Buckeye Terminals, LLC

Buckeye Council Bluffs Terminal
829 Tank Farm Road, Council Bluffs, Iowa

Project Overview, Objectives, and Future Opportunities

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BP Terminal Council Bluffs, Iowa (old photo)
pipeline
National Cooperative Refinery Assoc. Terminal
3 Bay Loading Rack
Stationary Remedial Trailer
Former SVE System Shed
Former Railroad Spur Operation
Former P&T Bldg; Currently Stormwater Treatment System
Former Landfarm Area
Stormwater Lagoon
13
14
11
12
9
10
7
8
4
6
5
3
2

Brief Site History

- 1939 to Present: The site has operated as a bulk oil storage and distribution terminal.
- 1986: Environmental work commenced at the site
  - From 1986 – 1996, total of 3 consultants: James M. Montgomery Consulting, Walsh, and Handex were in engaged
  - Total of 71 Monitoring Wells and 7 Recovery Wells were installed
  - Pump & Treat system installed (operated from 1991-1997)
    - P&T Data from April 1, 1992 to October 31, 1996 indicates:
      - 8,931,200 gallons Groundwater recovered
      - 40,891 gallons LNAPL recovered

Brief Site History cont…

- 1997: Delta Consultants (Antea now) retained
- 1997 - 1999: Compliance-only monitoring activities
  - (1997) P&T system no longer effective - turned system over to terminal operations for storm and wastewater treatment
  - (1999) High-vac pilot testing conducted; pilot scale SVE system installed; pilot study ended due to overloading the terminal's Vapor Recovery Unit (could not directly discharge recovered SVE vapors to atmosphere, so vapor recovery stream was routed to terminal VRU).
- 2001 - 2008: Operation of LNAPL collection systems
  - Stationary electric trailer skimming system (Trailer #1)
  - Two mobile solar powered skimming units (Trailer #2, #3)
    - Recovered a total of 3,670 gallons LNAPL between 2001 to 2008
  - Passive skimmers, adsorbent socks, and bailing conducted on wells not served by skimming units
    - Removed 650 gallons LNAPL with passive methods between 2001 and 2008

Brief Site History cont…

- LNAPL Investigation (2003-2004)
  - LNAPL fingerprinting
  - Misé a la masse survey to determine possible extent of LNAPL plume (non-intrusive investigation)
  - Cone Penetrometer Testing / Laser Induced Fluorescence (LIF) survey to determine actual extent of LNAPL plume and soil type (intrusive investigation)
  - 3-Dimensional subsurface modeling – RockWorks 2004 – to establish visualization of LNAPL spread and lithologic data in the subsurface
  - Recoverability modeling – RETC / API – to determine effectiveness and efficiency of various types of LNAPL recovery schemes

Recent proactive LNAPL recovery efforts:

- 2019: Monthly gauging, LNAPL recovery via bailers/recovery pumps
- 2020: Focused laser-induced fluorescence (LIF) assessment to determine new recovery well placement
- 2021: Five new recovery wells (RW-100, RW-101, RW-102, RW-103, and RW-104) were installed near the loading rack and LNAPL recovery began utilizing a vacuum truck.
- 2022: Continued LNAPL recovery via vacuum truck.
- 2023: First half of 2023-continued LNAPL recovery, second half-measure LNAPL recovery/rebound to determine next steps.

LNAPL Recovery for the last 12 years:

Year	Recovery Method(s)	Recovery Volume (gal)
2011	1st attempt at vac truck	287
2012	Manual recovery	235
2013	Manual recovery	132
2014	Manual recovery	225
2015	Manual recovery	201
2016 (1)	Manual recovery	149
2017 (2)	Manual recovery	173
2018	Manual recovery	212
2019	Manual recovery	250
2020	Manual recovery	156
2021 (3)	Manual recovery	166
2022 (4)	Vac truck recovery	284

LNAPL recovery notes:

- (1) 2016: Antea petitioned IDNR for reduced sampling and gauging.
- (2) 2017: 1st year of reduced monitoring.
- (3) 2021: RW-100, RW-101, RW-102, RW-103, and RW-104 were installed, vac truck recovery started mid year.
- (4) 2022: First full year of vacuum truck recovery with new recovery wells.
- Since 2016, ~90%+ of the total volume of annual LNAPL recovery has occurred from 2 wells (RW-205 & RW-305, primarily 205) located near the loading rack.
- In the last few years, of the wells with measurable product, between 8-10 wells only contained trace amounts (<0.01').

