0167-SD-P2-509.6-513.3-S

## KEYSTONE XL PIPELINE PROJECT - STEELE CITY SEGMENT
## PIPELINE ROUTE VARIATION FORM

1 **VARIATION TYPE**: Refinement: | Reroute: X | Centerline: X | Valve Site: | Pump Station:

2 **LOCATION:** Sketch: Attached | Pictures: See attached.

State: SD | County: Jones | Quad Map: N/A
Township: 1S, 2S | Range: 29E, 30E | Aerial Map: See attached map sheet
Section: 25, 36, 31, 32, 5 | Centerline: 3/26/2010 | MP: 509.58 to 513.34

3 **REASON FOR ROUTE VARIATION** (Please include reason for route variation):

The primary reason for this reroute is due to the current crossing location at Interstate highway (I-90) near MP 511.4, which has steep slopes on the north side and a broad right of way. This crossing location will require a deep bore pit (> 20 ft deep which requires an engineered hole on the north side) and a very long bore (~470 ft at current location). The deep bore pit (> 20 ft) presents a high safety risk, high costs and integrity concerns. Long bores (> 300 ft) reduce the accuracy and integrity of the bore by the contractor. Hence it is proposed to relocate the crossing location ~4,190 ft to the east which has gentle slopes (which requires regular bore pits) on either side and has a relatively narrow Interstate highway right of way.

Another reason for the proposed reroute due to the current crossing location of Hwy 16 and South Dakota State Railroad near MP 510.1 which is combined into a single bore, 340 ft long. This bore > 300 ft is an accuracy and integrity concern, hence it is proposed to relocate this crossing location ~1,100 ft to the northeast in order to bore the railroad and highway independent of each other. This relocation shortens the individual bore lengths and allows us to independently cross the railroad with a cased crossing, if required.

**DETAIL ROUTE VARIATION** (Please describe route variation in detail):

The proposed reroute starts at the PI near MP 509.6 and deviates (~26°) from the centerline towards the south east. It continues in this direction for ~2,850 ft. Along its path it crosses Hwy 16 and South Dakota State Railroad at ~1,100 ft northeast of its current crossing location. After crossing Hwy 16, the proposed reroute turns towards the east and continues for 9,130 ft until it reaches a good crossing location at Interstate highway I-90. The proposed reroute then turns towards the south and continues for ~840 ft crossing I-90 (approximately 4,190 ft east of its current crossing location) along its path. The proposed reroute then turns towards the southeast and continues for 6,300 ft to rejoin the centerline at the PI near MP 513.3. Along its path, it makes a deviation to avoid a drainage feature to its north east. The crossing locations of Hwy 16 and Interstate highway I-90 have been suggested by an engineer after field reconnaissance.

**ADDITIONAL IMPACTS** (Please include any additional impacts which may affect cost; crossings, induction bends, etc.):

The proposed reroute is ~740 ft shorter than the current centerline. The bore lengths for South Dakota State Railroad and Hwy 16 at the proposed location is estimated to be ~220 ft and ~180 ft respectively. The bore length at the proposed location of I-90 is estimated to be ~360 ft long. The cost savings due to the elimination of the engineered pit on north side is roughly estimated to be $180,000 based on a cost for shoring of the trench for the bore pit and well points to avoid flooding of the bore pit.

Is there an increase/decrease in the number of crossings? Yes | No X

If yes, please list:

**COST ANALYSIS** (costs incurred or saved from the route variation)

| | | | | |
|---|---|---|---|---|
| Additional length of route realignment: | -740 | ft. | $ (266,400.00) | $ 360/ft |
| Additional length of side-hill construction: | | ft. | $ - | $ 19/ft |
| Additional length of wetland construction: | | ft. | $ - | $ 195/ft |
| Additional bore length (Road, RR): | -50 | ft. | $ (27,000.00) | $ 540/ft |
| Additional foreign line/pipeline crossings: | | EA | $ - | $ 30,000/EA |
| Additional water body crossing (streams, ponds, etc.): | | | | |
| 35 - 65' + | | EA | $ - | $ 185,000/EA |
| 10' - 35' | | EA | $ - | $ 77,250/EA |
| Less than 10' | | EA | $ - | $ 32,500/EA |
| Additional survey required: | | | | |
| Civil: | 3.62 | mile | $ 18,100.00 | $ 5,000/mile |
| Cultural: | 3.62 | mile | $ 9,050.00 | $ 2,500/mile |
| Biological: | 3.62 | mile | $ 10,136.00 | $ 2,800/mile |

Miscellaneous costs saved or added due to route variation from **ADDITIONAL IMPACTS** listed above: $ (180,000)

Overall estimated costs of the route variation: $ (436,114) **(See "Additional Impacts" above)**

