CROWLEY | FLECK
ATTORNEYS

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June 10, 2024

Via Hand Delivery & Electronic Mail

Mr. Steve Kahl
North Dakota Public Service Commission
600 E. Boulevard, Dept. 408
Bismarck, ND 58505-0480
ndpsc@nd.gov

In re: Cerilon GTL ND Inc.
Cerilon GTL North Dakota Project
Siting Application – Williams County
Case No. PU-23-325
OAH File No. 20230374
Our File No. 201121-000004

Dear Mr. Kahl:

Enclosed for filing on behalf of Cerilon GTL ND Inc., please find eight copies of each of the following:

1) Phase II Investigation Results;
2) Facility Traffic Impact Study;
3) Technical Sound Memorandum;
4) ND Game and Fish Agency Correspondence; and
5) US Fish and Wildlife Service Agency Correspondence.

Please feel free to contact me if you have any questions. Thank you.

Sincerely,

Wade C. Mann

WCM/lh
Enc.
cc: ALJ Hope L. Hogan (via email & USPS)
John Schuh (via email)
Victor Schock (via email)
Casey Furey (via email)
Rochelle Harding (via email)
Jeff Pendrel (via email)
Erik Edison (via email)

resourceful. naturally.
engineering and environmental consultants

BARR

January 3, 2024

Rochelle Harding
Cerilon Inc.
First Canadian Centre
350 7th Avenue SW, Suite 2900
Calgary, Alberta T3H 4Y1, Canada

Re: Phase II Investigation Results – Proposed Cerilon Gas to Liquids Site

Dear Ms. Harding:

This letter summarizes the results of a subsurface investigation that was completed at the proposed Cerilon Gas to Liquids (GTL) facility located near Trenton, ND (Property; Figure 1). The goal of the subsurface investigation was to evaluate potential environmental conditions identified during a Phase I Environmental Site Assessment (ESA) and to provide a baseline characterization of the site conditions as a potential defense against future regulatory action or claims that Cerilon caused contamination as a result of its operations.

Background

Barr conducted a Phase I ESA of the proposed Cerilon GTL site in September 2022 and identified the following recognized environmental conditions (RECs) at the Property, as shown on Figure 2:

- **REC # 1** – Adjacent site, Savage Services, bulk petroleum terminal which has a documented spill history near the southwestern property boundary in potential upgradient position relative to groundwater flow.
- **REC #2** – Aune 1-36 oil and gas active production well with associated tank battery, methanol chemical storage, lack of containment, and obvious evidence of release to ground located near surface water.
- **REC #3** – Former Underground Storage Tank (UST) and Above-ground Storage Tank (AST) and hydraulic fluid storage at Oster farmstead.
- **REC #4** – Former UST and petroleum storage at Aune farmstead.

  REC #5 – Former Trenton State #1 oil well and abandoned ONEOK liquids pipeline terminus.
- **REC #6** – Adjoining site and Henry Hill Bearce #1 salt water disposal (SWD) well with spill history located near the western property boundary in upgradient position relative to groundwater flow.

A Phase II Investigation Proposal was submitted to Cerilon GTL ND Inc. on November 1, 2022. This proposal described a subsurface investigation to provide a baseline characterization of the site conditions as a potential defense against future regulatory action or claims that Cerilon caused contamination as a result of its operations. The proposed investigation included advancement of eight soil borings to a depth

of approximately 25 feet below ground surface (bgs) with continuous field screening for odor, sheen, discoloration, and documentation of organic vapor using a 10.6 eV photoionization detector (PID), and soil classification consistent with ASTM D-2488. One soil sample was proposed at each boring, with the sampling intervals dependent on field indications of impacts.

The Property is generally flat and is approximately 1,890 feet above mean sea level (MSL). Soils are classified primarily as glaciofluvial sand and silt deposits overlying the Paleocene-aged Sentinel Butte Formation. There are no predominant geological surface features, such as rock outcroppings, on the Property. Groundwater depth was anticipated to be encountered at between 10 and 20 feet bgs, based on previous investigation data on adjoining parcels.

Summary of Work

A shallow subsurface investigation was conducted on October 11 and 12, 2023. The investigation included advancement of eight soil borings with continuous soil classification and screening, collection of eight analytical soil samples, and collection of two analytical groundwater samples.

Eight soil borings were advanced by Geoprobe® direct-push technology by OneCor Services LLC, subcontracted to Barr. Barr staff were onsite during the assessment activities and provided field documentation for the work. The locations of the soil borings are shown on Figure 3.

Soils were screened in the field for odor, discoloration, and sheen and classified per ASTM 2488. Organic vapor headspace was measured with a PID equipped with a 10.6 eV lamp. At locations where groundwater was encountered, a temporary one-inch diameter PVC well was placed in the borehole with a ten-foot screen.

Generally, the soil profile consisted of alternating layers of olive-brown lean clay, fat-to-lean clay, and clayey silt. Thin lenses of poorly graded, fine sand were observed in multiple holes between 11 and 24 feet bgs. Groundwater was encountered in five boreholes at ranges from approximately eight to 24 feet bgs.

Based on field observations, there were no indications of discoloration, odor, or sheen, and organic headspace measurements were less than one part per million (ppm). As a result, the sampling intervals were from the surface to two feet bgs to evaluate potential impacts to human health from direct contact with the soil. A total of eight soil samples were collected for laboratory analysis and sent to ALS Environmental (ALS) in Holland, MI. Boring logs are provided in Attachment 1.

Groundwater was encountered in quantities for sample volume in boreholes SB-6 and SB-7. Groundwater was encountered in additional boreholes but was unable to be sampled due to low volume and slow recharge. Groundwater samples were collected at each of these boreholes for laboratory analysis and sent to ALS in Holland, MI.

Analytical Results

A total of eight soil samples were submitted for laboratory analysis of total petroleum hydrocarbons (TPH) as gasoline range organics (GRO), diesel range organics (DRO), and oil range organics (ORO), and benzene, toluene, ethyl benzene, and xylene (BTEX) to ALS Environmental, a ND-certified analytical laboratory. Analytical results were compared to the North Dakota Cleanup Criteria for UST Sites (North Dakota Department of Environmental Quality [NDDEQ] criteria), as summarized in Table 1.

TPH concentrations as GRO and DRO, along with BTEX were not detected in soil samples. TPH concentrations as ORO were detected in four soil samples (SB-1, SB-5, SB-6, SB-8) at concentrations below 15 mg/kg, which does not exceed the NDDEQ Criteria of 100 mg/kg.

A total of two groundwater samples were analyzed for VOCs, as GRO, ORO, and DRO, and BTEX. Analytical results were compared to NDDEQ Criteria and North Dakota Human Health Value Class III Standards, as summarized in Table 2. TPH as GRO, DRO, and ORO, and BTEX were not detected in either of the groundwater samples.

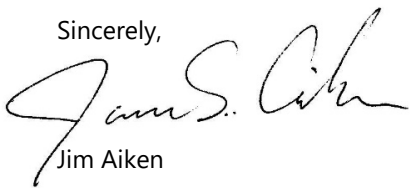
Conclusions

All soil analytical results were below the NDDEQ Criteria, with most parameters being non-detect. All groundwater analytical results were non-detect. Based on the lack of impacts observed during field screening of soil and all measured concentrations in soil and groundwater samples below NDDEQ Criteria, evidence of hydrocarbon releases in the shallow subsurface at the Property were not observed. No further investigation is recommended at this time.

Although this investigation does not provide evidence that precludes the possibility that a prior release on or near the Property may have occurred, the findings of the Phase II ESA provide documentation that Cerilon has acted on the RECs identified in the Phase I ESA and completed due diligence efforts consistent with the All Appropriate Inquiry requirements per 40 CFR §312.21.

If you have any questions, please contact me at jaiken@barr.com or 701.595.4155 or Amanda Gravseth at agravseth@barr.com or 701.221.5424.

Sincerely,



Jim Aiken

Encl. Table 1 – Soil Analytical Results
Table 2 – Groundwater Analytical Results

Figure 1 – Site Location
Figure 2 – Phase I Findings
Figure 3 – Borehole Locations

Attachment 1 – Boring Logs
Attachment 2 – ALS Analytical Lab Report

Table 1
Soil Analytical Data Summary
Phase II Investigation
Cerlion

Table 1 - Soil Analytical Results										
		Location	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6	SB-7	SB-8
		Date	10/11/2023	10/11/2023	10/11/2023	10/11/2023	10/11/2023	10/11/2023	10/12/2023	10/12/2023
		Depth	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft
Parameter	Units	North Dakota Cleanup Criteria for UST Sites - Soil								
		02/01/2021								
		No Exceedances								
General Parameters										
Moisture	%		13	22	21	25	5.5	16	13	16
Volatile Organic Compounds										
Benzene	ug/kg		< 37 UH	< 43 U	< 43 U	< 45 U	< 36 U	< 43 U	< 39 U	< 41 U
Ethyl benzene	ug/kg		< 37 UH	< 43 U	< 43 U	< 45 U	< 36 U	< 43 U	< 39 U	< 41 U
Toluene	ug/kg		< 37 UH	< 43 U	< 43 U	< 45 U	< 36 U	< 43 U	< 39 U	< 41 U
Xylene, m & p	ug/kg		< 74 UH	< 85 U	< 87 U	< 90 U	< 72 U	< 86 U	< 78 U	< 82 U
Xylene, o	ug/kg		< 37 UH	< 43 U	< 43 U	< 45 U	< 36 U	< 43 U	< 39 U	< 41 U
Xylene, total	ug/kg		< 110 UH	< 130 U	< 130 U	< 140 U	< 110 U	< 130 U	< 120 U	< 120 U
Total Petroleum Hydrocarbons										
Total Petroleum Hydrocarbons C6-C10	mg/kg	(1)	< 7.1 U	< 7.1 U	< 7.2 U	< 7.5 U	< 6 U	< 7.2 U	< 6.5 U	< 6.8 U
Total Petroleum Hydrocarbons C10-C20	mg/kg	(1)	< 11 U	< 13 U	< 12 U	< 13 U	< 10 U	< 12 U	< 11 U	< 12 U
Total Petroleum Hydrocarbons C20-C34	mg/kg	(1)	14	< 13 U	< 12 U	< 13 U	15	13	< 11 U	14
Sum of Total Petroleum Hydrocarbons (Barr Calc)	mg/kg	100	14	ND	ND	ND	15	13	ND	14

Notes:
U - The analyte was analyzed for, but was not detected.
H - The recommended sample preservation, extraction or analysis holding time was exceeded.
ND - Not detected.
(1) - Value should be included in the TPH sum and compared to the TPH criteria value.

Table 2
Groundwater Analytical Data Summary
Phase II Investigation
Cerlion

Table 2 - Groundwater Analytical Results					
			Location	**SB-6**	**SB-7**
			Date	**10/11/2023**	**10/12/2023**
Parameter	Units	North Dakota Cleanup Criteria for UST Sites - Groundwater	North Dakota Human Health Value Class III (2)		
Last Updated		02/01/2021	01/01/2019		
Exceedance Key		No Exceedances	No Exceedances		
Volatile Organic Compounds					
Benzene	ug/l	5	58 (3)	< 1.0 U	< 1.0 U
Ethyl benzene	ug/l		130 (4)	< 1.0 U	< 1.0 U
Toluene	ug/l		520	< 1.0 U	< 1.0 U
Xylene, m & p	ug/l			< 2.0 U	< 2.0 U
Xylene, o	ug/l			< 1.0 U	< 1.0 U
Xylene, total	ug/l			< 3.0 U	< 3.0 U
Total Petroleum Hydrocarbons					
Total Petroleum Hydrocarbons C10-C20	mg/l	(1)		< 0.099 U	< 0.10 UJ-
Total Petroleum Hydrocarbons C20-C40	mg/l	(1)		< 0.099 U	< 0.10 UJ-
Total Petroleum Hydrocarbons C6-C10	mg/l	(1)		< 0.2 U	< 0.2 U
Sum of Total Petroleum Hydrocarbons (Barr Calc)	mg/l	0.5		ND	ND a

Notes:

a - Estimated value, calculated using some or all values that are estimates.

U - The analyte was analyzed for, but was not detected.

J- - The result is an estimated quantity and may be biased low.

ND - Not detected.

(1) - Value should be included in the TPH sum and compared to the TPH criteria value.

(2) - Based on one route of exposure - ingestion of contaminated aquatic organisms only.

(3) - Substance classified as a carcinogen, with the value based on an incremental risk of one additional instance of cancer in one million persons.

(4) - Safe Drinking Water Act (MCL).

Data Footnotes and Qualifiers

Barr Standard Footnotes and Qualifiers

J-	The result is an estimated quantity and may be biased low.
U	The analyte was analyzed for, but was not detected.
UH	The recommended sample preservation, extraction or analysis holding time was exceeded.

North Dakota Cleanup Criteria for UST Sites

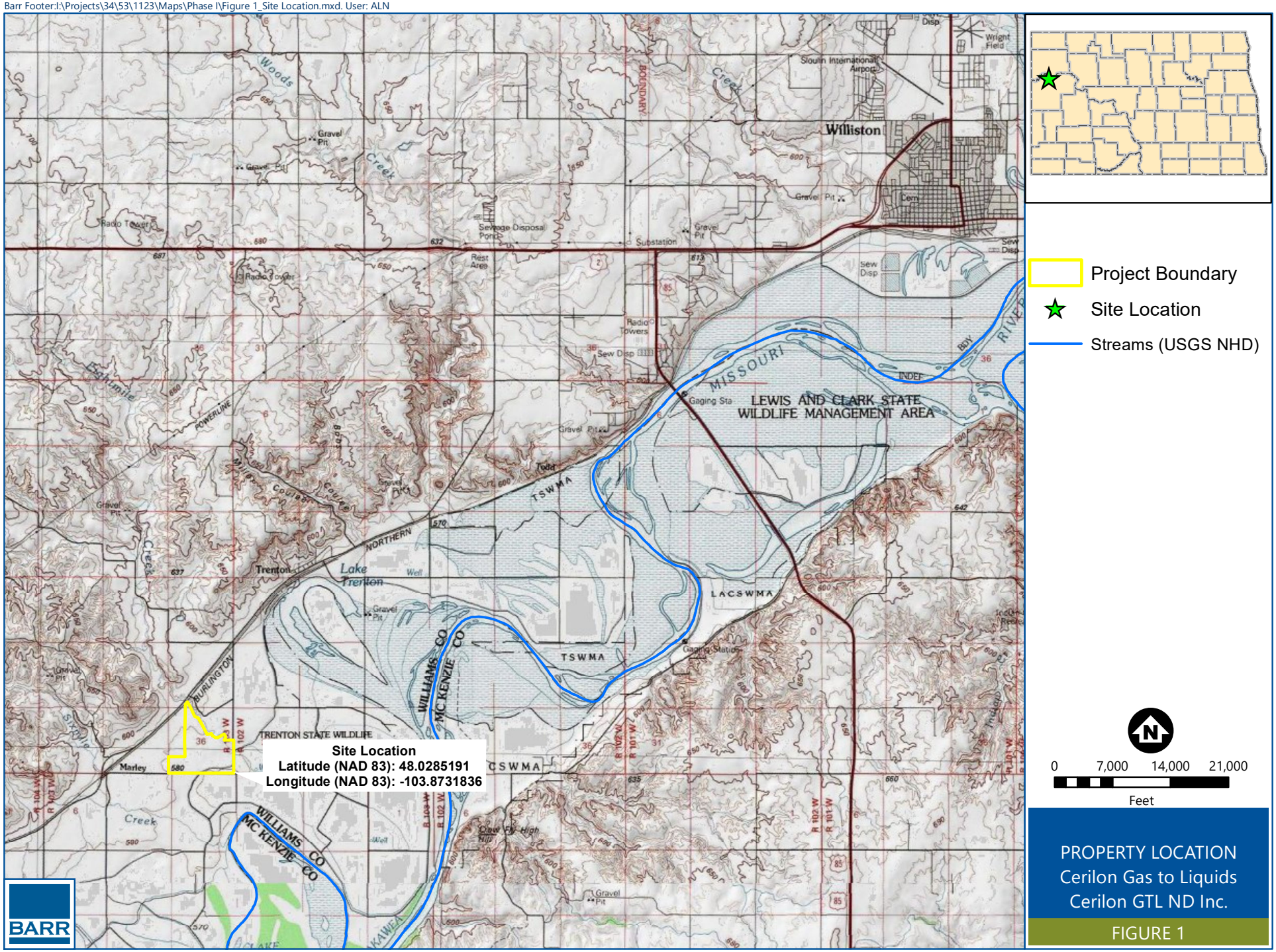
(1)	Value should be included in the TPH sum and compared to the TPH criteria value.

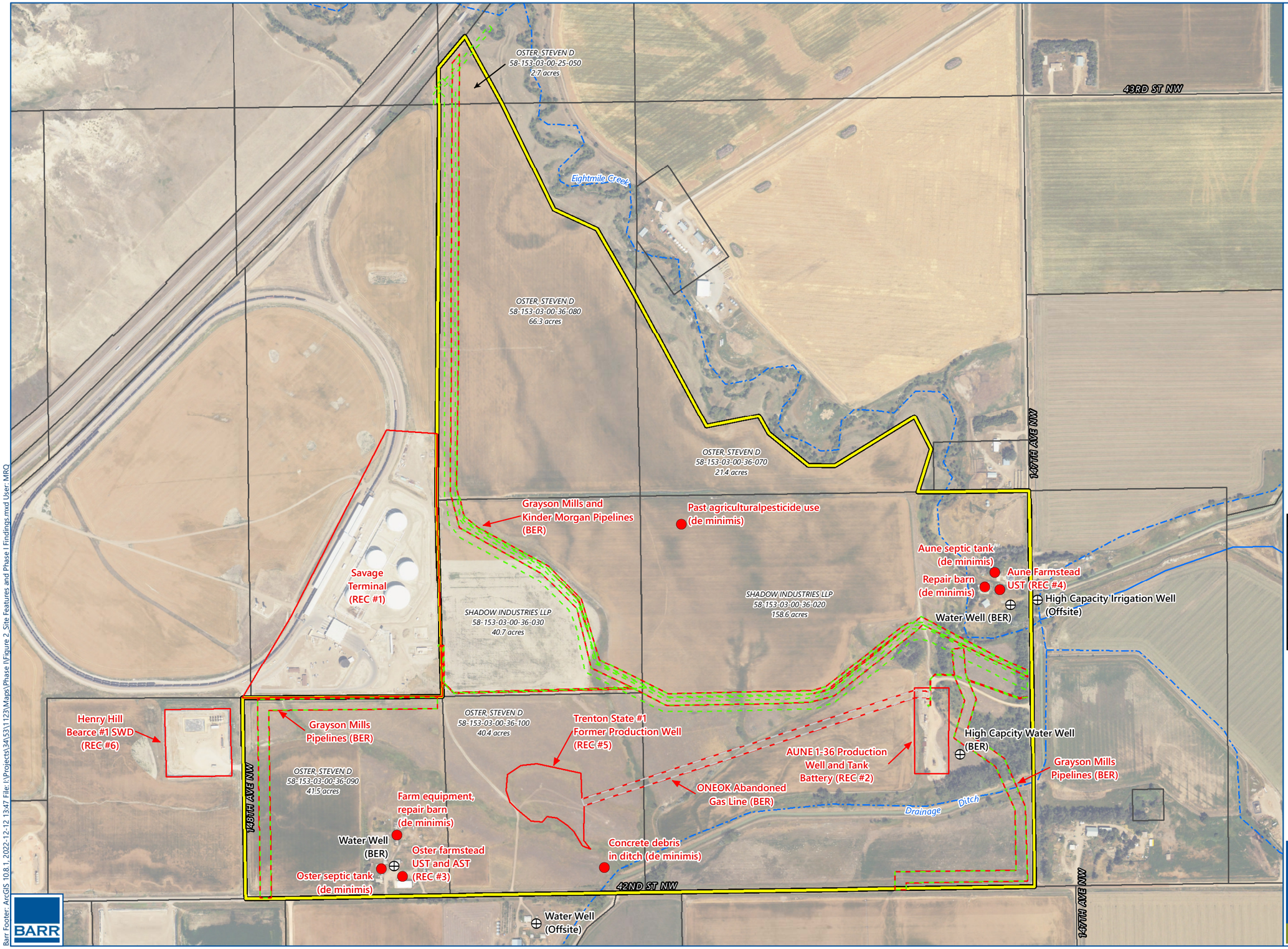
North Dakota Human Health Value Class III (2)

(3)	Substance classified as a carcinogen, with the value based on an incremental risk of one additional instance of cancer in one million persons.
(4)	Safe Drinking Water Act (MCL).

Figures

Barr Footer:I:\Projects\34\53\1123\Maps\Phase I\Figure 1_Site Location.mxd. User: ALN





Summary of Finding Location or Area

Water Well

Stream, Intermittent

Stream, Perennial

Project Boundary

Abandoned Pipeline Easement

Existing Pipeline Easement

Parcel Boundary

Note:
Finding locations are approximate and for illustration purposes only.

REC - Recognized environmental condition
BER - Business environmental risk
De minimis - De minimis conditions

REC ID	Description
REC #1	Adjoining site Savage Services bulk petroleum terminal
REC #2	Aune 1-36 oil and gas active production well with associated tank battery and chemical storage.
REC #3	Former UST and AST and hydraulic fluid storage at Oster farmstead.
REC #4	Former UST and petroleum storage at Aune farmstead.
REC #5	Former Trenton State #1 oil and gas well and associated ONEOK gas liquids pipeline.
REC #6	Adjoining site Henry Hill Bearce #1 SWD.

0 300 600
Feet

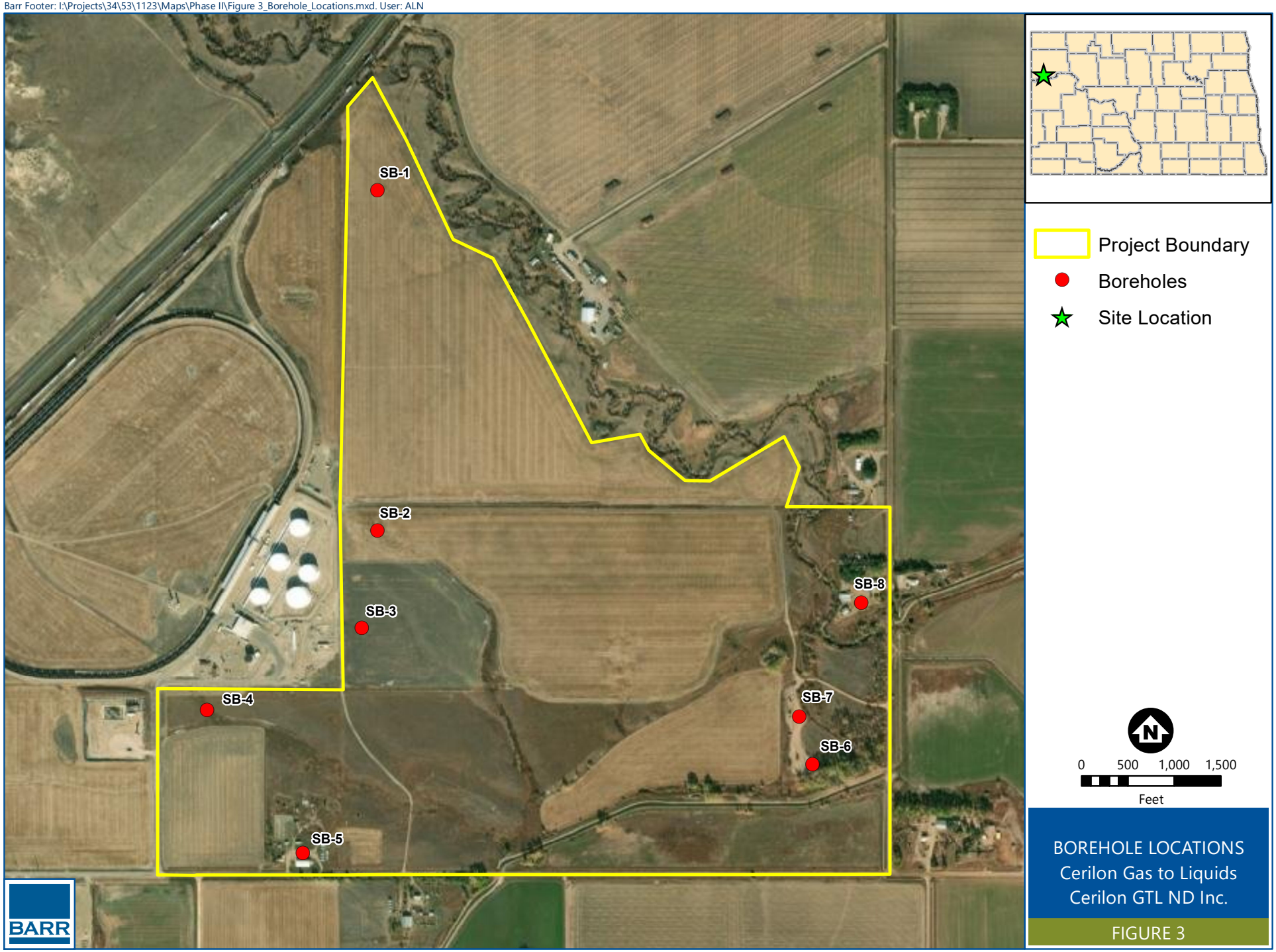
Imagery Source: USDA NAIP 2022

SITE FEATURES AND PHASE I FINDINGS
Cerilon Gas to Liquids
Cerilon GTL ND Inc.

