

KEYSTONE XL PIPELINE PROJECT

0512-SD-P4-XXX.X-XXX.X-S

KEYSTONE XL PIPELINE PROJECT PIPELINE ROUTE VARIATION FORM	
1	VARIATION TYPE: Refinement: <input type="text"/> Reroute: <input checked="" type="checkbox"/> Footprint: <input type="text"/> Design: <input type="text"/> Centerline: <input checked="" type="checkbox"/> Pump Station: <input type="text"/> Valve Site: <input type="text"/> CAR: <input type="text"/>
2	LOCATION: Sketch: <input type="text"/> Attached Pictures: <input type="text"/> N/A State: <input type="text"/> SD County: <input type="text"/> Various Quad Map: <input type="text"/> N/A Township: <input type="text"/> Various Range: <input type="text"/> Various Aerial Map: <input type="text"/> See attached map sheets Section: <input type="text"/> Various Centerline: <input type="text"/> 6/11/2013 MP: <input type="text"/> XXX.X to <input type="text"/> XXX.X
3	REASON FOR ROUTE VARIATION (Please include reason for route variation): <p>This report consists of 4 proposed CL route variations to shift the CL a minimum of 150 ft away from all field survey verified water wells. The primary reason for this route variation is to shift the CL a minimum distance of 150 ft. away from all registered domestic and livestock wells that are currently located within that radius, so as to avoid testing of water wells within 150 ft. of the CL as part of the blasting mitigative measures per the Construction Mitigation and Reclamation Plan (CMRP) under Section 4.7 "Trenching".</p> <p>The route variations are proposed by Engineering based on field verification by civil survey.</p>
	DETAIL ROUTE VARIATION (Please describe route variation in detail): <p>Listed in "Supplemental Info" Tab.</p> <p>No new landowners have been affected by the proposed route variations. The tracts impacted are as follows: No new landowners are impacted due to these reroutes</p> <p>RV-0512-01: 1 tract impacted: ML-SD-ME-00700.000 – Green Valley Limited Partnership</p> <p>RV-0512-02: 1 tract impacted: ML-SD-ME-01240.000 – Howes Grazing Association, Inc.</p> <p>RV-0512-03: 2 tracts impacted: ML-SD-TR-10150.000 and ML-SD-TR-10170.000 – T.J. Knutson</p> <p>RV-0512-04: 2 tracts impacted: ML-SD-TR-11280.000 – James E. & Katherine M. Cahoy ML-SD-TR-11290.000 – Rory M. Klein, Roderick G. Klein, Hustin D. Klein, Sharon Klein</p>
	ADDITIONAL IMPACTS (Please include any additional impacts which may affect cost; crossings, induction bends, etc.): <p>Listed in "Cost Analysis" Tab.</p> <p>Miscellaneous Costs savings include: Well testing/sampling costs (\$5,500/field visit, includes costs for mobilization to site+field screening+lab testing+letter report), anticipated a minimum of 2 visits pre-construction to establish baseline and during pipeline operations. Sampling includes: analyses for benzene, toluene, ethylbenzene, and xylenes (BTEX), Total Petroleum Hydrocarbon (TPH), Gasoline range organics (GRO) and Diesel Range organics (DRO), Well water quality testing for domestic suitability (Fecal Coliform, E-Coli, Nitrate/Nitrite, Hardness, Total dissolved solids (TDS), Total suspended solids).</p>
9	Originator: <input type="text"/> Engineering Date: <input type="text"/> 10/14/2013
10	Received by: <input type="text"/> Date: <input type="text"/> 10/14/2013 <i>Fax to: ?</i>
11	Assigned Tracking Number: <u>0512-SD-P4-XXX.X-XXX.X-S</u>
12	Filed by: <input type="text"/> Date: <input type="text"/> <i>Fax to: ?</i>

