

STATE OF NORTH DAKOTA

PUBLIC SERVICE COMMISSION

TransCanada Keystone Pipeline, LP
30-Inch Crude Oil Pipeline/Cavalier to
Sargent Ctys

Case No. PU-06-421

TESTIMONY OF STEPHEN E. CRAYCROFT

IN SUPPORT OF A REQUEST FOR APPROVAL OF STREAM CROSSING METHODS

STEPHENE CRAYCROFT, BEING FIRST DULY SWORN, ON OATH, DEPOSES AND STATES, AS FOLLOWS:

- I have attached a copy of my resume with my educational background and qualifications.
- Paragraph 12 of the North Dakota Public Service Commission (PSC) Order dated February 21, 2008 requires:

“Keystone shall study the feasibility of HDD at the crossings of the Tongue River; a tributary to the Tongue River running through section 18, Township 161 North, Range 56 West, Pembina County; the North Branch Park River; Middle Branch Park River; South Branch Park River; North Branch Forest River; Middle Branch Forest River; and Goose River, which are classified as valuable fisheries.”
- In accordance with paragraph 12 of the Order, I am filing this testimony as part of Keystone's request for approval of crossing methods for the above listed streams.
- I have over 16 years experience in planning, environmental permitting, auditing, inspection and on-site management of environmental compliance inspection programs for a variety of large-scale utility construction projects, including pipeline projects ranging from 20 to 42-inches in diameter and from 75 to 800 miles in length. I have extensive experience designing sensitive stream crossing methods and overseeing the construction of stream crossings across the United States. I have served as an Instructor at the Federal Energy Regulatory Commission's training classes, Bureau of Land Management Pipeline Systems courses, as well as at numerous industry training seminars where I have taught effective stream crossing techniques to industry and agency representatives. I am very familiar with construction techniques, workspace needs, the effectiveness of environmental mitigation and protective measures, and minimizing impacts of pipeline construction on environmental resources. I hold an M.S. in Wildlife Ecology and Forest Management from the State University of New York College of Environmental Science and Forestry - Syracuse, and a B.S. in Biology from Centre College of Kentucky.
- Keystone has evaluated the feasibility of HDD of the tributary to the Tongue River running through section 18, Township 161 North, Range 56 West, Pembina County; the North Branch Park River; Middle Branch Park River; North Branch Forest River; Middle Branch Forest River; and Goose River and determined HDD of these streams to not be feasible. (reference Mr. Loys Gray's affidavits and exhibits).
- Keystone met with North Dakota Game & Fish staff on March 4, 2008 and discussed the relative sensitivity of the stream crossings in the area of the Keystone crossings, Keystone's proposed methods of crossing the six crossings listed above, and the mitigation measures Keystone proposes to implement to protect aquatic resources of these streams. Exhibit A includes a copy of the minutes from this meeting.

- The following summarizes the crossing methods that Keystone proposes to implement at these crossings. The Dry Crossing Method designation below refers to either Dam and Pump Crossings or Flumed Crossing Methods. All of these streams will be constructed after June 1 (avoid construction April 15 to June 1); however, bridges may be installed for access prior to this date as long as equipment does not enter the stream to install the bridges:

- **Tributary to Tongue River (MP 16.1):** Open Cut Wet Crossing (Reference Exhibit B, Dwg. No. 1801-03-ML-03-006)

Due to the low flow/dry conditions and lower fishery value of this reach of the Tributary to the Tongue River, the crossing would be constructed with the Open Cut Wet crossing method. The crossing would be constructed, backfilled, the contours restored and the stream banks stabilized as quickly as possible.

- **North Branch Park River (MP 29.4):** Dry Crossing Method (Reference Exhibit B, Dwg. No. 1801-03-ML-03-113)

The Dam and Pump or Flumed crossing method would be implemented to isolate the construction area from live stream flow. The stream crossing would be constructed, backfilled, the contours restored and the stream banks stabilized as expeditiously as possible. Additional details specific to this method are included in the Project's Construction Mitigation and Reclamation Plan (Dam & Pump and Flume crossing methods)

- **Middle Branch Park River (MP 33.3):** Dry Crossing Method (Reference Exhibit B, Dwg. No. 1801-03-ML-03-116)

The Dam and Pump or Flumed crossing method would be implemented to isolate the construction area from live stream flow. The stream crossing would be constructed, backfilled, the contours restored and the stream banks stabilized as expeditiously as possible. Additional details specific to this method are included in the Project's Construction Mitigation and Reclamation Plan (Dam & Pump and Flume crossing methods)

- **North Branch Forest River (MP 46.4):** Dry Crossing Method (Reference Exhibit B, Dwg. No. 1802-03-ML-03-009)

The Dam and Pump or Flumed crossing method would be implemented to isolate the construction area from live stream flow. The stream crossing would be constructed, backfilled, the contours restored and the stream banks stabilized as expeditiously as possible. Additional details specific to this method are included in the Project's Construction Mitigation and Reclamation Plan (Dam & Pump and Flume crossing methods)

- **Middle Branch Forest River (MP 54.7):** Dry Crossing Method (Reference Exhibit B, Dwg. No. 1802-03-ML-03-004)

Sheet piling may be required for this crossing, which would lengthen the duration of construction activities; however, to the greatest extent practicable, the stream crossing would be constructed, backfilled, the contours restored and the stream banks stabilized as expeditiously as possible. The Dam and Pump or Flumed crossing method would be implemented to isolate the construction area from live stream flow. Additional details specific to this method are included in the Project's Construction Mitigation and Reclamation Plan (Dam & Pump and Flume crossing methods)

- **Goose River (MP 76.9):** Open Cut Wet Crossing (Reference Exhibit B, Dwg. No. 1803-03-ML-03-002)

Due to the low flow/dry conditions and lower fishery value of this reach of the Goose River, the crossing would be constructed with the Open Cut Wet crossing method. The crossing would be constructed, backfilled, the contours restored and the stream banks stabilized as quickly as possible. A sediment curtain will be installed during this crossing to reduce downstream sedimentation in the event that flow exists at this location during construction of the crossing.

- North Dakota Game & Fish issued correspondence of its concurrence with the above described crossing methods and this concurrence is included as Exhibit C.
- In accordance with paragraph 12 of the Order, Keystone is submitting site specific drawings and construction crossing details included in Exhibit B and advising the Commission of its intent to utilize mitigation measures for the above streams with concurrence of the North Dakota Game & Fish.
- It is my professional opinion that the mitigative measures shown on the site specific drawings will protect any valuable fisheries associated with these streams.

Dated this 1st day of April, 2008

Stephen E Craycroft
STEPHEN E CRAYCROFT

STATE OF Missouri)
) ss.
COUNTY OF Platte)

On the 1 day of April, 2008, before me personally appeared STEPHEN E CRAYCROFT, known to me to be the same person described in and who executed the within and foregoing instrument and acknowledged to me that he executed the same



Myrna E. Coleman
Notary Public, State of Missouri
My Commission expires 9-13-2011

STEPHEN E. CRAYCROFT

SUMMARY

Steve Craycroft has over 16 years experience in planning, environmental permitting, auditing and on-site management of environmental inspection compliance programs for large-scale utility construction projects. He has substantial experience on projects involving complex resource issues and multiple agency jurisdictions, with specific technical expertise in stream and river construction techniques, water quality issues, sensitive resource mitigation, and revegetation. Steve has unique expertise in reviewing construction plans, project routes, and mitigation measures for feasibility from both construction and environmental perspectives. Steve has a strong technical background in erosion and sedimentation control planning and implementation and earned credentials as a Certified Professional in Erosion and Sediment Control (CPESC). Steve has expertise in facilitating environmental training programs and has served as a key presenter at several industry training seminars. Steve holds an M.S. in Wildlife Ecology and Management from the State University of New York, Syracuse, and a B.S. in Biology from Centre College of Kentucky.

EXPERIENCE

2007 - **Keystone Pipeline Project**
Present ***Environmental Liaison***

Coordinating with environmental permitting and resource specialists, project engineers, lands staff and state and federal regulatory agencies during pre-construction planning and permitting efforts. Developing environmental inspection and training programs to ensure effective compliance with environmental and regulatory requirements during construction of the Keystone Project.

2002-2003 **Kern River Gas Transmission, 2003 Expansion**
Project Manager/Environmental Compliance Manager

Responsible for preconstruction environmental planning and supervision of the environmental inspection field staff for construction of a 730-mile natural gas pipeline from Wyoming to California. Developed the project's Environmental Compliance Management Plan in close coordination with the Bureau of Land Management (BLM) and the Federal Energy Regulatory Commission (FERC). Oversaw development of environmental contract specifications and mitigation plans, reviewed draft permit conditions for construction feasibility, oversaw development of training programs and electronic reporting systems, and developed protocols for environmental inspection and reporting. As Environmental Compliance Manager during construction, responsible for managing a staff of 39 environmental professionals on 10 construction spreads. Responsibilities included staffing, inspection assignment, reporting and documentation, ongoing quality assurance, and budget and staff management. Participated extensively in regulatory coordination during construction.

2002-2004 **Federal Energy Regulatory Commission, Environmental Training Seminars**
Instructor

Developed portions of the FERC Post-Certificate Environmental Compliance Seminar to reflect recent regulatory changes and industry advances in compliance management techniques. Managed the evaluation and public input into potential revisions of the FERC Upland Erosion Control, Revegetation, and Maintenance Plan and the FERC Wetland and Waterbody Construction and Mitigation Procedures. Presented at numerous FERC training seminars for natural gas industry professionals throughout the United States.