**KEYSTONE XL PIPELINE PROJECT PHASE II**
**PIPELINE ROUTE VARIATION FORM**

4
**LAND / UNIVERSAL FIELD** *Doug Reichley*

| | | |
|---|---|---|
| a) Is a new landowner affected by proposed variation? | Yes X | No |
| b) Is proposed realignment outside the easement/workspace? | Yes X | No |
| c) Is realignment proposed to satisfy landowner request? | Yes | No X |
| -If yes, name of landowner(s)/track number(s): | | |
| d) Has all the evaluation criteria been examined/provided for this specific discipline? | Yes X | No |

If no, please explain why:

5
**ENGINEERING/CONSTRUCTION / STATE PM** *David Guien*

| | | |
|---|---|---|
| a) Maximum deviation perpendicular to proposed alignment: | 2,640 ft. | |
| b) Has the centerline been staked for construction? | Yes | No X |
| c) Does route variation affect HDD crossing alignment? | Yes | No X |
| d) Is realignment proposed for engineering/construction reasons? | Yes X | No |
| e) Will the route variation require the relocation of a pump station? | Yes | No X |
| f) Has all the evaluation criteria been examined/provided for this specific discipline? | Yes X | No |

If no, please explain why:

6
**ENVIRONMENTAL / TROW** *Jonathan Minton*

| | | |
|---|---|---|
| a) Has the corridor been environmentally surveyed? | Yes X | No |
| b) Has the proposed variation been environmentally surveyed? | Yes | No X |
| c) Was variation proposed to satisfy environmental issues? | Yes | No X |
| d) Was realignment proposed to satisfy agency request? | Yes | No X |

-If yes, name of agency(s):

e) Environmental features:

Added (+): Add 4 desktop wetlands

Subtracted (-): 2 wetlands

Wetland ID # for newly impacted wetlands:

| | | |
|---|---|---|
| f) Has all the evaluation criteria been examined/provided for this specific discipline? | Yes X | No |

If no, please explain why:

7
**ENGINEERING / FACILITIES AND HYDRAULICS** *Neil Lewis*

| | | |
|---|---|---|
| a) Will the route variation require the relocation of a pump station? | Yes | No X |
| b) Will route variation impact hydraulics? | Yes | No X |
| c) Are additional valves required at HCA's or water crossing? | Yes | No X |
| d) Has all the evaluation criteria been examined/provided for this specific discipline? | Yes X | No |

If no, please explain why:

8
**STAKEHOLDER RELATIONS / TCPL** *Bud Andersen*

| | | |
|---|---|---|
| a) Does the variation result in any new stakeholders? | Yes | No |
| b) Does the variation require follow-up with specific stakeholder groups? | Yes | No |
| c) Was the variation proposed to satisfy stakeholder request? | Yes | No |
| -If yes, please specify issue type (as it aligns to stakeholder database): | | |
| d) Has all the evaluation criteria been examined/provided for this specific discipline? | Yes | No |

If no, please explain why:

9
Originator: Engineering
Date: 4/23/2010

10
Received by: *Centerline Coordinator*
Date: 4/23/2010
*Fax to: ?*

11
Assigned Tracking Number: 0167-SD-P2-509.6-513.3-S

12
Filed by:
Date:
*Fax to: ?*

0167-SD-P2-509.6-513.3-S

* Evaluation Criteria is located in Route Refinement and Reroute Process, Section 3 FORM 1

Document Control Number:
KXL10-00006-01-AA-180 (Form 1)

**KEYSTONE XL PIPELINE PROJECT PHASE II**
**PIPELINE ROUTE VARIATION AUTHORIZATION FORM**

**KEYSTONE XL PIPELINE PROJECT PHASE - STEELE CITY SEGMENT**
**ROUTE VARIATION AUTHORIZATION FORM**

0167-SD-P2-509.6-513.3-S

Date: 4/23/2010

Tracking Number: 0167-SD-P2-509.6-513.3-S

Description: Hwy 16 and I-90 Relocation

MP: 509.6 to 513.3

Originated By: Engineering

Variation Form Attached: Yes X No

| | | | |
|---|---|---|---|
| **Universal Field - Land** | Doug Reichley | Variation: Approved X Rejected | |
| Comments: | | *Doug Reichley* Date: 4/28/2010 | |
| | | If Rejected Why? | |
| **State PM - Construction / Eng.** | David Guien | Variation: Approved X Rejected | |
| Comments: | | *David Guien* Date: 4/26/2010 | |
| | | If Rejected Why? | |
| **Trow - Environmental** | Jonathan Minton | Variation: Approved X Rejected | |
| Comments: | Requires bio and cultural survey | *Jonathan Minton* Date: 5/5/2010 | |
| | | If Rejected Why? | |
| **Project Management** | Butch Wallace | Variation: Approved X Rejected | |
| Comments: | | *R.E. Wallace* Date: 5/4/2010 | |
| | | If Rejected Why? | |
| **Stakeholder Relations** | Bud Andersen | Variation: Approved Rejected | |
| Comments: | | *Name?* Date: | |
| | | If Rejected Why? | |
| **Facilities:** | Neil Lewis | Variation: Approved X Rejected | |
| Comments: | | *Neil Lewis* Date: 4/26/2010 | |
| | | If Rejected Why? | |
| **TransCanada:** | Alan Lietz | Variation: Approved X Rejected | |
| Comments: | | *Alan Lietz* Date: 5/6/2010 | |
| | | If Rejected Why? | |
| **TransCanada:** | Steve Hicks | Variation: Approved X Rejected | |
| Comments: | | *Steve Hicks* Date: 5/9/2010 | |
| | | If Rejected Why? | |