Historical Comparison & Trends

- Isoconcentration map from 2006 and 2022
  - One from the last GWE where all the wells were sampled (NA)
    - 2006: 42 wells sampled
    - 2022: 11 wells sampled
  - See figure packet

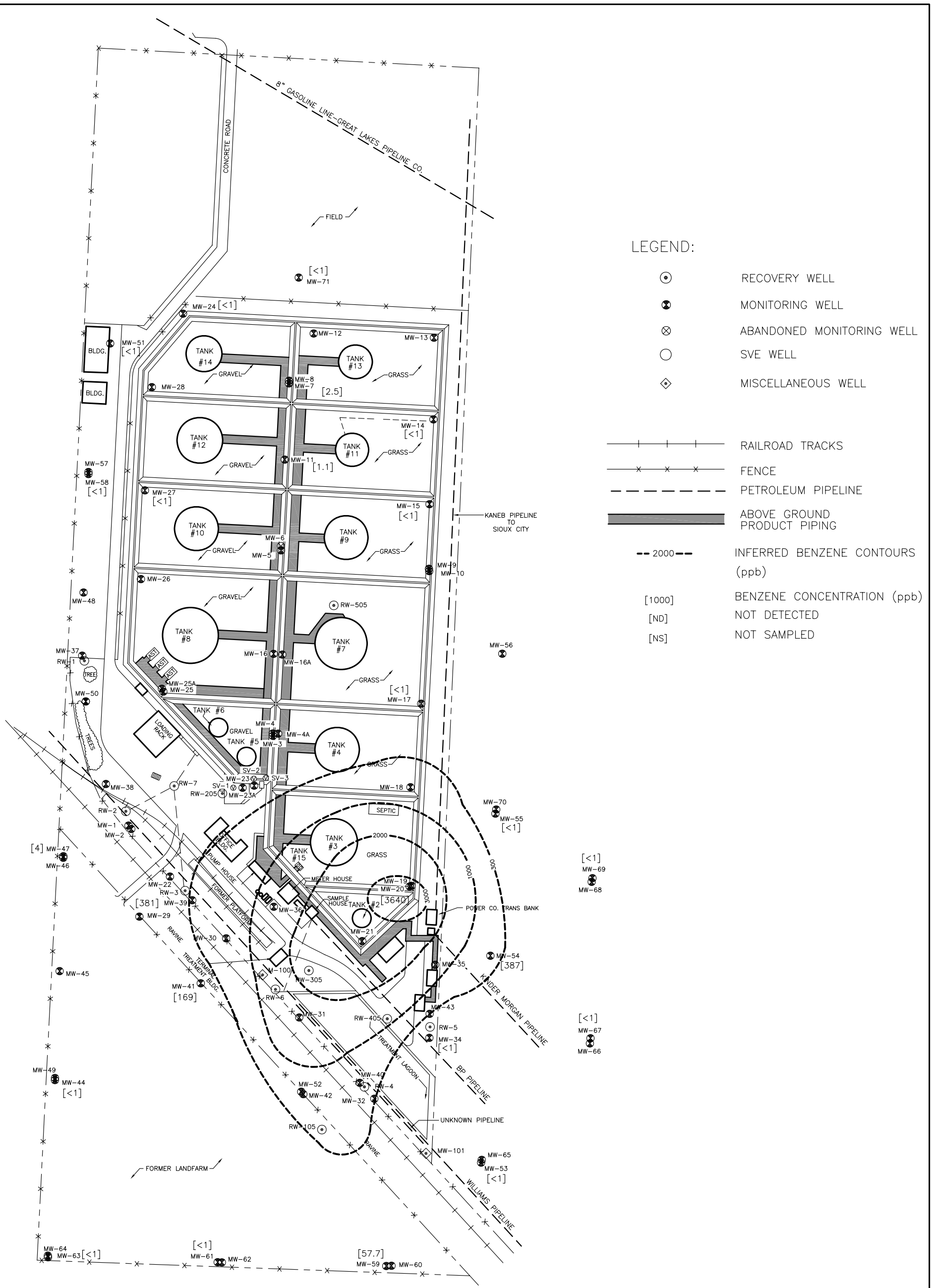
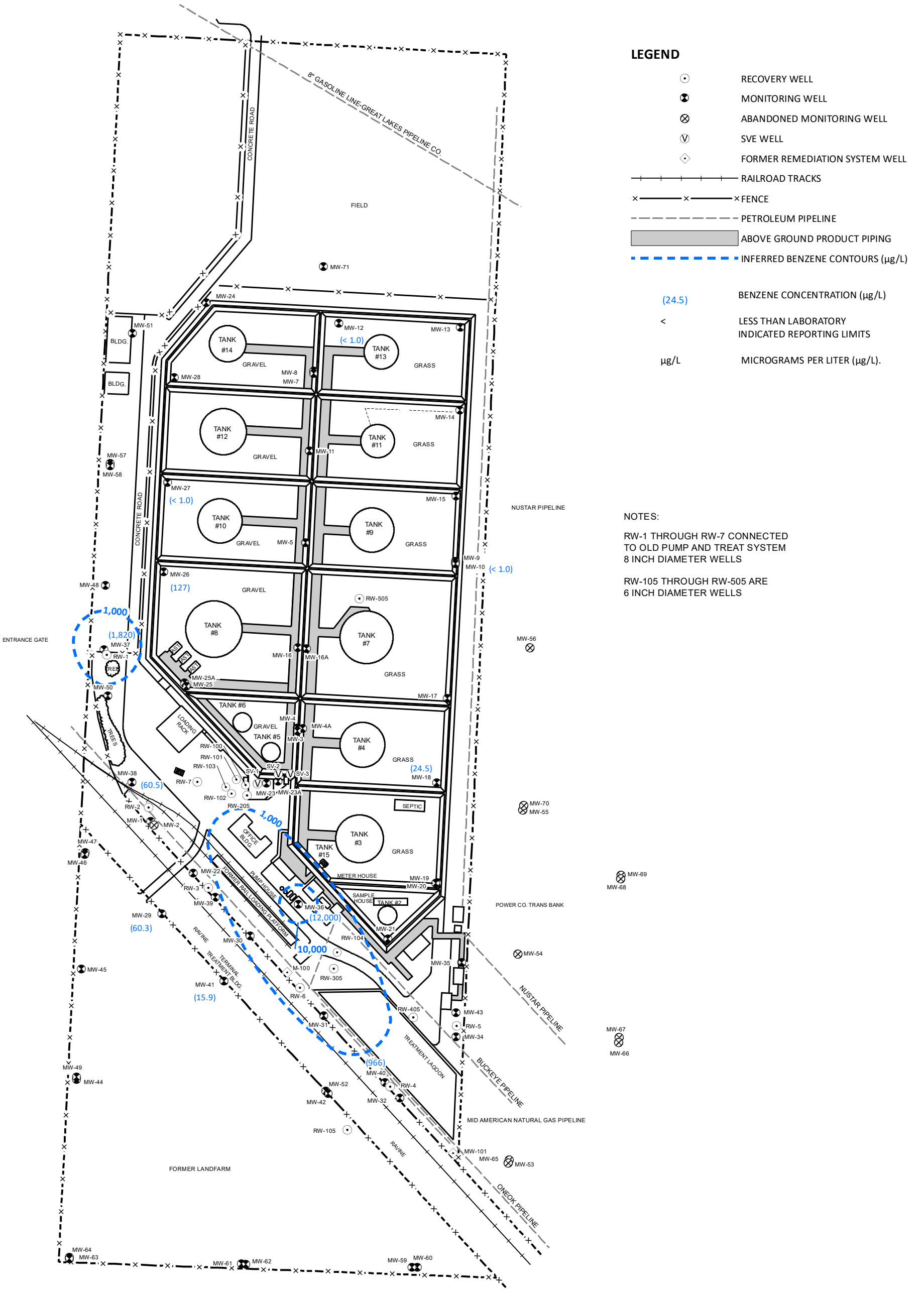