Keystone XL Pipeline - Supplemental Information for Route Variation Report 0512

Prepared: 2013-10-14

RV ID	MP Start	MP End	State	County	Section	Township	Range	Original Length (ft)	Reroute Length (ft)	Change in Length (ft)	Max. Perp. Deviation (ft)	Reason for Variation	Brief Variation Description	Additional Impacts/Comments	Originator
0512-01	406.62	406.96	SD	Meade	019	009N	015E	1,800	1,821	20.42	115.10	Shift CL to be 150' from existing water well.	The proposed route variation starts near -MP 406.6 and continues straight at the existing PI for -474 ft then deviates eastwards to parallel the current centerline for -372 ft and finally deviates eastwards again for -976ft to tie back in at -MP 406.9. Proposed Route Variation shifts Current CL away from water well (The distance is currently 39.34 ft.).	- Well data source was Survey Data. - RV also diminishes the Risk to the pipeline in the event of an unplanned release.	Engineering
0512-02	428.81	429.10	SD	Meade	002	006N	017E	1,541	1,549	8.50	46.87	Shift CL to be 150' from existing water well.	The proposed route variation starts near -MP 428.8 and deviates slightly southwest for -1,374 ft and then deviates back southeast for -175 ft to tie back in at MP429.1. Proposed Route Variation shifts Current CL away from water well (currently located at a distance of 25.71 ft. from the current CL).	- Well data source was Survey Data. - RV also diminishes the Risk to the pipeline in the event of an unplanned release.	Engineering
0512-03	546.04	546.20	SD	Tripp	011	102N	078W	823	860	37.64	117.85	Shift CL to be 150' from existing water well.	The proposed route variation starts near -MP 546.04 and deviates southeast for -574 ft and then deviates back in the south direction for -286ft to tie back in at -MP 546.2. Proposed Route Variation shifts Current CL away from water well (located a distance of 29.71 ft. from the current CL).	- Well data source was Survey Data. - RV also diminishes the Risk to the pipeline in the event of an unplanned release.	Engineering
0512-04	576.76	577.08	SD	Tripp	027	098N	076W	1,695	1,836	140.87	268.97	Shift CL to be 150' from existing water well.	The proposed route variation starts near MP576.8 and deviates southwest for -1466ft and then deviates back eastwards to tie back in at -MP577.078. Proposed Route Variation shifts Current CL away from water well that is located a distance of 22.42 ft. from the current CL. Well data Source was Survey Data. This route variation has been verified by field inspector and civil survey.	- Well data source was Survey Data. - RV also diminishes the Risk to the pipeline in the event of an unplanned release.	Engineering

RV ID	Civil Survey Complete?	Civil Survey Needed (ft)	Moves Pump Station?	Moves Valve Site?	In Co-located Area?	Does route variation impact ABB areas?	Biological Survey Complete for Existing Corridor?	Cultural Survey Complete for Existing Corridor?	Biological Survey Complete for Proposed Corridor?	Cultural Survey Complete for Proposed Corridor?	Estimated Length Requiring new Environmental Surveys (ft)	Number of New Landowners impacted by reroute	Number of Landowners on current route impacted by reroute	Is the affected landowner a possible condemnation?	Number of tracts purchased on original route.	Does proposed route variation impact Tribal Lands?	Does proposed route variation impact any Federal/State Lands?
0512-01	YES	0	NO	NO	NO	NO	YES	YES	YES	YES	0	0	1	NO		NO	NO
0512-02	YES	0	NO	NO	NO	NO	YES	YES	YES	YES	0	0	1	NO		NO	NO
0512-03	YES	0	NO	NO	NO	NO	YES	YES	YES	YES	0	0	2	NO		NO	NO
0512-04	YES	0	NO	NO	NO	NO	YES	YES	NO	NO	807	0	2	NO		NO	NO