2001-2002 **PG&E Gas Transmission Northwest, 2002 Expansion Project**
Project Director

Managed environmental compliance program, variance process, and finalization of project plans for 21 miles of a 42-inch-diameter pipeline loop segment and five compressor stations in the Pacific Northwest. Managed a field constructability review effort for 53.6 miles of natural gas pipeline looping as part of a Federal Energy Regulatory Commission filing. Developed an extensive evaluation of sensitive stream and river crossing techniques and options for the projects most sensitive coldwater fisheries.

- 2001–2002 **Questar Pipeline Company, Main Line 104 Project**
Project Director
Managed preconstruction tasks and environmental inspection for a 75-mile pipeline in Utah. Oversaw project team, identified and assigned project planning and inspection staff, prepared staff for field inspection effort, and facilitated environmental training programs for supervisory staff. Supervised development of a single inspection program and environmental compliance management program to represent the interests of the Federal Energy Regulatory Commission, Bureau of Land Management, two national forests, and Questar.
- 2001–2002 **El Paso Natural Gas, Line 2000**
Project Director
Managed preconstruction tasks and inspection program development and implementation for the conversion of the 786-mile project from oil to gas service. Oversaw project team, identified and assigned project inspection staff, reviewed project compliance management programs, and prepared Bureau of Land Management Plan of Development and the Federal Energy Regulatory Commission Implementation Plan.
- 2001 **Questar Corporation, Southern Trails Pipeline**
Project Director
Provided oversight for the development and implementation of the field environmental compliance management program for conversion of a 700-mile oil line to gas service. Oversaw the development of documentation and reporting protocols, development of a mitigation database and electronic reporting system, and review of the project's variance process. Selected, assigned, and oversaw project environmental compliance management and inspection staff. Established an environmental review to identify variances needed prior to construction start.
- 2001 **Equilon Pipeline Company, Marsh Creek Replacement Project**
Project Director
Managed project permitting and California Environmental Quality Act (CEQA) document preparation for the replacement of a heated oil pipeline in Contra Costa County, California. Oversaw the project team developing permit application packages, coordinated with agencies, and recommended project mitigation measures. Worked closely with the lead CEQA agency to facilitate project review and compliance. Coordinated with the client and agencies on strategies for streamlining the permitting and regulatory review process.
- 2001 **Bay Area Stormwater Management Agency Association**
Project Director
Coordinated and managed a task force comprised of the U.S. Army Corps of Engineers, California Department of Fish and Game (CDFG), California Regional Water Quality Control Board, local flood control agencies, and other state and federal agencies for the purpose of developing a stream diversion and dewatering workshop. The program focused on identification, development, and implementation of innovative stormwater management, stream diversion and dewatering techniques for construction projects. Prepared a technical bulletin summarizing acceptable methods for stream diversions and construction dewatering, and developed an outreach program for contractors and agencies.
- 2000–2001 **Tosco Refining Company, Regional Streambed Alteration Maintenance Agreement**
Project Director
Managed the development of a regional California Department of Fish and Game Streambed Alteration Agreement for pipeline maintenance activities within and near drainages in a four-county area of central California. Coordinated with client and agency representatives and identified regional best management practices for work near CDFG jurisdictional drainages. Oversaw development of the permit application package and CEQA documentation.
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- 2000 **Williams Communications, Inc., Fiber Optic Installation Project**
Environmental Compliance Program Manager
Managed the field environmental compliance management program for two underground fiber optic installation projects in California. Oversaw development of documentation and reporting protocols, developed a mitigation database and electronic reporting system, and reviewed the variance process. Selected, assigned, and managed up to 20 environmental professionals. Oversaw development and implementation of project-wide training programs.
- 1999–2000 **Maritimes & Northeast Phase II Pipeline Project**
Project Manager/Environmental Field Supervisor
Oversaw preconstruction environmental planning and supervised the environmental inspection field staff for construction of approximately 200 miles of 24- and 30-inch-diameter mainline pipeline. Assisted with development of the environmental contract specifications and mitigation plans, reviewed draft permit conditions for construction feasibility, oversaw training programs and electronic reporting systems, and developed protocols for environmental inspection and reporting. As Environmental Field Supervisor during construction, managed 14 environmental professionals on four construction spreads. Directed staffing, inspection assignment, reporting and documentation, and ongoing quality assurance. Participated extensively in regulatory coordination and communications and provided direction and oversight during several stream crossings containing endangered Atlantic salmon and significant coldwater fisheries.
- 1998–1999 **City of San Luis Obispo Waterline Project**
Senior Associate
Provided coordination and assistance for construction of a 24-inch-diameter waterline in central California. Worked with project engineers to incorporate environmental mitigation into project designs. Consulted with and obtained permits from the Central Coast Regional Water Quality Control Board, California Department of Fish and Game, the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, and the National Marine Fisheries Service. Conducted field surveys and site assessments to identify stream crossing mitigation measures and restoration plans.
- 1998 **Tuscarora Gas Transmission Company, U.S. Gypsum-Empire Pipeline Project**
Project Manager
Developed an auditing plan, conducted field environmental compliance reviews, and prepared an environmental compliance auditing report for a section of a 63-mile gas pipeline from the California-Nevada border to Empire, Nevada. The audit focused on evaluating environmental compliance during construction and on evaluating potential long-term environmental liabilities associated with final reclamation.
- 1997–1999 **Questar Corporation, TransColorado Phase II**
Field Supervisor
Assisted with inspection, training, and quality assurance reviews during the initial construction phases to ensure a consistent and effective effort on four construction spreads. Supervised preconstruction constructability field review for approximately 270 miles of 24- and 22-inch-diameter pipeline. Coordinated with construction representatives to evaluate required extra workspace, access roads, and ancillary facilities. Worked with the construction and environmental management team to develop sections of the project's Plan of Development and FERC Implementation Plan, including the Erosion Control Plan, the Stream and Wetland Crossing Plan, and the Environmental Compliance Management Plan. Ensured compliance during construction of numerous sensitive stream, river and wetland crossings.
- 1997–1999 **San Luis Obispo County, On-call Environmental Services**
Project Manager
Assisted county staff with "fast-track" permitting for over 100 road/bridge repair projects in central California. Developed a permit-tracking database that streamlined the process. Developed implementation schedule and checklist to assist county staff in managing permitting and restoration
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projects. Provided expertise to engineering staff in erosion control, restoration, and streambank stabilization. Prepared on-site and off-site Habitat Enhancement Plans to compensate for road construction impacts at creek crossing location. Consulted with the U.S. Environmental Protection Agency, Central Coast Regional Water Quality Control Board, CDFG, and The Land Conservancy of San Luis Obispo. Conducted field surveys and site assessments to identify resource issues and protective measures. Developed mitigation designs, detailed restoration specifications, and final restoration plans. Assisted with coordinating regulatory approvals.

1996–1998

Sierra Pacific Power Company, Alturas 345 kV Electric Transmission Project
Senior Associate

Wrote and/or reviewed several mitigation plans for a 164-mile electric transmission line in California and Nevada. Provided assistance with constructability issues, mitigation plan development and review, and environmental training programs. Provided training and Quality Assurance reviews for a team of environmental inspectors.

1997

KN Energy, Environmental Management Audit
Project Manager/Senior Auditor

Managed the development and implementation of a comprehensive, objective, and independent assessment of KN Energy's environmental management systems. Supervised and coordinated a team of eight senior staff. Oversaw development of a 100-page Audit Manual for use in the field. Developed standards for assessing the success of environmental management and compliance techniques. Coordinated the review of existing documents and the analysis of information gathered in the field. Developed a final report that assessed current conditions and provided recommendations to ensure the continued implementation of effective environmental management programs.

1996

Express Pipeline, Express Project
Lead Environmental Inspector

Supervised environmental inspection activities for approximately 100 miles of 24-inch-diameter crude oil pipeline construction in Montana. Assisted with preconstruction planning, including agency submittals, project implementation plans, staffing plans, and contingency plans for directional drilling. Worked closely with construction contractors, resource specialists, and agency representatives to find agreeable site-specific strategies to protect resources during construction. Oversaw inspection activities for hazardous materials, erosion control, topsoil handling, wetland and water crossings, and biological and cultural resources. Coordinated with the Bureau of Land Management, U.S. Bureau of Reclamation, U.S. Army Corps of Engineers, and Montana Department of Environmental Quality.

1995–1996

Central Coast Water Authority, Coastal Branch Phase II—Reaches 5B and 6
On-Site Environmental Coordinator

Developed site-specific plans for erosion control, stream crossings, and sensitive habitat areas for the construction of 28 miles of water pipeline in Santa Barbara and San Luis Obispo counties, California. Coordinated preconstruction surveys for state and federally protected species, including California red-legged frog, southwestern pond turtle, willow flycatcher, and tiger salamander. Oversaw environmental and cultural monitors and all compliance inspection and reporting. Implemented a contractor compensation program designed to protect oak trees and minimize ground disturbance in sensitive habitats. Coordinated on-site environmental training and managed the erosion control maintenance program.

1995

Tuscarora Gas Transmission Company, Tuscarora Gas Transmission Project
Lead Environmental Inspector

Supervised environmental inspection activities for approximately 228 miles of 20-inch-diameter gas pipeline in northern California and Nevada. Inspected for environmental compliance and coordinated daily with construction and agency representatives. Documented daily compliance activities using electronic reporting software. Assisted in preconstruction planning, including development of the Federal Energy Regulatory Commission Implementation Plan and project mitigation plans.