FIGURE 2
DISSOLVED PHASE BENZENE CONTOURS MAY 2006

BP AMOCO COUNCIL BLUFFS TERMINAL
829 EAST SOUTH OMAHA BRIDGE ROAD
COUNCIL BLUFFS, IOWA

PROJECT NO.	PREPARED BY	DRAWN BY
G0063	DP	DD/JH
DATE	REVIEWED BY	FILE NAME
06/05/06		AMG0-063

Delta Environmental Consultants, Inc



LEGEND

- RECOVERY WELL
- MONITORING WELL
- ABANDONED MONITORING WELL
- SVE WELL
- FORMER REMEDIATION SYSTEM WELL
- RAILROAD TRACKS
- FENCE
- PETROLEUM PIPELINE
- ABOVE GROUND PRODUCT PIPING
- INFERRED BENZENE CONTOURS (µg/L)

(24.5) BENZENE CONCENTRATION (µg/L)

< LESS THAN LABORATORY INDICATED REPORTING LIMITS

µg/L MICROGRAMS PER LITER (µg/L).

NOTES:

RW-1 THROUGH RW-7 CONNECTED TO OLD PUMP AND TREAT SYSTEM 8 INCH DIAMETER WELLS

RW-105 THROUGH RW-505 ARE 6 INCH DIAMETER WELLS

FIGURE

DISSOLVED PHASE BENZENE CONTOURS
MAY 18, 2022
BUCKEYE TERMINALS, LLC
COUNCIL BLUFFS TERMINAL
829 TANK FARM ROAD
COUNCIL BLUFFS, IOWA

PROJECT NO.	PREPARED BY	REF SCALE
BUCKCBT21	JLH	1:2,400
DATE	REVIEWED BY	MAP SCALE
7/25/2023	BF	1 INCH = 200 FEET

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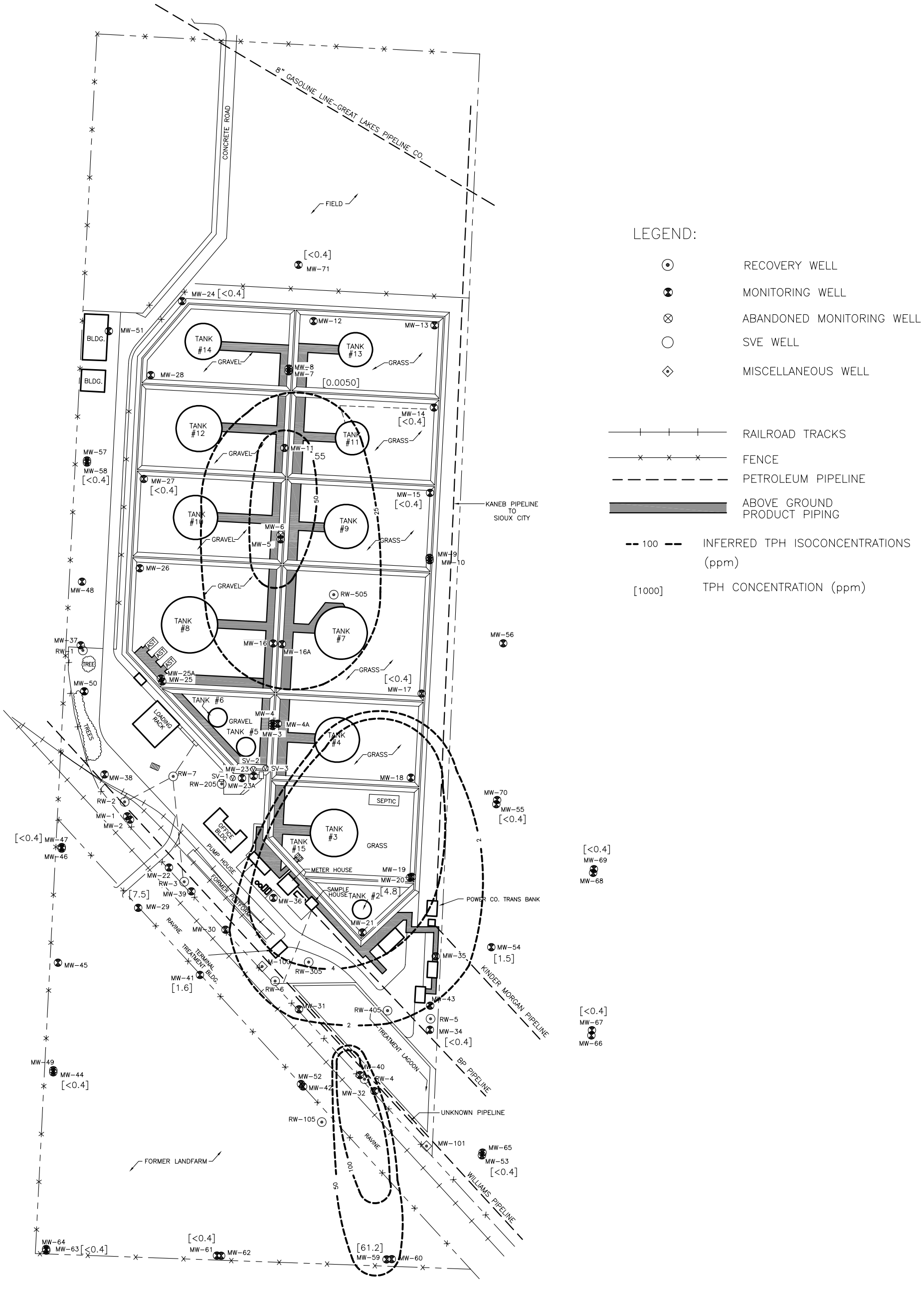
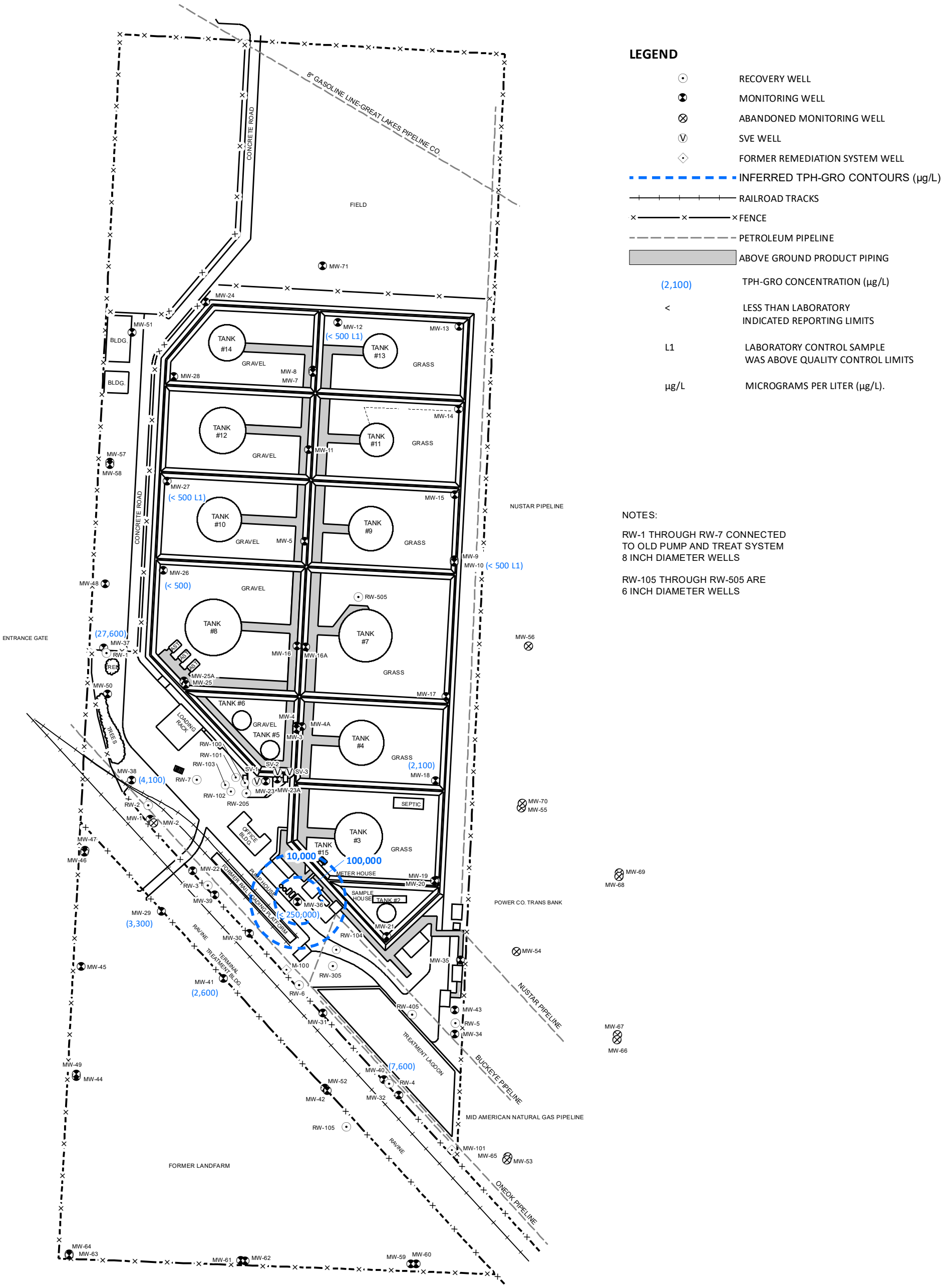


