WENCK File #B2579-0033
July 2019

Interim Topsoil Inspection Report
Cenex 10" Refined Fuels Pipeline
PU-17-97

Prepared for:

North Dakota
Public Service Commission

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Executive Summary

The North Dakota Public Service Commission (PSC) retained Wenck Associates, Inc. (Wenck) to complete topsoil inspections during construction of the 10" Refined Fuels Pipeline Project in Williams, Mountrail, and Ward Counties, North Dakota (ND), constructed by Cenex Pipeline L.L.C. (Cenex). The purpose of the inspections was to ensure the PU-17-97 project was constructed in compliance with the siting laws, rules and the applicable PSC Orders for the Project, which includes a requirement that topsoil must be segregated from subsoil during installation of the pipeline.

A pre-construction conference call was held for the Project on 20 May 2019; Wenck attended the call. Construction involving soil disturbance for the Project began 5 June 2019 on Spread 2 and 10 June 2019 on Spread 1. Prior to inspections, Wenck reviewed Project documents to become familiar with the Project and PSC Orders for the Project. Wenck visually inspected the Project area on June 5th, 6th, 10th, and 18th, as well as July 2nd and 3rd 2019 and observed topsoil and subsoil removal and segregation done by two separate contractor crews on the two separate pipeline spreads.

Overall, soil removal and storage processes appeared satisfactory and completed properly at most areas of the project. For the most part, only minor, and isolated issues of soil segregation or mixing were observed along both spreads of the ROW. These minor issues were resolved on-site with contractors or communicated to the respective field superintendents. Initially, issues of the amount of topsoil stripped and stockpiled along the first mile of the project occurred for both spread crews. This issue was immediately discussed with the contractors on-site and resolved by further stripping. Another issue was observed of little to no topsoil stripped and subsequent placement of subsoil stockpiles on the topsoil. This issue took place within and around three delineated wetland areas along Spread 1. Resolutions for this specific area are currently being considered.

1.0 Background and Scope

1.1 INTRODUCTION

The Cenex 10" Refined Fuels Pipeline (Project) in Williams, Mountrail, Ward counties, ND, is comprised of two spreads. Spread 1 begins in Williams County, ND and ends in Richland County, Montana (MT). Spread 1 is approximately 59.2 miles originating in Section 34, T156N, R97W, Williams County heading west and intersecting with the North Dakota and Montana border in Section 22, T153N, R104W, Williams County. Spread 2 is approximately 90.5 miles originating in Section 35, T156N, R97W, Williams County heading east through Williams, Mountrail, and Ward Counties, ending at the CHS terminal approximately one mile west of Minot in Section 20, T155N, R83W, Ward County. The total distance of the pipeline is approximately 181.5 miles, of which 149.7 miles is in North Dakota.

The pipe for the Project will be 10-inch diameter steel pipe with 0.307 inches wall thickness for line pipe except at river and road crossing sites where the thickness will be 0.365 inches. The maximum operating pressure for the pipeline will be 1,440 pounds per square inch throughout the Project. The Project will include 13 main line valves, one pipeline pig launcher located at the terminal in Glendive, Montana, and one pig receiver located at the terminal in Minot, North Dakota. Valves will be located on either side of the following rivers: The Little Muddy, White Earth, and Little Knife. The pipeline will transport approximately 38,000 barrels of refined fuels per day, but will have a maximum capacity of 60,000 barrels per day.

The Project is under the jurisdiction of the North Dakota Public Service Commission (PSC), which issued its Findings of Fact, Conclusions of Law, and Order in Case No. PU-17-97 on 14 March 2018, granting Certificates of Corridor Compatibility No. 202 and Route Permit No. 212 for the Project.

1.2 REGULATORY PURPOSE AND SCOPE OF WORK

The North Dakota Energy Conversion and Transmission Facility Act (North Dakota Century Code Chapter 49-22) authorizes the Public Service Commission to determine that the location, construction, and operation of jurisdictional energy conversion and transmission facilities will produce minimal adverse effects on the environment and the welfare of citizens of North Dakota. Construction inspections ensure that such projects are constructed in compliance with the siting laws (North Dakota Century Code Chapter 49-22) and rules (North Dakota Administrative Code Article 69-06) and the applicable Commission Orders.

The North Dakota PSC retained Wenck Associates, Inc. (Wenck) to complete construction inspections, and specifically a topsoil inspection, of the Project. The inspection process included a review of the Application for Corridor Compatibility and Route Permit, the Project's Order, and other applicable documents. PSC Certificate Relating to Order Provisions #12 for the Project states: "*Company understands and agrees that all topsoil, up to 12 inches, or topsoil to the depth of cultivation, whichever is greater, over and along trench areas where cuts will be made, must be stripped and segregated from the subsoil. Any area on which excavated subsoil will be placed must also be stripped of topsoil. After backfilling is completed, any excess subsoil must be placed over the excavation area,*

blending the grade into existing topography. Topsoil must be replaced over areas from which it was stripped only after the subsoil is replaced."

Wenck's scope of work was to perform and document on-site inspections during the topsoil removal phase of the Project to verify that topsoil was properly removed and kept segregated from subsoil until replacement occurred. The initial inspections on day-one of topsoil stripping activities provide an opportunity to train equipment operators on the specific topsoil stripping requirements and depth variability of topsoil resources along the Project. The number of on-site inspections is based on Wenck's determination that equipment operators demonstrated proficiency concerning topsoil and subsoil removal and segregation in compliance with the Commission's Order.

This interim report includes, but is not limited to, documentation of site visit observations and a summary of findings and issues that should be addressed for the Project to be considered in full compliance.

1.3 BACKGROUND

1.3.1 Regional Soils

The majority of the project is located in the dissected uplands of the Northwestern Glaciated Plains and Missouri Coteau. The primary soils of the region were formed in Wisconsin-aged till or residuum of weathered shale, siltstone, or sandstone of the Sentinel Butte Formation. The regional geology typically consists of a mantle of till (when present) overlying the older residual sediments. The majority of the soils present throughout the Project would be classified as mollisols and characterized by a relatively dark, thick "A" (topsoil) horizon. The primary exception to this are the entisols soils found nearer summit and shoulder-slopes of hilltops, that lack a mollic epipedon (i.e., thick A horizon). Some soils would be considered salt-affected, which have adverse properties from salinity and/or sodicity.

