BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA

IN THE MATTER OF THE APPLICATION BY SCS CARBON TRANSPORT LLC FOR A PERMIT TO CONSTRUCT A CARBON DIOXIDE TRANSMISSION PIPELINE

DOCKET NO. HP22-001

Direct Testimony of Herbert Pirela
On Behalf of the Staff of the South Dakota Public Utilities Commission
June 23, 2023

Q: Please state your name and business address.

A: Herbert Pirela, 112 Great Lake Drive, Annapolis, Maryland 21403

Q: Describe your educational background.

A: I received my Bachelor and Master of Science degrees from the Colorado State University, and Doctorate from the Iowa State University with a focus on soil science and soil chemistry.

Q: By whom are you now employed?

A: I have been employed by Environmental Resource Management, Inc. since February of 2006.

Q: What work experience have you had that is relevant to your involvement on this project?

A: While working at ERM my responsibilities have included providing clients in the pipeline and transmission and mining industry with environmental permitting and environmental services. Specific tasks have included assisting in the preparation of Environmental Impact Statements and Environmental Assessments under the National Environmental Policy Act and with the review, survey, permitting, and mitigation projects and programs. This includes the review and drafting of construction mitigation and rehabilitation, soil erosion and sediment control, and revegetation plans.

Q: What Professional Credentials do you hold?

A: I am a Professional Soil Scientist.

Q: What is the purpose of your testimony?

A: To provide an assessment of the construction impact, mitigation and rehabilitation measures that are proposed in the application for construction of the Summit Carbon Solutions (SCS) Carbon Dioxide Transmission Pipeline System.

Q: What methodology did you employ?

A: I reviewed and provided an assessment of Sections 2.0 (Project Description), 5.0 (Environmental Information and Impact on Physical Environment), 6.0 (Community Impact), and 7.0 (Other Information) of the application and October 13, 2022, Supplement of the Application and Data Requests to determine the completeness of the Environmental Construction Plan. This review and assessment was completed by comparing the impacts and mitigation measures and the

environmental construction guidance identified in the application and the consistency of the proposed measures with those from:

- other pipeline and transmission and mining projects on which I have worked,
- the Federal Energy Regulatory Commission's (FERC) *Upland Erosion Control, Revegetation and Maintenance Plan* and *Wetland and Waterbody Construction and Mitigation Procedures* (see Exhibit_HP-2), and
- my knowledge of the industry best management practices (BMPs), to which are the industry standards for buried pipeline projects.

Q: Did you review Summit's Appendix 3: Environmental Construction Plan?

A: Yes. I reviewed Appendix 3 – Environmental Construction Plan (ECP) of the Summit application.

Q: Please summarize what information is in that document.

A: The ECP describes construction procedures and mitigation measures to minimize environmental impacts and ensures successful restoration and revegetation of the project workspace. The ECP describes procedures for standard upland construction, including construction procedures in agricultural areas, as well as construction within sensitive areas such as wetlands and waterbodies (e.g., clearing and grading, trenching backfilling; waterbodies and wetlands a crossing; waste management; reclamation and revegetation; spill prevention, containment, and response; and waste management). The ECP also outlines procedures for environmental training, environmental inspection, and post-construction and monitoring and maintenance programs.

Q: Based on your experience, is the Environmental Construction Plan robust and complete? Please explain.

A: The ECP describes BMPs from identification of the workspace and avoidance areas to final restoration and monitoring that adhere to the industry standards. In addition to standard construction procedures and measures for temporary and permanent erosion and sedimentation control, the ECP includes measures for site-specific issues that may arise during construction, such as spill prevention and emergency response, and remediation and anticipated discovery of cultural resources. Based on my experience, the ECP upland restoration procedures are robust and complete and adheres to the industry standards for BMPs and FERC's guidance and procedures. As noted below, measures supplemental to the ECP that are typically developed at a later time, such as the Erosion and Sedimentation Control Plan, Weed Control Plan, HDD Plan, and Agricultural Impact Mitigation Plan, should be developed by Summit and provided to the Commission.

Q: In your opinion, is the Environmental Construction Plan consistent with the pipeline industry's best practices? Please explain.

A: In my opinion, the ECP is consistent with the pipeline industry's BMPs, including FERC's *Upland Erosion Control, Revegetation and Maintenance Plan* and *Wetland and Waterbody Construction and Mitigation Procedures*, which are the industry standards for natural gas pipeline projects.

Q: Do you have any proposed changes or recommendations for the Environmental Construction Plan?

A: No. Based on my review, I would consider the ECP to be complete.

Q: Did you review Summit's plans for Soil Erosion and Sedimentation Control?

A: Yes, Summit proposed methods for mitigating erosion during construction and operation are described within Section 5.1.4.6 of the Application and in the ECP outlined in Appendix 3. Sections 2.8 and 2.9 of Appendix 3 describes the types of temporary erosion control devices (ECDs) to be implemented to the project area including mulch, sediment barriers, trench plugs, and slope breakers and the permanent types of ECDs to be used along the proposed route including trench breakers, mulch, and slope breakers. In my opinion, a more detailed plan formalizing those soil erosion and sediment control procedures should be developed by Summit.

Q: Did you review Summit's plans to control and prevent the spread of noxious weeds?

A: Yes, in Section 5.3.1.4 of the Application, brief plans are provided describing the procedures that will be implemented to prevent the spread of noxious weeds. In my opinion, a more detailed plan formalizing those weed control procedures should be developed by Summit that includes cultural (e.g., prompt seeding and revegetation of disturbed soils with certified weed-free seed; and use of certified weed-free mulch/straw for erosion control); physical (e.g., moving of weeds in newly revegetated areas during the first season of establishment, hand pulling, and digging); biological (e.g., application of select insects into an infestation, and grazing by livestock); and chemical control methods (e.g., use of selective and non-selective herbicides).

