



MPLX LP

200 East Hardin Street
Findlay, OH 45840

January 24, 2020

The following documentation is for information purposes as requested by the Public Service Commission of North Dakota in regard to the Andeavor NGL Pipeline Project.

The documents following include:

Highway 23 Utility Occupancy Permit and DOT/FHA Permit

UTILITY OCCUPANCY APPLICATION AND PERMIT

North Dakota Department of Transportation, Design
SFN 7995 (6-2016)

FOR STATE USE ONLY (Type or Print)

RIMS Document Number 73400	Contract Number 67180238	District Tracking Number 7-023-005.6182
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APPLICANT INFORMATION

Authorized Utility Agent (must be same as signatory for permit)

Company Name Andeavor Field Services LLC	Contact Name James R. Sanford	Telephone Number (210) 844-5366		
Mailing Address 19100 Ridgeway Parkway	City San Antonio	State TX	ZIP Code 78259	Email Address james.r.sanford@andeavor.com

Preparer - Consultant

Company Name Andeavor Field Services LLC	Contact Name Martha Dowlearn	Telephone Number (210) 626-4229		
Mailing Address 19100 Ridgeway Parkway	City San Antonio	State TX	ZIP Code 78259	Email Address martha.m.dowlearn@andeavor.c

Utility Contractor

Company Name Andeavor Field Services LLC	Contact Name Martha Dowlearn	Telephone Number (210) 626-4229		
Mailing Address 19100 Ridgeway Parkway	City San Antonio	State TX	ZIP Code 78259	Email Address martha.m.dowlearn@andeavor.c

TYPE OF FACILITY (Complete appropriate space only.)

Description of Proposed Facility New 8" Steel NGL Pipeline that will be bored perpendicular to Highway 23.		
Size of Facility 8" Steel NGL Pipeline	Number of Cables N/A	Length of Down Guys N/A
Pipeline Pressure NGL - 500 PSI	Size of Casing N/A	Length of Casing N/A
Location of Pole(s) N/A	Location of Appurtenances N/A	Location - Others N/A


TERMS AND CONDITIONS: Installation and maintenance of said facilities on highway right of way shall be subject to the North Dakota Department of Transportation's (NDDOT's) "A Policy for Accommodation of Utilities on State Highway Right of Way", current edition, and the following terms and conditions, attached hereto and made a part hereof.

The installation shall be completed on or before:

Date 12/31/2018

See page 2 for additional Terms and Conditions.

APPROVAL

Company Name (Utility Agency) Andeavor Field Services LLC	Authorized Utility Agent Name (Type or Print) James R. Sanford	Authorize Agent Title Director of Right-of-Way & Real Estate
Date 02/28/2018	Authorized Agent's Signature 	

To be signed by Owner, Partner, Corporate President, Vice President, or other authorized Corporate Officer. If signed by other authorized Corporate Officer, please attach copy of Power of Attorney or other documentation showing authority to sign.

The Owner is hereby granted permission to install and maintain the facilities applied for, as shown on the plans attached hereto, and made a part hereof.

NDDOT Approved Date 3/12/18

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

District Engineer (Type or Print) Joel M. Wilt, PE	District Engineer Signature 
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R95197

- (A) Installation/maintenance of said facilities shall be done in a manner satisfactory to the NDDOT district engineer.
- (B) Owner shall notify the NDDOT district engineer forty-eight (48) hours prior to installing, maintaining, relocating, or removing said facilities. All disturbed areas shall be restored to their original condition in a manner satisfactory to the NDDOT district engineer.
- (C) The owner shall be required to wear an ANSI/ISEA 107-2010 Class II high visibility garment while within the highway right-of-way as per the requirements of 23 CFR 634.
- (D) Owner shall repair or replace highway structures and appurtenances, and any existing facilities located on, over, or under highway right of way, which may be damaged as a result of the installation and maintenance of said facilities on highway right of way.
- (E) The Risk Management Appendix, attached, is hereby incorporated and made a part of this agreement.
- (F) Owner shall promptly remove said facilities from highway right of way, or shall relocate or adjust said facilities, at its sole cost and expense when requested to do so by NDDOT. The owner may be held responsible for delay costs caused by the owner's failure to use reasonable efforts to relocate or adjust facilities in a timely manner.
- (G) NDDOT specifically reserves the right to revoke, or change the terms and conditions of, this Permit with or without cause and upon notice to the Owner.
- (H) The Owner, for him or herself, his or her personal representatives, successors in interest, and assigns, as a part of the consideration hereof, does hereby covenant and agree that (1) no person, on the grounds of race, color, national origin, will be excluded from participation in, denied the benefits of, or be otherwise subjected to discrimination in the use of said facilities, (2) that in the construction of any improvements on, over, or under such land and the furnishing of services thereon, no person, on the grounds of race, color, national origin, will be excluded from participation in, denied the benefits of, or otherwise be subjected to discrimination, (3) that the Owner will use the premises in compliance with all other requirements imposed by or pursuant to the Acts and regulations, such that no person on the grounds of race, color, or national origin, will be excluded from participation in, denied the benefits of, or be otherwise subjected to discrimination in the use of said facilities set forth in this Assurance.