- 1993–1995 **Northern Ecological Associates**
Associate/Inspector
Acted as project manager or team leader for preparation of FERC Environmental Assessments for pipeline projects in the eastern United States. Conducted wildlife, wetland, and other biological field surveys for the U.S. Fish and Wildlife Service and private clients. Assisted with the development of an environmental construction and restoration plan for the TransAndean Gas Pipeline Project through the Nuble Forest Reserve in Chile, South America. Provided both private and agency inspection services (Federal Energy Regulatory Commission and U.S. Army Corps of Engineers) for several utility construction projects.
- 1992–1993 **Bechtel Corporation – PGT-PG&E Pipeline Expansion Project**
Environmental Inspector/Acting Lead
Coordinated environmental training and inspections for the construction and restoration of 176 miles of the 830-miles PGT-PG&E Pipeline Expansion Project. Acted as Lead Environmental Inspector in 1993. Inspected all phases of construction of the 42-inch-diameter natural gas pipeline, including major river crossings. Served as liaison between regulatory agencies and construction personnel. Coordinated the 1992 training program and designed and conducted environmental briefings for 650 construction workers and supervisory staff. Coordinated an erosion control and storm damage remediation program for 110 miles of previously constructed right-of-way.

EDUCATION

- 1996 **State University of New York, College of Environmental Science and Forestry, Syracuse**
Master of Science, Wildlife Ecology and Forest Management
- 1988 **Centre College of Kentucky, Danville**
Bachelor of Science, Biology

PRESENTATIONS

- 2001–2004 Instructor, Federal Energy Regulatory Commission course
- 2001 - 2003 Instructor, Bureau of Land Management and International ROW Association—Pipeline Systems Course, Durango, Colorado
- 2000 *Managing the Variance Process—Evaluation of Strategies Utilized on Two Major Pipeline Projects.* Presented at the Seventh International Symposium on Environmental Concerns in Rights-of-Way Management, Calgary, Canada
- 2000–2004 Standing Instructor, Southern Gas Association's Environmental Inspection and Construction Compliance Workshop, Houston, Texas
- 1999 *Construction and Landowner Issues.* Panelist at the Southern Gas Association's Roundtable, Memphis, Tennessee
- 1998 *Environmental Auditing on Large-Scale Pipeline Projects.* Presented at the Southern Gas Association Round Table Discussions on Environmental Auditing, Fort Worth, Texas
- 1997 *Environmental Mitigation That Works.* Presented at the Statewide Conference of the Association of Environmental Professionals, San Francisco, California
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CERTIFICATIONS

2003 & 2005 Federal Energy Regulatory Commission Environmental Report Preparation Seminar
2001 & 2005 Federal Energy Regulatory Commission Post-Certificate Compliance Seminar
2000 Pathway to Principle
1998 Certified Professional in Erosion and Sediment Control (CPESC #888)
1996 California Department of Fish and Game Scientific Collecting Permit # 801035-06
1995 California Department of Fish and Game Wildlife Handling Class

EXHIBIT A

Final Summary– North Dakota Game and Fish Office – Bismarck, ND

March 4, 2008: 1:30 PM – 3:30 PM

Attendees:

Keystone Staff:

Steve Craycroft (ENSR)

Agency Staff:

John Schumacher (ND G&F Natural Resource Biologist)
Bruce Kreft (ND G&F Resource Biologist)

Meeting Objectives

Keystone visited with ND Game and Fish staff to discuss stream crossing methods for the streams classified as valuable fisheries in North Dakota. ND Game and Fish had listed ten streams in their May 2006 letter to the project where they indicated that they preferred for the project to HDD the crossings, or if HDD was not feasible, to cross the streams with conventional methods after June 1 to avoid the spawning period.

Meeting Discussion/Crossing Methods

During the meeting we discussed each crossing listed in the letter in detail regarding the appropriate crossing method and environmental protective measures that would be implemented. To aid in evaluating the streams, we reviewed field photographs of each of the crossings, as well as high resolution aerial photography of the crossing location and the pipeline route. In addition, Keystone provided an overview and discussion of various stream crossing methods including Open Cut, Dam and Pump and Flumed crossing methods. The discussion of these crossing methods was also accompanied by photos of each crossing method.

The following summarizes the crossing methods that ND G&F agreed would be acceptable and appropriate stream crossing methods. The Dry Crossing Method designation below refers to either Dam and Pump Crossings or Flumed Crossing Methods. All of these streams will be constructed after June 1 (avoid construction April 15 to June 1); however, bridges may be installed for access prior to this date as long as equipment does not operate within the stream to install the bridge until after June 1 and the bridge installation does not significantly disturb the stream.

Tributary to Tongue River (MP 16.1): Open Cut Wet Crossing

Due to the low flow/dry conditions and low fishery value of this reach of the Tributary to the Tongue River, the crossing would be constructed with the Open Cut Wet crossing method. The crossing would be constructed, backfilled, the contours restored and the stream banks stabilized as quickly as possible. Keystone may be able to coordinate with the Water Board to reduce flows through this area during the crossing, since a water control structure exists upstream of this crossing.

North Branch Park River (MP 29.4): Dry Crossing Method

The Dam and Pump or Flumed crossing method would be implemented to isolate the construction area from live stream flow. The stream crossing would be constructed, backfilled, the contours restored and the stream banks stabilized as expeditiously as possible. Additional details specific to this method are included in the Project's Construction Mitigation and Reclamation Plan (Dam & Pump and Flume crossing methods)

Middle Branch Park River (MP 33.3): Dry Crossing Method

The Dam and Pump or Flumed crossing method would be implemented to isolate the construction area from live stream flow. The stream crossing would be constructed, backfilled, the contours restored and

the stream banks stabilized as expeditiously as possible. Additional details specific to this method are included in the Project's Construction Mitigation and Reclamation Plan (Dam & Pump and Flume crossing methods)

North Branch Forest River (MP 46.4): Dry Crossing Method

The Dam and Pump or Flumed crossing method would be implemented to isolate the construction area from live stream flow. The stream crossing would be constructed, backfilled, the contours restored and the stream banks stabilized as expeditiously as possible. Additional details specific to this method are included in the Project's Construction Mitigation and Reclamation Plan (Dam & Pump and Flume crossing methods)

Middle Branch Forest River (MP 54.7): Dry Crossing Method

Sheet piling may be required for this crossing, which would lengthen the duration of construction activities; however, to the greatest extent practicable, the stream crossing would be constructed, backfilled, the contours restored and the stream banks stabilized as expeditiously as possible. Rocky substrate from the stream bottom will be salvaged during trenching operations and replaced during restoration.

The Dam and Pump or Flumed crossing method would be implemented to isolate the construction area from live stream flow. Additional details specific to this method are included in the Project's Construction Mitigation and Reclamation Plan (Dam & Pump and Flume crossing methods)

Goose River (MP 76.9): Open Cut Wet Crossing

Due to the low flow/dry conditions and lower fishery value of this reach of the Goose River, the crossing would be constructed with the Open Cut Wet crossing method. The crossing would be constructed, backfilled, the contours restored and the stream banks stabilized as quickly as possible. A sediment curtain will be installed during this crossing to reduce downstream sedimentation in the event that flow exists at this location during construction of the crossing.

Pembina River, Sheyenne River, Tongue River, South Branch Park River

The ND G&F staff found construction of the project through the Pembina, Sheyenne, Tongue and South Branch Park Rivers utilizing the HDD method acceptable.

Additional Crossing Notes

In the event that water levels at the time of crossing are too significant to implement the crossing methods noted below, Keystone will contact the ND G&F to discuss alternate crossing methods. Conditions noted in photos taken in mid-July for these crossings showed limited flow in each of these streams.

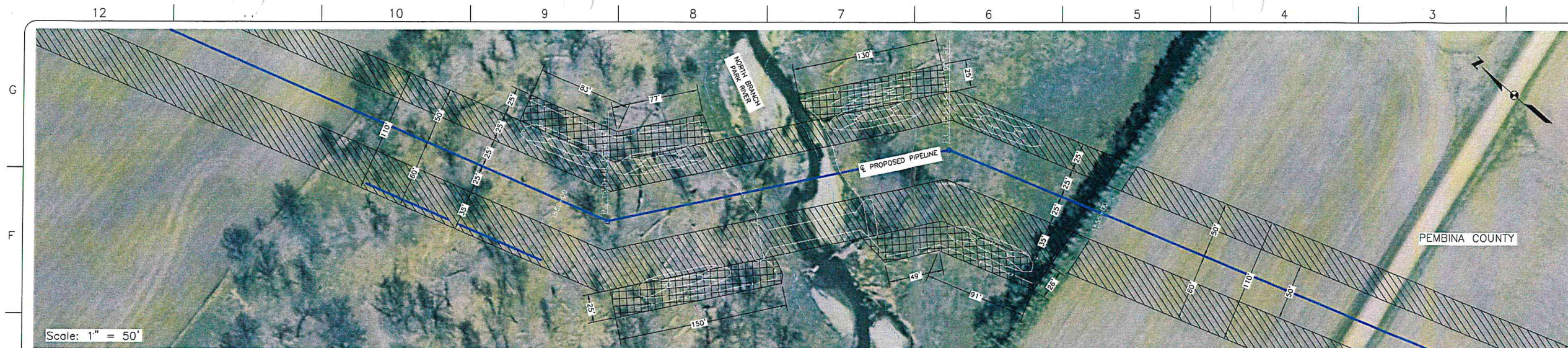
Keystone will complete construction of the crossings (in-stream activities and restoration of the stream bed and banks) as expeditiously as possible, and we would limit downstream sedimentation to the extent practicable through the use of Dry Crossing Methods or installation of sediment curtains during construction of the crossings.

ND G&F staff will be invited to the spread-level Environmental Training program and Keystone will notify ND Game and Fish of the estimated construction schedule through these streams so that they can observe the construction activities during the crossings (accompanied by an EI). Erosion and sediment control measures will be installed and maintained at these crossing throughout construction and until the streambanks and areas immediately adjacent to these crossings have stabilized.