Forward to:

| | | | | | |
|---|---|---|---|---|---|
| Butch Wallace | X | Jonathan Minton | X | Alan Lietz | X |
| David Guien | X | Bud Andersen | X | Steve Hicks | X |
| Doug Reichley | X | Neil Lewis | X | | |

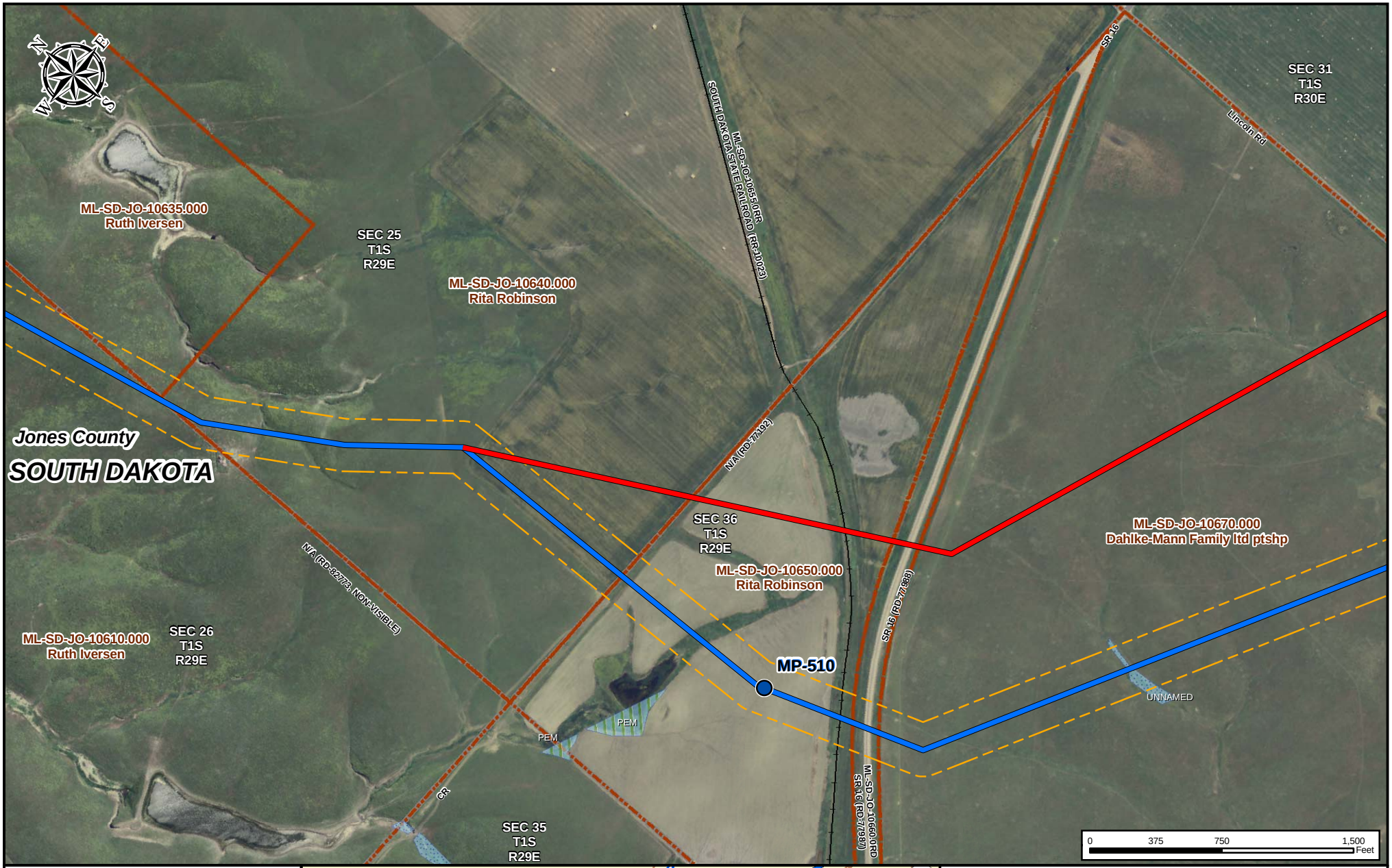
**Dispute Resolution, if Required:** Yes No