Keystone XL Pipeline - Cost Analysis for Route Variation Report 0512

Prepared: 2013-10-14

RV ID	Additional length (ft)	Cost \$360/ft	Additional length of wetland construction (ft)	Cost \$195/ft	Additional length of side hill construction (ft)	Cost \$19/ft	Additional bore length (ft)	Cost \$540/ft	Additional Waterbody crossings	Cost (\$77,250/EA btw 10' - 19') (\$32,500/EA < 10')	Cost of Environmental survey (\$5,300/mile)	Cost of Civil survey (\$5,000/mile)	Approximate cost for land purchased on current centerline	Miscellaneous cost for additional impacts	Total Cost
0512-01	20.42	\$ 7,351.20	0	\$ -	0	\$ -		\$ -	0	\$ -	\$ -		\$ -	\$ (11,000.00)	\$ (3,648.80)
0512-02	8.50	\$ 3,060.00	0	\$ -	0	\$ -		\$ -	0	\$ -	\$ -		\$ -	\$ (11,000.00)	\$ (7,940.00)
0512-03	37.64	\$ 13,550.40	0	\$ -	0	\$ -		\$ -	0	\$ -	\$ -		\$ -	\$ (11,000.00)	\$ 2,550.40
0512-04	140.87	\$ 50,713.20	0	\$ -	0	\$ -		\$ -	0	\$ -	\$ 810.13		\$ -	\$ (11,000.00)	\$ 40,523.33

Overall Estimated Costs of Routes Variations= \$ 31,484.93

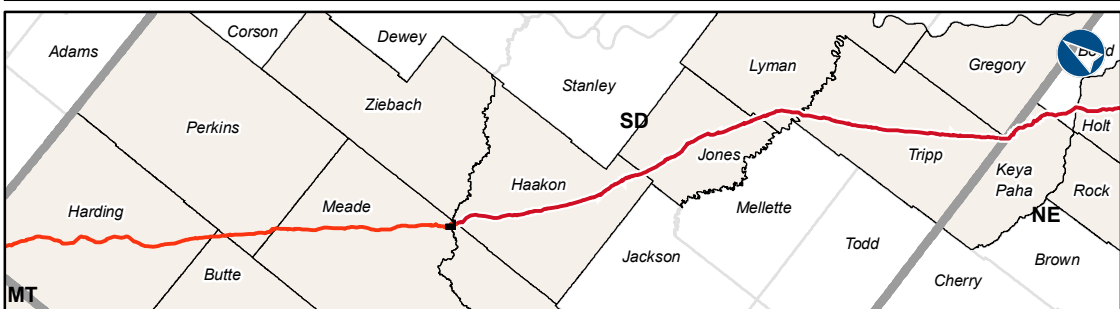
Keystone XL Pipeline - Approval form for Route Variation Report 0512

Prepared: 2013-10-14

RV ID	0512-01	0512-02	0512-03	0512-04
LAND (TransCanada) Thia Hill	Approval (Y/N)	✓	✓	✓
	Comments			
	Signature	<i>Tim M. Hadd</i>	<i>Tim M. Hadd</i>	<i>Tim M. Hadd</i>
ENGINEERING (TransCanada) Meera Kohari 10/17/13	Approval (Y/N)	✓	✓	✓
	Comments			
	Signature	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>
ENGINEERING (exp) Kevin McSlynn	Approval (Y/N)	✓	✓	✓
	Comments			
	Signature	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>
ENVIRONMENTAL (TransCanada) Sandra Barnett	Approval (Y/N)	✓	✓	✓
	Comments			
	Signature	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>
FACILITIES (TransCanada) Sandra Gigovic	Approval (Y/N)	✓	✓	✓
	Comments			
	Signature	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>
PROJECT MANAGEMENT - MONTANA (TransCanada) Alan Lutz	Approval (Y/N)	✓	✓	✓
	Comments			
	Signature	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>
PROJECT MANAGEMENT - SOUTH DAKOTA (TransCanada) James Odum	Approval (Y/N)	✓	✓	✓
	Comments			
	Signature	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>
PROJECT MANAGEMENT - NEBRASKA (TransCanada) Robert Bradley	Approval (Y/N)	✓	✓	✓
	Comments			
	Signature	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>
KEYSTONE XL MANAGER (TransCanada) Steve Marr	Approval (Y/N)	✓	✓	✓
	Comments			
	Signature	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>

Keystone XL Pipeline - Approval form for Route Variation Report 0612
 Prepared: 2013-10-14

