NOTICE: This report is required by 49 CFR Part 195. Failure to report can result in a civil penalty not to exceed $100,000 for each violation for each day that such violation persists except that the maximum civil penalty shall not exceed $1,000,000 as provided in 49 USC 60122.	OMB NO: 2137-0047 EXPIRATION DATE: 01/31/2014

U.S Department of Transportation Pipeline and Hazardous Materials Safety Administration	**Original Report Date:**	06/08/2011
	No.	20110171 - 16159 --- (DOT Use Only)

ACCIDENT REPORT - HAZARDOUS LIQUID PIPELINE SYSTEMS

INSTRUCTIONS

Important: *Please read the separate instructions for completing this form before you begin. They clarify the information requested and provide specific examples. If you do not have a copy of the instructions, you can obtain one from the PHMSA Pipeline Safety Community Web Page at http://www.phmsa.dot.gov/pipeline.*

PART A - KEY REPORT INFORMATION

Report Type: *(select all that apply)*	**Original:**	**Supplemental:**	**Final:**
		Yes	**Yes**

Last Revision Date:	11/02/2011
1. Operator's OPS-issued Operator Identification Number (OPID):	32334
2. Name of Operator	TC OIL PIPELINE OPERATIONS INC
3. Address of Operator:	
3a. Street Address	717 TEXAS AVE
3b. City	HOUSTON
3c. State	Texas
3d. Zip Code	77002
4. Local time *(24-hr clock)* and date of the Accident:	05/07/2011 06:20
5. Location of Accident:	
Latitude:	45.95307
Longitude:	-97.9057
6. National Response Center Report Number (if applicable):	975573
7. Local time *(24-hr clock)* and date of initial telephonic report to the National Response Center (if applicable):	05/07/2011 09:55
8. Commodity released: *(select only one, based on predominant volume released)*	Crude Oil
- Specify Commodity Subtype:	
- If "Other" Subtype, Describe:	
- If Biofuel/Alternative Fuel and Commodity Subtype is Ethanol Blend, then % Ethanol Blend: %:	
- If Biofuel/Alternative Fuel and Commodity Subtype is Biodiesel, then Biodiesel Blend (e.g. B2, B20, B100): B	
9. Estimated volume of commodity released unintentionally (Barrels):	400.00
10. Estimated volume of intentional and/or controlled release/blowdown (Barrels):	
11. Estimated volume of commodity recovered (Barrels):	400.00
12. Were there fatalities?	No
- If Yes, specify the number in each category:	
12a. Operator employees	
12b. Contractor employees working for the Operator	
12c. Non-Operator emergency responders	
12d. Workers working on the right-of-way, but NOT associated with this Operator	
12e. General public	
12f. Total fatalities (sum of above)	
13. Were there injuries requiring inpatient hospitalization?	No
- If Yes, specify the number in each category:	
13a. Operator employees	
13b. Contractor employees working for the Operator	
13c. Non-Operator emergency responders	

13d. Workers working on the right-of-way, but NOT associated with this Operator	
13e. General public	
13f. Total injuries (sum of above)	
14. Was the pipeline/facility shut down due to the Accident?	
- If No, Explain:	
- If Yes, complete Questions 14a and 14b: *(use local time, 24-hr clock)*	
14a. Local time and date of shutdown:	
14b. Local time pipeline/facility restarted:	
- Still shut down? (* Supplemental Report Required)	
15. Did the commodity ignite?	No
16. Did the commodity explode?	No
17. Number of general public evacuated:	0
18. Time sequence *(use local time, 24-hour clock)*:	
18a. Local time Operator identified Accident:	05/07/2011 09:00
18b. Local time Operator resources arrived on site:	05/07/2011 09:00

PART B - ADDITIONAL LOCATION INFORMATION

1. Was the origin of Accident onshore?	Yes
If Yes, Complete Questions (2-12)	
If No, Complete Questions (13-15)	
- If Onshore:	
2. State:	North Dakota
3. Zip Code:	58017
4. City	Brampton
5. County or Parish	Sargent
6. Operator-designated location:	Milepost/Valve Station
Specify:	MP ND 216.7
7. Pipeline/Facility name:	Ludden Pump Station
8. Segment name/ID:	Glacial Lakes
9. Was Accident on Federal land, other than the Outer Continental Shelf (OCS)?	No
10. Location of Accident:	Originated on Operator-controlled property, but then flowed or migrated off the property
11. Area of Accident (as found):	Aboveground
Specify:	Typical aboveground facility piping or appurtenance
- If Other, Describe:	
Depth-of-Cover (in):	
12. Did Accident occur in a crossing?	No
- If Yes, specify below:	
- If Bridge crossing –	
Cased/ Uncased:	
- If Railroad crossing –	
Cased/ Uncased/ Bored/drilled	
- If Road crossing –	
Cased/ Uncased/ Bored/drilled	
- If Water crossing –	
Cased/ Uncased	
- Name of body of water, if commonly known:	
- Approx. water depth (ft) at the point of the Accident:	
- Select:	
- If Offshore:	
13. Approximate water depth (ft) at the point of the Accident:	
14. Origin of Accident:	
- In State waters - Specify:	
- State:	
- Area:	
- Block/Tract #:	
- Nearest County/Parish:	
- On the Outer Continental Shelf (OCS) - Specify:	
- Area:	
- Block #:	
15. Area of Accident:	

PART C - ADDITIONAL FACILITY INFORMATION

1. Is the pipeline or facility:	Interstate
2. Part of system involved in Accident:	Onshore Pump/Meter Station Equipment and Piping
- If Onshore Breakout Tank or Storage Vessel, Including Attached Appurtenances, specify:	

3. Item involved in Accident:	Relief Line
- If Pipe, specify:	
3a. Nominal diameter of pipe (in):	
3b. Wall thickness (in):	
3c. SMYS (Specified Minimum Yield Strength) of pipe (psi):	
3d. Pipe specification:	
3e. Pipe Seam , specify:	
- If Other, Describe:	
3f. Pipe manufacturer:	
3g. Year of manufacture:	
3h. Pipeline coating type at point of Accident, specify:	
- If Other, Describe:	
- If Weld, including heat-affected zone, specify:	
- If Other, Describe:	
- If Valve, specify:	
- If Mainline, specify:	
- If Other, Describe:	
3i. Manufactured by:	
3j. Year of manufacture:	
- If Tank/Vessel, specify:	
- If Other - Describe:	
- If Other, describe:	
4. Year item involved in Accident was installed:	2009
5. Material involved in Accident:	Carbon Steel
- If Material other than Carbon Steel, specify:	
6. Type of Accident Involved:	Leak
- If Mechanical Puncture – Specify Approx. size:	
in. (axial) by	
in. (circumferential)	
- If Leak - Select Type:	Connection Failure
- If Other, Describe:	
- If Rupture - Select Orientation:	
- If Other, Describe:	
Approx. size: in. (widest opening) by	
in. (length circumferentially or axially)	
- If Other – Describe:	

PART D - ADDITIONAL CONSEQUENCE INFORMATION

1. Wildlife impact:	No
1a. If Yes, specify all that apply:	
- Fish/aquatic	
- Birds	
- Terrestrial	
2. Soil contamination:	Yes
3. Long term impact assessment performed or planned:	No
4. Anticipated remediation:	Yes
4a. If Yes, specify all that apply:	
- Surface water	Yes
- Groundwater	
- Soil	Yes
- Vegetation	
- Wildlife	
5. Water contamination:	Yes
5a. If Yes, specify all that apply:	
- Ocean/Seawater	
- Surface	Yes
- Groundwater	Yes
- Drinking water: *(Select one or both)*	
- Private Well	
- Public Water Intake	
5b. Estimated amount released in or reaching water (Barrels):	5.00
5c. Name of body of water, if commonly known:	Unknown, swamp area in close proximity to the pump station
6. At the location of this Accident, had the pipeline segment or facility been identified as one that "could affect" a High Consequence Area (HCA) as determined in the Operator's Integrity Management Program?	No
7. Did the released commodity reach or occur in one or more High Consequence Area (HCA)?	No
7a. If Yes, specify HCA type(s): *(Select all that apply)*	

- Commercially Navigable Waterway:	
Was this HCA identified in the "could affect" determination for this Accident site in the Operator's Integrity Management Program?	
- High Population Area:	
Was this HCA identified in the "could affect" determination for this Accident site in the Operator's Integrity Management Program?	
- Other Populated Area	
Was this HCA identified in the "could affect" determination for this Accident site in the Operator's Integrity Management Program?	
- Unusually Sensitive Area (USA) - Drinking Water	
Was this HCA identified in the "could affect" determination for this Accident site in the Operator's Integrity Management Program?	
- Unusually Sensitive Area (USA) - Ecological	
Was this HCA identified in the "could affect" determination for this Accident site in the Operator's Integrity Management Program?	
8. Estimated Property Damage:	
8a. Estimated cost of public and non-Operator private property damage	$ 1,000
8b. Estimated cost of commodity lost	$ 40,000
8c. Estimated cost of Operator's property damage & repairs	$ 25,000
8d. Estimated cost of Operator's emergency response	$ 250,000
8e. Estimated cost of Operator's environmental remediation	$ 750,000
8f. Estimated other costs	$ 250,000
Describe:	Repair costs to the faclity and other facilities
8g. Total estimated property damage (sum of above)	$ 1,316,000

PART E - ADDITIONAL OPERATING INFORMATION

1. Estimated pressure at the point and time of the Accident (psig):	1,097.00
2. Maximum Operating Pressure (MOP) at the point and time of the Accident (psig):	1,440.00
3. Describe the pressure on the system or facility relating to the Accident (psig):	Pressure did not exceed MOP
4. Not including pressure reductions required by PHMSA regulations (such as for repairs and pipe movement), was the system or facility relating to the Accident operating under an established pressure restriction with pressure limits below those normally allowed by the MOP?	No
- If Yes, Complete 4.a and 4.b below:	
4a. Did the pressure exceed this established pressure restriction?	
4b. Was this pressure restriction mandated by PHMSA or the State?	
5. Was "Onshore Pipeline, Including Valve Sites" OR "Offshore Pipeline, Including Riser and Riser Bend" selected in PART C, Question 2?	No
- If Yes - (*Complete 5a. – 5e. below)*	
5a. Type of upstream valve used to initially isolate release source:	
5b. Type of downstream valve used to initially isolate release source:	
5c. Length of segment isolated between valves (ft):	
5d. Is the pipeline configured to accommodate internal inspection tools?	
- If No, Which physical features limit tool accommodation? (*select all that apply)*	
- Changes in line pipe diameter	
- Presence of unsuitable mainline valves	
- Tight or mitered pipe bends	
- Other passage restrictions (i.e. unbarred tee's, projecting instrumentation, etc.)	
- Extra thick pipe wall (applicable only for magnetic flux leakage internal inspection tools)	
- Other -	
- If Other, Describe:	
5e. For this pipeline, are there operational factors which significantly complicate the execution of an internal inspection tool run?	

- If Yes, Which operational factors complicate execution? (*select all that apply*)	
- Excessive debris or scale, wax, or other wall buildup	
- Low operating pressure(s)	
- Low flow or absence of flow	
- Incompatible commodity	
- Other -	
- If Other, Describe:	
5f. Function of pipeline system:	
6. Was a Supervisory Control and Data Acquisition (SCADA)-based system in place on the pipeline or facility involved in the Accident?	Yes
If Yes -	
6a. Was it operating at the time of the Accident?	Yes
6b. Was it fully functional at the time of the Accident?	Yes
6c. Did SCADA-based information (such as alarm(s), alert(s), event(s), and/or volume calculations) assist with the detection of the Accident?	Yes
6d. Did SCADA-based information (such as alarm(s), alert(s), event(s), and/or volume calculations) assist with the confirmation of the Accident?	Yes
7. Was a CPM leak detection system in place on the pipeline or facility involved in the Accident?	Yes
- If Yes:	
7a. Was it operating at the time of the Accident?	Yes
7b. Was it fully functional at the time of the Accident?	Yes
7c. Did CPM leak detection system information (such as alarm(s), alert(s), event(s), and/or volume calculations) assist with the detection of the Accident?	Yes
7d. Did CPM leak detection system information (such as alarm(s), alert(s), event(s), and/or volume calculations) assist with the confirmation of the Accident?	Yes
8. How was the Accident initially identified for the Operator?	Controller
- If Other, Specify:	
8a. If "Controller", "Local Operating Personnel", including contractors", "Air Patrol", or "Guard Patrol by Operator or its contractor" is selected in Question 8, specify the following:	Operator employee
9. Was an investigation initiated into whether or not the controller(s) or control room issues were the cause of or a contributing factor to the Accident?	No, the Operator did not find that an investigation of the controller(s) actions or control room issues was necessary due to: (provide an explanation for why the Operator did not investigate)
- If No, the Operator did not find that an investigation of the controller(s) actions or control room issues was necessary due to: *(provide an explanation for why the operator did not investigate)*	due to the cause of the release resulted from a broken fitting on the thermal relief valve, the controlled did not contrubute to the release.
- If Yes, specify investigation result(s): *(select all that apply)*	
- Investigation reviewed work schedule rotations, continuous hours of service (while working for the Operator), and other factors associated with fatigue	
- Investigation did NOT review work schedule rotations, continuous hours of service (while working for the Operator), and other factors associated with fatigue	
Provide an explanation for why not:	
- Investigation identified no control room issues	
- Investigation identified no controller issues	
- Investigation identified incorrect controller action or controller error	
- Investigation identified that fatigue may have affected the controller(s) involved or impacted the involved controller(s) response	
- Investigation identified incorrect procedures	
- Investigation identified incorrect control room equipment operation	
- Investigation identified maintenance activities that affected control room operations, procedures, and/or controller response	
- Investigation identified areas other than those above:	
Describe:	

PART F - DRUG & ALCOHOL TESTING INFORMATION

1. As a result of this Accident, were any Operator employees tested under the post-accident drug and alcohol testing requirements of DOT's Drug & Alcohol Testing regulations?	No
- If Yes:	
1a. Specify how many were tested:	
1b. Specify how many failed:	
2. As a result of this Accident, were any Operator contractor employees tested under the post-accident drug and alcohol testing requirements of DOT's Drug & Alcohol Testing regulations?	No
- If Yes:	
2a. Specify how many were tested:	
2b. Specify how many failed:	

PART G – APPARENT CAUSE

Select only one box from PART G in shaded column on left representing the APPARENT Cause of the Accident, and answer the questions on the right. Describe secondary, contributing or root causes of the Accident in the narrative (PART H).