Q: Did you review Summit's plan to manage the inadvertent release of Horizontal Directional Drill (HDD) drilling mud?

A: Yes. An HDD Inadvertent Return Plan (referred to as a contingency plan in the Application) was provided. In my opinion, neither the Application (see Section 2.7.7), the ECP (see Sections 4.3.5 and 9.4). nor the HDD inadvertent Return Plan address the inadvertent return to aquifers, glacial deposits or wetlands. The Application, ECP, and the HDD inadvertent return plan do not address factors that can increase the likelihood for inadvertent returns (e.g., presence of loose, sandy

soils; poorly compacted soil and anthropogenic fills; and the presence of features such as tree roots and previous boreholes).

Q: Landowners have raised concerns to the Commission regarding permanent crop yield loss along the pipeline right-of-way (ROW) as a result of disturbing the soil. In your opinion, should landowners expect to experience ongoing crop yield loss on the ROW? Please explain.

A: The ECP (Sections 2.7 and 2.8) and the Supplemental Application (Section 6.1.3) provides special construction procedures in agricultural areas (i.e., topsoil and subsoil segregation, salvage/storage, replacement of subsoil and topsoil separately to avoid mixing, and deep tillage following construction to alleviate any soil compaction, avoidance or repair of drain and irrigation facilities, and repairs of damage of other agricultural-related facilities disturbed during construction). In my opinion, these are industry BMPs that would minimize any ongoing crop yield loss along the pipeline ROW. In addition, the ECP and the Supplemental Application also discusses monitoring measures that will be implemented in agricultural areas that considers successful revegetation when crop yields are similar to adjacent undisturbed portions of the sample field. Consideration to potential impacts, if any, to site hydrology should be incorporated. Impacts to site hydrology, if any, are being addressed by another witness from ERM, Brian Sterner.

.

Q: Would an Agricultural Impact Mitigation Plan identify the measures to be taken to mitigate ongoing yield loss after restoration is completed?

A: Yes. An Agricultural Impact Mitigation Plan would identify the mitigation measures to address ongoing yield loss after restoration. This plan would provide additional special pipeline construction procedures and mitigation measures to be used in agricultural areas and other areas of concern (e.g., wetlands and waterbody crossings; shallow soils, steep terrain and in other erosion prone settings; and HDD areas) to control erosion and sedimentation.

Q: Did you review Summit's Agricultural Impact Mitigation Plan?

A: No, while the acronym list in the Supplemental Application identified the existence of this plan, it was not mentioned anywhere in the Supplemental Application and was not provided by Summit for review.

Q: In your opinion, should the Agricultural Impact Mitigation Plan be provided by the Applicant for Commission review prior to the Commission making its determination on the Project? Please explain why or why not.

A: Yes. An Agricultural Impact Mitigation Plan should be prepared for submission to the commission that describes in detail the proper mitigation measures that will be implemented during the construction of the Project to avoid and minimize any potential yield loss and provide ample measures to determine if successful crop

yields are impacted and obtained. The Agricultural Impact Mitigation Plan should be submitted to the commission to review prior to making a determination.

Q: Should the Agricultural Impact Mitigation Plan include a monitoring plan to measure crop yields to determine if there is measurable yield loss along the ROW? Please explain.

A: Yes. It should include this type of monitoring plan even though, in Section 7.1.3 of the application general post-construction monitoring and maintenance measures are provided. In my opinion, an Agricultural Impact Mitigation Plan should be prepared to include a detailed monitoring plan that describes measures that will be implemented to monitor crop yields, including maps depicting the locations and acreage impacted. The Plan, at a minimum, should specifically address if there is a measurable yield loss along the ROW and provide ample measures to determine if successful crop yields are obtained.

Q: In your experience, is it typical at this point in the process for the information you discussed above not to be available?

A: Yes. In my opinion, it is typical at this point in the process that the detailed HDD Plan and the Agricultural Impact Mitigation Plan are not available. The Applicant should commit to the development of these detailed plans and the Commission should require these plans be submitted for review and approval prior to construction. All plans would be required at a later stage of the Project development.

Q: The Commission has received comment that the pipeline will adversely impact soil temperatures along the ROW. Do you have similar concerns that the pipeline could adversely impact soil temperatures? Please explain.

A: No. In my opinion and based on previous experience with other large pipeline projects and the results of steady-state temperature profiles modeled for winter and summer operations for these projects, changes of soils temperature by pipelines along the ROW is not an issue of concern. The temperatures above the pipeline at various distances from it deviate minimally from the background temperature. Therefore, the overall effect on vegetation and crops associated with heat generated by operation pipelines is not significant.

Q: Does this conclude your testimony?

A: Yes.

Herbert Pirela, PhD

Senior Project Manager

Dr. Pirela has over 23 years of experience in designing, conducting, and managing major environmental investigations and permitting projects. The major focus of his work has been on impact analyses for soils, reclamation, and geology, and includes environmental assessments under the National Environmental Act (NEPA) and other United States and international regulations. Herbert also has extensive experience with international standards and best practices, especially with the IFC Performance Standards and WBG EHS Guidelines, having lead and conducted multiple environmental and social and environmental and social impact assessments (ESIA) on behalf of International Development Finance Institutions.

Experience: 23 years' experience in the power, oil & gas, and mining sectors.

Email: herbert.pirela@erm.com

Linkedin: https://www.linkedin.com/in/herbert-pirela-9449a41b/

Education

- Ph.D., Soil Chemist, Iowa State University, 1987

Professional Affiliations and Registrations

- American Society of Agronomy
- Society of Environmental Toxicology and Chemistry
- Soil Science Society of America
- Chevron ESHIA Qualified Facilitator

Languages

- English, native speaker
- Spanish, High proficiency (Spoken and written)

Fields of Competence

- Environmental Impact Assessment
- *National Environmental Policy Act* (NEPA) and state-equivalent NEPA compliance
- Project Permitting and Documentation
- Project Planning and Design to Address Soils and Geological Issues
- Stakeholder Engagement
- Cumulative Impact Assessment
- Soil Restoration/Revegetation Specially in Desert or Arid Environments
- Pipelines and Other Energy Industry Projects

Key Industry Sectors

- Power
- Mining
- Oil & gas

Honors and Awards

- Graduate Research Excellence Award, Iowa State University, 1987.