FIGURE 2

Barr Footer: ArcGIS 10.8.1, 2022-12-12 13:47 File: I:\Projects\34\53\11\23\Maps\Phase I\Figure 2_Site Features and Phase I Findings.mxd User: MRQ

Barr Footer: I:\Projects\34\53\1123\Maps\Phase II\Figure 3_Borehole_Locations.mxd. User: ALN



Attachment 1:

Boring Logs

Barr Engineering Company
4300 MarketPointe Drive Suite 200
Minneapolis, MN 55435
Telephone: 952-832-2600

BORING: SB-1

SHEET 1 OF 1

Project: Cerilon PH2
Project No.: 34531123
Location: Trenton ND
Coordinates:
Coordinate System:

Surface Elevation:
Drilling Method: Geoprobe
Sampling Method: Direct Push, Continuous
Completion Depth: 25 ft

Depth, feet (write-in)	Sample Interval	Sample No.	Recovery	PID (ppm)	Disc./Odor/Sheen	USCS Symbol	Depth Interval, feet	LITHOLOGY & INCLUSIONS
0	0-5		4.5	0.0	N/N/N	CL		0-0.5 ft Topsoil, LEAN CLAY mix, dk brown, moist, roots,
				0.0				0.5-6.5 LEAN CLAY to SILTY LEAN CLAY (CL) olive brown (2.5Y 4/3), moist, mod plasticity, variable silt content
5	5-10		4.25	0.0	N/N/N	ML		6.5-10.25 ft CLAYEY SILT to SILT (ML) olive brown, moist, variable clay trace fine sand
				0.0				
10	10-15		4.5	0.0	N/N/N	CL		10.25-12 ft LEAN CLAY (CL), olive brown moist, trace black organics / lignite coal few silty areas w/in
				0.0		ML		12-25 ft CLAYEY SILT to SILT (ML) olive brown, moist variable clay content w/in silt moreso 12-20 ft
15	15-20		4.5	0.0	N/N/N			
				0.0				
20	20-25		5.0	0.0				Sandy silt 20-25 ft, fine gr. sand, few small (~1") sand lenses, fine trace black organics / lignite fragments
				0.0				
25								EOB @ 25 ft

Date/Time Started: 10-11-23 0940
Date/Time Completed: 10-11-23 1010
Logged By: DJZ
Drilling Contractor: One Cor 7822 DT
Drill Rig: Geoprobe
Weather: 45°F mostly sunny, windy

Remarks:
Sample SB-1 (0-2 ft) @1010
No groundwater
Bore backfilled w/ bentonite

W:\Business Units\AR\Subunit Admin\Practice Groups\Geosciences\Documents\Soil_Boring_Log_Graphic_v1.0.pdf Revised: 2/8/2017

1" = 0.083'; 2"=0.167'; 3"=0.250'; 4"=0.333'; 5"=0.417'; 6"=0.500'; 7"=0.583'; 8"=0.667'; 9"=0.750'; 10"=0.833'; 11"=0.917'; 12"=1.000'; 13"=1.083'; 14"=1.167'; 15"=1.250'; 16"=1.333'; 17"=1.417'; 18"=1.500'

Barr Engineering Company
4300 MarketPointe Drive Suite 200
Minneapolis, MN 55435
Telephone: 952-832-2600

BORING: SB-2

SHEET 1 OF 1

Project: Cerilon PH 2
Project No.: 34531123
Location: Trenton NJ
Coordinates:
Coordinate System:

Surface Elevation:
Drilling Method: Geoprobe
Sampling Method: Direct Push – continuous
Completion Depth: 25 ft

Depth, feet (write-in)	Sample Interval ft	Sample No.	Recovery	PID (ppm)	Disc./Odor/Sheen	USCS Symbol	Depth Interval, feet	LITHOLOGY & INCLUSIONS
0	0-5 ft		4.75	0.0	N/N/N	CL/CH		0-0.25 ft Topsoil, LEAN CLAY (CL), dk brn, moist, roots
				0.0				0.25-2.5 ft LEAN to FAT CLAY (CL/CH) olive brown (2.5Y 4/3), moist
5	5-10 ft		5.0	0.0	N/N/N	CL		2.5-17.5 ft LEAN CLAY (CL) olive brown, moist, trace variable silt w/in
				0.0				
10	10-15		4.75	0.0				
				0.0				
15	15-20		4.75	0.0				trace fine sand & silty at bottom
				0.0	N/N/N	SP		17.5-21 ft POORLY GRADED SAND (SP), low moist, loose, mostly fine gr sand with trace to few med & coarse gr. sand, subrounded trace fines
20	20-25		5.0	0.0	N/N/N	CL		21-24 ft LEAN CLAY (CL), olive brown, moist, softer, variable silt within, trace organics trace fine sand w/in - subrounded
				0.0				
25					N/N/N	ML		24-25 ft SILT to CLAYEY SILT (ML) olive brown, wet, trace very fine sand
								EOB @ 25 ft

Date/Time Started: 10-11-23 1050
Date/Time Completed: 10-11-23 1110
Logged By: PJZ
Drilling Contractor: One Cor
Drill Rig: Geoprobe 7822 DT
Weather: 50°F mostly sunny

Remarks:
Sample SB-2 (0-2 ft) @ 1125
Possible water at very bottom - not able to sample
Bore backfilled with bentonite

W:\Business Units\AR\Subunit Admin\Practice Groups\Geosciences\Documents\Soil_Boring_Log_Graphic_v1.0.pdf Revised: 2/8/2017

1" = 0.083'; 2"=0.167'; 3"=0.250'; 4"=0.333'; 5"=0.417'; 6"=0.500'; 7"=0.583'; 8"=0.667'; 9"=0.750'; 10"=0.833'; 11"=0.917'; 12"=1.000'; 13"=1.083'; 14"=1.167'; 15"=1.250'; 16"=1.333'; 17"=1.417'; 18"=1.500'

Barr Engineering Company
4300 MarketPointe Drive Suite 200
Minneapolis, MN 55435
Telephone: 952-832-2600

BORING: SB-3

SHEET 1 OF 1

Project: Cerilon Ph 2
Project No.: 34531123
Location: Trenton, ND
Coordinates:
Coordinate System:

Surface Elevation:
Drilling Method: Geoprobe
Sampling Method: Direct Push - continuous
Completion Depth:

Depth, feet (write-in)	Sample Interval	Sample No.	Recovery	PID (ppm)	Disc./Odor/Sheen	USCS Symbol	Depth Interval, feet	LITHOLOGY & INCLUSIONS
0	0-5		3.5	0.0 0.0	N/N/N	CL/CH		0-0.5 ft Topsoil, LEAN CLAY (CL), black 0.5-25 ft moist, roots LEAN to FAT CLAY (CL/CH) dark grayish brown (2.5Y 4/2) to olive brown (2.5Y 4/3) moist, mod/high plasticity trace variable silt within
5	5-10		3.0	0.0 0.0				
10	10-15		4.5	0.0 0.0	N/N/N	CL		Wet at 11 ft, soft few fine gr. sand lenses ~1" thick, moist/wet @ 19.75 ft, 23 ft, 23.5 ft, 24.25 ft Lean clay is soft, wet from 11-25 ft
15								
20	15-20		4.0	0.0 0.0				
25	20-25		3.0	0.0 0.0	N/N/N	CL		EOB @ 25 ft

Date/Time Started: 10-11-23 1150
Date/Time Completed: 10-11-23 1220
Logged By: DJZ
Drilling Contractor: One Cor
Drill Rig: Geoprobe 7822 DT
Weather: 50 °F Mostly sunny

Remarks:
Sample SB-3 (0-2) @ 1230
Installed temp well, screen 10-25 ft. Waited 15 minutes No water.
Bore backfilled with bentonite

1" = 0.083'; 2"=0.167'; 3"=0.250'; 4"=0.333'; 5"=0.417'; 6"=0.500'; 7"=0.583'; 8"=0.667'; 9"=0.750'; 10"=0.833'; 11"=0.917'; 12"=1.000'; 13"=1.083'; 14"=1.167'; 15"=1.250'; 16"=1.333'; 17"=1.417'; 18"=1.500'

Barr Engineering Company
4300 MarketPointe Drive Suite 200
Minneapolis, MN 55435
Telephone: 952-832-2600

BORING: SB-4

SHEET 1 OF 1

Project: Cerilon PH2
Project No.: 34531.23
Location: Trenton ND
Coordinates:
Coordinate System:

Surface Elevation:
Drilling Method: Geoprobe
Sampling Method: Direct Push – Continuous
Completion Depth:

Depth, feet (write-in)	Sample Interval	Sample No.	Recovery	PID (ppm)	Disc./Odor/Sheen	USCS Symbol	Depth Interval, feet	LITHOLOGY & INCLUSIONS
0	0-5		4.25	0.0	N/N/N	CL/CH		0-0.5 ft Topsoil, LEAN CLAY (CL), moist, dark grayish brown, roots
				0.0				0.5-3 ft LEAN to FAT CLAY (CL/CH), moist, dark grayish brown (2.5Y 4/2) to olive brown (2.5Y 4/3) moist to wettish, mod plasticity
5	5-10		4.9	0.0	N/N/N	CL		3-22.25 LEAN CLAY (CL), moist, olive brown w/white precipitate spots & veins mod plasticity, trace variable silt, trace black organics / lignite fragments trace manganese oxidation → near 11 ft
				0.0				
10	10-15		5.0	0.0				
				0.0				
15	15-20		4.75	0.0	N/N/N	CL		Wet at 17.5 ft, soft Soft lean clay 17.5-22.25, wet wet silty lens at 19.75 ft, fine sand w/in at bottom 3 inches
				0.0				
20	20-25		4.0	0.0				22.25-24 ft LEAN to FAT CLAY (CL/CH), moist, harder, olive brown, dk grayish brown, with white precipitate and calcite veins, spots
				0.0	N/N/N	CL/CH		
25					N/N/N	ML		24-25 ft CLAYEY SILT (ML), olive brown, Wet, softer, few very fine sand / coarse silt w/in
								EOB @ 25 ft

Date/Time Started: 10-11-23 1305
Date/Time Completed: 10-11-23 1335
Logged By: DJZ
Drilling Contractor: OneCor
Drill Rig: Geoprobe 7822 DT
Weather: 50 °F mostly sunny

Remarks:
SB-4 (0-2) @ 1345
Installed temp well, screen 15-25 ft, waited 15 min, no water
Bore backfilled with bentonite

1" = 0.083'; 2" = 0.167'; 3" = 0.250'; 4" = 0.333'; 5" = 0.417'; 6" = 0.500'; 7" = 0.583'; 8" = 0.667'; 9" = 0.750'; 10" = 0.833'; 11" = 0.917'; 12" = 1.000'; 13" = 1.083'; 14" = 1.167'; 15" = 1.250'; 16" = 1.333'; 17" = 1.417'; 18" = 1.500'

Barr Engineering Company
4300 MarketPointe Drive Suite 200
Minneapolis, MN 55435
Telephone: 952-832-2600

BORING: SB-5

SHEET 1 OF 1

Project: Cerilon PH2
Project No.: 34531123
Location: Trenton ND
Coordinates:
Coordinate System:

Surface Elevation:
Drilling Method: Geoprobe
Sampling Method: Direct Push - Continuous
Completion Depth: 25 ft

Depth, feet (write-in)	Sample Interval	Sample No.	Recovery	PID (ppm)	Disc./Odor/Sheen	USCS Symbol	Depth Interval, feet	LITHOLOGY & INCLUSIONS
0								Gravelled Surface
	0-5		3.75	0.0	N/N/N	CL		0-4.5 FILL 10YR 4/3 0-1 ft Clay mix with gravel, moist, brown
				0.0		SM		1-4.5 ft SILTY SAND, fine gr sand, low moist, loose. brown/tan
5	5-10		5.0	0.0	N/N/N	CL		4.5-7.0 ft LEAN CLAY (CL), moist, olive brown (2.5Y 4/3), few gray mottles trace white precipitate, trace manganese oxidation
				9.0	N/N/N	CH		7-8.5 ft FAT CLAY (CH), moist, harder olive brown to dk grayish brown, w/ gray mottles
				0.0	N/N/N	SC		trace oxidation, softer at bottom 9-9.75 CLAYEY SAND (SC), olive brown, wet, fine gr. sand, est 15% fines, no odor
10	10-15		5.0	0.0	N/N/N	CH		9.75-13 ft FAT CLAY (CH), olive brown, moist few white precipitate spots w/in
				0.0				
15	15-20		4.75	0.0	N/N/N	CL/CH		13-20 ft LEAN to FAT CLAY (CL/CH) olive brown, moist, some softer areas, white precipitate spots + veins w/in trace black organics w/in
				0.0				wet 2" silty inclusion near 18.5 ft
20	20-25		5.0	0.0	N/N/N	CH		20-23.25 ft FAT CLAY (CH), olive brown, moist, w/ white precipitate spots + veins w/ trace black organics w/in
				0.0	N/N/N	SP		23.25-23.75 ft POORLY GRADED SAND (SP), brown, moist to wet, fine gr. sand, trace fines w/in, trace black organics w/in
25					N/N/N	CL		23.75-25 ft SILTY + SANDY CLAY (CL), moist to wet olive brown, fine sand w/in near top Silttier toward bottom, soft EOB @ 25 ft

Date/Time Started: 10-11-23 1440
Date/Time Completed: 10-11-23 1505
Logged By: DSZ
Drilling Contractor: One Cor
Drill Rig: Geoprobe 7822 DT
Weather: 55°F mostly sunny

Remarks:
Sample SB-5 (0-2 ft) @ 1520
Installed temp well, screened 15-25 ft

10-12-23 @ 0800 WL 21.5'

1" = 0.083'; 2" = 0.167'; 3" = 0.250'; 4" = 0.333'; 5" = 0.417'; 6" = 0.500'; 7" = 0.583'; 8" = 0.667'; 9" = 0.750'; 10" = 0.833'; 11" = 0.917'; 12" = 1.000'; 13" = 1.083'; 14" = 1.167'; 15" = 1.250'; 16" = 1.333'; 17" = 1.417'; 18" = 1.500'

Barr Engineering Company
4300 MarketPointe Drive Suite 200
Minneapolis, MN 55435
Telephone: 952-832-2600

BORING: SB-6

SHEET 1 OF 1

Project: Cerilon PH2
Project No.: 34531123
Location: Trenton ND
Coordinates:
Coordinate System:

Surface Elevation:
Drilling Method: Geoprobe
Sampling Method: Direct Push - continuous
Completion Depth:

Depth, feet (write-in)	Sample Interval	Sample No.	Recovery	PID (ppm)	Disc./Odor/Sheen	USCS Symbol	Depth Interval, feet	LITHOLOGY & INCLUSIONS
0	0-5		4.75	0.0	N/N/N	CL		0-0.5 ft Topsoil, LEAN CLAY (CL), olive brown moist, roots
				0.0				0.5-2.75 ft SILTY LEAN CLAY / LEAN CLAY (CL) olive brown, moist, roots, soft, few white precipitate spots
5	5-10		4.5	0.1	N/N/N	ML		2.75-7.5 ft SANDY SILT (ML), moist to wet, olive brown, 2.5Y 4/3, fine/very fine sand variable fine sand. Wet at ~4 ft. with SILTY SAND intervals, wet
				0.0	N/N/N	CL		
10	10-15		5.0	0.0	N/N/N	SM		7.5-11 ft SILTY LEAN CLAY / LEAN CLAY (CL) olive brown, wet, variable silt content areas with gray mottles & rusty oxidation stains trace black organics / lignite fragments few SILTY SAND intervals - wet / saturated
				0.0	N/N/N	CL		11-12.25 ft SILTY SAND (SM), saturated, olive brown, variable fines est 30% or more very fine sand / coarse silt,
15								12.25-15 ft SILTY LEAN CLAY / LEAN CLAY (CL) olive brown with abundant gray mottles, saturated, Some oxidation staining, soft variable silt content and few silty inclusions, saturated few areas with fine sand w/in near bottom
20								EOB @ 15 ft
25								

1640 Pumped dry, 1/2 gal
1630 WL 6.69 ft
1625 WL 7.6 ft.
@1620 WL 8.4 ft bgs

Date/Time Started: 10-11-23 1555
Date/Time Completed: 10-11-23 1610
Logged By: DJZ
Drilling Contractor: OneCor
Drill Rig: Geoprobe 7822 DT
Weather: 55 of cloudy

Remarks:
Sample SB-6 (0-2 ft) @ 1620
Installed temp well, screened 5-15 ft,
Bore backfilled w/ bentonite

GW Sample SB-6 @1705

Purge start @ 1632

1" = 0.083'; 2" = 0.167'; 3" = 0.250'; 4" = 0.333'; 5" = 0.417'; 6" = 0.500'; 7" = 0.583'; 8" = 0.667'; 9" = 0.750'; 10" = 0.833'; 11" = 0.917'; 12" = 1.000'; 13" = 1.083'; 14" = 1.167'; 15" = 1.250'; 16" = 1.333'; 17" = 1.417'; 18" = 1.500'

Barr Engineering Company
4300 MarketPointe Drive Suite 200
Minneapolis, MN 55435
Telephone: 952-832-2600

BORING: SB-7

SHEET 1 OF 1

Project: Cerilon PH 2
Project No.: 34531123
Location: Trenton ND
Coordinates:
Coordinate System:

Surface Elevation:
Drilling Method: Geoprobe
Sampling Method: Direct Push - Continuous
Completion Depth: 20 ft

Depth, feet (write-in)	Sample Interval ft	Sample No.	Recovery ft	PID (ppm)	Disc./Odor/Sheen	USCS Symbol	Depth Interval, feet	LITHOLOGY & INCLUSIONS
0								Scoria Surface
	0-5		5.0	0.0	N/N/N	ML		0-5.25 ft FILL CLAYEY SILT (ML) moist, olive brown, variable clay w/in some areas with very fine sand / coarse silt
				0.0				
5								Native
	5-10		4.75	0.0	N/N/N	ML		5.25-7.5 ft CLAYEY SILT (ML), moist, olive brown 2.5Y 4/3 likely native. variable clay fines, rusty oxidation staining, light gray mottles areas with very fine sand / coarse silt
				0.0	N/N/N	CL		7.5-10 ft SILTY & SANDY LEAN CLAY (CL) olive brown, moist, black organics / lignite w/in some silt & fine sand thin intervals near top. areas w/ sand w/in clay, fine sand.
10								8.25-9.5 ft fine / med sand intervals, moist, trace gravel,
	10-15		3.5	0.0	N/N/N	ML		9.5-10 ft Sandy clay - fine to coarse sand w/in few areas w/ rusty oxidation subround / subangular
				0.0				
15					N/N/N			10-14.75 ft CLAYEY SILT (ML), moist to wet soft dark grayish brown to olive brown, w/ rusty oxidation stains areas with gray mottles, black organics / lignite frags w/in
	15-20		Ø	-		ML		12-13.5 more of a lean clay, soft, moist to wet w/ precipitate, mottles, oxidation
				-				some areas w/ very fine sand / coarse silt 11 ft, 14 ft
20								14.75-20 ft SANDY SILT (ML), wet / saturated olive brown, very fine Sand / coarse silt - variable
	20-25							No recovery in 15-20 ft tube. "soupy" Several inches in bottom catch at 20 ft was sandy silt.
25								EOB @ 20 ft

0920 WL @ 16.3 ft 0925 WL @ 14.51 ft

Date/Time Started: 10-12-23 0845
Date/Time Completed: 10-12-23 0916
Logged By: DJE
Drilling Contractor: OneCore
Drill Rig: Geoprobe 7822 DT
Weather: 45°F Cloudy

Remarks:
Sample SB-7 (0-2 ft) @ 0920 GW Sample SB-7 @ 0955
Installed temp well, screen 10-20 ft w/ expendable point
Bore backfilled w/ bentonite

W:\Business Units\AR\Subunit Admin\Practice Groups\Geosciences\Documents\Soil_Boring_Log_Graphic_v1.0.pdf Revised: 2/8/2017

Purge start at 0930

1" = 0.083'; 2" = 0.167'; 3" = 0.250'; 4" = 0.333'; 5" = 0.417'; 6" = 0.500'; 7" = 0.583'; 8" = 0.667'; 9" = 0.750'; 10" = 0.833'; 11" = 0.917'; 12" = 1.000'; 13" = 1.083'; 14" = 1.167'; 15" = 1.250'; 16" = 1.333'; 17" = 1.417'; 18" = 1.500'

Barr Engineering Company
4300 MarketPointe Drive Suite 200
Minneapolis, MN 55435
Telephone: 952-832-2600

BORING: SB-8

SHEET 1 OF 1

Project: Cerilon PH2
Project No.: 34531123
Location: Trenton ND
Coordinates:
Coordinate System:

Surface Elevation:
Drilling Method: Geoprobe
Sampling Method: Direct Push - continuous
Completion Depth: 25 ft

Depth, feet (write-in)	Sample Interval	Sample No.	Recovery	PID (ppm)	Disc./Odor/Sheen	USCS Symbol	Depth Interval, feet	LITHOLOGY & INCLUSIONS
0					N/N/N	ML		Gravel surface 0-1 ft FILL SILTY GRAVEL & SILT olive brown, moist, 0-0.5 ft Gravel
	0-5		4.25	0.0 0.0	N/N/N	SM		1-25 ft SILTY SAND (SM), moist light olive brown 2.5Y 5/3 white precipitate fragments near top more silt fines near top few black organics / lignite fragments w/in very fine / fine sand & coarse silt variable silt fines w/in some deeper intervals of poorly graded fine sand
5								
	5-10		4.25	0.0 0.0				
10								
	10-15		4.5	0.0 0.0	N/N/N			
15								15-25 ft trace med gr sand in intervals subround to subangular areas with rusty oxidation w/in
	15-20		4.0	0.0 0.0				20-25 ft few siltier inclusions
20								
	20-25		4.25	0.0 0.0	N/N/N	SM		
25								EOB @ 25 ft

Date/Time Started: 10-12-23 1035
Date/Time Completed: 10-12-23 1100
Logged By: DB
Drilling Contractor: OneCor
Drill Rig: Geoprobe 7822 DT
Weather: 40°F cloudy windy

Remarks:
Sample SB-8 (0-2 ft) @ 1115
No groundwater
Bore backfilled w/ bentonite

1" = 0.083'; 2"=0.167'; 3"=0.250'; 4"=0.333'; 5"=0.417'; 6"=0.500'; 7"=0.583'; 8"=0.667'; 9"=0.750'; 10"=0.833'; 11"=0.917'; 12"=1.000'; 13"=1.083'; 14"=1.167'; 15"=1.250'; 16"=1.333'; 17"=1.417'; 18"=1.500'

Attachment 2:

ALS Analytical Report

26-Oct-2023

Jim Taraldsen
Barr Engineering Co.
234 West Century Avenue
Bismarck, ND 58503

Re: **Cerilon Phase II (34531123)** Work Order: **23101278**

Dear Jim,

ALS Environmental received 12 samples on 13-Oct-2023 09:30 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 31.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Jodi Blouw

Electronically approved by: Jodi Blouw

Jodi Blouw

Report of Laboratory Analysis

Certificate No: ND: R-192

ALS Group, USA

Date: 26-Oct-23

Client: Barr Engineering Co.
Project: Cerilon Phase II (34531123)
Work Order: **23101278**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
23101278-01	SB-1	Soil		10/11/2023 10:10	10/13/2023 09:30	☐
23101278-02	SB-2	Soil		10/11/2023 11:25	10/13/2023 09:30	☐
23101278-03	SB-3	Soil		10/11/2023 12:30	10/13/2023 09:30	☐
23101278-04	SB-4	Soil		10/11/2023 13:45	10/13/2023 09:30	☐
23101278-05	SB-5	Soil		10/11/2023 15:20	10/13/2023 09:30	☐
23101278-06	SB-6	Soil		10/11/2023 16:20	10/13/2023 09:30	☐
23101278-07	SB-7	Soil		10/12/2023 09:20	10/13/2023 09:30	☐
23101278-08	SB-8	Soil		10/12/2023 11:15	10/13/2023 09:30	☐
23101278-09	SB-6	Groundwater		10/11/2023 17:05	10/13/2023 09:30	☐
23101278-10	SB-7	Groundwater		10/12/2023 09:55	10/13/2023 09:30	☐
23101278-11	Trip Blank	Soil		10/11/2023	10/13/2023 09:30	☐
23101278-12	Trip Blank	Water		10/11/2023	10/13/2023 09:30	☐

Client: Barr Engineering Co.
Project: Cerilon Phase II (34531123)
WorkOrder: **23101278**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
Hr	BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated.
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Analyte accreditation is not offered
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

Units Reported	Description
% of sample	Percent of Sample
µg/Kg-dry	Micrograms per Kilogram Dry Weight
µg/L	Micrograms per Liter
mg/Kg-dry	Milligrams per Kilogram Dry Weight
mg/L	Milligrams per Liter

Client: Barr Engineering Co.
Project: Cerilon Phase II (34531123)
Work Order: 23101278

Case Narrative

Samples for the above noted Work Order were received on 10/13/2023. The attached "Sample Receipt Checklist" documents the status of custody seals, container integrity, preservation, and temperature compliance.

Samples were analyzed according to the analytical methodology previously transmitted in the "Work Order Acknowledgement". Methodologies are also documented in the "Analytical Result" section for each sample. Quality control results are listed in the "QC Report" section. Sample association for the reported quality control is located at the end of each batch summary. If applicable, results are appropriately qualified in the Analytical Result and QC Report sections. The "Qualifiers" section documents the various qualifiers, units, and acronyms utilized in reporting. A copy of the laboratory's scope of accreditation is available upon request.

With the following exceptions, all sample analyses achieved analytical criteria.

Volatile Organics:
Batch 227440, Method SW8015C, Sample 23101278-08B MSD: The MSD recovery was outside of the control limit. However, the MS recovery and the RPD between the MS and MSD was in control. No qualification is required for this analyte: GRO(C6-C10)
No other deviations or anomalies were noted.

Extractable Organics:
Batch 227363, Method SW8015C, Sample SB-7 (23101278-10A): Low surrogate recovery due to sample matrix confirmed by re-extraction

Batch 227363, Method SW8015C, Sample DLCSDW1-227363: The RPD between the LCS and LCSD was outside of the control limit. The sample results should be considered estimated for this analyte: 4-terphenyl-d14
No other deviations or anomalies were noted.

Wet Chemistry:
No deviations or anomalies were noted.