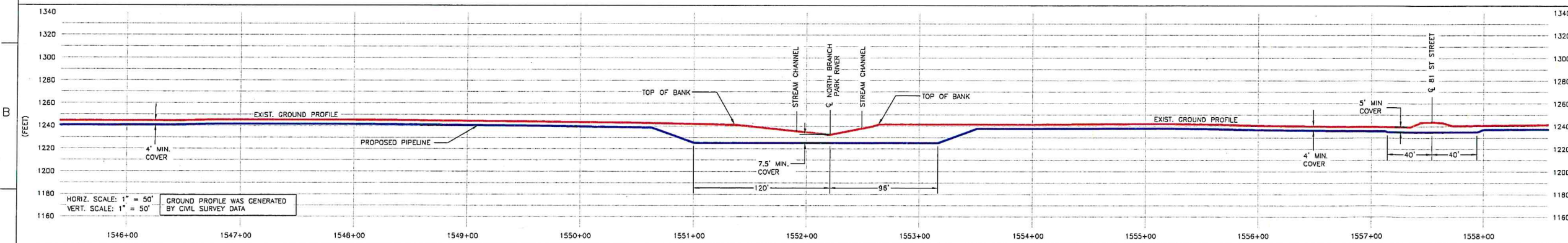
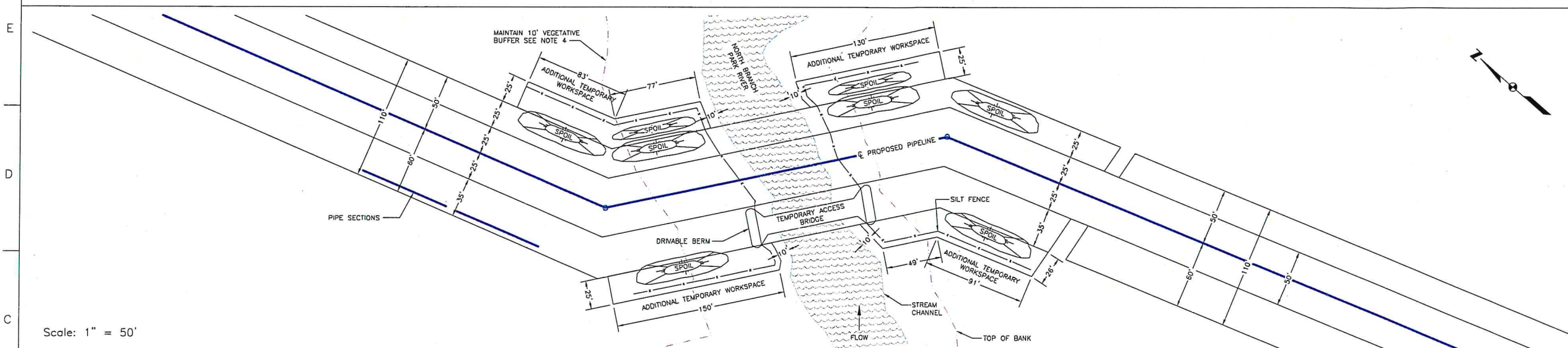
At crossings where the stream bottom materials consist of larger rocky substrate, the stream bottom material will be salvaged during trenching operations and replaced during restoration.

Keystone will send ND Game and Fish a communication defining the crossing methods for each of these streams as noted above. The ND Game and Fish will send Keystone a communication confirming their agreement with these crossing methods.

EXHIBIT B



- GENERAL NOTES**
- CONSTRUCTION OF STREAM CROSSING IS NOT PERMITTED UNTIL AFTER JUNE 1.
 - NO GAME AND FISH TO BE NOTIFIED OF ESTIMATED STREAM CONSTRUCTION SCHEDULE.
 - THE CONTRACTOR SHALL ACCESS THE WORK AREA USING ONLY PUBLIC ROADS AND APPROVED PRIVATE ACCESS ROADS.
 - THE BOUNDARIES OF ALL WORK AREAS WILL BE CLEARLY MARKED IN THE FIELD AND ALL WORK SHALL REMAIN WITHIN THE APPROVED WORK AREA. EXTRA WORKSPACES FOR MAKEUP SECTIONS AND ADDITIONAL SPOIL STORAGE SHALL BE LOCATED A MINIMUM OF 10 FEET FROM WETLAND AND WATERS EDGE.
 - WETLAND, STREAM, AND RECLAMATION DATA TO BE FIELD VERIFIED.
 - A 10-FOOT VEGETATIVE BUFFER STRIP BETWEEN DISTURBED AREAS AND THE WATER BODY TOP OF BANK SHALL BE MAINTAINED TO THE EXTENT POSSIBLE. ALL CLEARING SHALL BE MINIMIZED TO THE EXTENT POSSIBLE AND TO ONLY THAT NECESSARY FOR CONSTRUCTION. WOODY VEGETATION SHALL BE CUT AT CRACK LEVEL AND THE STUMPS/ROOTS LEFT IN PLACE TO THE EXTENT POSSIBLE.
 - TOPSOIL SHALL BE STRIPPED FROM THE DITCH LINE AND ANY LOCATIONS WHERE GRADING IS NEEDED. TOPSOIL SHALL BE KEPT SEPARATE FROM SUBSOIL AND WILL BE HANDLED IN ACCORDANCE WITH THE CONSTRUCTION MITIGATION AND RECLAMATION PLAN (CMRP).
 - LARGER ROCKY SUBSTRATE TO BE SALVAGED FROM THE STREAM BOTTOM (WHERE PRESENT) DURING TRENCHING AND REPLACED DURING RESTORATION.
 - CONTRACTOR SHALL INSTALL SIGNS A MINIMUM OF 100 FEET FROM EACH WATER BODY AND WETLAND BOUNDARY TO IDENTIFY THE HAZARDOUS MATERIALS EXCLUSION AREA. PUMPS USED WITHIN 100 FEET OF ANY WATER BODY OR WETLAND SHALL BE OPERATED IN ACCORDANCE WITH THE CURB. REFUELING OF CONSTRUCTION EQUIPMENT AND STORAGE OF HAZARDOUS MATERIALS, FUELS, ETC. SHALL BE CONDUCTED AT LEAST 100 FEET FROM WATER BODIES AND WETLANDS. EACH CONSTRUCTION CREW SHALL HAVE ON HAND SUFFICIENT TOOLS AND MATERIALS TO STOP LEAKS AND SUPPLIES OF ABSORBENT AND BARRIER MATERIALS TO ALLOW RAMP CONTAINMENT AND RECOVERY OF SPILLED MATERIALS.
 - EROSION AND SEDIMENT CONTROL.
 - CONTRACTOR SHALL SUPPLY AND INSTALL EROSION AND SEDIMENT CONTROL DEVICES BEFORE OR IMMEDIATELY AFTER INITIAL DISTURBANCE AS DEPICTED OR AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR. CONTRACTOR SHALL MAINTAIN DEVICES UNTIL SUCCESSFUL REVEGETATION AND STABILIZATION IS ACHIEVED.
 - CONTRACTOR SHALL PLACE TRENCH SPOIL ONLY IN APPROVED WORK SPACE. SPOIL SHALL BE CONTAINED IN THE WORKSPACE USING APPROPRIATE SEDIMENT BARRIERS WHERE NECESSARY.
 - IN SITUATIONS WHERE SPOIL IS TEMPORARILY STORED IN-STREAM DURING TRENCH EXCAVATION AND PIPE INSTALLATION, GAPS SHALL BE ADEQUATE TO ENSURE RIVER FLOW IS MAINTAINED.
 - SEDIMENT LOADED WATER FROM TRENCH DEWATERING SHALL BE DISCHARGED TO A WELL VEGETATED UPLAND AREA AND/OR INTO A STRAIN BALE DEWATERING STRUCTURE OR GEOTEXTILE FILTER BAG.
 - CONTRACTOR SHALL COMPLETE ALL IN-STREAM ACTIVITIES AS EXPEDITIOUSLY AS POSSIBLE. THE RIVER CROSSING SECTION SHALL BE WELDED, X-HAVED, AND COATED BEFORE IN-STREAM ACTIVITIES ARE INITIATED.
 - TRENCH BREAKERS ARE TO BE INSTALLED AT THE SAME SPACING AND IMMEDIATELY UPSTREAM OF PERMANENT SLOPE BREAKERS, OR AS DIRECTED BY THE COMPANY.
 - CONTRACTOR SHALL RESTORE THE WATER BODY BED AND BANKS TO APPROXIMATE PRECONSTRUCTION CONTOURS IMMEDIATELY AFTER PIPE INSTALLATION AND BACKFILL UNLESS OTHERWISE APPROVED BY THE COMPANY. THE CONTRACTOR SHALL TO THE EXTENT PRACTICAL IMPLEMENT PERMANENT EROSION AND SEDIMENT CONTROL AND RECLAMATION PROCEDURES ON DISTURBED LAND, INCLUDING WATER BODY BANKS, IMMEDIATELY FOLLOWING COMPLETION OF PIPE INSTALLATION AND BACKFILLING.
 - VEHICLE CROSSING SHALL BE CONSTRUCTED AS DETAILED IN CMRP. VEHICLE CROSSING MAY REMAIN IN PLACE UNTIL HYDROLOGIC TESTING AND CLEAN-UP ACTIVITIES HAVE BEEN COMPLETED.
 - VEHICLE CROSSING INSTALLATION PERMITTED BEFORE JUNE 1; HOWEVER, EQUIPMENT IS NOT PERMITTED TO ENTER THE WATERBODY AND PLACEMENT OF VEHICLE CROSSING SHALL NOT DISTURB STREAM SIGNIFICANTLY BEFORE JUNE 1.
 - REFERENCE SPECIFICATIONS - REFER TO THE KEYSTONE CMRP.
 - SEDIMENT CURTAIN WILL BE INSTALLED DOWNSTREAM OF THE CROSSING.
 - IF CONDITIONS AT THE TIME OF CROSSING PRECLUDE THE DRY CROSSING METHOD, KEYSTONE WILL CONSULT WITH ND GAF TO DETERMINE ALTERNATE CROSSING METHOD.