Apparent Cause:	G6 - Equipment Failure
G1 - Corrosion Failure - only one **sub-cause** can be picked from shaded left-hand column	
External Corrosion:	
Internal Corrosion:	
- If External Corrosion:	
1. Results of visual examination:	
- If Other, Describe:	
2. Type of corrosion: *(select all that apply)*	
- Galvanic	
- Atmospheric	
- Stray Current	
- Microbiological	
- Selective Seam	
- Other:	
- If Other, Describe:	
3. The type(s) of corrosion selected in Question 2 is based on the following: *(select all that apply)*	
- Field examination	
- Determined by metallurgical analysis	
- Other:	
- If Other, Describe:	
4. Was the failed item buried under the ground?	
- If Yes :	
4a. Was failed item considered to be under cathodic protection at the time of the Accident?	
If Yes - Year protection started:	
4b. Was shielding, tenting, or disbonding of coating evident at the point of the Accident?	
4c. Has one or more Cathodic Protection Survey been conducted at the point of the Accident?	
If "Yes, CP Annual Survey" – Most recent year conducted:	
If "Yes, Close Interval Survey" – Most recent year conducted:	
If "Yes, Other CP Survey" – Most recent year conducted:	
- If No:	
4d. Was the failed item externally coated or painted?	
5. Was there observable damage to the coating or paint in the vicinity of the corrosion?	
- If Internal Corrosion:	
6. Results of visual examination:	
- Other:	
7. Type of corrosion *(select all that apply)*: -	
- Corrosive Commodity	
- Water drop-out/Acid	
- Microbiological	
- Erosion	
- Other:	
- If Other, Describe:	
8. The cause(s) of corrosion selected in Question 7 is based on the following *(select all that apply)*: -	
- Field examination	
- Determined by metallurgical analysis	

- Other:	
- If Other, Describe:	
9. Location of corrosion *(select all that apply)*: -	
- Low point in pipe	
- Elbow	
- Other:	
- If Other, Describe:	
10. Was the commodity treated with corrosion inhibitors or biocides?	
11. Was the interior coated or lined with protective coating?	
12. Were cleaning/dewatering pigs (or other operations) routinely utilized?	
13. Were corrosion coupons routinely utilized?	
Complete the following if any Corrosion Failure sub-cause is selected AND the "Item Involved in Accident" (from PART C, Question 3) is Tank/Vessel.	
14. List the year of the most recent inspections:	
14a. API Std 653 Out-of-Service Inspection	
- No Out-of-Service Inspection completed	
14b. API Std 653 In-Service Inspection	
- No In-Service Inspection completed	
Complete the following if any Corrosion Failure sub-cause is selected AND the "Item Involved in Accident" (from PART C, Question 3) is Pipe or Weld.	
15. Has one or more internal inspection tool collected data at the point of the Accident?	
15a. If Yes, for each tool used, select type of internal inspection tool and indicate most recent year run: -	
- Magnetic Flux Leakage Tool	
Most recent year:	
- Ultrasonic	
Most recent year:	
- Geometry	
Most recent year:	
- Caliper	
Most recent year:	
- Crack	
Most recent year:	
- Hard Spot	
Most recent year:	
- Combination Tool	
Most recent year:	
- Transverse Field/Triaxial	
Most recent year:	
- Other	
Most recent year:	
Describe:	
16. Has one or more hydrotest or other pressure test been conducted since original construction at the point of the Accident?	
If Yes -	
Most recent year tested:	
Test pressure:	
17. Has one or more Direct Assessment been conducted on this segment?	
- If Yes, and an investigative dig was conducted at the point of the Accident::	
Most recent year conducted:	
- If Yes, but the point of the Accident was not identified as a dig site:	
Most recent year conducted:	
18. Has one or more non-destructive examination been conducted at the point of the Accident since January 1, 2002?	
18a. If Yes, for each examination conducted since January 1, 2002, select type of non-destructive examination and indicate most recent year the examination was conducted:	
- Radiography	
Most recent year conducted:	
- Guided Wave Ultrasonic	
Most recent year conducted:	
- Handheld Ultrasonic Tool	
Most recent year conducted:	
- Wet Magnetic Particle Test	
Most recent year conducted:	
- Dry Magnetic Particle Test	
Most recent year conducted:	
- Other	
Most recent year conducted:	
Describe:	

G2 - Natural Force Damage - only one **sub-cause** can be picked from shaded left-handed column	
Natural Force Damage – Sub-Cause:	
- If Earth Movement, NOT due to Heavy Rains/Floods:	
1. Specify:	
- If Other, Describe:	
- If Heavy Rains/Floods:	
2. Specify:	
- If Other, Describe:	
- If Lightning:	
3. Specify:	
- If Temperature:	
4. Specify:	
- If Other, Describe:	
- If High Winds:	
- If Other Natural Force Damage:	
5. Describe:	
Complete the following if any Natural Force Damage sub-cause is selected.	
6. Were the natural forces causing the Accident generated in conjunction with an extreme weather event?	
6a. If Yes, specify: *(select all that apply)*	
- Hurricane	
- Tropical Storm	
- Tornado	
- Other	
- If Other, Describe:	
G3 - Excavation Damage - only one **sub-cause** can be picked from shaded left-hand column	
Excavation Damage – Sub-Cause:	
- If Excavation Damage by Operator (First Party):	
- If Excavation Damage by Operator's Contractor (Second Party):	
- If Excavation Damage by Third Party:	
- If Previous Damage due to Excavation Activity:	
Complete Questions 1-5 ONLY IF the "Item Involved in Accident" (from PART C, Question 3) is Pipe or Weld.	
1. Has one or more internal inspection tool collected data at the point of the Accident?	
1a. If Yes, for each tool used, select type of internal inspection tool and indicate most recent year run: -	
- Magnetic Flux Leakage	
Most recent year conducted:	
- Ultrasonic	
Most recent year conducted:	
- Geometry	
Most recent year conducted:	
- Caliper	
Most recent year conducted:	
- Crack	
Most recent year conducted:	
- Hard Spot	
Most recent year conducted:	
- Combination Tool	
Most recent year conducted:	
- Transverse Field/Triaxial	
Most recent year conducted:	
- Other	
Most recent year conducted:	
Describe:	
2. Do you have reason to believe that the internal inspection was completed BEFORE the damage was sustained?	
3. Has one or more hydrotest or other pressure test been conducted since original construction at the point of the Accident?	
- If Yes:	
Most recent year tested:	
Test pressure (psig):	

4. Has one or more Direct Assessment been conducted on the pipeline segment?	
- If Yes, and an investigative dig was conducted at the point of the Accident:	
Most recent year conducted:	
- If Yes, but the point of the Accident was not identified as a dig site:	
Most recent year conducted:	
5. Has one or more non-destructive examination been conducted at the point of the Accident since January 1, 2002?	
5a. If Yes, for each examination, conducted since January 1, 2002, select type of non-destructive examination and indicate most recent year the examination was conducted:	
- Radiography	
Most recent year conducted:	
- Guided Wave Ultrasonic	
Most recent year conducted:	
- Handheld Ultrasonic Tool	
Most recent year conducted:	
- Wet Magnetic Particle Test	
Most recent year conducted:	
- Dry Magnetic Particle Test	
Most recent year conducted:	
- Other	
Most recent year conducted:	
Describe:	
Complete the following if Excavation Damage by Third Party is selected as the sub-cause.	
6. Did the operator get prior notification of the excavation activity?	
6a. If Yes, Notification received from: *(select all that apply)* -	
- One-Call System	
- Excavator	
- Contractor	
- Landowner	
Complete the following mandatory CGA-DIRT Program questions if any Excavation Damage sub-cause is selected.	
7. Do you want PHMSA to upload the following information to CGA-DIRT (www.cga-dirt.com)?	
8. Right-of-Way where event occurred: *(select all that apply)* -	
- Public	
- If "Public", Specify:	
- Private	
- If "Private", Specify:	
- Pipeline Property/Easement	
- Power/Transmission Line	
- Railroad	
- Dedicated Public Utility Easement	
- Federal Land	
- Data not collected	
- Unknown/Other	
9. Type of excavator:	
10. Type of excavation equipment:	
11. Type of work performed:	
12. Was the One-Call Center notified?	
12a. If Yes, specify ticket number:	
12b. If this is a State where more than a single One-Call Center exists, list the name of the One-Call Center notified:	
13. Type of Locator:	
14. Were facility locate marks visible in the area of excavation?	
15. Were facilities marked correctly?	
16. Did the damage cause an interruption in service?	
16a. If Yes, specify duration of the interruption (hours)	
17. Description of the CGA-DIRT Root Cause *(select only the one predominant first level CGA-DIRT Root Cause and then, where available as a choice, the one predominant second level CGA-DIRT Root Cause as well):*	
Root Cause:	
- If One-Call Notification Practices Not Sufficient, specify:	
- If Locating Practices Not Sufficient, specify:	
- If Excavation Practices Not Sufficient, specify:	
- If Other/None of the Above, explain:	
G4 - Other Outside Force Damage - *only one **sub-cause** can be selected from the shaded left-hand column*	
Other Outside Force Damage – Sub-Cause:	

- If Nearby Industrial, Man-made, or Other Fire/Explosion as Primary Cause of Incident:	
- If Damage by Car, Truck, or Other Motorized Vehicle/Equipment NOT Engaged in Excavation:	
1. Vehicle/Equipment operated by:	
- If Damage by Boats, Barges, Drilling Rigs, or Other Maritime Equipment or Vessels Set Adrift or Which Have Otherwise Lost Their Mooring:	
2. Select one or more of the following IF an extreme weather event was a factor:	
- Hurricane	
- Tropical Storm	
- Tornado	
- Heavy Rains/Flood	
- Other	
- If Other, Describe:	
- If Routine or Normal Fishing or Other Maritime Activity NOT Engaged in Excavation:	
- If Electrical Arcing from Other Equipment or Facility:	
- If Previous Mechanical Damage NOT Related to Excavation:	
Complete Questions 3-7 ONLY IF the "Item Involved in Accident" (from PART C, Question 3) is Pipe or Weld.	
3. Has one or more internal inspection tool collected data at the point of the Accident?	
3a. If Yes, for each tool used, select type of internal inspection tool and indicate most recent year run:	
- Magnetic Flux Leakage	
Most recent year conducted:	
- Ultrasonic	
Most recent year conducted:	
- Geometry	
Most recent year conducted:	
- Caliper	
Most recent year conducted:	
- Crack	
Most recent year conducted:	
- Hard Spot	
Most recent year conducted:	
- Combination Tool	
Most recent year conducted:	
- Transverse Field/Triaxial	
Most recent year conducted:	
- Other	
Most recent year conducted:	
Describe:	
4. Do you have reason to believe that the internal inspection was completed BEFORE the damage was sustained?	
5. Has one or more hydrotest or other pressure test been conducted since original construction at the point of the Accident?	
- If Yes:	
Most recent year tested:	
Test pressure (psig):	
6. Has one or more Direct Assessment been conducted on the pipeline segment?	
- If Yes, and an investigative dig was conducted at the point of the Accident:	
Most recent year conducted:	
- If Yes, but the point of the Accident was not identified as a dig site:	
Most recent year conducted:	
7. Has one or more non-destructive examination been conducted at the point of the Accident since January 1, 2002?	
7a. If Yes, for each examination conducted since January 1, 2002, select type of non-destructive examination and indicate most recent year the examination was conducted:	
- Radiography	
Most recent year conducted:	
- Guided Wave Ultrasonic	
Most recent year conducted:	
- Handheld Ultrasonic Tool	
Most recent year conducted:	
- Wet Magnetic Particle Test	
Most recent year conducted:	
- Dry Magnetic Particle Test	
Most recent year conducted:	
- Other	
Most recent year conducted:	