ALS Group, USA

Date: *26-Oct-2023*

Client: Barr Engineering Co.
Project: Cerilon Phase II (34531123)
Work Order: 23101278
Sample ID: SB-1
Lab ID: 23101278-01
Collection Date: 10/11/2023 10:10 AM
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015C**	Prep: SW3550 10/17/23 14:49		Analyst: **SJB**
DRO (C10-C20)	ND		11	mg/Kg-dry	1	10/18/2023 04:05 AM
ORO (C20-C34)	**14**		**11**	**mg/Kg-dry**	1	10/18/2023 04:05 AM
Surr: 4-Terphenyl-d14	*63.3*		*41-102*	*%REC*	1	10/18/2023 04:05 AM
GASOLINE RANGE ORGANICS BY GC-FID			**SW8015C**	Prep: SW5035A 10/14/23 09:50		Analyst: **SJB**
GRO (C6-C10)	ND		7,100	µg/Kg-dry	1	10/18/2023 01:11 AM
Surr: Toluene-d8	*108*		*75-120*	*%REC*	1	10/18/2023 01:11 AM
VOLATILE ORGANIC COMPOUNDS			**SW8260D**	Prep: SW5035A 10/17/23 14:27		Analyst: **SBR**
Benzene	ND		37	µg/Kg-dry	1	10/26/2023 04:27 AM
Ethylbenzene	ND		37	µg/Kg-dry	1	10/26/2023 04:27 AM
m,p-Xylene	ND		74	µg/Kg-dry	1	10/26/2023 04:27 AM
o-Xylene	ND		37	µg/Kg-dry	1	10/26/2023 04:27 AM
Toluene	ND		37	µg/Kg-dry	1	10/26/2023 04:27 AM
Xylenes, Total	ND		110	µg/Kg-dry	1	10/26/2023 04:27 AM
Surr: 1,2-Dichloroethane-d4	*112*		*80-120*	*%REC*	1	10/26/2023 04:27 AM
Surr: 4-Bromofluorobenzene	*107*		*80-120*	*%REC*	1	10/26/2023 04:27 AM
Surr: Dibromofluoromethane	*103*		*80-120*	*%REC*	1	10/26/2023 04:27 AM
Surr: Toluene-d8	*102*		*80-120*	*%REC*	1	10/26/2023 04:27 AM
MOISTURE			**SW3550C**			Analyst: **LAD**
Moisture	**13**		**0.10**	**% of sample**	1	10/16/2023 02:07 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Barr Engineering Co.
Project: Cerilon Phase II (34531123) **Work Order:** 23101278
Sample ID: SB-2 **Lab ID:** 23101278-02
Collection Date: 10/11/2023 11:25 AM **Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015C**	Prep: SW3550 10/17/23 14:49		Analyst: **SJB**
DRO (C10-C20)	ND		13	mg/Kg-dry	1	10/18/2023 04:42 AM
ORO (C20-C34)	ND		13	mg/Kg-dry	1	10/18/2023 04:42 AM
Surr: 4-Terphenyl-d14	*69.5*		*41-102*	*%REC*	1	10/18/2023 04:42 AM
GASOLINE RANGE ORGANICS BY GC-FID			**SW8015C**	Prep: SW5035A 10/14/23 09:50		Analyst: **SJB**
GRO (C6-C10)	ND		7,100	µg/Kg-dry	1	10/18/2023 06:03 AM
Surr: Toluene-d8	*106*		*75-120*	*%REC*	1	10/18/2023 06:03 AM
VOLATILE ORGANIC COMPOUNDS			**SW8260D**	Prep: SW5035A 10/17/23 14:27		Analyst: **DMS**
Benzene	ND		43	µg/Kg-dry	1	10/24/2023 04:27 PM
Ethylbenzene	ND		43	µg/Kg-dry	1	10/24/2023 04:27 PM
m,p-Xylene	ND		85	µg/Kg-dry	1	10/24/2023 04:27 PM
o-Xylene	ND		43	µg/Kg-dry	1	10/24/2023 04:27 PM
Toluene	ND		43	µg/Kg-dry	1	10/24/2023 04:27 PM
Xylenes, Total	ND		130	µg/Kg-dry	1	10/24/2023 04:27 PM
Surr: 1,2-Dichloroethane-d4	*102*		*80-120*	*%REC*	1	10/24/2023 04:27 PM
Surr: 4-Bromofluorobenzene	*95.2*		*80-120*	*%REC*	1	10/24/2023 04:27 PM
Surr: Dibromofluoromethane	*93.3*		*80-120*	*%REC*	1	10/24/2023 04:27 PM
Surr: Toluene-d8	*97.8*		*80-120*	*%REC*	1	10/24/2023 04:27 PM
MOISTURE			**SW3550C**			Analyst: **LAD**
Moisture	**22**		**0.10**	**% of sample**	1	10/16/2023 02:07 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Barr Engineering Co.
Project: Cerilon Phase II (34531123) **Work Order:** 23101278
Sample ID: SB-3 **Lab ID:** 23101278-03
Collection Date: 10/11/2023 12:30 PM **Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015C**	Prep: SW3550 10/17/23 14:49		Analyst: **SJB**
DRO (C10-C20)	ND		12	mg/Kg-dry	1	10/18/2023 02:51 AM
ORO (C20-C34)	ND		12	mg/Kg-dry	1	10/18/2023 02:51 AM
Surr: 4-Terphenyl-d14	*69.9*		*41-102*	*%REC*	1	10/18/2023 02:51 AM
GASOLINE RANGE ORGANICS BY GC-FID			**SW8015C**	Prep: SW5035A 10/17/23 08:31		Analyst: **SJB**
GRO (C6-C10)	ND		7,200	µg/Kg-dry	1	10/18/2023 01:34 AM
Surr: Toluene-d8	*104*		*75-120*	*%REC*	1	10/18/2023 01:34 AM
VOLATILE ORGANIC COMPOUNDS			**SW8260D**	Prep: SW5035A 10/14/23 11:07		Analyst: **EZH**
Benzene	ND		43	µg/Kg-dry	1	10/24/2023 09:24 AM
Ethylbenzene	ND		43	µg/Kg-dry	1	10/24/2023 09:24 AM
m,p-Xylene	ND		87	µg/Kg-dry	1	10/24/2023 09:24 AM
o-Xylene	ND		43	µg/Kg-dry	1	10/24/2023 09:24 AM
Toluene	ND		43	µg/Kg-dry	1	10/24/2023 09:24 AM
Xylenes, Total	ND		130	µg/Kg-dry	1	10/24/2023 09:24 AM
Surr: 1,2-Dichloroethane-d4	*97.4*		*80-120*	*%REC*	1	10/24/2023 09:24 AM
Surr: 4-Bromofluorobenzene	*98.2*		*80-120*	*%REC*	1	10/24/2023 09:24 AM
Surr: Dibromofluoromethane	*91.9*		*80-120*	*%REC*	1	10/24/2023 09:24 AM
Surr: Toluene-d8	*99.5*		*80-120*	*%REC*	1	10/24/2023 09:24 AM
MOISTURE			**SW3550C**			Analyst: **LAD**
Moisture	**21**		**0.10**	**% of sample**	1	10/16/2023 02:07 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Barr Engineering Co.
Project: Cerilon Phase II (34531123) **Work Order:** 23101278
Sample ID: SB-4 **Lab ID:** 23101278-04
Collection Date: 10/11/2023 01:45 PM **Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015C**	Prep: SW3550 10/17/23 14:49		Analyst: **SJB**
DRO (C10-C20)	ND		13	mg/Kg-dry	1	10/18/2023 05:19 AM
ORO (C20-C34)	ND		13	mg/Kg-dry	1	10/18/2023 05:19 AM
Surr: 4-Terphenyl-d14	*70.2*		*41-102*	*%REC*	1	10/18/2023 05:19 AM
GASOLINE RANGE ORGANICS BY GC-FID			**SW8015C**	Prep: SW5035A 10/17/23 08:31		Analyst: **SJB**
GRO (C6-C10)	ND		7,500	µg/Kg-dry	1	10/18/2023 03:49 AM
Surr: Toluene-d8	*109*		*75-120*	*%REC*	1	10/18/2023 03:49 AM
VOLATILE ORGANIC COMPOUNDS			**SW8260D**	Prep: SW5035A 10/14/23 11:07		Analyst: **NTJ**
Benzene	ND		45	µg/Kg-dry	1	10/25/2023 04:55 AM
Ethylbenzene	ND		45	µg/Kg-dry	1	10/25/2023 04:55 AM
m,p-Xylene	ND		90	µg/Kg-dry	1	10/25/2023 04:55 AM
o-Xylene	ND		45	µg/Kg-dry	1	10/25/2023 04:55 AM
Toluene	ND		45	µg/Kg-dry	1	10/25/2023 04:55 AM
Xylenes, Total	ND		140	µg/Kg-dry	1	10/25/2023 04:55 AM
Surr: 1,2-Dichloroethane-d4	*115*		*80-120*	*%REC*	1	10/25/2023 04:55 AM
Surr: 4-Bromofluorobenzene	*97.3*		*80-120*	*%REC*	1	10/25/2023 04:55 AM
Surr: Dibromofluoromethane	*97.2*		*80-120*	*%REC*	1	10/25/2023 04:55 AM
Surr: Toluene-d8	*102*		*80-120*	*%REC*	1	10/25/2023 04:55 AM
MOISTURE			**SW3550C**			Analyst: **LAD**
Moisture	**25**		**0.10**	**% of sample**	1	10/16/2023 02:07 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Barr Engineering Co.
Project: Cerilon Phase II (34531123) **Work Order:** 23101278
Sample ID: SB-5 **Lab ID:** 23101278-05
Collection Date: 10/11/2023 03:20 PM **Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015C**	Prep: SW3550 10/17/23 14:49		Analyst: **SJB**
DRO (C10-C20)	ND		10	mg/Kg-dry	1	10/18/2023 05:56 AM
ORO (C20-C34)	**15**		**10**	**mg/Kg-dry**	1	10/18/2023 05:56 AM
Surr: 4-Terphenyl-d14	*63.0*		*41-102*	*%REC*	1	10/18/2023 05:56 AM
GASOLINE RANGE ORGANICS BY GC-FID			**SW8015C**	Prep: SW5035A 10/17/23 08:31		Analyst: **SJB**
GRO (C6-C10)	ND		6,000	µg/Kg-dry	1	10/18/2023 04:11 AM
Surr: Toluene-d8	*114*		*75-120*	*%REC*	1	10/18/2023 04:11 AM
VOLATILE ORGANIC COMPOUNDS			**SW8260D**	Prep: SW5035A 10/14/23 11:07		Analyst: **NTJ**
Benzene	ND		36	µg/Kg-dry	1	10/25/2023 04:31 AM
Ethylbenzene	ND		36	µg/Kg-dry	1	10/25/2023 04:31 AM
m,p-Xylene	ND		72	µg/Kg-dry	1	10/25/2023 04:31 AM
o-Xylene	ND		36	µg/Kg-dry	1	10/25/2023 04:31 AM
Toluene	ND		36	µg/Kg-dry	1	10/25/2023 04:31 AM
Xylenes, Total	ND		110	µg/Kg-dry	1	10/25/2023 04:31 AM
Surr: 1,2-Dichloroethane-d4	*112*		*80-120*	*%REC*	1	10/25/2023 04:31 AM
Surr: 4-Bromofluorobenzene	*96.6*		*80-120*	*%REC*	1	10/25/2023 04:31 AM
Surr: Dibromofluoromethane	*98.0*		*80-120*	*%REC*	1	10/25/2023 04:31 AM
Surr: Toluene-d8	*101*		*80-120*	*%REC*	1	10/25/2023 04:31 AM
MOISTURE			**SW3550C**			Analyst: **LAD**
Moisture	**5.5**		**0.10**	**% of sample**	1	10/16/2023 02:07 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Barr Engineering Co.
Project: Cerilon Phase II (34531123) **Work Order:** 23101278
Sample ID: SB-6 **Lab ID:** 23101278-06
Collection Date: 10/11/2023 04:20 PM **Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015C**	Prep: SW3550 10/17/23 14:49		Analyst: **SJB**
DRO (C10-C20)	ND		12	mg/Kg-dry	1	10/18/2023 06:33 AM
ORO (C20-C34)	**13**		**12**	**mg/Kg-dry**	1	10/18/2023 06:33 AM
Surr: 4-Terphenyl-d14	*62.3*		*41-102*	*%REC*	1	10/18/2023 06:33 AM
GASOLINE RANGE ORGANICS BY GC-FID			**SW8015C**	Prep: SW5035A 10/17/23 08:31		Analyst: **SJB**
GRO (C6-C10)	ND		7,200	µg/Kg-dry	1	10/18/2023 04:33 AM
Surr: Toluene-d8	*109*		*75-120*	*%REC*	1	10/18/2023 04:33 AM
VOLATILE ORGANIC COMPOUNDS			**SW8260D**	Prep: SW5035A 10/14/23 11:07		Analyst: **NTJ**
Benzene	ND		43	µg/Kg-dry	1	10/25/2023 04:07 AM
Ethylbenzene	ND		43	µg/Kg-dry	1	10/25/2023 04:07 AM
m,p-Xylene	ND		86	µg/Kg-dry	1	10/25/2023 04:07 AM
o-Xylene	ND		43	µg/Kg-dry	1	10/25/2023 04:07 AM
Toluene	ND		43	µg/Kg-dry	1	10/25/2023 04:07 AM
Xylenes, Total	ND		130	µg/Kg-dry	1	10/25/2023 04:07 AM
Surr: 1,2-Dichloroethane-d4	*112*		*80-120*	*%REC*	1	10/25/2023 04:07 AM
Surr: 4-Bromofluorobenzene	*96.5*		*80-120*	*%REC*	1	10/25/2023 04:07 AM
Surr: Dibromofluoromethane	*114*		*80-120*	*%REC*	1	10/25/2023 04:07 AM
Surr: Toluene-d8	*99.2*		*80-120*	*%REC*	1	10/25/2023 04:07 AM
MOISTURE			**SW3550C**			Analyst: **LAD**
Moisture	**16**		**0.10**	**% of sample**	1	10/16/2023 02:07 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Barr Engineering Co.
Project: Cerilon Phase II (34531123) **Work Order:** 23101278
Sample ID: SB-7 **Lab ID:** 23101278-07
Collection Date: 10/12/2023 09:20 AM **Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015C**	Prep: SW3550 10/17/23 14:49		Analyst: **SJB**
DRO (C10-C20)	ND		11	mg/Kg-dry	1	10/18/2023 07:10 AM
ORO (C20-C34)	ND		11	mg/Kg-dry	1	10/18/2023 07:10 AM
Surr: 4-Terphenyl-d14	*62.6*		*41-102*	*%REC*	1	10/18/2023 07:10 AM
GASOLINE RANGE ORGANICS BY GC-FID			**SW8015C**	Prep: SW5035A 10/17/23 08:31		Analyst: **SJB**
GRO (C6-C10)	ND		6,500	µg/Kg-dry	1	10/18/2023 04:56 AM
Surr: Toluene-d8	*107*		*75-120*	*%REC*	1	10/18/2023 04:56 AM
VOLATILE ORGANIC COMPOUNDS			**SW8260D**	Prep: SW5035A 10/14/23 11:07		Analyst: **NTJ**
Benzene	ND		39	µg/Kg-dry	1	10/25/2023 05:42 AM
Ethylbenzene	ND		39	µg/Kg-dry	1	10/25/2023 05:42 AM
m,p-Xylene	ND		78	µg/Kg-dry	1	10/25/2023 05:42 AM
o-Xylene	ND		39	µg/Kg-dry	1	10/25/2023 05:42 AM
Toluene	ND		39	µg/Kg-dry	1	10/25/2023 05:42 AM
Xylenes, Total	ND		120	µg/Kg-dry	1	10/25/2023 05:42 AM
Surr: 1,2-Dichloroethane-d4	*112*		*80-120*	*%REC*	1	10/25/2023 05:42 AM
Surr: 4-Bromofluorobenzene	*94.4*		*80-120*	*%REC*	1	10/25/2023 05:42 AM
Surr: Dibromofluoromethane	*94.8*		*80-120*	*%REC*	1	10/25/2023 05:42 AM
Surr: Toluene-d8	*101*		*80-120*	*%REC*	1	10/25/2023 05:42 AM
MOISTURE			**SW3550C**			Analyst: **LAD**
Moisture	**13**		**0.10**	**% of sample**	1	10/16/2023 02:07 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Barr Engineering Co.
Project: Cerilon Phase II (34531123) **Work Order:** 23101278
Sample ID: SB-8 **Lab ID:** 23101278-08
Collection Date: 10/12/2023 11:15 AM **Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015C**	Prep: SW3550 10/17/23 14:49		Analyst: **SJB**
DRO (C10-C20)	ND		12	mg/Kg-dry	1	10/17/2023 11:45 PM
ORO (C20-C34)	**14**		**12**	**mg/Kg-dry**	1	10/17/2023 11:45 PM
Surr: 4-Terphenyl-d14	*59.0*		*41-102*	*%REC*	1	10/17/2023 11:45 PM
GASOLINE RANGE ORGANICS BY GC-FID			**SW8015C**	Prep: SW5035A 10/17/23 08:31		Analyst: **SJB**
GRO (C6-C10)	ND		6,800	µg/Kg-dry	1	10/18/2023 12:49 AM
Surr: Toluene-d8	*105*		*75-120*	*%REC*	1	10/18/2023 12:49 AM
VOLATILE ORGANIC COMPOUNDS			**SW8260D**	Prep: SW5035A 10/14/23 11:07		Analyst: **NTJ**
Benzene	ND		41	µg/Kg-dry	1	10/25/2023 05:18 AM
Ethylbenzene	ND		41	µg/Kg-dry	1	10/25/2023 05:18 AM
m,p-Xylene	ND		82	µg/Kg-dry	1	10/25/2023 05:18 AM
o-Xylene	ND		41	µg/Kg-dry	1	10/25/2023 05:18 AM
Toluene	ND		41	µg/Kg-dry	1	10/25/2023 05:18 AM
Xylenes, Total	ND		120	µg/Kg-dry	1	10/25/2023 05:18 AM
Surr: 1,2-Dichloroethane-d4	*111*		*80-120*	*%REC*	1	10/25/2023 05:18 AM
Surr: 4-Bromofluorobenzene	*93.2*		*80-120*	*%REC*	1	10/25/2023 05:18 AM
Surr: Dibromofluoromethane	*97.3*		*80-120*	*%REC*	1	10/25/2023 05:18 AM
Surr: Toluene-d8	*98.5*		*80-120*	*%REC*	1	10/25/2023 05:18 AM
MOISTURE			**SW3550C**			Analyst: **LAD**
Moisture	**16**		**0.10**	**% of sample**	1	10/16/2023 02:07 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Barr Engineering Co.
Project: Cerilon Phase II (34531123) **Work Order:** 23101278
Sample ID: SB-6 **Lab ID:** 23101278-09
Collection Date: 10/11/2023 05:05 PM **Matrix:** GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015C**		Prep: SW3511 10/16/23 14:53	Analyst: **SJB**
DRO (C10-C20)	ND		0.099	mg/L	1	10/19/2023 12:10 AM
ORO (C20-C40)	ND		0.099	mg/L	1	10/19/2023 12:10 AM
Surr: 4-Terphenyl-d14	*49.6*		*44-111*	*%REC*	1	10/19/2023 12:10 AM
GASOLINE RANGE ORGANICS BY GC-FID			**SW8015C**			Analyst: **SJB**
GRO (C6-C10)	ND		200	µg/L	1	10/19/2023 08:02 PM
Surr: Toluene-d8	*108*		*77-116*	*%REC*	1	10/19/2023 08:02 PM
VOLATILE ORGANIC COMPOUNDS			**SW8260D**			Analyst: **EZH**
Benzene	ND		1.0	µg/L	1	10/24/2023 01:11 AM
Ethylbenzene	ND		1.0	µg/L	1	10/24/2023 01:11 AM
m,p-Xylene	ND		2.0	µg/L	1	10/24/2023 01:11 AM
o-Xylene	ND		1.0	µg/L	1	10/24/2023 01:11 AM
Toluene	ND		1.0	µg/L	1	10/24/2023 01:11 AM
Xylenes, Total	ND		3.0	µg/L	1	10/24/2023 01:11 AM
Surr: 1,2-Dichloroethane-d4	*101*		*80-120*	*%REC*	1	10/24/2023 01:11 AM
Surr: 4-Bromofluorobenzene	*105*		*80-120*	*%REC*	1	10/24/2023 01:11 AM
Surr: Dibromofluoromethane	*106*		*80-120*	*%REC*	1	10/24/2023 01:11 AM
Surr: Toluene-d8	*101*		*80-120*	*%REC*	1	10/24/2023 01:11 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Barr Engineering Co.
Project: Cerilon Phase II (34531123) **Work Order:** 23101278
Sample ID: SB-7 **Lab ID:** 23101278-10
Collection Date: 10/12/2023 09:55 AM **Matrix:** GROUNDWATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			**SW8015C**		Prep: SW3511 10/16/23 14:53	Analyst: **SJB**
DRO (C10-C20)	ND		0.10	mg/L	1	10/19/2023 12:48 AM
ORO (C20-C40)	ND		0.10	mg/L	1	10/19/2023 12:48 AM
Surr: 4-Terphenyl-d14	*32.0*	S	*44-111*	*%REC*	1	10/19/2023 12:48 AM
GASOLINE RANGE ORGANICS BY GC-FID			**SW8015C**			Analyst: **SJB**
GRO (C6-C10)	ND		200	µg/L	1	10/19/2023 08:24 PM
Surr: Toluene-d8	*103*		*77-116*	*%REC*	1	10/19/2023 08:24 PM
VOLATILE ORGANIC COMPOUNDS			**SW8260D**			Analyst: **EZH**
Benzene	ND		1.0	µg/L	1	10/24/2023 01:29 AM
Ethylbenzene	ND		1.0	µg/L	1	10/24/2023 01:29 AM
m,p-Xylene	ND		2.0	µg/L	1	10/24/2023 01:29 AM
o-Xylene	ND		1.0	µg/L	1	10/24/2023 01:29 AM
Toluene	ND		1.0	µg/L	1	10/24/2023 01:29 AM
Xylenes, Total	ND		3.0	µg/L	1	10/24/2023 01:29 AM
Surr: 1,2-Dichloroethane-d4	*107*		*80-120*	*%REC*	1	10/24/2023 01:29 AM
Surr: 4-Bromofluorobenzene	*104*		*80-120*	*%REC*	1	10/24/2023 01:29 AM
Surr: Dibromofluoromethane	*104*		*80-120*	*%REC*	1	10/24/2023 01:29 AM
Surr: Toluene-d8	*99.2*		*80-120*	*%REC*	1	10/24/2023 01:29 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Barr Engineering Co.
Project: Cerilon Phase II (34531123) **Work Order:** 23101278
Sample ID: Trip Blank **Lab ID:** 23101278-11
Collection Date: 10/11/2023 **Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
GASOLINE RANGE ORGANICS BY GC-FID			**SW8015C**	Prep: SW5035A 10/17/23 08:31		Analyst: **SJB**
GRO (C6-C10)	ND		5,000	µg/Kg-dry	1	10/18/2023 05:18 AM
Surr: Toluene-d8	*108*		*75-120*	*%REC*	1	10/18/2023 05:18 AM
GASOLINE RANGE ORGANICS BY GC-FID			**SW8015C**			Analyst: **SJB**
GRO (C6-C10)	ND		200	µg/L	1	10/19/2023 05:01 PM
Surr: Toluene-d8	*108*		*77-116*	*%REC*	1	10/19/2023 05:01 PM
VOLATILE ORGANIC COMPOUNDS			**SW8260D**	Prep: SW5035A 10/14/23 11:07		Analyst: **SBR**
Benzene	ND		30	µg/Kg-dry	1	10/26/2023 12:32 AM
Ethylbenzene	ND		30	µg/Kg-dry	1	10/26/2023 12:32 AM
m,p-Xylene	ND		60	µg/Kg-dry	1	10/26/2023 12:32 AM
o-Xylene	ND		30	µg/Kg-dry	1	10/26/2023 12:32 AM
Toluene	ND		30	µg/Kg-dry	1	10/26/2023 12:32 AM
Xylenes, Total	ND		90	µg/Kg-dry	1	10/26/2023 12:32 AM
Surr: 1,2-Dichloroethane-d4	*112*		*80-120*	*%REC*	1	10/26/2023 12:32 AM
Surr: 4-Bromofluorobenzene	*104*		*80-120*	*%REC*	1	10/26/2023 12:32 AM
Surr: Dibromofluoromethane	*101*		*80-120*	*%REC*	1	10/26/2023 12:32 AM
Surr: Toluene-d8	*103*		*80-120*	*%REC*	1	10/26/2023 12:32 AM
VOLATILE ORGANIC COMPOUNDS			**SW8260D**			Analyst: **EZH**
Benzene	ND		1.0	µg/L	1	10/23/2023 11:03 PM
Ethylbenzene	ND		1.0	µg/L	1	10/23/2023 11:03 PM
m,p-Xylene	ND		2.0	µg/L	1	10/23/2023 11:03 PM
o-Xylene	ND		1.0	µg/L	1	10/23/2023 11:03 PM
Toluene	ND		1.0	µg/L	1	10/23/2023 11:03 PM
Xylenes, Total	ND		3.0	µg/L	1	10/23/2023 11:03 PM
Surr: 1,2-Dichloroethane-d4	*103*		*80-120*	*%REC*	1	10/23/2023 11:03 PM
Surr: 4-Bromofluorobenzene	*107*		*80-120*	*%REC*	1	10/23/2023 11:03 PM
Surr: Dibromofluoromethane	*104*		*80-120*	*%REC*	1	10/23/2023 11:03 PM
Surr: Toluene-d8	*103*		*80-120*	*%REC*	1	10/23/2023 11:03 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Barr Engineering Co.
Project: Cerilon Phase II (34531123) **Work Order:** 23101278
Sample ID: Trip Blank **Lab ID:** 23101278-12
Collection Date: 10/11/2023 **Matrix:** WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
GASOLINE RANGE ORGANICS BY GC-FID			**SW8015C**	Prep: SW5035A 10/17/23 08:31		Analyst: **SJB**
GRO (C6-C10)	ND		5,000	µg/Kg-dry	1	10/18/2023 05:18 AM
Surr: Toluene-d8	*108*		*75-120*	*%REC*	1	10/18/2023 05:18 AM
GASOLINE RANGE ORGANICS BY GC-FID			**SW8015C**			Analyst: **SJB**
GRO (C6-C10)	ND		200	µg/L	1	10/19/2023 05:01 PM
Surr: Toluene-d8	*108*		*77-116*	*%REC*	1	10/19/2023 05:01 PM
VOLATILE ORGANIC COMPOUNDS			**SW8260D**	Prep: SW5035A 10/14/23 11:07		Analyst: **SBR**
Benzene	ND		30	µg/Kg-dry	1	10/26/2023 12:32 AM
Ethylbenzene	ND		30	µg/Kg-dry	1	10/26/2023 12:32 AM
m,p-Xylene	ND		60	µg/Kg-dry	1	10/26/2023 12:32 AM
o-Xylene	ND		30	µg/Kg-dry	1	10/26/2023 12:32 AM
Toluene	ND		30	µg/Kg-dry	1	10/26/2023 12:32 AM
Xylenes, Total	ND		90	µg/Kg-dry	1	10/26/2023 12:32 AM
Surr: 1,2-Dichloroethane-d4	*112*		*80-120*	*%REC*	1	10/26/2023 12:32 AM
Surr: 4-Bromofluorobenzene	*104*		*80-120*	*%REC*	1	10/26/2023 12:32 AM
Surr: Dibromofluoromethane	*101*		*80-120*	*%REC*	1	10/26/2023 12:32 AM
Surr: Toluene-d8	*103*		*80-120*	*%REC*	1	10/26/2023 12:32 AM
VOLATILE ORGANIC COMPOUNDS			**SW8260D**			Analyst: **EZH**
Benzene	ND		1.0	µg/L	1	10/23/2023 11:03 PM
Ethylbenzene	ND		1.0	µg/L	1	10/23/2023 11:03 PM
m,p-Xylene	ND		2.0	µg/L	1	10/23/2023 11:03 PM
o-Xylene	ND		1.0	µg/L	1	10/23/2023 11:03 PM
Toluene	ND		1.0	µg/L	1	10/23/2023 11:03 PM
Xylenes, Total	ND		3.0	µg/L	1	10/23/2023 11:03 PM
Surr: 1,2-Dichloroethane-d4	*103*		*80-120*	*%REC*	1	10/23/2023 11:03 PM
Surr: 4-Bromofluorobenzene	*107*		*80-120*	*%REC*	1	10/23/2023 11:03 PM
Surr: Dibromofluoromethane	*104*		*80-120*	*%REC*	1	10/23/2023 11:03 PM
Surr: Toluene-d8	*103*		*80-120*	*%REC*	1	10/23/2023 11:03 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 26-Oct-23

Client: Barr Engineering Co.

Work Order: 23101278

Project: Cerilon Phase II (34531123)

QC BATCH REPORT

Batch ID: **227363** Instrument ID **GC8** Method: **SW8015C**

MBLK Sample ID: **DBLKW1-227363-227363** Units: **mg/L** Analysis Date: **10/17/2023 05:34 PM**

Client ID: Run ID: **GC8_231016B** SeqNo: **10099700** Prep Date: **10/16/2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	ND	0.10								
ORO (C20-C40)	ND	0.10								
Surr: 4-Terphenyl-d14	*0.0315*	0	*0.0417*	0	*75.5*	*44-111*	0			

LCS Sample ID: **DLCSW1-227363-227363** Units: **mg/L** Analysis Date: **10/17/2023 06:48 PM**

Client ID: Run ID: **GC8_231016B** SeqNo: **10099702** Prep Date: **10/16/2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	3.265	0.10	4.17	0	78.3	72-126	0			
ORO (C20-C40)	3.714	0.10	4.17	0	89.1	68-125	0			
Surr: 4-Terphenyl-d14	*0.02617*	0	*0.0417*	0	*62.7*	*44-111*	0			

LCSD Sample ID: **DLCSDW1-227363-227363** Units: **mg/L** Analysis Date: **10/17/2023 07:25 PM**

Client ID: Run ID: **GC8_231016B** SeqNo: **10099703** Prep Date: **10/16/2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	3.559	0.10	4.17	0	85.3	72-126	3.265	8.61	20	
ORO (C20-C40)	3.941	0.10	4.17	0	94.5	68-125	3.714	5.93	20	
Surr: 4-Terphenyl-d14	*0.03383*	0	*0.0417*	0	*81.1*	*44-111*	0.02617	*25.6*	*20*	*R*

The following samples were analyzed in this batch: 23101278-09A 23101278-10A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Barr Engineering Co.
Work Order: 23101278
Project: Cerilon Phase II (34531123)

QC BATCH REPORT

Batch ID: **227465** Instrument ID **GC8** Method: **SW8015C**

MBLK Sample ID: **DBLKS1-227465-227465** Units: **mg/Kg** Analysis Date: **10/17/2023 08:40 PM**
Client ID: Run ID: **GC8_231016C** SeqNo: **10100797** Prep Date: **10/17/2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	ND	10								
ORO (C20-C34)	ND	10								
Surr: 4-Terphenyl-d14	*2.476*	0	*3.33*	0	*74.4*	*41-102*	0			

LCS Sample ID: **DLCSS1-227465-227465** Units: **mg/Kg** Analysis Date: **10/17/2023 09:17 PM**
Client ID: Run ID: **GC8_231016C** SeqNo: **10100798** Prep Date: **10/17/2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	341.9	10	333	0	103	59-126	0			
ORO (C20-C34)	326.9	10	333	0	98.2	67.8-120	0			
Surr: 4-Terphenyl-d14	*2.509*	0	*3.33*	0	*75.4*	*41-102*	0			

MS Sample ID: **23101278-03A MS** Units: **mg/Kg** Analysis Date: **10/18/2023 01:37 AM**
Client ID: **SB-3** Run ID: **GC8_231016C** SeqNo: **10100805** Prep Date: **10/17/2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	327	9.8	325.5	0	100	59-126	0			
ORO (C20-C34)	316.3	9.8	325.5	2.866	96.3	67.8-120	0			
Surr: 4-Terphenyl-d14	*2.4*	0	*3.255*	0	*73.7*	*41-102*	0			

MSD Sample ID: **23101278-03A MSD** Units: **mg/Kg** Analysis Date: **10/18/2023 02:14 AM**
Client ID: **SB-3** Run ID: **GC8_231016C** SeqNo: **10100806** Prep Date: **10/17/2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C20)	328.3	9.9	331.2	0	99.1	59-126	327	0.394	30	
ORO (C20-C34)	321.1	9.9	331.2	2.866	96.1	67.8-120	316.3	1.5	30	
Surr: 4-Terphenyl-d14	*2.482*	0	*3.312*	0	*74.9*	*41-102*	2.4	*3.37*	*30*	

The following samples were analyzed in this batch:

23101278-01A	23101278-02A	23101278-03A
23101278-04A	23101278-05A	23101278-06A
23101278-07A	23101278-08A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Barr Engineering Co.
Work Order: 23101278
Project: Cerilon Phase II (34531123)

QC BATCH REPORT

Batch ID: **227332** Instrument ID **GC9** Method: **SW8015C**

MBLK Sample ID: **MBLK-227332-227332** Units: **µg/Kg-dry** Analysis Date: **10/18/2023 01:56 PM**
Client ID: Run ID: **GC9_231017A** SeqNo: **10102974** Prep Date: **10/14/2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	ND	5,000	0	0	0		0			
Surr: Toluene-d8	*5336*	0	*5000*	0	*107*	*75-120*	0			

LCS Sample ID: **LCS-227332-227332** Units: **µg/Kg-dry** Analysis Date: **10/18/2023 03:04 AM**
Client ID: Run ID: **GC9_231017A** SeqNo: **10102960** Prep Date: **10/14/2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	252000	5,000	250000	0	101	63-126	0			
Surr: Toluene-d8	*5826*	0	*5000*	0	*117*	*75-120*	0			

MS Sample ID: **23101278-02B MS** Units: **µg/Kg-dry** Analysis Date: **10/18/2023 06:26 AM**
Client ID: **SB-2** Run ID: **GC9_231017A** SeqNo: **10102969** Prep Date: **10/14/2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	372700	7,100	354700	0	105	63-126	0			
Surr: Toluene-d8	*7885*	0	*7093*	0	*111*	*75-120*	0			

MSD Sample ID: **23101278-02B MSD** Units: **µg/Kg-dry** Analysis Date: **10/18/2023 06:48 AM**
Client ID: **SB-2** Run ID: **GC9_231017A** SeqNo: **10102970** Prep Date: **10/14/2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	365600	7,100	354700	0	103	63-126	372700	1.93	30	
Surr: Toluene-d8	*7939*	0	*7093*	0	*112*	*75-120*	7885	*0.672*	*30*	

The following samples were analyzed in this batch: 23101278-01B 23101278-02B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Barr Engineering Co.
Work Order: 23101278
Project: Cerilon Phase II (34531123)

QC BATCH REPORT

Batch ID: **227440** Instrument ID **GC9** Method: **SW8015C**

MBLK Sample ID: **MBLK-227440-227440** Units: **µg/Kg-dry** Analysis Date: **10/17/2023 11:18 PM**
Client ID: Run ID: **GC9_231017A** SeqNo: **10102950** Prep Date: **10/17/2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	ND	5,000								
Surr: Toluene-d8	*5079*	0	*5000*	0	*102*	*75-120*	0			

LCS Sample ID: **LCS-227440-227440** Units: **µg/Kg-dry** Analysis Date: **10/17/2023 10:33 PM**
Client ID: Run ID: **GC9_231017A** SeqNo: **10102949** Prep Date: **10/17/2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	241600	5,000	250000	0	96.6	63-126	0			
Surr: Toluene-d8	*5466*	0	*5000*	0	*109*	*75-120*	0			

MS Sample ID: **23101278-08B MS** Units: **µg/Kg-dry** Analysis Date: **10/18/2023 01:56 AM**
Client ID: **SB-8** Run ID: **GC9_231017A** SeqNo: **10102957** Prep Date: **10/17/2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	386000	6,800	342000	0	113	63-126	0			
Surr: Toluene-d8	*7676*	0	*6840*	0	*112*	*75-120*	0			

MSD Sample ID: **23101278-08B MSD** Units: **µg/Kg-dry** Analysis Date: **10/18/2023 02:19 AM**
Client ID: **SB-8** Run ID: **GC9_231017A** SeqNo: **10102958** Prep Date: **10/17/2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	437200	6,800	342000	0	128	63-126	386000	12.4	30	S
Surr: Toluene-d8	*7934*	0	*6840*	0	*116*	*75-120*	7676	*3.3*	*30*	

The following samples were analyzed in this batch:

23101278-03B	23101278-04B	23101278-05B
23101278-06B	23101278-07B	23101278-08B
23101278-11A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Barr Engineering Co.
Work Order: 23101278
Project: Cerilon Phase II (34531123)

QC BATCH REPORT

Batch ID: **R386091** Instrument ID **GC9** Method: **SW8015C**

MBLK Sample ID: **9G-BLKW1-231017-R386091** Units: **µg/L** Analysis Date: **10/19/2023 02:23 PM**
Client ID: Run ID: **GC9_231017B** SeqNo: **10111022** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	ND	200								
Surr: Toluene-d8	*106.6*	0	*100*	0	*107*	*77-116*	0			

LCS Sample ID: **9G-LCSW1-231017-R386091** Units: **µg/L** Analysis Date: **10/19/2023 01:38 PM**
Client ID: Run ID: **GC9_231017B** SeqNo: **10111021** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	4549	200	5000	0	91	71-130	0			
Surr: Toluene-d8	*110.6*	0	*100*	0	*111*	*77-116*	0			

MS Sample ID: **23101209-05B MS** Units: **µg/L** Analysis Date: **10/19/2023 09:32 PM**
Client ID: Run ID: **GC9_231017B** SeqNo: **10111041** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	4668	200	5000	0	93.4	71-130	0			
Surr: Toluene-d8	*110.7*	0	*100*	0	*111*	*77-116*	0			

