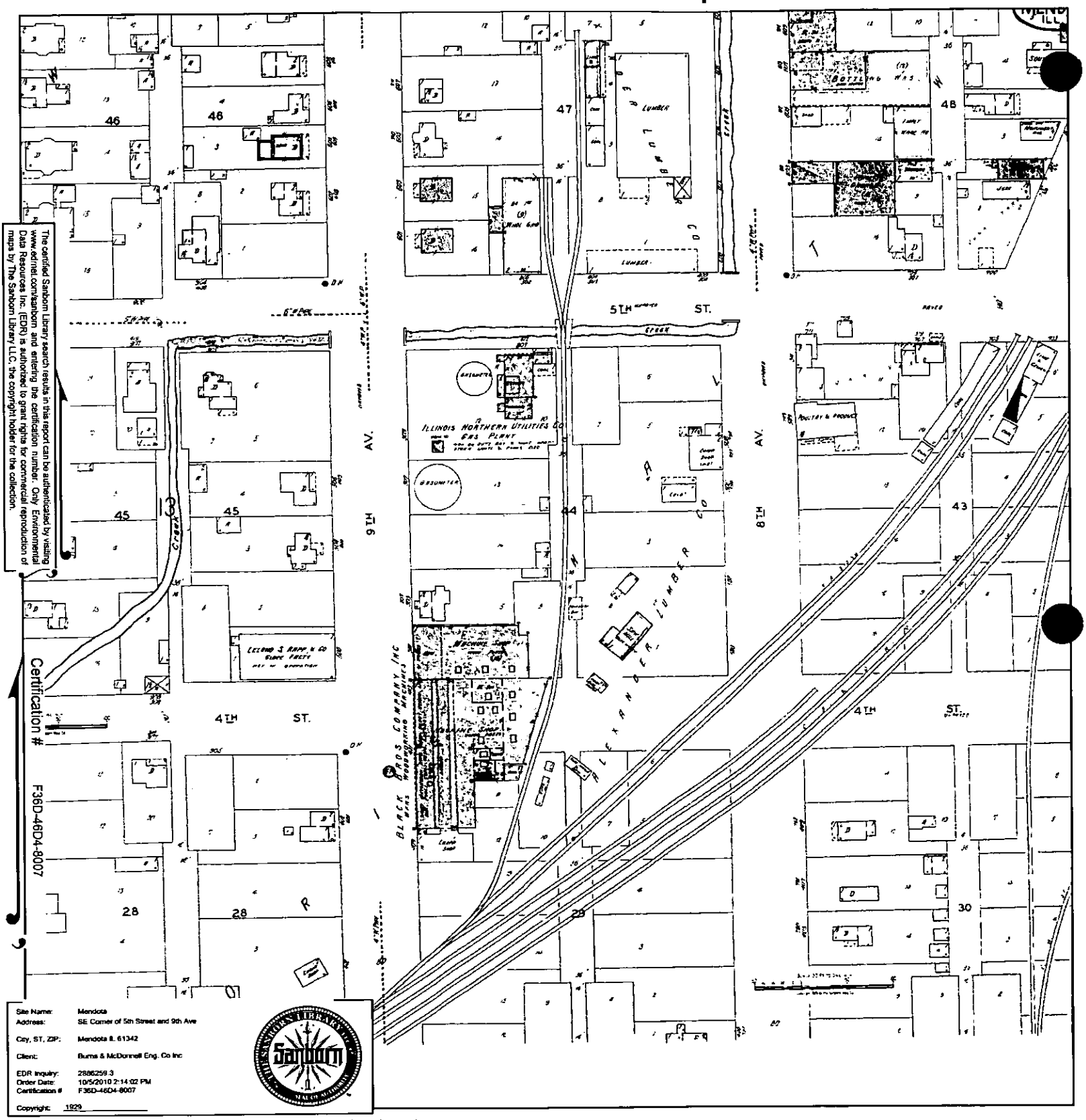




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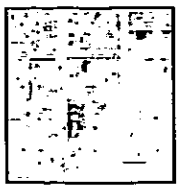

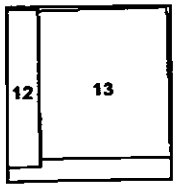


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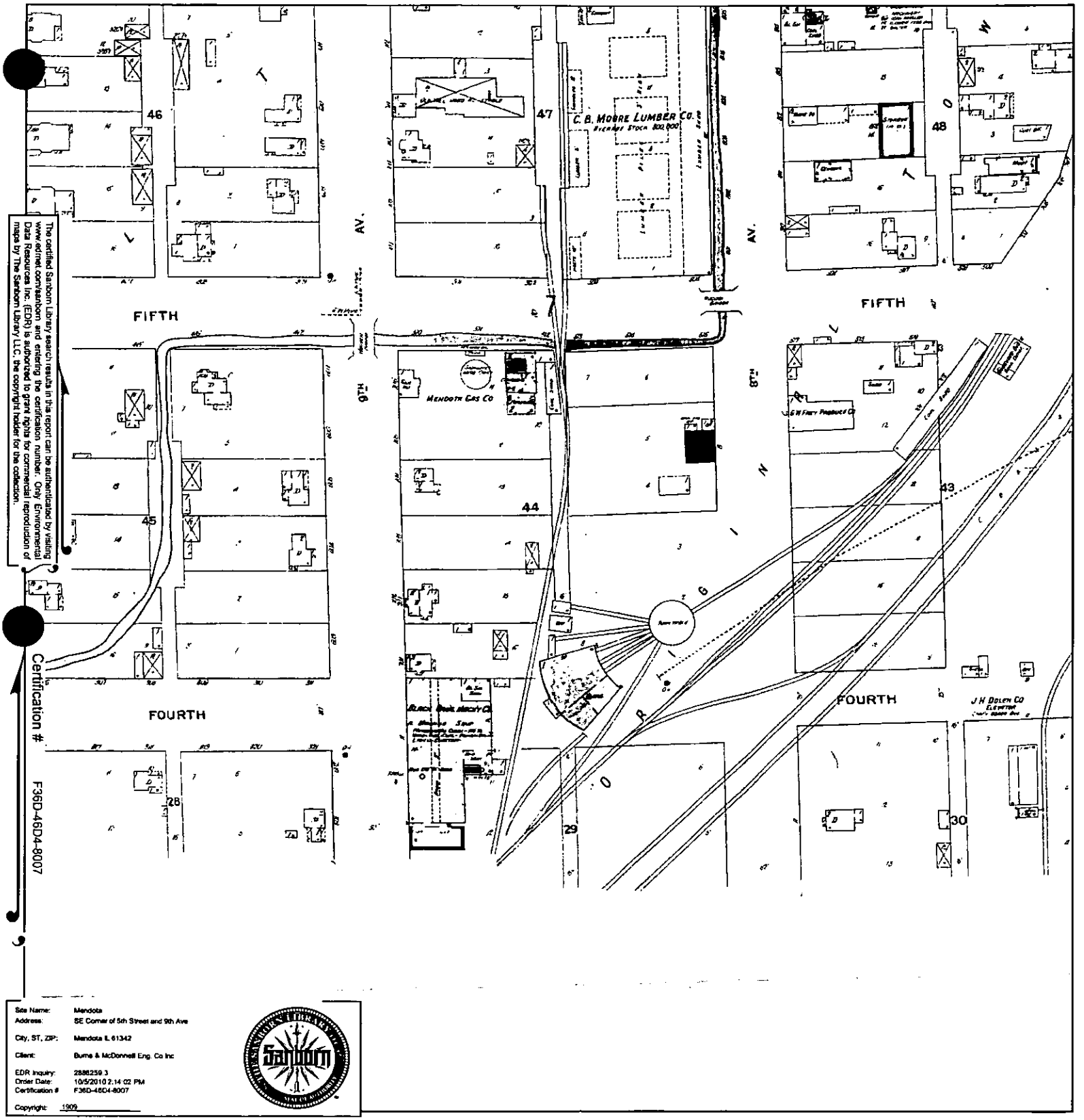




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| City, ST, ZIP: | Mendota IL 61342 |
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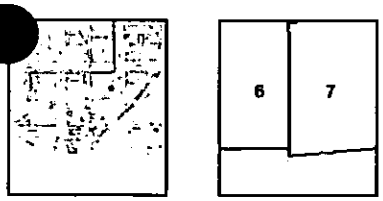


