2-2 **Updated October 1, 2007**

Data Request:

Please provide the exact locations of pipe yards, other staging yards and roads subject to sustained construction traffic.

Response:

Keystone's pipeline construction plan has been finalized for 2008, it will include work in Marshall and Day Counties. The locations of proposed contractor and pipe yards are subject to Keystone's ability to successfully conclude negotiations for use of these sites. These locations are depicted on the following attached drawings:

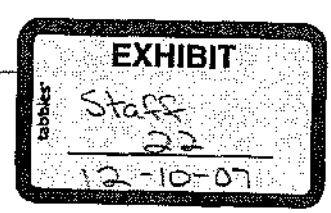
• Drwg. No. SD-PY-8.9-R1	Pipe Yard & Rail Siding	Amherst – MP 237.5
• Drwg. No. SD-PY-9.4-R0	Pipe Yard	Conde – MP 268
• Drwg. No. SD-RS-9.5-R0	Rail Siding	Andover – MP 255
• Drwg. No. SD-PC-1.0-R0	Pipe Yard & Rail Siding	Iroquois – MP 339
• Drwg. No. SD-CY-6.5-R0	Contractor Yard	Aberdeen – MP N/A

Roads anticipated to have sustained construction traffic are depicted on the following attached drawing:

- Drwg. No. 1805-03-ML-00-81 Construction Traffic Map (sheets 1 and 2 of 2)

Keystone's pipeline construction plan for 2009 is expected to be completed in the spring of 2008. It will include work in Clark, Beadle, Kingsbury, Miner, McCook, Hutchinson, and Yankton counties. The locations of the pipe yards, other staging yards and roads subject to sustained construction traffic will be submitted by July 1, 2008 for these counties.

Response prepared by: L.A. Gray



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Data Request:

Please provide a more detailed, and to the extent possible, quantitative assessment of the construction activities effects on the following areas other than what is provided in the application:

a. Housing supplies;
b. Educational facilities and manpower;
c. Water supply and distribution;
d. Waste water treatment and collection;
e. Solid waste disposal and collection;
f. Law enforcement;
g. Transportation;
h. Fire protection;
i. Health;
j. Recreation;
k. Government; and
l. Energy.

Response:

a. Housing supplies

It is expected that most project workers will use temporary housing, such as rental units, hotels/motels, campgrounds, and recreational vehicle parks. In the South Dakota counties that the pipeline corridor crosses, there are approximately 9,530 available rental units, 86 motels, 27 campgrounds, and seven Recreational Vehicle ("RV") Parks. These accommodations are all within approximately 40 – 50 miles of the pipeline corridor. Pipeline construction in South Dakota will be completed over two years with the peak construction months being from June through November. During the 2008 construction season, Keystone will utilize one construction spread and estimates the need for 500 to 600 pipeline construction workers. In 2009, Keystone will utilize two construction spreads and estimates 1,000 to 1,200 pipeline construction workers. It is anticipated that most of the temporary workers will seek housing in the more populated, service-oriented towns located within a reasonable commuting distance to the work site. With the total

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number of available temporary housing units, there should be adequate housing for the project's workforce.

b. Educational facilities and manpower

Due to the transitory nature and short duration of pipeline construction, most workers do not travel with their families or enroll their children in the local schools. The pipeline corridor in South Dakota passes through twelve South Dakota counties – using the peak projected workforce of 1,000 to 1,200 workers for 2009 (2000 U.S. census cites 0.9 average children per adult = 900 to 1,080 children) and a very conservative estimate that 15% of school age children would need to be enrolled, the twelve counties involved would need to accommodate an average of approximately 11 - 14 children each for approximately one half of the school year (pipeline construction workers typically leave the project area upon completion of work). Local schools should be capable of providing more than adequate opportunities and accommodations for this number of new students.

c. Water supply and distribution

During non-working hours, pipeline workers will primarily utilize existing potable water facilities in permitted lodging facilities such as motels, campgrounds, and RV parks. These facilities are designed, built and permitted for a maximum resident capacity which includes drinking water use. New or expanded potable water supply will not be required. There should not be any significant impacts from workers for the pipeline project on local communities' water supply or storage systems. At pipeline work sites, bottled water will be provided for drinking.

Water will be utilized along the pipeline corridor for dust control on the right-of-way ("ROW") and hydrostatic testing of the pipeline once it is constructed. Water used for these purposes will be withdrawn from nearby surface water sources, not from municipal systems or public water supplies. Keystone will apply for and obtain a Temporary Water Use Permit from the South Dakota ("SD") Department of Natural Resources for these water uses and will comply with all requirements of that permit. Hydrostatic test water will be returned to its source after testing is completed.