Key Projects

Coastal Pipeline West Virginia, Virginia, and North Carolina
For a 600 miles long interstate natural gas transmission pipeline that crosses West Virginia, Virginia, and North Carolina, and would serve multiple public utilities and their growing energy needs in Virginia and North Carolina. Herbert was the lead soil scientist in charge of the development comprehensive Rehabilitation and Restoration Plan for the project, including detailed plans to include pollinator plant and warm season grasses species in the restoration of the right-of-way in in piedmont and coastal plain areas in Virginia and North Carolina.

Pipeline, Alberta and Saskatchewan Canada, and Montana, South Dakota and Nebraska
TransCanada Keystone Pipeline, LP (TransCanada) is proposing the construction of a new pipeline approximately 1,980-mile, 36-inch and related facilities to transport crude oil from the Western Canadian Sedimentary Basin to the Texas Gulf Coast. The original Project application, submitted in 2008, was subjected to NEPA review and an FEIS was issued in August 2011. That project was found to not serve the national interest, and TransCanada submitted an application for a revised route in May 2012. That route follows the original corridor in Montana and South Dakota with a significant realignment in Nebraska, avoiding the ecologically sensitive Sand Hills area. For the revised route EIS, Herbert is the lead geologist/soil scientist that evaluated the impacts of the project on the geological and soil resources along the route and proposed appropriate mitigation and best management practices to avoid or minimize the impacts on these resources. Herbert worked closely with the Nebraska Department of Environment Quality and TransCanada to develop innovative soil erosion control measures that minimize the impacts to Fragile Soils in Northern South Dakota and Nebraska near the ecologically sensitive Sand Hills area

Kern River Expansion, California, Nevada, Utah, and Wyoming
For this fast-tracked, nearly 800-mile pipeline project, Herbert was lead soil scientist in the preparation of the complete FERC ER filing to Order 603 standards in less than five months. For the Phase 1 initial filing, he collected soil information for all four states traversed by the project, completed a detailed analysis of the project-related impacts on soil and topographic features, and prepared the soil resources report. In Phase 2, he conducted field surveys and developed comprehensive soil erosion and management control plans for the four States, including detailed plans for Dixie National Forest in Utah and Red Rock Canyon National Conservation Area and Spring Mountain National Recreation Area (Humbolt-Toiyabe National Forest) in Nevada. Requiring his extensive consultation with DOI's Bureau of Land Management, USFWS, and the California Department of Fish and Game, the plans included restoration and mitigation guidelines and strategies to minimize impacts through implementation of best management practices and site-specific restoration measures.

Alliance Pipeline North Dakota, Minnesota, Iowa, and Illinois
To support the preparation of a third party EIS for this 900-mile pipeline, Herbert identified data gaps and issued data requests, verified ER information, and prepared the soil resource affected environment and environmental consequences sections for the advanced preliminary draft EIS. He evaluated soil along the proposed route and determined best management practices to minimize erosion. He also characterized wildlife and plant communities and identified potential impacts on sensitive species and plant communities. He coordinated with biologists of federal and state agencies regarding impacts on riparian and stream habitat, developed mitigation measures, and evaluated alternative routes to minimize or avoid impacts. Herbert also conducted a noxious weed evaluation and addressed concerns of

farmers and state agencies concerning weed proliferation as a result of pipeline development.
Duke Energy Gas Transmission subsidiary, Copiah Storage Project Copiah County, Mississippi
For Copiah County Storage Company, he provided siting assistance and contributed to the preparation of the FERC ER for this high-productivity salt cavern natural gas storage/hub facility.

Improving the Transport Logistics and Competiveness of the Dr. Jules Sedney Port of Paramaribo, Suriname – IDB
ERM was contracted to perform an Environmental, Social, and Health & Safety (ESHS) review of the Dr. Jules Sedney Port in Paramaribo to assess the compliance status of existing Port operations, including the Environmental and Social Management System, against different criteria, standards, and regulatory requirements, such as, Surinamese laws and regulations, and applicable best management practices, international treaties and conventions such as ISO 14001:2015, the Basel Convention and Marine Pollution – MARPOL 73/78. Dr. Pirela served as project manager to conduct the ESHS review.

Saramacca Satellite Mine Project ESA, Rosebel Gold Mines (RGM) – IAMGOLD Corporation, Suriname
The Project consisted of two main components: an open pit mine and a private road for hauling mined mineralized material to the existing RGM mill for processing. Dr. Pirela served as the assistance Project Manager in the development of the ESIA to satisfy contractual obligations, national guidelines, and draft regulations as well as international and corporate standards for project development.

Gold Mine Tailings Storage Facility Expansion ESIA, Rosebel Gold Mines – IAMGOLD Corporation, Suriname
To maintain gold production levels, Rosebel Gold Mines investigated the feasibility of expanding its mines tailings storage facility. The expansion included the expansion of the existing tailings facility to the east by constructing seven additional dams, which raised total vertical containment by 43 meters when the Project was completed. Dr. Pirela served as project manager and soils lead to conduct an environmental and impact assessment for the expansion of the gold mines existing tailings storage facilities in according to local and international guidelines.

Nassau Plateau Bauxite Mine ESHIA, Suriname Aluminum Company, Suriname
Manager and soil lead for the development of an ESHIA for new bauxite mine on the Nassau Plateau that evaluated the environmental and social impacts of the proposed new mine. Suralco, subsidiary of the international metals company Alcoa, conducted environmental and social studies that evaluated the feasibility of developing bauxite mine on the Nassau Plateau in eastern Suriname.