That in the event of breach of any of the above Non discrimination covenants, the NDDOT will have the right to terminate this Permit and to enter or re-enter and repossess said land and the facilities thereon and hold the same as if said Permit had never been made or issued.
- (I) If the utility facility includes drain tile, a "Request for Drainage on Highway Rights of Way", state form number 50909, must be made in conjunction with this permit.
- (J) The Department's review and subsequent approval of this permit request does not relieve the applicant of the responsibility to comply with all Federal and State laws and regulations that govern, but are not limited to, the protection of wetlands, threatened and endangered species, and migratory birds. The applicant is responsible to comply with all Federal and State laws and regulations that govern the protection of cultural resources within the permit application area (e.g., S.106 of the National Historic Preservation Act, 36 CRF Part 800; ND Century Code 55-02-07; ND Century Code 55-03-01.1). The applicant shall be aware of the ND State burial law (ND Century code 23-06-27; Administrative Rule 40-02) and ensure compliance for any discovery of human remains within the permit request area.
- (K) The Contractor agrees that NDDOT's review of the utility relocation plans, specifications, calculations, and field inspections shall be solely for NDDOT purposes and not for the benefit of the Utility or any third party and shall not be deemed to mean that the Utility's design and construction is structurally sound and appropriate or meets applicable federal and state regulations, laws, or local ordinances, codes, or industry standards (collectively, "Requirements"). The Utility affirms that it has taken all of the actions necessary and required for the construction, operation, and maintenance of its facility authorized hereunder, including compliance with all Requirements."
- (L) Detailed location maps showing lateral offsets from roadway centerlines are required for a permit.

For State Use Only

District Tracking Number

Please attach detail location map for each Utility Location. Use multiple utility locations when changing lateral offsets.

Highway Number 23		Utility Location <input type="checkbox"/> Along or <input checked="" type="checkbox"/> Across		For State Use Only				
Nearest City or Hwy Jct. Watford City		Direction (N, S, E, W) East	Approximate Miles From 5.22 Miles	Begin		End		
Begin	Reference Marker 5	Direction (N, S, E, W) East	Longitudinal Offset (feet) 3,264' SW 1,618'	Location Number	Reference Pt 005.6182	Offset	Reference Pt	Offset
	Direction From Centerline (N, S, E, W) West	Lateral Offset (feet) N/A						
End	Reference Marker 6	Direction (N, S, E, W) West	Longitudinal Offset (feet) 1,982'	Location Number			Reference Pt	Offset
	Direction From Centerline (N, S, E, W) East	Lateral Offset (feet) N/A						

174m @ 1,00 sec


NOTICE: The Recipient must comply with ALL applicable Federal, State and local laws, rules, regulations, codes, ordinances, etc., including, but not limited to North Dakota Century Code, Chapter 49-23. (ONE-CALL EXCAVATION NOTICE SYSTEM)

INSTALLATION AND MAINTENANCE: Installation and maintenance of said facilities on highway right of way shall conform to the following provisions:

1. Within thirty (30) days after construction, maintenance, relocation, or removal of said facilities, any right of way scars shall be removed and disturbed areas restored to original condition. Existing topsoil shall be removed prior to excavation and stockpiled until all disturbed areas are restored to original grade. The stockpiled topsoil shall be evenly and smoothly replaced over the areas disturbed by the trenches or pits.

2. Vehicles and other work equipment used to install or maintain said facilities within highway right of way shall, where possible, use established access points, service roads, driveways and approaches to enter or leave the outer portion of the right of way for the performance of necessary work operations. Such vehicles and work equipment shall not be parked on the through-traffic lanes or shoulders of the highway during installation or maintenance of said facilities. **The parking of equipment, vehicles, and storing of materials in the median on divided roadways is not permitted. On all roadways, parking and storing of materials may be permitted only if equipment, vehicles and material are located a minimum of 60 feet from the outside edge of the driving lane.**

3. Protection to the free and safe flow of the highway traffic shall be as required in accordance with the "Manual on Uniform Traffic Control Devices", current edition.

4. The Recipient will notify the District Engineer of the Department of Transportation forty-eight (48) hours prior to beginning this installation. Immediately following the final clean-up of the area, the Recipient shall again notify the District Engineer of the Department of Transportation.

5. The Department of Transportation may not be the total fee owner and does not warrant the title to the highway right of way covered by the terms of this permit. The Recipient shall be responsible for reviewing the public records to determine ownerships and any encumbrances to the title of the properties covered by the terms of this permit.

6. Trenches and pits opened within the right of way shall be cut to O.S.H.A. Standards and shall be of minimum width necessary to accommodate installation of said facilities. **Trenches and Pits shall not be left open overnight, or unattended. Slopes shall not have more than a 2" drop off, all slopes shall be 4:1.**

7. Trenches and pits opened within the right of way shall be backfilled with the same material originally in place, compacted to a density equal to that of the adjacent undisturbed soil and restored to the original grade. The backfill shall be tamped in layers not exceeding six (6) inches in compacted thickness. Consolidation of the backfill by saturation or ponding is not permissible.