Describe:	
- If Intentional Damage:	
8. Specify:	
- If Other, Describe:	
- If Other Outside Force Damage:	
9. Describe:	
G5 - Material Failure of Pipe or Weld - only one **sub-cause** can be selected from the shaded left-hand column	
Use this section to report material failures ONLY IF the "Item Involved in Accident" (from PART C, Question 3) is "Pipe" or "Weld."	
Material Failure of Pipe or Weld – Sub-Cause:	
1. The sub-cause selected below is based on the following: *(select all that apply)*	
- Field Examination	
- Determined by Metallurgical Analysis	
- Other Analysis	
- If "Other Analysis", Describe:	
- Sub-cause is Tentative or Suspected; Still Under Investigation (Supplemental Report required)	
- If Construction, Installation, or Fabrication-related:	
2. List contributing factors: *(select all that apply)*	
- Fatigue or Vibration-related	
Specify:	
- If Other, Describe:	
- Mechanical Stress:	
- Other	
- If Other, Describe:	
- If Original Manufacturing-related (NOT girth weld or other welds formed in the field):	
2. List contributing factors: *(select all that apply)*	
- Fatigue or Vibration-related:	
Specify:	
- If Other, Describe:	
- Mechanical Stress:	
- Other	
- If Other, Describe:	
- If Environmental Cracking-related:	
3. Specify:	
- Other - Describe:	
Complete the following if any Material Failure of Pipe or Weld sub-cause is selected.	
4. Additional factors: (*select all that apply*):	
- Dent	
- Gouge	
- Pipe Bend	
- Arc Burn	
- Crack	
- Lack of Fusion	
- Lamination	
- Buckle	
- Wrinkle	
- Misalignment	
- Burnt Steel	
- Other:	
- If Other, Describe:	
5. Has one or more internal inspection tool collected data at the point of the Accident?	
5a. If Yes, for each tool used, select type of internal inspection tool and indicate most recent year run:	
- Magnetic Flux Leakage	
Most recent year run:	
- Ultrasonic	
Most recent year run:	
- Geometry	
Most recent year run:	
- Caliper	
Most recent year run:	
- Crack	
Most recent year run:	
- Hard Spot	
Most recent year run:	

- Combination Tool	
Most recent year run:	
- Transverse Field/Triaxial	
Most recent year run:	
- Other	
Most recent year run:	
Describe:	
6. Has one or more hydrotest or other pressure test been conducted since original construction at the point of the Accident?	
- If Yes:	
Most recent year tested:	
Test pressure (psig):	
7. Has one or more Direct Assessment been conducted on the pipeline segment?	
- If Yes, and an investigative dig was conducted at the point of the Accident -	
Most recent year conducted:	
- If Yes, but the point of the Accident was not identified as a dig site -	
Most recent year conducted:	
8. Has one or more non-destructive examination(s) been conducted at the point of the Accident since January 1, 2002?	
8a. If Yes, for each examination conducted since January 1, 2002, select type of non-destructive examination and indicate most recent year the examination was conducted: -	
- Radiography	
Most recent year conducted:	
- Guided Wave Ultrasonic	
Most recent year conducted:	
- Handheld Ultrasonic Tool	
Most recent year conducted:	
- Wet Magnetic Particle Test	
Most recent year conducted:	
- Dry Magnetic Particle Test	
Most recent year conducted:	
- Other	
Most recent year conducted:	
Describe:	
G6 – **Equipment Failure** - only one **sub-cause** can be selected from the shaded left-hand column	
Equipment Failure – **Sub-Cause:**	Threaded Connection/Coupling Failure
- If Malfunction of Control/Relief Equipment:	
1. Specify: *(select all that apply)* -	
- Control Valve	
- Instrumentation	
- SCADA	
- Communications	
- Block Valve	
- Check Valve	
- Relief Valve	
- Power Failure	
- Stopple/Control Fitting	
- ESD System Failure	
- Other	
- If Other – Describe:	
- If Pump or Pump-related Equipment:	
2. Specify:	
- If Other – Describe:	
- If Threaded Connection/Coupling Failure:	
3. Specify:	Threaded Fitting
- If Other – Describe:	
- If Non-threaded Connection Failure:	
4. Specify:	
- If Other – Describe:	
- If Defective or Loose Tubing or Fitting:	
- If Failure of Equipment Body (except Pump), Tank Plate, or other Material:	
- If Other Equipment Failure:	
5. Describe:	

Complete the following if any Equipment Failure sub-cause is selected.	
6. Additional factors that contributed to the equipment failure: *(select all that apply)*	
- Excessive vibration	Yes
- Overpressurization	
- No support or loss of support	
- Manufacturing defect	
- Loss of electricity	
- Improper installation	
- Mismatched items (different manufacturer for tubing and tubing fittings)	
- Dissimilar metals	
- Breakdown of soft goods due to compatibility issues with transported commodity	
- Valve vault or valve can contributed to the release	
- Alarm/status failure	
- Misalignment	
- Thermal stress	
- Other	
- If Other, Describe:	

G7 - Incorrect Operation - only one **sub-cause** can be selected from the shaded left-hand column	
Incorrect Operation – Sub-Cause:	
Damage by Operator or Operator's Contractor NOT Related to Excavation and NOT due to Motorized Vehicle/Equipment Damage	
Tank, Vessel, or Sump/Separator Allowed or Caused to Overfill or Overflow	
1. Specify:	
- If Other, Describe:	
Valve Left or Placed in Wrong Position, but NOT Resulting in a Tank, Vessel, or Sump/Separator Overflow or Facility Overpressure	
Pipeline or Equipment Overpressured	
Equipment Not Installed Properly	
Wrong Equipment Specified or Installed	
Other Incorrect Operation	
2. Describe:	
Complete the following if any Incorrect Operation sub-cause is selected.	
3. Was this Accident related to *(select all that apply)*: -	
- Inadequate procedure	
- No procedure established	
- Failure to follow procedure	
- Other:	
- If Other, Describe:	
4. What category type was the activity that caused the Accident?	
5. Was the task(s) that led to the Accident identified as a covered task in your Operator Qualification Program?	
5a. If Yes, were the individuals performing the task(s) qualified for the task(s)?	

G8 - Other Accident Cause - only one **sub-cause** can be selected from the shaded left-hand column	
Other Accident Cause – Sub-Cause:	
- If Miscellaneous:	
1. Describe:	
- If Unknown:	

2. Specify:	

PART H - NARRATIVE DESCRIPTION OF THE ACCIDENT

A release occurred at the Ludden Pump Station on the ¾" pipe nipple under the thermal relief valve located on the facility discharge piping. A root cause analysis has been conducted and the failed fitting investigation performed. The fatique failure of the 3/4" pipe nipple occurred as a result of excessive vibratio. Results have been provided to PHMSA.

File Full Name

PART I - PREPARER AND AUTHORIZED SIGNATURE

Preparer's Name	Daniel C Cerkoney
Preparer's Title	Compliance Engineer
Preparer's Telephone Number	701-483-1434
Preparer's E-mail Address	dan_cerkoney@transcanada.com
Preparer's Facsimile Number	701-483-1431
Authorized Signature's Name	Daniel C Cerkoney
Authorized Signature Title	Compliance Engineer
Authorized Signature Telephone Number	701-290-1176
Authorized Signature Email	dan_cerkoney@transcanada.com
Date	11/02/2011

URS

November 18, 2011

Mr. Kris Roberts
North Dakota Department of Health
918 E. Divide Avenue, 4th Floor
Bismarck, North Dakota 58501-1947

Subject: Release Progress Report – Ludden Pump Station
TransCanada – Keystone Pipeline, LP
Brampton, North Dakota

Dear Mr. Roberts:

This report transmits the results of the October 2011 sampling of the land farmed area and surface water in the wetlands at the TransCanada Keystone Pipeline, LP Ludden Pump Station site near Brampton, North Dakota. This report is submitted in reference to your October 26, 2011 correspondence and the finalization of cleanup actions by TransCanada at this site.

Sampling and Analysis Results

Soil Sampling

The land farmed area was resampled on October 20, 2011. The sample locations are shown on Figure 1 and the results are summarized on Table 1. Analytical results continued to show total extractable hydrocarbon (TEH) concentrations in soils below North Dakota Department of Health (NDDH) clean-up levels at all sampling locations.

Water Sampling

The majority of the wetlands previously sampled were found to have no standing water on October 20, 2011, with the exception of the background sample location ¼ mile north of the pump station. The sample location is shown on Figure 2 and the results are summarized on Table 2.

Observed Site Conditions

The crops in the farmed area had been destroyed prior to the October 20, 2011 site visit and the field had been tilled. See attached aerial photograph from October 5, 2011 (Figure 3) showing site and land farm restoration condition.

Recommendation

Based on current conditions at the TransCanada Ludden Pump Station site and your correspondence dated October 26, 2011, we request that no further investigation or remediation be required and that the site be considered for closure.

URS Corporation
Fifth Street Towers
100 South Fifth Street, Suite 1500
Minneapolis, MN 55402
612.370.0700 Tel
612.370.1378 Fax

URS

If you have any questions, please contact Robert Baumgartner of TransCanada Keystone Pipeline at (832) 320-5538 or myself at (612) 373-6849.

Sincerely,

Bruce R. Galer, PG
Senior Geologist

cc: Robert Baumgartner, TransCanada Keystone Pipeline

Table 1
Summary of Laboratory Analysis-Wetland Water Samples
Ludden Pump Station, Brampton, ND-October 20, 2011

Location	Units	WTLD-025	WTLD-26-N	WTLD-026-S	WTLD-026-Trench	WTLD-027	1/2 Mi-WILD	1/4 MI-N-WTLD	PS-ADJ-WTLD	Human Health Limit Class III Water
Sample Date		10/20/11	10/20/11	10/20/11	10/20/11	10/20/11	10/20/11	10/20/11	10/20/11	
Type		NA	NA	NA	NA	NA	NA	Background-Grab	NA	
Analyte										
TEH(C09-C40)	mg/L	NA	NA	NA	NA	NA	NA	0.11	NA	---
TEM (C09-C40)	mg/L	NA	NA	NA	NA	NA	NA	0.11	NA	---
Benzene	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	71
Ethylbenzene	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	2,900
Toluene	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	200,000
Xylene (Total)	µg/L	NA	NA	NA	NA	NA	NA	<3	NA	10,000*

NOTES: mg/L=Milligrams per liter
µg/L= Micrograms per liter
<x = Not detected to reporting limits of x
TEM=total extractable range hydrocarbons without silica gel preparation
TEH=total extractable range hydrocarbons with silica gel preparation
* None listed for Class III water, value represents Class II water, wetlands unlisted are considered Class III waters
--- = No applicable standard
NA = No surface water present at sample location

Location	Units	WTLD-25	WTLD-26-N	WTLD-26-S	WTLD-26-Trench	WTLD-27	1/2 Mi-WILD	1/4 MI-N-WTLD	PS-ADJ-WTLD	Aquatic Life Value Acute ***	Aquatic Life Value Chronic ***
Sample Date		10/20/11	10/20/11	10/20/11	10/20/11	10/20/11	10/20/11	10/20/11	10/20/11		
Type		NA	NA	NA	NA	NA	NA	Background-Grab	NA		
Analyte											
Aluminum, dissolved	µg/L	NA	NA	NA	NA	NA	NA	<200	NA	---	---
Antimony, dissolved	µg/L	NA	NA	NA	NA	NA	NA	<10	NA	---	640**
Arsenic, dissolved	µg/L	NA	NA	NA	NA	NA	NA	<10	NA	340	150
Barium, dissolved	µg/L	NA	NA	NA	NA	NA	NA	56.5	NA	---	---
Beryllium, dissolved	µg/L	NA	NA	NA	NA	NA	NA	<5.0	NA	---	---
Boron, dissolved	µg/L	NA	NA	NA	NA	NA	NA	<150	NA	---	---
Cadminum, dissolved	µg/L	NA	NA	NA	NA	NA	NA	<1	NA	2.1	0.27
Chromium, dissolved	µg/L	NA	NA	NA	NA	NA	NA	<10	NA	1,800	86
Copper, dissolved	µg/L	NA	NA	NA	NA	NA	NA	<10	NA	14.0	9.3
Lead, dissolved	µg/L	NA	NA	NA	NA	NA	NA	<3	NA	82	3.2
Nickel, dissolved	µg/L	NA	NA	NA	NA	NA	NA	<20	NA	470	52
Selenium, dissolved	µg/L	NA	NA	NA	NA	NA	NA	<15	NA	20	5.0
Silver, dissolved	µg/L	NA	NA	NA	NA	NA	NA	<10	NA	3.8	---
Thallium, dissolved	µg/L	NA	NA	NA	NA	NA	NA	<15	NA	---	0.47**
Zinc, dissolved	µg/L	NA	NA	NA	NA	NA	NA	<20	NA	120	120
Ammonia Nitrogen	mg/L	NA	NA	NA	NA	NA	NA	0.13	NA	---	---