The Keystone pipeline route will cross seven rural water systems in South Dakota. Keystone has or will contact the operators of these water systems for maps to identify the location of their existing water lines. Additionally, Keystone will ascertain any specific requirements for crossing these water lines. Prior to initiating grading or construction activities, Keystone will determine the exact location of those pipelines by notifying the "One-Call" locate system and coordinating physical location of the existing water lines. Typically, existing utilities, including water lines, are crossed by installing the pipeline a

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minimum of 12" separation beneath the existing utility while the existing utility remains in operation.

d. Waste water treatment and collection

During non-working hours, pipeline workers will utilize existing sanitary sewage collection facilities in permitted lodging facilities such as motels, campgrounds, and RV parks. These facilities are designed, built and permitted for a maximum resident capacity which includes sanitary use. New or expanded sanitary sewage treatment facilities will not be required. There should not be any significant impacts from workers for the pipeline project on individual septic systems or local communities' treatment works.

At pipeline work sites, portable toilets will be provided. These temporary units will be regularly serviced by a permitted waste disposal company. No other waste water will be generated from construction activities.

e. Solid waste disposal and collection

There will be increased utilization of solid waste management facilities in South Dakota due to the pipeline construction offices, the influx of temporary construction workers utilizing local lodging and services and solid wastes from pipeline construction (stumps, rock, spacer ropes, end caps, welding rods, pipe shavings, and other trash/debris). It is anticipated that there will be one spread construction office in 2008 and two spread construction offices in 2009 in South Dakota. Each construction office will be associated with a contractor yard. Each office will consist of five to six office trailers, utilizing approximately 20 to 30 full-time workers. These construction offices would each produce the same amount of solid waste such as paper, cardboard and general office waste in volumes comparable to a small commercial office.

Construction contractors will collect solid waste from the ROW and return it to the closest contractor yard. Several dumpsters and roll-off boxes will be stationed onsite at each contractor yard. A waste disposal company will be contracted to haul these containers when full to local permitted landfills. Used oils and grease that are not contaminated with solvents will be collected in dedicated and labelled used oil containers and will be transported by a licensed hauler to an oil recycling company. Hazardous wastes, which will be limited to very small volumes of paint and solvents, will be transported to permitted hazardous waste disposal facilities by licensed transporters. Keystone will monitor the proper management, disposal and recordkeeping required for hazardous waste. Construction activities will not generate any wastes that are highly toxic or unusual in composition – wastes should be readily handled and disposed of at local waste disposal sites.

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f. Law enforcement

The linear nature of pipeline construction dictates that pipeline workers often spend a limited amount of time in each given community since these employees will work 10 to 12 hour days, six days a week. It is anticipated that the 27 local law enforcement agencies along the pipeline corridor in South Dakota will have adequate full and part-time law enforcement officers to accommodate the temporary population increase from the pipeline project. However, the temporary increases in local population from the project could result in a minor short-term increase in workloads for those agencies.

Workplace accidents on the ROW, as well as vehicular accidents, are representative of the types of incidents that emergency departments may be responding to during pipeline construction. Since response times may be lengthy due to communication, dispatch, and travel time considerations, Keystone will implement several procedures to support and optimize emergency response. All supervisory personnel will receive first aid and cardiopulmonary resuscitation ("CPR") training. A communications protocol for emergencies will also be established that may include direct contact of local ambulance services, escort of emergency response vehicles from major highways and transport of injured personnel by Keystone, if necessary. Keystone will work with local law enforcement, fire departments, and emergency medical services to determine the best course of action and coordinate for effective emergency response.

g. Transportation

Transportation Routes

Keystone will identify transportation routes to be utilized during construction in consultation with county and municipal authorities along the pipeline route. To the extent possible, transportation routes for line pipe and heavy equipment will be developed to avoid main routes through towns and near schools.

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Permitting

The following state agency has jurisdiction over the federal and state highway system in South Dakota and is responsible for issuing transportation-related permits to accommodate construction vehicles and traffic.

Department of Commerce and Regulation
Division of Highway Patrol
500 E. Capital Avenue
Pierre, SD 57501-5070
(605) 773-4578 (information)
(605) 698-3925 (permit center)

In addition, Keystone expects local road permitting to be conducted at the county and township level. Keystone has initiated contacts with local permitting authorities, including the South Dakota Association of Towns and Townships, for the purpose of obtaining permits and establishing timelines for road approvals.

Traffic Impacts and Road Crossings

The transportation system will be minimally impacted by construction and by the travel of construction workers and equipment due to the generally rural nature of the project area in South Dakota. Impacts will vary depending on the conditions and capacities of the roadways and transportation routes used by the project. Since many of the local roadways in the project area are unpaved, they may be subject to excessively wet or dry conditions. Any damage to unpaved roads will be repaired to pre-existing conditions or better, following construction. Special attention will be paid to safety concerns or the concerns of residents along the roadways. Since construction will move sequentially along the pipeline route, most transportation impacts will be temporary on any given roadway.