The main difference between topsoil and subsoil in this region are most often the presence of calcium carbonates, salts such as sodium, and the reduction in organic matter. Calcareous soils can be visually distinguished by the lighter colors associated with calcium carbonates, which generally also correlates to a reduction in organic matter. Topsoil segregation on saline and sodium affected soils (i.e., natric soils) are usually less apparent, but can distinguished by accumulations of salt, clay and/or associated columnar structure (i.e., clay pans). Salt-affected sodic soils, when tilled or disturbed, are typically hard and cloddy when dry, often coated with a visible salt crust.

1.3.2 Soil Stripping and Segregation Best Practices

Topsoil has biological, physical and chemical properties that are critical to successful reclamation of the project site. The surface layer of most soils is generally preferred for topsoil because of its content of organic matter. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth. Topsoil, typically considered the A horizon, should be stripped to the correct depth according to natural variations in the depth of this top layer of organic matter rich soil.

During pipeline installation preparation and excavation work, contractors are to segregate topsoil and subsoil. Mixing subsoil with the topsoil can be detrimental to the re-vegetation of a site. Subsoil material generally has lower organic matter content than topsoil, making it typically lighter in color. It may also have a different chemical (i.e., salts) and physical properties (i.e., texture) than the topsoil. Occasionally, the most unfavorable characteristic

of subsoil horizons is the accumulations salts. Salts, such as sodium, among others, can severely restrict plant growth. The presence or absence of existing plant roots can be used as an indication between topsoil and unsuitable subsoil in certain situations, such as clay-pan subsoils.

To summarize, hilltops and steeper sloping terrain generally have thinner topsoil layers; while lower, flatter foot-slopes and swales typically have thicker topsoil layers. The most common exception to this are salt-affected soils, where the accumulation of salts and clay often restrict plant root growth. Equipment operates should be aware of the natural soil landscape relationships, as well as the potential for accumulations of salts, both of which drive topsoil thicknesses, and adjust stripping depths accordingly.

2.0 Findings of Site Inspection

2.1 METHODS

Matt Retka, Soil Classifier and Jeremy Hackley, Field Inspector, (both from Wenck) visited Spread 2 of the Project on 5 and 6 June 2019. Also present were Jeffrey Moss, Environmental Inspector and Jim Sandau, ROW Liaison (both from KLJ Engineering); Thomas Stark, Chief Inspector, Wm Clay Inspection LLC (WCI); and Travis Gillett, Field Superintendent, Loenbro Pipeline LLC. (Loenbro) . Janson Howe, Field Inspector (Wenck) visited Spread 1 of the Project on 10 June 2019. Mr. Howe was accompanied by Matt Oliver, Field Crew Superintendent, Frontier Services, Inc. (Frontier). Mr. Hackley visited Spread 1 and 2 for a follow-up inspection on 18 June 2019 and a further follow-up inspection of Spread 1 and 2 on 3 July 2019.

The Project was inspected visually by driving to access points and walking or driving within the Project right-of-way (ROW). Two pipeline contractor companies worked on two different spreads; Loenbro began on Spread 2 working east on 5 June 2019 and Frontier began on Spread 1 working west on 10 June 2019. Contractors/equipment operators were observed during the topsoil removal phase of the Project to check that topsoil has been properly removed, piled, and kept segregated from subsoil. Digital photographs were taken showing typical Project infrastructure and documenting problem areas (**Appendix A**). Geographic coordinates were recorded at observation points or potential problem areas using a handheld Global Positioning System (GPS) (Garmin GPSMAP 60CSx; <10m accuracy; NAD83 datum) (**Table 1**).

2.2 ON-SITE INSPECTION OBSERVATIONS

Spread 2-Loenbro

Construction for Spread 2 of the Project began 5 June 2019. Wenck staff met with Jeffrey Moss, KLJ Environmental Lead, Thomas Stark, WCI and Loenbro staff at the first construction site location east of 113th Ave NW, southeast of Ray, ND, in Section 35, T156N, R97W **(Appendix A, Observation Points 1-6)**. Loenbro did not conduct any ground disturbing work until Wenck staff were on site. Three dozers began topsoil stripping and positioning the topsoil stockpiles on the south side of the ROW. The dozers performed several passes over each area of ground removing topsoil until the subsoil was reached. Contractors eventually employed a combination of graders and dozers depending on the equipment limitations, slope, and depth of topsoil. Spotters observing the work and guiding dozer operators helped to ensure work remained within the ROW. An average depth of approximately 11 inches of topsoil was stripped at the beginning station.

As soil stripping continued, issues of not enough topsoil being stripped or stripping too deep beyond that of suitable topsoil were observed. An issue with topsoil spilling beyond the ROW was also observed. An in-depth discussion regarding topsoil stripping procedures and requirements was held between Wenck staff, Loenbro operators, and WCI Chief Inspector, Thomas Stark. Topsoil removal depth per PSC guidelines was clarified and advice on adjusting stripping depth upon hilltops and swales were heeded by Loenbro operators and WCI Chief Inspector (**Appendix A, Observation Points 6-10**).

On 6 June 2019, Mr. Hackley re-visited Spread 2 to follow up on the topsoil stripping progress. Wenck observed that equipment operators were varying the topsoil stripping

depths to appropriately correspond with topography as required. Straw wattles were installed along natural drainage areas to mitigate against water erosion of topsoil. Subsoil had been stripped and graded into the ROW to level the area for further construction (**Appendix A, Observation Points 25-32**).

The next topsoil inspection of Spread 2 was conducted on 18 June 2019. This inspection was another follow-up to ensure topsoil removal continued within regulatory guidelines. Mr. Hackley meet with Mr. Moss, KLJ and Mr. Stark, WCI. Mr. Hackley toured Spread 2 intermittently from Station 4940+00 to Station 5115+00. Areas were observed where topsoil stockpiles and subsoil stockpiles touched. This was brought to the attention of Mr. Stark. It was discussed how motor grader operators would be able to take away the subsoil first leaving the topsoil stockpile with very little subsoil left. Another pass with the grader would be completed to spread soil where the subsoil and topsoil were contacting each other. Then the topsoil will be placed over the redistributed subsoils. This will help ensure that any mixed subsoil/topsoil is located beneath the unmixed topsoil (**Appendix A, Observation Points 65-69**).