NOTES: mg/L=Milligrams per liter
µg/L= Micrograms per liter
<x = Not detected to reporting limits of x
** Class III Steam Human Health Standard, no aquatic standard listed
*** Some values may be adjusted based on hardness and pH.
NA = No surface water present at sample location

Table 2
Summary of Laboratory Analysis-Land Farming
Ludden Pump Station, Brampton, ND

May 15, 2011

Location	Units	LF-A	LF-B	LF-C	LF-D	LF-BKG-A	LF-BKG-B	Clean-up Level
Sample Date		5/15/11	5/15/11	5/15/11	5/15/11	5/15/11	5/15/11	
Sample Type		Composite	Composite	Composite	Composite	Composite	Composite	
Chemical of Concern								
% Moisture	%	29.3	28	21.6	18.9	20.7	20.7	
TEH(C09-C40)	mg/kg	228	3.1	4.9	143	3.0	3.5	100
TEM(C09-C40)	mg/kg	214	13	10.7	198	13.7	9.2	100
pH	Std. Units	7.2	5.4	7.1	7.1	5.6	5.9	
Nitrate as N	mg/kg	<5.7	9.4	5.1	<4.9	8.1	7.2	
Total Phosphorus	mg/kg	348	388	349	332	428	337	
Total Organic Carbon	mg/kg	3530	5630	6980	10300	4070	4140	

August 2, 2011

Location	Units	LF-A	LF-B	LF-C	LF-D	LF-E*	LF-BKG-A	LF-BKG-B	Clean-up Level
Sample Date		8/2/11	8/2/11	8/2/11	8/2/11	8/2/11	8/2/11	8/2/11	
Sample Type		Composite	Composite	Composite	Composite	Composite	Composite	Composite	
Chemical of Concern									
% Moisture	%	6.4	12.4	21.1	11.8	23.4	36.2	10.1	
TEH(C09-C40)	mg/kg	4.6	4.2	4.1	5.6	7.7	6.8	4.3	100
TEM(C09-C40)	mg/kg	8.8	9.1	5.3	15.2	11.2	10.3	8.9	100
pH	Std. Units	5.3	5.2	5.5	5.0	7.5	7.7	8.2	
Nitrate as N	mg/kg	<4.3	4.6	<5.1	5.9	<5.2	<6.3	<4.5	
Total Phosphorus	mg/kg	274	287	329	340	273	404	307	
Total Organic Carbon	mg/kg	3810	7300	6670	4810	2810	8670	2870	

October 20, 2011

Location	Units	LF-A	LF-B	LF-C	LF-D	LF-BKG-A	LF-BKG-B	Clean-up Level
Sample Date		10/20/11	10/20/11	10/20/11	10/20/11	10/20/11	10/20/11	
Sample Type		Composite	Composite	Composite	Composite	Composite	Composite	
Chemical of Concern								
% Moisture	%	14.4	7	12.6	9.5	17.5	8.7	
TEH(C09-C40)	mg/kg	8.6	4.1	8.4	74.2	6.2	5.6	100
TEM(C09-C40)	mg/kg	14.2	6.5	10.8	87.4	6.8	9.7	100
pH	Std. Units	7	5	6.3	6.0	8.3	7.9	
Nitrate as N	mg/kg	18.6	10.2	31.2	12.4	6.7	4.3	
Total Phosphorus	mg/kg	347	344	363	327	406	348	
Total Organic Carbon	mg/kg	12100	8030	7040	5640	7100	6690	

NOTES:

TEM=total extractable range hydrocarbons without silica gel preparation

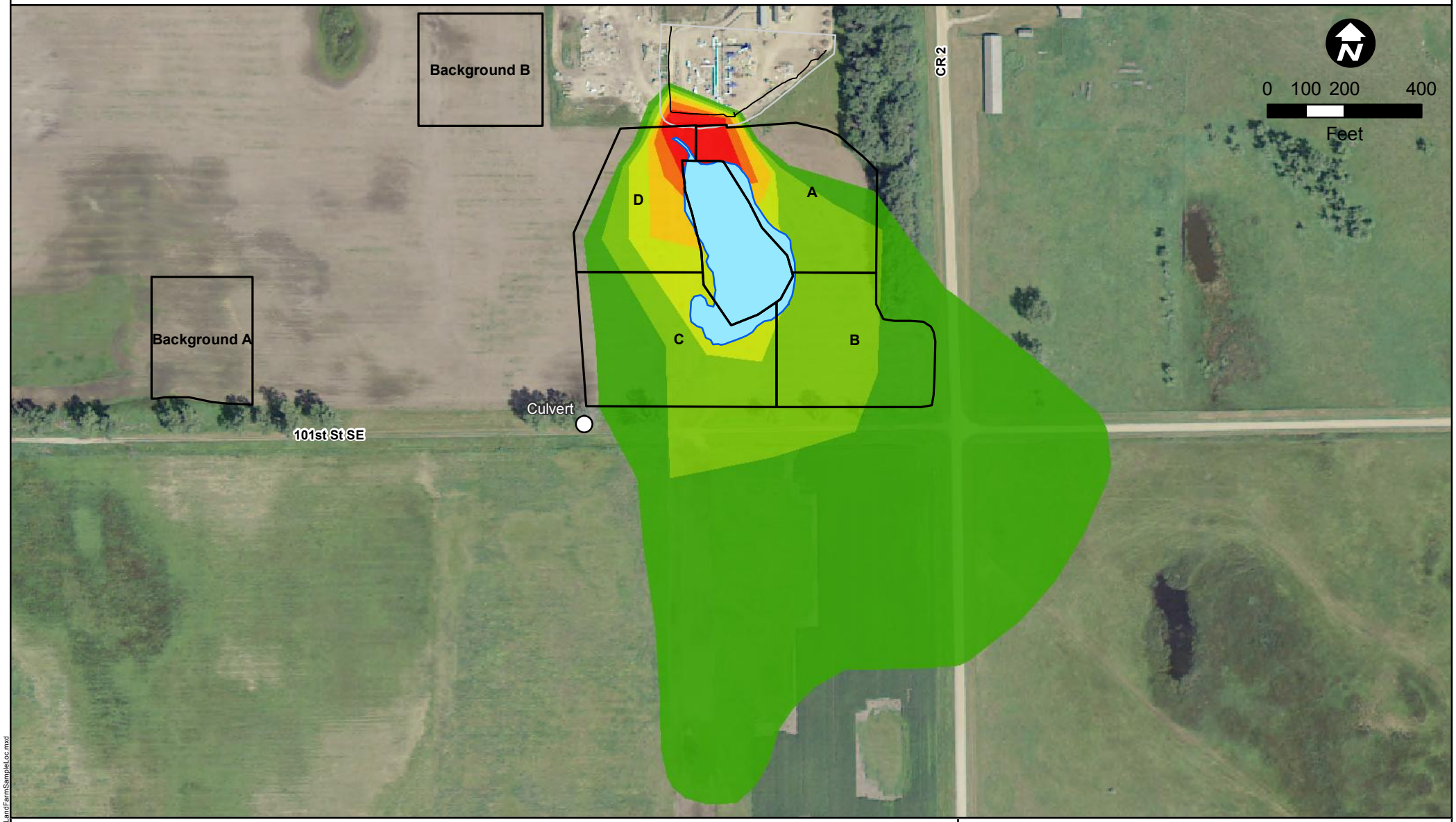
TEH=total extractable range hydrocarbons with silica gel preparation

* In August 2 sampling, the portion of the field that was scraped to remove surficial oil was separated from sample areas LF-A and LF-B and sampled as sample LF-E.

TransCanada Ludden Pump Station

Figure 1. Land Farm Sample Locations - October 20, 2011

URS
Fifth Street Towers
100 South Fifth Street, Suite 1500
Minneapolis, MN 55402
612.370.0700 Tel
612.370.1378 Fax

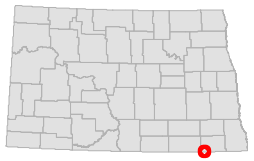


Fence
Toe of Slope
Pond

Misted Areas
Continuous = 91-100% coverage
Broken = 51-90% coverage
Patchy = 11-50% coverage
Sporadic-High = 6-10% coverage
Sporadic-Low = 1-5% coverage
Trace = <1% coverage

Data:
SCAT areas collected by GPS in May 2011.

Projection:
NAD83 UTM Zone 14N

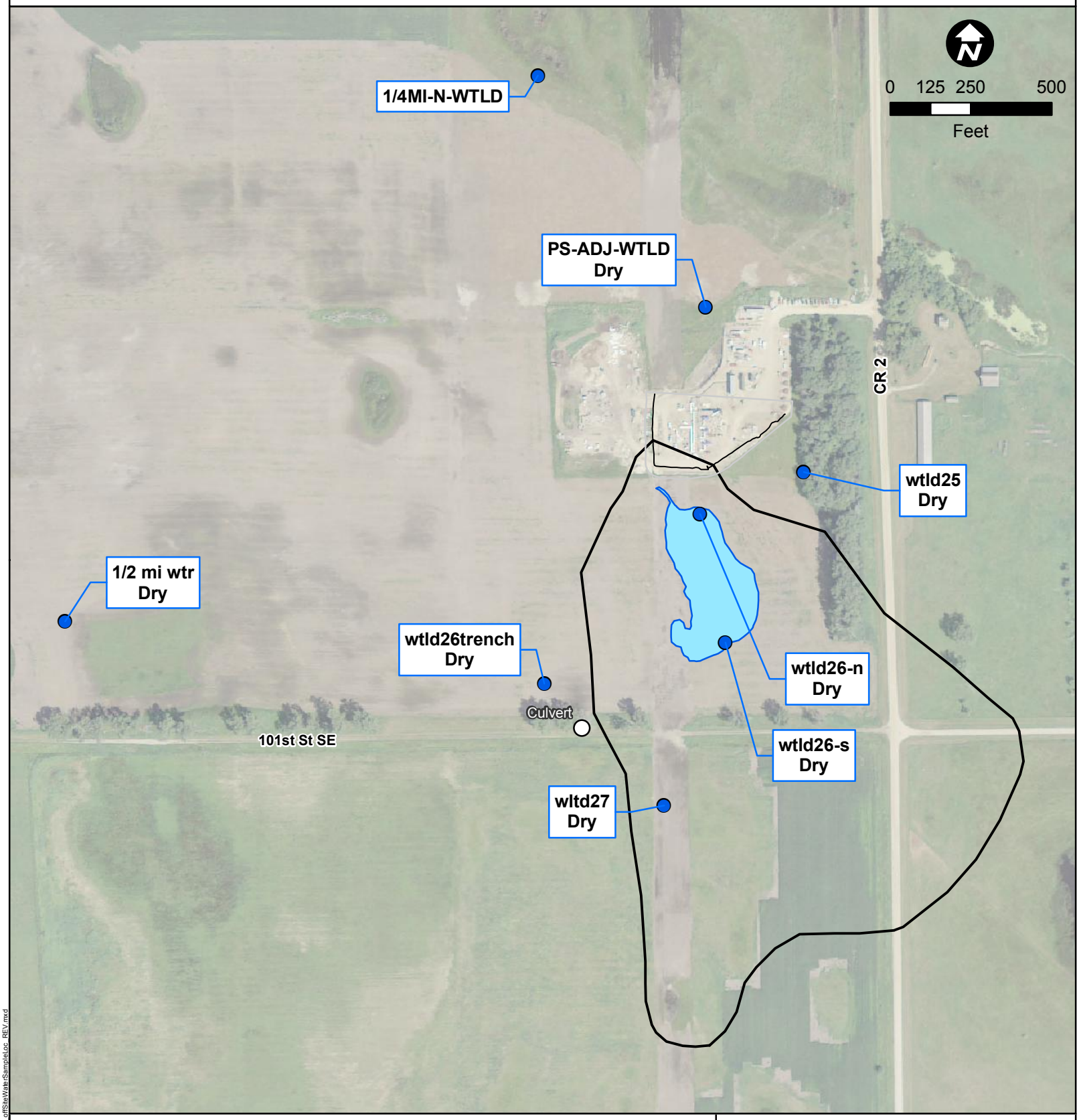


Q:\31810956\06_GIS\Data\08312011\Fig1_LandFarmSampleLoc.mxd

TransCanada Ludden Pump Station

Figure 2. Off-Site Water Sampling Locations - October 20, 2011

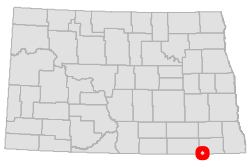
URS
Fifth Street Towers
100 South Fifth Street, Suite 1500
Minneapolis, MN 55402
612.370.0700 Tel
612.370.1378 Fax



Fence
Toe of Slope
Pond
Off-Site Water Sample
Misted Spray Area

Data:
SCAT areas collected by GPS in May 2011.