8. The pipeline shall have a minimum of thirty-six (36) inches of cover within highway right of way.
9. On longitudinal installations, where the buried cable or pipe is installed by plowing, the plowed ridges shall be mechanically compacted and made flush with the original ground.
10. Casing pipe, where installed, shall extend a minimum of two (2) feet beyond the toe of the highway inslopes. The casing pipe shall be sealed at both ends to prevent formation of a waterway through the casing.
11. The pipeline shall be installed under the surfaced section of the highway by boring or jacking pipe through the roadbed between the clear zone limits. Wet boring or jetting of the pipe under the roadway is not permissible.
12. The diameter of the hole for bored or jacked installations shall not exceed by more than one (1) inch the outside diameter of the facility. Oversized bores, overbreaks, and unused holes shall be backfilled with grout.
13. The location of the pipeline crossing shall be indicated by a marker post installed on each side of the highway at the right of way line. An identification sign shall be attached to one of the marker posts showing the name, address, and telephone number of the pipeline company.
14. The Department of Transportation shall be notified in advance of any proposed change in the type of transmittant carried by the pipeline, or any increase in the maximum working pressure specified in the application for the permit.
15. The casing pipe shall be continuous and shall extend a minimum of two (2) feet beyond the clear zone or two (2) feet beyond the toes of outer inslopes of the highway, whichever is further from the highway center line. The casing pipe shall be adequately sealed at both ends with suitable material that will prevent the formation of a waterway.
16. Casing is not required if approved extra wall thickness pipe is installed.
17. The Recipient shall indemnify, save, hold harmless, the State of North Dakota, its agencies, offices and employees, from any and all claims of any nature arising from any direct, indirect, or consequential damage to real property or business, including all costs, expenses, and attorney's fees, which may in any manner arise out of or result from this project.
18. The topsoil will be replaced on all disturbed areas and seeded as determined below (provide a temporary cover crop):

Seed Class Mix Requirements		
Class II – Early Season		
Grass Species	Variety	Pounds Pure Live Seed Per Acre

Western Wheatgrass	Rodan, Rosana, Walsh, Flintlock, W.R. Poole, Recovery	9.6
Switchgrass	Dacotah, Forestburg, or Sunburst, Summer	3.2
Green Needlegrass	Lodorm, AC Mallard, Fowler	2.4
Sideoats Grama	Killdeer, Pierre, Butte	3.6
Slender Wheatgrass	Revenue, Primar, Adanac, Pryor, Firstrike	5.0
Total		23.8

Seed Class Mix Requirements		
Class II – Late Season		
Grass Species	Variety	Pounds Pure Live Seed Per Acre
Western Wheatgrass	Rodan, Rosana, Walsh, Flintlock, W.R. Poole, Recovery	9.6
Switchgrass	Dacotah, Forestburg, or Sunburst, Summer	1.6
Green Needlegrass	Lodorm, AC Mallard, Fowler	3.6
Canada Wild-rye	Mandan	5.2
Slender Wheatgrass	Revenue, Primar, Adanac, Pryor, Firstrike	5.0
Total		25.0

Risk Management Appendix

Permits and Licenses with Private Individuals, Companies, Corporations, Etc. (referred to as Recipient):

Recipient agrees to defend, indemnify, and hold harmless the state of North Dakota, its agencies, officers and employees (State), from and against claims based on the vicarious liability of the State or its agents, but not against claims based on the State's contributory negligence, comparative and/or contributory negligence or fault, sole negligence, or intentional misconduct. The legal defense provided by the Recipient to the State under this provision must be free of any conflicts of interest, even if retention of separate legal counsel for the State is necessary. Recipient also agrees to defend, indemnify, and hold the State harmless for all costs, expenses and attorneys' fees incurred if the State prevails in an action against the Recipient in establishing and litigating the indemnification coverage provided herein. This obligation shall continue after the termination of this agreement.

Recipient shall secure and keep in force during the term of this agreement, from insurance companies, government self-insurance pools or government self-retention funds authorized to do business in North Dakota, the following insurance coverages:

- 1) **Commercial general liability and automobile liability** insurance – minimum limits of liability required are **\$250,000 per person and \$1,000,000 per occurrence.**
- 2) **Workers compensation** insurance meeting all statutory limits.
- 3) The State of North Dakota and its agencies, officers, and employees (State) shall be endorsed as an **additional** insured on the commercial general liability and automobile liability policies.
- 4) Said endorsements shall contain a **"Waiver of Subrogation"** in favor of the state of North Dakota.
- 5) The policies and endorsements may not be canceled or modified without **thirty (30) days prior written notice** to the undersigned State representative.

Recipient shall furnish a certificate of insurance evidencing the requirements in 1, 3, and 4 above to the undersigned State representative prior to commencement of this agreement.

The State reserves the right to obtain complete, certified copies of all required insurance documents, policies, or endorsements at any time. If Recipient's insurance will expire prior to the term of this agreement, Recipient shall renew the above requirements and furnish a certificate of insurance evidencing the renewal to the undersigned State representative prior to the expiration of the insurance. Any attorney who represents the State under this policy must first qualify as and be appointed by the North Dakota Attorney General as a Special Assistant Attorney General as required under N.D.C.C. Section 54-12-08.

When a portion of a Contract is sublet, the Recipient shall obtain insurance protection (as outlined above) to provide liability coverage to protect the Recipient and the State as a result of work undertaken by the Subcontractor. In addition, the Recipient shall ensure that any and all parties performing work under the Contract are covered by public liability insurance as outlined above. All Subcontractors performing work under the Contract are required to maintain the same scope of insurance required of the Recipient. The Recipient shall be held responsible for ensuring compliance with those requirements by all Subcontractors.

Recipient's insurance coverage shall be primary (i.e., pay first) as respects any insurance, self-insurance or self-retention maintained by the State. Any insurance, self-insurance or self-retention maintained by the State shall be excess of the Recipient's insurance and shall not contribute with it. The insolvency or bankruptcy of the insured Recipient shall not release the insurer from payment under the policy, even when such insolvency or bankruptcy prevents the insured Recipient from meeting the retention limit under the policy. Any deductible amount or other obligations under the policy(ies) shall be the sole responsibility of the Recipient. This insurance may be in policy or policies of insurance, primary and excess, including the so-called umbrella or catastrophe form and be placed with insurers rated "A-" or better by A.M. Best Company, Inc. The State will be indemnified, saved, and held harmless to the full extent of any coverage actually secured by the Recipient in excess of the minimum requirements set forth above.