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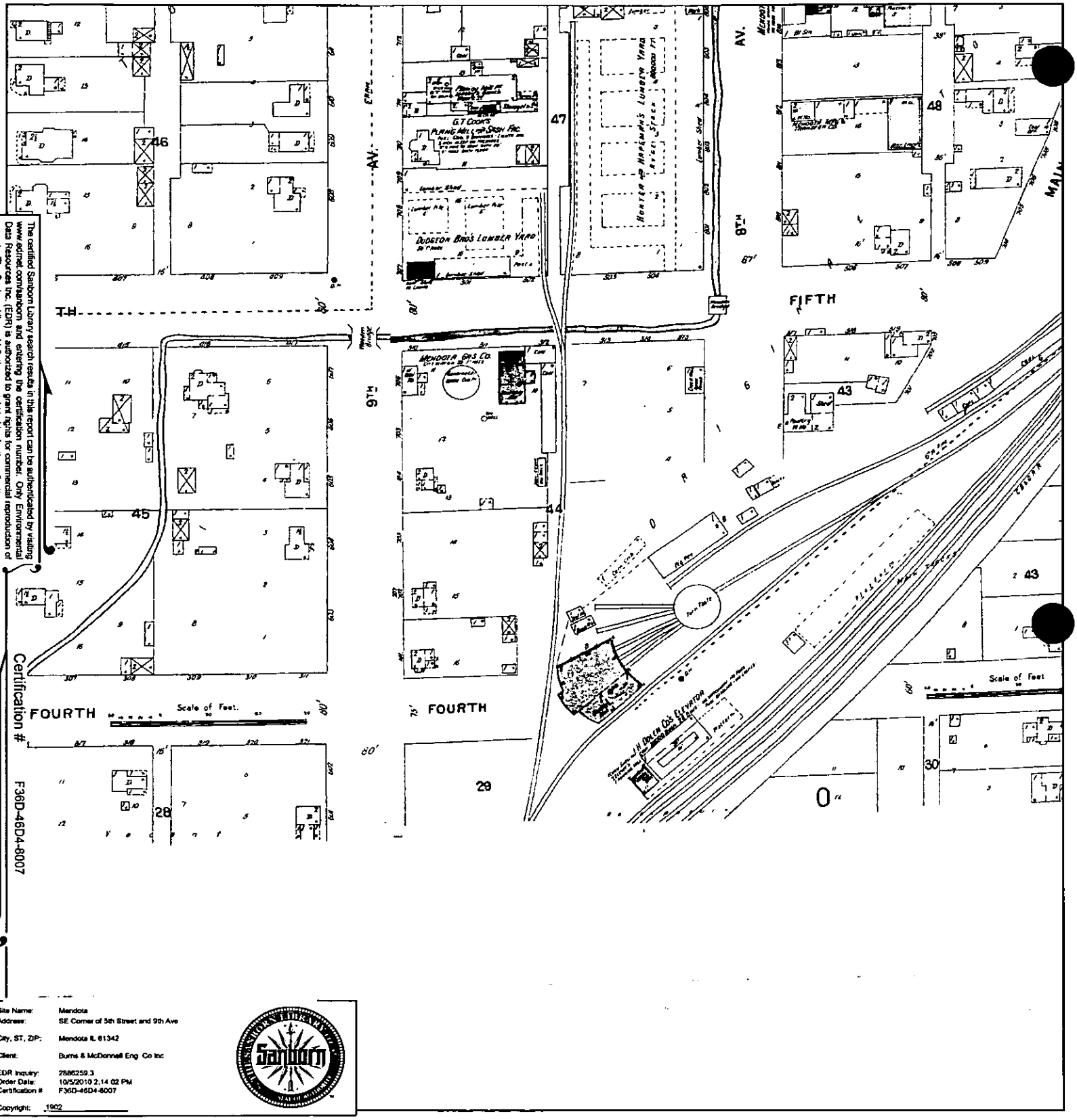


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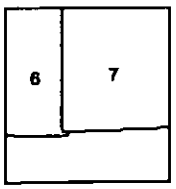


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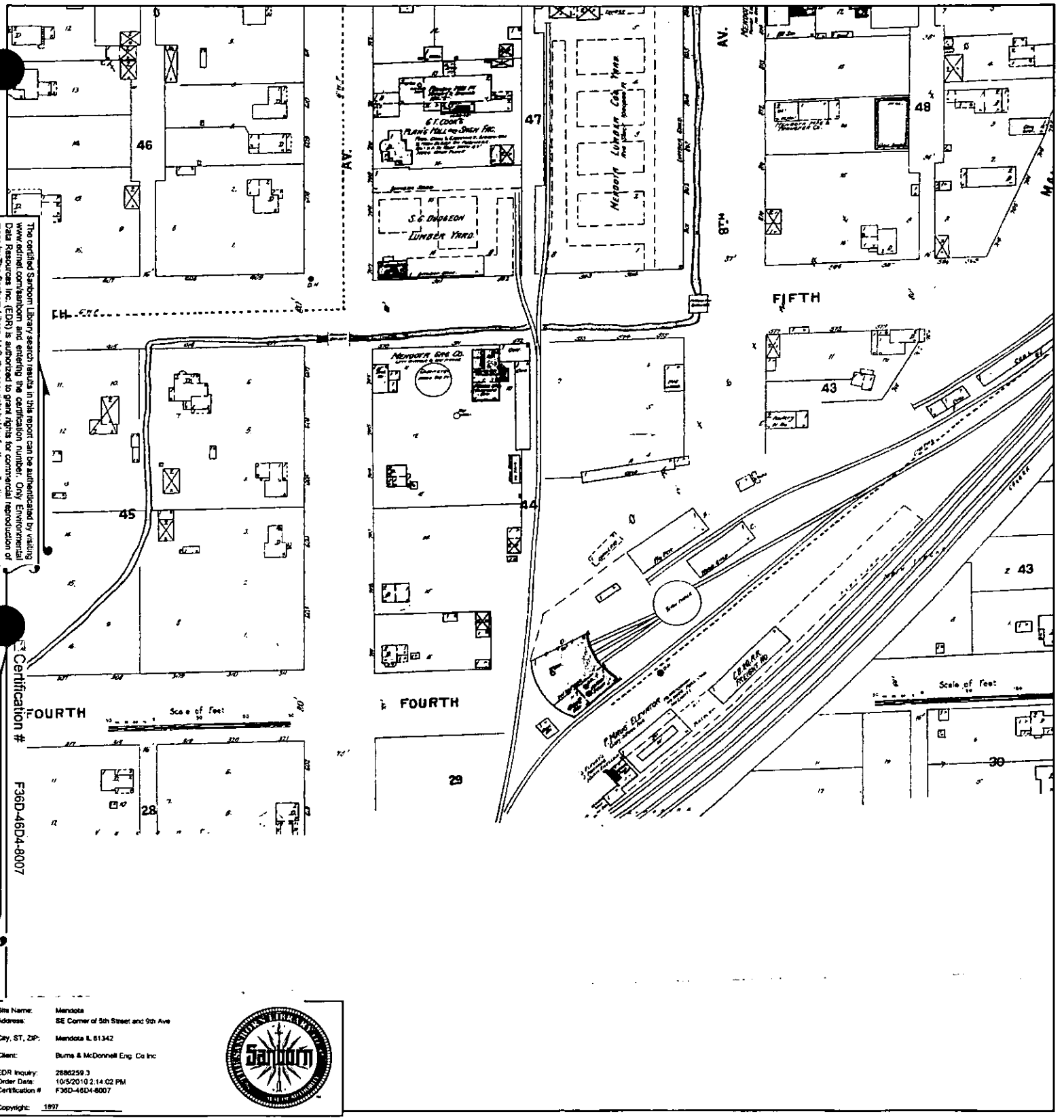
# 1897 Certified Sanborn Map






Certification # F36D-46D4-8007

| | |
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| Site Name: | Mendota |
| Address: | SE Corner of 5th Street and 9th Ave |
| City, ST, ZIP: | Mendota IL 61342 |
| Client: | Burns & McDonnell Eng. Co Inc |
| EDR Inquiry: | 2886259.3 |
| Order Date: | 10/5/2010 2:14:02 PM |
| Certification # | F36D-46D4-8007 |
| Copyright: | 1897 |