Spread 1-Frontier

Construction for Spread 1 of the Project began 10 June 2019. Jansen Howe, Wenck Field Inspector, met with Matt Oliver, Frontier, Field Crew Superintendent at the first construction site location west of 113th Ave NW, southeast of Ray, ND. Frontier did not conduct any ground disturbing work until Wenck staff were on site. Mr. Howe observed a motor grader stripping topsoil and communicated with the operator that more topsoil needed to be stripped from the lower swale areas. (**Appendix A, Observation Points 601-618**).

A follow-up topsoil inspection on Spread 1 occurred on 18 June 2019. Mr. Hackley arrived at the Spread 1 kick-off location. The north side of the ROW had only been stripped approximately 1-3 inches on the length of the ROW that was inspected. The south side of the ROW had been stripped slightly deeper, however, approximately 5-9 inches topsoil remained that needed to be removed in many areas. This was brought to the attention of Mr. Oliver and the issue was later resolved by continuing topsoil stripping of the ROW in that location (**Appendix A, Observation Points 70-74**).

The next follow-up topsoil inspection for Spread 1 occurred on 2 and 3 July 2019. Upon arrival Mr. Hackley was meet by Scott Lawson, Frontier Co-owner, who expressed his willingness to collaborate to ensure the Project meets PSC guidelines. Observations of re-stripped areas showed that topsoil had been further stockpiled and the south side of the ROW had been appropriately stripped to subsoil. Portions of the trench had been dug, pipe placed, and buried since the time of the last inspection. Observations of pipe in the trench measured at a depth of approximately 48 inches (**Appendix A, Observation Point 92**) and approximately 60 inches (**Appendix A, Observation Point 93**).

Observations at Section 29, T156N, R97W, in the vicinity of the stake for Station 4648+28 showed no indications that topsoil had been stripped within the ROW outside of the trench area; pipe was placed in the trench and buried with what appeared to be mostly relatively light-colored and calcareous subsoil. Similarly, west of the stake for Station 4642+48, topsoil was not stripped along the ROW outside of the trench area. Trenching had occurred, the pipe placed in the trench, and was in the process of being buried. These observations continued to the vicinity of the quarter section road in Section 29, T156N, R97W where work was being conducted on timber mats adjacent to what appeared to be a wetland area. This was brought to the attention of Jean Rowland and Robert Sanchez, both WCI inspectors. Mr. Rowland had commented that he was unsure that the area was a designated

wetland and that their alignment sheets did not specify either way. Mr. Rowland further explained that due to wet conditions, topsoil stripping was only attempted above the trench area, and the excavated subsoil was placed adjacent to the trench. This direct trenching process occurred along the length of the timber mats. Mr. Oliver (Frontier) was notified of this issue. At the time of this report, resolutions to this issue are being considered. Visual inspection of the topsoil removal continued intermittently along the ROW heading west to T156N, R99W, Section 35 with no other issues observed. (**Appendix A, Observation Points 96-100**).

Summary

Contractors on both Spread 1 and 2 were aware of some initial discrepancies in topsoil stripping depths and isolated locations where subsoil and topsoil stockpiles had periodically come in contact with each other. These minor issues were addressed and and/or a resolution proposed. The soil segregation issues near the wetland areas in Section 29, T156N, R97W at Spread 1 is further discussed in Section 3.0 below.

Overall, the contractors on both Spread 1 and 2 did a satisfactory job with the stripping of topsoil in most areas, and paid attention to topsoil stripping depths which tended to vary several inches depending upon the location. Adequate stripping and stockpiling of subsoil were observed along areas of uneven terrain in order to create a level workspace for equipment and pipe installation. Topsoil stockpiles were kept free of subsoils with few exceptions.

3.0 Issues, Resolutions, and Recommendations

Initial inspections yielded some topsoil stripping depth issues at both Spread 1 and Spread 2. As previously explained, each of these early minor issues was resolved either on-site or by communicating with crew superintendents via telephone or e-mail. During subsequent site inspections, locations were observed where the subsoil pile was touching the topsoil pile, and very few locations where subsoil was mixed slightly with the topsoil. Both types of mixing are minimal and were known to occur by the contractors. The mixed soils are located on the surface of the stockpile and will be the first layer spread when replacing the soils. As a result, any mixed soils will be covered with the majority of the topsoil.

An issue of topsoil-subsoil mixing was observed within and around a group of wetlands in the SE quarter of Section 20, T156N, R97W, of Williams County (Spread 1). It would be recommended that any subsoil spoils from the associated trenching in this area, which appear to have been spread out over the non-trench areas atop in-situ and unstripped topsoil, be removed and/or replaced directly back over the trench area. Any salvaged topsoil from the trench, or salvaged organic layer in the case of standing water wetlands, should then be replaced over the trench area after subsoil replacement. In the future, it appears the contractor could reasonably salvage more topsoil (i.e., 12 inches) during initial trenching, especially in non-standing water areas. Furthermore, topsoil should be first stripped from any areas used for subsoil stockpiling, prior to trenching. This issue is in the process of being resolved at the time of this report.

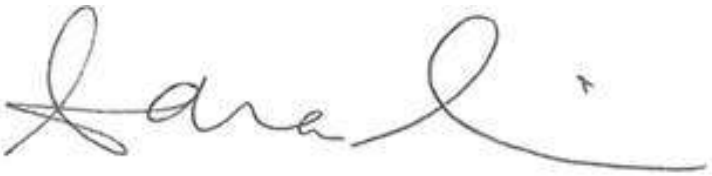
4.0 References

North Dakota Public Service Commission (ND PSC). Online Case Search. Available from: http://www.psc.nd.gov/database/company_case_list.php. Accessed May-July 2019.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook.Energy Information Administration, www.eia.doe.gov/oiaf/1605/coefficients.html

5.0 Signatures

The services performed by Wenck staff for this project have been conducted in a manner consistent with the degree of care and technical skill appropriately exercised by professionals currently practicing in this area under similar time and budget constraints. Recommendations and findings contained in this report represent our professional judgment and are based upon available information and technically accepted practices at the present time and location. Other than this, no warranty is implied or expressed.