Projection:
NAD83 UTM Zone 14N

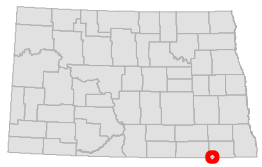


Q:\31810658.06_GIS\Data\08312011\Fig2_offSiteWaterSampleLoc_REV.mxd

TransCanada Ludden Pump Station

Figure 3. Site Restoration as of October 5, 2011

URS
Fifth Street Towers
100 South Fifth Street, Suite 1500
Minneapolis, MN 55402
612.370.0700 Tel
612.370.1378 Fax



Environmental Incident Report

This report has been submitted.

North Dakota Department of Health
Environmental Health Section
1.701.328.5210 or 1.701.328.5166

North Dakota Department of Emergency Services
1.701.328.8100
1.800.472.2121 State Radio 24-Hour Hotline

If this is an emergency, or for additional assistance, please call the Health or Emergency Services Department at the numbers shown above

This form is NOT for RCRA-exempt oilfield related incidents
(for RCRA-exempt oilfield incidents click here)
(if you are not sure which form to use click here)

Fill out information as completely as possible
Error messages appear to the right of the field
Use the Tab key or mouse to move between fields
Pressing the Enter key while in the form will submit the report
Required fields are shown in Red

Location Information:

County	Sargent
Township	129
Range	58
Section	26
Quarter	
QQSection	
QQQSection	

Location Description (911 address or location from nearest town)

10075 119th Ave SE
Brampton, ND 58017

Distance to Nearest Residence or Occupied Building 1.3 Units Miles

Incident Information:

Date 5/7/2011
(mm/dd/yyyy) If unknown, enter date of discovery
Time

0605

hhmm 24-hour time, no colon

Type: Other (fill in box)

Pipeline Pump Station Equipment

Estimated Duration	30	Units	minutes
Estimated Volume	500	Units	barrels

Substance released or of concern (include trade and/or chemical name if applicable)

Crude Oil

Agriculture Related? No

Is this substance on EPA's Extremely Hazardous Substance list? No

To find out if this substance is on the EHS list, Click Here

Describe Cause

Small diameter piping failure.

Action Taken and Recommended/Planned Future Action
(how spill was contained, soil excavated, emergency approval to burn contaminant, evacuation of nearby personnel, etc.)

Pipeline system shutdown and pump station isolated.
Company and contractor spill response crews mobilized to the facility.
Oil contained and controlled onsite by earthen berm. Offsite oil mist delineated. Absorbent boom and earthen dam were used to collect sheen and control flow from ponded water on adjacent property to the

Where will recovered wastes be disposed?

Recovered crude oil/water mix transported to LePier Oil, Fosston, MN for recycling.
Excavated oil impacted gravel/soil will be transported to Veolia LF, Buffalo MN

Impact Information:

Fatalities	0
Injuries	0
Medium affected	04 - water and soil

Immediate Risk Evaluation (explosive atmosphere, immediate health hazards, etc.)

NA - work conditions were monitored throughout response/cleanup activities.

Potential Environmental Impacts

(describe impacts to, or likelihood of impacts, to surface water, ground water, soils, etc.)

Soils - oil saturated soils were excavated as described above. Residual oil impacts will be treated using insitu landfarming techniques.
Surface water - oil sheen was collected utilizing absorbent boom. Potential dissolved impacts are being monitored.

Responsible Party Information:

Responsible Party	TransCanada
Address (Line 1)	13710 FNB Parkway
Address (Line 2)	Suite 300
City	Omaha
State/Province	NE - Nebraska
Zip	68154
Contact First Name	Robert
Contact Last Name	Baumgartner
Contact Telephone	832-320-5538
Contact Email	robert_baumgartner@tra

Property Owner if not the Responsible Party

Has or will the incident be reported to property owner? Unknown

Reporting Information:

First Name	Robert
Last Name	Baumgartner
Date Reported (mm/dd/yyyy)	5/7/2011
Time Reported	1015

hhmm 24-hour time, no colon

Other agencies that have or will be notified

- [ ] NDDES
- [ ] State Fire Marshal
- [ ] State Highway Patrol
- [x] Local Fire Department
- [x] Local Law Enforcement
- [x] Local Emergency Manager

Other

To see if this incident is required to be reported to the National Response Center (NRC) Click Here

Has or will the incident be reported to the NRC ?? 1-800-424-8802 Yes

Additional E-Mail Recipients to send report to

robert_baumgartner@transcanada

Official Use Only:

State Agency Person Who Received Call First Name

Last Name

Department of Emergency Services Incident Number

Send this email to Department of Mineral Resources No

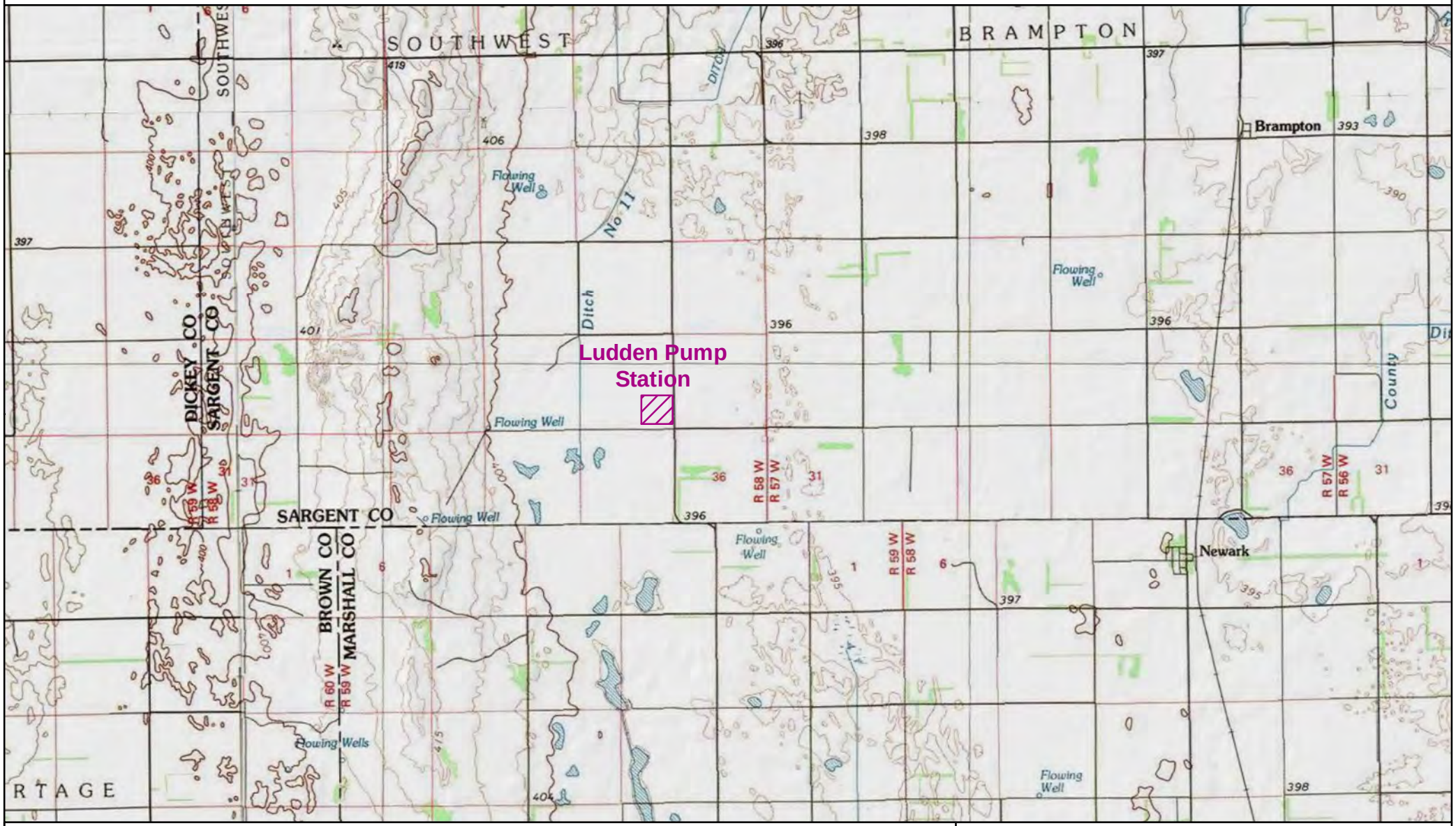
Pressing the submit button will send an E-Mail version of this completed Environmental Incident Report to NDDH Environmental Health Section and ND Dept. of Emergency Services personnel

Submit

TransCanada Ludden Pump Station

Figure 1. Site Location Map

URS
Fifth Street Towers
100 South Fifth Street, Suite 1500
Minneapolis, MN 55402
612.370.0700 Tel
612.370.1378 Fax

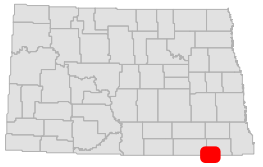


0 0.5 1 2

Miles

Data:
USGS 7.5" topographic basemap.

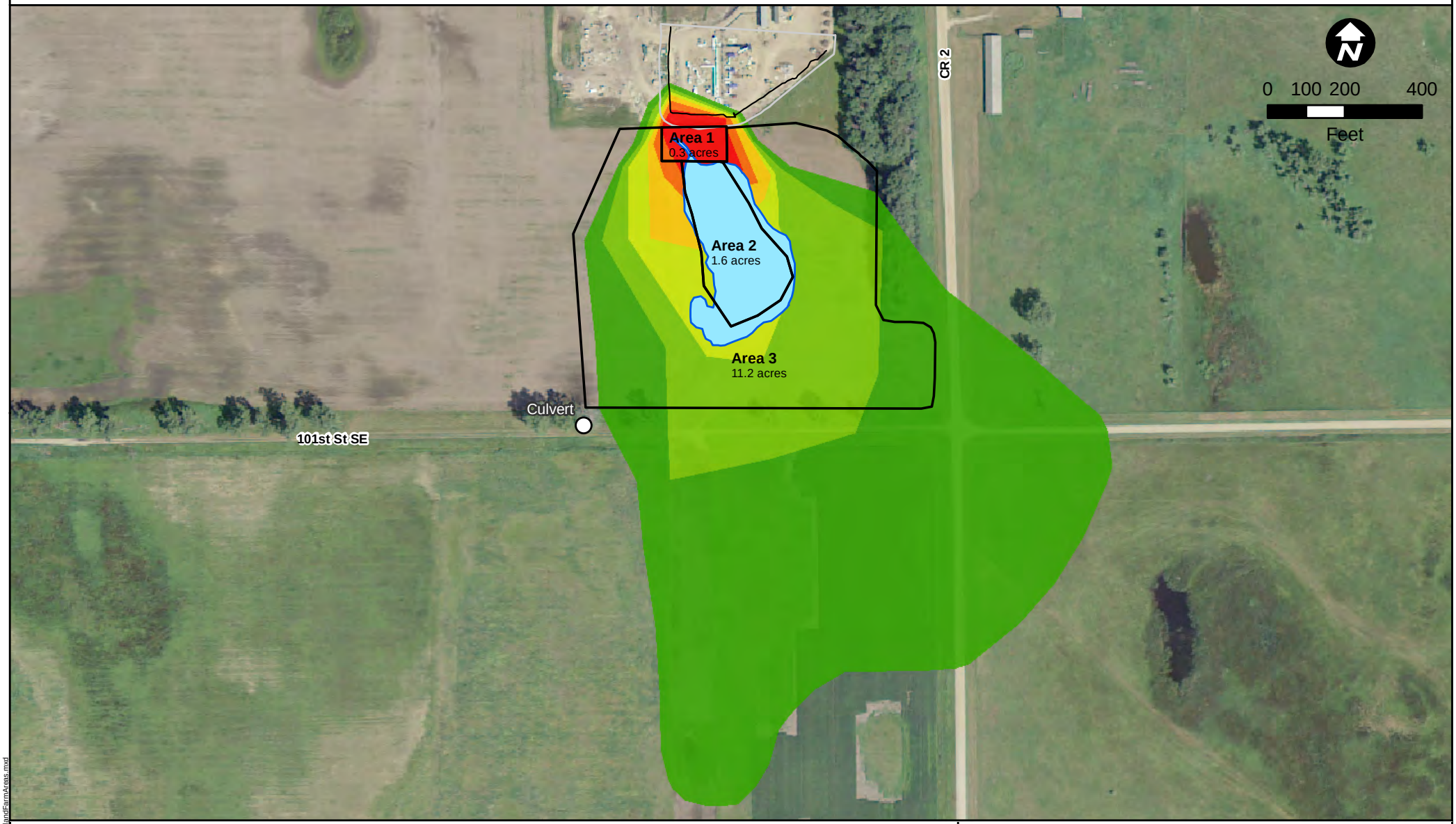
Projection:
NAD83 UTM Zone 14N



TransCanada Ludden Pump Station

Figure 7. Land Farm Areas

URS
Fifth Street Towers
100 South Fifth Street, Suite 1500
Minneapolis, MN 55402
612.370.0700 Tel
612.370.1378 Fax

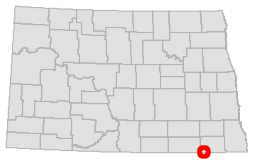


Fence
Toe of Slope
Pond

Misted Areas
Continuous = 91-100% coverage
Broken = 51-90% coverage
Patchy = 11-50% coverage
Sporadic-High = 6-10% coverage
Sporadic-Low = 1-5% coverage
Trace = <1% coverage

Data:
SCAT areas collected by GPS in May 2011.