This Certified Sanborn Map combines the following sheets.
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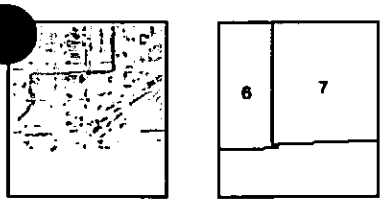


Volume 1, Sheet 6
Volume 1, Sheet 7

0 Feet 150 300 600

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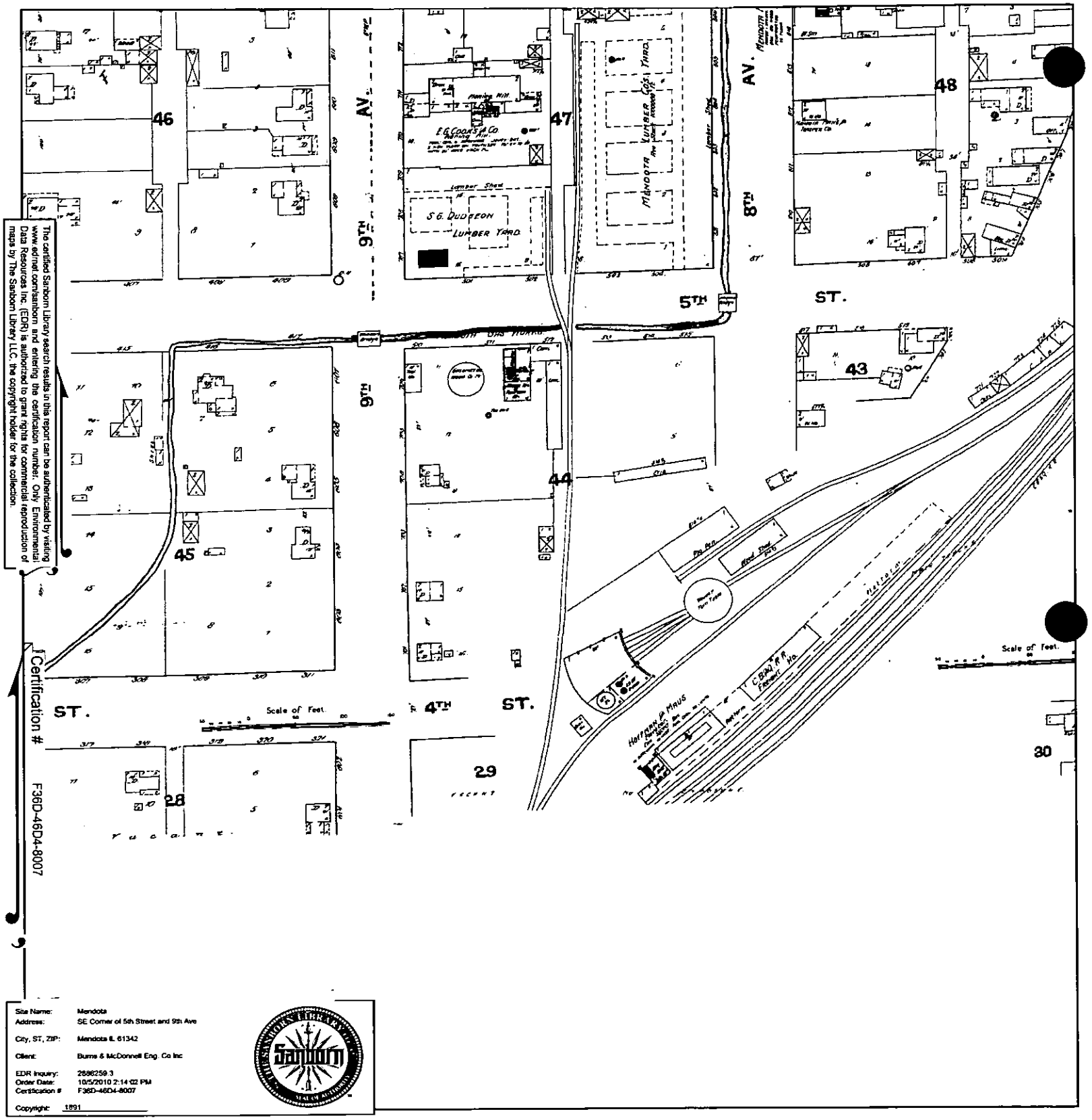




Certification # F36D-46D4-8007

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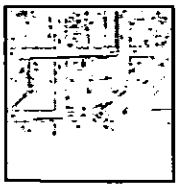

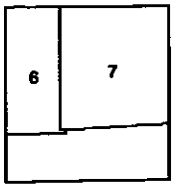


Volume 1, Sheet 6
Volume 1, Sheet 7

0 Feet 150 300 600

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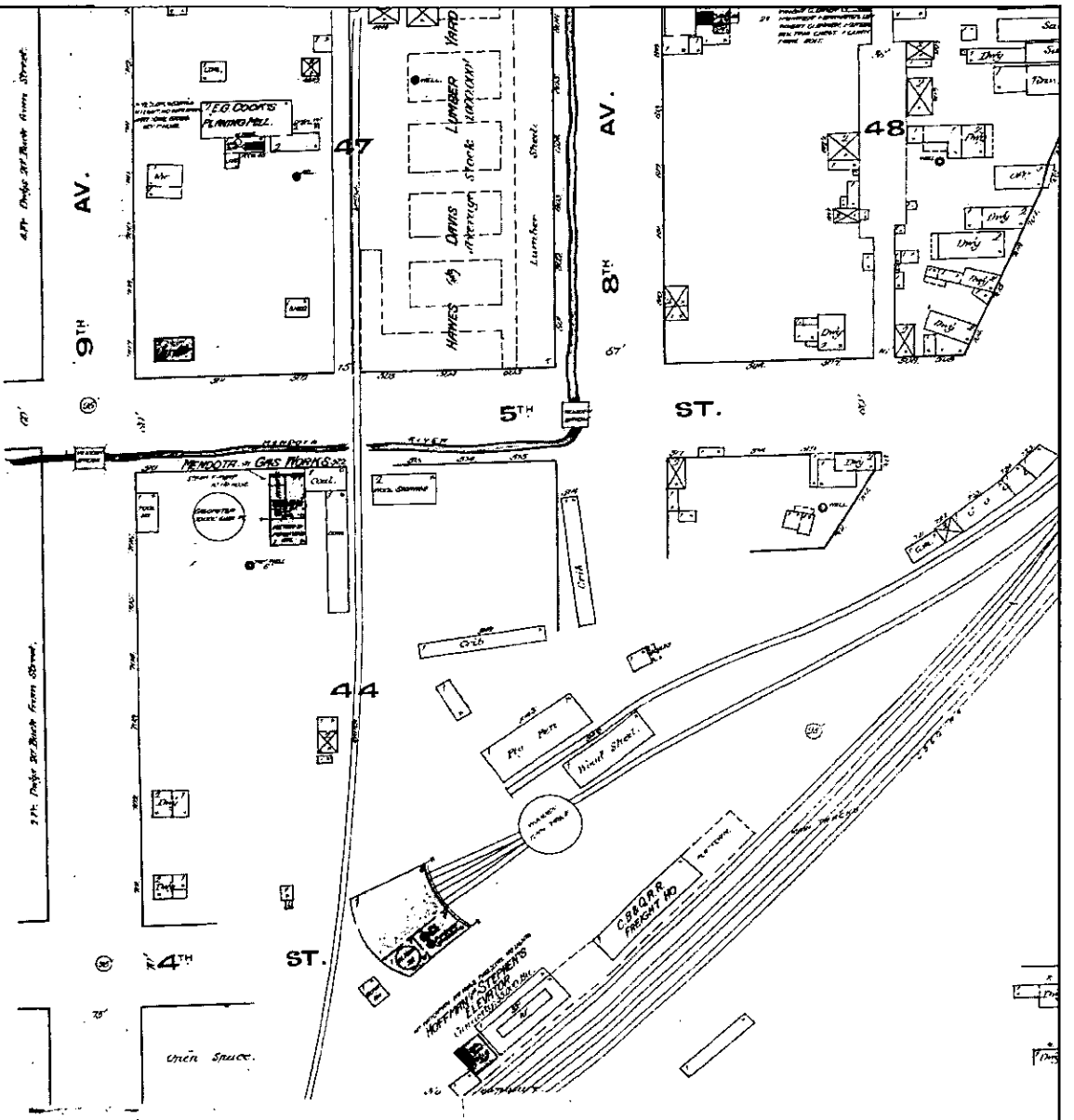




Certification # F36D-46D4-8007

Site Name: Mendota
Address: SE Corner of 5th Street and 9th Ave
City, ST, ZIP: Mendota IL 61342
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EDR Inquiry: 2886259.3
Order Date: 10/5/2010 2:14:02 PM
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This Certified Sanborn Map combines the following sheets.
Outlined areas indicate map sheets within the collection.