Sara Simmers, Project Manager — Date: 7/19/19

Matt Retka, Professional Soil Classifier — Date: 7/19/19

Tables

1. Observation Point Coordinates

Observation Point	Date	Lat.	Long.	Observation Point	Date	Lat.	Long.
1	5-Jun-19	48.288675	-103.129863	65	18-Jun-19	48.288896	-103.063176
2	5-Jun-19	48.288749	-130.129624	66	18-Jun-19	48.289923	-103.061533
3	5-Jun-19	48.288711	-103.128137	67	18-Jun-19	48.291102	-103.059764
4	5-Jun-19	48.288531	-103.127192	68	18-Jun-19	48.292014	-103.046447
5	5-Jun-19	48.28868	-103.127072	69	18-Jun-19	48.283547	-103.008386
6	5-Jun-19	48.288521	-103.126407	70	18-Jun-19	48.289015	-103.136426
7	5-Jun-19	48.288523	-103.125759	71	18-Jun-19	48.289063	-103.140839
8	5-Jun-19	48.288466	-103.125489	72	18-Jun-19	48.288954	-103.141111
9	5-Jun-19	48.288637	-103.124745	73	18-Jun-19	48.288976	-103.143238
10	5-Jun-19	48.288637	-103.128818	74	18-Jun-19	48.288836	-103.135527
25	6-Jun-19	48.288585	-103.124281	85	2-Jul-19	48.288855	-103.131877
26	6-Jun-19	48.288537	-103.12163	86	2-Jul-19	48.288829	-103.132638
27	6-Jun-19	48.288449	-103.121677	87	2-Jul-19	48.288896	-103.13392
28	6-Jun-19	48.288399	-103.121657	88	2-Jul-19	48.288947	-103.136976
29	6-Jun-19	48.288464	-103.118456	89	2-Jul-19	48.288946	-103.141218
30	6-Jun-19	48.288401	-103.118432	90	2-Jul-19	48.289057	-103.142117
31	6-Jun-19	48.288552	-103.119628	91	2-Jul-19	48.289088	-103.147475
32	6-Jun-19	48.288367	-103.116346	92	2-Jul-19	48.289502	-103.150964
600	10-Jun-19	48.288718	-103.128796	93	2-Jul-19	48.290661	-103.15659
603	10-Jun-19	48.288752	-103.128613	94	2-Jul-19	48.292956	-103.168585
607	10-Jun-19	48.288754	-103.13072	95	2-Jul-19	48.299358	-103.178109
608	10-Jun-19	48.288987	-103.142099	96	2-Jul-19	48.299448	-103.178664
610	10-Jun-19	48.288879	-103.133406	97	2-Jul-19	48.299453	-103.180257
612	10-Jun-19	48.288994	-103.138991	98	2-Jul-19	48.299442	-103.18271
614	10-Jun-19	48.288942	-103.143514	99	2-Jul-19	48.299324	-103.17549
615	10-Jun-19	48.288968	-103.143846	100	2-Jul-19	48.299332	-103.186179
616	10-Jun-19	48.288871	-103.134566				
617	10-Jun-19	48.288872	-103.13455				

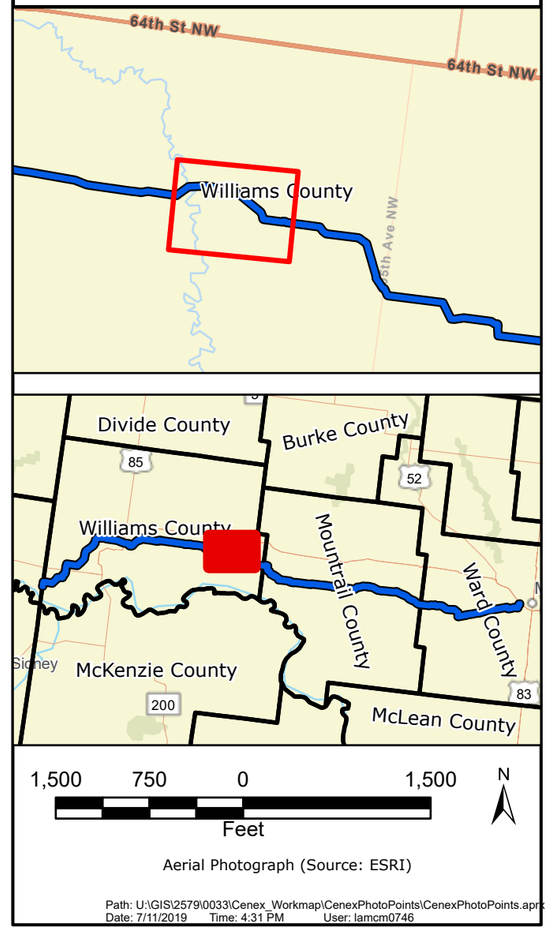
Figures

North Dakota Public Service Commission

Cenex Pipeline
Figure 1

Legend

- Cenex PU-17-97 Centerline
- Photo Observation Points



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PU-17-97 CONSTRUCTION INSPECTION

Interim Topsoil Observation Locations

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Figure 1

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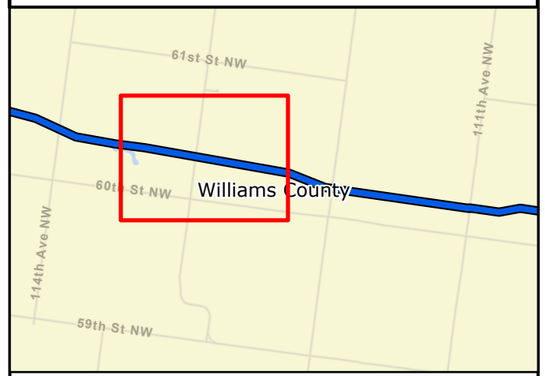
Cenex Pipeline
Figure 2

Legend

- Cenex PU-17-97 Centerline
- Photo Observation Points



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PU-17-97 CONSTRUCTION INSPECTION