The pipeline will typically be installed by horizontal boring underneath all paved or improved surface roadways, wherever possible. Private and unimproved roadways generally involve pipeline installation using the open cut construction method unless site-specific circumstances or county requirements dictate otherwise. Temporary travel measures, such as steel plates or temporary diversion roads, will be available during open cut construction to allow passage of emergency vehicles, as necessary. Construction personnel will be stationed appropriately to manage local traffic safely and with minimum delays at any open cut pipeline crossing locations.

A temporary increase in traffic is expected from commuter (worker) traffic and from the transportation of equipment and materials. Typically, workers are expected to be onsite prior to peak morning commuting hours and they depart after peak evening commuting

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hours. The initial staging, which will involve transporting the bulk of construction equipment and materials to the respective spread contractor yards and the ROW, and the daily transportation of additional equipment and materials may temporarily affect local transportation. To maintain safe conditions and minimize impacts to road surfaces, major highways will be used to the extent possible to transport slow-moving, heavy construction equipment to the spreads and ROW. To maintain safe conditions, Keystone would direct its construction contractors to ensure compliance with local weight restrictions and limitations by its vehicles and to remove any soil that is left on the road surface from construction equipment. There will be isolated hauling of equipment that will require special permits for weight and/or width and a corresponding increased temporary demand for permits for these vehicle loads and widths. All applicable local, state, and federal traffic control measures will be followed to ensure the safety of the local traffic as well as the construction traffic.

State and local road approval processes related to traffic will commence in late 2007 and continue throughout construction in 2008 and 2009. Input from the pipeline construction contractors and pipe suppliers will be required to obtain appropriate approvals. Any required traffic studies will be completed at that time.

h. Fire protection

Within the Keystone project area in South Dakota, there are 39 local fire departments within approximately 30 miles of the pipeline route. These local fire departments are identified in the following table:

County	Municipality
Marshall	Eden – Eden Fire Department
	Langford - Langford Volunteer Fire Department
	Britton - North Marshall Fire Department
	Britton - Sunset Fire Department
	Veblen - Veblen Volunteer Fire Department
Day	Andover - Andover Volunteer Fire Department
	Bristol - Bristol Fire Department
	Pierpont - Pierpont Rural Fire Department
	Waubay - Waubay Volunteer Fire Department
	Webster - Webster Fire Department
Clark	Clark - Clark Volunteer Fire Department
	Raymond - Raymond Fire Community Association
	Vienna - Vienna Rural Fire Department

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County	Municipality
Beadle	Cavour - Cavour Volunteer Fire Department Hitchcock - Hitchcock Community Fire Department Huron - Huron Fire Department Wessington - Wessington Rural Fire Department
Kingsbury	Arlington - Arlington Volunteer Fire Department De Smet – De Smet Fire Department Iroquois - Iroquois Fire & Rescue District – Iroquois Lake Preston – Lake Preston Volunteer Fire Department Oldham– Oldham Volunteer Fire Department
Miner	Canova – Canova Fire Department Howard – Howard Volunteer Fire Department
Hanson	Ethan – Ethan Fire Department Mitchell – Mitchell Fire & Ambulance Mt Vernon – Mt Vernon Fire Department
McCook	Montrose – Montrose Volunteer Fire Department Salem - Salem Fire Department Spencer - Spencer Volunteer Fire Department
Hutchinson	Freeman – Freeman Fire Department Menno – Menno Fire Department Parkston – Parkston Fire Department Tripp - Tripp Fire Department
Yankton	Gayville– Gayville Community Fire Department Lesterville - Lesterville Fire & Rescue Utica – Utica Volunteer Fire Department Volia – Volia Fire Department Yankton - Yankton Fire Department

Although the potential is relatively low, fire emergencies are the type of incident that these fire and emergency departments may be responding to during pipeline construction. Response times may be lengthy given communication, dispatch, and travel time considerations. Since response times may be lengthy due to communication, dispatch, and travel time considerations, Keystone and its contractors will provide immediate fire response training to construction personnel. Keystone will work with local law enforcement and fire departments to determine the best course of action and coordinate for effective emergency response.

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Keystone's contractors will comply with all federal, state, county and local fire regulations pertaining to burning permits and the prevention of uncontrolled fires. Each contractor will provide equipment to handle any possible fire emergency. Equipment will include, but not be limited to, water trucks, portable water pumps, chemical fire extinguishers, hand tools such as shovels, axes, chain saws, etc. and heavy equipment adequate for the construction of fire breaks when required. Each Keystone contractor will also be responsible for supplying and maintaining an adequate supply of company approved fire extinguishers for each crew that is engaged in work such as welding, cutting, grinding, or burning of brush or vegetative debris and similar activities.