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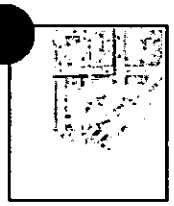

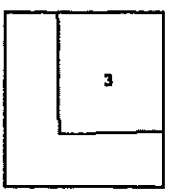


Volume 1, Sheet 3

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**APPENDIX B**
**Well Survey Documentation**
**Black Brothers Company Site**

FILE NO. L 0990555005

EXEMPT DOCUMENT NO. 001

**THE AGENCY HAS DETERMINED THIS DOCUMENT IS EXEMPT FROM PUBLIC DISCLOSURE**

# EXEMPT

# DOCUMENT

FILE CATEGORY 31A/SRTCN

DOCUMENT DATE 4/17/12

**APPENDIX C**
**Quality Assurance Project Plan**
**Black Brothers Company Site**

# Black Brothers Company Site
# Quality Assurance Project Plan

**Prepared July 2011**

## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| ASTM | American Society for Testing and Materials |
| BMcD | Burns & McDonnell |
| DMW | deep monitoring well |
| DQOs | data quality objectives |
| HDPE | high-density polyethylene |
| Illinois EPA | Illinois Environmental Protection Agency |
| MDL | method detection limit |
| MGP | manufactured gas plant |
| MS/MSD | matrix spike/matrix spike duplicate |
| NELAC | National Environmental Laboratory Accreditation Certified |
| PQL | practical quantitation limit |
| QA | quality assurance |
| QAPP | quality assurance project plan |
| QC | quality control |
| RPD | relative percent difference |
| SB | soil boring |
| SD | sediment |
| SI | site investigation |
| SMW | shallow monitoring well |
| SP | soil probe |
| SR | source material |
| SRP | Site Remediation Program |
| SS | surface soil |
| SW | surface water |
| TP | test pit |

# TABLE OF CONTENTS

## TABLE OF CONTENTS (Continued)



## Table

# 1.0 INTRODUCTION

This quality assurance project plan (QAPP) establishes consistent field and laboratory procedures and methods for environmental investigations at Nicor Gas manufactured gas plant (MGP) sites. This plan will be used in conjunction with the site investigation (SI) work plan(s) for each MGP site.

The QAPP has 15 sections:

- **Section 1.0–Introduction**
  This section presents the purpose and organization of the QAPP.
- **Section 2.0–Project Description and Objectives**
  This section outlines data quality and overall objectives of the project and identifies sections in the work plan where additional project specific information can be found.
- **Section 3.0–Project Organization and Responsibility**
  This section defines the roles and responsibilities of the Burns & McDonnell (BMcD) project manager, project engineer/review team leader and site manager.
- **Section 4.0–Quality Assurance Objectives for Measurement Data**
  This section presents the level of quality control (QC) that will be adhered to; analytical detection limits; and precision, accuracy, representativeness, completeness and comparability criteria and objectives.
- **Section 5.0–Sampling and Decontamination Procedures**
  This section presents decontamination procedures and identifies section(s) in the site-specific SI work plan that further describe decontamination and sampling procedures.
- **Section 6.0–Sample Custody**
  This section presents sample documentation and custody procedures.
- **Section 7.0–Calibration Procedures and Frequency**
  This section presents procedures for maintaining the accuracy of instruments and measuring equipment used to perform field measurement and laboratory analyses.
- **Section 8.0–Sample Transport and Analytical Procedures**
  This section discusses sample transport and laboratory analytical procedures.
- **Section 9.0–Internal Quality Control Checks**
  This section presents procedures that will be followed to ensure that QC samples and field QC procedures are performed in accordance with this QAPP.
- **Section 10.0–Data Reduction, Validation and Reporting**
  This section presents data reduction and validation procedures.
- **Section 11.0–Performance and System Audits**
  This section describes auditing procedures that will be done to ensure adherence to field and laboratory procedures.
- **Section 12.0–Preventative Maintenance Procedures**
  This section defines procedures that will be followed by field and laboratory personnel to maintain equipment and instruments in proper working condition.

- **Section 13.0–Procedures to Assess Data Precision, Accuracy and Completeness**
  This section discusses procedures that will be used to assess compliance with precision, accuracy and completeness criteria.
- **Section 14.0–Corrective Actions**
  This section defines corrective actions to be implemented if QC procedures are not met.
- **Section 15.0–Quality Assurance Report**
  This section details quality assurance (QA) reporting procedures.

* * * * *

# 2.0 PROJECT DESCRIPTION AND OBJECTIVES

## 2.1 PROJECT OBJECTIVES

Section 1.1 of each site-specific work plan presents project objectives for MGP site investigation activities.

## 2.2 DATA QUALITY OBJECTIVES

Section 4.0 of each site-specific SI work plan presents data quality objectives (DQO) to be used for field and laboratory operations to ensure that all data is scientifically valid. DQOs specify the analytical data quality required for SI. DQOs used for MGP SIs will be consistent with established analytical DQOs that address various data uses, methods of analysis and QA/QC efforts required.

- All field sampling activities relative to sample collection, documentation, preparation labeling, storage, shipment and security, quality assurance and quality control, acceptance criteria, corrective action, and decontamination procedures shall be conducted in accordance with "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846), Vol. One, Ch. One (Quality Control) and Vol. Two (Field Manual), incorporated by reference in the Illinois Site Remediation Program (SRP) at 35 Illinois Administrative Code (IAC) 740 at section 740.125. If approved, such activities also may be conducted in accordance with American Society for Testing and Materials (ASTM) standards, methods identified OSWER Directive 9355.0-14, December 1987), "Subsurface Characterization and Monitoring Techniques: A Desk Reference Guide, Volume I: Solids and Ground Water, Appendices A and B" (EPA/625/R-93/003a, May 1993), "Subsurface Characterization and Monitoring Techniques: A Desk Reference Guide, Volume II: The Vadose Zone, Field Screening and Analytical Methods, Appendices C and D" (EPA/625/R-93/003b, May 1993), incorporated by reference at Section 740.125 of Title 35, or other procedures.

- All field measurement activities relative to equipment and instrument operation, calibration and maintenance, corrective action, and data handling shall be conducted in accordance with "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846), Vol. One, Ch. One (Quality Control), incorporated by reference at Section 740.125 of Title 35, or with an equipment or instrument manufacturer's or vendor's published standard operating procedures.

- All laboratory quantitative analysis of samples to determine concentrations of regulated substances or pesticides shall be conducted fully in accordance with "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846), incorporated by reference at Section 740.125 of Title 35, relative to all facilities, equipment and instrumentation, operating procedures, sample management, test methods, equipment calibration and maintenance, quality assurance and quality control, corrective action, data reduction and validation, reporting, and records management. The practical quantitation limit (PQL) of the test methods selected must be less than or equal to the most protective soil remediation objectives in the Tiered Approach

to Corrective Action Objectives (TACO) at 35 IAC 742 Appendix B, applicable groundwater remediation objectives under 35 IAC 742 Appendix B, or, if already determined, the remediation objective concentrations for the site. If a contaminant of concern is not identified in Part 742 or the remediation objectives for the site have not been determined, the PQL shall equal the lowest concentration that reliably can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions but shall not be greater than ten times the method detection limit.

- All field or laboratory measurements of samples to determine physical or geophysical characteristics shall be conducted in accordance with ASTM standards.