Comments:

Teleconference Required: Yes No

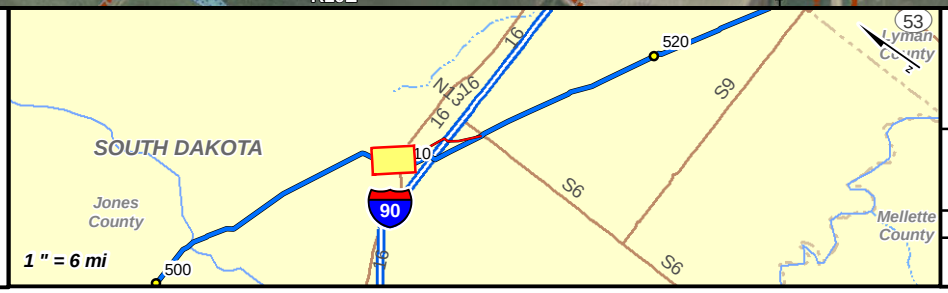
Decision:

| | |
|---|---|
| **Database -** ? | **Database -** ? |
| Filed By: | Filed By: |
| Date: | Date: |
| *Fax to: ?* | *Fax to: ?* |




## Legend

- Milepost
- Centerline (2010-03-26)
- Revised Route Variation
- 300ft Corridor
- Waterbody
- Wetland
- Parcel Boundary
- Cultural Feature
- Section Line
- County Boundary
- State Boundary




# KEYSTONE XL PROJECT - STEELE CITY SEGMENT
# PROPOSED ROUTE VARIATION 0167
# JONES COUNTY, SD

Trow

| DATE | PROJECT | MAP PARAMETERS |
|---|---|---|
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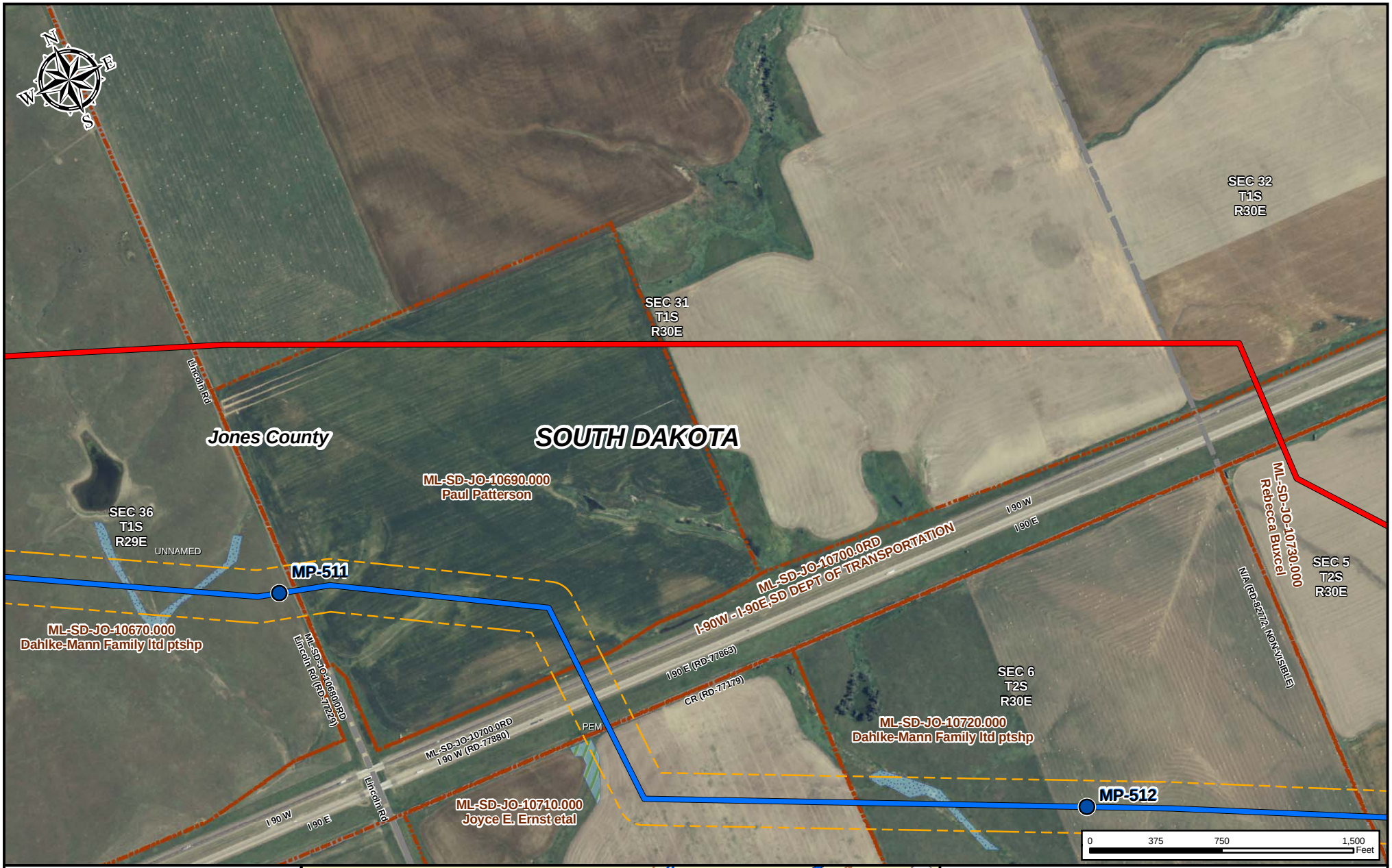