FIGURE 3
DISSOLVED PHASE TPH CONTOURS MAY 2006

BP AMOCO COUNCIL BLUFFS TERMINAL
829 EAST SOUTH OMAHA BRIDGE ROAD
COUNCIL BLUFFS, IOWA

PROJECT NO.	PREPARED BY	DRAWN BY
G0063	DP	DD/JH
DATE	REVIEWED BY	FILE NAME
06/05/06		AMG0-063

Delta Environmental Consultants, Inc



LEGEND

- RECOVERY WELL
- MONITORING WELL
- ABANDONED MONITORING WELL
- SVE WELL
- FORMER REMEDIATION SYSTEM WELL
- INFERRED TPH-GRO CONTOURS (µg/L)
- RAILROAD TRACKS
- FENCE
- PETROLEUM PIPELINE
- ABOVE GROUND PRODUCT PIPING
- (2,100) — TPH-GRO CONCENTRATION (µg/L)
- < — LESS THAN LABORATORY INDICATED REPORTING LIMITS
- L1 — LABORATORY CONTROL SAMPLE WAS ABOVE QUALITY CONTROL LIMITS
- µg/L — MICROGRAMS PER LITER (µg/L).

NOTES:

RW-1 THROUGH RW-7 CONNECTED TO OLD PUMP AND TREAT SYSTEM 8 INCH DIAMETER WELLS

RW-105 THROUGH RW-505 ARE 6 INCH DIAMETER WELLS

FIGURE

DISSOLVED PHASE TPH-GRO CONTOURS
MAY 18, 2022
BUCKEYE TERMINALS, LLC
COUNCIL BLUFFS TERMINAL
829 TANK FARM ROAD
COUNCIL BLUFFS, IOWA

PROJECT NO.	PREPARED BY	REF SCALE
BUCKCBT21	JLH	1:2,400
DATE	REVIEWED BY	MAP SCALE
7/25/2023	BF	1 INCH = 200 FEET

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Site Setting Summary

- 37+ year history of environmental remediation and monitoring
- Site has been active petroleum terminal since 1939. LNAPL and dissolved phase impacts are from historic operations.
- No residential property nearby (closest = 0.5mi to the SW).
- Boundary and perimeter wells have typically been below laboratory detection limits
- No drinking water/potable wells identified within 2500 feet of the site.
- History of ongoing LNAPL recovery – LNAPL is confined to shallow, fine grained (clay)soils within the upper twenty-five feet of site borings and wells.
  - Challenging conditions for increasing volumes of free product recovery
  - LNAPL is not migrating. LNAPL mobility beyond the wells where it is observed is limited.
  - LNAPL measurements limited to ~6 wells near the loading rack, most of the wells have limited LNAPL measured in hundredths.
- Adjacent properties also consist of petroleum terminals, highway, light agriculture, and commercial. No change in anticipated future uses.
- Site monitoring data shows steady state / stable conditions for both dissolved phase impacts and LNAPL.

Path Forward

- Not requesting regulatory closure or No Further Action letter from IDNR
- Site is not in a program with clear environmental regulatory closure endpoints or metrics
- Considerations for cessation of work due to overall stable conditions and lack of environmental receptors.
- Additional information or data requirements for IDNR?

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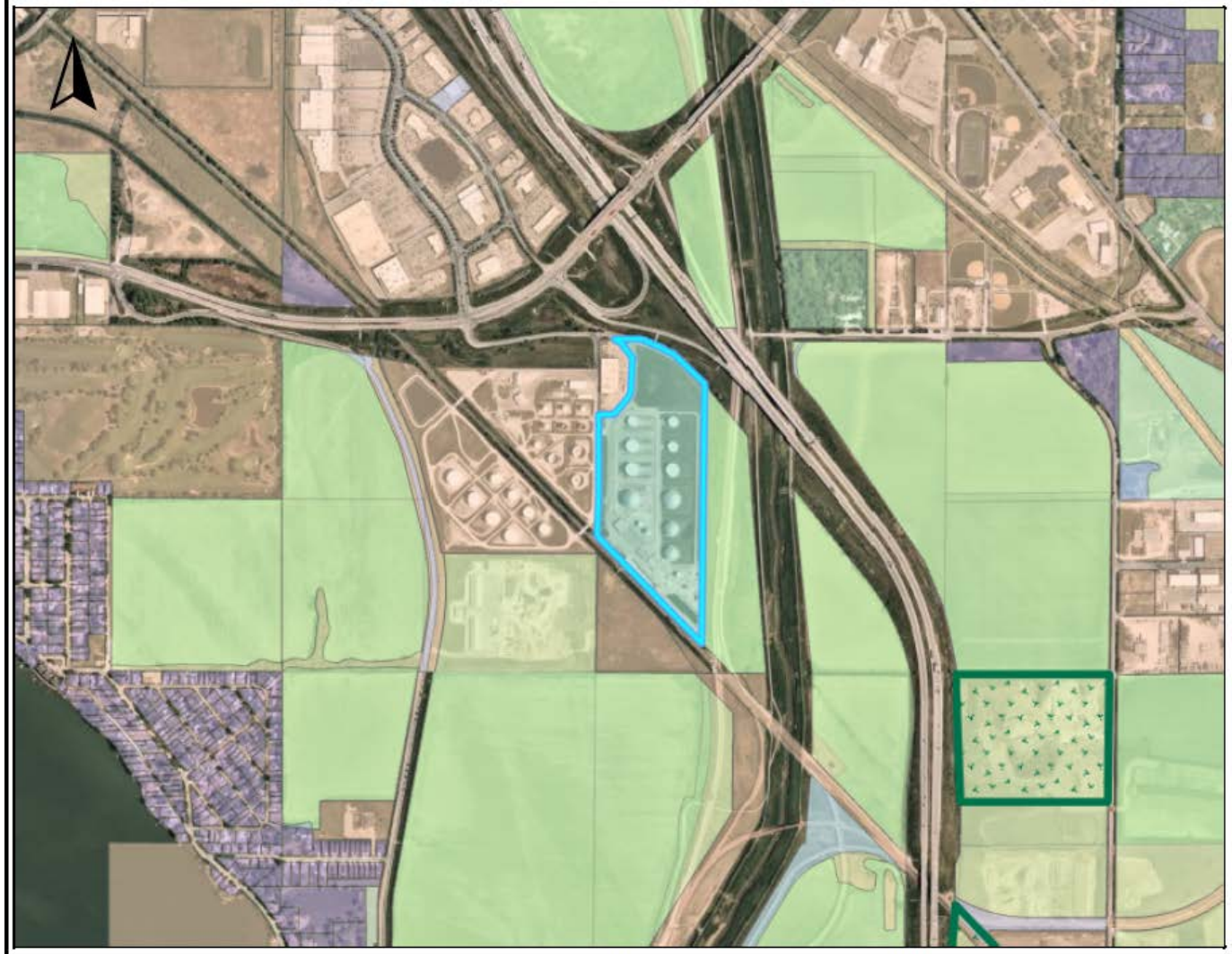
Property Boundaries