- All laboratory quantitative analyses of samples to determine concentrations of any regulated substances or pesticides that require more exacting detection limits or cannot be analyzed by standard methods identified in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846), incorporated by reference at Section 740.125 of Title 35, shall be conducted in accordance with analytical protocols developed in consultation with and approved by appropriate agency(s).

## 2.3 SITE BACKGROUND AND CURRENT INFORMATION

Section 2.1 of each site-specific work plan presents general MGP site background and historical information; site characteristics; existing features and climatological data; and topography, drainage, hydrology, geology and hydrogeology.

## 2.4 PREVIOUS INVESTIGATIONS

Section 2.2 of each site-specific work plan presents information on past investigations or studies performed at the MGP site.

## 2.5 INVESTIGATION ACTIVITIES AND RATIONALE

Section 3.0 of each site-specific work plan describes field investigation activities and rationale for sample collection locations. It also describes sample matrices, analytical parameters and sample frequency.

## 2.6 PROJECT SCHEDULE

Section 1.3 of each site-specific work plan provides the anticipated project schedule for the investigation of the MGP site.

* * * * *

## 3.0 PROJECT ORGANIZATION AND RESPONSIBILITY

Each site-specific investigation will include the following key Burns & McDonnell personnel: project manager, project engineer/review team leader and site manager. The project manager has the primary responsibility for ensuring project deliverables meet project objectives. The project engineer/review team leader is responsible for QA/QC activities and providing technical support, as needed. Each site will also have a site manager who will be in charge of daily field activities, coordination of field team members and subcontractor coordination. Section 1.2 of the site-specific work plan contains anticipated names and titles of the individuals who will perform these roles.

* * * * *

# 4.0 QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA

The overall QA objective is to develop and implement procedures for field sampling, laboratory analysis and information reporting that will achieve the data quality objectives described in Section 2.2 of this QAPP. This section addresses the level of quality control; analytical methods, presentation and holding times; analytical detection limits; and the accuracy, precision, completeness, representativeness and comparability of the sample data. To ensure sample analyses and laboratory QA/QC procedures are consistent with Illinois Environmental Protection Agency (EPA) protocols, laboratories performing soil and water chemical analyses will be accredited by the Illinois Environmental Laboratory Accreditation Laboratory Program (IL ELAP) as required by the SRP.

## 4.1 LEVEL OF QUALITY CONTROL

To assess the quality of the data obtained during the field investigation, rinsate blanks, trip blanks, field duplicates and matrix spike/matrix spike duplicate (MS/MSD) samples will be collected and analyzed. Rinsate and trip blanks, made with laboratory grade water or sorbent tube media used for TO-17 analysis, will be analyzed to assess field sampling activity data quality. Rinsate blanks are analyzed to verify decontamination procedure adequacy. Trip blanks are used to ensure that no volatile organic contamination is introduced into the samples as a result of sampling or shipping activities. Field duplicates are analyzed to check the precision of sampling and analytical methods. MS/MSD samples are analyzed to evaluate the effect of the sample matrix on compound or analyte recovery. Table 4-1 presents the frequency of QA/QC collection. Site-specific work plans will discuss additional or alterations to the QC samples presented in Table 4-1.

**Table 4-1**
**Quality Control Sample Frequency**

| QC Sample | Matrix | Frequency |
|---|---|---|
| Field Duplicate | Water and Soil Gas | 1 per 10 or fewer samples |
| MS/MSD | Soil and Water | 1 per 20 or fewer samples |
| Rinsate Blank | Water | 1 per 20 or fewer samples for each major piece of equipment used during sampling* |
| Trip Blank | Water and Sorbent Tube for TO-17 analysis | 1 per cooler containing volatile sample(s) |

* Major pieces of equipment include monitoring well bailers, split spoon sampler, mixing bowl/spoon, drilling equipment (e.g., auger flight), etc.

## 4.2 ANALYTICAL METHODS, PRESERVATION AND HOLDING TIMES

The analytical methods that will be used to determine chemical concentrations are presented in each site-specific work plan. The methods used will be consistent with acceptable methods listed in the Illinois EPA Site Remediation Program, primarily with "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846). Preservation requirements and holding times will as specified for SW-846 or other analytical methods used.

## 4.3 DETECTION LIMITS

Detection limits for selected analytical methods will be consistent with the guidelines established in the Illinois EPA SRP. (See Section 2.2)

## 4.4 ACCURACY AND PRECISION

Accuracy and precision measure the reproducibility of analytical results and the bias of the measurement method. Overall, accuracy and precision of analytical data are affected by field sampling and laboratory techniques. Data accuracy and precision will be monitored through the collection and analysis of duplicate, MS/MSD, rinsate and trip blank samples; and the analysis of laboratory quality control (QC) samples including surrogates (organic compounds only), laboratory control samples (LCS) and laboratory control sample duplicates (LCSD).

Accuracy is the ability of a measurement to match an accepted reference value. This is typically measured as percent recovery (% R). Laboratory surrogates are used to measure accuracy of the method for recovering specific organic compounds and LCS are used to measure accuracy of the instrument to detect the analytes (organic and inorganic analytes). Percent recoveries of surrogates and LCS are calculated using Equation 4.1.

$$\%R = \frac{Q_d}{Q_a} x\ 100 \qquad Equation\ 4\text{-}1$$

Where: $Q_d$ = Quantity determined by analysis
$Q_a$ = Quantity added to sample/blank.

Accuracy of laboratory results also will be assessed by evaluating MS/MSD % R, which will be calculated using Equation 4-2.

$$\%R = \frac{A - B}{C} x\ 100 \qquad Equation\ 4\text{-}2$$

Where: A = Concentration of spiked sample.
B = Concentration of unspiked sample.
C = Amount of spike added.

Evaluating rinsate blanks and trip blanks prepared in the field, as well as laboratory method and

reagent/preparation blanks, assists in the assessment of accuracy and precision by measuring the presence of any compounds/analytes due to field or laboratory contamination that might bias the sample results.

Precision is the ability of a measurement to be consistently reproduced. This is typically measured as a relative percent difference (RPD) in recovery for a pair of samples. Field duplicates, MS/MSD or LCS/LCSD pairs are used to measure precision. RPD is calculated using Equation 4-3.

$$\%\ RPD = \frac{S - D}{(S + D)/2} \times 100 \qquad Equation\ 4 - 3$$

Where: S = First sample value (original or MS value).
D = Second sample value (duplicate or MSD value).

The laboratory establishes statistically-valid acceptance criteria for % R and RPD for the methods used to analyze the samples. The acceptance criterion is a range of values for % R or an upper limit value for RPD. When QC sample results are within acceptance criteria, associated primary sample results are valid without bias. QC sample results that fall marginally outside the acceptance criteria may indicate that a bias is present in the primary sample results and data will be considered valid with bias. (Bias may be high or low depending on QC sample results.) QC sample results that fall grossly outside the acceptance may indicate a problem with the sample or the analytical procedure that causes the data to be considered invalid. Laboratory data will be validated in accordance with the procedures presented in Section 10.0 of this QAPP. Results of the accuracy and precision evaluation will be documented in a data validation memorandum.

## 4.5 COMPLETENESS, REPRESENTATIVENESS, COMPARABILITY AND SENSITIVITY

### 4.5.1 Completeness

Completeness measures the amount of valid data obtained compared to the amount expected to be obtained under normal conditions. A goal of 90 percent (%) completeness is anticipated for this environmental investigation. The percent completeness will be calculated using Equation 4-3.

$$Completeness\ (\%) = \frac{Valid\ data\ obtained}{Total\ data\ set} \times 100 \qquad Equation\ 4 - 3$$

### 4.5.2 Representativeness

Representativeness is the degree to which data accurately and precisely represent site conditions. The determination of the data representativeness will be performed in the following manner:

- Compare actual sampling procedures to those delineated in the site-specific work plan and QAPP.
- Verify that analytical procedures and sample holding times are consistent with the methodologies specified in this QAPP.
- Compare analytical results of field duplicates to determine the spread in analytical results.
- Examine the results of QC blanks for evidence of contamination; contamination may cause

invalidation or qualification of affected samples.

Results of the representativeness analysis will be documented in a data validation memorandum.