RV ID	0612-01	0612-02	0612-03	0612-04
LAND (TransCanada) Tina Hall	Approval (Y/N)			
	Comments			
	Signature			
ENGINEERING (TransCanada) Meera Kohari	Approval (Y/N)			
	Comments			
	Signature			
ENGINEERING (exp) Kevin McSlynn	Approval (Y/N)			
	Comments			
	Signature			
ENVIRONMENTAL (TransCanada) Sandra Barnett	Approval (Y/N)			
	Comments			
	Signature			
FACILITIES (TransCanada) Sandra Glogovic	Approval (Y/N)	Y	Y	Y
	Comments	Oct 18, 2013	Oct 18, 2013	Oct 18, 2013
	Signature	G. Govec A.	G. Govec A.	G. Govec A.
PROJECT MANAGEMENT - MONTANA (TransCanada) Aim Lutz	Approval (Y/N)			
	Comments			
	Signature			
PROJECT MANAGEMENT - SOUTH DAKOTA (TransCanada) James Colom	Approval (Y/N)			
	Comments			
	Signature			
PROJECT MANAGEMENT - NEBRASKA (TransCanada) Robert Bradley	Approval (Y/N)			
	Comments			
	Signature			
KEYSTONE XL MANAGER (TransCanada) Steve Mair	Approval (Y/N)			
	Comments			
	Signature			



LEGEND

- 1/10 Mile Post
- Mile Post (2013-06-11)
- ⊗ Valve
- ▭ Valve Site
- Keystone XL Project Centerline (2013-06-11)
- Route Variation
- Access Road - Permanent
- Access Road - Temporary
- ▭ Workspace
- Cultural Site
- Pump Station
- ▭ Property Parcels
- ▭ Section Line
- ▭ County Line
- ▭ Current Waterbody
- ▭ Current Wetland

KEYSTONE XL PROJECT

RV-0512-01 PROPOSED CL RV

COUNTY: MEADE DRAWN BY: CC

STATE: SOUTH DAKOTA CHECKED BY: PD

REV. NO.: REVISION DATE

0 ISSUED FOR REVIEW 2013-10-09

PRELIMINARY

DATE: 2013-10-09 PROJECTION: NAD83 | UTM13 N

PREPARED BY:

exp Energy Services Inc.

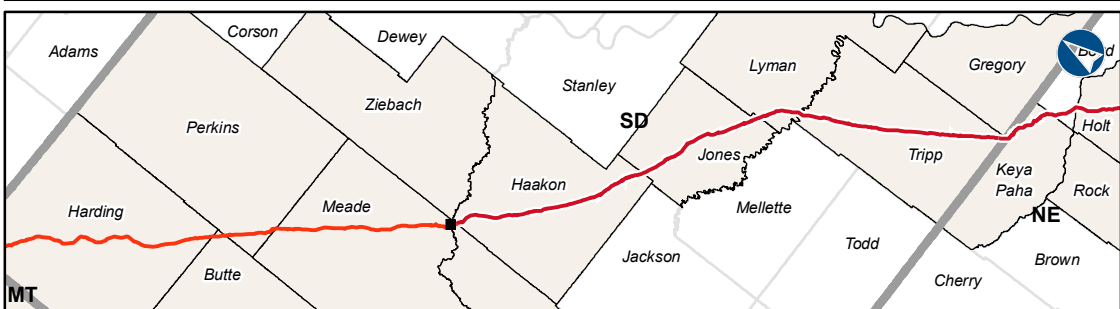
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DWG: XL-46-P-9299-A-RV-0512-01 SHEET: 1



LEGEND

- 1/10 Mile Post
- Mile Post (2013-06-11)
- ⊗ Valve
- ⊞ Valve Site
- Keystone XL Project Centerline (2013-06-11)
- Route Variation
- Access Road - Permanent
- Access Road - Temporary
- Workspace
- Cultural Site
- Pump Station
- ▭ Property Parcels
- ▭ Section Line
- ▭ County Line
- ▭ Current Waterbody
- ▭ Current Wetland

KEYSTONE XL PROJECT

RV-0512-02 PROPOSED CL RV

COUNTY:	MEADE	DRAWN BY:	CC
STATE:	SOUTH DAKOTA	CHECKED BY:	PD
REV. NO.:	REVISION	DATE	
0	ISSUED FOR REVIEW	2013-10-09	

PRELIMINARY

DATE:	2013-10-09	PROJECTION:	NAD83 UTM13 N
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PREPARED BY:

exp Energy Services Inc.