Lelydorp I Bauxite Mine ESIA, Suriname Aluminum Company, Suriname
In 1965, the Suriname Aluminum Company (Suralco) began operating the Paranam alumina refinery, located south of Paramaribo in northern Suriname. Historically, most of the Bauxite ore for the Paranam refinery had come from mines that were expected to be depleted. Suralco identified the Lelydorp I Bauxite deposits as a potential source of bauxite. Suralco engaged ERM to conduct the ESIA for this fast tracked Project. Dr. Pirela served as the Deputy Project Manager and soils lead for the Project.

Merian Gold Mine Project ESHIA, Newmont Mining Corporation, Suriname
Suriname Gold Company, LLC (Surgold) owns and operates the Merian Gold Project 30 Km to the north of the Nassau Mountains in eastern Suriname. Dr. Pirela led the soils impact assessment for the Environmental and Social Impact Assessment of a new gold mine in Suriname. The Project straddles the divide of two major watersheds and is located in the equatorial rain forest. The impact assessment included the assessment of the impacts of the mine pits and other infrastructure and proposed mitigation measures.

Federal Energy Regulatory Commission

Office of Energy Projects

May 2013

UPLAND EROSION CONTROL, REVEGETATION, AND MAINTENANCE PLAN

Washington, DC 20426

MAY 2013 VERSION

UPLAND EROSION CONTROL, REVEGETATION, AND MAINTENANCE PLAN

TABLE OF CONTENTS

UPLAND EROSION CONTROL, REVEGETATION, AND MAINTENANCE PLAN (PLAN)

I. APPLICABILITY

A. The intent of this Plan is to assist project sponsors by identifying baseline mitigation measures for minimizing erosion and enhancing revegetation. Project sponsors shall specify in their applications for a new FERC authorization and in prior notice and advance notice filings, any individual measures in this Plan they consider unnecessary, technically infeasible, or unsuitable due to local conditions and fully describe any alternative measures they would use. Project sponsors shall also explain how those alternative measures would achieve a comparable level of mitigation.

Once a project is authorized, project sponsors can request further changes as variances to the measures in this Plan (or the applicant's approved plan). The Director of the Office of Energy Projects (Director) will consider approval of variances upon the project sponsor's written request, if the Director agrees that a variance:

1. provides equal or better environmental protection;

2. is necessary because a portion of this Plan is infeasible or unworkable based on project-specific conditions; or

3. is specifically required in writing by another federal, state, or Native American land management agency for the portion of the project on its land or under its jurisdiction.

Sponsors of projects planned for construction under the automatic authorization provisions in the FERC's regulations must receive written approval for any variances in advance of construction.

Project-related impacts on wetland and waterbody systems are addressed in the staff's Wetland and Waterbody Construction and Mitigation Procedures (Procedures).

II. SUPERVISION AND INSPECTION

A. ENVIRONMENTAL INSPECTION

1. At least one Environmental Inspector is required for each construction spread during construction and restoration (as defined by section V). The number and experience of Environmental Inspectors assigned to each construction spread shall be appropriate for the length of the construction spread and the number/significance of resources affected.

2. Environmental Inspectors shall have peer status with all other activity inspectors.

3. Environmental Inspectors shall have the authority to stop activities that violate the environmental conditions of the FERC's Orders, stipulations of other environmental permits or approvals, or landowner easement agreements; and to order appropriate corrective action.

B. RESPONSIBILITIES OF ENVIRONMENTAL INSPECTORS

At a minimum, the Environmental Inspector(s) shall be responsible for:

1. Inspecting construction activities for compliance with the requirements of this Plan, the Procedures, the environmental conditions of the FERC's Orders, the mitigation measures proposed by the project sponsor (as approved and/or modified by the Order), other environmental permits and approvals, and environmental requirements in landowner easement agreements.

2. Identifying, documenting, and overseeing corrective actions, as necessary to bring an activity back into compliance;

3. Verifying that the limits of authorized construction work areas and locations of access roads are visibly marked before clearing, and maintained throughout construction;

4. Verifying the location of signs and highly visible flagging marking the boundaries of sensitive resource areas, waterbodies, wetlands, or areas with special requirements along the construction work area;

5. Identifying erosion/sediment control and soil stabilization needs in all areas;

6. Ensuring that the design of slope breakers will not cause erosion or direct water into sensitive environmental resource areas, including cultural resource sites, wetlands, waterbodies, and sensitive species habitats;

7. Verifying that dewatering activities are properly monitored and do not result in the deposition of sand, silt, and/or sediment into sensitive environmental resource areas, including wetlands, waterbodies, cultural resource sites, and sensitive species habitats; stopping dewatering activities if such deposition is occurring and ensuring the design of the discharge is changed to prevent reoccurrence; and verifying that dewatering structures are removed after completion of dewatering activities;

8. Ensuring that subsoil and topsoil are tested in agricultural and residential areas to measure compaction and determine the need for corrective action;

9. Advising the Chief Construction Inspector when environmental conditions (such as wet weather or frozen soils) make it advisable to restrict or delay construction activities to avoid topsoil mixing or excessive compaction;

10. Ensuring restoration of contours and topsoil;

11. Verifying that the soils imported for agricultural or residential use are certified as free of noxious weeds and soil pests, unless otherwise approved by the landowner;

12. Ensuring that erosion control devices are properly installed to prevent sediment flow into sensitive environmental resource areas (e.g., wetlands, waterbodies, cultural resource sites, and sensitive species habitats) and onto roads, and determining the need for additional erosion control devices;

13. Inspecting and ensuring the maintenance of temporary erosion control measures at least:

    a. on a daily basis in areas of active construction or equipment operation;

    b. on a weekly basis in areas with no construction or equipment operation; and

    c. within 24 hours of each 0.5 inch of rainfall;

14. Ensuring the repair of all ineffective temporary erosion control measures within 24 hours of identification, or as soon as conditions allow if compliance with this time frame would result in greater environmental impacts;

15. Keeping records of compliance with the environmental conditions of the FERC's Orders, and the mitigation measures proposed by the project sponsor in the application submitted to the FERC, and other federal or state environmental permits during active construction and restoration;

16. Identifying areas that should be given special attention to ensure stabilization and restoration after the construction phase; and

17. Verifying that locations for any disposal of excess construction materials for beneficial reuse comply with section III.E.