### 4.5.3 Comparability

Comparability expresses the confidence with which one analytical data set may be compared with another. Comparability is maintained by being aware of previous analytical work and through the use of standard analytical methods and units. Available analytical results from previous studies will be compared with data generated during this investigation. Comparability will be achieved through adherence to procedures specified in this QAPP.

### 4.5.4 Sensitivity

Sensitivity or method detection limit (MDL) is the minimum amount of a substance that can be measured with a 99% confidence that the amount is greater than zero using a specific measurement system. The MDL should be achievable all instruments that are to be used in routine performance of the test method. The MDL must be verified, and the MDL records shall be retained as part of the laboratory's quality records for the same required period as analytical data

* * * * *

# 5.0 SAMPLING AND DECONTAMINATION PROCEDURES

## 5.1 SAMPLING PROCEDURES

Section 5.0 of each site-specific work plan presents sampling procedures.

## 5.2 DECONTAMINATION PROCEDURES

### 5.2.1 Drilling Equipment

Procedures for equipment decontamination will be implemented to avoid cross-contamination of subsurface strata and various media sampled. The drill rig and all drilling and sampling tools will be thoroughly cleaned and decontaminated before initial use.

Initial decontamination will be performed in two separate phases. The first phase will be performed before moving equipment to the site. In this phase, equipment required to perform drilling and sampling will be thoroughly cleaned. Any encrusted soil, mud or organic matter adhering to the equipment will be removed using a high-pressure potable water wash. Equipment and materials subjected to this decontamination phase will include, but not be limited to, the drill rig, pumps, drill rods, augers, drill bits, threads, steel casing, sampling equipment and other tools and materials required to complete soil borings and monitoring wells. All drill rig, drilling and sampling tools brought to the site by the driller will be inspected by the BMcD field personnel for cleanliness prior to commencement of drilling activities.

The second phase of initial decontamination will be performed onsite at a location where spread of contamination before and during field activities can be controlled. The area will be made into a decontamination pad consisting of a sturdy base, lined with plastic sheeting of high-density polyethylene (HDPE). The decontamination pad will have four raised sides and a sump for collection of fluids. All decontamination pad wastewater and any potentially contaminated materials remaining on the pad after the decontamination process is performed will be managed as specified in each site-specific work plan.

The second phase of initial decontamination for sampling equipment includes the following steps:

- Wash with laboratory detergent and potable water.
- Rinse with potable water.
- Rinse with reagent grade ethanol or isopropanol if grease or oil is observed.
- Rinse with distilled water.
- Air dry.
- Wrap in aluminum foil, if necessary, to prevent contamination before use.

The second phase of initial decontamination for drilling equipment consists of the following steps:

- Wash with a high-pressure steam cleaner using laboratory detergent and potable water.
- Rinse with high-pressure steam cleaner using potable water.
- Rinse with reagent grade ethanol or isopropanol, if necessary to remove grease or oil.

- Air dry.
- Rinse with potable water.

Decontamination of drilling equipment between borings and monitoring wells (i.e., intermediate decontamination) will include augers, drill rods, drill bits and all other tools and equipment considered contaminated. The procedure used during the second phase of initial decontamination for drilling equipment will be used during intermediate decontamination.

Intermediate decontamination of sampling equipment will be required between sampling attempts, as well as between different boring locations. Intermediate decontamination procedures for sampling equipment are the same as those outlined for the second phase of initial decontamination.

Because tar contamination may be encountered, a more intense procedure may be required to perform intermediate decontamination of drilling and sampling tools and equipment. The following decontamination procedure will be used for drilling equipment that cannot be decontaminated using the standard procedure:

- Remove soil with high-pressure steam cleaner using potable water.
- Wash with Stoddard solvent, or equivalent, to remove tar.
- Wash with a high-pressure steam cleaner using laboratory detergent and potable water.
- Rinse with high-pressure steam cleaner using potable water.

The following decontamination procedure will be used for sampling equipment that cannot be decontaminated using the standard procedure:

- Remove soil with high-pressure steam cleaner using potable water.
- Wash with Stoddard solvent, or equivalent, to remove tar.
- Wash with high-pressure steam cleaner using laboratory detergent and potable water.
- Rinse with high-pressure steam cleaner using potable water.
- Rinse with reagent grade ethanol or isopropanol.
- Rinse with distilled water.

To prevent the movement of contaminants into off-site areas, final decontamination of all equipment used to drill and sample borings and construct monitoring wells will be required before equipment demobilization from the site. Final decontamination will be performed at the decontamination pad and will be verified by BMcD field personnel. Final decontamination will include, at a minimum, the drill rig, pumps, augers, sampling equipment and any tools used during drilling. The procedures used during intermediate decontamination will be used during final decontamination.

### 5.2.2 Sampling Equipment and Monitoring Well Materials

Sampling equipment and monitoring well materials including stainless steel riser pipe, screen, bailers and soil sampling equipment will be decontaminated before installation or use by steam cleaning followed by a distilled water rinse. No solvent rinse will be used to decontaminate the riser pipe, screen or bailers.

The pH meter probe, specific conductance probe and thermometer used for field measurements will be rinsed with ethanol or isopropanol, if necessary to remove visible oil or grease and washed with distilled water after each use.

Field measurement permeability equipment (i.e., slug bombs) will be decontaminated before, between and at the completion of usage. The decontamination procedure to be implemented will consist of the following:

- Wash with laboratory detergent and potable water.
- Rinse with potable water.
- Rinse with reagent grade ethanol or isopropanol.
- Rinse with distilled water.

Field measurement permeability equipment will not be used in wells known to be oily or in a condition that would make decontamination of the equipment difficult.

* * * * *

# 6.0 SAMPLE CUSTODY

Each sample or field measurement must be properly documented to identify, track and monitor them from the point of collection through final data reporting. Proper sample documentation and custody procedures help ensure data are accurate and usable. This section discusses the following areas of field investigation documentation: field logbook, photographs, sample numbering system, sample documentation and custody, corrections to documentation, document control and project files.

## 6.1 FIELD RECORDS

Information pertinent to a field survey or sampling event will be recorded in a bound field logbook with consecutively numbered pages or on site-specific field log forms. Entries in logbooks and on sample documentation forms will be made in waterproof ink. Corrections will consist of single line-out deletions that are initialed and dated. Entries will include the following, as applicable:

- Name and title of author, date and time of entry and physical/environmental conditions during field activity;
- Names and addresses of field contacts;
- Names and responsibilities of field crew members;
- Names and titles of site visitors;
- Location, description and log of photographs of sampling points, as needed;
- References for maps and photographs of sampling site.
- Information concerning sampling changes, scheduling modifications and change orders;
- Information concerning drilling decisions;
- Details of sampling location (sketches of sampling locations may be appropriate);
- Date and time of sample collection;
- Field observations;
- Field measurements (pH, specific conductance, temperature, depth to water and measuring point);
- Calibration and maintenance information concerning field analytical and monitoring equipment;
- Sample identification number(s);
- Information from reagent container labels (laboratory grade water used for blanks);
- Sample distribution and transportation (e.g., name of laboratory and overnight delivery service);
- Sample documentation, such as chain-of-custody form numbers and shipment airbill numbers;
- Decontamination procedures;
- Documentation for investigation-derived wastes, such as contents and approximate waste volume in each drum, number of drums generated and type and predicted level of contamination.
- Summary of daily tasks;
- Documentation for cost or scope of work changes required by field conditions; and
- Signature of personnel responsible for observations and date.

Sampling situations vary widely; therefore, the exact information that must be entered in the logbook and field log forms will vary from site to site. However, the logbook and field log forms should contain enough information to allow anyone to reconstruct the sampling activity without relying on the collector's memory. During the investigation activities, field records will be kept in the possession of a BMcD field team member or in a secure place on-site. Following the investigation, field records will become part of the final project file.

## 6.2 PHOTOGRAPHS

Digital photographs will be downloaded from the camera each day or as soon after the sampling event as reasonably possible to the field office computer or BMcD office computer. Photograph file names will provide enough information to identify files by date and activity type.

When photographing soil samples, an informational sign will be prepared and photographed with each sample. This sign will have the site name, initials of photographer, date and a brief description of the sample photographed.