Keystone will require its pipeline contractors to develop a comprehensive fire prevention and suppression plan for implementation during pipeline construction.

i. Health

There are 26 health facilities (e.g., hospitals, urgent care clinics) serving the South Dakota counties that are affected by the Keystone pipeline corridor. These local health facilities are identified in the following table:

County	Health Care Facility and Location
Marshall	Marshall County Health Care Center/Avera Health (Britton) Avera Saint Lukes (Aberdeen) Coteau Des Prairies Hospital (Sisseton)
Day	Lake Area Hospital (Webster)
Clark	Prairie Lakes Healthcare Systems – Hospital (Watertown) Community Memorial Hospital (Redfield)
Beadle	Huron Regional Medical Center (Huron)
Kingsbury	De Smet Memorial Hospital (De Smet) Brookings Hospital (Brookings)
Miner	Madison Community Hospital (Madison) Avera Weskota Memorial Medical Center (Wessington Springs)
Hanson	Avera Queen of Peace Hospital (Mitchell)
McCook	Sioux Valley USD Medical Center (Sioux Falls) Avera McKennan Hospital & University Health Center (Sioux Falls) Dell Area Health Center (Dell Rapids)
Hutchinson	Freeman Community Hospital & Nursing Home (Freeman)

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County	Health Care Facility and Location
	Avera Saint Benedict Health Center (Parkston) Douglas County Memorial Hospital (Armour) Pioneer Memorial Hospital (Viborg) Canton-Inwood Memorial Hospital (Canton)
Yankton	Landmann-Jungmann Memorial Hospital (Scotland) Saint Michael's Hospital & Nursing Home (Tyndall) Avera Sacred Heart Hospital (Yankton) South Dakota Human Services Center (Yankton) Sioux Valley Vermilion Medical Center (Vermillion) Wagner Community Memorial Hospital (Wagner)

Keystone expects to utilize these local health facilities to provide health services to Keystone workers during the construction and operation phases of the project, as necessary.

Worker and employee safety is of the utmost concern on the Keystone project. Rigorous and frequent safety training is required of all Keystone employees and contractors before access is allowed on the ROW during the construction phase of the project. While it is anticipated that a small number of injuries and minor illnesses will occur, there should not be any sizeable demands on or impacts to the local health care facilities as a result of this project.

As part of its health and safety planning, Keystone will develop a list of emergency responders near the route that will include phone numbers, and emergency response capabilities. The list of emergency responder will also include regional hospitals with helicopter emergency response capability, as well as specialized services that may exceed the capabilities of local medical units.

j. Recreation

Eastern South Dakota has extensive recreational opportunities including swimming, boating, open water fishing, ice fishing, hiking, camping, hunting, exploring, biking, sightseeing, and photography. The area lakes, streams and other waterbodies provide yearly recreational opportunities to residents and visitors. Some temporary workers will buy hunting and fishing licenses and utilize them during the project construction period. In South Dakota, the Keystone project passes near seven recreation areas and four state parks which are identified in the table below. However, long work days (10 to 12 hours per day) and six day work weeks will curtail impacts to state parks and local recreation

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areas. Camping day limits in most recreational areas are expected to discourage workers from using these areas as home base sites during construction.

County	Recreation Areas/State Parks
Marshall	Roy Lake State Park
	Fort Sisesston State Park
	Sica Hollow State Park
Day	Pickerel Lake State Park
	Pierpont Lake Recreation Area
Yankton	Cottonwood Recreation Area
	Gavins Point Recreation Area
	Midway Recreation Area
Yankton – cont.	Chief White Crane Recreation Area
	Lesterville Recreation Area
	Pierson Ranch Recreation Area

There should be limited recreational availability impacts from pipeline workers and it is not expected that workers will overtax the many recreational facilities in the area of the project.

k. Government

The only additional demand on government services will be an increase in requested permits and approvals from South Dakota and local agencies. This will require time initially from agency employees to discuss, review and process permit applications and for some types of permits, follow-up after permit issuance such as inspections, report review and project recordkeeping.

Permit application submittals will be provided well in advance of project activities to allow agencies to schedule the time required and minimize workload and budget impacts. Should an agency experience significant budget impacts, Keystone will work with that agency on potential reimbursement.

l. Energy

During construction of the pipeline, power will be generated on the ROW by on-site diesel fueled generators – these generators will be operated only during working hours. Other temporary short term uses of power during the construction phase are expected to be minimal and relegated to powering field construction offices. Since local electric

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cooperatives, not Keystone, will be constructing and operating the electrical power lines, the electric coops will be responsible for obtaining any necessary approvals or authorizations from federal, state, and local governments.

There will also be a temporary increase in power demand from increased use of temporary housing facilities but that power use will be within the permitted design of each housing facility's electrical system.

Electrical service requirements for operation of project components include utilizing existing service lines and constructing electrical transmission and distribution power lines to pump stations. This power supply is expected to be provided by existing local electric coops, utilizing existing power generation capacity. No new generation capacity will be required and new transmission capacity will be limited to power supply to the four pump stations.