Projection:
NAD83 UTM Zone 14N



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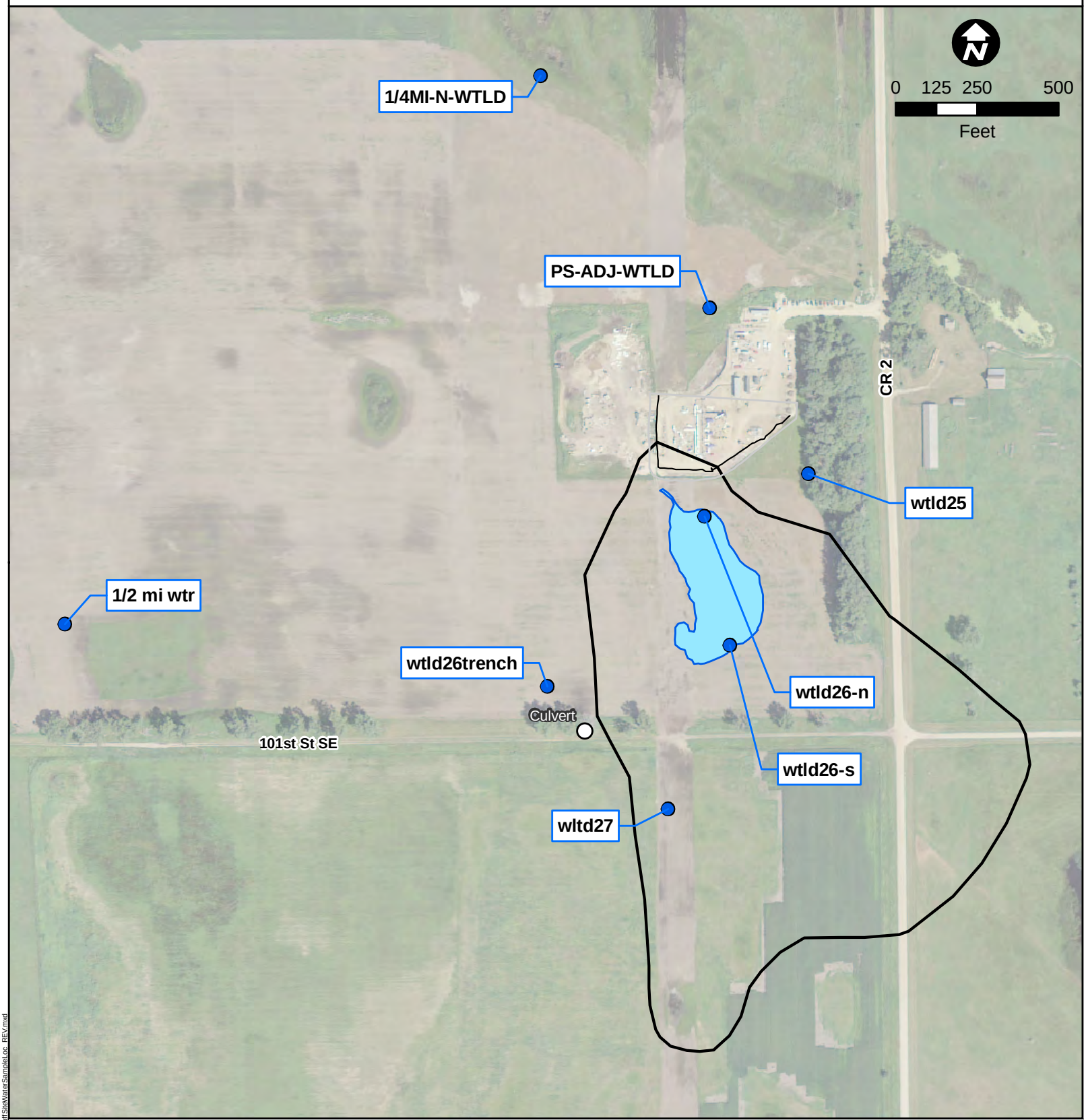
TransCanada Ludden Pump Station

Figure 6. Off-Site Water Sampling Locations

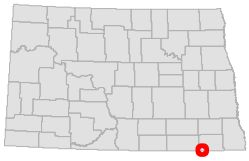
URS
Fifth Street Towers
100 South Fifth Street, Suite 1500
Minneapolis, MN 55402
612.370.0700 Tel
612.370.1378 Fax



Fence
Misted Spray Area
Toe of Slope
Pond
Off-Site Water Sample

Data:
SCAT areas collected by GPS in May 2011.

Projection:
NAD83 UTM Zone 14N

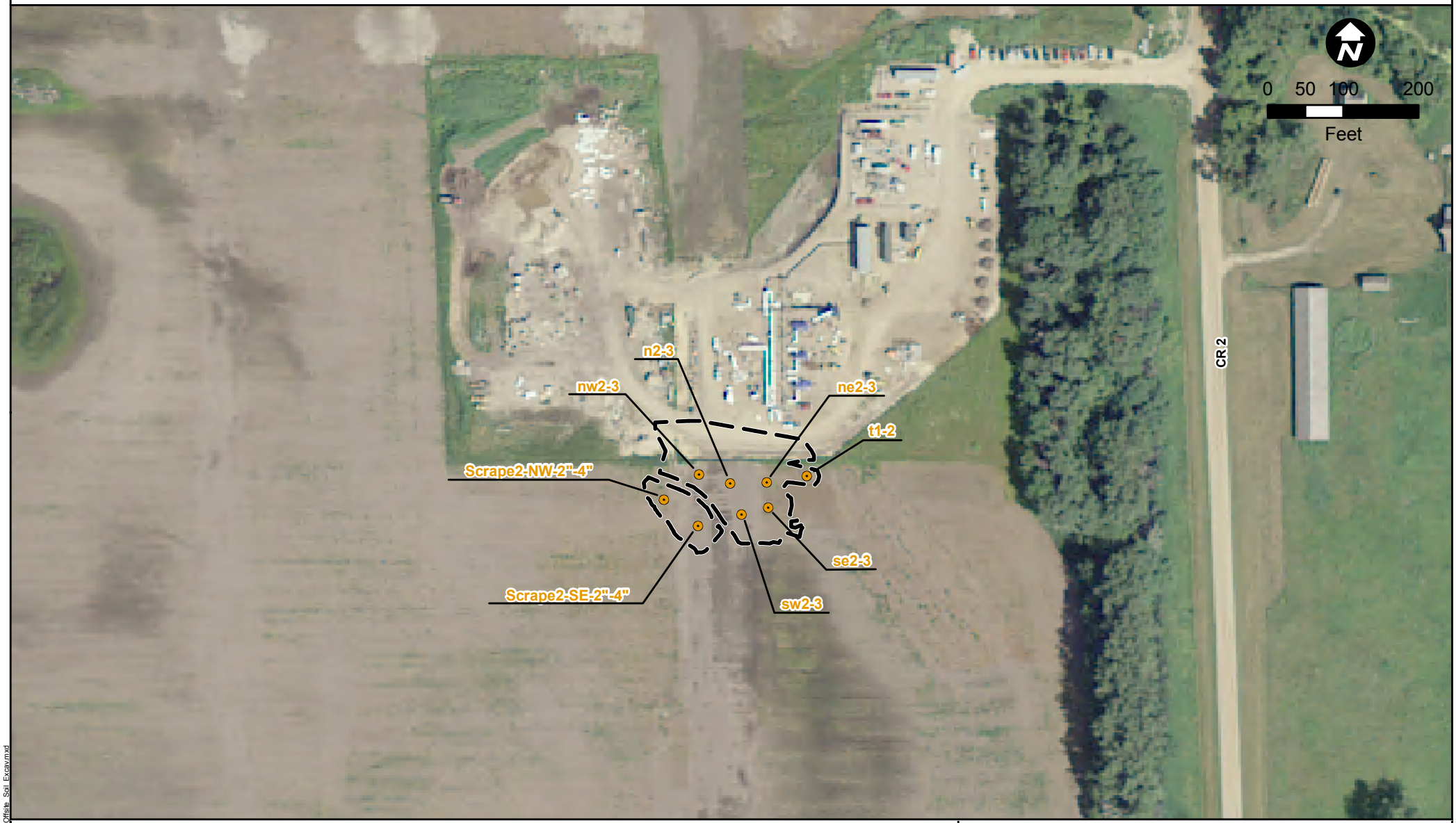


Q:\31\81095806_GIS\Data\08312011\Fig6_offSiteWaterSampleLoc_REV.mxd

TransCanada Ludden Pump Station

Figure 5. Off-Site Soil Excavation

URS
Fifth Street Towers
100 South Fifth Street, Suite 1500
Minneapolis, MN 55402
612.370.0700 Tel
612.370.1378 Fax

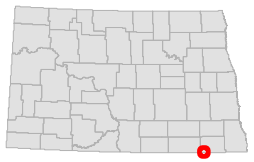


Off-Site Excavation Areas

Soil Sample Locations

Data:
SCAT areas collected by GPS in May 2011.

Projection:
NAD83 UTM Zone 14N

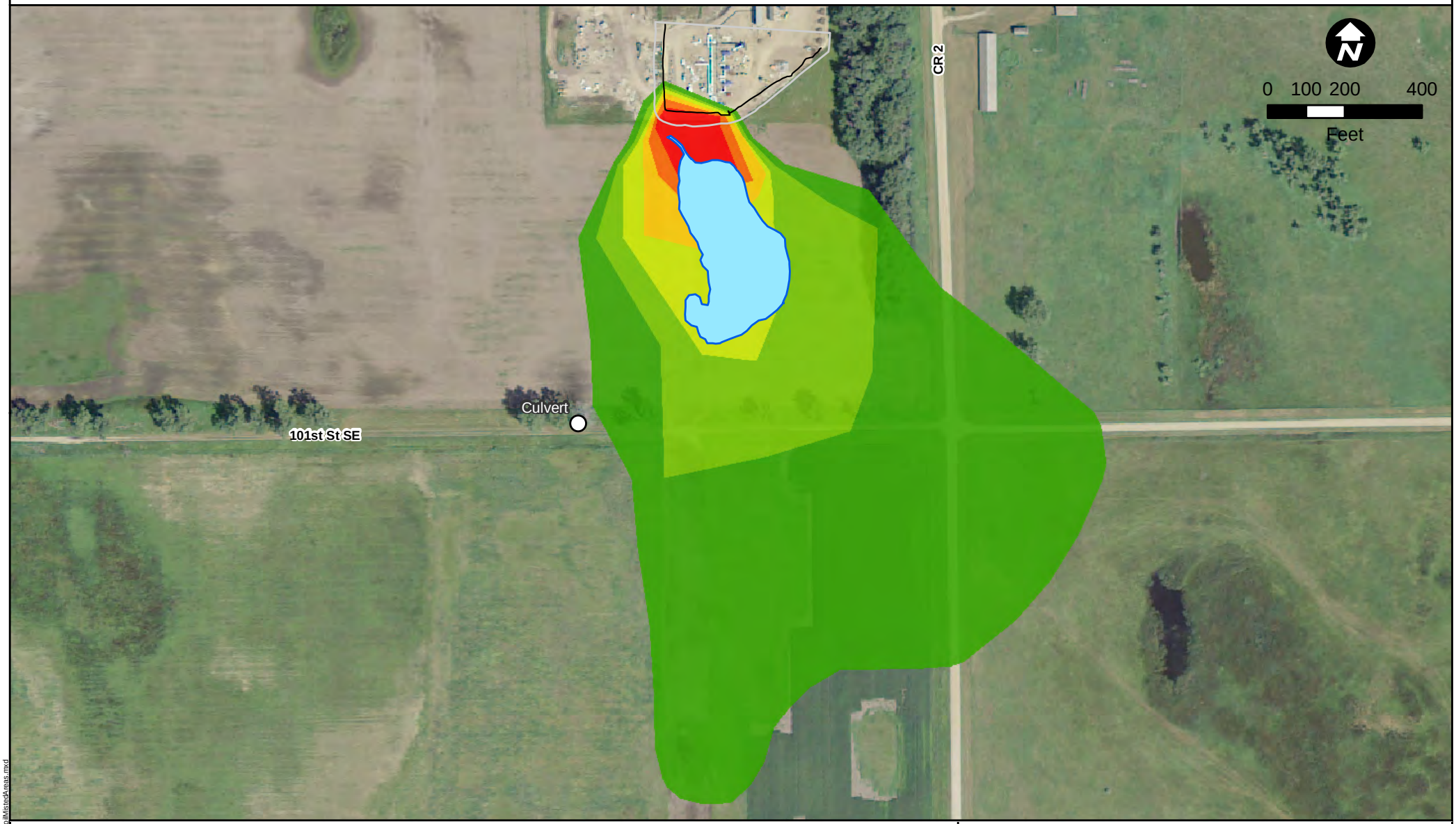


Q:\318109\88\06_GIS\Data\08312011\Fig5_Offsite_Soil_Excav.mxd

TransCanada Ludden Pump Station

Figure 4. Oil Misted Areas

URS
Fifth Street Towers
100 South Fifth Street, Suite 1500
Minneapolis, MN 55402
612.370.0700 Tel
612.370.1378 Fax