DUP Sample ID: **23101209-02B DUP** Units: **µg/L** Analysis Date: **10/19/2023 09:09 PM**
Client ID: Run ID: **GC9_231017B** SeqNo: **10111040** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	ND	200	0	0	0		0	0	30	
Surr: Toluene-d8	*108.2*	0	*100*	0	*108*	*77-116*	109.2	*0.874*	*30*	

The following samples were analyzed in this batch: 23101278-09B 23101278-10B 23101278-12A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Barr Engineering Co.
Work Order: 23101278
Project: Cerilon Phase II (34531123)

QC BATCH REPORT

Batch ID: **227333** Instrument ID **VMS10** Method: **SW8260D**

MBLK Sample ID: **MBLK-227333-227333** Units: **µg/Kg-dry** Analysis Date: **10/24/2023 05:55 AM**
Client ID: Run ID: **VMS10_231023B** SeqNo: **10122237** Prep Date: **10/14/2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	ND	30								
Ethylbenzene	ND	30								
m,p-Xylene	ND	60								
o-Xylene	ND	30								
Toluene	ND	30								
Xylenes, Total	ND	90								
Surr: 1,2-Dichloroethane-d4	*990*	0	*1000*	0	*99*	*80-120*	0			
Surr: 4-Bromofluorobenzene	*988.5*	0	*1000*	0	*98.8*	*80-120*	0			
Surr: Dibromofluoromethane	*914*	0	*1000*	0	*91.4*	*80-120*	0			
Surr: Toluene-d8	*1004*	0	*1000*	0	*100*	*80-120*	0			

LCS Sample ID: **LCS-227333-227333** Units: **µg/Kg-dry** Analysis Date: **10/24/2023 04:45 AM**
Client ID: Run ID: **VMS10_231023B** SeqNo: **10122234** Prep Date: **10/14/2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	933	30	1000	0	93.3	78-122	0			
Ethylbenzene	958	30	1000	0	95.8	75-121	0			
m,p-Xylene	1904	60	2000	0	95.2	67-129	0			
o-Xylene	972	30	1000	0	97.2	75-120	0			
Toluene	941	30	1000	0	94.1	76-120	0			
Xylenes, Total	2876	90	3000	0	95.9	67-129	0			
Surr: 1,2-Dichloroethane-d4	*977*	0	*1000*	0	*97.7*	*80-120*	0			
Surr: 4-Bromofluorobenzene	*1048*	0	*1000*	0	*105*	*80-120*	0			
Surr: Dibromofluoromethane	*1000*	0	*1000*	0	*100*	*80-120*	0			
Surr: Toluene-d8	*994*	0	*1000*	0	*99.4*	*80-120*	0			

MS Sample ID: **23101278-03B MS** Units: **µg/Kg-dry** Analysis Date: **10/24/2023 10:33 AM**
Client ID: **SB-3** Run ID: **VMS10_231023B** SeqNo: **10122252** Prep Date: **10/14/2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	1418	43	1442	0	98.3	78-122	0			
Ethylbenzene	1349	43	1442	0	93.5	75-121	0			
m,p-Xylene	2685	87	2884	0	93.1	67-129	0			
o-Xylene	1411	43	1442	0	97.8	75-120	0			
Toluene	1330	43	1442	0	92.2	76-120	0			
Xylenes, Total	4095	130	4327	0	94.7	67-129	0			
Surr: 1,2-Dichloroethane-d4	*1442*	0	*1442*	0	*100*	*80-120*	0			
Surr: 4-Bromofluorobenzene	*1474*	0	*1442*	0	*102*	*80-120*	0			
Surr: Dibromofluoromethane	*1454*	0	*1442*	0	*101*	*80-120*	0			
Surr: Toluene-d8	*1374*	0	*1442*	0	*95.3*	*80-120*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Barr Engineering Co.
Work Order: 23101278
Project: Cerilon Phase II (34531123)

QC BATCH REPORT

Batch ID: **227333** Instrument ID **VMS10** Method: **SW8260D**

MSD Sample ID: **23101278-03B MSD** Units: **µg/Kg-dry** Analysis Date: **10/24/2023 10:50 AM**

Client ID: **SB-3** Run ID: **VMS10_231023B** SeqNo: **10122253** Prep Date: **10/14/2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	1449	43	1442	0	100	78-122	1418	2.11	30	
Ethylbenzene	1439	43	1442	0	99.8	75-121	1349	6.46	30	
m,p-Xylene	2932	87	2884	0	102	67-129	2685	8.81	30	
o-Xylene	1505	43	1442	0	104	75-120	1411	6.48	30	
Toluene	1429	43	1442	0	99.1	76-120	1330	7.11	30	
Xylenes, Total	4437	130	4327	0	103	67-129	4095	8.01	30	
Surr: 1,2-Dichloroethane-d4	*1413*	0	*1442*	0	*98*	*80-120*	1442	*2.02*	*30*	
Surr: 4-Bromofluorobenzene	*1512*	0	*1442*	0	*105*	*80-120*	1474	*2.56*	*30*	
Surr: Dibromofluoromethane	*1382*	0	*1442*	0	*95.8*	*80-120*	1454	*5.14*	*30*	
Surr: Toluene-d8	*1416*	0	*1442*	0	*98.2*	*80-120*	1374	*2.95*	*30*	

The following samples were analyzed in this batch:

23101278-03B	23101278-04B	23101278-05B
23101278-06B	23101278-07B	23101278-08B
23101278-11A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Barr Engineering Co.
Work Order: 23101278
Project: Cerilon Phase II (34531123)

QC BATCH REPORT

Batch ID: **227485** Instrument ID **VMS10** Method: **SW8260D**

MBLK Sample ID: **MBLK-227485-227485** Units: **µg/Kg-dry** Analysis Date: **10/19/2023 06:13 AM**
Client ID: Run ID: **VMS10_231018B** SeqNo: **10105718** Prep Date: **10/17/2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	ND	30	0	0	0	0-0	0			
Ethylbenzene	ND	30	0	0	0	0-0	0			
m,p-Xylene	ND	60	0	0	0	0-0	0			
o-Xylene	ND	30	0	0	0	0-0	0			
Toluene	ND	30	0	0	0	0-0	0			
Xylenes, Total	ND	90	0	0	0	0-0	0			
Surr: 1,2-Dichloroethane-d4	*1082*	0	*1000*	0	*108*	*80-120*	0			
Surr: 4-Bromofluorobenzene	*1004*	0	*1000*	0	*100*	*80-120*	0			
Surr: Dibromofluoromethane	*947*	0	*1000*	0	*94.7*	*80-120*	0			
Surr: Toluene-d8	*994*	0	*1000*	0	*99.4*	*80-120*	0			

LCS Sample ID: **LCS-227485-227485** Units: **µg/Kg-dry** Analysis Date: **10/19/2023 05:03 AM**
Client ID: Run ID: **VMS10_231018B** SeqNo: **10105715** Prep Date: **10/17/2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	1154	30	1000	0	115	78-122	0			
Ethylbenzene	1046	30	1000	0	105	75-121	0			
m,p-Xylene	2116	60	2000	0	106	67-129	0			
o-Xylene	1082	30	1000	0	108	75-120	0			
Toluene	1102	30	1000	0	110	76-120	0			
Xylenes, Total	3198	90	3000	0	107	67-129	0			
Surr: 1,2-Dichloroethane-d4	*1058*	0	*1000*	0	*106*	*80-120*	0			
Surr: 4-Bromofluorobenzene	*1025*	0	*1000*	0	*102*	*80-120*	0			
Surr: Dibromofluoromethane	*1041*	0	*1000*	0	*104*	*80-120*	0			
Surr: Toluene-d8	*1024*	0	*1000*	0	*102*	*80-120*	0			

MS Sample ID: **23101453-02C MS** Units: **µg/Kg-dry** Analysis Date: **10/19/2023 10:16 AM**
Client ID: Run ID: **VMS10_231018B** SeqNo: **10105732** Prep Date: **10/17/2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	1205	32	1056	0	114	78-122	0			
Ethylbenzene	1098	32	1056	193.8	85.6	75-121	0			
m,p-Xylene	2272	63	2113	1002	60.1	67-129	0			S
o-Xylene	1169	32	1056	289.4	83.3	75-120	0			
Toluene	1154	32	1056	0	109	76-120	0			
Xylenes, Total	3441	95	3169	1290	67.9	67-129	0			
Surr: 1,2-Dichloroethane-d4	*1102*	0	*1056*	0	*104*	*80-120*	0			
Surr: 4-Bromofluorobenzene	*1281*	0	*1056*	0	*121*	*80-120*	0			*S*
Surr: Dibromofluoromethane	*1016*	0	*1056*	0	*96.2*	*80-120*	0			
Surr: Toluene-d8	*1061*	0	*1056*	0	*100*	*80-120*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Barr Engineering Co.
Work Order: 23101278
Project: Cerilon Phase II (34531123)

QC BATCH REPORT

Batch ID: **227485** Instrument ID **VMS10** Method: **SW8260D**

MSD Sample ID: **23101453-02C MSD** Units: **µg/Kg-dry** Analysis Date: **10/19/2023 10:34 AM**

Client ID: Run ID: **VMS10_231018B** SeqNo: **10105733** Prep Date: **10/17/2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	1240	32	1056	0	117	78-122	1205	2.89	30	
Ethylbenzene	1131	32	1056	193.8	88.8	75-121	1098	2.99	30	
m,p-Xylene	2355	63	2113	1002	64	67-129	2272	3.58	30	S
o-Xylene	1204	32	1056	289.4	86.6	75-120	1169	2.94	30	
Toluene	1173	32	1056	0	111	76-120	1154	1.68	30	
Xylenes, Total	3559	95	3169	1290	71.6	67-129	3441	3.37	30	
Surr: 1,2-Dichloroethane-d4	*1131*	0	*1056*	0	*107*	*80-120*	1102	*2.6*	*30*	
Surr: 4-Bromofluorobenzene	*1264*	0	*1056*	0	*120*	*80-120*	1281	*1.33*	*30*	
Surr: Dibromofluoromethane	*1096*	0	*1056*	0	*104*	*80-120*	1016	*7.55*	*30*	
Surr: Toluene-d8	*1062*	0	*1056*	0	*101*	*80-120*	1061	*0.149*	*30*	

The following samples were analyzed in this batch: 23101278-01B 23101278-02B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Barr Engineering Co.
Work Order: 23101278
Project: Cerilon Phase II (34531123)

QC BATCH REPORT

Batch ID: **R386301** Instrument ID **VMS8** Method: **SW8260D**

MBLK Sample ID: **8V-BLKW2-231023-R386301** Units: **µg/L** Analysis Date: **10/23/2023 10:27 PM**
Client ID: Run ID: **VMS8_231023A** SeqNo: **10120084** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	ND	1.0								
Ethylbenzene	ND	1.0								
m,p-Xylene	ND	2.0								
o-Xylene	ND	1.0								
Toluene	ND	1.0								
Xylenes, Total	ND	3.0								
Surr: 1,2-Dichloroethane-d4	*19.83*	0	*20*	0	*99.2*	*80-120*	0			
Surr: 4-Bromofluorobenzene	*19.93*	0	*20*	0	*99.6*	*80-120*	0			
Surr: Dibromofluoromethane	*20.85*	0	*20*	0	*104*	*80-120*	0			
Surr: Toluene-d8	*20.21*	0	*20*	0	*101*	*80-120*	0			

LCS Sample ID: **8V-LCSW2-231023-R386301** Units: **µg/L** Analysis Date: **10/23/2023 09:32 PM**
Client ID: Run ID: **VMS8_231023A** SeqNo: **10120082** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	21.98	1.0	20	0	110	78-120	0			
Ethylbenzene	20.84	1.0	20	0	104	76-116	0			
m,p-Xylene	43.1	2.0	40	0	108	76-119	0			
o-Xylene	21.76	1.0	20	0	109	77-116	0			
Toluene	20.83	1.0	20	0	104	78-116	0			
Xylenes, Total	64.86	3.0	60	0	108	77-119	0			
Surr: 1,2-Dichloroethane-d4	*19.81*	0	*20*	0	*99*	*80-120*	0			
Surr: 4-Bromofluorobenzene	*20.03*	0	*20*	0	*100*	*80-120*	0			
Surr: Dibromofluoromethane	*20.73*	0	*20*	0	*104*	*80-120*	0			
Surr: Toluene-d8	*20.28*	0	*20*	0	*101*	*80-120*	0			

MS Sample ID: **23101278-10B MS** Units: **µg/L** Analysis Date: **10/24/2023 05:23 AM**
Client ID: **SB-7** Run ID: **VMS8_231023A** SeqNo: **10120131** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	20.59	1.0	20	0	103	78-120	0			
Ethylbenzene	19.97	1.0	20	0	99.8	76-116	0			
m,p-Xylene	40.44	2.0	40	0	101	76-119	0			
o-Xylene	19.86	1.0	20	0	99.3	77-116	0			
Toluene	19.96	1.0	20	0	99.8	78-116	0			
Xylenes, Total	60.3	3.0	60	0	100	77-119	0			
Surr: 1,2-Dichloroethane-d4	*19.45*	0	*20*	0	*97.2*	*80-120*	0			
Surr: 4-Bromofluorobenzene	*20.77*	0	*20*	0	*104*	*80-120*	0			
Surr: Dibromofluoromethane	*20.59*	0	*20*	0	*103*	*80-120*	0			
Surr: Toluene-d8	*20.38*	0	*20*	0	*102*	*80-120*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Barr Engineering Co.
Work Order: 23101278
Project: Cerilon Phase II (34531123)

QC BATCH REPORT

Batch ID: **R386301** Instrument ID **VMS8** Method: **SW8260D**

DUP Sample ID: **23101278-09B DUP** Units: **µg/L** Analysis Date: **10/24/2023 05:05 AM**

Client ID: **SB-6** Run ID: **VMS8_231023A** SeqNo: **10120129** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	ND	1.0	0	0	0		0	0	30	
Ethylbenzene	ND	1.0	0	0	0		0	0	30	
m,p-Xylene	1.85	2.0	0	0	0		0	0	30	J
o-Xylene	ND	1.0	0	0	0		0	0	30	
Toluene	ND	1.0	0	0	0		0	0	30	
Xylenes, Total	1.85	3.0	0	0	0		0	0	30	J
Surr: 1,2-Dichloroethane-d4	*20.52*	0	*20*	0	*103*	*80-120*	20.15	*1.82*	*30*	
Surr: 4-Bromofluorobenzene	*20.82*	0	*20*	0	*104*	*80-120*	21.06	*1.15*	*30*	
Surr: Dibromofluoromethane	*20.5*	0	*20*	0	*102*	*80-120*	21.16	*3.17*	*30*	
Surr: Toluene-d8	*20.5*	0	*20*	0	*102*	*80-120*	20.18	*1.57*	*30*	

The following samples were analyzed in this batch: 23101278-09B 23101278-10B 23101278-12A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Barr Engineering Co.
Work Order: 23101278
Project: Cerilon Phase II (34531123)

QC BATCH REPORT

Batch ID: **R385785** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R385785** Units: **% of sample** Analysis Date: **10/16/2023 02:07 PM**
Client ID: Run ID: **MOIST_231016C** SeqNo: **10094593** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.10								

LCS Sample ID: **LCS-R385785** Units: **% of sample** Analysis Date: **10/16/2023 02:07 PM**
Client ID: Run ID: **MOIST_231016C** SeqNo: **10094592** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	99.98	0.10	100	0	100	98-102	0			

DUP Sample ID: **23101272-01C DUP** Units: **% of sample** Analysis Date: **10/16/2023 02:07 PM**
Client ID: Run ID: **MOIST_231016C** SeqNo: **10094572** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	17.14	0.10	0	0	0	0-0	16.86	1.65	10	

DUP Sample ID: **23101278-01A DUP** Units: **% of sample** Analysis Date: **10/16/2023 02:07 PM**
Client ID: **SB-1** Run ID: **MOIST_231016C** SeqNo: **10094574** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	13.61	0.10	0	0	0	0-0	13.19	3.13	10	

The following samples were analyzed in this batch:

23101278-01A	23101278-02A	23101278-03A
23101278-04A	23101278-05A	23101278-06A
23101278-07A	23101278-08A	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Barr Engineering Co. Chain of Custody

23101278
BARRENG-MN: Barr Engineering Company
Project: xxx

COC Number: № 596068
COC 1 of 1

Sample Origination State
☐ CO ☐ MI ☐ MN ☐ MO ☒ ND ☐ NV ☐ TX ☐ UT ☐ WI ☐ WY ☐

REPORT TO	INVOICE TO
Company: Barr Engineering Co.	Company: SAME
Address: 234W Century Ave	Address:
Address: Bismarck ND 58503	Address:
Name: James Taraldson	Name:
email: JTaraldson@barr.com	email:
Copy to: BarrDM@barr.com	P.O.
Project Name: Cerilon Phase II	Barr Project No: 34531123

Matrix Code: GW = Groundwater; SW = Surface Water; DW = Drinking Water; PW = Pore Water; WW = Waste Water; WQ = TB, FB, EB, etc.; W = Unspecified; S = Soil/Solid; SD = Sediment; SQ = MeOH blank; OTH = Other (Oil, etc.)

Preservative Code: A = None; B = HCl; C = HNO_3; D = H_2SO_4; E = NaOH; F = MeOH; G = $NaHSO_4$; H = $Na_2S_2O_3$; I = Ascorbic Acid; J = Zn Acetate; K = Other

№	Location	Sample Depth Start	Stop	Unit (m./ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix Code	Perform MS/MSD Y / N	Total Number Of Containers	125mL amber A	40mL VOA B	4 oz glass jar A	40 mL VOA F	% Solids	Preservative Code	Field Filtered Y/N	Analyte
1.	SB-1	0	2	ft	10/11/2023	1010	S	N	3			1	2				Analyze for in Soil:
2.	SB-2	0	2	ft	10/11/2023	1125	S	N	3			1	2				TPH as GRO, DRO, ORO and BTEX
3.	SB-3	0	2	ft	10/11/2023	1230	S	N	3			1	2				
4.	SB-4	0	2	ft	10/11/2023	1345	S	N	3			1	2				Analyze for in Water:
5.	SB-5	0	2	ft	10/11/2023	1520	S	N	3			1	2				TPH as GRO, DRO, ORO, and BTEX
6.	SB-6	0	2	ft	10/11/2023	1620	S	N	3			1	2				
7.	SB-7	0	2	ft	10/12/2023	0920	S	N	3			1	2				
8.	SB-8	0	2	ft	10/12/2023	1115	S	N	3			1	2				
9.	SB-6	—	—		10/11/2023	1705	GW	N	8	2	6						Contact James Taraldson with any questions.
10.	SB-7	—	—		10/12/2023	0955	GW	N	8	2	6						

BARR USE ONLY		Relinquished by:	On Ice?	Date	Time	Received by:	Date	Time
Sampled by:	ALN		Y N	10-12-23	1600	Fedex		
Barr Proj. Manager:	AMG4	Relinquished by: Fedex	Y N	10/13/23	0930	Received by: Karlyegalilauski	10/13/23	0930
Barr DQ Manager:	JET	Samples Shipped VIA: ☐ Ground Courier ☐ Air Carrier ☐ Sampler ☐ Other: Fedex				Air Bill Number:		
Lab Name:	ALS						Requested Due Date: ☒ Standard Turn Around Time ☐ Rush (mm/dd/yyyy)	
Lab Location:	Holland, MI	Lab WO: IA3	Temperature on Receipt (°C): 2.0			Custody Seal Intact? ☐ Y ☐ N ☐ None		

Distribution - **White-Original:** Accompanies Shipment to Laboratory; **Yellow Copy:** Include in Field Documents; **Scan and email:** a copy to BarrDM@barr.com for tracking and filing procedures

H:RLG\STDFORMS\Chain of Custody Form 2022 RLG Rev. 10/14/2021

ALS Group, USA
Holland, Michigan

Sample Receipt Checklist

Client Name: **BARRENG - ND** Date/Time Received: **13-Oct-23 09:30**

Work Order: **23101278** Received by: **KYB**

Checklist completed by Karly Yablonski (eSignature) 13-Oct-23 (Date) Reviewed by: Jodi Blouw (eSignature) 16-Oct-23 (Date)

Matrices: Soil/Water
Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Sample(s) received on ice?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	2.9/3.9C	IR3	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	10/13/2023 3:20:46 PM		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

Cerilon Facility

Traffic Impact Study

Trenton, North Dakota

BOLTON & MENK

Real People. Real Solutions.

Prepared for:

Barr Engineering Co.

Traffic Impact Study

for

Cerilon Facility

Trenton, ND

May 2024

PROFESSIONAL ENGINEER

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision, and that I am a duly Licensed Professional Engineer under the laws of the State of North Dakota.

Typed or Printed Name: Kevin D. Mackey

Date: 5/2/2024 License Number: PE-40412

Prepared By: AGW

Reviewed By: JTR/KDM

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APPENDIX

MEMORANDUM

Date: May 2, 2024

To: North Dakota Department of Transportation

From: Kevin Mackey PE, PTOE, Bolton & Menk, Inc.

Josh Reinke PE, Bolton & Menk, Inc.

Subject: Cerilon Facility - Traffic Impact Study
Trenton, ND
Project No.: 0T4.M00231

I hereby certify that this report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of North Dakota.

By: Kevin Mackey PE, PTOE

License No. PE - 40412

Date: May 2, 2024

Introduction

This report presents the findings of the Traffic Impact Study (TIS) conducted for the proposed Cerilon GTL North Dakota Project (the Project) to be located in the northwest quadrant of the intersection of 42nd Street NW and 147th Avenue NW in Trenton, ND. The purpose of this study is to determine the potential impacts to the surrounding transportation system created by daily operations (Daytime Staff, Nighttime Staff, Contractors, and Trucks) traffic generated by the Project, as well as recommend improvements to mitigate these impacts. Additionally, this study analyzes the proposed access spacing and sight distance based on the North Dakota Department of Transportation (NDDOT) Traffic Operations Manual guidelines. This TIS follows guidance from the NDDOT Traffic Operations Manual.

Project Details

The Project includes two identical gas-to-liquid (GTL) facilities on a single 370 acre site. Each GTL facility will convert 240 million standard cubic feet of natural gas per day to 24,000 barrels per day (bpd) of liquid hydrocarbon products; specifically, lubricant base oils, ultra-low sulfur diesel (ULSD) and naphtha. The two GTL facilities will be constructed in separate phases, hereby referred to as Phase 1 and Phase 2 anticipated to be completed and operational in 2028 and 2032, respectively. For analysis purposes, Full Build (2032) conditions consists of Phase 1 and Phase 2 of the Project fully built-out.

Cerilon provided information regarding shifts, staff, contractors, and trucks proposed for each phase of the Project. The information is summarized on the following page.

Phase 1:

- 143 Daytime Staff
- 22 Nighttime Staff
- 50 Contractors
- 4 Daily Site Delivery Trucks via Proposed Delivery Driveway along 42nd Street NW
- 76 Daily Savage Tanker Trucks via Savage Services (these utilize the existing Savage Services Driveway along 42nd Street NW – see below for more information)

Full Build (Phase 1 and Phase 2):

- 87 Daytime Staff (in addition to Phase 1)
- 7 Nighttime Staff (in addition to Phase 1)
- 40 Contractors (in addition to Phase 1)
- 4 Daily Site Delivery Trucks via Proposed Delivery Driveway along 42nd Street NW (in addition to Phase 1)
- 76 Daily Savage Tanker Trucks via Savage Services (in addition to Phase 1) - (these utilize the existing Savage Services Driveway along 42nd Street NW – see below for more information)

Access to the site is proposed via the following:

- One (1) full movement Main Driveway along 42nd Street NW
- One (1) full movement Delivery Driveway along 42nd Street NW
- One (1) full movement East Driveway along 147th Avenue NW

The Savage Bakken Petroleum Services Hub (Savage) is an existing petroleum bulk storage terminal adjacent to the west side of the Project site that transloads petroleum liquids between railcars and tanker trucks. Savage operates five large petroleum storage tanks, a rail loop, and ten rail spurs to facilitate its transloading activities.

Cerilon and Savage are actively evaluating a commercial arrangement wherein Savage constructs and operates tankage for Cerilon's final products on Savage's property. Savage's existing railroad connection and liquid loading racks provide feasible means of delivering finished products without permitting and construction additional, similar infrastructure on the Project site. It is anticipated that Savage will permit, construct, own, and operate the storage tanks used to store the Project's finished products, as well as any new rail and truck loading infrastructure that is required.

All of the site generated Tanker Trucks are expected to be handled via Savage Services (west of the Project) and utilize the existing Savage Services Driveway along 42nd Street NW. Cerilon intends to require daily operations (Daytime Staff, Nighttime Staff, Contractors, and Trucks) traffic generated by this site to use the Connector Street to access the proposed driveways along 42nd Street NW to access the site. Daily operations traffic generated by the site will not be permitted to utilize 147th Avenue NW along ND 1804 to access the site due to safety concerns for traffic turning onto 147th Avenue NW and traveling through the railroad crossing.

The Proposed East Driveway will typically not be used during operations. This driveway will be used during construction, as an emergency site exit and for some contractor access during plant turnarounds. Therefore, the Proposed East Driveway was not analyzed under Opening Day (2028/2032) and Future (2043) conditions defined below, as the limited number of vehicles using this driveway during daily operations will be random and likely not be constrained to arriving during peak time periods; however, a sight distance evaluation was conducted to indicate any safety concerns. Refer to **Figure A** for the site location map.

Scope of Traffic Analysis

This study analyzes traffic conditions during the weekday AM and PM peak hours for the following scenarios:

- Opening Day Conditions – Phase 1 (2028)
- Opening Day Conditions – Full Build (2032)
- Future Traffic Conditions (2043)

Existing (2023) and No-Build (2028/2032) conditions were not analyzed in this study due to the minimal growth and impacts in the area. The roadways intersecting with ND 1804 in the study area are currently very low volume roads (380 Average Daily Traffic [ADT] on the Connector Street to 149th Avenue NW and 126 ADT on 147th Avenue NW / 44th Lane NW); therefore, there is very little potential for traffic flow issues. The 13-hour turning movement data collected in December 2023 was utilized to estimate ADT on the low volume roads discussed above. It was assumed the 13-hour traffic count data accounts for 85% of the average daily traffic.

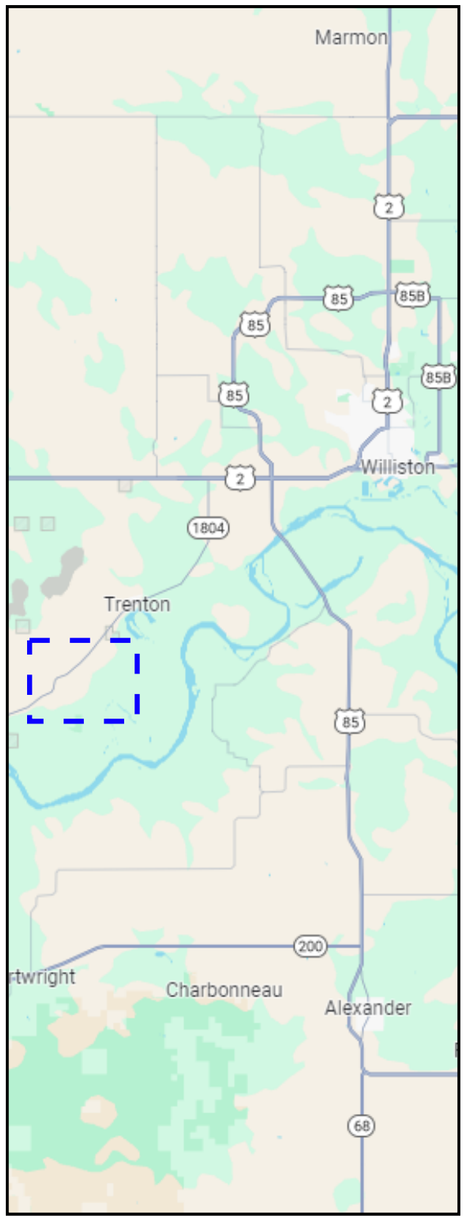
The study area for the TIS consists of the following existing intersections:

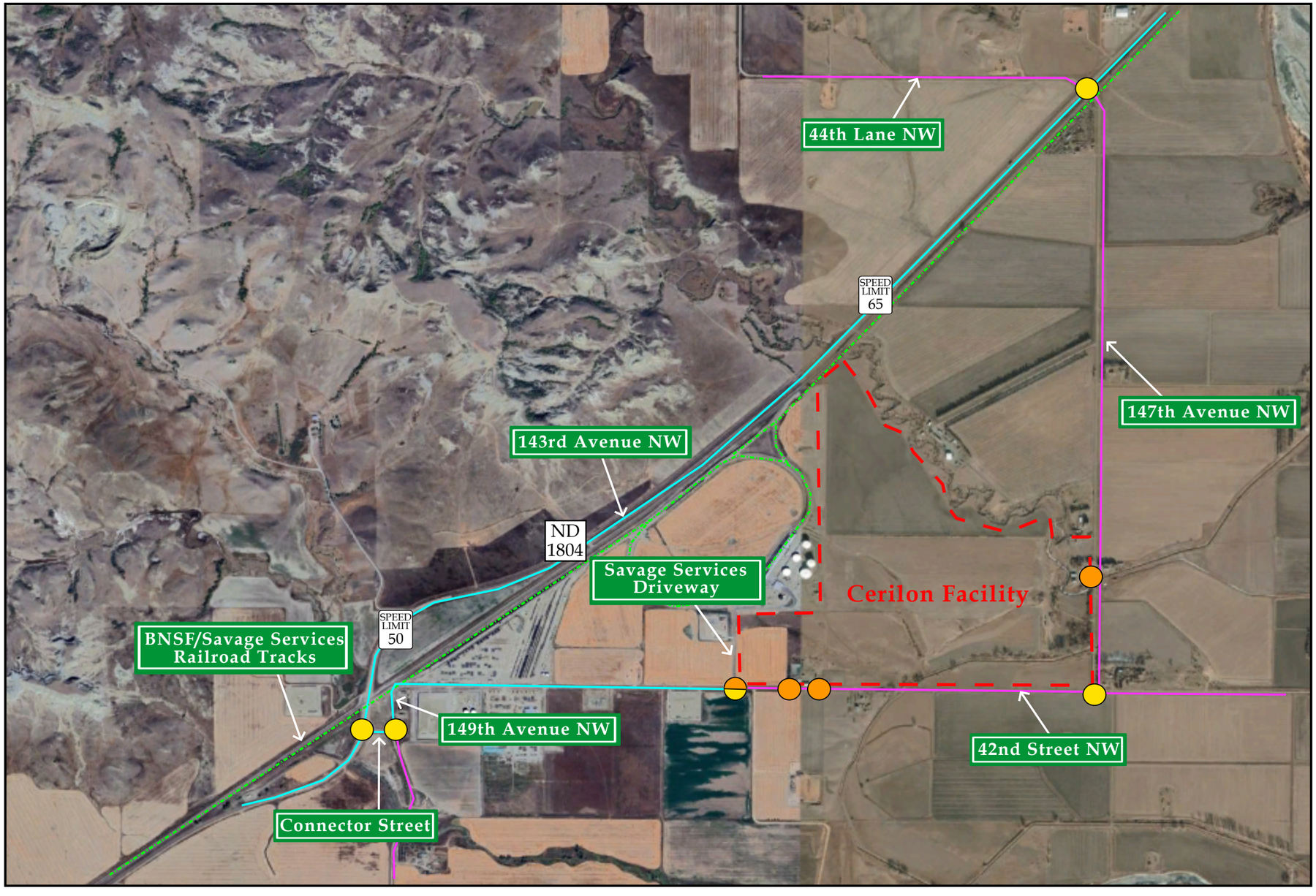
- ND 1804 and 147th Avenue NW / 44th Lane NW (unsignalized)
- 42nd Street NW and 147th Avenue NW (unsignalized)
- 42nd Street NW and Savage Services Driveway (unsignalized)
- 149th Avenue NW and Connector Street (unsignalized)
- ND 1804 and Connector Street (unsignalized)

Construction Traffic and Construction Management Plan (CMP)

This traffic impact study was performed for anticipated traffic conditions when the Cerilon Facility is operational. Analysis did not estimate construction traffic or traffic conditions during construction activities.