2-2

Data Request:

Please provide the exact locations of pipe yards, other staging yards and roads subject to sustained construction traffic.

Response:

Keystone is in the process of finalizing the pipe yard and contractor yard locations in South Dakota. Once finalized, these yards will define the roads that will be subject to sustained construction traffic. Keystone will submit the requested data on or before October 1, 2007.

Response prepared by: L.A. Gray

2-3

Data Request:

Please provide electronic shape files for the route maps provided in data response 1-2.

Response:

The attached shape files contain all the latest routing data available and contain the following:

- Centerline;
- Permanent easement;
- Temporary easement;
- Mile posts;
- Extra workspaces;
- Pump stations; and
- Access Roads.

Response prepared by: Michael James Koski

2-4

Data Request:

Please provide the current locations of the shutoff valves as they were missing from the maps provided in data response 1-2.

Response:

The attached shape file contains the most up to date valve locations.

Response prepared by: Michael James Koski

2-5

Data Request:

Please update all sections of the application to reflect all changes as a result of the route changes from the route submitted with the application to the route submitted in data response 1-2.

Response:

As indicated in Keystone's response to Staff's Data Request 1-2, maps were provided that delineated various physical features and public facilities in relation to the pipeline route. Subsequent to the Keystone's response to Staff's First's Data Request, additional small deviations have been incorporated into the proposed route to: 1) account for landowner requests; 2) avoid or reduce the length of wetland crossings; 3) avoid or increase the distance from residences and farm buildings; and 4) improve the pipeline location in relation to road and railroad crossings, and other utilities. Because of these route variations, Keystone recalculated the project footprint, and the relative effects on different natural resources and land uses crossed. Attached to this response are replacement pages of the application showing the magnitude of the referenced route changes.

Response prepared by: Scott Ellis

Surface disturbance associated with the construction and operation of the Keystone Pipeline Project is summarized in **Table 2**. In South Dakota, approximately 3,399~~521~~ acres of land will be disturbed during construction. This total includes temporary construction workspace and approximately 1,333~~4~~ acres that will be retained as permanent ROW. All disturbed acreage will be restored and returned to its previous use after construction, except for approximately 12 acres of permanent ROW, which will not be restored but will serve to provide adequate space for aboveground facilities, including pump stations and valves, for the life of the pipeline.

Table 2 Summary of Land Requirements in South Dakota Associated with the Keystone Pipeline Project

Facility	Land Affected During Construction (acres)	Land Affected During Operation (acres)
Pipeline ROW	2,~~829~~928	1,~~334~~333
Lateral ROWs	0	0
Additional Temporary Workspace Areas	~~170~~ 129 (approximate)	0
Pipe and Contractor Yards	~~490~~ 320 (approximate)	0
Pump Stations	22	12

Additional temporary workspace will be required at areas requiring special construction techniques (e.g., river, wetland, and road crossings; horizontal directional drill entry and exit points; steep slopes; rocky soils) and construction staging areas.

Off-ROW extra workspace areas will be required during the construction phase of the project to serve as pipe storage yards and contractor yards. Pipe storage and staging yards will be used to stockpile pipe for use during construction of the pipeline. Pipe storage yards are located at approximately 30-mile intervals along the pipeline route and typically are located in proximity to existing railroad siding facilities. Pipe yards typically will occupy approximately 20 to 30 acres. Keystone has identified 12 possible locations for pipe storage yards. These potential pipe storage yard locations are near the following towns and cities: Hecla, Ferney, Doland, Iroquois, Fedora, Bridgewater, Utica, Claremont, Groton, Yate, Emery, and Yankton. It is unlikely that Keystone will use all identified potential sites. Actual sites will be determined following discussions with pipe suppliers and contractors.

Three to five contractor yards will be required and possible locations have been identified near the following towns and cities: Aberdeen, Mitchell, Yankton, Bath, and Huron. Contractor yards will reduce worker transportation requirements during construction and will occupy approximately 15 to 20 acres. To the extent practical, Keystone proposes to use existing commercial/industrial sites or sites that previously have been used for construction. Existing public or private roads will be used to access each yard. Both pipe storage yards and contractor yards will be used on a temporary basis and will be restored upon completion of construction.

crossed using one of four techniques: the open-cut wet method (Keystone's preferred method), open-cut flume method, open-cut dam-and-pump method, or Horizontal Directional Drill (HDD) method. When crossing waterbodies, Keystone will adhere to the guidelines outlined in Keystone's CMR Plan (Exhibit B). Additional information on waterbody crossings is provided in Section 5.4.1.