III. PRECONSTRUCTION PLANNING

The project sponsor shall do the following before construction:

A. CONSTRUCTION WORK AREAS

1. Identify all construction work areas (e.g., construction right-of-way, extra work space areas, pipe storage and contractor yards, borrow and disposal areas, access roads) that would be needed for safe construction. The project sponsor must ensure that appropriate cultural resources and biological surveys are conducted, as determined necessary by the appropriate federal and state agencies.

2. Project sponsors are encouraged to consider expanding any required cultural resources and endangered species surveys in anticipation of the need for activities outside of authorized work areas.

3. Plan construction sequencing to limit the amount and duration of open trench sections, as necessary, to prevent excessive erosion or sediment flow into sensitive environmental resource areas.

B. DRAIN TILE AND IRRIGATION SYSTEMS

1. Attempt to locate existing drain tiles and irrigation systems.

2. Contact landowners and local soil conservation authorities to determine the locations of future drain tiles that are likely to be installed within 3 years of the authorized construction.

3. Develop procedures for constructing through drain-tiled areas, maintaining irrigation systems during construction, and repairing drain tiles and irrigation systems after construction.

4. Engage qualified drain tile specialists, as needed to conduct or monitor repairs to drain tile systems affected by construction. Use drain tile specialists from the project area, if available.

C. GRAZING DEFERMENT

Develop grazing deferment plans with willing landowners, grazing permittees, and land management agencies to minimize grazing disturbance of revegetation efforts.

D. ROAD CROSSINGS AND ACCESS POINTS

Plan for safe and accessible conditions at all roadway crossings and access points during construction and restoration.

E. DISPOSAL PLANNING

Determine methods and locations for the regular collection, containment, and disposal of excess construction materials and debris (e.g., timber, slash, mats, garbage, drill cuttings and fluids, excess rock) throughout the construction process. Disposal of materials for beneficial reuse must not result in adverse environmental impact and is subject to compliance with all applicable survey, landowner or land management agency approval, and permit requirements.

F. AGENCY COORDINATION

The project sponsor must coordinate with the appropriate local, state, and federal agencies as outlined in this Plan and/or required by the FERC's Orders.

1. Obtain written recommendations from the local soil conservation authorities or land management agencies regarding permanent erosion control and revegetation specifications.

2. Develop specific procedures in coordination with the appropriate agencies to prevent the introduction or spread of invasive species, noxious weeds, and soil pests resulting from construction and restoration activities.

3. Develop specific procedures in coordination with the appropriate agencies and landowners, as necessary, to allow for livestock and wildlife movement and protection during construction.

4. Develop specific blasting procedures in coordination with the appropriate agencies that address pre- and post-blast inspections; advanced public notification; and mitigation measures for building foundations, groundwater wells, and springs. Use appropriate methods (e.g., blasting mats) to prevent damage to nearby structures and to prevent debris from entering sensitive environmental resource areas.

G. SPILL PREVENTION AND RESPONSE PROCEDURES

The project sponsor shall develop project-specific Spill Prevention and Response Procedures, as specified in section IV of the staff's Procedures. A copy must be filed with the Secretary of the FERC (Secretary) prior to construction and made available in the field on each construction spread. The filing requirement does not apply to projects constructed under the automatic authorization provisions in the FERC's regulations.

H. RESIDENTIAL CONSTRUCTION

For all properties with residences located within 50 feet of construction work areas, project sponsors shall: avoid removal of mature trees and landscaping within the construction work area unless necessary for safe operation of construction equipment, or as specified in landowner agreements; fence the edge of the construction work area for a distance of 100 feet on either side of the residence; and restore all lawn areas and landscaping immediately following clean up operations, or as specified in landowner agreements. If seasonal or other weather conditions prevent compliance with these time frames, maintain and monitor temporary erosion controls (sediment barriers and mulch) until conditions allow completion of restoration.

I. WINTER CONSTRUCTION PLANS

If construction is planned to occur during winter weather conditions, project sponsors shall develop and file a project-specific winter construction plan with the FERC application. This filing requirement does not apply to projects constructed under the automatic authorization provisions of the FERC's regulations.

The plan shall address:

1. winter construction procedures (e.g., snow handling and removal, access road construction and maintenance, soil handling under saturated or frozen conditions, topsoil stripping);

2. stabilization and monitoring procedures if ground conditions will delay restoration until the following spring (e.g., mulching and erosion controls, inspection and reporting, stormwater control during spring thaw conditions); and

3. final restoration procedures (e.g., subsidence and compaction repair, topsoil replacement, seeding).

IV. INSTALLATION

A. APPROVED AREAS OF DISTURBANCE

1. Project-related ground disturbance shall be limited to the construction right-of-way, extra work space areas, pipe storage yards, borrow and disposal areas, access roads, and other areas approved in the FERC's Orders. Any project-related ground disturbing activities outside these areas will require prior Director approval. This requirement does not apply to activities needed to comply with the Plan and Procedures (i.e., slope breakers, energy-dissipating devices, dewatering structures, drain tile system repairs) or minor field realignments and workspace shifts per landowner needs and requirements that do not affect other landowners or sensitive environmental resource areas. All construction or restoration activities outside of authorized areas are subject to all applicable survey and permit requirements, and landowner easement agreements.