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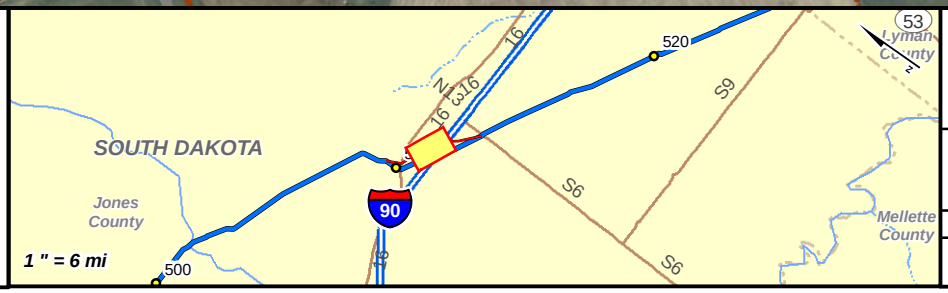


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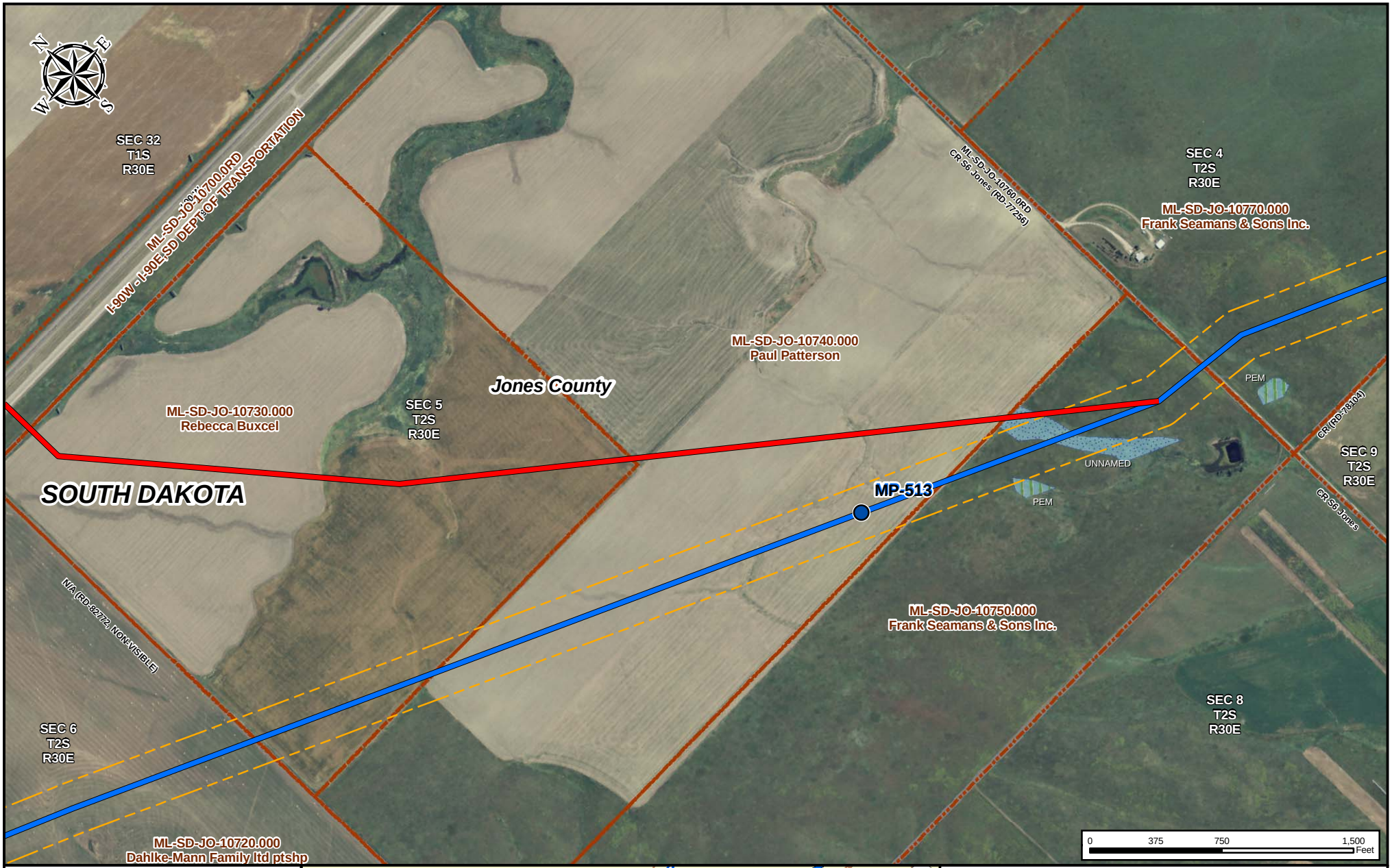