A Construction Management Plan (CMP) will be developed by Cerilon separate from this study, which will discuss construction phase traffic management accessing the site from both proposed entrances. Cerilon indicated that the construction traffic will utilize the intersection of ND 1804 and 147th Avenue NW to access the Proposed East Driveway along 147th Avenue NW to access the site.





LEGEND

- Proposed Site Location
- Study Area
- Study Intersection
- Proposed Site Access
- Posted Speed Limit XX
- Paved Road
- Unpaved Road
- Railroad Tracks

N

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Cerilon Facility
Trenton, ND

Site Location Map

Scale: Not to Scale | Figure A

Existing Conditions

Data Collection

Existing weekday AM (7:15 AM to 8:15 AM) and PM (5:00 PM to 6:00 PM) peak hour traffic volumes were determined based on 13-hour traffic counts conducted at the study intersections listed below in December 2023, while schools were in session. Weekday AM and PM peak hours were determined based on the traffic utilizing ND 1804 to access the study area (highest volumes). The same weekday AM and PM peak hours were utilized at all the study area intersections to provide a precise analysis throughout the study area intersections.

- ND 1804 and 147th Avenue NW / 44th Lane NW
- 42nd Street NW and 147th Avenue NW
- 42nd Street NW and Savage Services Driveway
- 149th Avenue NW and Connector Street
- ND 1804 and Connector Street

The existing weekday AM and PM peak hour heavy vehicle percentage was calculated utilizing the count data on each movement and the peak hour factor by approach. Refer to **Figure B** for an illustration of the Existing Peak Hour Traffic (2023). Refer to **Appendix A** of this report for a copy of the count data.

Crash Data

Crash data was obtained at the study intersections for the most recent five-year period (2018-2023) to determine existing safety issues at these intersections. A summary of the crash results is provided for the intersections in **Table 1**. Refer to **Appendix B** for the crash analysis report.

Table 1: Crash Analysis Summary:

Study Intersections	Type of Crash	
	Rear End	Non-Collison with Motor Vehicle
ND 1804 and 147th Avenue NW / 44th Lane NW	2	1
147th Avenue NW and 42nd Street NW	0	0
42nd Street NW and Savage Services Driveway	0	0
149th Avenue NW and Connector Street	0	0
ND 1804 and Connector Street	0	0
Total Crashes	**2**	**1**

The intersection of ND 1804 and 147th Avenue NW / 44th Lane NW indicated 3 crashes over the most recent five years (2018-2023) and none at the other study intersections. It should be noted that 2 crashes were categorized as property damage only (PDO), and 1 was non-incapacitating injury (B) under “clear” and “dry” conditions during the daytime.

These rear end crashes could have been a result of the lack of turn-lanes at the intersection ND 1804 and 44th Lane NW / 147th Avenue NW. While daily operations traffic should not impact this movement, a southbound left-turn lane along ND 1804 could help prevent rear-end collisions.

No-Build Conditions

In order to account for the growth of traffic and subsequent traffic conditions at a future year, No-Build traffic projections are needed. No-Build traffic is the component of traffic due to the growth of the community and surrounding area that is anticipated to occur regardless of whether or not the Project is constructed.

Ambient Traffic Growth

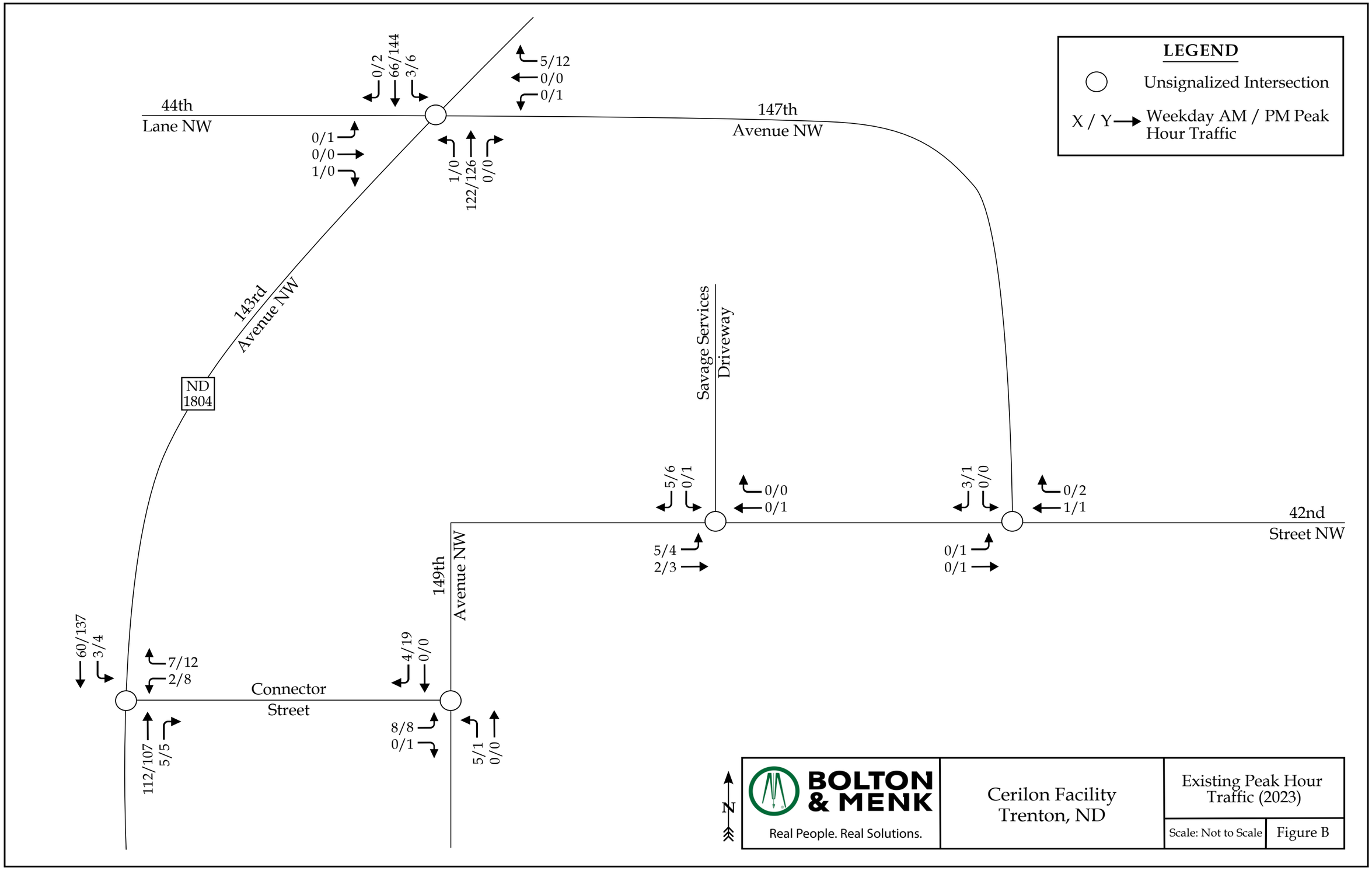
Average Daily Traffic (ADT) volumes along ND 1804 from the NDDOT Interactive Transportation Information Map were utilized to determine a growth rate based on the historical growth in the area, as well as engineering judgement. The ADT volumes show minimal growth historically along ND 1804; therefore, it was assumed that a conservative annual growth rate of 2% (higher than historical average) would be used to generate 2028 (Phase 1), 2032 (Full Build), and 2043 (Future) projected weekday AM and PM peak hour traffic volumes.

Adjacent Development Traffic

Known potential adjacent developments are expected to be low trip generators with unknown built-out dates (SA Fuels X, Wellspring Hydro, Buckshot Seeds Crushing); therefore, trips generated by the potential adjacent developments are assumed to be included in the growth rate. While historically the annual growth rate was shown to be below 1% (average), a growth rate of 2% was utilized to account for these potential adjacent developments.

Future Roadway Conditions

There are no known roadway improvements in the study area that were considered in the future year analysis.


LEGEND
Unsignalized Intersection
X / Y
Weekday AM / PM Peak Hour Traffic
44th Lane NW
147th Avenue NW
143rd Avenue NW
149th Avenue NW
Savage Services Driveway
42nd Street NW
Connector Street
ND 1804
0/2
66/144
3/6
5/12
0/0
0/1
0/1
0/0
1/0
1/0
122/126
0/0
5/6
0/1
0/0
0/1
5/4
2/3
3/1
0/0
0/2
1/1
0/1
0/1
60/137
3/4
7/12
2/8
112/107
5/5
4/19
0/0
8/8
0/1
5/1
0/0
N
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Existing Peak Hour Traffic (2023)
Scale: Not to Scale
Figure B

Opening Day Conditions – Phase 1 (2028) and Full Build (2032)

Trip Generation

The Project will be constructed in separate phases, Phase 1 and Phase 2 anticipated to be completed and operational in 2028 and 2032, respectfully. For analysis purposes, Full Build (2032) conditions consist of Phase 1 and Phase 2 of the Project fully built-out. Since the Project is unique and does not fit into typical land uses described in the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 11th Edition, the project team provided information regarding shifts, staff, contractors, and trucks proposed for each phase of the Project. The following is proposed for each phase of the Project:

Phase 1:

- 143 Daytime Staff
- 22 Nighttime Staff
- 50 Contractors
- 4 Daily Site Delivery Trucks via Proposed Delivery Driveway along 42nd Street NW
- 76 Daily Savage Tanker Trucks via Savage Services (these utilize the existing Savage Services Driveway along 42nd Street NW – see below for more information)

Full Build (Phase 1 and Phase 2):

- 87 Daytime Staff (in addition to Phase 1)
- 7 Nighttime Staff (in addition to Phase 1)
- 40 Contractors (in addition to Phase 1)
- 4 Daily Site Delivery Trucks via Proposed Delivery Driveway along 42nd Street NW (in addition to Phase 1)
- 76 Daily Savage Tanker Trucks via Savage Services (in addition to Phase 1) - (these utilize the existing Savage Services Driveway along 42nd Street NW – see below for more information)

This analysis assumes there will be no pedestrian or bike trips as a result of the Project.

Access to the site is proposed via the following:

- One (1) full movement Main Driveway along 42nd Street NW
  - Utilized for the majority (95%) of Passenger Vehicles (Daytime Staff, Nighttime Staff, and Contractors).
  - Cerilon indicated this driveway would provide access to a large parking lot with a security gate for people to enter after parking.
- One (1) full movement Delivery Driveway along 42nd Street NW
  - Utilized for Site Delivery Trucks and a portion of Passenger Vehicles.
  - Cerilon indicated there is a guard-controlled security gate for Site Delivery Trucks and a small portion (5%) of Passenger Vehicles accessing the site.
- One (1) full movement East Driveway along 147th Avenue NW
  - Utilized for movement of oversized loads during construction and for emergency egress.
  - Cerilon indicated there is a guard-controlled security gate that will not typically be used during operations.

All of the site generated Tanker Trucks are expected to be handled via Savage Services (west of the Project) and utilize the existing Savage Services Driveway along 42nd Street NW. Refer to **Figure C** for the preliminary site plan.

For the purposes of this study, it is assumed the weekday AM and PM peak hours at the study intersections and the shift change peaks occur during the same time. It should be noted that the weekday AM and PM peak hours were determined based on traffic utilizing ND 1804 to access the study area (highest volumes). The same weekday AM and PM peak hours were utilized at all the study area intersections to provide a consistent analysis throughout the study area intersections. **Table 2** and **Table 3**, below, outline the expected trips at each phase created by the site based on data provided by Cerilon (see **Appendix C**).

In **Table 2** below, it is illustrated that Phase 1 of the Project is anticipated to generate approximately 590 total site trips on the roadway network during a typical 24-hour weekday period. Of the daily traffic volume, it is anticipated that 223 trips (197 entering and 26 exiting) will occur during the weekday AM peak Hour and 223 trips (26 entering and 197 exiting) will occur during the weekday PM peak hour.

Truck traffic is expected to be around 27 percent of total site-generated traffic after Phase 1 is complete. Site-generated truck traffic is expected to be spread throughout the day, therefore truck traffic is expected to make up around 4 percent of peak hour traffic.

Table 2: Trip Generation Summary – Phase 1 (2028)

Development	Intensity	Daily Traffic (vpd)	Weekday AM Peak Hour Trips (vph)		Weekday PM Peak Hour Trips (vph)	
			Enter	Exit	Enter	Exit
Phase 1	143 Daytime Staff	286	143	--	--	143
	22 Nighttime Staff	44	--	22	22	--
	50 Contractors	100	50	--	--	50
	4 Daily Site Delivery Trucks	8	1	1	1*	1*
Savage Services (Phase 1)	76 Daily Savage Tanker Trucks	152	3**	3**	3**	3**
Phase 1 Total Trips		**590**	**197**	**26**	**26**	**197**

*For the purposes of this study, it was assumed that the same weekday AM peak hour Site Delivery Truck traffic would access the site during the weekday PM peak hour.
**Based on the data provided by Cerilon, it was assumed that the Daily Savage Tanker Truck traffic is spread out evenly over 24 hours.
Site traffic accessing the site via the Proposed Delivery Driveway along 42nd Street NW are shown in blue.
Site traffic utilizing the existing Savage Services Driveway are shown in red.

In **Table 3** on the following page, it is illustrated that the Project at full built-out is anticipated to generate approximately 1,018 total site trips on the roadway network during a typical 24-hour weekday period. Of the daily traffic volume, it is anticipated that 365 trips (328 entering and 37 exiting) will occur during the weekday AM peak Hour and 365 trips (37 entering and 328 exiting) will occur during the weekday PM peak hour.

Truck traffic is expected to be around 31 percent of total site-generated traffic after Phase 2 is complete, with this traffic assumed to continue being spread throughout the day. As such, truck traffic is expected to remain around 4 percent of peak hour traffic, similar to conditions expected after Phase 1 is completed. The Project at full build-out is anticipated to generate 16 truck trips (8 entering and 8 exiting) during the weekday AM and PM peak hours. The majority of these trucks will use the existing Savage Services Driveway along 42nd Street NW.

Table 3: Trip Generation Summary – Full Build (2032)

Development	Intensity	Daily Traffic (vpd)	Weekday AM Peak Hour Trips (vph)		Weekday PM Peak Hour Trips (vph)	
			Enter	Exit	Enter	Exit
Phase 1 and Phase 2	230 Daytime Staff	460	230	--	--	230
	29 Nighttime Staff	58	--	29	29	--
	90 Contractors	180	90	--	--	90
	8 Daily Site Delivery Trucks	16	2	2	2*	2*
Savage Services (Phase 1 and Phase 2)	152 Daily Savage Tanker Trucks	304	6**	6**	6**	6**
Full Build Total Trips		**1,018**	**328**	**37**	**37**	**328**

*For the purposes of this study, it was assumed that the same weekday AM peak hour Site Delivery Truck traffic would access the site during the weekday PM peak hour.
**Based on the data provided by Cerilon, it was assumed that the Daily Savage Tanker Truck traffic is spread out evenly over 24 hours.
Site traffic accessing the site via the Proposed Delivery Driveway along 42nd Street NW are shown in blue.
Site traffic utilizing the existing Savage Services Driveway are shown in red.

Site Trip Distribution and Assignment

The trip distribution used in assigning the site traffic for the Project was estimated based on a combination of existing traffic patterns, population centers adjacent to the study area, and engineering judgement. When determining the regional distribution, population centers north of the study area have significantly higher populations when compared to those to the south. Based on the United States Census Bureau in 2020, Williston, ND had a population of 29,160 (approximately 14 miles northeast of Trenton, ND) and Sidney, MT had a population of 6,346 (approximately 32 miles southwest of Trenton, ND). Additionally, major regional roadways like US 2 and US 85 can be accessed north of the site. For the purposes of this analysis, Passenger Vehicle trips associated with the Project consist of Daytime Staff, Nighttime Staff, and Contractors. Passenger Vehicles and Trucks (Site Delivery Trucks and Savage Tanker Trucks) follow the same regional distribution.

It is estimated that the Passenger Vehicle (Daytime Staff/Nighttime Staff/Contractors) and Truck site trips will be regionally distributed as follows:

- 95% to/from the north via ND 1804
- 5% to/from the south via ND 1804

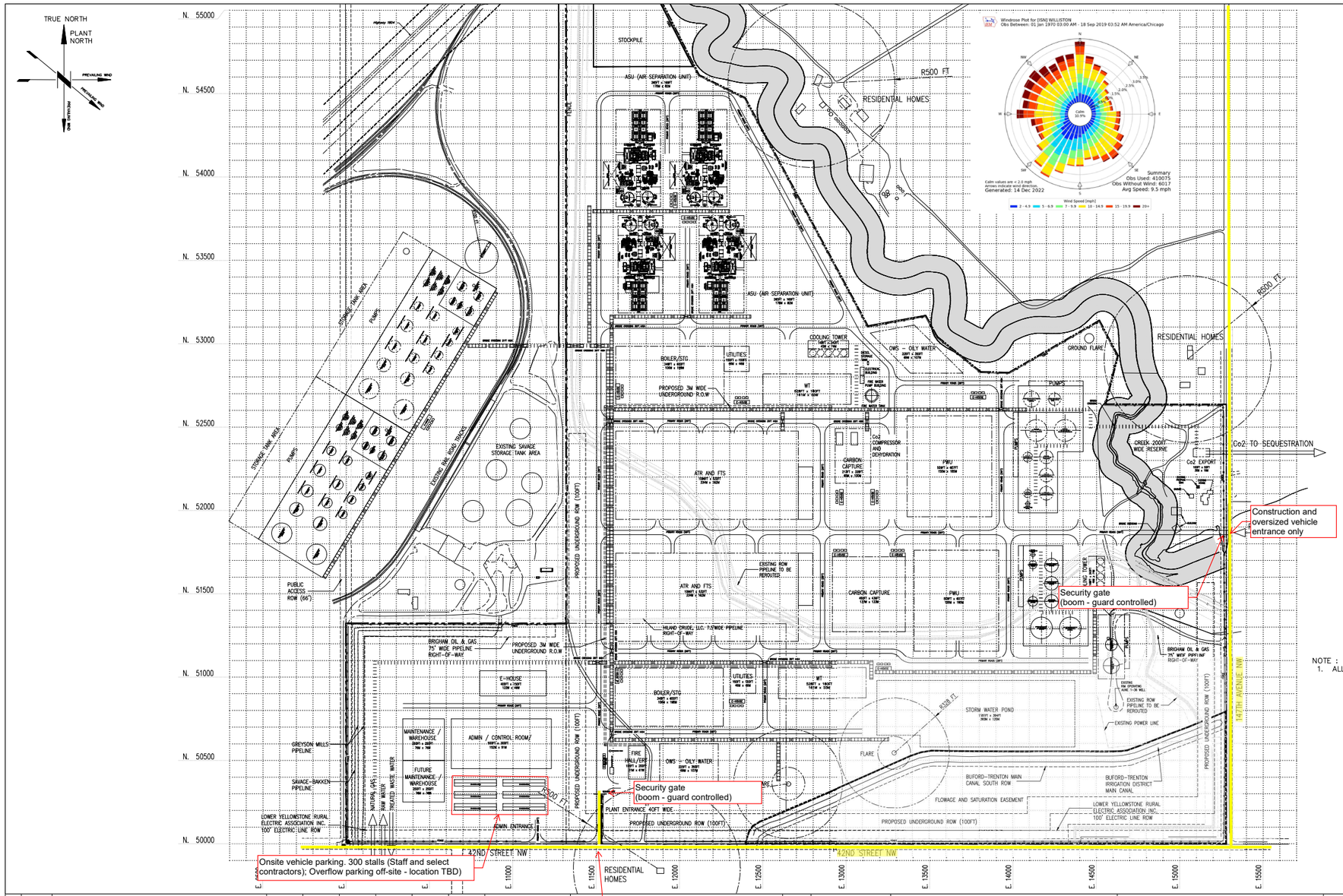
Access to the site is proposed via the following:

- One (1) full movement Main Driveway along 42nd Street NW
  - Utilized for the majority (95%) of Passenger Vehicles (Daytime Staff, Nighttime Staff, and Contractors).
  - Cerilon indicated this driveway would provide access to a large parking lot with a security gate for people to enter after parking.
- One (1) full movement Delivery Driveway along 42nd Street NW
  - Utilized for Site Delivery Trucks and a portion of Passenger Vehicles.
  - Cerilon indicated there is a guard-controlled security gate for Site Delivery Trucks and a small portion (5%) of Passenger Vehicles accessing the site.
- One (1) full movement East Driveway along 147th Avenue NW
  - Utilized for movement of oversized loads during construction and for emergency egress.
  - Cerilon indicated there is a guard-controlled security gate that will not typically be used during operations.

All of the site generated Tanker Trucks via Savage Services (west of the Project) utilize the existing Savage Services Driveway along 42nd Street NW. Cerilon indicated that the majority (95%) of the Passenger Vehicle trips associated with the Project will utilize the Proposed Main Driveway and a small portion (5%) will utilize the Proposed Delivery Driveway along 42nd Street NW.

Cerilon intends to require daily operations (Daytime Staff, Nighttime Staff, Contractors, and Trucks) traffic generated by this site to use the Connector Street to access the Proposed Driveways along 42nd Street NW to access the site. It should be noted that the daily operations traffic generated by the site will not be permitted to utilize 147th Avenue NW along ND 1804 to access the site due to safety concerns for traffic turning onto 147th Avenue NW and traveling through the railroad crossing.

The Passenger Vehicle and Truck Site Trip Distributions are shown in **Figure D**. Refer to **Figure E** for the Passenger Vehicle Site Trip Assignment – Phase 1, **Figure F** for the Truck Site Trip Assignment – Phase 1, and **Figure G** for the Total Site Trip Assignment – Phase 1. Refer to **Figure H** for the Passenger Vehicle Site Trip Assignment – Full Build, **Figure I** for the Truck Site Trip Assignment – Full Build, and **Figure J** for the Total Site Trip Assignment – Full Build.



NOTE :
1. ALL DIMENSIONS AND COORDINATES ARE IN IMPERIAL UNITS.

REV	DATE	REVISION DESCRIPTION	DRAWN	DRAFT CHK	DESIGNED	ENG CHK	APPROVED	CUSTOMER	REF DRAWING No	REFERENCE DRAWING TITLE
			DS AE	DS MZ	DS CG	DS TM	DS TC			
									UEL2103-0000-3114-PLP01-000101	CERILON GTL ND SITE
A	23.06.27	ISSUED FOR ESTIMATE	AG	MZ	CG	TM	TC		UEL2103-0000-3114-PLP01-000102	CERILON GTL ND SITE

D SHEET | SCALE 1"=300FT

Worley

WORLEY PROJECT No. 417011-00541

ENGINEERING AND PERMIT STAMPS (As Required)

THIS DRAWING IS PREPARED FOR THE USE OF THE CONTRACTUAL CUSTOMER OF WORLEY CANADA SERVICES LTD (WORLEY) AND WORLEY ASSUMES NO LIABILITY TO ANY OTHER PARTY FOR ANY REPRESENTATIONS CONTAINED IN THIS DRAWING