RM Consulted 2007
Revised 5-09





CERTIFICATE OF LIABILITY INSURANCE

DATE(MM/DD/YYYY)
03/09/2018

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Aon Risk Services Southwest, Inc. Aon Risk Ins Services Southwest, Inc Houston TX Office CA License # 0559715 5555 San Felipe, Suite 1500 Houston TX 77056 USA	CONTACT NAME: PHONE (A/C. No. Ext): (832) 476-6000 FAX (A/C. No.): (800) 953-4542		
	E-MAIL ADDRESS:		
INSURED Andeavor Field Services LLC 19100 Ridgewood Parkway San Antonio TX 78259 USA	INSURER(S) AFFORDING COVERAGE		NAIC #
	INSURER A: Zurich American Ins Co		16535
	INSURER B: American Zurich Ins Co		40142
	INSURER C:		
	INSURER D:		
	INSURER E:		
INSURER F:			

COVERAGES **CERTIFICATE NUMBER: 570070405155** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS. **Limits shown are as requested**

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: <input checked="" type="checkbox"/> POLICY <input type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC OTHER:			GL0593930403	05/01/2017	05/01/2018	EACH OCCURRENCE	\$10,000,000
							DAMAGE TO RENTED PREMISES (Ea occurrence)	\$10,000,000
							MED EXP (Any one person)	Excluded
							PERSONAL & ADV INJURY	\$10,000,000
							GENERAL AGGREGATE	\$10,000,000
							PRODUCTS - COMP/OP AGG	\$10,000,000
A	<input checked="" type="checkbox"/> AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> OWNED AUTOS ONLY <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> HIRED AUTOS ONLY <input type="checkbox"/> NON-OWNED AUTOS ONLY			BAP5939303-03	05/01/2017	05/01/2018	COMBINED SINGLE LIMIT (Ea accident)	\$5,000,000
							BODILY INJURY (Per person)	
							BODILY INJURY (Per accident)	
							PROPERTY DAMAGE (Per accident)	
	<input type="checkbox"/> UMBRELLA LIAB <input type="checkbox"/> OCCUR <input type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE <input type="checkbox"/> DED <input type="checkbox"/> RETENTION						EACH OCCURRENCE	
							AGGREGATE	
B	<input checked="" type="checkbox"/> WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR / PARTNER / EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below			WC593930503 EWS981938303	05/01/2017 05/01/2017	05/01/2018 05/01/2018	<input checked="" type="checkbox"/> PER STATUTE <input type="checkbox"/> OTHER	
				SIR applies per policy terms & conditions			E.L. EACH ACCIDENT	\$2,000,000
							E.L. DISEASE-EA EMPLOYEE	\$2,000,000
							E.L. DISEASE-POLICY LIMIT	\$2,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)
The State of North Dakota and its agencies, officers and employees (State) are included as Additional Insured in accordance with the policy provisions of the Auto and General Liability policy.
A Waiver of Subrogation is granted in favor of Certificate Holder in accordance with the policy provisions of the AL GL and WC policy.

CERTIFICATE HOLDER

CANCELLATION

North Dakota Dept. of Transportation Williston District Office Attn: Sharlene Lind PO Box 698 Williston ND 58802 USA	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS. AUTHORIZED REPRESENTATIVE <i>Aon Risk Services Southwest, Inc.</i>
--	--

Holder Identifier :

Certificate No : 570070405155



March 5, 2018

Andeavor Field Services LLC
19100 Ridgewood Parkway
San Antonio, TX 78259

Subject: Insurance Coverage Consistent With Contract
RIMS Document Number: 73400

You have submitted to the North Dakota Department of Transportation (NDDOT), in connection with your certificate of insurance, additional pages or language on the certificate which either purports to limit or qualify the information reflected on the certificate of insurance or which purports to change, modify or amend your company's insurance policies. NDDOT policy is to not solicit, review or approve contractors' insurance policies, endorsements or amendments to insurance policies, or insurance documents other than properly completed certificates of insurance. NDDOT contracts specify that contractors are responsible for acquiring and maintaining specified coverages and proof of insurance.

Please have a company executive authorized to execute contract documents sign and date the statement below attesting that your company has insurance coverage consistent with the contract provisions and immediately fax and mail it back to us.

Be advised that execution of this contract will be delayed until these issues have been resolved.

Sincerely,

Joel M. Wilt

The following signatory hereby states that the company has, and will maintain in force, insurance coverages (including proof of coverages) consistent with the contract specifications.

Utility Company Name: Andeavor Field Services LLC

Authorized Utility Agent Name (Type or Print): James R. Sanford

Authorized Utility Agent Title: Authorized Signatory - Legal

Date: 03/05/2018

Signature





19100 Ridgewood Parkway
San Antonio, Texas 78259

October 26, 2017

State of North Dakota
Department of Transportation

RE: Signature Authority

To Whom It May Concern:

This letter is being written to advise that Andeavor Field Services, LLC would like to define the authority of the following individual:

James Sanford, Director, Right of Way & Real Estate has the authority to execute on behalf of Andeavor Field Services, LLC application, easement, permit, or any other document pertaining to real estate. His contact information is:

James Sanford, Director, Right of Way & Real Estate
Authorized Signature – Legal
19100 Ridgewood Parkway
San Antonio, Texas 78259
(210) 626-6507
james.r.sanford@andeavor.com