Interim Topsoil Observation Locations

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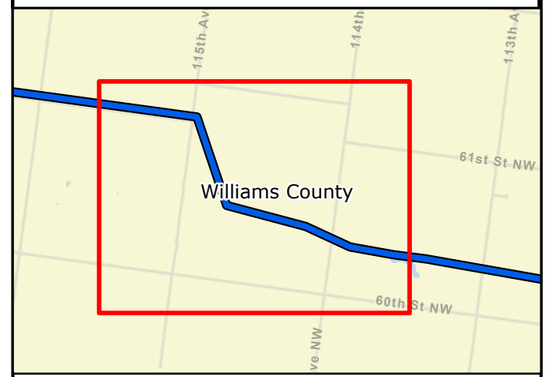
Figure 2

North Dakota Public Service Commission

Cenex Pipeline
Figure 3

Legend

- Cenex PU-17-97 Centerline
- Photo Observation Points



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Feet

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PU-17-97 CONSTRUCTION INSPECTION

Interim Topsoil Observation Locations

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Figure 3

Appendix A

On-Site Photographs

On-Site Photographs

	**Observation Point: 1** Date Taken: June 5, 2019 Direction Photo is Taken: East Station 4785+57 Spread 2 Photo Description: Topsoil stockpile at the beginning of Spread 2. Latitude: 48.2886750810001 Longitude: -103.129863739
	**Observation Point: 2** Date Taken: June 5, 2019 Direction Photo is Taken: West Station 4788+00 Spread 2 Photo Description: Topsoil stripping depth approximately 11 inches at center of ROW. Latitude: 48.288749512 Longitude: -103.129624771
	**Observation Point: 3** Date Taken: June 5, 2019 Direction Photo is Taken: South Station 4790+00 Spread 2 Photo Description: Topsoil stripping with slight over excavation. Issue resolved on site with Loenbro and KLJ staff. Latitude: 48.2887114580001 Longitude: -103.128137905

On-Site Photographs

	**Observation Point: 4** Date Taken: June 5, 2019 Direction Photo is Taken: West Station 4792+00 Spread 2 Photo Description: Topsoil properly stockpiled within ROW boundary. Latitude: 48.288531499 Longitude: -103.127162587
	**Observation Point: 5** Date Taken: June 5, 2019 Direction Photo is Taken: West Station 4792+00 Spread 2 Photo Description: ROW stripped of topsoil to approximately 12 inches on a backslope of Williams-like soil. Latitude: 48.2886800260001 Longitude: -103.127072146
	**Observation Point: 6** Date Taken: June 5, 2019 Direction Photo is Taken: East Station 4793+00 Spread 2 Photo Description: Linemen guiding dozer operator for proper placement of topsoil stockpile. Latitude: 48.288521105 Longitude: -103.126407377

On-Site Photographs

	**Observation Point: 7** Date Taken: June 5, 2019 Direction Photo is Taken: North Station 4795+00 Spread 2 Photo Description: Topsoil stripped slightly to deep by approximately 2-3 inches. Limited topsoil present. Naturally poor soil quality on shoulder slope. Zahl-like soil. Stripping terminated at location. Latitude: 48.2885232850001 Longitude: -103.12575954
	**Observation Point: 8** Date Taken: June 5, 2019 Direction Photo is Taken: East Station 4796+00 Spread 2 Photo Description: Topsoil stockpile slightly beyond ROW boundary. Discussed and resolved with on-site inspectors. Latitude: 48.2884668740001 Longitude: -103.125489224
	**Observation Point: 9a** Date Taken: June 5, 2019 Direction Photo is Taken: West Station 4798+00 Spread 2 Photo Description: Topsoil stripping activities. Additional topsoil to be stripped down to approximately 12 inches total. Latitude: 48.288637614 Longitude: -103.124745414

On-Site Photographs

	**Observation Point: 9b** Date Taken: June 5, 2019 Direction Photo is Taken: East Station4798+00 Spread 2 Photo Description: Cut boundary lines of ROW. Latitude: 48.288637614 Longitude: -103.124745414
	**Observation Point: 10** Date Taken: June 5, 2019 Direction Photo is Taken: East Station 4788+00 Spread 2 Photo Description: Subsoil and topsoil stockpile segregation on shoulder slope. Latitude: 48.288637362 Longitude: -103.128818264
	**Observation Point: 25a** Date Taken: June 6, 2019 Direction Photo is Taken: North Station 4799+00 Spread 2 Photo Description: Approximately 10 inches topsoil stripped at toe slope. Latitude: 48.2885857300001 Longitude: -103.124281727

On-Site Photographs

	**Observation Point: 25b** Date Taken: June 6, 2019 Direction Photo is Taken: West Station 4799+00 Spread 2 Photo Description: Topsoil stockpile. Light colored soil at station 4796+00 along hilltop with limited in-situ topsoil. Latitude: 48.2885857300001 Longitude: -103.124281727
	**Observation Point: 26** Date Taken: June 6, 2019 Direction Photo is Taken: Northeast Station 4806+00 Spread 2 Photo Description: Topsoil stripped and segregated. Subsoil tripped to aid in ROW leveling. Latitude: 48.2885376180001 Longitude: -103.121630196
	**Observation Point: 27** Date Taken: June 6, 2019 Direction Photo is Taken: East Station 4806+00 Spread 2 Photo Description: Topsoil and subsoil segregation. Topsoil stockpile reflects the limited topsoil available on shoulder slope. Note the raised ROW to level against natural topography. Latitude: 48.288449692 Longitude: -103.121677721

On-Site Photographs

	**Observation Point: 28** Date Taken: June 6, 2019 Direction Photo is Taken: east Station 4806+00 Spread 2 Photo Description: Straw wattles installed to mitigate water erosion of topsoil stockpile. Latitude: 48.2883994840001 Longitude: -103.12165794
	**Observation Point: 29** Date Taken: June 6, 2019 Direction Photo is Taken: West Station 4812+00 Spread 2 Photo Description: ROW leveled and raised above natural topography by approximately 2 inches using stripped subsoil. Latitude: 48.28846436 Longitude: -103.118456975
	**Observation Point: 30** Date Taken: June 6, 2019 Direction Photo is Taken: West Station 4812+00 Spread 2 Photo Description: Light mixing of subsoil on topsoil stockpile. Subsoil stockpile touching topsoil stockpile. Discussed such issues with Mr. Stark. Resolution of issue would involve spreading the mixed soil first, then grading the rest of the topsoil on top of it. Latitude: 48.288401999 Longitude: -103.118432332