Legend

Parcel Designation

AgCatalog

Land Use

- Crop
- Non-Crop
- Non-Crop Building Site

Parcel Property Class

- A
- A, AD

Pottawattamie County GIS Dept.
223 S 6th St.
Council Bluffs, IA 51501
(712) 328-4885
gis@pottcounty-ia.gov
https://gis.pottcounty-ia.gov

7/25/2023

Pottawattamie County
Geographic Information Systems

SCALE: 17629

0 500 1000 ft

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Surrounding properties

Source: Pottawattamie County Assessor GIS Viewer

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Nearest surface water:

Mosquito Creek

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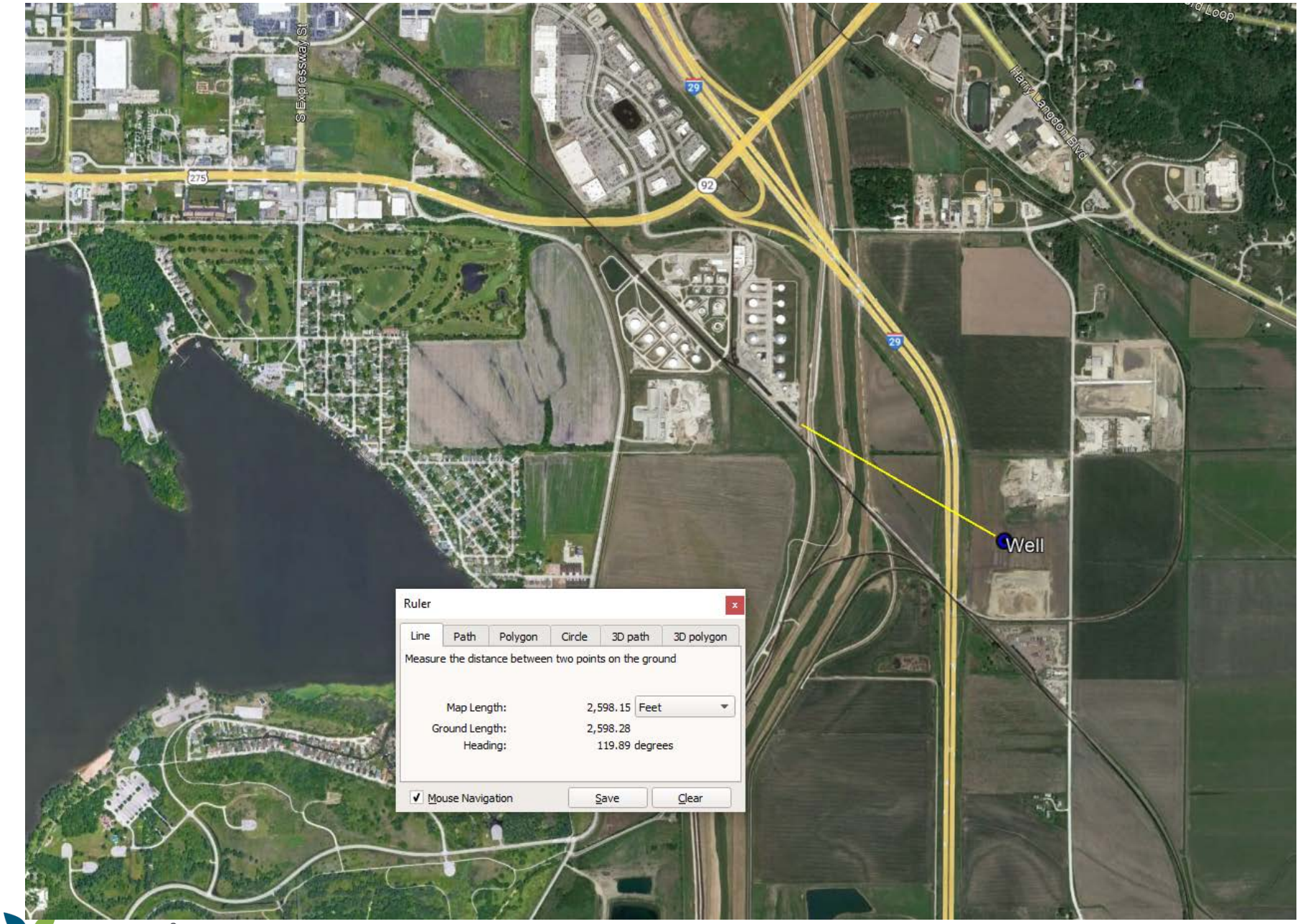