CUSTOMER: CERILON

417011-00541-00-PI-DAL-0001-01

DRG TITLE: CERILON GTL ND PROJECT
PLANT 1 & 2
PLOT PLAN

DRG No: WOR2103-1000-3040-PLP01-0001-01 | REV: A

Worley_D

Preliminary Site Plan

Figure C

LOCATION \\CADCWPFL03\LARGEPROJ\CERILON\417011-00541\11_DRAWINGS\06_PIPING\DPP_PLOT PLAN\WORKING\WOR2103-1000-3040-PLP01-0001-01_RA.DWG
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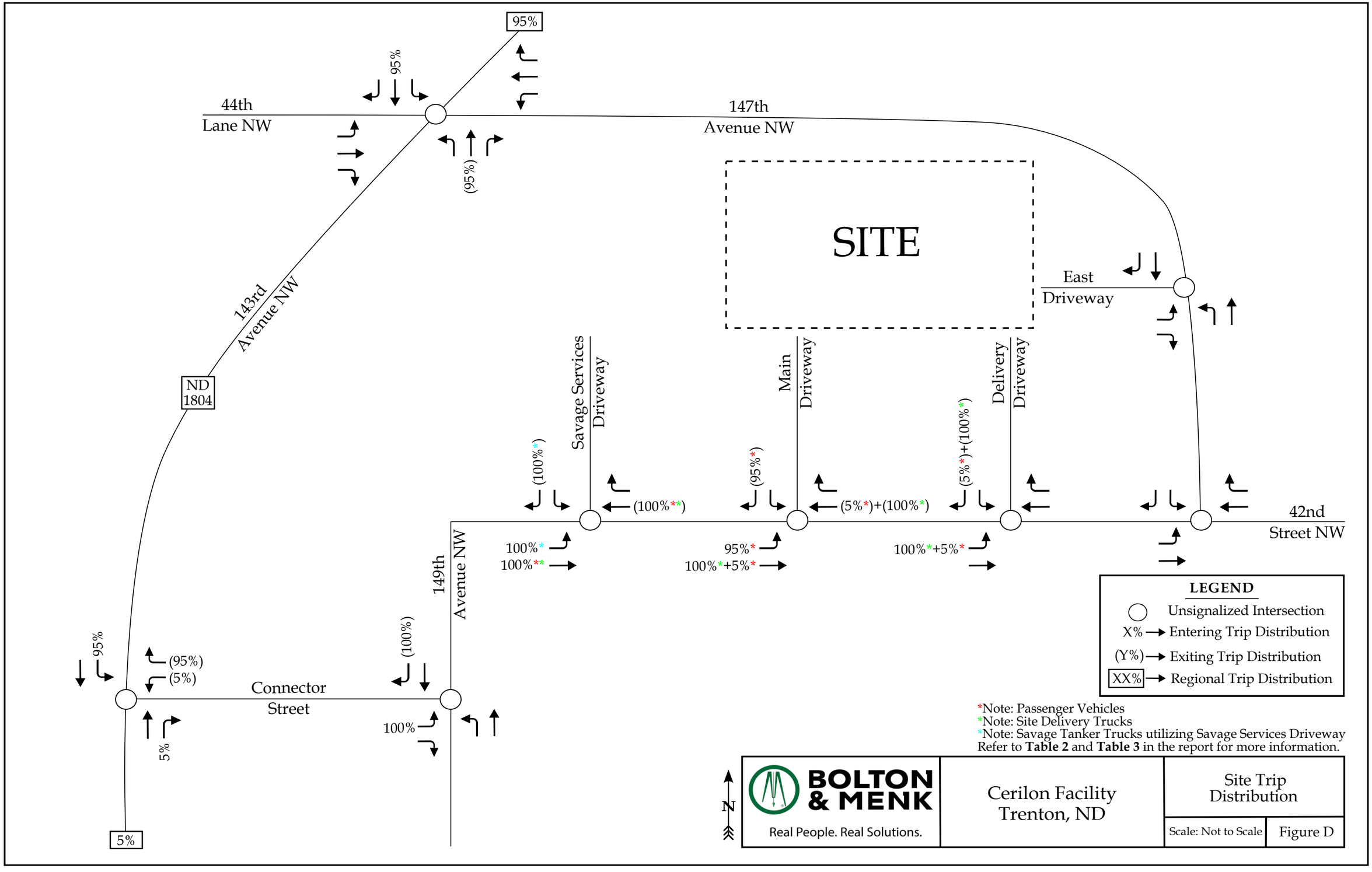
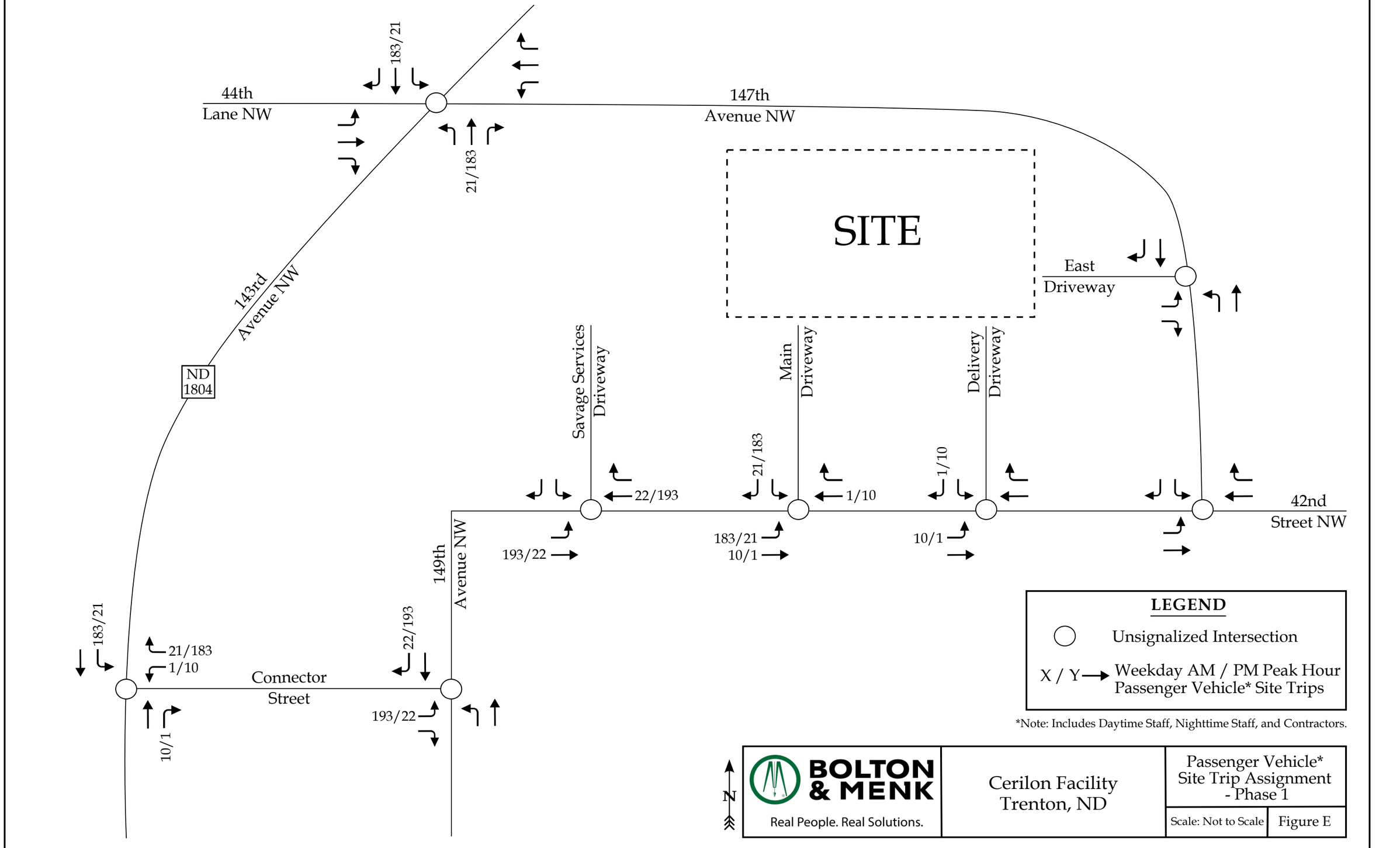
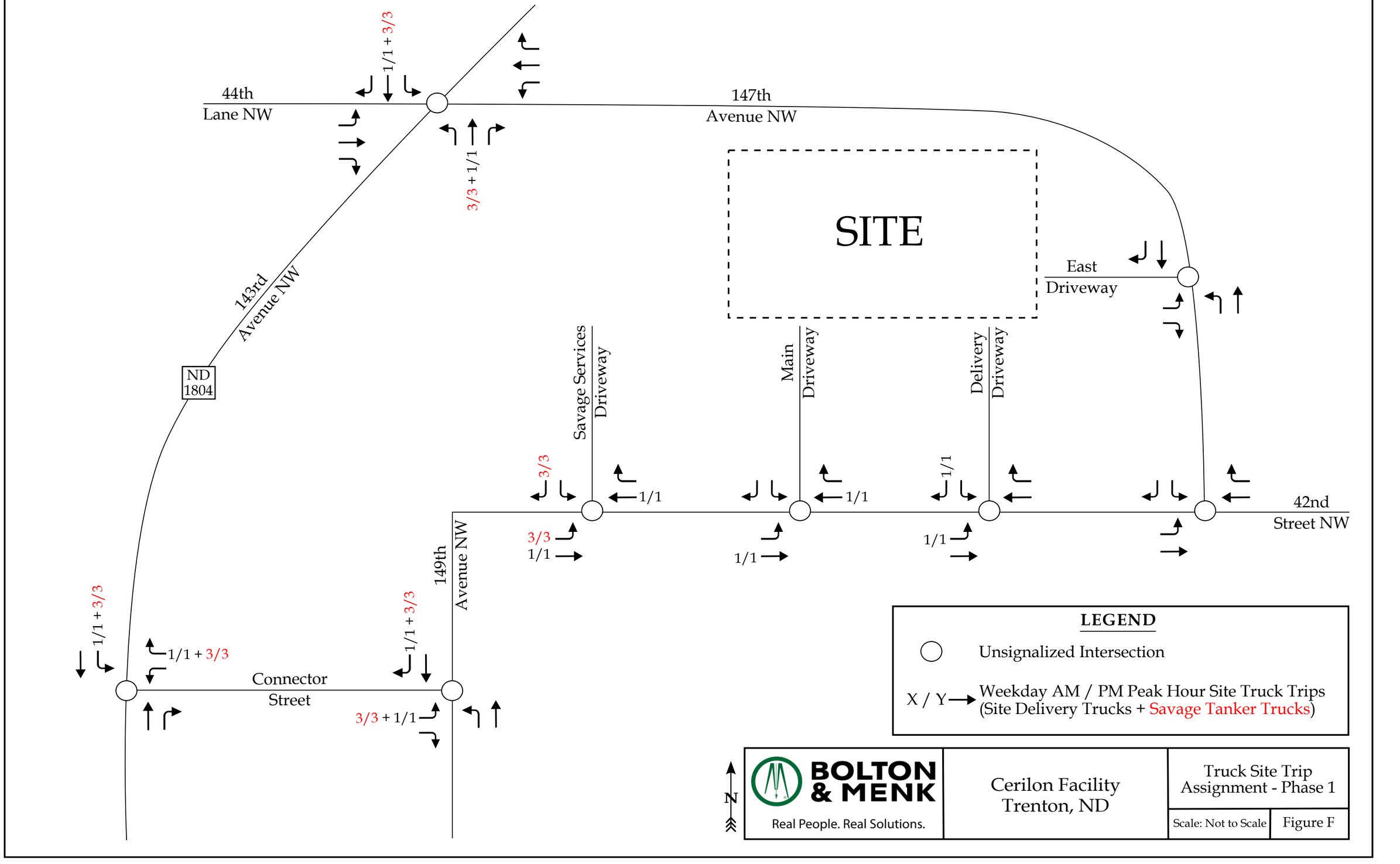
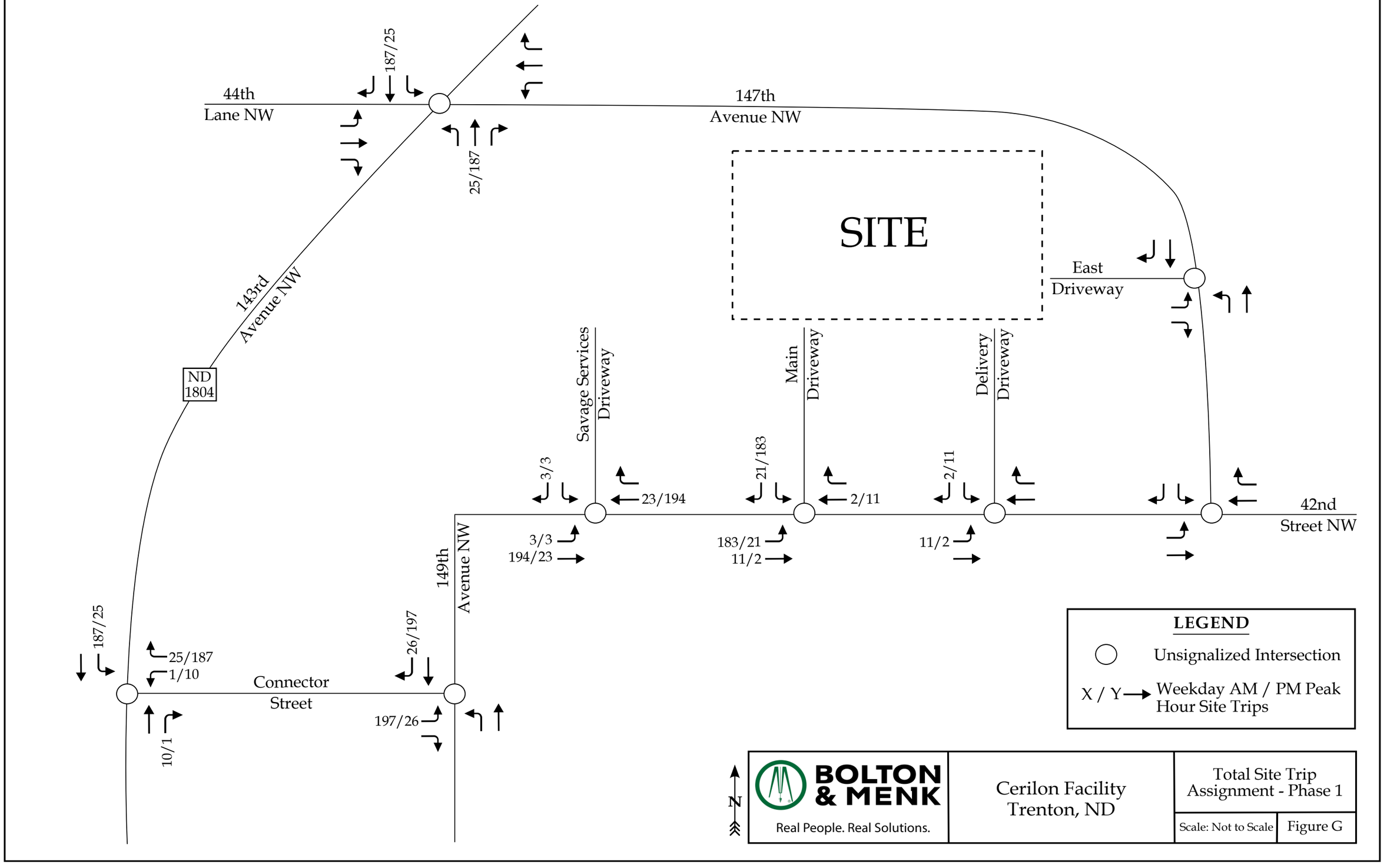
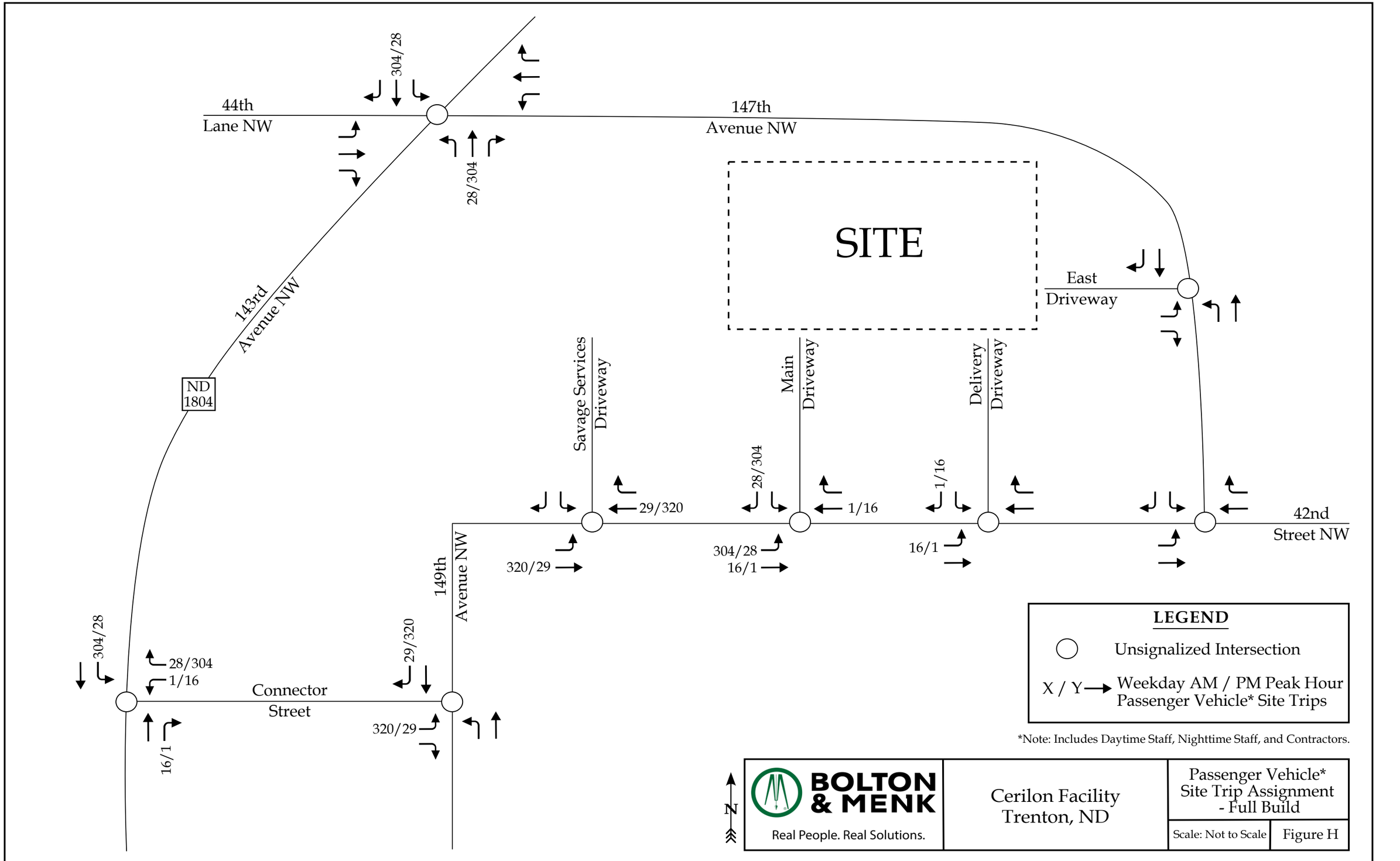
SAVE DATE & TIME 5/7/2023 9:21:12 AM

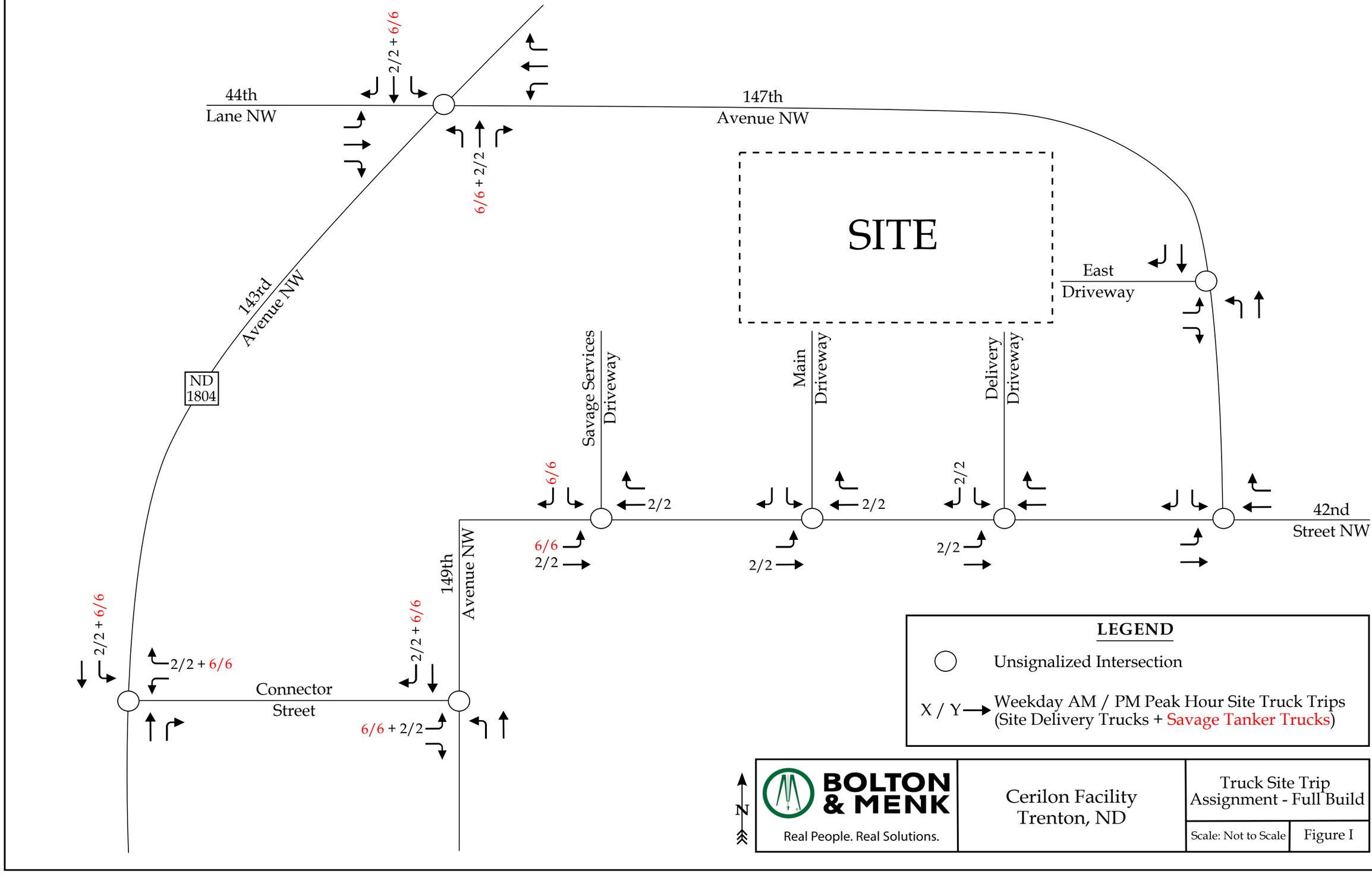

95%
95%
44th
Lane NW
147th
Avenue NW
(95%)
SITE
East
Driveway
143rd
Avenue NW
ND
1804
Savage Services
Driveway
Main
Driveway
Delivery
Driveway
(100%*)
(100%**)
(95%*)
(5%*)+(100%*)
(5%**)+(100%*)
42nd
Street NW
149th
Avenue NW
100%*
100%**
95%*
100%*+5%*
100%*+5%*
95%
(95%)
(5%)
Connector
Street
(100%)
100%
5%
5%
LEGEND
Unsignalized Intersection
X% Entering Trip Distribution
(Y%) Exiting Trip Distribution
XX% Regional Trip Distribution
*Note: Passenger Vehicles
*Note: Site Delivery Trucks
*Note: Savage Tanker Trucks utilizing Savage Services Driveway
Refer to **Table 2** and **Table 3** in the report for more information.
N
BOLTON & MENK
Real People. Real Solutions.
Cerilon Facility
Trenton, ND
Site Trip Distribution
Scale: Not to Scale
Figure D

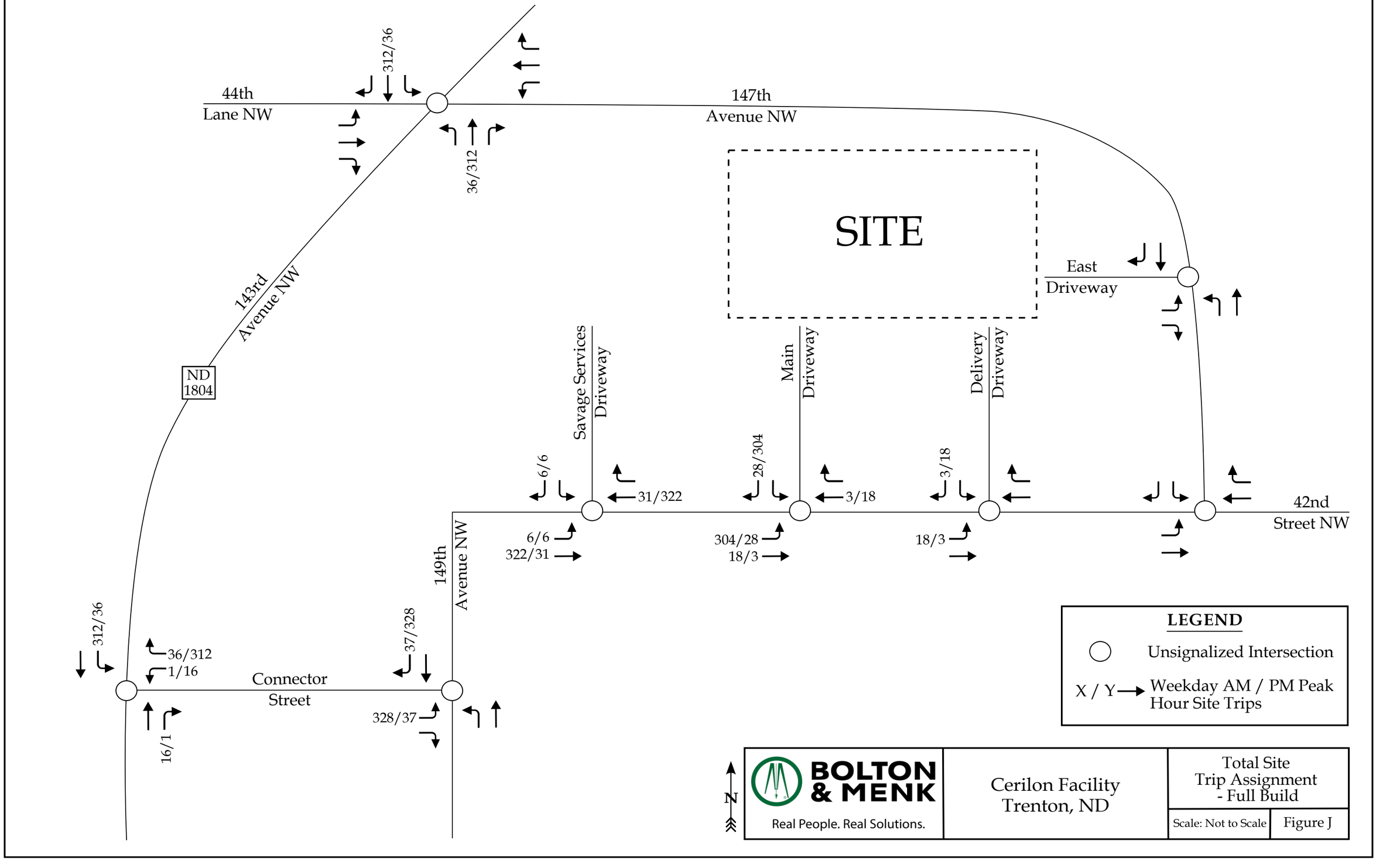

44th
Lane NW
183/21
21/183
147th
Avenue NW
SITE
East
Driveway
143rd
Avenue NW
ND
1804
Savage Services
Driveway
Main
Driveway
Delivery
Driveway
21/183
1/10
22/193
1/10
42nd
Street NW
193/22
183/21
10/1
10/1
149th
Avenue NW
183/21
21/183
1/10
Connector
Street
22/193
193/22
10/1
LEGEND
Unsignalized Intersection
X / Y
Weekday AM / PM Peak Hour
Passenger Vehicle* Site Trips
*Note: Includes Daytime Staff, Nighttime Staff, and Contractors.
N
BOLTON & MENK
Real People. Real Solutions.
Cerilon Facility
Trenton, ND
Passenger Vehicle*
Site Trip Assignment
- Phase 1
Scale: Not to Scale
Figure E


44th
Lane NW
1/1 + 3/3
3/3 + 1/1
147th
Avenue NW
SITE
East
Driveway
143rd
Avenue NW
ND
1804
Savage Services
Driveway
Main
Driveway
Delivery
Driveway
3/3
1/1
1/1
1/1
3/3
1/1
1/1
1/1
42nd
Street NW
149th
Avenue NW
1/1 + 3/3
1/1 + 3/3
1/1 + 3/3
Connector
Street
3/3 + 1/1
LEGEND
Unsignalized Intersection
X / Y
Weekday AM / PM Peak Hour Site Truck Trips
(Site Delivery Trucks + Savage Tanker Trucks)
N
BOLTON & MENK
Real People. Real Solutions.
Cerilon Facility
Trenton, ND
Truck Site Trip
Assignment - Phase 1
Scale: Not to Scale
Figure F


44th
Lane NW
187/25
25/187
147th
Avenue NW
SITE
East
Driveway
143rd
Avenue NW
ND
1804
Savage Services
Driveway
Main
Driveway
Delivery
Driveway
3/3
23/194
21/183
2/11
2/11
42nd
Street NW
3/3
194/23
183/21
11/2
11/2
149th
Avenue NW
187/25
25/187
1/10
Connector
Street
26/197
197/26
10/1
LEGEND
Unsignalized Intersection
X / Y
Weekday AM / PM Peak Hour Site Trips
N
BOLTON & MENK
Real People. Real Solutions.
Cerilon Facility
Trenton, ND
Total Site Trip Assignment - Phase 1
Scale: Not to Scale
Figure G


44th
Lane NW
304/28
28/304
147th
Avenue NW
SITE
East
Driveway
143rd
Avenue NW
ND
1804
Savage Services
Driveway
Main
Driveway
Delivery
Driveway
28/304
1/16
29/320
320/29
304/28
16/1
42nd
Street NW
149th
Avenue NW
304/28
28/304
1/16
Connector
Street
29/320
320/29
16/1
LEGEND
Unsignalized Intersection
X / Y
Weekday AM / PM Peak Hour
Passenger Vehicle* Site Trips
*Note: Includes Daytime Staff, Nighttime Staff, and Contractors.
N
BOLTON & MENK
Real People. Real Solutions.
Cerilon Facility
Trenton, ND
Passenger Vehicle*
Site Trip Assignment
- Full Build
Scale: Not to Scale
Figure H


44th
Lane NW
2/2 + 6/6
6/6 + 2/2
147th
Avenue NW
SITE
East
Driveway
143rd
Avenue NW
ND
1804
Savage Services
Driveway
Main
Driveway
Delivery
Driveway
6/6
2/2
2/2
2/2
2/2
6/6
2/2
42nd
Street NW
149th
Avenue NW
2/2 + 6/6
2/2 + 6/6
2/2 + 6/6
Connector
Street
6/6 + 2/2
LEGEND
Unsignalized Intersection
X / Y
Weekday AM / PM Peak Hour Site Truck Trips
(Site Delivery Trucks + Savage Tanker Trucks)
N
BOLTON & MENK
Real People. Real Solutions.
Cerilon Facility
Trenton, ND
Truck Site Trip
Assignment - Full Build
Scale: Not to Scale
Figure I


44th
Lane NW
312/36
36/312
147th
Avenue NW
SITE
East
Driveway
143rd
Avenue NW
ND
1804
Savage Services
Driveway
Main
Driveway
Delivery
Driveway
6/6
31/322
28/304
3/18
3/18
42nd
Street NW
6/6
322/31
304/28
18/3
18/3
149th
Avenue NW
312/36
36/312
1/16
Connector
Street
37/328
328/37
16/1
LEGEND
Unsignalized Intersection
X / Y
Weekday AM / PM Peak
Hour Site Trips
N
BOLTON & MENK
Real People. Real Solutions.
Cerilon Facility
Trenton, ND
Total Site
Trip Assignment
- Full Build
Scale: Not to Scale
Figure J

Opening Day Conditions (2028/2032)

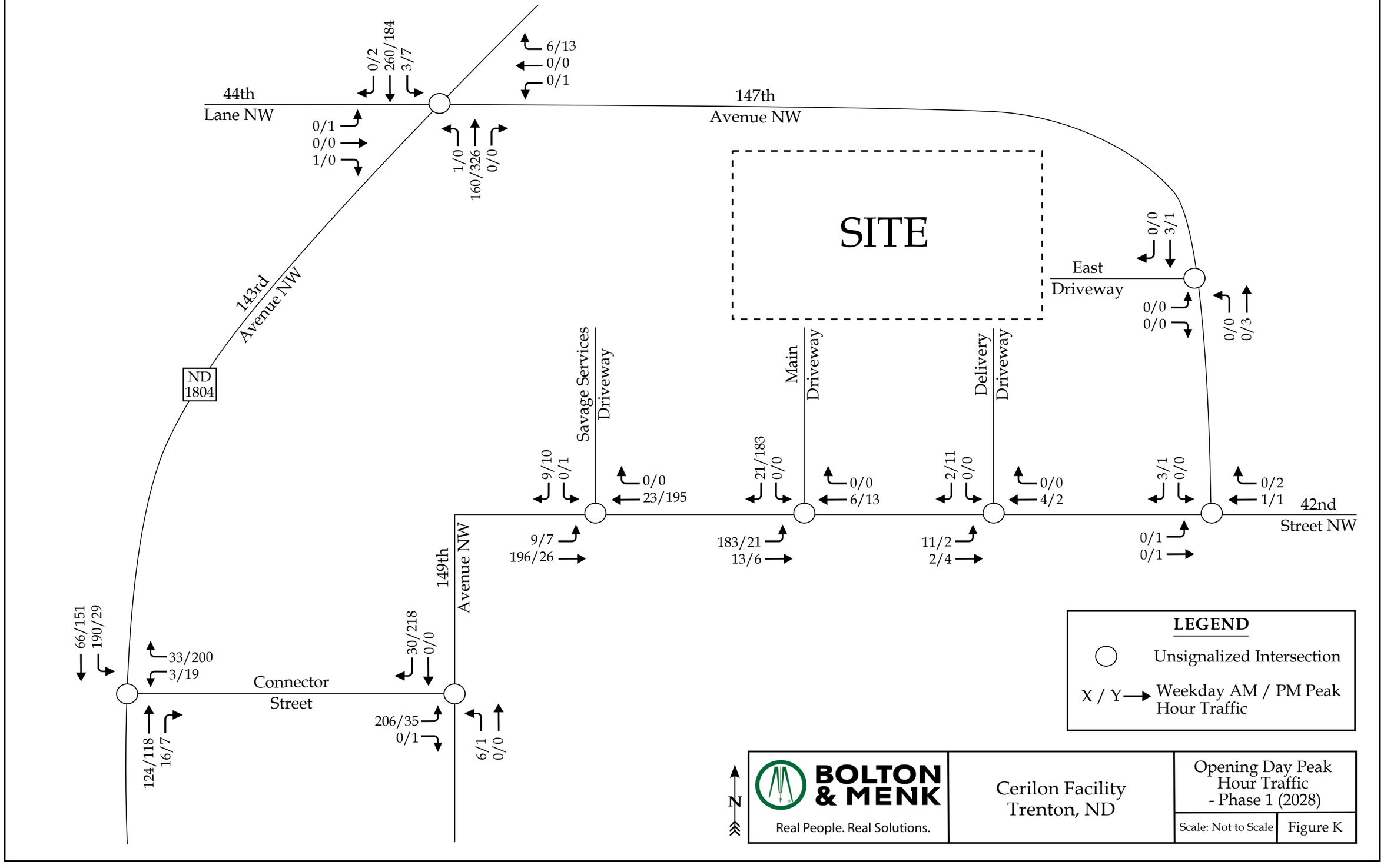
To estimate traffic conditions with the site fully built-out, the total site trips were added to the No-Build traffic volumes to determine the Opening Day traffic volumes. Refer to **Figure K** for an illustration of the Opening Day Peak Hour Traffic – Phase 1 (2028) and **Figure L** for the Opening Day Peak Hour Traffic – Full Build (2032).