CROSSING INFORMATION (AS SHOWN)	1550+45 P.I. 32'10"31' LT.	1551+00 TOP OF BANK	1551+91 STREAM CHANNEL	1552+01 & NORTH BRANCH PARK RIVER	1552+49 STREAM CHANNEL	1552+84 TOP OF BANK	1553+17 END HORIZONTAL PIPE SECTIONS	1553+84 P.I. 34'11"00' RT.	1557+54 81 ST STREET
	GROUND PROFILE WAS GENERATED BY CIVIL SURVEY DATA								

DRAWING NOTES

- EQUIPMENT AND ACCESS LAYOUT MAY BE ADJUSTED WITHIN THE APPROVED WORKSPACE AND IN ACCORDANCE WITH RELEVANT PERMITS.

LEGEND

- PROPOSED PIPELINE
- EXISTING PIPELINE
- WORKSPACE BOUNDARY
- PROPOSED SILT FENCE
- EXISTING TREE LINE
- WATER BODY TOP OF BANK
- POINT OF INTERSECTION (P.I.)
- TEMPORARY EASEMENT
- ADDITIONAL TEMPORARY WORKSPACE
- WATER BODY
- WETLAND BOUNDARY

REFERENCE DRAWINGS	
DRAWING No	TITLE
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ZONE 14 OPEN CUT BASE FILE	ML_14_OC_BASE.dwg
AERIAL, NORTH DAKOTA	ND12.sld
NOTES AND LEGEND	NOTES_LEGEND_OPEN_CUT_new_border.dwg
MAIN LINE PROFILE	PROFILE_ML.dwg
TRANSCANADA BORDER	TC_UD_BR.dwg

REVISION				APPROVAL					
REV No	DATE	DESCRIPTION	PROJECT CODE	DRAFTER	DRAFTING CHECKER	DESIGNER	DESIGN CHECKER	PROJECT MANAGER	COMPANY
0	MAR 31 08	FILED WITH ND PSC MARCH 31, 2008	THES00538BE	JB	SS	HF	SS	RG	TROW

PROFESSIONAL ENGINEER/RPT		PERMIT/ ENG. APPROVAL	
DATE	SIGNATURE	DATE	SIGNATURE

1300 Metropolitan Boulevard, Suite 200
 Tallahassee, Florida, USA 32308
 Phone: 1-850-385-5441
 Fax: 1-850-385-5533

EDINBURG PUMP STATION
 FIA # 1801 CHAINAGE: MP 29.4 DISCIPLINE # 03
NORTH BRANCH PARK RIVER DRY CROSSING
 PEMBINA COUNTY, NORTH DAKOTA
 SCALE: As Shown DRAWING No 1801-03-ML-03-113 REV 0

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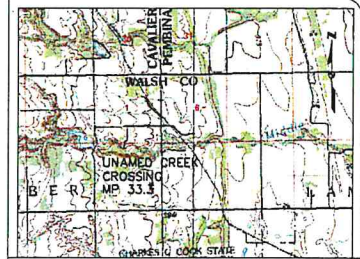
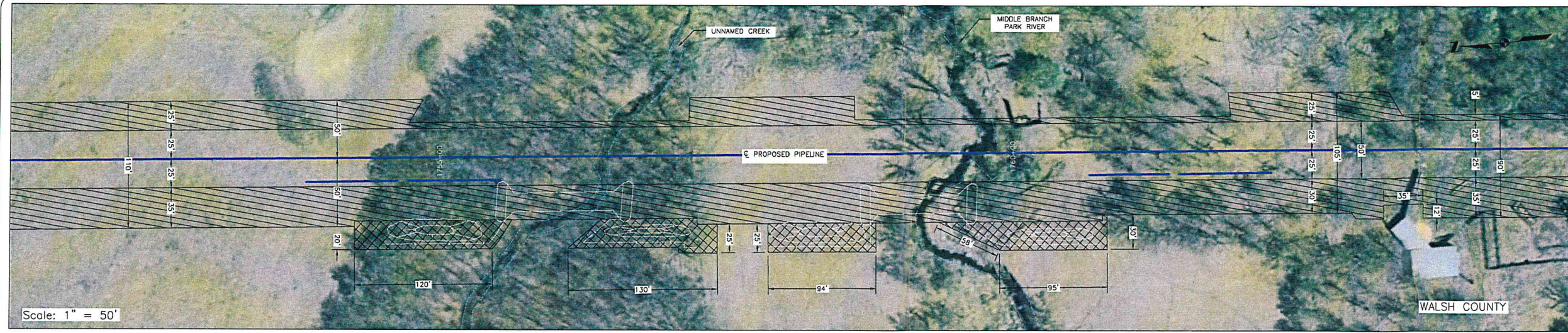
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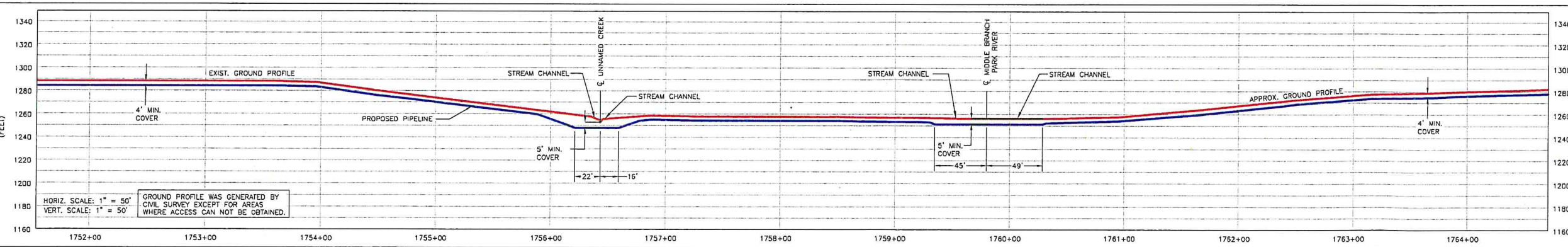
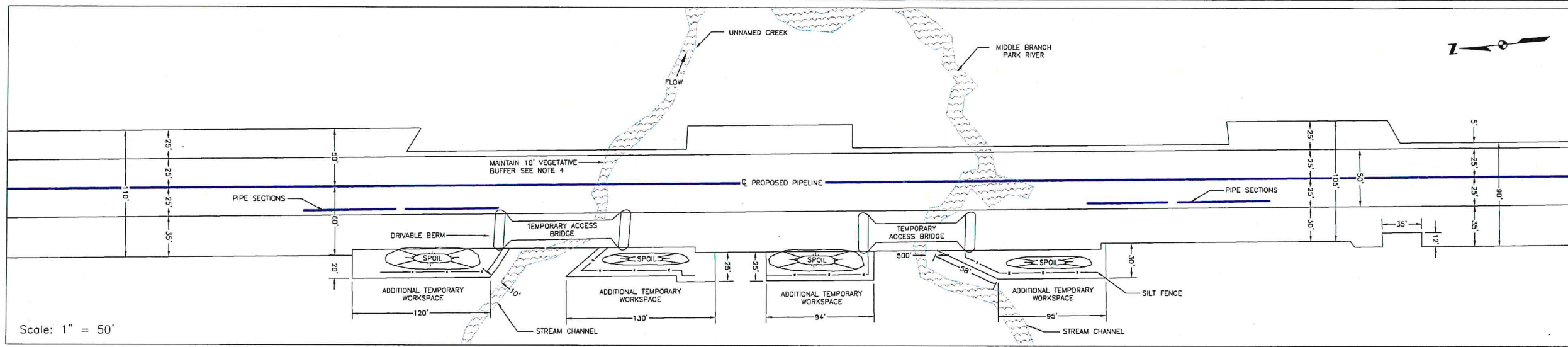
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2