On-Site Photographs

	**Observation Point: 31** Date Taken: June 6, 2019 Direction Photo is Taken: East Station 4810+00 Spread 2 Photo Description: ROW shown cut and graded against a slope in the topography. Latitude: 48.2885526210001 Longitude: -103.119628178
	**Observation Point: 32** Date Taken: June 6, 2019 Direction Photo is Taken: South Station 4818+00 Spread 2 Photo Description: Slight amount of subsoil on topsoil. Subsoil stockpile touching topsoil stockpile. Latitude: 48.28836713 Longitude: -103.116346998
	**Observation Point: 600a** Date Taken: June 10, 2019 Direction Photo is Taken: East Station 4788+00 Spread 2 Photo Description: ROW stripped and graded on Spread 2. Latitude: 48.288718 Longitude: -103.128796

On-Site Photographs

	**Observation Point: 600b** Date Taken: June 10, 2019 Direction Photo is Taken: South Station 4788+00 Spread 2 Photo Description: Topsoil stockpile. Latitude: 48.288718 Longitude: -103.128796
	**Observation Point: 600c** Date Taken: June 10, 2019 Direction Photo is Taken: West Station 4788+00 Spread 2 Photo Description: ROW stripped and graded. Latitude: 48.288718 Longitude: -103.128796
	**Observation Point: 603** Date Taken: June 10, 2019 Direction Photo is Taken: North Station 4789+00 Spread 2 Photo Description: View of the soil horizons. Subsoil was stockpiled separate from the topsoil. Latitude: 48.2887527 Longitude: -103.128613

On-Site Photographs

	**Observation Point: 603b** Date Taken: June 10, 2019 Direction Photo is Taken: South Station 4789+00 Spread 2 Photo Description: View of the soil where topsoil stripping occurred. Latitude: 48.2887527 Longitude: -103.128613
	**Observation Point: 603c** Date Taken: June 10, 2019 Direction Photo is Taken: East Station 4789+00 Spread 2 Photo Description: View of the soil stockpiles. It appears that subsoil was properly stockpiled separate from topsoil. Latitude: 48.2887527 Longitude: -103.128613
	**Observation Point: 607** Date Taken: June 10, 2019 Direction Photo is Taken: West Station 4783+00 Spread 1 Photo Description: Topsoil stripping commenced at approximately 10:00 AM. Latitude: 48.288754 Longitude: -103.130720

On-Site Photographs

	**Observation Point: 608a** Date Taken: June 10, 2019 Direction Photo is Taken: East Station 4756+00 Spread 1 Photo Description: View along pipeline ROW. Latitude: 48.288987 Longitude: -103.142099
	**Observation Point: 608b** Date Taken: June 10, 2019 Direction Photo is Taken: West Station 4756+00 Spread 1 Photo Description: View along pipeline ROW. Latitude: 48.288987 Longitude: -103.142099
	**Observation Point: 610a** Date Taken: June 10, 2019 Direction Photo is Taken: West Station 4776+00 Spread 1 Photo Description: ROW after motor grader. Latitude: 48.288879 Longitude: -103.133406

On-Site Photographs

	**Observation Point: 610b** Date Taken: June 10, 2019 Direction Photo is Taken: East Station 4776+00 Spread 1 Photo Description: ROW after motor grader. Latitude: 48.288879 Longitude: -103.133406
	**Observation Point: 612a** Date Taken: June 10, 2019 Direction Photo is Taken: West Station 4763+22 Spread 1 Photo Description: View along pipeline ROW. Latitude: 48.288994 Longitude: -103.138991
	**Observation Point: 612b** Date Taken: June 10, 2019 Direction Photo is Taken: East Station 4763+22 Spread 1 Photo Description: View along pipeline ROW. Latitude: 48.288994 Longitude: -103.138991

On-Site Photographs

	**Observation Point: 614** Date Taken: June 10, 2019 Direction Photo is Taken: West Station 4753+11 Spread 1 Photo Description: View towards the end of the corridor where soil stockpiling will occur on this segment. Crews will bore underneath the water feature. Latitude: 48.288942 Longitude: -103.143514
	**Observation Point: 615a** Date Taken: June 10, 2019 Direction Photo is Taken: West Station 4752+00 Spread 1 Photo Description: View of water feature that crosses pipeline ROW. Crews will install the pipe by boring under this feature. Latitude: 48.288968 Longitude: -103.143846
	**Observation Point: 615b** Date Taken: June 10, 2019 Direction Photo is Taken: Southeast Station 4752+00 Spread 1 Photo Description: View of pond/wetland to the South of ROW. Latitude: 48.288968 Longitude: -103.143846

On-Site Photographs

	**Observation Point: 617** Date Taken: June 10, 2019 Direction Photo is Taken: East Station 4773+00 Spread 1 Photo Description: View of grader stripping topsoil. Latitude: 48.288871 Longitude: -103.134566
	**Observation Point: 618** Date Taken: June 10, 2019 Direction Photo is Taken: East Station 4773+00 Spread 1 Photo Description: View of grader stripping topsoil. Latitude: 48.288872 Longitude: -103.134550
	**Observation Point: 65a** Date Taken: June 18, 2019 Direction Photo is Taken: Northeast Station 4950+00 Spread 2 Photo Description: Calcareous topsoil. Summit of hill stripped to approximately 2-3 inches. Naturally poor quality soil. Latitude: 48.2888967820001 Longitude: -103.063176395

On-Site Photographs

	**Observation Point: 65b** Date Taken: June 18, 2019 Direction Photo is Taken: Northwest Station 4950+00 Spread 2 Photo Description: Opposite side of ROW. Stake shows depth of topsoil removed. Approximately 2-3 inches. Latitude: 48.2888967820001 Longitude: -103.063176395
	**Observation Point: 66** Date Taken: June 18, 2019 Direction Photo is Taken: Southwest Station 4957+00 Spread 2 Photo Description: Topsoil and subsoil stockpiles. Most of subsoil used to grade and level ROW. Limited amount left for stockpile. Subsoil stockpile touching topsoil stockpile. Issue will be resolve with motor grader activities after filling trench. Latitude: 48.289923398 Longitude: -103.061533039
	**Observation Point: 67** Date Taken: June 18, 2019 Direction Photo is Taken: East Station 4962+00 Spread 2 Photo Description: Subsoil stockpile touching topsoil stockpile. Issue will resolve with motor grader activities after filling trench. Latitude: 48.2911027320001 Longitude: -103.05976429