2.2.6.3 Wetland Crossings

Data from wetland delineation field surveys, aerial photography, and National Wetland Inventory (NWI) map data were used to identify wetlands crossed by the proposed Keystone Mainline in South Dakota. Approximately 97 acres of wetlands will be disturbed by the construction corridor. Wetlands are classified as palustrine emergent, palustrine forested and palustrine shrub-scrub. All wetland areas that will be affected have been categorized as palustrine emergent (wet meadows) except for 0.32 acre of palustrine forested and 1.52 acres of palustrine shrub-scrub. Pipeline construction across wetlands will be similar to typical conventional upland cross-country construction procedures, with several modifications where necessary to reduce the potential for pipeline construction to affect wetland hydrology and soil structure. Specific protection measures for wetlands are described in Section 5.5.1.1

2.2.6.4 Fences and Grazing

To minimize the impacts to grazing and livestock movement, Keystone will implement protective measures on rangeland. Detail on these protective measures can be found in Section 6.1.2.2 and in the CMR Plan. All work on pasture and farmlands including access and removal of bevel shavings, litter, and garbage will be in accordance with applicable permits. Temporary gates used for access will remain closed at all times. The temporary gates will be replaced with permanent fence.

Keystone will prohibit feeding or harassment of livestock or wildlife, firearms, and pets on the construction ROW. Food and food wastes will be stored and secured.

Once construction is completed, grazing and livestock movement over the permanent ROW may resume. Landowners will be compensated for the temporary loss of land use. Grazing may return to normal after vegetation is re-established.

2.3 Operation and Maintenance

Keystone will operate and maintain the project facilities in accordance with the USDOT regulations in 49 CFR Parts 194 and 195 and other applicable federal and state regulations. Operation and maintenance of the pipeline system in most cases will be accomplished by Keystone personnel. Keystone estimates that operation of the pipeline may require a small number of permanent employees for the South Dakota segment of the pipeline. Keystone may utilize contractors to perform other services including ROW maintenance and emergency response.

2.3.1 Normal Operations and Routine Maintenance

The pipeline will be inspected periodically from the air and on foot as operating conditions permit but no less frequently than as required by 49 CFR Part 195. These surveillance activities will provide information on possible encroachments and nearby construction activities, erosion, exposed pipe, and other potential concerns that may affect the safety and operation of the pipeline. Evidence of population changes will be monitored and HCAs will be identified as required by federal regulations. HCAs, as defined by 49 CFR Section 195.450, are high population areas (urbanized

Table 3 Impact Summary

Resource	Impact Summary
	aquatic life and downstream water users. Hydrostatic test water will be discharged to the land surface at an approved location. Discharged water may evaporate or infiltrate into the soil or drainage where the water is released.
	• Pipeline construction will disturb a total of 103 acres of wetlands, river systems and open water in South Dakota. Of this total, approximately 97 acres are wetlands and 6 acres are located in river systems and open water. It is estimated that vegetation cover in palustrine emergent wetlands will recover in three to five years; recovery of forested wetlands will require 20 to 50 years. No permanent loss of wetlands will occur as a result of this project.
Vegetation	• Pipeline construction will disturb a total of 3,~~521~~399 acres including ~~633~~653 acres of native and modified grassland and ~~32~~.4 acres of forested land. It is estimated that vegetation cover in native and modified grasslands will recover in 3 to 5 years, while recovery of forests and woodlands will require 20 to 50 years in the temporary workspace. Trees will not be permitted to grow on approximately ~~1~~.52 acres of currently forested woodlands during pipeline operations to allow for aerial surveillance.
Wildlife	• Approximately ~~734~~752 acres of upland and wetland wildlife habitats will be cleared during pipeline construction and then will recover over short- and long-term time frames (see Wetlands and Vegetation above).
	• Wildlife displacement from the construction ROW is expected to be short-term. No long-term displacement impacts from increased human activity are expected.
	• There may be a potential loss of bird eggs and young from pipeline clearing activities or increased human presence, if these activities occur during the breeding season, along the entire length of the pipeline.
	• Power lines will be constructed to serve the pump stations. The power lines represent a collision hazard for waterfowl and other birds similar to existing electrical distribution lines.
Aquatic Resources	• Based on the implementation of mitigative measures at watercourse crossings, the project will experience only short-term (1 to 2 days) effects on fish and fish habitat at the four perennial river and stream crossings designed for open cut water-course crossing. These effects will consist of potential increases in total suspended solids and sediment deposition downstream from channel excavation.
Sensitive Species	• There will be a potential reduction in sensitive wildlife and aquatic species habitats as the result of pipeline construction. These habitat changes are described for wildlife and aquatic resources above.
	• Keystone received the USFWS and state wildlife agency lists of species to be evaluated for project effects. In 2006, Keystone initiated habitat and occurrence surveys for several federally listed and state sensitive species. Keystone will continue these surveys in 2007.