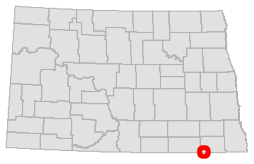


Fence
Toe of Slope
Pond

Misted Areas
Continuous = 91-100% coverage
Broken = 51-90% coverage
Patchy = 11-50% coverage
Sporadic-High = 6-10% coverage
Sporadic-Low = 1-5% coverage
Trace = <1% coverage

Data:
SCAT areas collected by GPS in May 2011.

Projection:
NAD83 UTM Zone 14N

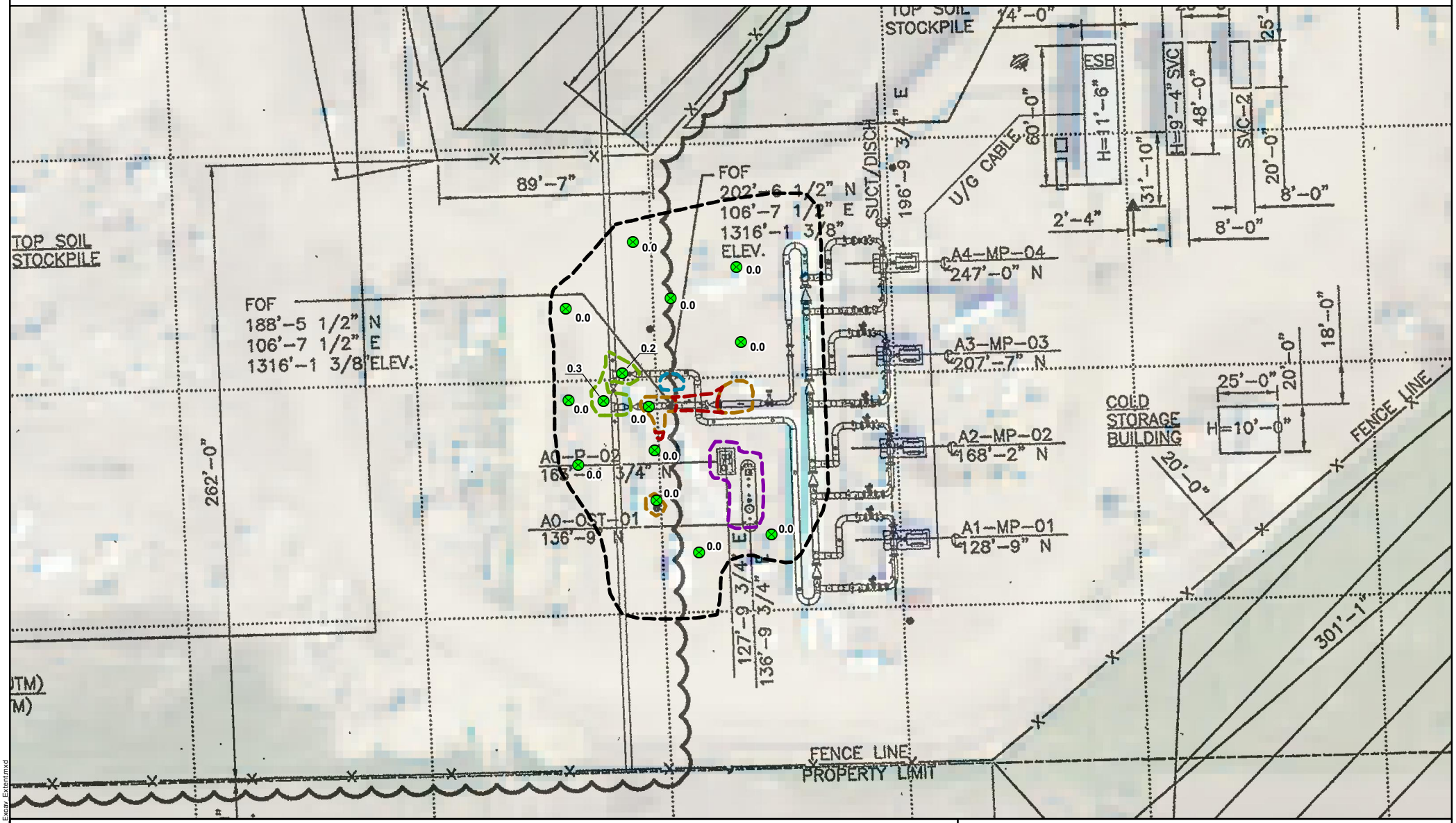


Q:\318109598\06_GIS\Data\08312011\Fig4_oilMistedAreas.mxd

TransCanada Ludden Pump Station

Figure 3. On-Site Excavation Extent

URS
Fifth Street Towers
100 South Fifth Street, Suite 1500
Minneapolis, MN 55402
612.370.0700 Tel
612.370.1378 Fax



Excavation Depth

- -1'
- -2'
- -3'
- -4'
- -5'
- -6' to -8'

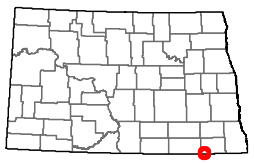
PID Reading in PPM

N

0 15 30 60

Feet

Projection:
NAD83 UTM Zone 14N



Q:\31810956\06_GIS\Projects\Fig3_Onsite_Excav_Extent.mxd

TransCanada Ludden Pump Station

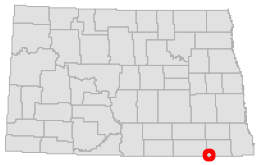
Figure 2. Site Plan with Pump Station

URS
Fifth Street Towers
100 South Fifth Street, Suite 1500
Minneapolis, MN 55402
612.370.0700 Tel
612.370.1378 Fax

0 75 150 300
Feet

Data:
SCAT areas collected by GPS in May 2011.

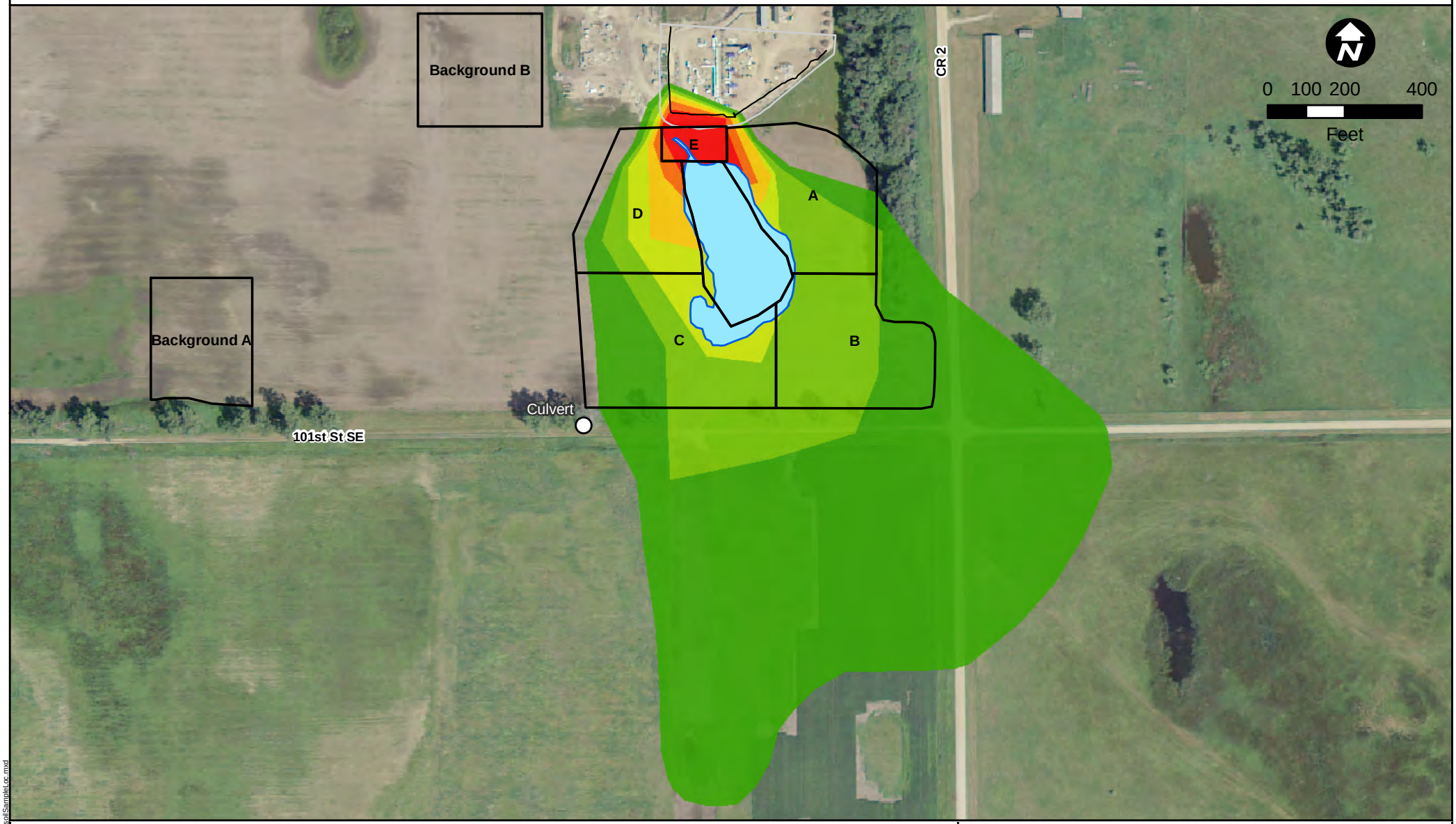
Projection:
NAD83 UTM Zone 14N



TransCanada Ludden Pump Station

Figure 8. Land Farm Sample Locations

URS
Fifth Street Towers
100 South Fifth Street, Suite 1500
Minneapolis, MN 55402
612.370.0700 Tel
612.370.1378 Fax

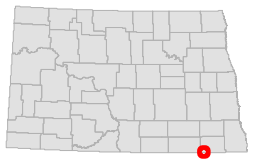


Fence
Toe of Slope
Pond

Misted Areas
Continuous = 91-100% coverage
Broken = 51-90% coverage
Patchy = 11-50% coverage
Sporadic-High = 6-10% coverage
Sporadic-Low = 1-5% coverage
Trace = <1% coverage

Data:
SCAT areas collected by GPS in May 2011.

Projection:
NAD83 UTM Zone 14N



Q:\318109598\06_GIS\Data\08312011\Fig8_soilSampleLoc.mxd

Fifth Street Towers
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RELEASE PROGRESS REPORT
Ludden Pump Station
Brampton, ND

Prepared For: TransCanada
Keystone Pipeline, LP

Date: September 20, 2011

URS Project No. 31810958

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 Overview

TransCanada Keystone Pipeline, LP (TransCanada) has prepared this *Release Progress Report* (Report) in response to a May 7, 2011 crude oil spill at its Ludden Pump Station near Brampton, North Dakota. The objective of this Report is to communicate TransCanada's interim actions to mitigate residual on-site crude oil impacts and off-site crude oil impacts to agricultural property located directly south of the Ludden Pump Station.

1.2 Site History

On Saturday, May 7, 2011, at 6:05 am local time, TransCanada oil control centre detected a drop in pressure at Ludden pump station in Sargent County, approximately six miles southwest of Brampton, North Dakota. Shortly after an initial investigation began, TransCanada received a call from a nearby resident indicating there was an incident at the pump station. Within minutes, TransCanada isolated the pump station by remotely closing the valves both up and down stream from the site. The first technician on site reported back that there was a release of oil from the pump station and the majority of it was contained on TransCanada's property. Some mist travelled outside of the TransCanada site and settled on neighboring agricultural land.