Example: Mendota (or MEN) Site
08/1/11
MEN-SB005-001
RAD

When photographing sampling locations, a nearby structure or other reference point will be included in the photograph frame to establish orientation and scale whenever possible.

## 6.3 SAMPLE NUMBERING SYSTEM

A sample numbering system will be used to identify each sample collected for chemical and physical analysis. The numbering system provides accurate sample tracking and facilitates retrieval of sample data. Sample identification numbers will be used on sample labels, chain-of-custody forms and other applicable sampling activity documentation. A list of sample identification numbers will be maintained in field records. Each sample collected will be assigned a unique sample number. Sample numbers will change when the media (soil, water, etc.) or location changes. Sample numbers will not change because different analyses are requested.

Sample identification numbers consist of three components: a three-character alpha site identification code; a four to five-character alpha-numeric sample type code; and a three-digit sample characteristic code. The following is an example of a completely numbered sample, with each component identified:

Example: MEN-SP01-001

Where: MEN–Black Brothers Company Site
SB01–soil probe location No. 1
001–primary soil sample No.1

The site identification code (e.g., MEN in the example above) will remain the same for all samples collected at the site. Section 4.0 of each site-specific work plan designates the specific site identification code.

The sample type code (SB01) will vary depending on sample type and location. The following are typical MGP alpha codes to be used in the alphanumeric sample type code:

- DMW deep monitoring well
- SB soil boring
- SD sediment
- SG soil gas
- SMW shallow monitoring well
- SP soil probe
- SS surface soil
- SR source material
- SW surface water
- TP test pit

When completing soil borings and probes, if a water sample is collected from an open boring or probe location a "W" will be attached to the end of the alpha-numeric sample type code (e.g., SB01W). Section 4.0 of each site-specific work plan defines additional or alternate sample type codes. The numerical portion of the sample type code will indicate the sample location (i.e., boring location 01, 02, 03, etc.).

The three-digit sample characteristic code (001) indicates the type of analyses (chemical, QC or physical) and the number of samples collected from each media at a specific sampling location. The first digit will be zero through two for all chemical analyses: zero (0) for primary samples, one (1) for duplicate samples and two (2) for QC samples. The first digit will be three (3) for physical analyses. The last two digits of the sample characteristic code will indicate the number of each sample collected from each medium at a specific location.

## 6.4 SAMPLE DOCUMENTATION AND CUSTODY

The following subsections describe sample documents and procedures for completing these documents for each soil, surface water, groundwater and source sample collected.

### 6.4.1 Sample Containers

Sample containers will be obtained in sealed cartons from the laboratory. Each carton will contain a cleanliness certification appropriate to the analyses to be performed on soil collected in the container. A record will be kept in the field office of sampling containers used for individual samples and the corresponding certification lots.

### 6.4.2 Sample Labels

The following information will be included on each sample label: site name, sample number, initials of sampler, sample collection date and time, analysis requested and preservatives added.

Information known before field activities (site name, sample numbers, etc.) can be preprinted on sample labels. Duplicate sample labels can be prepared when various sample aliquots must be submitted separately for individual analyses.

### 6.4.3 Chain-of-Custody Forms

A chain-of-custody form will be completed for each sample shipment. After completion of the chain-of-custody form, the original signature (top) copy will be enclosed in a plastic bag and secured to the inside of the cooler lid. A copy of the original custody form will be retained for BMcD files.

### 6.4.4 Custody Seals

Custody seals will be used to ensure the integrity of samples from the time they are relinquished to a delivery service or the laboratory by the sampling team until they are opened in the laboratory. Samples will be shipped in coolers. Each cooler will be sealed with at least two custody seals. Seals must be attached to each cooler so that it is necessary to break them to open the cooler.

### 6.4.5 Receipt for Samples Form

A receipt-for-samples form will be completed when split samples are requested. After completion of this form, the original copy, which is to be signed by both BMcD and the receiving party, will be retained for BMcD files; the bottom copy will be given to the sample recipient.

### 6.4.6 Airbill

If samples are to be shipped, an airbill will be completed for each different laboratory address to which samples are to be shipped. More than one cooler may be shipped to the same address under one airbill. A copy of the airbill will be given to the BMcD representative and will be retained for the BMcD project file. For each shipment of samples, the appropriate Federal Express Airbill numbers will be recorded on chain-of-custody forms to assist in tracking laboratory shipments.

### 6.4.7 Sample Documentation Procedures

The following itemized list will be used as a general reference for completion of sample documentation:

- Make or obtain a list of samples to be packaged and shipped that day.
- Determine number of coolers required to accommodate the day's shipment based on number of samples to be shipped, number of containers per sample and number of sample containers that will fit in each cooler.
- If samples are shipped by Federal Express, complete an airbill.
- Assign a chain-of-custody form to each cooler and determine which sample containers will be shipped in each cooler. (Note: More than one chain-of-custody form may be needed to accommodate number of samples to be shipped in one cooler).

- Determine which samples will be shipped under each chain-of-custody form. Each day that samples are shipped, record chain-of-custody form numbers and air bill numbers (if used) in field logbook. Cross-reference airbill and chain-of-custody numbers.
- Assign custody seals to each cooler and temporarily clip seals to each chain-of-custody form.
- Group all paperwork associated with each cooler with a separate clip.
- Obtain necessary field team members' full signatures or initials on appropriate paperwork.
- Package samples for shipment.

## 6.5 CORRECTIONS TO DOCUMENTATION

Original information will be recorded with waterproof ink. If an error is made on a document, corrections will be made by making a single line through the error and entering the correct information. Erroneous information should not be obliterated. Any error discovered on a document should be corrected by the person who identified the error. Corrections must be initialed and dated.

## 6.6 DOCUMENT CONTROL

The goal of document control is to ensure all documents for a group of samples will be accounted for when the project is complete. Project file audits may be scheduled. The document control audit consists of checking each document submitted for accountability. Written explanations must be made for missing documents.

## 6.7 PROJECT FILES

At the completion of the project, individual files will be assembled, organized and stored as final evidence for the project. Hard copies of analytical data will be stored with project files. In addition, all analytical data results will be submitted electronically and stored in a BMcD database.

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# 7.0 CALIBRATION PROCEDURES AND FREQUENCY

This section describes procedures for maintaining the accuracy of instruments and measuring equipment used to perform field measurements and laboratory analyses.

## 7.1 FIELD INSTRUMENTS/EQUIPMENT

Instruments and equipment used to gather, generate or measure environmental data will be calibrated daily before each use according to manufacturer's specifications. Equipment and field instruments will also be examined daily to verify proper operating conditions. The manufacturer's operating instructions and manuals for each instrument will be read and understood to ensure maintenance requirements are being observed. If the equipment or instruments were used in a previous investigation, field notes will be checked or the equipment manager will be contacted to verify that prior equipment problems were not overlooked and necessary equipment repairs have been performed.

## 7.2 LABORATORY INSTRUMENTS

Laboratory personnel will be responsible for calibration procedures and frequency of calibration for laboratory instruments. Calibration procedures and frequencies will comply with appropriate instrument specifications and laboratory standard operating procedures (SOPs).

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## 8.0 SAMPLE SHIPPING AND ANALYTICAL PROCEDURES

In general, samples collected during remedial action activities will be delivered to the laboratory within 48 hours of collection. Volatile EnCore soil samples must be sent to the lab within 24 hours to ensure preservation within the 48-hour holding time for preservation. The preferred method of transporting samples is to have the laboratory pick up samples at the site. If this is not possible, BMcD will hand deliver or ship the samples by overnight carrier (overnight priority). Laboratory pickups and sample shipment deliveries will occur daily. Burns & McDonnell will notify and coordinate weekend deliveries with the laboratory no later than 3 p.m. on the Friday preceding the weekend delivery.

The laboratory will perform sample analyses by the specified methods in accordance with its (SOP) for each method.

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# 9.0 INTERNAL QUALITY CONTROL CHECKS

## 9.1 FIELD SAMPLE COLLECTION

Section 3.0 of the site-specific work plan describes sample collection frequency, and Section 5.0 details collection procedures. The site project manager and engineer will ensure field sampling quality control by verifying that sample collection frequencies and procedures outlined in the site-specific work plan are maintained. Field duplicates, blanks and MS/MSD samples will also be collected and analyzed to check field QC procedures.