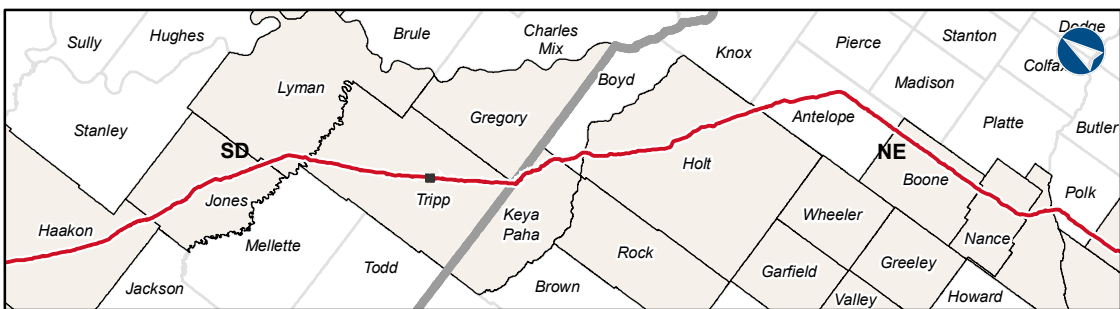
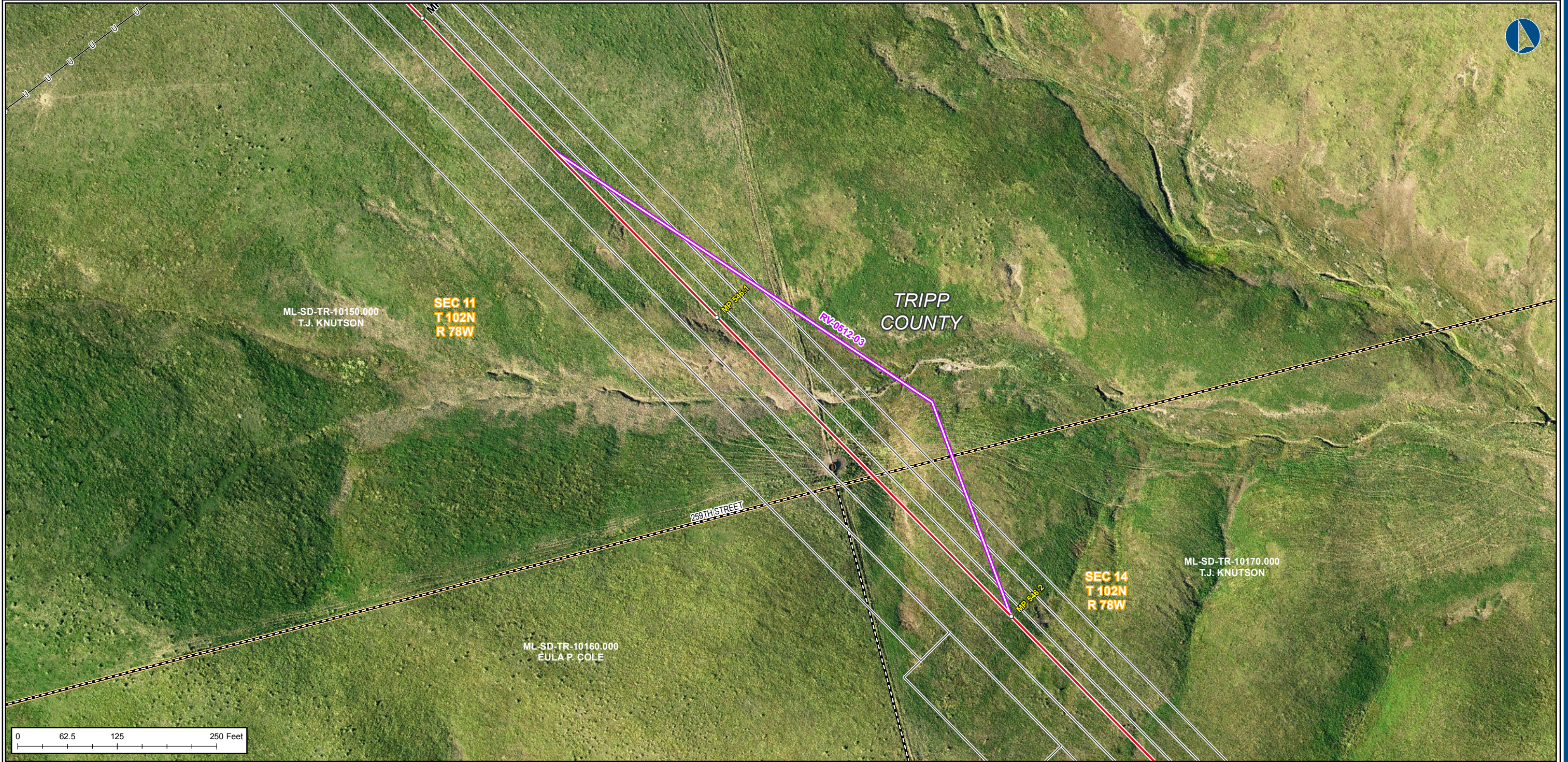
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DWG:	XL-46-P-9299-A-RV-0512-02	SHEET:	1
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LEGEND