On-Site Photographs

	**Observation Point: 68** Date Taken: June 18, 2019 Direction Photo is Taken: East Station 4995+00 Spread 2 Photo Description: Subsoil and topsoil touching. Mr. Stark aware of these issues. Resolutions to these issues will be made with motor grader activities. Topsoil naturally calcareous. Poor quality soil on hill summit. Latitude: 48.292014431 Longitude: -103.046447374
	**Observation Point: 69** Date Taken: June 18, 2019 Direction Photo is Taken: East Station 5100+00 Spread 2 Photo Description: Topsoil and subsoil segregated. In background subsoil piled on topsoil. Discussed the issues of segregation and subsoil on top of topsoil with Thomas Stark, Chief Inspector, WCI. He will work to resolve the issues as ROW stripping and grading continue. Latitude: 48.2835477030001 Longitude: -103.00838666
	**Observation Point: 70a** Date Taken: 6-18-2019 Direction Photo is Taken: NA Station 4770+00 Spread 1 Photo Description: Approximately 6 inches of remaining topsoil still to be stripped on northside of ROW. Issue brought to the attention of Mr. Oliver (Frontier). Resolved with contractor and later fixed. Latitude: 48.289015 Longitude: -103.136426

On-Site Photographs

	**Observation Point: 70b** Date Taken: 6-18-2019 Direction Photo is Taken: West Station 4770+00 Spread 1 Photo Description: Very little topsoil in stockpile. ROW needs further topsoil removal. Latitude: 48.289015 Longitude: -103.136426
	**Observation Point: 70c** Date Taken: 6-18-2019 Direction Photo is Taken: South Station 4770+00 Spread 1 Photo Description: Topsoil stockpile on southside of ROW. Little topsoil stripped. Approximately 2-3 inches more topsoil stripped than northside of ROW. Station 4770+00 Latitude: 48.289015 Longitude: -103.136426
	**Observation Point: 71** Date Taken: 6-18-2019 Direction Photo is Taken: West Station 4757+00 Spread 1 Photo Description: Vegetation still rooted in soil after initial topsoil removal along northside of ROW. Latitude: 48.289063 Longitude: -103.140839

On-Site Photographs

	**Observation Point: 72a** Date Taken: 6-18-2019 Direction Photo is Taken: East Station 4757+00 Spread 1 Photo Description: Vegetation still rooted in soil after initial topsoil removal along southside of ROW. Latitude: 48.288954 Longitude: -103.141111
	**Observation Point: 72b** Date Taken: 6-18-2019 Direction Photo is Taken: NA Station 4757+00 Spread 1 Photo Description: Topsoil remaining after initial topsoil removal approximately 5 inches on southside of ROW. Issue brought to the attention of Mr. Oliver (Frontier). Resolved with contractor and later fixed. Latitude: 48.288954 Longitude: -103.141111
	**Observation Point: 73** Date Taken: 6-18-2019 Direction Photo is Taken: NA Station 4753+11 Spread 1 Photo Description: Approximately 9 inches topsoil remaining after initial topsoil removal on southside of ROW. Issue brought to the attention of Mr. Oliver (Frontier). Resolved with contractor and later fixed. Latitude: 48.288976 Longitude: -103.143238

On-Site Photographs

	**Observation Point: 74** Date Taken: 6-18-2019 Direction Photo is Taken: NA Station 4770+00 Spread 1 Photo Description: Approximately 10-11 inches Topsoil remaining after initial topsoil removal on southside of ROW. Issue brought to the attention of Mr. Oliver (Frontier). Resolved with contractor and later fixed. Latitude: 48.288836 Longitude: -103.135527
	**Observation Point: 85** Date Taken: 7-2-2019 Direction Photo is Taken: West Station 4780+00 Spread 1 Photo Description: Buried pipe. Soil covering pipe and soil on southside of ROW is violently effervescent. Northside of ROW and topsoil stockpile is non-effervescent. Latitude: 48.288855 Longitude: -103.131877
	**Observation Point: 86a** Date Taken: 7-2-2019 Direction Photo is Taken: West Station 4777+00 Spread 1 Photo Description: Vegetation on Topsoil stockpile within swale. Straw wattle installed. Topsoil stockpile non-effervescent. Latitude: 48.288829 Longitude: -103.132638

On-Site Photographs

	**Observation Point: 86b** Date Taken: 7-2-2019 Direction Photo is Taken: West Station 4777+00 Spread 1 Photo Description: Topsoil stockpile with vegetation continues west. Latitude: 48.288829 Longitude: -103.132638
	**Observation Point: 86c** Date Taken: 7-2-2019 Direction Photo is Taken: West Station 4777+00 Spread 1 Photo Description: Southside of ROW very slightly to slightly effervescent. Latitude: 48.288829 Longitude: -103.132638
	**Observation Point: 87** Date Taken: 7-2-2019 Direction Photo is Taken: West Station 4775+00 Spread 1 Photo Description: Light Grey soil on buried pipe slightly effervescent. Dark soil (middle) non-effervescent. Topsoil stockpile (far left) slightly effervescent. Shoulder/backslope. Latitude: 48.288896 Longitude: -103.133920

On-Site Photographs

	**Observation Point: 88** Date Taken: 7-2-2019 Direction Photo is Taken: West Station 4768+00 Spread 1 Photo Description: Topsoil stockpile non-effervescent. Very little subsoil (very slightly effervescent) spilled on topsoil stockpile. Stripped to color change. Latitude: 48.288947 Longitude: -103.136976
	**Observation Point: 89** Date Taken: 7-2-2019 Direction Photo is Taken: NA Station 4757+00 Spread 1 Photo Description: Toeslope with Dark 10YR 3/3 soil with fine roots under compacted light grey subsoil on southside of ROW. Dark soil coincides with a Williams-like Bt1 horizon. Before Subsoil was placed on ROW, topsoil was stripped correctly. Latitude: 48.288946 Longitude: -103.141218
	**Observation Point: 90a** Date Taken: 7-2-2019 Direction Photo is Taken: South Station 4755+00 Spread 1 Photo Description: Straw wattles no longer installed. Latitude: 48.289057 Longitude: -103.142117