## 9.2 FIELD MEASUREMENT

Field measurement QC procedures will be checked by obtaining multiple readings and by calibrating field instruments daily according to manufacturer's specifications. Field personnel will read and understand applicable sections in manufacturer's literature and operations manuals before field instrument usage. Additionally, field personnel will be trained in proper instrument calibration and handling procedures before using field instruments.

## 9.3 LABORATORY ANALYSIS

The laboratory will follow QC procedures provided in method SOPs and its quality assurance manual (QAM).

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# 10.0 DATA REDUCTION, VALIDATION AND REPORTING

## 10.1 FIELD MEASUREMENTS AND SAMPLE COLLECTION

Field measurement and sample collection activities will be documented in a field logbook or on field data sheets. Data used in project reports will be reduced, validated (to the extent possible) and summarized consistent with other sampling data. A data validation memorandum will be produced, detailing reduction and validation procedures.

## 10.2 LABORATORY SERVICES

Data reduction includes processes that change either the form of expression, quantity of data values or number of data items. If data reduction is required, methods used for data reduction will be described in the final report.

Burns & McDonnell personnel will perform data assessment evaluations (determine whether analytical work is of acceptable quality). Analytical work will be performed in accordance with approved protocols and procedures capable of meeting DQOs specified in Section 2.2 of this QAPP. Data will be validated using United States Environmental Protection Agency (USEPA) Contract Laboratory Program (CLP) National Functional Guidelines for organic and inorganic data review. Professional judgment will be applied to validation where discrepancies exist between CLP analytical methods and USEPA SW-846 analytical methods. A data validation memorandum will be produced, detailing validation procedures and results of the validation.

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# 11.0 PERFORMANCE AND SYSTEM AUDITS

Performance and system audits of field and laboratory activities will be conducted to verify that sampling and analysis are performed in accordance with procedures established in this QAPP and the site-specific work plan. The following sections describe field and laboratory activity audits.

## 11.1 FIELD AUDITS

The project manager or project engineer/review team leader will conduct a field activity audit during field sampling activities. The audit will include examination of field sampling and field instrument operating records, verification of sample collection procedures, compliance with sample handling and packaging procedures and maintenance of QA documents (chain-of-custody forms, log books and forms, sampling tracking forms, etc.). Following the audit, a brief report will be prepared summarizing the audit results. Deviations from this QAPP or the site-specific work plan noted during the audit will be remedied immediately.

## 11.2 LABORATORY AUDITS

Once the laboratory is selected, an audit will be performed of the laboratory by Burns & McDonnell personnel prior to the start of field investigation activities. (Out-of-state laboratories may be audited by review of its QA documents and performance measurement sample results only.) The laboratory selected for soil and water analyses will also be accredited through the Illinois Environmental Laboratory Accreditation Program (IL ELAP) as required by the Illinois EPA. The laboratory selected for soil gas sampling will be accredited through the National Environmental Laboratory Accreditation Program (NELAP) for air (soil gas) analyses.

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# 12.0 PREVENTATIVE MAINTENANCE PROCEDURES

## 12.1 FIELD EQUIPMENT/INSTRUMENTS

Field equipment to be used during the investigation may include PIDs, temperature thermometers, pH meter, conductivity meter or dissolved oxygen meter. Manufacturers' specifications for preventative maintenance and calibration will be followed while using field equipment. Field instruments will be checked and calibrated before being taken to the field. Instruments will be checked and calibrated daily before use. Calibration checks will be performed periodically and documented in a field logbook or on calibration log sheets. Critical spare parts and backup equipment for field instruments will be available for delivery within one day to avoid delays in field activities.

## 12.2 LABORATORY INSTRUMENTS

Preventative maintenance of laboratory instruments is the responsibility of the laboratory. Laboratory instruments are maintained in accordance with manufacturer's specifications and requirements of the specific method employed. Maintenance is carried out on a regular, scheduled basis and is documented in laboratory instrument service logbook(s) for each instrument. Emergency repair or scheduled manufacturer's maintenance is provided under repair and maintenance contracts with factory representatives.

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# 13.0 PROCEDURES TO ASSESS DATA PRECISION, ACCURACY AND COMPLETENESS

## 13.1 FIELD MEASUREMENTS

The field team leader will assess field measurements daily. The field team leader will review field results for compliance with established QA/QC criteria specified in this QAPP and the site-specific work plan. Accuracy of field measurements will be assessed by calibrating or field checking field instruments daily and, when necessary, by performing field instrument performance checks (testing known solutions). Precision will be assessed by obtaining multiple instrument readings. Completeness will be evaluated by checking field notes to verify that appropriate measurements and frequency of measurements are performed and obtained.

## 13.2 LABORATORY MEASUREMENTS

The laboratory will conduct all analyses using quality control requirements for precision, accuracy, representativeness, and completeness as established in its method SOPs and QAM.

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# 14.0 CORRECTIVE ACTIONS

The following subsections describe corrective actions for sample collection/field measurements and laboratory analyses. Nonconformance with established QC procedures outlined in this QAPP or the site-specific work plan will be identified and corrected.

The project engineer/review team leader will be notified immediately of any nonconformance issue. The project engineer/review team leader will promptly report nonconformance to the project manager, who will discuss major problems, if any, with Nicor Gas representatives.

## 14.1 SAMPLE COLLECTION/FIELD MEASUREMENTS

Technical staff and project personnel will be responsible for reporting all nonconformance issues to the project engineer/review team leader. The project engineer/review team leader will be responsible for assessing suspected problem(s), and deciding whether the problem(s) will affect data quality. Corrective actions for field measurements may include the following measures:

- Repeat measurements.
- Check for proper adjustments for ambient conditions, such as temperature.
- Check batteries.
- Check instrument calibrations.
- Recalibrate instrument.
- Replace or repair instrument or measurement device.
- Stop work.
- Contact and consult with project manager.

The project engineer/review team leader is responsible for controlling, tracking and implementing corrective actions. The project engineer/review team leader will inform the project manager of field changes.

## 14.2 LABORATORY ANALYSES

If audits or data reviews result in detection of unacceptable data, the project manager will be responsible for developing and initiating corrective action, which may include the following measures:

- Re-analyzing soil samples if holding time criteria permit and adequate sample volumes exist.
- Re-sampling and analyzing groundwater.
- Evaluating and amending sampling and analytical procedures.
- Accepting data and acknowledging that the level of uncertainty that exists.

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## 15.0 QUALITY ASSURANCE REPORTS

Separate quality assurance reports will not be submitted. The final Black Brothers Company Site Investigation report will summarize data quality information for data collected during field activities. Memoranda that address field activity results may be submitted to Nicor Gas.

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**APPENDIX D**
**En Core Handle Soil Sampling Procedures**
**Black Brothers Company Site**

## EN CORE SOIL SAMPLING PROCEDURE

- Remove En Core sampler and cap from its re-sealable pouch and attach T-handle to sampler body. (**Note**: when dealing with soft or sandy solid, it may be necessary to retract the plunger in the sampler before sample collection.)

- Using the T-handle for leverage, push the sampler into a freshly exposed surface of soil until the sampler is full.

- Brush any soil off the sampler head and securely attach the sampler cap by pushing with a twisting motion.

- Complete the sample label and attach to the sampler body; place labeled sampler in its re-sealable pouch and seal the pouch.

- Repeat the procedure for two additional samples collected from the same soil stratum or the same area. (**Note:** this step may be eliminated or the number of samples reduced if the suspected level of VOCs is known [i.e., low or high concentration sample]. Consult method 5035 or discuss procedure with the analytical laboratory for further details.)

- Use a stainless steel spoon or similar tool to collect an additional sample from the same soil stratum or the same area. Place collected material in a 2-ounce, wide-mouth jar with no preservatives. (**Note:** this additional soil volume is for dry weight and percent moisture determination. This step is not necessary if additional soil from the sample location is collected for other parameter analyses upon which dry weight and percent moisture will be determined.)

- Immediately place samples in a cooler with ice.

- Ship En Core samples (next day priority delivery) to the contracted laboratory the day they are collected. Alternatively, arrange to have samples picked-up by the laboratory or delivered to the laboratory by field personnel within 24 hours of collection.