1.3 Site Description

The Ludden Pump Station site is located on 119th Avenue SE, Cogswell, North Dakota **(Figure 1).** The location is T129N, R58W, Section 26, SE Quarter.

The pump station is an approximate 8 acre facility utilized to pump crude oil through the Keystone Pipeline in a southerly direction. The pump station was constructed in 2009 and is equipped with secondary containment structures and remote control and shutdown capabilities. The location of the release was from a pressure relief valve fitting on the western side of the facility. The site plan is shown in **Figure 2**.

1.4 General Area Environment

The site is located in a very low population density area of southeastern North Dakota. The nearest residence to the site is over 1.3 miles to the north-northwest. Primary land use in the area is agricultural production to include hay, corn, soybean, and grazing. Primary land types include agriculture and wetlands. The nearest major surface water body is Lake Taayer approximately 12 miles from the site (**Figure 1**).

2.0 ON-SITE RESPONSE ACTIONS

2.1 Oil Recovery

The bulk of the released oil was contained by earthen dikes located on the southern, western, and northern perimeters of the pump station property. Between May 7 and 16, 2011, vac trucks and a hydrovac were used to recover 345 barrels of crude oil and 24 barrels of oil/water mixture. All oil and water were recycled with LePier Oil Company in Fosston, Minnesota. Manifests are included in **Appendix A**.

Between May 9 and 16, 2011, Seneca Companies cleaned pump station piping with Citrol (citrus cleaner and degreaser) and absorbents. Spent absorbents were contained in garbage bags and placed in a lined roll off dumpster. Approximately 100 linear feet of chain link fencing, barb wire fence, and fence posts that were partially covered with misted crude oil were removed and placed in a lined roll off dumpster.

2.2 Soil Excavation

Between May 11 and 16, 2011, a backhoe and hydrovacs were utilized to excavate approximately 1,250 tons of site gravel/soil from the pump station property within the area shown in **Figure 3**. Excavation limits were typically less than one foot deep, except in areas with underground piping. In those areas, excavation depths ranged from three to eight feet below grade. In addition to visual inspection, soil was screened with a photoionization detector (PID) with a 10.6 eV lamp to segregate impacted soil and determine limits of excavation. The limited to no availability of sample media, because pump station surface cover material is gravel, prohibited the collection of confirmation soil samples from the pump station property. Crude oil impacts, both visual and those detected with the PID, were excavated, with the exception of a residual amount of minor oil stained gravel that could not be removed from the sidewalls beneath a concrete pad to avoid undermining the pad.

Excavated soil was stored within a bermed area lined and covered with visqueen at the southwest corner of the pump station property.

Spent absorbents from pipe cleaning, oil-coated fencing, absorbent booms used in wetlands (discussed below), excavated off-site soil (discussed below), and excavated on-site soil were combined, for a total of 1,441 tons. The combined waste was transferred to the Veolia Environmental Services – Rolling Hills Landfill, Inc. in Buffalo, Minnesota on July 25-29, 2011. Manifests and scale tickets are included in **Appendix B**.

Pump station restoration was completed in August 2011.

3.0 OFF-SITE RESPONSE ACTIONS

The off-site area has been designated as the farmed agricultural property to the south of the pump station which was impacted by residual oil mist from the release (**Figure 4**).

3.1 Absorbents and Sheen Recovery

During the initial response on May 7, 2011, absorbent boom was used to contain the sheen on the ponded water in the wetland to the south of the pump station from a drainage trench dug by the property owner. Additional boom was placed further downstream in the trench as secondary and tertiary containment measures. The drainage trench was blocked with permission of the property owner to further contain sheen in the event of heavy rain. After the drainage trench was blocked and with a prevailing wind from the south, absorbent boom was pulled across the ponded water from south to north to contain sheen to the north end of the pond, adjacent to the pump station. Additional boom was used to replace the boom at the south end of the wetland. The absorbent boom was inspected and replaced as needed on May 23, June 1, June 16, June 30, July 14, and July 28.

On June 1, 2011, to reduce scattered petroleum sheen, DeAngelo Brothers, Inc. applied a 10 percent solution of Micro-Blaze® Emergency Liquid Spill Control (Micro-Blaze) at a rate of one gallon of concentrate per 10 cubic yards to the water surface of the wetland south of the pump station. Follow-up applications of Micro-Blaze were used to periodically spot treat scattered sheen observed during absorbent boom inspections. After the initial application of Micro-Blaze, a silvery sheen was occasionally observed in an area at the north end of the wetland varying from 100 to 500 square feet. Micro-Blaze was applied to spot treat the sheen on June 16 (one gallon of concentrate with three gallons of water, June 30 (two gallons of concentrate in two gallons of water), and July 14 (2.5 gallons of concentrate in 1.5 gallons of water).

3.2 Soil Excavation

During the initial response, on May 13 and 15, 2011, a backhoe was used to remove a two inch layer of soil in the field to the south of the pump station that was covered with crude oil (**Figure 5**). The excavation resulted in the removal of approximately 175 tons of oily soil. A narrow trench was also dug in the bottom of the excavation in an area where there was rainbow sheen observed and shallow pooling of oil in a relic tracker track.

A total of nine confirmation samples were collected and analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX) and Total Extractable Materials (TEM). Two of the confirmation samples were also analyzed for Total Extractable Hydrocarbons (TEH). All analytical results are summarized in **Table 1** and complete analytical reports are provided in **Appendix C**. All analytical results were below regulatory action levels.

3.3 SCAT Assessment

On May 11, 2011, a modified application of the National Oceanic and Atmospheric Administration (NOAA) Shoreline Clean-Up Assessment Technique (SCAT) outlined in the *Shoreline Assessment Manual, Third Edition* (NOAA, 2000) was used to delineate the degrees of oil coverage in the off-site agricultural land that was sprayed with oil.

SCAT Category	Percent Oil Coverage
Continuous	91-100
Broken	51-90
Patchy	11-50
Sporadic-High	6-10
Sporadic-Low	1-5
Trace	<1

The term "Sporadic" as used by NOAA covers a percentage range from 1 to 10 percent. For the purposes of this project, "Sporadic" was split into "Sporadic-Low" (1-5%) and "Sporadic-High (6-10%). The results of the SCAT Assessment are presented in **Figure 4**.

3.4 Wetland Surface Water Sampling

Surface water samples were collected from three downwind wetlands and two potential downstream drainage locations on May 13, 2011 for BTEX and TEM. The same locations were resampled on May 16, 2011 for ammonia nitrogen and a suite of metals requested by North Dakota Department of Health (NDDH), which included aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, nickel, selenium, silver, thallium, and zinc (Metals Suite). Two upwind wetlands were also sampled for background purposes on May 16, 2011 for BTEX, TEM, ammonia nitrogen, and the Metals Suite. All sample locations are presented in **Figure 6**. The wetland immediately south of the pump station that received oil misting was also sampled for total suspended solids, pH, and total phosphorus. All surface water sample locations were resampled on June 30, 2011 and August 2, 2011 for BTEX, TEH, TEM, and the Metals Suite. The analytical results are summarized in **Table 2A, 2B, 2C,** respectively and complete analytical reports are provided in **Appendix C**.

All detections were below applicable Human Health Limits for Class III Waters or Aquatic Life Values (Acute).

3.5 Off-Site In-Situ Land Farm

In accordance with the May 19, 2011 *Draft Interim Off-Site Area Clean-up Plan* (URS, 2011), the portions of the agricultural field to the south of the pump station property that were lightly impacted by crude oil mist on the soil surface were treated as an in-situ land farm. Following NDDH guidance documents, the volume of impacted soil was calculated, nutrient needs were calculated, initial soil samples were collected and analyzed, soil amendments were applied, tilling occurred (with minor adjustments), and follow-up monitoring was conducted.

For treatment calculations, the off-site area is divided into three areas as shown in **Figure 7**. Areas 1 and 3 are the non-flooded areas that have oil impacts and decreasing amounts of oil toward the south of Area 3. Area 2 is impacted and ponded water exists in this lower wetland area of the south field. Area 2 is included for in-situ treatment of the water. Based on the areas outlined in **Figure 7** the following are the associated contaminated volumes assuming a 2 inch depth for Area #1 and 1 inch depth for Areas #2 and #3:

- Area #1 - 93 cubic yards (CY)
- Area #2 - 217 CY
- Area #3 - 1,509 CY

Based on total volume, the land farm area was divided into four parts (**Figure 8**) and sampled on May 15, 2011 for TEH, TEM, pH, nitrate nitrogen, total phosphorus, and total organic carbon. For the May 15, 2011 land farm soil samples, the excavated area that is labeled as Area E in Figure 8 was divided equally between Areas A and D. Two background area samples were also collected. Each area included four to six discrete samples that were composited to represent each area. Analytical results are summarized in **Table 3** and complete analytical results are included in **Appendix C**.

Based on nitrate nitrogen and TEM results, Area A required the application of nine pounds per acre of nitrogen and Area D required the application of eight pounds per acre. Areas B and C contained sufficient nitrate nitrogen in the soil for treatment of the levels of TEM present.

On May 31-June 1, 2011, DeAngelo Bros. Inc. applied a 10 percent solution of Micro-Blaze to the land farm area at a rate of one gallon of concentrate per 10 cubic yards of impacted soil. Prior to this application, the dry portions of Areas C and D were tilled and planted in corn and fertilized with anhydrous ammonia at planting time. On June 1, Kris Roberts with NDDH toured the site and recommended that the vegetated areas around the wetland, that were too wet to till, did not need to be tilled after the Micro-Blaze was applied.

During a June 16, 2011 site visit with the property owner, it was determined that the accessible portions of Areas A and B had been planted in narrow row soybeans with no-till methods. After speaking with the land owner, it was determined that his contracts with Natural Resource Conservation Service (NRCS) require minimum till in the soil types present in Areas A and B due to soil types present are listed as NRCS Wind Erodibility Group 1 and 2. As such, tilling is not recommended. The soybeans would also be a nitrogen fixing crop, so additional fertilizer was not applied to this area.

On July 1, 2011, the area labeled as Area E on **Figure 8** was fertilized with 20-0-0 lawn fertilizer at a rate of 1.2 pounds per 1,000 square feet and tilled using a rear tine garden tiller.

On August 2, 2011, the land farm and background locations were resampled for TEH, TEM, pH, nitrate nitrogen, total phosphorus, and total organic carbon. Soil samples were collected from a depth of four to six inches in the treatment area using NDDH "Procedures for the collection of soil samples at underground storage tank (UST) sites". The results are summarized in **Table 3** and complete analytical report is provided in **Appendix C**. The TEH and TEM results are below the regulatory limit of 100 mg/kg.

4.0 SUMMARY AND RECOMMENDATIONS

On May 7, 2011, a crude oil release occurred on the TransCanada Keystone Pipeline at the Ludden Pump Station near Brampton, North Dakota. The majority of the release was contained on the Ludden Pump Station property. Some mist travelled outside of the TransCanada site and settled on neighboring agricultural land. Liquid recovery consisted of 345 barrels of crude oil and 24 barrels of oil/water mixture. Soil excavation resulted in the removal and disposal of 1,441 tons of crude oil impacted site gravel/soil, absorbent boom, and fencing. Prior to in-situ treatment, TEM results of soil samples collected from the agricultural field to the south of the Ludden Pump Station property exceeded the 100 part per million (ppm) clean-up goal. The agricultural field and wetland to the south of the Ludden Pump Station property were treated with Micro-Blaze ® Emergency Liquid Spill Control on May 31 and June 1, 2011. Spot treatments to control a small area of silvery sheen occurred in June and July. The agricultural field was treated as an in-situ land farm and resampled on August 2, 2011. All soil sample results for TEM were below the 100 ppm clean-up goal.

Surface water samples were collected on May 13-16, June 30, and August 2, 2011 from wetlands that were upwind (background) and downwind at the time of the release. All detections are below applicable regulatory limits. Absorbent booms have been maintained on the wetland to the south of the Ludden Pump Station property since the release as a protective measure.

Based on current conditions at the TransCanada Ludden Pump Station site, the following activities are planned in October:

- Remove all remaining absorbent booms.
- Re-sample wetland surface water.
- Re-sample land farm.
- Neighboring property owner will till under cover crops.

Analytical results from the above activities will be forwarded to the NDDH, along with a request for closure.

5.0 REFERENCES

NOAA. 2000. *Shoreline Assessment Manual, Third Edition*. National Oceanic and Atmospheric Administration. 2000.

URS. 2011. *Draft Interim Off-Site Area Clean-up Plan.* URS Corporation. May 19, 2011.

APPENDIX A

Oil and Water Recycling Manifests

APPENDIX B

Soil Disposal Manifests and Scale Tickets

APPENDIX C

Analytical Reports