2. The construction right-of-way width for a project shall not exceed 75 feet or that described in the FERC application unless otherwise modified by a FERC Order. However, in limited, non-wetland areas, this construction right-of-way width may be expanded by up to 25 feet without Director approval to accommodate full construction right-of-way topsoil segregation and to ensure safe construction where topographic conditions (e.g., side-slopes) or soil limitations require it. Twenty-five feet of extra construction right-of-way width may also be used in limited, non-wetland or non-forested areas for truck turn-arounds where no reasonable alternative access exists.

   Project use of these additional limited areas is subject to landowner or land management agency approval and compliance with all applicable survey and permit requirements. When additional areas are used, each one shall be identified and the need explained in the weekly or biweekly construction reports to the FERC, if required. The following material shall be included in the reports:

   a. the location of each additional area by station number and reference to previously filed alignment sheets, or updated alignment sheets showing the additional areas;

   b. identification of the filing at FERC containing evidence that the additional areas were previously surveyed; and

c. a statement that landowner approval has been obtained and is available in project files.

Prior written approval of the Director is required when the authorized construction right-of-way width would be expanded by more than 25 feet.

B. TOPSOIL SEGREGATION

1. Unless the landowner or land management agency specifically approves otherwise, prevent the mixing of topsoil with subsoil by stripping topsoil from either the full work area or from the trench and subsoil storage area (ditch plus spoil side method) in:

   a. cultivated or rotated croplands, and managed pastures;

   b. residential areas;

   c. hayfields; and

   d. other areas at the landowner's or land managing agency's request.

2. In residential areas, importation of topsoil is an acceptable alternative to topsoil segregation.

3. Where topsoil segregation is required, the project sponsor must:

   a. segregate at least 12 inches of topsoil in deep soils (more than 12 inches of topsoil); and

   b. make every effort to segregate the entire topsoil layer in soils with less than 12 inches of topsoil.

4. Maintain separation of salvaged topsoil and subsoil throughout all construction activities.

5. Segregated topsoil may not be used for padding the pipe, constructing temporary slope breakers or trench plugs, improving or maintaining roads, or as a fill material.

6. Stabilize topsoil piles and minimize loss due to wind and water erosion with use of sediment barriers, mulch, temporary seeding, tackifiers, or functional equivalents, where necessary.

C. DRAIN TILES

1. Mark locations of drain tiles damaged during construction.

2. Probe all drainage tile systems within the area of disturbance to check for damage.

3. Repair damaged drain tiles to their original or better condition. Do not use filter-covered drain tiles unless the local soil conservation authorities and the landowner agree. Use qualified specialists for testing and repairs.

4. For new pipelines in areas where drain tiles exist or are planned, ensure that the depth of cover over the pipeline is sufficient to avoid interference with drain tile systems. For adjacent pipeline loops in agricultural areas, install the new pipeline with at least the same depth of cover as the existing pipeline(s).

D. IRRIGATION

Maintain water flow in crop irrigation systems, unless shutoff is coordinated with affected parties.

E. ROAD CROSSINGS AND ACCESS POINTS

1. Maintain safe and accessible conditions at all road crossings and access points during construction.

2. If crushed stone access pads are used in residential or agricultural areas, place the stone on synthetic fabric to facilitate removal.

3. Minimize the use of tracked equipment on public roadways. Remove any soil or gravel spilled or tracked onto roadways daily or more frequent as necessary to maintain safe road conditions. Repair any damages to roadway surfaces, shoulders, and bar ditches.

F. TEMPORARY EROSION CONTROL

Install temporary erosion controls immediately after initial disturbance of the soil. Temporary erosion controls must be properly maintained throughout construction (on a daily basis) and reinstalled as necessary (such as after backfilling of the trench) until replaced by permanent erosion controls or restoration is complete.

1. Temporary Slope Breakers

   a. Temporary slope breakers are intended to reduce runoff velocity and divert water off the construction right-of-way. Temporary slope

breakers may be constructed of materials such as soil, silt fence, staked hay or straw bales, or sand bags.

b. Install temporary slope breakers on all disturbed areas, as necessary to avoid excessive erosion. Temporary slope breakers must be installed on slopes greater than 5 percent where the base of the slope is less than 50 feet from waterbody, wetland, and road crossings at the following spacing (closer spacing shall be used if necessary):

Slope (%)	Spacing (feet)
5 - 15	300
>15 - 30	200
>30	100

c. Direct the outfall of each temporary slope breaker to a stable, well vegetated area or construct an energy-dissipating device at the end of the slope breaker and off the construction right-of-way.

d. Position the outfall of each temporary slope breaker to prevent sediment discharge into wetlands, waterbodies, or other sensitive environmental resource areas.

2. Temporary Trench Plugs

Temporary trench plugs are intended to segment a continuous open trench prior to backfill.

a. Temporary trench plugs may consist of unexcavated portions of the trench, compacted subsoil, sandbags, or some functional equivalent.

b. Position temporary trench plugs, as necessary, to reduce trenchline erosion and minimize the volume and velocity of trench water flow at the base of slopes.

3. Sediment Barriers

Sediment barriers are intended to stop the flow of sediments and to prevent the deposition of sediments beyond approved workspaces or into sensitive resources.

a. Sediment barriers may be constructed of materials such as silt fence, staked hay or straw bales, compacted earth (e.g., driveable berms across travelways), sand bags, or other appropriate materials.

b. At a minimum, install and maintain temporary sediment barriers across the entire construction right-of-way at the base of slopes greater than 5 percent where the base of the slope is less than 50 feet from a waterbody, wetland, or road crossing until revegetation is successful as defined in this Plan. Leave adequate room between the base of the slope and the sediment barrier to accommodate ponding of water and sediment deposition.

c. Where wetlands or waterbodies are adjacent to and downslope of construction work areas, install sediment barriers along the edge of these areas, as necessary to prevent sediment flow into the wetland or waterbody.