On-Site Photographs

	**Observation Point: 90b** Date Taken: 7-2-2019 Direction Photo is Taken: Southwest Station 4755+00 Spread 1 Photo Description: Waterbody adjacent to ROW. Latitude: 48.289057 Longitude: -103.142117
	**Observation Point: 91** Date Taken: 7-2-2019 Direction Photo is Taken: NA Station 4743+00 Spread 1 Photo Description: 10YR 3/2 with many roots dark soil under compacted light grey subsoil southside of ROW. Dark soil coincides with description of Bowbells-like soil Bt1 horizon. Before Subsoil was placed on ROW, topsoil was stripped correctly. Latitude: 48.289088 Longitude: -103.147475
	**Observation Point: 92** Date Taken: 7-2-2019 Direction Photo is Taken: South Station 4735+00 Spread 1 Photo Description: Trench with a pipe depth of approximately 48 inches. Trench wall shows topsoil completely stripped as no topsoil horizon present on trench wall. Backslope. Latitude: 48.289502 Longitude: -103.150964

On-Site Photographs

Observation Point: 93
Date Taken: 7-2-2019
Direction Photo is Taken: South
Station 4720+00 Spread 1

Photo Description: Trench with a pipe depth of approximately 60 inches. No topsoil horizon present on trench wall.

Latitude: 48.290661
Longitude: -103.156590

Observation Point: 94
Date Taken: 7-2-2019
Direction Photo is Taken: West
Station 4687+00 Spread 1

Photo Description: Small area of subsoil spilled on topsoil stockpile.

Latitude: 48.292956
Longitude: -103.168585

Observation Point: 95a
Date Taken: 7-2-2019
Direction Photo is Taken: East
Station 4649+00 Spread 1

Photo Description: Trenching subsoil stockpile appropriately segregated from topsoil stockpile.

Latitude: 48.299358
Longitude: -103.178109

On-Site Photographs

	**Observation Point: 95b** Date Taken: 7-2-2019 Direction Photo is Taken: East Station 4649+00 Spread 1 Photo Description: Machine tracks on topsoil stockpile. Latitude: 48.299358 Longitude: -103.178109
	**Observation Point: 96a** Date Taken: 7-2-2019 Direction Photo is Taken: West Station 4648+28 Spread 1 Photo Description: No topsoil removed from southside of ROW. Subsoil trench spoils had been placed on non-stripped ROW. Subsoil moved back to fill trench after pipe placement. Latitude: 48.299448 Longitude: -103.178664
	**Observation Point: 96b** Date Taken: 7-2-2019 Direction Photo is Taken: North Station 4648+28 Spread 1 Photo Description: Northside of ROW. Timber mats placed down over non-stripped ROW. Latitude: 48.299448 Longitude: -103.178664

On-Site Photographs

	**Observation Point: 97a** Date Taken: 7-2-2019 Direction Photo is Taken: East Station 4642+48 Spread 1 Photo Description: Northside of ROW not stripped. Latitude: 48.299453 Longitude: -103.180257
	**Observation Point: 97b** Date Taken: 7-2-2019 Direction Photo is Taken: West Station 4642+48 Spread 1 Photo Description: Timber mats placed on ROW at East end of large wetland area. Latitude: 48.299453 Longitude: -103.180257
	**Observation Point: 97c** Date Taken: 7-2-2019 Direction Photo is Taken: South Station 4642+48 Spread 1 Photo Description: Southside of ROW. Very little topsoil stockpile. Topsoil not stripped from Southside of ROW. Vegetation still present north and within topsoil stockpiles. Latitude: 48.299453 Longitude: -103.180257

On-Site Photographs

	**Observation Point: 98a** Date Taken: 7-2-2019 Direction Photo is Taken: South Station 4638+00 Spread 1 Photo Description: ROW not stripped. Excavated subsoil placed on in-situ topsoil. Subsoil raked back to fill trench. Only small topsoil stockpiles presumably stripped from trench area. Latitude: 48.299442 Longitude: -103.182710
	**Observation Point: 98b** Date Taken: 7-2-2019 Direction Photo is Taken: Southeast Station 4638+00 Spread 1 Photo Description: No topsoil stripped on northside of ROW. Latitude: 48.299442 Longitude: -103.182710
	**Observation Point: 98c** Date Taken: 7-2-2019 Direction Photo is Taken: East Station 4638+00 Spread 1 Photo Description: ROW with buried pipe. Subsoil covering southside with very little topsoil stockpiled. Latitude: 48.299442 Longitude: -103.182710

On-Site Photographs

	**Observation Point: 98d** Date Taken: 7-2-2019 Direction Photo is Taken: West Station 4638+00 Spread 1 Photo Description: Backhoe burying pipe and filling trench. Subsoil covering southside of ROW. Very little topsoil stockpiled. Latitude: 48.299442 Longitude: -103.182710
	**Observation Point: 98e** Date Taken: 7-2-2019 Direction Photo is Taken: North Station 4638+00 Spread 1 Photo Description: Wetland with straw wattles installed. Latitude: 48.299442 Longitude: -103.182710
	**Observation Point: 99** Date Taken: 7-2-2019 Direction Photo is Taken: West Station 4687+00 Spread 1 Photo Description: Topsoil and subsoil stockpiles. Subsoil touching topsoil stockpile. Latitude: 48.299324 Longitude: -103.175490

On-Site Photographs

	**Observation Point: 100a** Date Taken: 7-3-2019 Direction Photo is Taken: East Station 4620+79 (Stake) 4630+00 (Alignment map) Spread 1 Photo Description: Topsoil stockpile with subsoil touching. Machine tracks on topsoil stockpile. Latitude: 48.299332 Longitude: -103.186179
	**Observation Point: 100b** Date Taken: 7-3-2019 Direction Photo is Taken: West Station 4620+79 (Stake) 4630+00 (Alignment map) Spread 1 Photo Description: Topsoil stockpile with subsoil touching. Machine tracks on topsoil stockpile. To resolve issue, subsoil should be removed with a motor grader and topsoil stockpile graded over ROW to cover subsoil. Latitude: 48.299332 Longitude: -103.186179

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