1



- GENERAL NOTES**
- CONSTRUCTION OF STREAM CROSSING IS NOT PERMITTED UNTIL AFTER JUNE 1.
 - NO GAME AND FISH TO BE NOTIFIED OF ESTIMATED STREAM CONSTRUCTION SCHEDULE.
 - THE CONTRACTOR SHALL ACCESS THE WORK AREA USING ONLY PUBLIC ROADS AND APPROVED PRIVATE ACCESS ROADS.
 - THE BOUNDARIES OF ALL WORK AREAS WILL BE CLEARLY MARKED IN THE FIELD AND ALL WORK SHALL REMAIN WITHIN THE APPROVED WORK AREA. EXTRA WORKSPACES FOR MAKEUP SECTIONS AND ADDITIONAL SPOIL STORAGE SHALL BE LOCATED A MINIMUM OF 10 FEET FROM WETLAND AND WATERS EDGE.
 - WETLAND, STREAM, AND RECLAMATION DATA TO BE FIELD VERIFIED.
 - A 10-FOOT VEGETATIVE BUFFER STRIP BETWEEN DISTURBED AREAS AND THE WATER BODY TOP OF BANK SHALL BE MAINTAINED TO THE EXTENT POSSIBLE. ALL CLEARING SHALL BE MINIMIZED TO THE EXTENT POSSIBLE AND TO ONLY THAT NECESSARY FOR CONSTRUCTION. WOODY VEGETATION SHALL BE CUT AT GROUND LEVEL AND THE STUMPS/ROOTS LEFT IN PLACE TO THE EXTENT POSSIBLE.
 - TOPSOIL SHALL BE STRIPPED FROM THE DITCH LINE AND ANY LOCATIONS WHERE GRADING IS NEEDED. TOPSOIL SHALL BE KEPT SEPARATE FROM SUBSOIL AND WILL BE HANDLED IN ACCORDANCE WITH THE CONSTRUCTION MITIGATION AND RECLAMATION PLAN (CWRP).
 - LARGER ROCKY SUBSTRATE TO BE SALVAGED FROM THE STREAM BOTTOM (WHERE PRESENT) DURING TRENCHING AND REPLACED DURING RESTORATION.
 - CONTRACTOR SHALL INSTALL SIGNS A MINIMUM OF 100 FEET FROM EACH WATER BODY AND WETLAND BOUNDARY TO IDENTIFY THE HAZARDOUS MATERIALS EXCLUSION AREA. PUMPS USED WITHIN 100 FEET OF ANY WATER BODY OR WETLAND SHALL BE OPERATED ACCORDANCE WITH THE CWRP. REFUELING OF CONSTRUCTION EQUIPMENT AND STORAGE OF HAZARDOUS MATERIALS, FUELS, ETC. SHALL BE CONDUCTED AT LEAST 100 FEET FROM WATER BODIES AND WETLANDS. EACH CONSTRUCTION CREW SHALL HAVE ON HAND SUFFICIENT TOOLS AND MATERIALS TO STOP LEAKS AND SUPPLIES OF ABSORBENT AND BARRIER MATERIALS TO ALLOW RAPID CONTAINMENT AND RECOVERY OF SPILLED MATERIALS.
 - EROSION AND SEDIMENT CONTROL.
 - CONTRACTOR SHALL SUPPLY AND INSTALL EROSION AND SEDIMENT CONTROL DEVICES BEFORE OR IMMEDIATELY AFTER INITIAL DISTURBANCE AS DIRECTED OR AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR. CONTRACTOR SHALL MAINTAIN DEVICES UNTIL SUCCESSFUL REVEGETATION AND STABILIZATION IS ACHIEVED.
 - CONTRACTOR SHALL PLACE SPOIL ONLY IN APPROVED WORK SPACE. SPOIL SHALL BE CONTAINED IN THE WORKSPACE USING APPROPRIATE SEDIMENT BARRIERS WHERE NECESSARY.
 - IN SITUATIONS WHERE SPOIL IS TEMPORARILY STORED IN-STREAM DURING TRENCH EXCAVATION AND PIPE INSTALLATION, CAPS SHALL BE ADEQUATE TO ENSURE RIVER FLOW IS MAINTAINED.
 - SEDIMENT LOOSED FROM TRENCH DEWATERING SHALL BE DISCHARGED TO A WELL VEGETATED UPLAND AREA AND/OR INTO A STRAIN BALE DEWATERING STRUCTURE OR GEOTEXTILE FILTER BAG.
 - CONTRACTOR SHALL COMPLETE ALL IN-STREAM ACTIVITIES AS EXPEDITIOUSLY AS POSSIBLE. THE RIVER CROSSING SECTION SHALL BE WELDED, X-MAILED, AND COATED BEFORE IN-STREAM ACTIVITIES ARE INITIATED.
 - TRENCH BREAKERS ARE TO BE INSTALLED AT THE SAME SPACING AND IMMEDIATELY UPLAND OF PERMANENT SLOPE BREAKERS, OR AS DIRECTED BY THE COMPANY.
 - CONTRACTOR SHALL RESTORE THE WATER BODY BED AND BANKS TO APPROXIMATE PRE-CONSTRUCTION CONDITIONS IMMEDIATELY AFTER PIPE INSTALLATION AND BACKFILL UNLESS OTHERWISE APPROVED BY THE COMPANY. THE CONTRACTOR SHALL TO THE EXTENT PRACTICAL, IMPLEMENT PERMANENT EROSION AND SEDIMENT CONTROL AND RECLAMATION PROCEDURES ON DISTURBED LAND, INCLUDING WATER BODY BANKS, IMMEDIATELY FOLLOWING COMPLETION OF PIPE INSTALLATION AND BACKFILLING.
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 - SEDIMENT CURTAIN WILL BE INSTALLED DOWNSTREAM OF THE CROSSING.
 - IF CONDITIONS AT THE TIME OF CROSSING PRECLUDE THE DRY CROSSING METHOD, KEYSTONE WILL CONSULT WITH NO GAP TO DETERMINE ALTERNATE CROSSING METHOD.



CROSSING INFORMATION	STATIONING
1756+16	END HORIZONTAL PIPE SECTIONS
1756+38	STREAM CHANNEL
1756+43	UNNAMED CREEK
1756+47	STREAM CHANNEL
1756+22	END HORIZONTAL PIPE SECTIONS
1758+35	END HORIZONTAL PIPE SECTIONS
1758+43	STREAM CHANNEL
1758+49	MIDDLE BRANCH PARK RIVER
1760+07	STREAM CHANNEL
1760+29	END HORIZONTAL PIPE SECTIONS

DRAWING NOTES:

- EQUIPMENT AND ACCESS LAYOUT MAY BE ADJUSTED WITHIN THE APPROVED WORKSPACE AND IN ACCORDANCE WITH RELEVANT PERMITS.

LEGEND

- PROPOSED PIPELINE
- EXISTING PIPELINE
- WORKSPACE BOUNDARY
- PROPOSED SILT FENCE
- EXISTING TREE LINE
- WATER BODY TOP OF BANK
- POINT OF INTERSECTION (P.I.)
- TEMPORARY EASEMENT
- ADDITIONAL TEMPORARY WORKSPACE
- WATER BODY
- WETLAND BOUNDARY

REFERENCE DRAWINGS	
DRAWING No	TITLE
100K QUAD, NORTH DAKOTA	F48097a1.tif
ZONE 14 OPEN CUT BASE FILE	ML_14_OC_BASE.dwg
AERIAL, NORTH DAKOTA	ND14.sld
NOTES AND LEGEND	NOTES_LEGEND_OPEN_CUT_new_border.dwg
MAIN LINE PROFILE	PROFILE_ML.dwg
TRANSCANADA BORDER	TC_UD_BR.dwg

REVISION			APPROVAL						
REV No	DATE	DESCRIPTION	PROJECT CODE	DRAFTER	DRAFTING CHECKER	DESIGNER	DESIGN CHECKER	PROJECT MANAGER	COMPANY
0	MAR 31 08	FILED WITH THE ND PSC MARCH 31, 2008	THES005388E	JB	SS	HF	SS	RG	TROW

PROFESSIONAL ENGINEER/RPT	PERMIT/ ENG. APPROVAL

PREPARED BY:
TROW ENGINEERING CONSULTANTS INC.

1300 Metropolitan Boulevard, Suite 200
Tallahassee, Florida, USA 32308
Phone: 1-850-383-3441
Fax: 1-850-383-5823

EDINBURG PUMP STATION
FIA # 1801 CHAINAGE: MP 33.3 DISCIPLINE # 03

UNNAMED CREEK & MIDDLE BRANCH PARK RIVER
DRY CROSSINGS
WALSH COUNTY, NORTH DAKOTA

SCALE: As Shown DRAWING No 1801-03-ML-03-116 REV 0

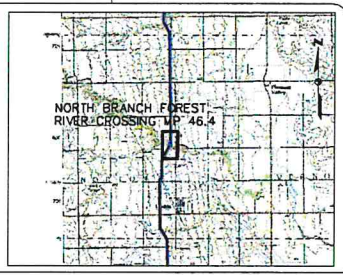
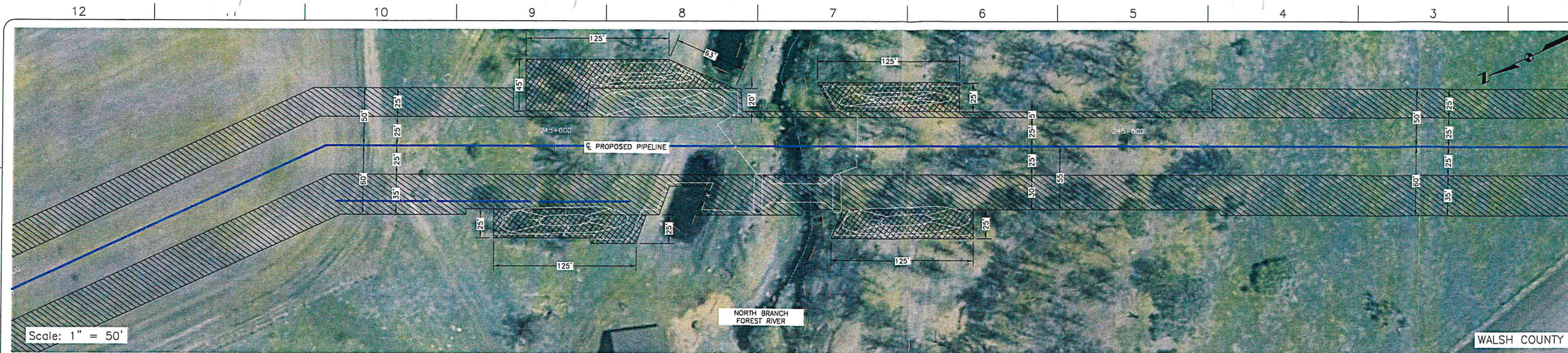
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CADD DRAWING: DO NOT MAKE MANUAL REVISIONS