4. Mulch

a. Apply mulch on all slopes (except in cultivated cropland) concurrent with or immediately after seeding, where necessary to stabilize the soil surface and to reduce wind and water erosion. Spread mulch uniformly over the area to cover at least 75 percent of the ground surface at a rate of 2 tons/acre of straw or its equivalent, unless the local soil conservation authority, landowner, or land managing agency approves otherwise in writing.

b. Mulch can consist of weed-free straw or hay, wood fiber hydromulch, erosion control fabric, or some functional equivalent.

c. Mulch all disturbed upland areas (except cultivated cropland) before seeding if:

(1) final grading and installation of permanent erosion control measures will not be completed in an area within 20 days after the trench in that area is backfilled (10 days in residential areas), as required in section V.A.1; or

(2) construction or restoration activity is interrupted for extended periods, such as when seeding cannot be completed due to seeding period restrictions.

d. If mulching before seeding, increase mulch application on all slopes within 100 feet of waterbodies and wetlands to a rate of 3 tons/acre of straw or equivalent.

e. If wood chips are used as mulch, do not use more than 1 ton/acre and add the equivalent of 11 lbs/acre available nitrogen (at least 50 percent of which is slow release).

f. Ensure that mulch is adequately anchored to minimize loss due to wind and water.

g. When anchoring with liquid mulch binders, use rates recommended by the manufacturer. Do not use liquid mulch binders within 100 feet of wetlands or waterbodies, except where the product is certified environmentally non-toxic by the appropriate state or federal agency or independent standards-setting organization.

h. Do not use synthetic monofilament mesh/netted erosion control materials in areas designated as sensitive wildlife habitat, unless the product is specifically designed to minimize harm to wildlife. Anchor erosion control fabric with staples or other appropriate devices.

V. RESTORATION

A. CLEANUP

1. Commence cleanup operations immediately following backfill operations. Complete final grading, topsoil replacement, and installation of permanent erosion control structures within 20 days after backfilling the trench (10 days in residential areas). If seasonal or other weather conditions prevent compliance with these time frames, maintain temporary erosion controls (i.e., temporary slope breakers, sediment barriers, and mulch) until conditions allow completion of cleanup.

   If construction or restoration unexpectedly continues into the winter season when conditions could delay successful decompaction, topsoil replacement, or seeding until the following spring, file with the Secretary for the review and written approval of the Director, a winter construction plan (as specified in section III.I). This filing requirement does not apply to projects constructed under the automatic authorization provisions of the FERC's regulations.

2. A travel lane may be left open temporarily to allow access by construction traffic if the temporary erosion control structures are installed as specified in section IV.F. and inspected and maintained as specified in sections II.B.12 through 14. When access is no longer required the travel lane must be removed and the right-of-way restored.

3. Rock excavated from the trench may be used to backfill the trench only to the top of the existing bedrock profile. Rock that is not returned to the trench shall be considered construction debris, unless approved for use as mulch or for some other use on the construction work areas by the landowner or land managing agency.

4. Remove excess rock from at least the top 12 inches of soil in all cultivated or rotated cropland, managed pastures, hayfields, and residential areas, as well as other areas at the landowner's request. The size, density, and distribution of rock on the construction work area shall be similar to adjacent areas not disturbed by construction. The landowner or land management agency may approve other provisions in writing.

5. Grade the construction right-of-way to restore pre-construction contours and leave the soil in the proper condition for planting.

6. Remove construction debris from all construction work areas unless the landowner or land managing agency approves leaving materials onsite for beneficial reuse, stabilization, or habitat restoration.

7. Remove temporary sediment barriers when replaced by permanent erosion control measures or when revegetation is successful.

B. PERMANENT EROSION CONTROL DEVICES

1. Trench Breakers

   a. Trench breakers are intended to slow the flow of subsurface water along the trench. Trench breakers may be constructed of materials such as sand bags or polyurethane foam. Do not use topsoil in trench breakers.

   b. An engineer or similarly qualified professional shall determine the need for and spacing of trench breakers. Otherwise, trench breakers shall be installed at the same spacing as and upslope of permanent slope breakers.

   c. In agricultural fields and residential areas where slope breakers are not typically required, install trench breakers at the same spacing as if permanent slope breakers were required.

   d. At a minimum, install a trench breaker at the base of slopes greater than 5 percent where the base of the slope is less than 50 feet from a waterbody or wetland and where needed to avoid draining a waterbody or wetland. Install trench breakers at wetland boundaries, as specified in the Procedures. Do not install trench breakers within a wetland.

2. Permanent Slope Breakers

a. Permanent slope breakers are intended to reduce runoff velocity, divert water off the construction right-of-way, and prevent sediment deposition into sensitive resources. Permanent slope breakers may be constructed of materials such as soil, stone, or some functional equivalent.

b. Construct and maintain permanent slope breakers in all areas, except cultivated areas and lawns, unless requested by the landowner, using spacing recommendations obtained from the local soil conservation authority or land managing agency.

In the absence of written recommendations, use the following spacing unless closer spacing is necessary to avoid excessive erosion on the construction right-of-way:

Slope (%)	Spacing (feet)
5 - 15	300
>15 - 30	200
>30	100

c. Construct slope breakers to divert surface flow to a stable area without causing water to pool or erode behind the breaker. In the absence of a stable area, construct appropriate energy-dissipating devices at the end of the breaker.

d. Slope breakers may extend slightly (about 4 feet) beyond the edge of the construction right-of-way to effectively drain water off the disturbed area. Where slope breakers extend beyond the edge of the construction right-of-way, they are subject to compliance with all applicable survey requirements.

C. SOIL COMPACTION MITIGATION

1. Test topsoil and subsoil for compaction at regular intervals in agricultural and residential areas disturbed by construction activities. Conduct tests on the same soil type under similar moisture conditions in undisturbed areas to approximate preconstruction conditions. Use penetrometers or other appropriate devices to conduct tests.