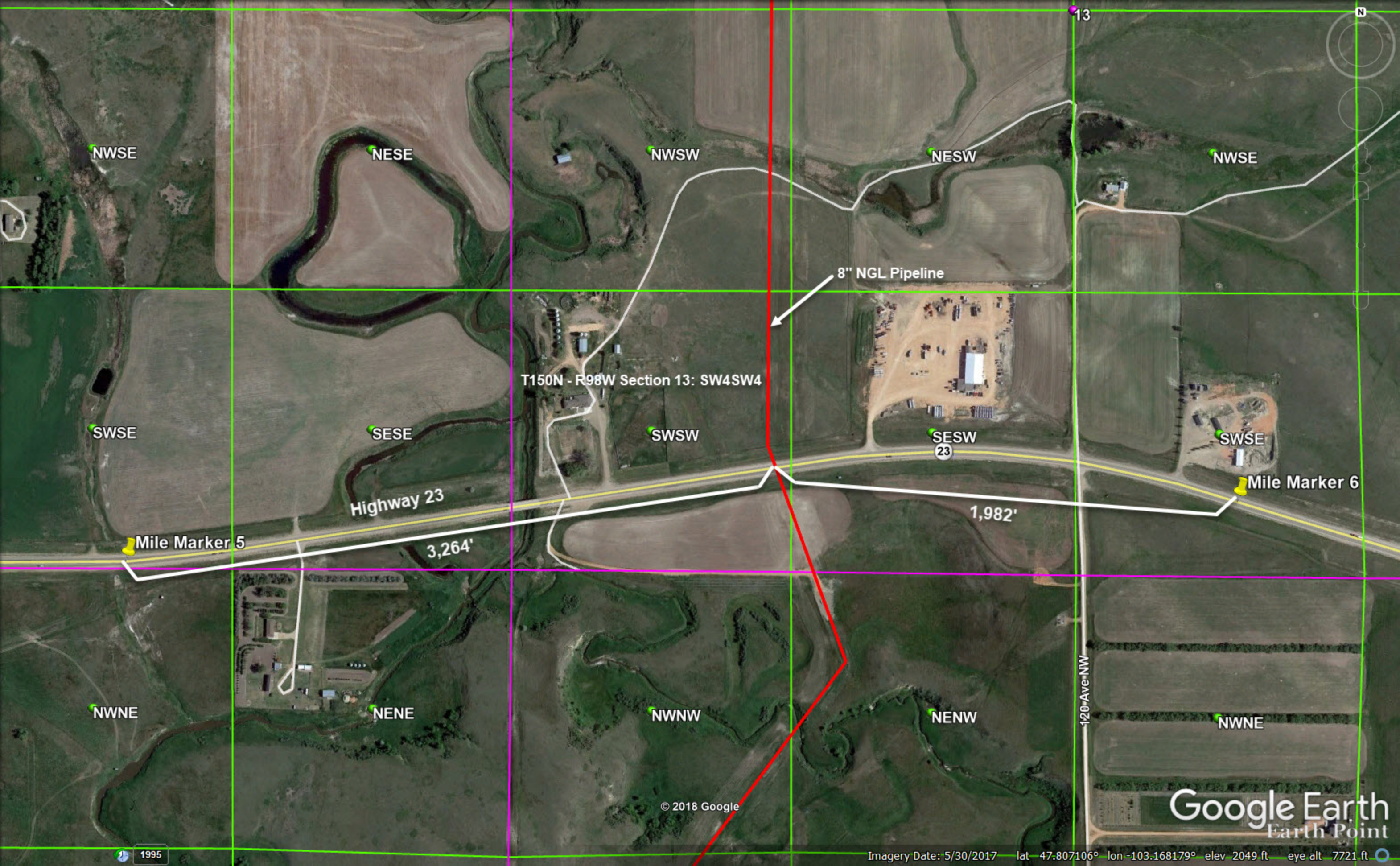
As Senior Vice President of Operations for Andeavor Field Services, LLC, I have the authority to execute all reference documents as well.

Please contact James Sanford if you have any questions, or if any additional information is required.

Sincerely,

A handwritten signature in blue ink, appearing to read "Don J. Sorenson".

Don J. Sorenson
Senior Vice President



NWSE

NESE

NWSW

NESW

NWSE

SWSE

SESE

SWSW

SESW

SWSE

NWNE

NENE

NWNW

NENW

NWNE

T150N - R98W Section 13: SW4SW4

8" NGL Pipeline

Highway 23

Mile Marker 6

Mile Marker 5

3,264'

1,982'

120th Ave NW

© 2018 Google

Google Earth
Earth Point

1995

Imagery Date: 5/30/2017 lat 47.807106° lon -103.168179° elev 2049 ft eye alt 7721 ft



Andeavor

L52279 Y-Grade Hub North Pipeline State Hwy 23 HDD - McKenzie County, North Dakota

BARLOW CALCULATIONS - UNCASSED CROSSING

Document Number: 10832.18-PL-CAL-0001

REVISION and APPROVALS

Rev.	Date	Description	By	Chkd	Appd
A	10-Feb-18	Issued for Permit	BGL	BGL	DW



Spartan Engineering, Inc.
12345 West Alameda Parkway, Suite 205
Lakewood, CO 80228
(303) 658-0358

Andeavor

L52279 Y-Grade Hub North Pipeline State Hwy 23 HDD - McKenzie County, North Dakota

BARLOW CALCULATIONS - UNCASED CROSSING

Onshore Natural Gas Liquids Pipeline > 60 PSIG Crossing

EXHIBIT A

CARRIER PIPE:

Outside Diameter in. (D) 8.625 "
 Wall Thickness in. (t) 0.500 "
 Material Specification X-52
 Minimum Yield Strength (S) 52,000 psig
 Design Factor (F) 0.40 Note 1.
 Longitudinal Joint Seam Factor (E) 1.00
 Temperature Derating Factor (T) N/A! §195.106
 Maximum Operating Pressure 1440 psig
 Design Pressure (P) 2412 psig
 Contents: Natural Gas Liquids

CASING PIPE:

- N/A No Casing
 Outside Diameter in. (D) "
 Wall Thickness in. (t) "
 Material Specification
 Minimum Yield Strength (S) psig

The pipeline material and design must meet minimum Federal Safety Standards stated in 49 CFR:

Gas Pipeline Part 192 subpart C

$P = ((2 \times S \times (t/D)) \times F \times E \times T)$
 Design Factor (F): See § 192.111
 Longitudinal Joint Factor (E): See § 192.113
 Temperature Derating Factor (T): See § 192.115

Liquid Pipeline Part 195 subpart C

$P = ((2 \times S \times (t/D)) \times E \times F)$
 Steam Joint Factor (E): See § 195.106
 Design Factor (F): See § 195.106

$P = (2 \times S \times (t / D)) \times F \times E$
 $= (2 \times 52,000 \text{ psig} \times (0.500" / 8.625")) \times (0.40) \times (1.00)$
 $= 2,412 \text{ psig}$

The calculated Design Pressure of 2,412 psig is > the Maximum Operating Pressure of 1,440 psig.

Note 1: The crossing specific Class Location requires a 0.60 design factor, but the material selection provides a 0.40 design factor, as the calculations show.



Engineer's Signature

Date

A	Issued for Permit	10-Feb-2018	BGL	BGL	DW	DW	N/A
Rev	Description	Date	By	Checked	Approved	PM	Client



SPARTAN ENGINEERING, Inc.
 12345 W Alameda Pkwy
 Suite 205
 Lakewood, CO 80228
 (303) 658-0358

Document Number:

10832.18-PL-CAL-0001

Project
L52279 Y-Grade Hub North Pipeline State Hwy 23 HDD

Location
McKenzie County, North Dakota

Date
2/10/2018



Document Number: 10832.18-PL-CAL-0001, Rev A, Issued for Permit

Installation of Pipelines by HDD - Operating Stress Analysis

PIPE AND OPERATIONAL DATA:

Young's Modulus for Steel [ksi]	30,000
Poisson's Ratio for Steel	0.3
Coefficient of Thermal Expansion [per°F]	0.000065
Operating Pressure [psig]	1440
Pipe Outside Diameter [in.]	8.63
Pipe Wall Thickness [in.]	0.500
Specified Minimum Yield Strength [psi]	52,000
Installation Temperature [°F]	40
Operating Temperature [°F]	100
Depth of the Pipe at Horizontal Section [ft]	17
Groundwater Table below Datum [ft]	0
Shortest Radius of Curvature [ft]	800



RESULTS OF CALCULATION:

Bending Stress [psi]	13,484
Hoop Stress [psi]	12,364
Thermal Stress [psi]	-11,700
Total Longitudinal Compressive Stress [psi]	-21,475
Maximum Shear Stress [psi]	16,919
Maximum Allowable Shear Stress (45% of SMYS)	23,400
Operating Conditions:	ACCEPTABLE

Notes: HDD PIPE, 8.625" OD X 0.500" WT, API 5L, X52, ERW
LINE PIPE, 8.625" OD X 0.250" WT, API 5L, X52, ERW

Reference: "Installation of Pipelines by Horizontal Directional Drilling", PRCI Report PR-227-9424

Prepared By Bernard Lafleur

Approved By

Revision: 10.0.0

Project
L52279 Y-Grade Hub North Pipeline State Hwy 23 HDD



Location
McKenzie County, North Dakota

Date
2/10/2018

Document Number: 10832.18-PL-CAL-0001, Rev A, Issued for Permit

HDD - Pull Force and Installation Stress Analysis

PIPE AND PROFILE DATA:

Pipe Outside Diameter [in.]	8.63
Pipe Wall Thickness [in.]	0.500
Specified Minimum Yield Strength [psi]	52,000
Young's Modulus for Steel [ksi]	30,000
Poisson's Ratio for Steel	0.30
Mud Weight [lbs/ft ³]	89.8
Soil Friction Coefficient	0.30
Fluid Drag Coefficient [psi]	0.05
Water Density [lbs/ft ³]	62.40
Pipe Filled with Water:	No

Straight Section "A - B" Downslope:

Measured Length [ft]	1
Angle of Inclination [°]	11

Curved Section "B - C" Downslope:

Measured Length [ft]	150
Half of the Angle of Inclination [°]	5.5
Radius of Curvature [ft]	800

Straight Section "C - D":

Measured Length [ft]	.1
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Curved Section "D - E" Upslope:

Measured Length [ft]	150
Half of the Angle of Inclination [°]	5
Radius of Curvature [ft]	800

Straight Section "E - F" Upslope:

Measured Length [ft]	1
Angle of Inclination [°]	10

RESULTS OF CALCULATION:

Pipe Weight in Air [lbs/ft]	43.41
Pipe Exterior Volume [ft ³ /ft]	0.41
Pipe Interior Volume [ft ³ /ft]	0.32
Weight of Water [lbs/ft]	0.00
Displaced Mud Weight [lbs/ft]	36.48
Effective Weight of Pipe [lbs/ft]	6.937