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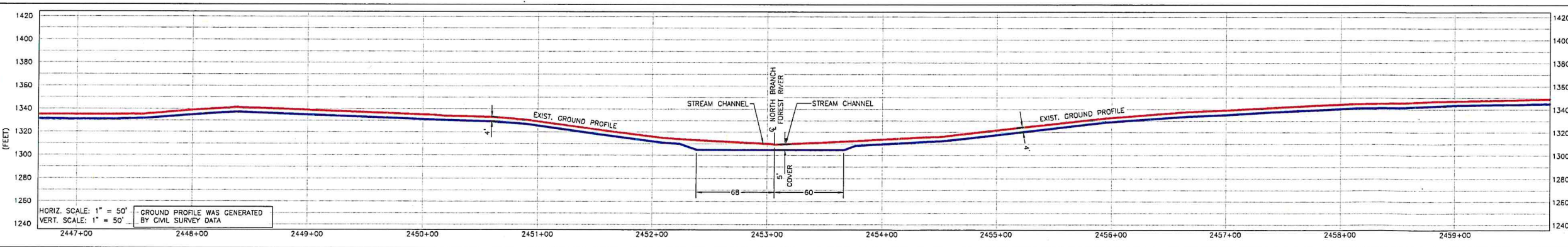
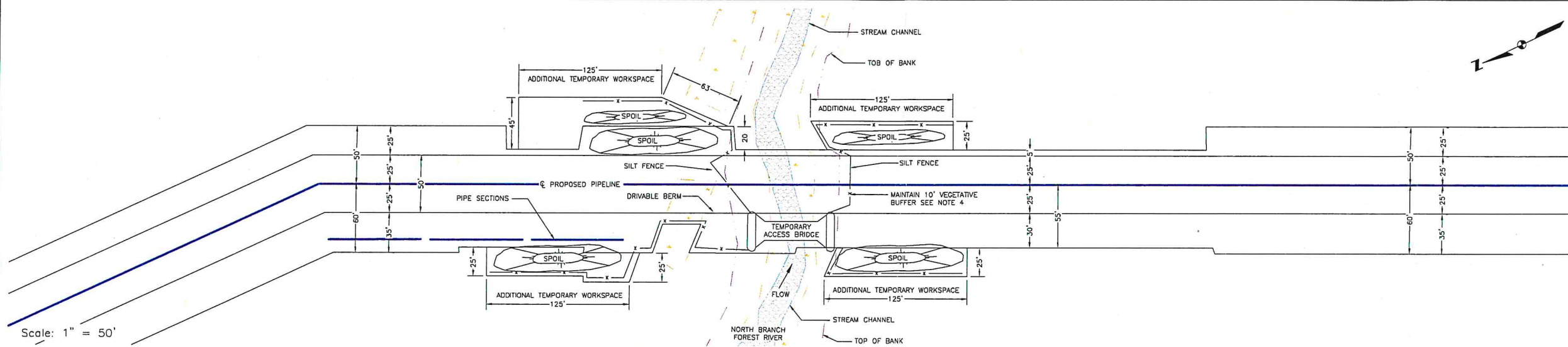
PRELIMINARY

THIS DESIGNFILE



GENERAL NOTES

1. CONSTRUCTION OF STREAM CROSSING IS NOT PERMITTED UNTIL AFTER JUNE 1.
2. NO GAME AND FISH TO BE NOTIFIED OF ESTIMATED STREAM CONSTRUCTION SCHEDULE.
3. THE CONTRACTOR SHALL ACCESS THE WORK AREA USING ONLY PUBLIC ROADS AND APPROVED PRIVATE ACCESS ROADS.
4. THE BOUNDARIES OF ALL WORK AREAS WILL BE CLEARLY MARKED IN THE FIELD AND ALL WORK SHALL REMAIN WITHIN THE APPROVED WORK AREA. EXTRA WORKSPACES FOR MAKEUP SECTIONS AND ADDITIONAL SPOIL STORAGE SHALL BE LOCATED A MINIMUM OF 10 FEET FROM WETLAND AND WATER'S EDGE.
5. WETLAND, STREAM, AND RECLAMATION DATA TO BE FIELD VERIFIED.
6. A 10-FOOT VEGETATIVE BUFFER STRIP BETWEEN DISTURBED AREAS AND THE WATER BODY TOP OF BANK SHALL BE MAINTAINED TO THE EXTENT POSSIBLE. ALL CLEARING SHALL BE MINIMIZED TO THE EXTENT POSSIBLE AND TO ONLY THAT NECESSARY FOR CONSTRUCTION. WOODY VEGETATION SHALL BE CUT AT GROUND LEVEL AND THE STUMPS/ROOTS LEFT IN PLACE TO THE EXTENT POSSIBLE.
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9. EROSION AND SEDIMENT CONTROL.
 - a. CONTRACTOR SHALL SUPPLY AND INSTALL EROSION AND SEDIMENT CONTROL DEVICES BEFORE OR IMMEDIATELY AFTER INITIAL DISTURBANCE AS DIRECTED OR AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR. CONTRACTOR SHALL MAINTAIN DEVICES UNTIL SUCCESSFUL REVEGETATION AND STABILIZATION IS ACHIEVED.
 - b. CONTRACTOR SHALL PLACE TRENCH SPOIL ONLY IN APPROVED WORK SPACE. SPOIL SHALL BE CONTAINED IN THE WORKSPACE USING APPROPRIATE SEDIMENT BARRIERS WHERE NECESSARY.
 - c. IN SITUATIONS WHERE SPOIL IS TEMPORARILY STORED IN-STREAM BURIED TRENCH EXCAVATION AND PIPE INSTALLATION, GAPS SHALL BE ADEQUATE TO ENSURE RIVER FLOW IS MAINTAINED.
 - d. SEDIMENT LADEN WATER FROM TRENCH DEWATERING SHALL BE DISCHARGED TO A WELL VEGETATED UPLAND AREA AND/OR INTO A STREAM BALE DEWATERING STRUCTURE OR GEOTEXTILE FILTER BAG.
10. CONTRACTOR SHALL COMPLETE ALL IN-STREAM ACTIVITIES AS EXPEDITIOUSLY AS POSSIBLE. THE RIVER CROSSING SECTION SHALL BE RELEASD, X-RAYED, AND COATED BEFORE IN-STREAM ACTIVITIES ARE INITIATED.
11. TRENCH BREAKERS ARE TO BE INSTALLED AT THE SAME SPACING AND IMMEDIATELY UPSTREAM OF PERMANENT SLOPE BREAKERS, OR AS DIRECTED BY THE COMPANY.
12. CONTRACTOR SHALL RESTORE THE WATER BODY BED AND BANKS TO APPROXIMATE PRECONSTRUCTION CONTOURS IMMEDIATELY AFTER PIPE INSTALLATION AND BACKFILL. UNLESS OTHERWISE APPROVED BY THE COMPANY, THE CONTRACTOR SHALL TO THE EXTENT PRACTICAL, IMPLEMENT PERMANENT EROSION AND SEDIMENT CONTROL AND RECLAMATION PROCEDURES ON DISTURBED LAND, INCLUDING WATER BODY BANKS, IMMEDIATELY FOLLOWING COMPLETION OF PIPE INSTALLATION AND BACKFILLING.
13. VEHICLE CROSSING SHALL BE CONSTRUCTED AS DETAILED IN CMRP. VEHICLE CROSSING MAY REMAIN IN PLACE UNTIL HYDROSTATIC TESTING AND CLEAN-UP ACTIVITIES HAVE BEEN COMPLETED.
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14. REFERENCE SPECIFICATIONS - REFER TO THE KEYSTONE CMRP.
15. SEDIMENT CURTAIN WILL BE INSTALLED DOWNSTREAM OF THE CROSSING.
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DRAWING NOTES:

1. EQUIPMENT AND ACCESS LAYOUT MAY BE ADJUSTED WITHIN THE APPROVED WORKSPACE AND IN ACCORDANCE WITH RELEVANT PERMITS.

LEGEND

	PROPOSED PIPELINE
	EXISTING PIPELINE
	WORKSPACE BOUNDARY
	PROPOSED SILT FENCE
	EXISTING TREE LINE
	WATER BODY TOP OF BANK
	POINT OF INTERSECTION (P.I.)
	TEMPORARY EASEMENT
	ADDITIONAL TEMPORARY WORKSPACE
	WATER BODY
	WETLAND BOUNDARY

CROSSING INFORMATION (ESTIMATED SPACING)	2448+00
	P.I. 24'45'52" RT

2452+38	END PIPELINE HORIZONTAL LENGTH
2452+86	STREAM CHANNEL
2453+08	NORTH BRANCH FOREST RIVER
2453+16	STREAM CHANNEL
2453+66	END PIPELINE HORIZONTAL LENGTH

REFERENCE DRAWINGS	
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ND QUAD	F48097A1.jpg

REVISION		APPROVAL							
REV No	DATE	DESCRIPTION	PROJECT CODE	DRAFTER	DRAFTING CHECKER	DESIGNER	DESIGN CHECKER	PROJECT MANAGER	COMPANY
0	MARCH 31 08	FILED WITH ND PSC MARCH 31, 2008	THS00503888	TB	SS			RG	TROW

PROFESSIONAL ENGINEER/RPT	PERMIT/ ENG. APPROVAL
	DATE
PRELIMINARY	
REV. NO.	DATE
	PERMIT NUMBER:

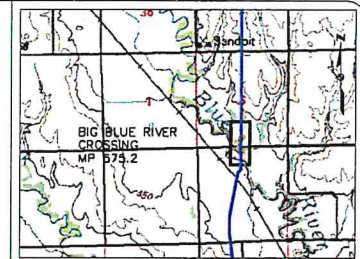
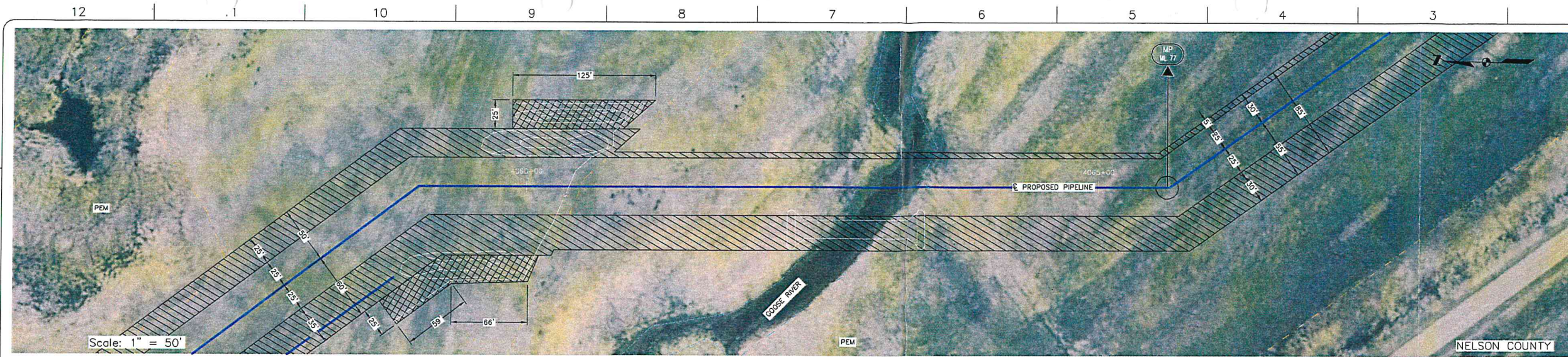
PREPARED BY:
TROW ENGINEERING CONSULTANTS INC.
 1300 Metrocenter Boulevard, Suite 200
 Tallahassee, Florida, USA 32308
 Phone: 1-850-369-5441
 Fax: 1-850-369-5533