2. Plow severely compacted agricultural areas with a paraplow or other deep tillage implement. In areas where topsoil has been segregated, plow the subsoil before replacing the segregated topsoil.

If subsequent construction and cleanup activities result in further compaction, conduct additional tilling.

3. Perform appropriate soil compaction mitigation in severely compacted residential areas.

D. REVEGETATION

1. General

a. The project sponsor is responsible for ensuring successful revegetation of soils disturbed by project-related activities, except as noted in section V.D.1.b.

b. Restore all turf, ornamental shrubs, and specialized landscaping in accordance with the landowner's request, or compensate the landowner. Restoration work must be performed by personnel familiar with local horticultural and turf establishment practices.

2. Soil Additives

Fertilize and add soil pH modifiers in accordance with written recommendations obtained from the local soil conservation authority, land management agencies, or landowner. Incorporate recommended soil pH modifier and fertilizer into the top 2 inches of soil as soon as practicable after application.

3. Seeding Requirements

a. Prepare a seedbed in disturbed areas to a depth of 3 to 4 inches using appropriate equipment to provide a firm seedbed. When hydroseeding, scarify the seedbed to facilitate lodging and germination of seed.

b. Seed disturbed areas in accordance with written recommendations for seed mixes, rates, and dates obtained from the local soil conservation authority or the request of the landowner or land management agency. Seeding is not required in cultivated croplands unless requested by the landowner.

c. Perform seeding of permanent vegetation within the recommended seeding dates. If seeding cannot be done within those dates, use appropriate temporary erosion control measures discussed in section IV.F and perform seeding of permanent vegetation at the beginning of the next recommended seeding season. Dormant seeding or temporary

seeding of annual species may also be used, if necessary, to establish cover, as approved by the Environmental Inspector. Lawns may be seeded on a schedule established with the landowner.

d. In the absence of written recommendations from the local soil conservation authorities, seed all disturbed soils within 6 working days of final grading, weather and soil conditions permitting, subject to the specifications in section V.D.3.a through V.D.3.c.

e. Base seeding rates on Pure Live Seed. Use seed within 12 months of seed testing.

f. Treat legume seed with an inoculant specific to the species using the manufacturer's recommended rate of inoculant appropriate for the seeding method (broadcast, drill, or hydro).

g. In the absence of written recommendations from the local soil conservation authorities, landowner, or land managing agency to the contrary, a seed drill equipped with a cultipacker is preferred for seed application.

Broadcast or hydroseeding can be used in lieu of drilling at double the recommended seeding rates. Where seed is broadcast, firm the seedbed with a cultipacker or roller after seeding. In rocky soils or where site conditions may limit the effectiveness of this equipment, other alternatives may be appropriate (e.g., use of a chain drag) to lightly cover seed after application, as approved by the Environmental Inspector.

VI. OFF-ROAD VEHICLE CONTROL

To each owner or manager of forested lands, offer to install and maintain measures to control unauthorized vehicle access to the right-of-way. These measures may include:

A. signs;

B. fences with locking gates;

C. slash and timber barriers, pipe barriers, or a line of boulders across the right-of-way; and

D. conifers or other appropriate trees or shrubs across the right-of-way.

VII. POST-CONSTRUCTION ACTIVITIES AND REPORTING

A. MONITORING AND MAINTENANCE

1. Conduct follow-up inspections of all disturbed areas, as necessary, to determine the success of revegetation and address landowner concerns. At a minimum, conduct inspections after the first and second growing seasons.

2. Revegetation in non-agricultural areas shall be considered successful if upon visual survey the density and cover of non-nuisance vegetation are similar in density and cover to adjacent undisturbed lands. In agricultural areas, revegetation shall be considered successful when upon visual survey, crop growth and vigor are similar to adjacent undisturbed portions of the same field, unless the easement agreement specifies otherwise.

   Continue revegetation efforts until revegetation is successful.

3. Monitor and correct problems with drainage and irrigation systems resulting from pipeline construction in agricultural areas until restoration is successful.

4. Restoration shall be considered successful if the right-of-way surface condition is similar to adjacent undisturbed lands, construction debris is removed (unless otherwise approved by the landowner or land managing agency per section V.A.6), revegetation is successful, and proper drainage has been restored.

5. Routine vegetation mowing or clearing over the full width of the permanent right-of-way in uplands shall not be done more frequently than every 3 years. However, to facilitate periodic corrosion/leak surveys, a corridor not exceeding 10 feet in width centered on the pipeline may be cleared at a frequency necessary to maintain the 10-foot corridor in an herbaceous state. In no case shall routine vegetation mowing or clearing occur during the migratory bird nesting season between April 15 and August 1 of any year unless specifically approved in writing by the responsible land management agency or the U.S. Fish and Wildlife Service.

6. Efforts to control unauthorized off-road vehicle use, in cooperation with the landowner, shall continue throughout the life of the project. Maintain signs, gates, and permanent access roads as necessary.

B. REPORTING

1. The project sponsor shall maintain records that identify by milepost:

   a. method of application, application rate, and type of fertilizer, pH modifying agent, seed, and mulch used;

   b. acreage treated;

   c. dates of backfilling and seeding;

   d. names of landowners requesting special seeding treatment and a description of the follow-up actions;

   e. the location of any subsurface drainage repairs or improvements made during restoration; and

   f. any problem areas and how they were addressed.

2. The project sponsor shall file with the Secretary quarterly activity reports documenting the results of follow-up inspections required by section VII.A.1; any problem areas, including those identified by the landowner; and corrective actions taken for at least 2 years following construction.

   The requirement to file quarterly activity reports with the Secretary does not apply to projects constructed under the automatic authorization, prior notice, or advanced notice provisions in the FERC's regulations.