The Opening Day (2028/2032) weekday AM and PM peak hour traffic volumes were analyzed to determine the levels of service at the study intersections under Opening Day conditions with the Project. Study area intersections were analyzed with improvements necessary to accommodate Opening Day traffic volumes. The results of the capacity analysis for each intersection are presented in the **Capacity Analysis** section of this report.

Future Conditions (2043)

To understand long-term roadway needs, Future traffic volumes were estimated by adding the total site trips with the site fully built-out to the No-Build traffic volumes (2043). Refer to **Figure M** for an illustration of the Future Peak Hour Traffic (2043).

The Future (2043) weekday AM and PM peak hour traffic volumes were analyzed to determine the levels of service at the study intersections under Future conditions with the Project. Study area intersections were analyzed with improvements necessary to accommodate Future traffic volumes. The results of the capacity analysis for each intersection are presented in the **Capacity Analysis** section of this report.


44th
Lane NW
147th
Avenue NW
143rd
Avenue NW
149th
Avenue NW
42nd
Street NW
Connector
Street
East
Driveway
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ND
1804
Savage Services
Driveway
Main
Driveway
Delivery
Driveway
0/2
260/184
3/7
6/13
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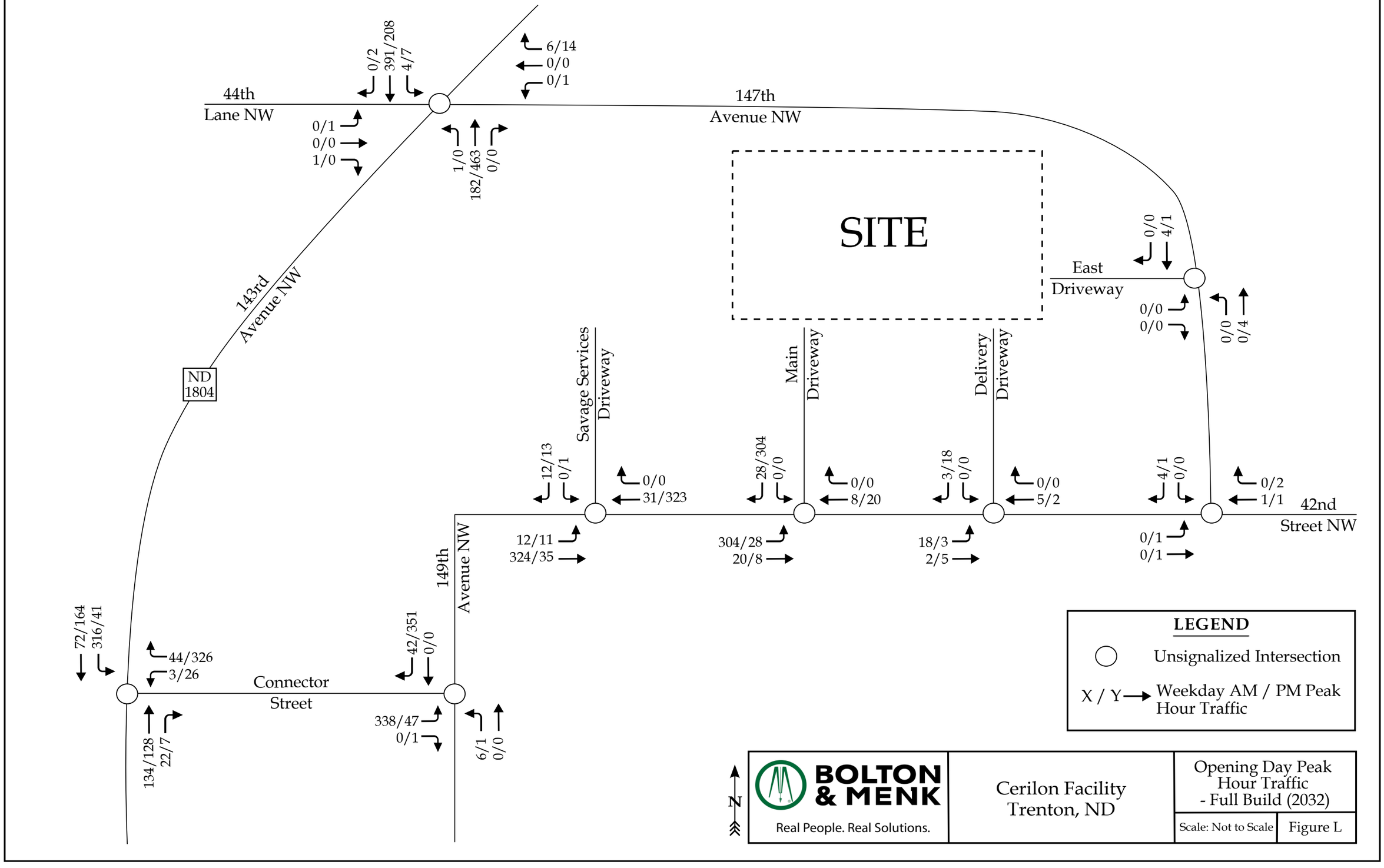
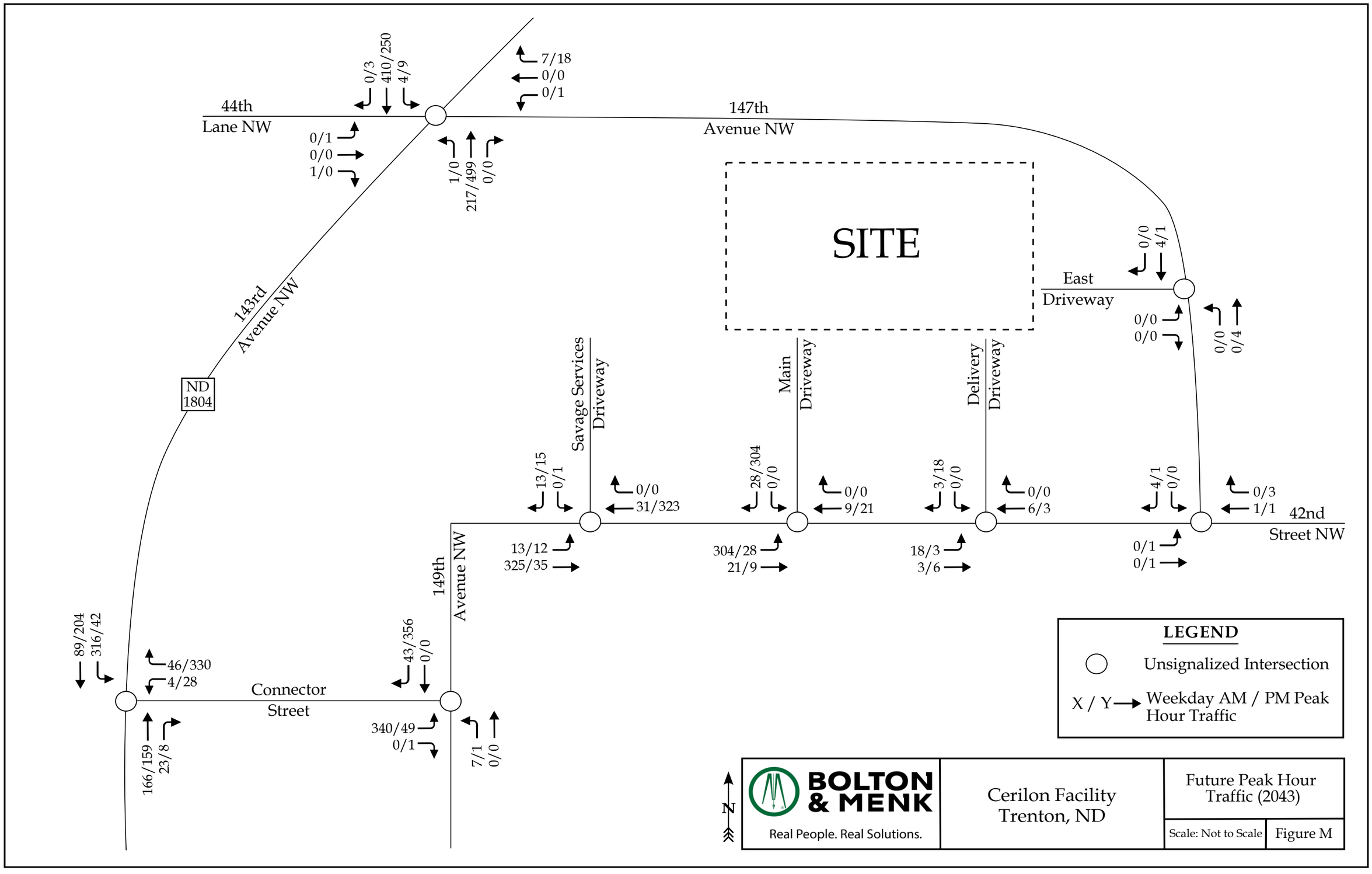
0/1
0/0
23/195
21/183
0/0
0/0
6/13
2/11
0/0
0/0
4/2
3/1
0/0
0/2
1/1
9/7
196/26
183/21
13/6
11/2
2/4
0/1
0/1
66/151
190/29
33/200
3/19
124/118
16/7
30/218
0/0
206/35
0/1
6/1
0/0
LEGEND
Unsignalized Intersection
X / Y
Weekday AM / PM Peak Hour Traffic
N
BOLTON & MENK
Real People. Real Solutions.
Cerilon Facility
Trenton, ND
Opening Day Peak Hour Traffic - Phase 1 (2028)
Scale: Not to Scale
Figure K


44th
Lane NW
147th
Avenue NW
143rd
Avenue NW
149th
Avenue NW
42nd
Street NW
Connector
Street
East
Driveway
Savage Services
Driveway
Main
Driveway
Delivery
Driveway
ND
1804
SITE
0/2
391/208
4/7
6/14
0/0
0/1
0/1
0/0
1/0
1/0
182/463
0/0
0/0
4/1
0/0
0/0
0/4
12/13
0/1
0/0
31/323
28/304
0/0
0/0
8/20
3/18
0/0
0/0
5/2
4/1
0/0
0/2
1/1
12/11
324/35
304/28
20/8
18/3
2/5
0/1
0/1
72/164
316/41
44/326
3/26
134/128
22/7
42/351
0/0
338/47
0/1
6/1
0/0
LEGEND
Unsignalized Intersection
X / Y
Weekday AM / PM Peak Hour Traffic
N
BOLTON & MENK
Real People. Real Solutions.
Cerilon Facility
Trenton, ND
Opening Day Peak Hour Traffic
- Full Build (2032)
Scale: Not to Scale
Figure L


44th
Lane NW
147th
Avenue NW
143rd
Avenue NW
149th
Avenue NW
Connector
Street
42nd
Street NW
East
Driveway
Savage Services
Driveway
Main
Driveway
Delivery
Driveway
ND
1804
SITE
0/3
410/250
4/9
7/18
0/0
0/1
0/1
0/0
1/0
1/0
217/499
0/0
0/0
4/1
0/0
0/0
0/4
13/15
0/1
0/0
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28/304
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9/21
3/18
0/0
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6/3
4/1
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1/1
13/12
325/35
304/28
21/9
18/3
3/6
0/1
0/1
89/204
316/42
46/330
4/28
166/159
23/8
43/356
0/0
340/49
0/1
7/1
0/0
LEGEND
Unsignalized Intersection
X / Y
Weekday AM / PM Peak Hour Traffic
N
BOLTON & MENK
Real People. Real Solutions.
Cerilon Facility
Trenton, ND
Future Peak Hour Traffic (2043)
Scale: Not to Scale
Figure M

Capacity Analysis

Intersection capacity analysis for the study intersections was performed using the Highway Capacity Manual (HCM) intersection level of service methodology (analysis was performed with the Synchro 11 analysis software).

Intersection level of service (LOS) is a metric used to describe the quality of traffic flow at intersections, with LOS A indicating near free-flow traffic conditions with minimal delays and LOS F representing a breakdown of traffic flow with major delays. Intersection LOS is a function of control delay at intersections, with delay thresholds for each LOS shown in **Table 4**.

Table 4: Highway Capacity Manual – Levels-of-Service and Delay

UNSIGNALIZED INTERSECTION		SIGNALIZED INTERSECTION	
LEVEL OF SERVICE	**AVERAGE CONTROL DELAY PER VEHICLE (SECONDS)**	**LEVEL OF SERVICE**	**AVERAGE CONTROL DELAY PER VEHICLE (SECONDS)**
A	0-10	A	0-10
B	10-15	B	10-20
C	15-25	C	20-35
D	25-35	D	35-55
E	35-50	E	55-80
F	>50	F	>80

Intersection level of service analysis was performed for the follow traffic scenarios:

- Opening Day Conditions – Phase 1 (2028)
- Opening Day Conditions – Full Build (2032)
- Future Traffic Conditions (2043)

Applying guidance from the NDDOT Traffic Operations Manual traffic operations at LOS E or LOS F are considered deficient and in need of some type of mitigation to improve traffic flow.

ND 1804 and 147th Avenue NW / 44th Lane NW

The existing unsignalized intersection of ND 1804 and 147th Avenue NW / 44th Lane NW was analyzed under Opening Day – Phase 1 (2028), Opening Day – Full Build (2032), and Future (2043) traffic conditions with existing lane configurations and traffic control shown in **Table 5**. Any proposed lane configurations are shown in **bold**. Refer to **Table 5** for a summary of the analysis results. Refer to **Appendix D** for the Synchro capacity analysis reports.

Table 5: Analysis Summary of ND 1804 and 147th Avenue NW / 44th Lane NW

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
Opening Day - Phase 1 (2028)	EB	1 LT-TH-RT	B[2]	N/A	C[2]	N/A
	WB	1 LT-TH-RT	A[2]		B[2]	
	NB	1 LT-TH-RT	A[1]		A[1]	
	SB	1 LT-TH-RT	A[1]		A[1]	
Opening Day – Full Build (2032)	EB	1 LT-TH-RT	B[2]	N/A	D[2]	N/A
	WB	1 LT-TH-RT	A[2]		C[2]	
	NB	1 LT-TH-RT	A[1]		A[1]	
	SB	1 LT-TH-RT	A[1]		A[1]	
Future (2043)	EB	1 LT-TH-RT	B[2]	N/A	D[2]	N/A
	WB	1 LT-TH-RT	B[2]		C[2]	
	NB	1 LT-TH-RT	A[1]		A[1]	
	SB	1 LT-TH-RT	A[1]		A[1]	

1. Level of service for major-street left-turn movement.
2. Level of service for minor-street approach.

Capacity analysis of all scenarios indicated that the major-street left-turn movement is expected to operate at LOS A during the weekday AM and PM peak hours. The minor-street approach is expected to operate at LOS B or better during the weekday AM peak hour and LOS D or better during the weekday PM peak hour without improvements. This study assumed that the daily operations (Daytime Staff, Nighttime Staff, Contractors, and Trucks) traffic generated by this site, will be required to use the Connector Street to access the proposed driveways along 42nd Street NW to access the site; therefore, the site is not expected to add any daily operations traffic to the minor-street approaches.

Cerilon will work with the Township responsible for 147th Avenue NW to develop a plan to pave the unpaved portion of 147th Avenue NW from ND 1804 to 42nd Street NW.

42nd Street NW and 147th Avenue NW

The existing unsignalized intersection of 42nd Street NW and 147th Avenue NW was analyzed under Opening Day – Phase 1 (2028), Opening Day – Full Build (2032), and Future (2043) traffic conditions with existing lane configurations and traffic control shown in **Table 6**. Any proposed lane configurations are shown in **bold**. Refer to **Table 6** for a summary of the analysis results. Refer to **Appendix D** for the Synchro capacity analysis reports.

Table 6: Analysis Summary of 42nd Street NW and 147th Avenue NW

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
Opening Day - Phase 1 (2028)	EB WB SB	1 LT-TH 1 TH-RT 1 LT-RT	A[1] -- A[2]	N/A	A[1] -- A[2]	N/A
Opening Day – Full Build (2032)	EB WB SB	1 LT-TH 1 TH-RT 1 LT-RT	A[1] -- A[2]	N/A	A[1] -- A[2]	N/A
Future (2043)	EB WB SB	1 LT-TH 1 TH-RT 1 LT-RT	A[1] -- A[2]	N/A	A[1] -- A[2]	N/A

1. Level of service for major-street left-turn movement.
2. Level of service for minor-street approach.

Capacity analysis of all scenarios indicated that the major-street left-turn movement and minor-street approach is expected to operate at LOS A during the weekday AM and PM peak hours. This study assumed that the daily operations (Daytime Staff, Nighttime Staff, Contractors, and Trucks) traffic generated by this site will be required to use the Connector Street to access the proposed driveways along 42nd Street NW to access the site; therefore, the site is not expected to add any daily operations traffic to this intersection. No improvements are recommended at this intersection due to acceptable levels of service and minimal queueing.

Cerilon will work with the Township responsible for 147th Avenue NW to develop a plan to pave the unpaved portion of 147th Avenue NW from ND 1804 to 42nd Street NW.

42nd Street NW and Savage Services Driveway

The existing unsignalized intersection of 42nd Street NW and Savage Services Driveway was analyzed under Opening Day – Phase 1 (2028), Opening Day – Full Build (2032), and Future (2043) traffic conditions with existing lane configurations and traffic control shown in **Table 7**. Any proposed lane configurations are shown in **bold**. Refer to **Table 7** for a summary of the analysis results. Refer to **Appendix D** for the Synchro capacity analysis reports.

Table 7: Analysis Summary of 42nd Street NW and Savage Services Driveway

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
Opening Day - Phase 1 (2028)	EB WB SB	1 LT-TH 1 TH-RT 1 LT-RT	A[1] -- A[2]	N/A	A[1] -- B[2]	N/A
Opening Day – Full Build (2032)	EB WB SB	1 LT-TH 1 TH-RT 1 LT-RT	A[1] -- A[2]	N/A	B[1] -- B[2]	N/A
Future (2043)	EB WB SB	1 LT-TH 1 TH-RT 1 LT-RT	A[1] -- A[2]	N/A	B[1] -- B[2]	N/A

1. Level of service for major-street left-turn movement.
2. Level of service for minor-street approach.

Capacity analysis of all scenarios indicated that the major-street left-turn movement and minor-street approach is expected to operate at LOS A during the weekday AM peak hour and LOS B or better during the weekday PM peak hour. No improvements are recommended at this intersection due to acceptable levels of service and minimal queueing.

Based on the data provided by Cerilon, it was assumed that the Daily Savage Tanker Truck traffic is spread out evenly over 24 hours.

149th Avenue NW and Connector Street

The existing unsignalized intersection of 149th Avenue NW and Connector Street was analyzed under Opening Day – Phase 1 (2028), Opening Day – Full Build (2032), and Future (2043) traffic conditions with existing lane configurations and traffic control shown in **Table 8**. Any proposed lane configurations are shown in **bold**. Refer to **Table 8** for a summary of the analysis results. Refer to **Appendix D** for the Synchro capacity analysis reports.

Table 8: Analysis Summary of 149th Avenue NW and Connector Street

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
Opening Day - Phase 1 (2028)	EB NB SB	1 LT-TH 1 LT-RT 1 TH-RT	B[2] A[1] --	N/A	B[2] A[1] --	N/A
Opening Day – Full Build (2032)	EB NB SB	1 LT-TH 1 LT-RT 1 TH-RT	C[2] A[1] --	N/A	B[2] A[1] --	N/A
Future (2043)	EB NB SB	1 LT-TH 1 LT-RT 1 TH-RT	C[2] A[1] --	N/A	B[2] A[1] --	N/A

1. Level of service for major-street left-turn movement.
2. Level of service for minor-street approach.

Capacity analysis of all scenarios indicated that the major-street left-turn movement is expected to operate at LOS A during the weekday AM and PM peak hours. The minor-street approach is expected to operate at LOS C or better during the weekday AM peak hour and LOS B during the weekday PM peak hour. No improvements are recommended at this intersection due to acceptable levels of service and minimal queueing.

The eastbound approach of the intersection (Connector Street) was analyzed as stop-controlled under all scenarios. It should be noted that this intersection is approximately 380 feet east of the adjacent intersection of ND 1804 and Connector Street. Based on the 95th percentile queues reported in Synchro and simulations in SimTraffic, queues on the minor-street approach are not anticipated to exceed 158 feet with site traffic associated with the Project.

ND 1804 and Connector Street

The existing unsignalized intersection of ND 1804 and Connector Street was analyzed under Opening Day – Phase 1 (2028), Opening Day – Full Build (2032), and Future (2043) traffic conditions with existing lane configurations and traffic control shown in **Table 9**. Any proposed lane configurations are shown in **bold**. Refer to **Table 9** for a summary of the analysis results. Refer to **Appendix D** for the Synchro capacity analysis reports.

Table 9: Analysis Summary of ND 1804 and Connector Street

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
Opening Day - Phase 1 (2028)	WB NB SB	1 LT-RT 1 TH, 1 TH-RT 1 LT, 2 TH	B[2] -- A[1]	N/A	B[2] -- A[1]	N/A
Opening Day – Full Build (2032)	WB NB SB	1 LT-RT 1 TH, 1 TH-RT 1 LT, 2 TH	C[2] -- A[1]	N/A	C[2] -- A[1]	N/A
Future (2043)	WB NB SB	1 LT-RT 1 TH, 1 TH-RT 1 LT, 2 TH	D[2] -- B[1]	N/A	D[2] -- A[1]	N/A

1. Level of service for major-street left-turn movement.
2. Level of service for minor-street approach.

Capacity analysis of all scenarios indicated that the major-street left-turn movement is expected to operate at LOS B or better during the weekday AM peak hour and LOS A during the weekday PM peak hour. The minor-street approach is expected to operate at LOS D or better during the weekday AM and PM peak hours. No improvements are recommended at this intersection due to acceptable levels of service and minimal queueing.

It should be noted that this intersection is approximately 380 feet west of the adjacent intersection of 149th Avenue NW and Connector Street. Based on the 95th percentile queues reported in Synchro and simulations in SimTraffic, queues on the minor-street approach are not anticipated to exceed 243 feet with site traffic associated with the Project. Additionally, this intersection is approximately 350 feet south of an at-grade railroad crossing and the southbound left-turn queues (maintained within the existing storage length) are not expected to back into the railroad crossing. Based on the Federal Railroad Administration Office of Safety Analysis, the estimated level of train activity at the railroad crossing is currently 30 trains per day.

42nd Street NW and Proposed Main Driveway

The proposed intersection of 42nd Street NW and Proposed Main Driveway was analyzed under Opening Day – Phase 1 (2028), Opening Day – Full Build (2032), and Future (2043) traffic conditions with existing lane configurations and traffic control shown in **Table 10**. Any proposed lane configurations are shown in **bold**. Refer to **Table 10** for a summary of the analysis results. Refer to **Appendix D** for the Synchro capacity analysis reports.

Table 10: Analysis Summary of 42nd Street NW and Proposed Main Driveway

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
Opening Day - Phase 1 (2028)	EB WB **SB**	1 **LT-**TH 1 TH-**RT** **1 LT-RT**	A[1] -- A[2]	N/A	A[1] -- B[2]	N/A
Opening Day – Full Build (2032)	EB WB **SB**	1 **LT-**TH 1 TH-**RT** **1 LT-RT**	A[1] -- A[2]	N/A	A[1] -- B[2]	N/A
Future (2043)	EB WB **SB**	1 **LT-**TH 1 TH-**RT** **1 LT-RT**	A[1] -- A[2]	N/A	A[1] -- B[2]	N/A

Improvements by Developer shown in bold.

1. Level of service for major-street left-turn movement.
2. Level of service for minor-street approach.

Capacity analysis of all scenarios indicated that the major-street left-turn movement and minor-street approach is expected to operate at LOS A during the weekday AM peak hour and LOS B or better during the weekday PM peak hour. It should be noted that the Proposed Main Driveway will be utilized by the majority (95%) of Passenger Vehicles (Daytime Staff/Nighttime Staff/Contractors). Cerilon indicated this driveway would provide access to a large parking lot with a security gate for people to enter after parking.

Cerilon will work with the Township responsible for 42nd Street NW to develop a plan to pave the unpaved portion of 42nd Street NW from Savage Services Driveway to 147th Avenue NW.

Right and left-turn lanes were considered at the Proposed Main Driveway based on the NDDOT Traffic Operations Manual. Under Future (2043) conditions, right and left-turn lanes are not expected to be needed based on a capacity standpoint; therefore, turn lanes are not recommended. It should be noted that there is minimal through traffic along 42nd Street NW and 147th Avenue NW.

42nd Street NW and Proposed Delivery Driveway

The proposed intersection of 42nd Street NW and Proposed Delivery Driveway was analyzed under Opening Day – Phase 1 (2028), Opening Day – Full Build (2032), and Future (2043) traffic conditions with existing lane configurations and traffic control shown in **Table 11**. Any proposed lane configurations are shown in **bold**. Refer to **Table 11** for a summary of the analysis results. Refer to **Appendix D** for the Synchro capacity analysis reports.

Table 11: Analysis Summary of 42nd Street NW and Proposed Delivery Driveway

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
Opening Day - Phase 1 (2028)	EB WB **SB**	1 **LT**-TH 1 TH-**RT** **1 LT-RT**	A[1] -- A[2]	N/A	A[1] -- A[2]	N/A
Opening Day – Full Build (2032)	EB WB **SB**	1 **LT**-TH 1 TH-**RT** **1 LT-RT**	A[1] -- A[2]	N/A	A[1] -- A[2]	N/A
Future (2043)	EB WB **SB**	1 **LT**-TH 1 TH-**RT** **1 LT-RT**	A[1] -- A[2]	N/A	A[1] -- A[2]	N/A

Improvements by Developer shown in bold.

1. Level of service for major-street left-turn movement.
2. Level of service for minor-street approach.

Capacity analysis of all scenarios indicated that the major-street left-turn movement and minor-street approach is expected to operate at LOS A during the weekday AM and PM peak hours.

The Proposed Delivery Driveway will be utilized by Site Delivery Trucks and a small portion (5%) of Passenger Vehicles. SimTraffic simulation models were used to evaluate potential queue spillback issues associated with the guard gate. To provide a conservative analysis and accurately simulate the guard gate operations at the Proposed Delivery Driveway (approximately 300 ft internal stem provided, accommodates 5 Site Delivery Trucks before the gated access north of 42nd Street NW), a signal with a 180-second cycle length was utilized to simulate the guard gate. It was assumed each Site Delivery Truck would take approximately 180 seconds to enter/exit the site. Based on SimTraffic simulations, minimal queueing was observed and all queues were maintained on site.

Cerilon will work with the Township responsible for 42nd Street NW to develop a plan to pave the unpaved portion of 42nd Street NW from Savage Services Driveway to 147th Avenue NW.

Right and left-turn lanes were considered at the Proposed Delivery Driveway based on the NDDOT Traffic Operations Manual. Under Future (2043) conditions, right and left-turn lanes are not expected to be needed based on a capacity standpoint; therefore, turn lanes are not recommended. It should be noted that there is minimal through traffic along 42nd Street NW and 147th Avenue NW.

Sight Distance Evaluation and Access Spacing

Intersection sight distance analysis was performed at all study area intersections and proposed driveways applying guidance from "A Policy on Geometric Design of Highways and Streets, 2018" from the American Association of State Highway and Transportation Officials (AASHTO). The study area intersections meet all sight distance guidelines from AASHTO. Based on the NDDOT desired access spacing, there are no conflicts at the proposed driveways with adjacent intersections.

Sight distance triangle diagrams and tables for each study area intersection can be found in **Appendix E**.

Recommendations

Based on the findings of this study, specific geometric improvements have been identified and are recommended to accommodate Future traffic conditions. This study assumed that the daily operations (Daytime Staff, Nighttime Staff, Contractors, and Trucks) traffic generated by this site will be required to use the Connector Street to access the proposed driveways along 42nd Street NW to access the site. See a more detailed description of the recommended improvements below. Refer to **Figure N** for an illustration of the recommended lane geometry for the Project.