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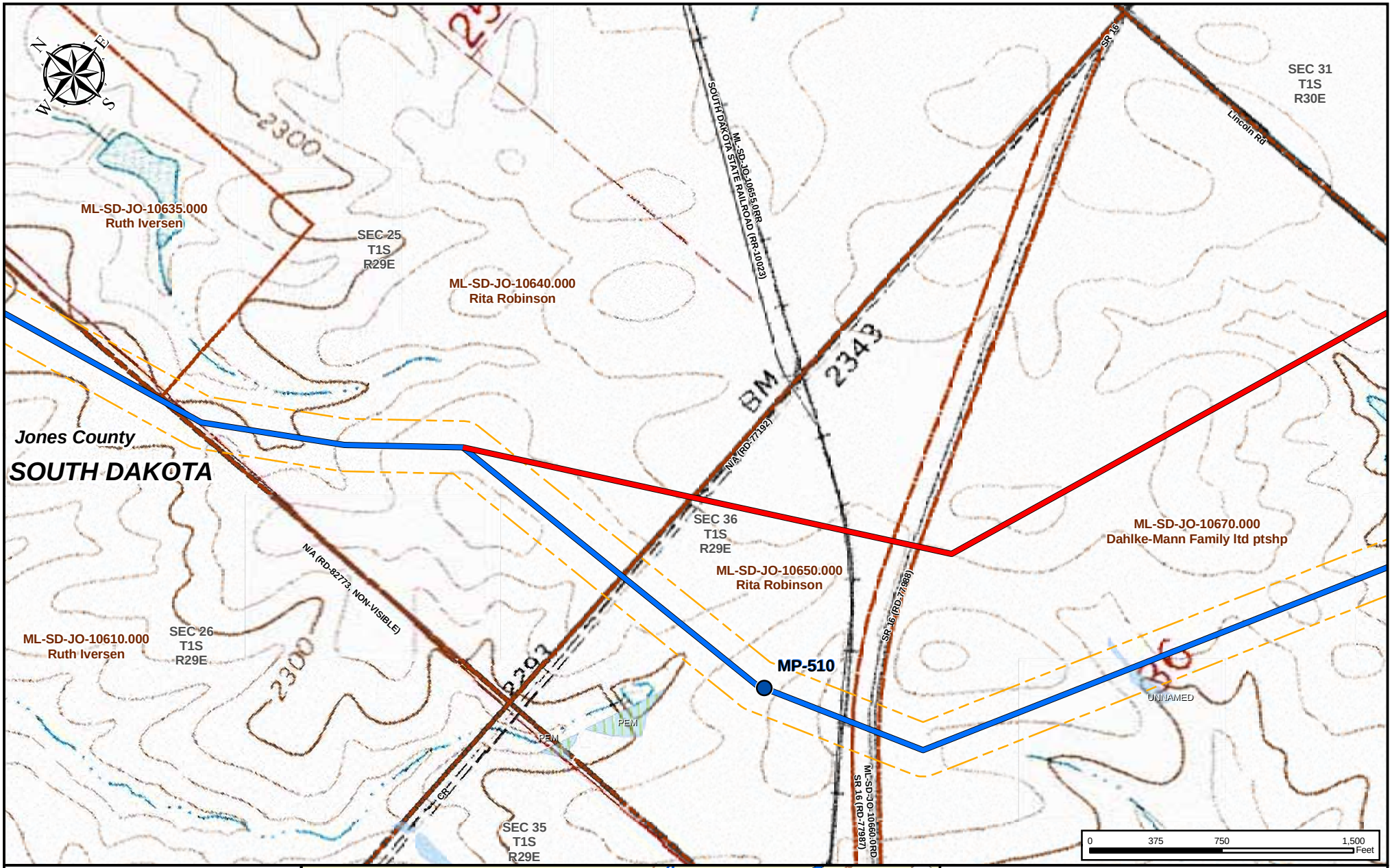