Table 3 Impact Summary

Resource	Impact Summary
	• Keystone will coordinate with the USFWS and state wildlife agencies to estimate direct and indirect impacts to federally listed and sensitive species and to identify pipeline route adjustments, and construction procedures that will avoid or minimize effects to these species. Keystone has adjusted its proposed pipeline route at several locations in South Dakota to reduce the length of wetland and native prairie crossings.
Land Use (including noise, transportation)	• Approximately 1,331345 acres will not be permitted to be occupied by residential or other structures within the permanent pipeline ROW and pump station sites over the life of the project. Agricultural uses (cropland) will be allowed to continue as before except at the pump station and other aboveground facility sites.
	• A small parcel of state land (approximately 0.5 acre of surface disturbance) will be crossed in South Dakota. This state land is used for wildlife management purposes. Keystone has and will continue to consult with the state manager of this land to develop site-specific crossing plans to maintain public access and existing land uses.
	• Construction noise will be generated and potentially heard at nearby (generally 0.5 mile or less) residences during daytime construction activities over a period of several weeks.
	• Long-term operational noise from pump stations will be maintained at acceptable noise level thresholds.
	• Aboveground facilities (pump stations, power lines, valves, densitometers) will exist for the life of the project. The majority of these facilities will be located in rural areas. Power lines will be located along county roads and, therefore, will pass within the view of roadside residences.
	• Short-term obstruction or temporary disruption to local roads may occur during construction across those roads. Major highways will be bored. There will be no long-term impacts to transportation.
Cultural Resources	• Keystone developed study plans that were approved by the State Historic Preservation Office. Keystone then initiated field surveys in 2006 to determine the locations of prehistoric and historic cultural resources that could be affected by surface disturbance caused by pipeline and ancillary facility construction. Cultural resource impacts could include physical disturbance of archaeological sites or architecturally significant structures and features, and introduction of visual or audible elements (e.g., pump stations) that would alter the setting of a cultural resource feature.
	• Impacts to sites that are eligible for the National Register of Historic Places (NRHP) will be mitigated by one or more of the following measures: avoidance through use of pipeline realignments and facility relocations; approved data recovery from sites that cannot be avoided; and use of landscaping or other techniques to minimize or eliminate effects on the historic setting or ambience of standing structures.
	• Construction activities could adversely affect undiscovered archaeological sites. If previously undocumented sites are discovered during construction within the construction corridor, work that could adversely affect the discovery will cease until consultation with appropriate cultural preservation agencies is completed. If a previously unidentified site is recommended as eligible to the NRHP, impacts will be mitigated through the procedures included in an Unanticipated Discovery Plan.

drilling and enlarging the hole, a slurry consisting mainly of water and bentonite clay will be circulated to power and lubricate the down-hole tools, remove drill cuttings, and hold the hole open. Pipe sections long enough to span the entire crossing will be staged and welded along the construction work area on the opposite side of the waterbody and then pulled through the drilled hole. Ideally, use of the HDD method results in no impact on the banks, bed, or water quality of the waterbody being crossed.

The Missouri River has been designated a National Recreational River at the proposed crossing at the North Dakota/South Dakota border near Yankton, South Dakota and the Niobrara/Missouri National River Area is crossed at this location. Keystone's preliminary HDD plan will avoid direct land disturbance within the NPS WSRA administrative boundary associated with this Missouri River crossing. The NPS administers, but does not own, land at the proposed crossing location. The HDD entry point will be located on City of Yankton land on the north shore; the HDD exit point will be located on private land on the south shore. Keystone conducted preliminary discussions with the NPS and the City of Yankton in February 2006. A meeting was held in Yankton on May 19, 2006, to discuss the proposed directional drill under the Missouri River. Preliminary crossing drawings were provided. A Special Use Permit was obtained from the NPS to conduct geotechnical drilling near the banks of the river. Keystone submitted copies of NPS consultation documents to the DOS in the September 15, 2006 filing. A site-specific crossing plan utilizing HDD methods has been developed, which will maintain public access to the river, and avoid disturbance of existing land uses and designations.

5.4.2 Groundwater

Based on a review of published wellhead maps and aquifer protection areas, the pipeline will cross near a water supply well in Marshall County and will cross an aquifer protection area in Kingsbury County (see **Table 5**).

Table 5 Public Water Supplies within 1 Mile of Pipeline Centerline (CL)

County	Approximate MP Marker (mi)	Well Distance From CL (mi)	Well Cardinal Direction from CL	PWS Name	Well ID
~~Marshall~~	~~235.8-236.2~~	~~Approximately 200 feet~~	~~West~~	~~Marshall County Source Water Area~~	~~Unknown~~
Kingsbury	326.7	Not Applicable	Not Applicable	Zone B Aquifer Protection Area	None

The pipeline corridor also will pass through areas where shallow and surficial aquifers exist. "Shallow" and "surficial" aquifers are considered to have the greatest potential for yielding significant quantities of water for municipal, industrial, and agricultural purposes.