Recommended Improvements

42nd Street NW and Proposed Main Driveway

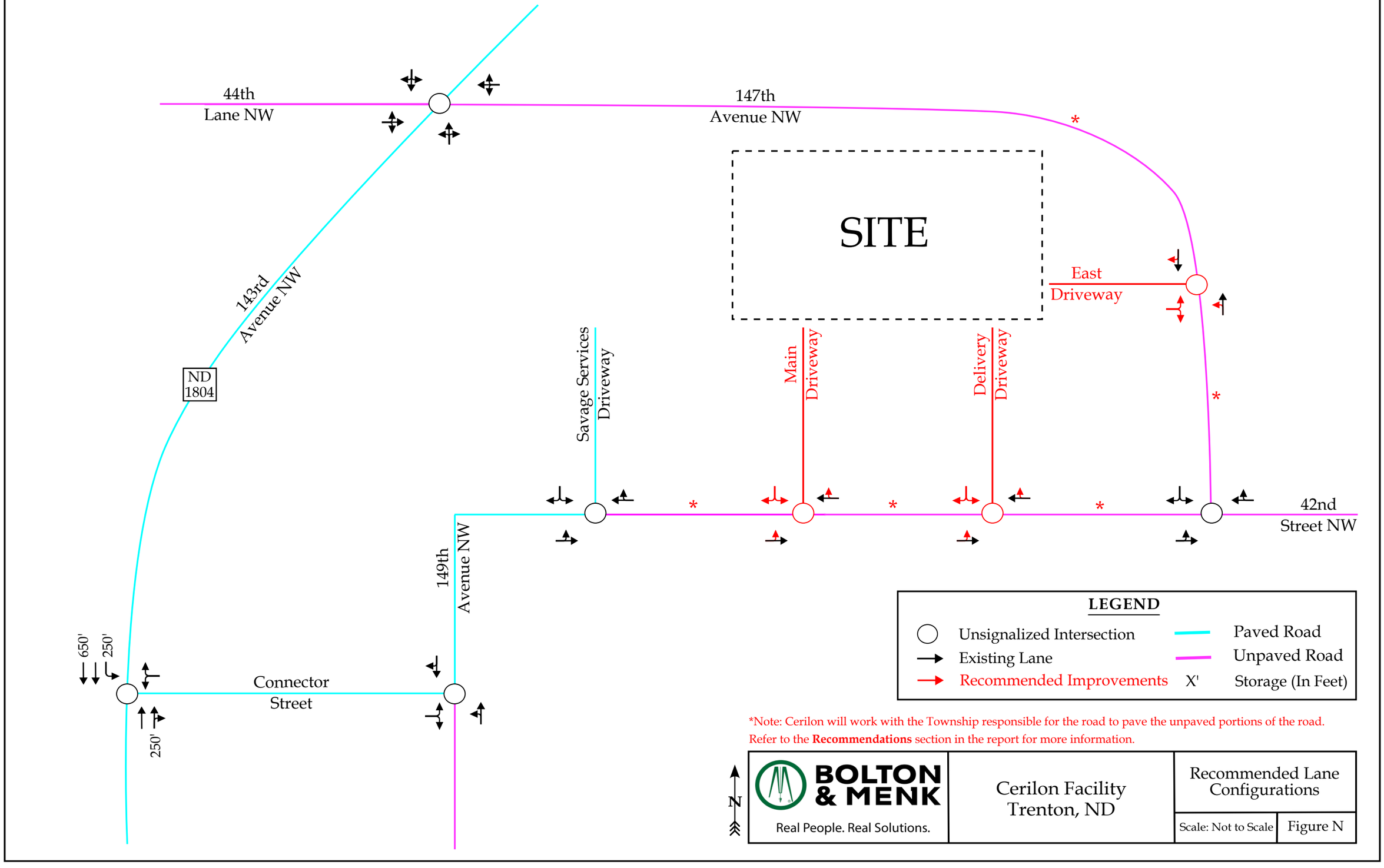
- Construct southbound approach with one (1) ingress lane and one (1) egress lane.
- Provide stop-control for the southbound approach.
- Cerilon will work with the Township responsible for 42nd Street NW to develop a plan to pave the unpaved portion of 42nd Street NW from Savage Services Driveway to 147th Avenue NW.

42nd Street NW and Proposed Delivery Driveway

- Construct southbound approach with one (1) ingress lane and one (1) egress lane.
- Provide stop-control for the southbound approach.
- Cerilon will work with the Township responsible for 42nd Street NW to develop a plan to pave the unpaved portion of 42nd Street NW from Savage Services Driveway to 147th Avenue NW.

147th Avenue NW and Proposed East Driveway

- Construct eastbound approach with one (1) ingress and one (1) egress lane.
- Provide stop-control for the eastbound approach.
- Cerilon will work with the Township responsible for 147th Avenue NW to develop a plan to pave the unpaved portion of 147th Avenue NW from ND 1804 to 42nd Street NW.


44th
Lane NW
147th
Avenue NW
143rd
Avenue NW
ND
1804
SITE
East
Driveway
Savage Services
Driveway
Main
Driveway
Delivery
Driveway
42nd
Street NW
149th
Avenue NW
650'
250'
250'
Connector
Street
LEGEND
Unsignalized Intersection
Existing Lane
Recommended Improvements
Paved Road
Unpaved Road
X'
Storage (In Feet)
*Note: Cerilon will work with the Township responsible for the road to pave the unpaved portions of the road.
Refer to the Recommendations section in the report for more information.
N
BOLTON & MENK
Real People. Real Solutions.
Cerilon Facility
Trenton, ND
Recommended Lane Configurations
Scale: Not to Scale
Figure N

Technical Memorandum

To: Rochelle Harding, Cerilon
From: Andrew Skoglund
Subject: Technical Sound Memorandum
Date: May 24, 2024
Project: 34/53-1123
c: Beau Thurman, Amanda Gravseth, Joel Trinkle

Barr Engineering Co. provides this memo as a high-level summary of relevant noise analyses related to the Cerilon project based on information provided to Barr to-date. It summarizes basic noise concepts, applicable regulations, and limitations of current modeling efforts.

Basics of Noise

Noise levels are usually measured in units of decibels ("dB"). For applications where human hearing is the prime consideration, A-weighting is applied to yield A-weighted decibels ("dBA"). This weighting serves to better replicate the way the human ear perceives sound. This scale puts more weight on the range of frequencies that the average human ear perceives and less on those that we do not hear as well, such as very high and very low frequencies. A level of 0 dBA is nominally the threshold of hearing, below which a healthy human ear cannot detect sound. Most situations never yield levels this low, with a quiet bedroom or rural nighttime falling around 25 dBA. Table 1 provides a range of common noise sources and their typical sound levels.

Table 1. Common Indoor and Outdoor Noises and Their Associated Sound Level

Outdoor Noises	Indoor Noises	Sound Pressure Levels (dBA)
Jet Flyover at 300 m	Rock Band at 5 m	110
Gas Lawn Mower at 1 m	Inside Subway Train (New York)	100
Diesel Truck at 15 m	Food Blender at 1 m	90
Noisy Urban Daytime	Garbage Disposal at 1 m Shouting at 1 m	80
Gas Lawn Mower at 30 m	Vacuum Cleaner at 1 m Normal Speech at 1 m	70
Commercial Area	Large Business Office	60
Quiet Urban Daytime	Dishwasher Next Room	50
Quiet Urban Nighttime	Small Theatre Large Conference Room Library	40
Quiet Suburban Nighttime	--	30
Quiet Rural Nighttime	Bedroom at Night Concert Hall	25
--	Broadcast and Recording Studio	15

Source: United States Federal Highway Administration https://highways.dot.gov/public-roads/common-outdoor-and-indoor-noises

Decibels are on a logarithmic scale; thus, sound levels add logarithmically rather than arithmetically. Combining two equal sound levels results in a net increase of +3 dBA versus one of the initial sound levels. For example, a 37 dBA new source added to a 37 dBA background level results in a combined sound level of 40 dBA. A 3 dBA increase is barely perceptible, while an increase of 10 dBA is perceived as a doubling of the sound level.

The propagation of noise into the environment is also dependent on a number of factors. Lower-frequency sounds generally propagate better through the air than higher frequency sounds (i.e., lower-frequency noises will be audible further from a source than a higher-frequency noise). The ambient temperature, humidity, wind, and other atmospheric affects also impact the propagation of noise into the environment. Physical obstructions, both natural and man-made, can also attenuate noise impacts.

Applicable Noise Standards

There are no numerical local noise ordinances that currently apply to the project.

There are no statewide general noise standards in North Dakota. There are state-level noise impact metrics for wind farms, but this does not apply to the Cerilon project.[1] Williams County also does not currently have a numerical standard for noise impacts, but does have basic standards regarding nuisances, including noise:[2]

> *Dust, fumes, odors, smoke, vapor, noise, lights, and vibrations from any industrial or manufacturing operations shall be contained within the HI district.*

Ongoing concerns with other noise-generating activities in the Williams County area may spur further development of specific numerical noise standards as the Cerilon project continues planning and development. This would also provide a clearer interpretation of 'contained within' in the Williams County nuisance standard as it pertains to facility impacts.

Project Noise Modeling

Barr Engineering modeled projected sound levels from the Cerilon Project for both scenarios with Phase 1 only operating and both Phase 1 and 2 operating. Noise modeling was conducted using iNoise® software, which uses standard ISO noise propagation methodology. The ISO 9613 standard simulates downwind, moderate inversion conditions, aiming to provide a conservative calculation of potential source impacts to nearby receptors.

The current state of project design includes only high-level sound emission information, with projected sound emissions for equipment largely associated with employee exposure limits under OSHA. While the ISO modeling methodology can apply frequency-specific sound attenuation characteristics, current project information lacks this level of detail, only having overall sound levels available at this time. As such, initial modeling analyses are limited to simplified assumptions about source frequency

[1] North Dakota Administrative Code 69-06-08-01(4) requires wind turbines not to exceed 45 dBA within 100 ft of an inhabited residence.
[2] *Williams County Zoning Ordinance and Subdivision Regulations*, ordinance 2-8-7.3 for heavy industrial zoning (January 2024).

characteristics. Sources without specific frequency data are modeled using the 500Hz band values per ISO 9613, providing a conservative approximation of potential frequency-specific impacts. Refined source frequency information may yield lower modeled dBA levels, as higher frequencies typically experience greater attenuation than the 500Hz band. While providing a useful check for ongoing project design and a guide toward potential mitigation opportunities, the current level of input detail limits the ability of the modeling to provide a refined noise impact assessment.

With these caveats accounted for, projected sound levels reaching nearby residences were modeled for both Phase 1 of the project only operating as well as the final configuration with Phases 1 and 2 operating (Figures 1 and 2, respectively). Modeled levels are based on steady operating configurations (i.e., not including emergency flaring). The five nearest residences modeled sound levels ranging from 46 to 56 dBA depending on location and project phase. Projected levels are shown in Table 2. As most facility source sound levels are similar, source culpability is primarily a function of proximity between source and receptor. Elevated sources like coolers and condensers are less shielded by plant structures and have slightly higher influences than ground-level sources like pumps.

Table 2. Modeled Project Sound Levels

Receptor	Direction from Project	Modeled Phase 1 Sound Level (dBA)	Modeled Phase 1 & 2 Sound Level (dBA)	Leading Contributing Source Groups
Residence R1	Northeast	52	54	NE ASU Venting and Condensers, Ph.1 Cooling Tower
Residence R2	East-Northeast	50	52	Ph.1 PWU Area Coolers and Heaters
Residence R3	Southeast	47	49	Ph.2 ATR Fans, Ph. 2 PWU Area Pumps and Coolers
Residence R4	South	49	56	Ph.2 Boiler/STG Area Coolers
Residence R9	East	46	50	Ph.2 Cooling Tower, Ph2. PWU Area Heaters, Ph.2 ATR Fans

From: Johnson, Sandra K. <sajohnson@nd.gov>
Sent: Monday, June 5, 2023 7:51 AM
To: David S. Haar
Subject: RE: Eagle Nest Query

CAUTION: This email originated from outside of your organization.

Hi David,
There are no known bald or golden eagle nests within 1 mile of the coordinates.
Thanks,
Sandy

Sandra Johnson
Conservation Biologist

(701) 328-6382 • sajohnson@nd.gov • gf.nd.gov

NORTH Dakota | Game and Fish
Be Legendary.

From: David S. Haar <DHaar@barr.com>
Sent: Wednesday, May 24, 2023 4:01 PM
To: Johnson, Sandra K. <sajohnson@nd.gov>
Cc: Beau Thurman <BThurman@barr.com>; Amanda Gravseth <AGravseth@barr.com>
Subject: Eagle Nest Query

Hi Sandra,

Would you please review the attached location and let me know if you have any records of bald or golden eagle nests in the vicinity?

Here are the approximate coordinates of the site.
Latitude: 48.034805°
Longitude: -103.876893°

Thank you!

David S. Haar

Senior Environmental Scientist
Minneapolis, MN office: 952.842.3625
DHaar@barr.com
www.barr.com

resourceful. naturally.
engineering and environmental consultants

BARR

June 9, 2023

North Dakota Game and Fish Department
Director Jeb Williams
100 N. Bismarck Expressway
Bismarck, ND 58501-5095

Re: Proposed Energy Conversion Facility – Request for Comments

To Whom It May Concern:

Barr Engineering Co. (Barr) is supporting Cerilon GTL ND Inc. (Cerilon) in preparing an application to the North Dakota Public Service Commission (ND PSC) for a Certificate of Site Compatibility for a greenfield industrial facility near Trenton, ND (Project). The Project is located on approximately 370 acres in Sections 25 and 36, Township 153 North, Range 103 West in Williams County. See attached Figure 1 for a map of Cerilon's property where the project is proposed to be constructed.

The proposed Project will contain two primary operations:

- **Conversion of Natural Gas to Liquids**: Cerilon intends to construct two gas-to-liquids (GTL) facilities (Phase 1 and Phase 2) to convert natural gas into low-carbon, high-value synthetic hydrocarbon liquids. Phase 1 will convert 240 million standard cubic feet per day (MMscf/day) of natural gas into 24,000 barrels per day (bpd) of liquid products, including approximately 14,600 bpd of ultra-low sulfur diesel, 3,600 bpd of naphtha, and 5,800 bpd of base oils. Phase 2 will be constructed with the same capacity, but the specific product slate may be altered based on future market conditions.

- **Electric Energy Generation**: The GTL process will contain several high-temperature and exothermic processes. Cerilon intends to recover this energy to generate steam which will be routed to steam turbines to generate electricity. Additional steam will be generated by a battery of package boilers combusting excess gases unable to be converted to saleable liquid products. Cerilon's preliminary estimate is that each project phase will generate approximately 100 megawatts (MW) of electricity. Most of this electricity will be used on-site, with any excess exported to the electrical grid.

Additional processes will be conducted at the site to support these primary operations. These include but are not limited to raw material and product storage, product loading to tanker trucks and railcars, wastewater treatment, flares to eliminate process upset gases, and other shared utilities. Cerilon also proposes installing a carbon capture system on the GTL facilities, which will reduce the project's carbon dioxide (CO_2) emissions. The captured carbon will be routed by a third-party to an off-site location for geological sequestration by a third-party.

Phase 1 of the project is proposed to begin construction in mid-2025 and begin commercial operation in 2028. Phase 2 will begin construction after Phase 1 begins commercial operation, but the specific timing is still being evaluated. The Project will apply for all required local, state, and federal permits and approvals.

Cerilon requests your input to identify any concerns your agency may have regarding the Project's potential impacts that fall within the purview of your agency and any potential permits or approvals your agency may require. Your agency's input will be incorporated into the Project's application for a Certificate of Site Compatibility that Barr and Cerilon are developing for submittal to the ND PSC. The ND PSC will also evaluate your input via their approval process.

Please refer to Chapter 69-06-08 of the North Dakota Administrative Code for a complete list of the criteria that will be considered in the siting application.

We would appreciate receiving your response by July 24, 2023. Please send your comments to cerilon@barr.com or 234 West Century Avenue, Bismarck, ND 58503. If no reply is received, it will be assumed that your agency has no comment on the Project. If you require further information or have questions, please do not hesitate to send an email to the previously provided email address or contact me via phone at 701.221.5424.

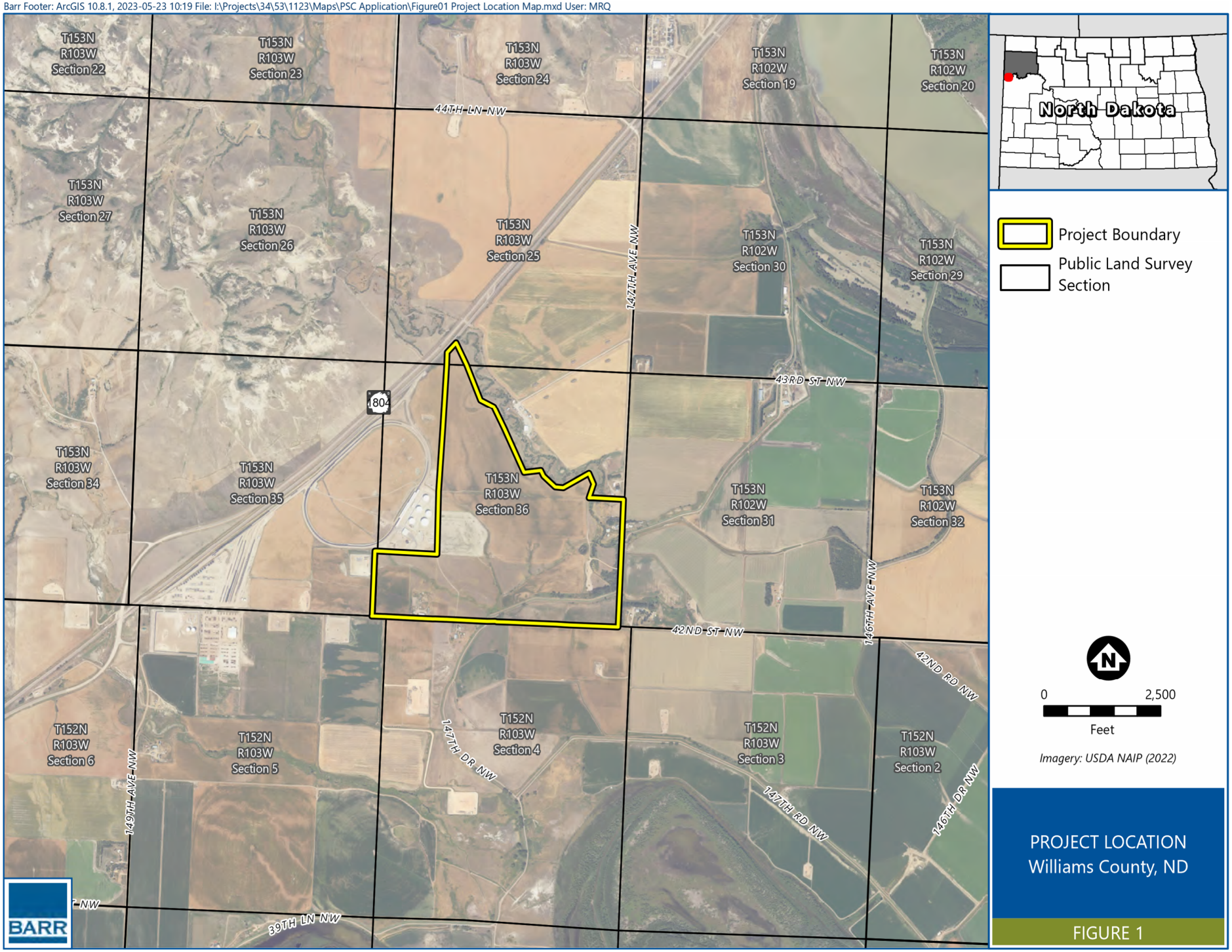
Sincerely,

Amanda Gravseth
Project Manager, Senior Chemical Engineer

Attachment: Figure 1 – Project Location Map

cc: Nico Duursema (Cerilon)
Rochelle Harding (Cerilon)
Joel Trinkle (Barr)
Casey Furey (Crowley-Fleck)

Barr Footer: ArcGIS 10.8.1, 2023-05-23 10:19 File: I:\Projects\34\53\1123\Maps\PSC Application\Figure01 Project Location Map.mxd User: MRQ



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BARR

June 9, 2023

US Fish and Wildlife Service
3425 Miriam Avenue
Bismarck, ND 58501-7926

Re: Proposed Energy Conversion Facility – Request for Comments

To Whom It May Concern:

Barr Engineering Co. (Barr) is supporting Cerilon GTL ND Inc. (Cerilon) in preparing an application to the North Dakota Public Service Commission (ND PSC) for a Certificate of Site Compatibility for a greenfield industrial facility near Trenton, ND (Project). The Project is located on approximately 370 acres in Sections 25 and 36, Township 153 North, Range 103 West in Williams County. See attached Figure 1 for a map of Cerilon's property where the project is proposed to be constructed.

The proposed Project will contain two primary operations:

- **Conversion of Natural Gas to Liquids**: Cerilon intends to construct two gas-to-liquids (GTL) facilities (Phase 1 and Phase 2) to convert natural gas into low-carbon, high-value synthetic hydrocarbon liquids. Phase 1 will convert 240 million standard cubic feet per day (MMscf/day) of natural gas into 24,000 barrels per day (bpd) of liquid products, including approximately 14,600 bpd of ultra-low sulfur diesel, 3,600 bpd of naphtha, and 5,800 bpd of base oils. Phase 2 will be constructed with the same capacity, but the specific product slate may be altered based on future market conditions.

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Sincerely,

Amanda Gravseth
Project Manager, Senior Chemical Engineer

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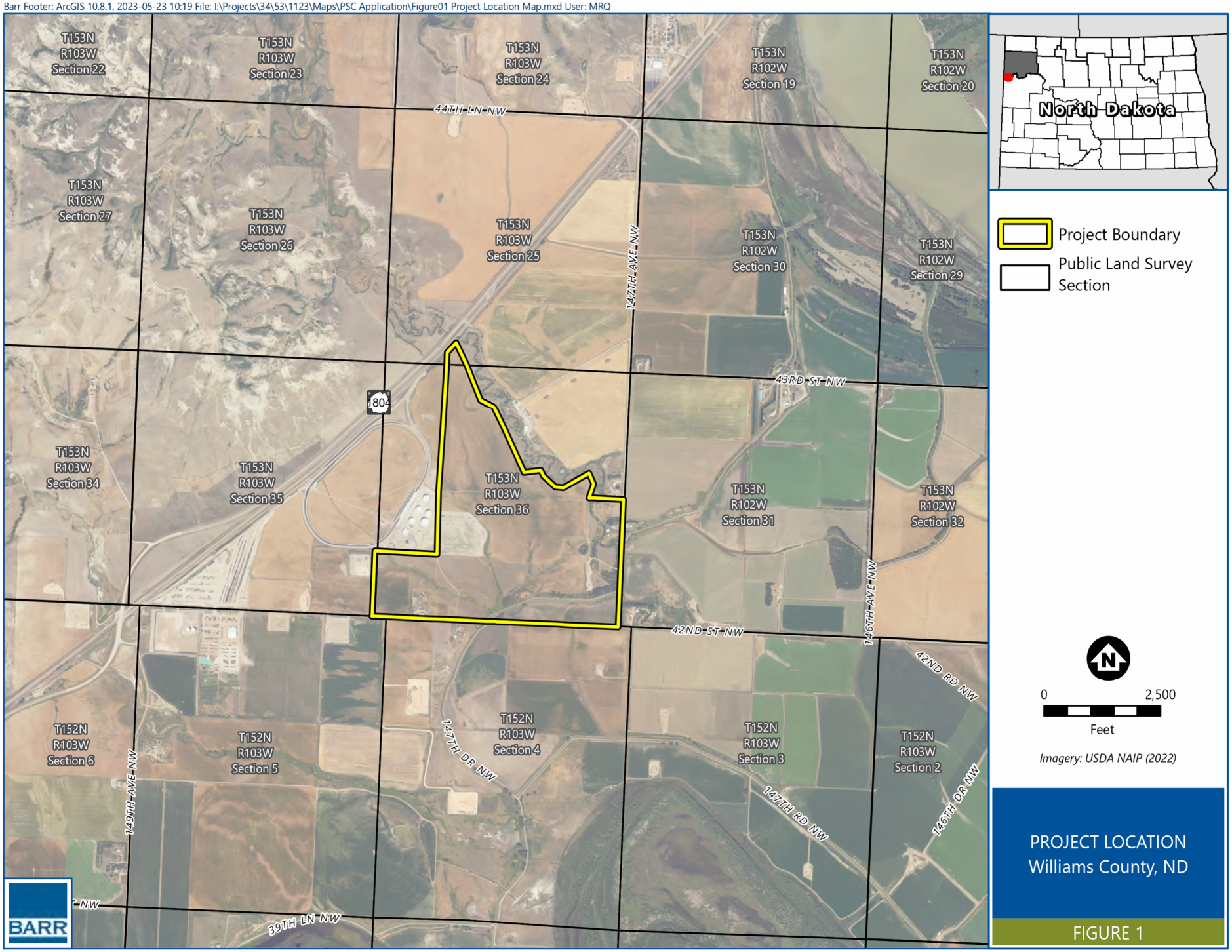

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Meeting Notes

USFWS/Cerilon/Barr Meet and Greet

Thursday, May 25, 2023
9AM CST

Attendees:

U.S. Fish and Wildlife Service: Luke Toso, Jerry Reinisch, Seth Jones

Cerilon: Rochelle Harding

Barr: Amanda Gravseth, David Haar, Beau Thurman

Project Overview

- Rochelle provided a project overview and project location map
  - Cerilon plans to submit the PSC CSC application in Q3 2023
  - Cerilon intends to receive all regulatory permits in-hand to support final investment decision (FID) by the end of 2024.

Desktop Review

- David reviewed iPaC website endangered species and critical habitat results
- Jerry is most concerned with pallid sturgeon noting the project location is great for spawning.
- Also discussed paddlefish with similar concerns. He plans to review West Dakota Water's in-take structure (and floating mechanism).
  - If Cerilon needs to design their own water in-take structure, USFWS is willing to provide recommendations on screen size, velocity, floating, and neon lights
  - Also, team would need coordinate permitting of intake with USACE and water commission

Project Habitat/Location Discussion

- USFWS asks the following questions for every project:
  - Are there impacts to trees (Northern Long Eared Bat habitat)?
  - Are there impacts to native (prairie) habitat?
  - Are there impacts to migratory birds?
- USFWS most concerned with pallid sturgeon, piping plover, and whooping crane
  - Although desktop review is okay; USFWS recommends field survey / habitat assessment
  - USFWS recommends education to construction team if whooping crane(s) are present (1-mile no-activity zone when present)
- Per USFWS Timing/Buffer Recommendations sheet, if trees need to be removed from the project site, the suggested tree (3" diameter at breast height) removal period is November 1 – March 31

    - Region 3 is driving potential changes to the regulations, so USFWS recommends cutting down trees before March 2024
    - Guidance for NLEB may change April 1, 2024
- Beau asked USFWS if the nearby Wildlife and Waterfowl Management Areas are state or federal – Seth indicated one is state and the other federal. Minimal concerns for project, more concerned with impacts to birds from wind farms.
    - USFWS discussed doing a field survey of these areas to check bird population, then repeat the survey after the facility is built/operating. This is not required but was presented as something that could be done.

ACTION ITEMS:

1. Cerilon/Barr to perform recommended fieldwork to look piping plover habitat and eagle nests – ***rescheduled for week of June 5, 2023***
    a. Can the piping plover see or hear the construction?
2. USFWS to send USFWS Timing/Buffer Recommendations sheet – ***complete***
3. Cerilon to consider wetland baseline monitoring data during construction and after startup

United States Department of the Interior

FISH AND WILDLIFE SERVICE
North Dakota Ecological Services
3425 Miriam Avenue
Bismarck, ND 58501

May 22, 2024

In reply, please refer to:
Cerilon GTL ND Inc. near Trenton, ND

Ms. Amanda Gravseth
Project Manager, Senior Chemical Engineer
Barr Engineering
234 West Century Avenue
Bismarck, North Dakota 58503

Dear Ms. Gravseth:

Thank you for your letter on June 9, 2023, and email of May 9, 2024, regarding the Cerilon GTL Project in Williams County, North Dakota. The Project consists of construction of a facility that would convert natural gas to liquids and generate electric energy. On May 25, 2024, the United States Fish & Wildlife (Service) met with representatives from Barr Engineering and Cerilon to initiate discussions in reference to the proposed project.

The Service appreciates the early contact by the proponents to discuss and review possible effects to threatened and endangered species and their habitats that may be present in the proposed project area. This demonstrates Cerilon's willingness to cooperate with the Service to avoid potential impacts to listed species. Recent changes in listing status for some of the species will require additional review. Using the USFWS IPAC system will assist with the beginning stages of this process and provides information on possible impacts.

The early preliminary review of anticipated species impacts from the proposed project will help with avoidance and minimization of these impacts. The willingness to work with the Service on these and other issues as they may arise should help with a timely consultation that will benefit both Cerilon and listed species they may otherwise be affecting.

The proposed Project actions should be re-analyzed if any of the following occur:

1. New information reveals effects of the action that may affect listed species in a manner or to an extent not previously considered.
2. The identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this consultation.
3. A new species is listed, or critical habitat is designated that may be affected by this Project.

The FWS appreciates the opportunity to work with Barr Engineering and Cerilon to ensure the conservation of federal listed species to conserve threatened and endangered species and their habitats. If you have any additional questions or concerns, please contact Jerry Reinisch at (701) 425-2133 or via email at jerry_reinisch @fws.gov or contact me at (720) 793-6797 or luke_toso@fws.gov.

Sincerely,

Luke Toso
North Dakota Ecological Services Supervisor