Total Pull Force [lbs] 5,737

Notes: HDD PIPE, 8.625" OD X 0.500" WT, API 5L, X52, ERW
LINE PIPE, 8.625" OD X 0.250" WT, API 5L, X52, ERW

Reference: "Installation of Pipelines by Horizontal Directional Drilling", PRCI Report PR-227-9424

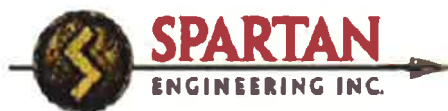


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Project
L52279 Y-Grade Hub North Pipeline State Hwy 23 HDD



Location
McKenzie County, North Dakota

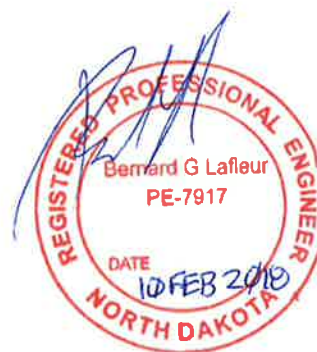
Date
2/10/2018

Document Number: 10832.18-PL-CAL-0001, Rev A, Issued for Permit

HDD - Installation Stress Analysis

Point: "B"	This Project	Allowable	PASS/FAIL
Tensile Stress [psi]	1	46,800	Pass
Bending Stress [psi]	0	39,000	Pass
External Hoop Stress [psi]	1	26,148	Pass
Unity Check: Tensile & Bending Stress	0.00	1.00	Pass
Unity Check: Tensile,Bending & Hoop Stress	0.00	1.00	Pass
Point: "C"	This Project	Allowable	PASS/FAIL
Tensile Stress [psi]	216	46,800	Pass
Bending Stress [psi]	13,484	39,000	Pass
External Hoop Stress [psi]	80	26,148	Pass
Unity Check: Tensile & Bending Stress	0.35	1.00	Pass
Unity Check: Tensile,Bending & Hoop Stress	0.11	1.00	Pass
Point: "D"	This Project	Allowable	PASS/FAIL
Tensile Stress [psi]	216	46,800	Pass
Bending Stress [psi]	0	39,000	Pass
External Hoop Stress [psi]	80	26,148	Pass
Unity Check: Tensile & Bending Stress	0.00	1.00	Pass
Unity Check: Tensile,Bending & Hoop Stress	0.00	1.00	Pass
Point: "E"	This Project	Allowable	PASS/FAIL
Tensile Stress [psi]	448	46,800	Pass
Bending Stress [psi]	13,484	39,000	Pass
External Hoop Stress [psi]	15	26,148	Pass
Unity Check: Tensile & Bending Stress	0.36	1.00	Pass
Unity Check: Tensile,Bending & Hoop Stress	0.11	1.00	Pass
Point: "F"	This Project	Allowable	PASS/FAIL
Tensile Stress [psi]	449	46,800	Pass
Bending Stress [psi]	0	39,000	Pass
External Hoop Stress [psi] [psi]	0	26,148	Pass
Unity Check: Tensile & Bending Stress	0.01	1.00	Pass
Unity Check: Tensile,Bending & Hoop Stress	0.00	1.00	Pass

Notes: HDD PIPE, 8.625" OD X 0.500" WT, API 5L, X52, ERW
LINE PIPE, 8.625" OD X 0.250" WT, API 5L, X52, ERW



Reference: "Installation of Pipelines by Horizontal Directional Drilling", PRCI Report PR-227-9424

Prepared By Bernard Lafleur

Approved By

Revision: 10.0.0

Project

L52279 Y-Grade Hub North Pipeline State Hwy 23 HDD



Location

McKenzie County, North Dakota

Date

2/10/2018

Document Number: 10832.18-PL-CAL-0001, Rev A, Issued for Permit

API 1102 - Liquid Pipeline Crossing Highway

PIPE AND OPERATIONAL DATA:

Operating Pressure [psi] 1440
 Operating Temperature [°F] 100
 Pipe Outside Diameter [in] 8.63
 Pipe Wall Thickness [in] 0.500
 Pipe Grade: X52
 Specified Minimum Yield Stress 52,000
 Design Factor .40
 Weld Joint Factor 1.00
 Pipe Class: Electric Resistance Welded and
 Flash Welded
 Young's Modulus for Steel [ksi] 30,000
 Poisson's Ratio for Steel 0.30
 Coefficient of Thermal Expansion [per°F] 0.0000065
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SITE AND INSTALLATION DATA:

Soil Type: Soft to medium clays and silts with high plasticities
 E' - Modulus of Soil Reaction [ksi] 0.2
 Er - Resilient Modulus [ksi] 5.0
 Average Unit Weight of Soil [lb/ft³] 120
 Pipe Depth [ft] 10
 Bored Diameter [in] 14
 Installation Temperature [°F] 40
 Design Wheel Load from Single Axle [kips] 12.00
 Design Wheel Load from Tandem Axles [kips] 10.00
 Pavement Type: Rigid
 Impact Factor Method: ASCE - Highway

RESULTS:

Hoop (Barlow) Stress [psi]	12,427	Maximum Circumferential Stress [psi]	12,631
Allowable Hoop Stress [psi]	20,800	Maximum Longitudinal Stress [psi]	-7,314
Stiffness Factor for Earth Load Circumferential Stress	405	Maximum Radial Stress [psi]	-1,440
Burial Factor for Earth Load Circumferential Stress	1.28	Total Effective Stress [psi]	17,752
Excavation Factor for Earth Load Circumferential Stress	2.17	Allowable Effective Stress [psi]	20,800
Circumferential Stress from Earth Load [psi]	670		
Impact Factor	1.35		
Highway Stiffness Factor for Cyclic Circumferential	4.30		
Highway Geometry Factor for Cyclic Circumferential	0.70		
Cyclic Circumferential Stress [psi]	254		
Highway Stiffness Factor for Cyclic Longitudinal Stress	7.90		
Highway Geometry Factor for Cyclic Longitudinal Stress	1.01		
Cyclic Longitudinal Stress [psi]	673		

Stress [psi]	Calculated	Allowable	PASS/FAIL
Hoop	12,427	20,800	PASS
Effective	17,752	20,800	PASS
Girth Welds	254	4,800	PASS
Long. Welds	673	8,400	PASS



Notes: HDD PIPE, 8.625" OD X 0.500" WT, API 5L, X52, ERW
 LINE PIPE, 8.625" OD X 0.250" WT, API 5L, X52, ERW
 STATE HWY 23, ASPHALT, UNCASED 8" CROSSING
 Reference: API RP 1102 "Steel Pipelines Crossing Railroads and Highways"

Prepared By Bernard Lafleur

Approved By

Revision: 13.0.1

**Suggested Utility Conditions for Oil/Gas Along and/or Across
Primary and Secondary Highways**

April 1, 2003

NOTICE: The Recipient must comply with ALL applicable Federal, State and local laws, rules, regulations, codes, ordinances, etc., including, but not limited to North Dakota Century Code, Chapter 49-23. (ONE-CALL EXCAVATION NOTICE SYSTEM)

1. **INSTALLATION AND MAINTENANCE:** Installation and maintenance of said facilities on highway right of way shall conform to the following provisions:
2. Within thirty (30) days after construction, maintenance, relocation, or removal of said facilities, any right of way scars shall be removed and disturbed areas restored to original condition. Existing topsoil shall be removed prior to excavation and stockpiled until all disturbed areas are restored to original grade. The stockpiled topsoil shall be evenly and smoothly replaced over the areas disturbed by the trenches or pits.
3. Vehicles and other work equipment used to install or maintain said facilities within highway right of way shall, where possible, use established access points, service roads, driveways and approaches to enter or leave the outer portion of the right of way for the performance of necessary work operations. Such vehicles and work equipment shall not be parked on the through-traffic lanes or shoulders of the highway during installation or maintenance of said facilities.
4. Protection to the free and safe flow of the highway traffic shall be as required in accordance with the "Manual on Uniform Traffic Control Devices", current edition.
5. The Recipient will notify the District Engineer of the Department of Transportation forty-eight (48) hours prior to beginning this installation. Immediately following the final clean up of the area, the Recipient shall again notify the District Engineer of the Department of Transportation.
6. The Department of Transportation may not be the total fee owner and does not warrant the title to the highway right of way covered by the terms of this permit. The Recipient shall be responsible for reviewing the public records to determine ownerships and any encumbrances to the title of the properties covered by the terms of this permit.
7. For highway crossings, the buried telephone wire or cable shall be installed under the surfaced sections by boring or jacking pipe through the roadbed between the clear zone limits. Wet boring or jetting of the pipe under the roadway is not permissible.
8. Trenches and pits opened within the right of way shall be cut to O.S.H.A. Standards and shall be of minimum width necessary to accommodate installation of said facilities. Open trenches and pits shall be barricaded if left unattended.
9. Trenches and pits opened within the right of way shall be backfilled with the same material originally in place, compacted to a density equal to that of the adjacent undisturbed soil and restored to the original grade. The backfill shall be tamped in layers not exceeding six (6) inches in compacted thickness. Consolidation of the backfill by saturation or ponding is not permissible.
12. The pipeline shall have a minimum of thirty-six (36) inches of cover within highway right of way.
15. On longitudinal installations, where the buried cable or pipe is installed by plowing, the plowed ridges shall be mechanically compacted and made flush with the original ground.

20. Casing pipe, where installed, shall extend a minimum of two (2) feet beyond the toe of the highway inslopes. The casing pipe shall be sealed at both ends to prevent formation of a waterway through the casing.
24. The diameter of the hole for bored or jacked installations shall not exceed by more than one (1) inch the outside diameter of the facility. Oversized bores, overbreaks, and unused holes shall be backfilled with grout.
25. The location of the pipeline crossing shall be indicated by a marker post installed on each side of the highway at the right of way line. An identification sign shall be attached to one of the marker posts showing the name, address, and telephone number of the Recipient.
26. The Department of Transportation shall be notified in advance of any proposed change in the type of transmittant carried by the pipeline, or any increase in the maximum working pressure specified in the application for the permit.
28. Marker posts shall be installed at the highway right of way line at intervals not to exceed 1,000 feet. An identification sign shall be attached to one of the marker posts and shall show the name, address, telephone number, and location of the pipeline.
48. The casing pipe shall be continuous and shall extend a minimum of two (2) feet beyond the clear zone or two (2) feet beyond the toes of outer inslopes of the highway, whichever is further from the highway center line. The casing pipe shall be adequately sealed at both ends with suitable material that will prevent the formation of a waterway.
55. Casing is not required if approved extra wall thickness pipe is installed.
- 58. The Recipient shall indemnify, save, hold harmless, the State of North Dakota, its agencies, offices and employees, from any and all claims of any nature arising from any direct, indirect, or consequential damages to real property or business, including all costs, expenses, and attorney's fees, which may in any manner arise out of or result from this project.**