NIAGRA PUMP STATION

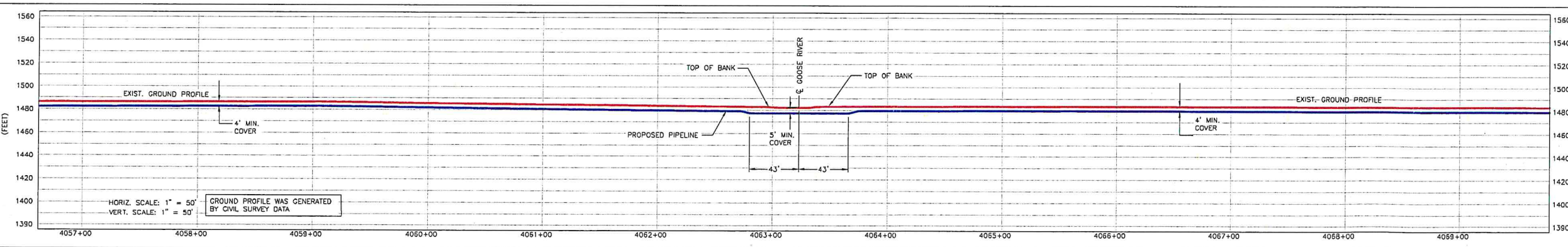
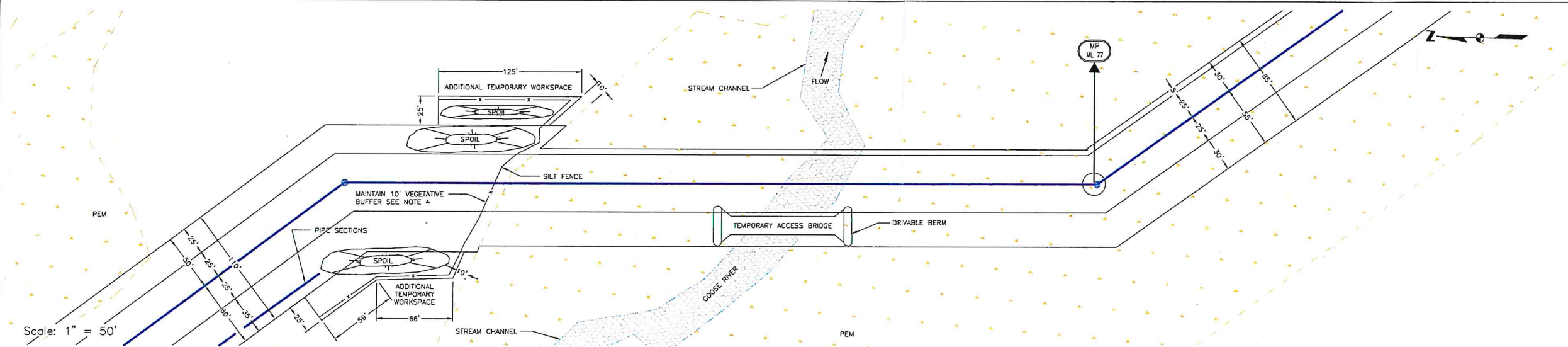
FIA # 1802 CHAINAGE: MP 46.4 DISCIPLINE # 03

**NORTH BRANCH FOREST RIVER
 DRY CROSSING
 WALSH COUNTY, NORTH DAKOTA**

SCALE: As Shown DRAWING No 1802-03-ML-03-009 REV 2



- GENERAL NOTES**
- CONSTRUCTION OF STREAM CROSSING IS NOT PERMITTED UNTIL AFTER JUNE 1.
 - NO GAME AND FISH TO BE NOTIFIED OF ESTIMATED STREAM CONSTRUCTION SCHEDULE.
 - THE CONTRACTOR SHALL ACCESS THE WORK AREA USING ONLY PUBLIC ROADS AND APPROVED PRIVATE ACCESS ROADS.
 - THE BOUNDARIES OF ALL WORK AREAS WILL BE CLEARLY MARKED IN THE FIELD AND ALL WORK SHALL REMAIN WITHIN THE APPROVED WORK AREA. EXTRA WORKSPACES FOR MAKEUP SECTIONS AND ADDITIONAL SPOIL STORAGE SHALL BE LOCATED A MINIMUM OF 10 FEET FROM WETLAND AND WATERS EDGE.
 - WETLAND, STREAM, AND RECLAMATION DATA TO BE FIELD VERIFIED.
 - A 15-FOOT VEGETATIVE BUFFER STRIP BETWEEN DISTURBED AREAS AND THE WATER BODY TOP OF BANK SHALL BE MAINTAINED TO THE EXTENT POSSIBLE. ALL CLEARING SHALL BE MINIMIZED TO THE EXTENT POSSIBLE AND TO ONLY THAT NECESSARY FOR CONSTRUCTION. WOODY VEGETATION SHALL BE CUT AT GROUND LEVEL AND THE STUMPS/ROOTS LEFT IN PLACE TO THE EXTENT POSSIBLE.
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 - SEDIMENT LADEN WATER FROM TRENCH DEWATERING SHALL BE DISCHARGED TO A WELL VEGETATED UPLAND AREA AND/OR INTO A STRAIN BALE DEWATERING STRUCTURE OR CONTROL FILTER BAG.
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 - SEDIMENT CURTAIN WILL BE INSTALLED DOWNSTREAM OF THE CROSSING.



- DRAWING NOTES:**
- EQUIPMENT AND ACCESS LAYOUT MAY BE ADJUSTED WITHIN THE APPROVED WORKSPACE AND IN ACCORDANCE WITH RELEVANT PERMITS.

LEGEND

- PROPOSED PIPELINE
- EXISTING PIPELINE
- WORKSPACE BOUNDARY
- PROPOSED SILT FENCE
- EXISTING TREE LINE
- WATER BODY TOP OF BANK
- POINT OF INTERSECTION (P.I.)
- TEMPORARY EASEMENT
- ADDITIONAL TEMPORARY WORKSPACE
- WATER BODY
- WETLAND BOUNDARY

CROSSING INFORMATION (Continued)	4058+06	RT
	P.I. 36°42'35"	
	4062+00	RT
	P.I. 35°15'43"	LT

REV No	DATE	DESCRIPTION	PROJECT CODE	DRAFTER	DRAFTING CHECKER	DESIGNER	DESIGN CHECKER	PROJECT MANAGER	COMPANY
0	MARCH 31 08	FILED WITH ND PSC MARCH 31, 2008	THS005388E	TB	SS	HF	SS	RG	TROW

PROFESSIONAL ENGINEER/RPT	PERMIT/ ENG. APPROVAL

DRAWING No	REFERENCE DRAWINGS	TITLE
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APPROVAL	PROFESSIONAL ENGINEER/RPT	PERMIT/ ENG. APPROVAL

REV. NO.	DATE	PERMIT NUMBER:

PREPARED BY:
TransCanada
 In business to deliver
Trow
 TROW ENGINEERING CONSULTANTS INC.
 1350 Metropolitan Boulevard, Suite 200
 Tallahassee, Florida, USA 32308
 Phone: 1-850-385-5441
 Fax: 1-850-385-5523

LUVIERNE PUMP STATION
 CHAINAGE: MP 76.9
 DISCIPLINE # 03

GOOSE RIVER
 OPEN CUT
 NELSON COUNTY, NORTH DAKOTA

SCALE: As Shown
 DRAWING No: 1803-03-ML-03-002
 REV: 0

EXHIBIT C

From: Kreft, Bruce L. [bkreft@nd.gov]
Sent: Friday, March 28, 2008 3:42 PM
To: Craycroft, Stephen
Subject: RE: ND Stream Crossing Methods - Streams Classified As Valuable Fisheries in ND

Steve,
confirm that these crossing methods are acceptable and consistent with our discussions. Thank you for the correspondence.
Bruce

From: Craycroft, Stephen [mailto:scraycroft@ensr.aecom.com]
Sent: Friday, March 28, 2008 3:35 PM
To: Kreft, Bruce L.
Cc: Schumacher, Jessica K.
Subject: ND Stream Crossing Methods - Streams Classified As Valuable Fisheries in ND

Bruce:

Thank you for the feedback on the crossing methods and issues of concern to the ND Game and Fish Department.

The attached meeting minutes summarize the crossing methods and protective measures that we discussed for each of the streams classified as valuable fisheries in the ND G&F's May 2006 letter.

Would you confirm that these crossing methods are acceptable and consistent with our discussion in your office on March 4?

Please feel free to call me with any questions or concerns.

Best Regards,

Steve Craycroft
ENSR
Keystone Project Environmental Liaison
16-880-4881 (o)
170-219-0184 (c)

3/31/2008