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- Mile Post (2013-06-11)
- ⊗ Valve
- ⊗ Valve Site
- Keystone XL Centerline (2013-06-11)
- Route Variation
- Access Road - Permanent
- Access Road - Temporary
- Workspace
- Cultural Site
- Pump Station
- ▭ Property Parcel
- ▭ Section Line
- ▭ County Line
- ▭ Current Waterbody
- ▭ Currently Wetland

KEYSTONE XL PROJECT

RV-0512-03 PROPOSED CL RV

COUNTY:	TRIPP	DRAWN BY:	CC
STATE:	SOUTH DAKOTA	CHECKED BY:	PD
REV. NO.:	REVISION	DATE	
0	ISSUED FOR REVIEW	2013-10-09	

PRELIMINARY

DATE:	2013-10-09	PROJECTION:	NAD83 UTM14 N
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PREPARED BY:

exp Energy Services Inc.

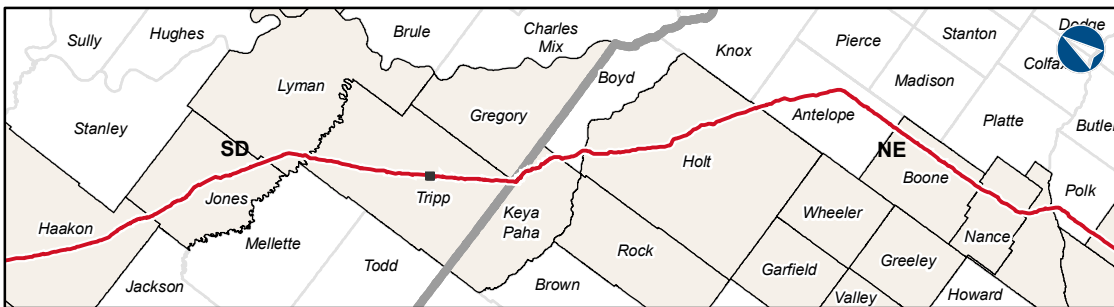
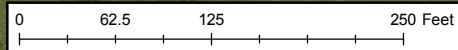