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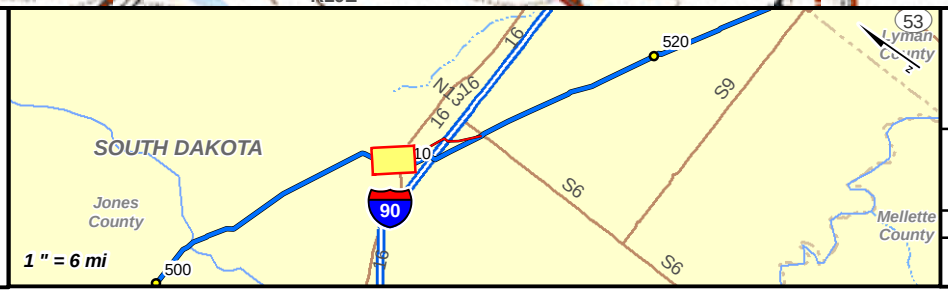


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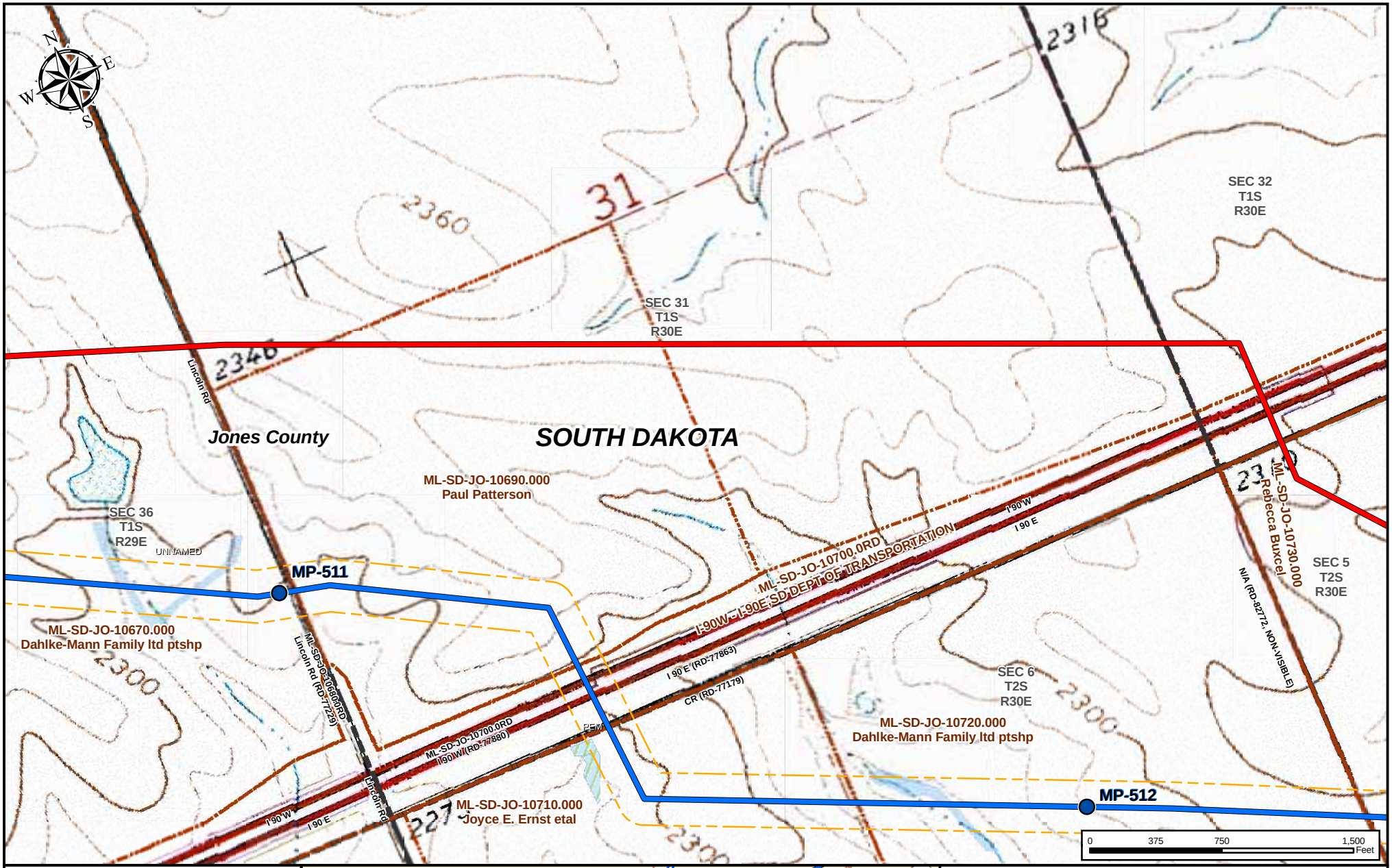