Nearest private well

TD-120’

Source: University of Iowa’s GeoSam viewer

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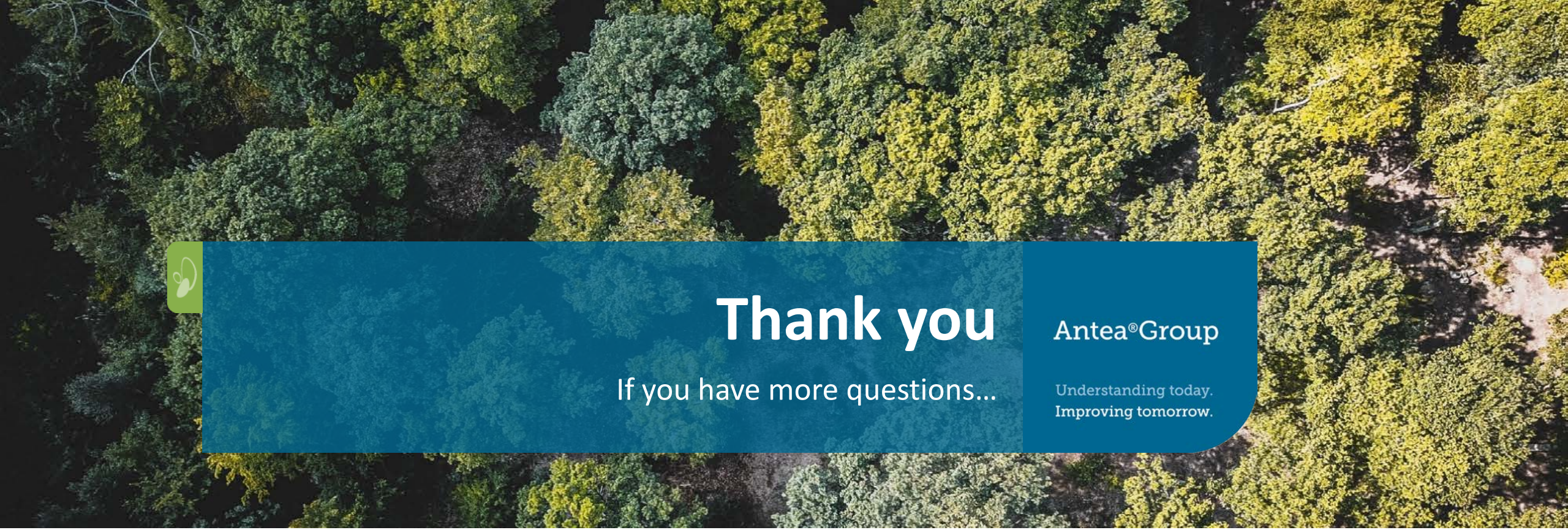

Thank you

If you have more questions…

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We do more than effectively solve client challenges; we deliver sustainable results for a better future.

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