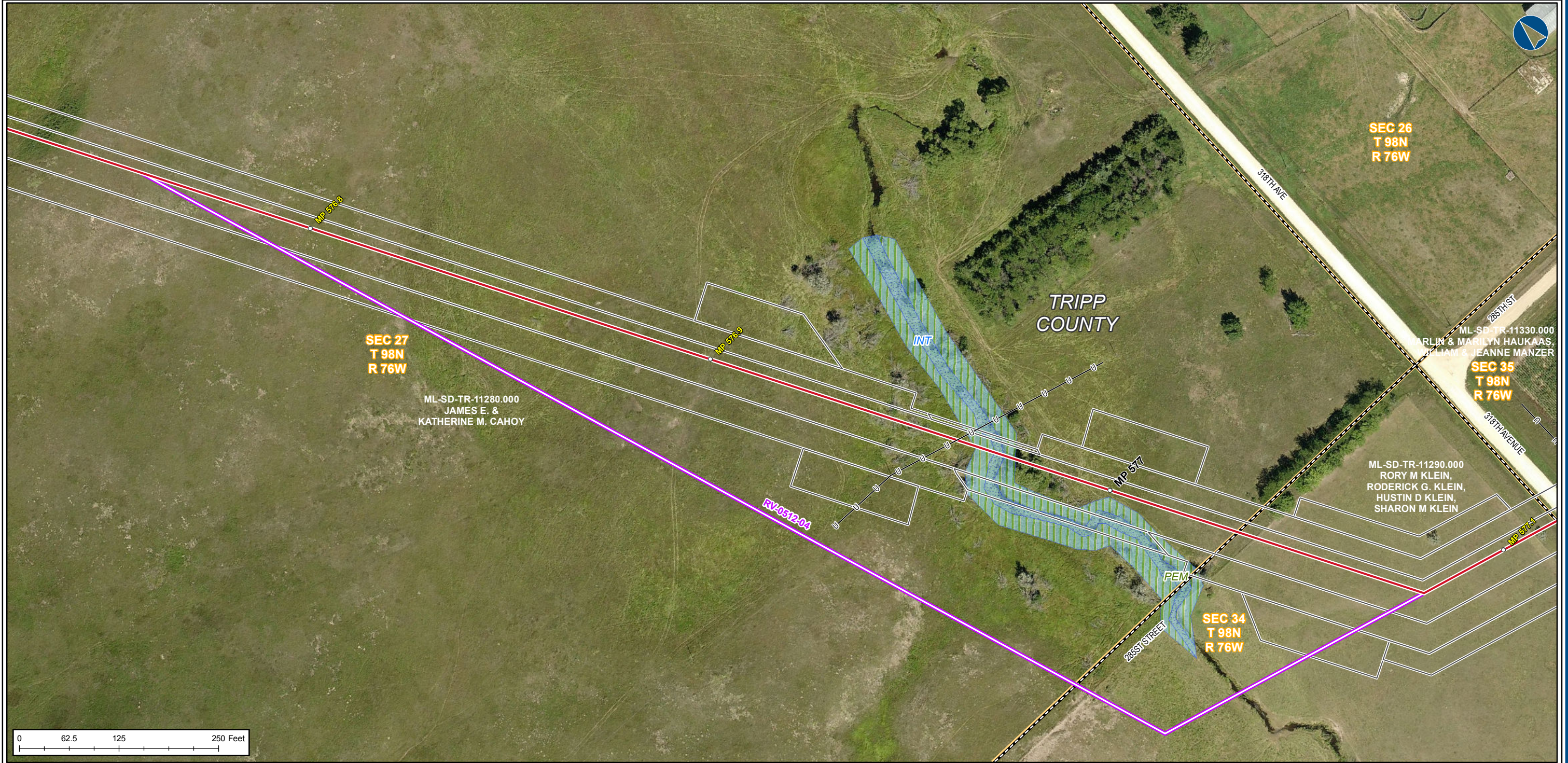
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DWG:	XL-46-P-9299-A-RV-0512-03	SHEET:	1
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Keystone XL Project

LEGEND

- 1/10 Mile Post
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- Pump Station
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- ▭ Section Line
- ▭ County Line
- ▭ Current Waterbody
- ▭ Currently Wetland

KEYSTONE XL PROJECT

RV-0512-04 PROPOSED CL RV

COUNTY:	TRIPP	DRAWN BY:	CC
STATE:	SOUTH DAKOTA	CHECKED BY:	PD
REV. NO.:	REVISION	DATE	
0	ISSUED FOR REVIEW	2013-10-08	

PRELIMINARY

DATE:	2013-10-08	PROJECTION:	NAD83 UTM14 N
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PREPARED BY:

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