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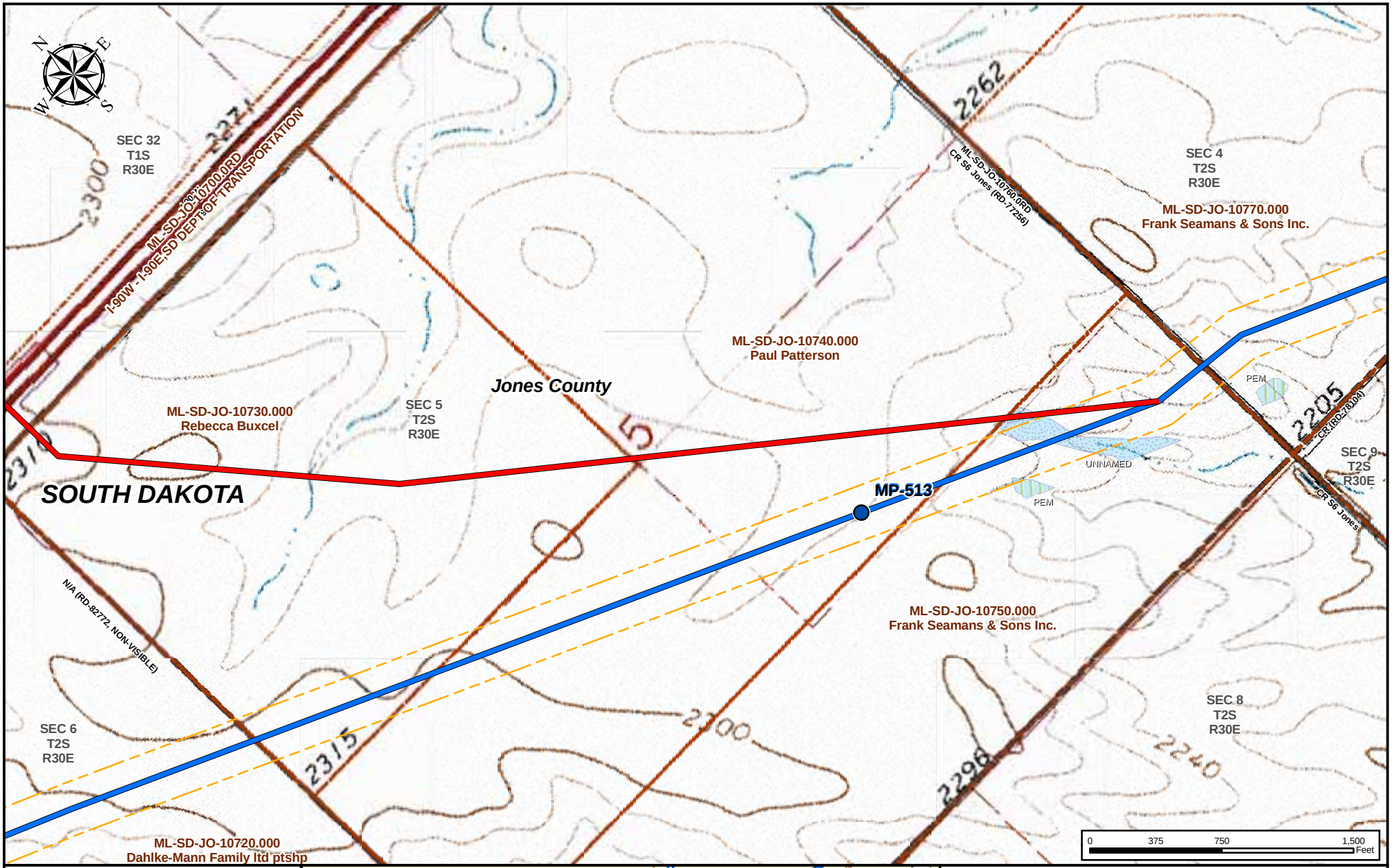


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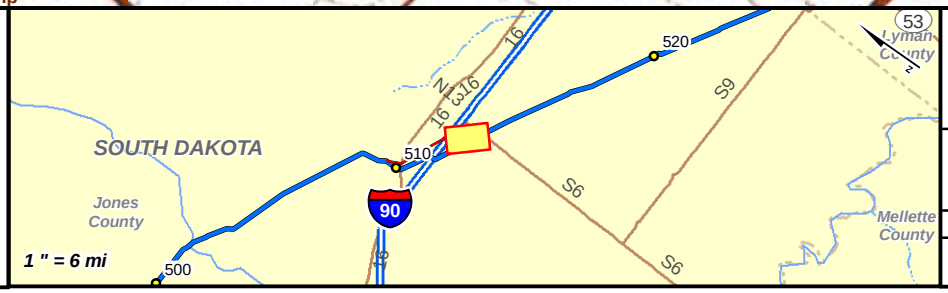


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