Since the pipeline will be buried at a shallow depth, it is unlikely that the construction or operation of the pipeline will alter the yield from any aquifers that are used for drinking water purposes. Keystone will investigate shallow groundwater when it is encountered during construction to determine if there are any nearby livestock or domestic wells that might be affected by construction activities. Appropriate measures will be implemented to prevent groundwater contamination and steps will be taken to manage the flow of any groundwater encountered. In the event that construction of the

5.5 Terrestrial Ecosystems

5.5.1 Vegetation Communities

Vegetation types crossed by the Keystone Pipeline Project were delineated based on the review of aerial photographs, general observations made during field reconnaissance activities, and detailed information collected during wetland and waters of the U.S. delineation activities and grassland assessment surveys. Seven major vegetation types or general land use categories are crossed by the proposed route including cropland, grassland/rangeland, upland forest, non-forested wetland, forested wetland, open water and developed land. The predominant vegetation community is agricultural/cropland followed by grassland/rangeland, wetland/riparian and forest. Descriptions of the cropland, grassland/rangeland, and developed land are presented under Land Use in Section 5.7.

5.5.1.1 Wetland/Riparian

Construction of the pipeline will disturb approximately 98 acres (3 percent of the proposed corridor) of wetland/riparian areas. These wetlands are almost entirely palustrine emergent wetlands (wet meadows) – only 0.3~~1~~22 acre of forested wetlands will be affected. Effects on wetland vegetation will be greatest during and immediately following construction. To mitigate the potential for these impacts, Keystone will implement specific procedures as outlined in the CMR Plan. The construction ROW width will typically be reduced to 85 feet through wetlands with saturated soils to minimize potential effects. Keystone will restore or mitigate impacts to wetlands affected by construction activities, to the extent practicable. Pipeline construction through wetlands must comply, at a minimum, with USACE Section 404 permit conditions. Section 404(b)(1) guidelines restrict the discharge of dredged or fill material into wetland areas where a less environmentally damaging practicable alternative exists.

Smaller streams and ephemeral or intermittent drainages will likely be open cut and wetlands located in these areas will be crossed by trenching. However, no installation of surface facilities will occur in wetlands and no permanent loss of wetlands will occur as a result of this project. Herbaceous vegetation in palustrine emergent wetlands is expected to reestablish to pre-construction levels within 3 to 5 years following the completion of reclamation, resulting in a short-term loss of vegetation and available habitat for some wildlife species. Trees in forested wetlands will recover in 20 to 50 years.

As described in the CMR Plan, specific construction techniques will be used to retain the hydrological and vegetation characteristics of wetlands that will be disturbed by construction. These techniques will include:

- Narrowing the ROW for certain wetlands;
- Minimizing the duration of construction-related disturbance within wetlands to the extent practicable;
- Attempting to use no more than two layers of timber riprap to stabilize the construction ROW;
- Cutting vegetation off at ground level leaving existing root systems in place and remove it from the wetland for disposal;

Keystone will monitor revegetation success along the pipeline ROW in accordance with applicable permits and agency guidance.

5.5.2 Wildlife

5.5.2.1 Biological Consultations

Keystone developed general wildlife habitat and occurrence information from published sources and interviews with state agency staff. This information is included in the Environmental Reports provided in **Exhibit D**. Keystone coordinated with the USFWS and the South Dakota Game and Fish Department (SDGFD) to identify listed, candidate, and species of special concern that could be affected by pipeline construction and operation. Keystone obtained a list of species from both the USFWS and the South Dakota Natural Heritage Programs (SDNHP). Based on the information received, Keystone initiated biological surveys in the summer of 2006, and the winter of 2006-2007.

Keystone also initiated wetland surveys in 2006 along the pipeline as support for the U.S. Army Corps of Engineers (USACE) Section 404 permit applications. Estimates of acreages of wetlands affected by construction by type have been included in filings to the DOS.

A summary of Keystone's consultations with respect to biological resources and wetlands is provided in **Exhibit D**.

The following biological reports are included in **Exhibit D** in chronological order.

- October 2006. A Field Survey of the Keystone Pipeline Project Construction Corridor in North and South Dakota for Dakota Skipper (Hesperia dacotae), Western Prairie Fringed Orchid (Platanthera praeclara) Habitat, and for Native Grassland. Prepared by ENSR Corporation. Fort Collins, Colorado.
- October 2006. Keystone Pipeline Project Progress Report for Wetlands Surveys. Prepared by ENSR Corporation, Fort Collins, Colorado.
- March 2007. Bald Eagle and Raptor Nest Survey Report. Prepared by ENSR Corporation, Fort Collins, Colorado.

In 2007, Keystone will collect additional biological data on proposed South Dakota pump station sites, short pipeline reroute segments, proposed access roads, and on mainline pipeline segments for which access was denied in 2006.

5.5.2.2 Wildlife Habitat

Wildlife habitats along the proposed route consist of cropland, native prairie, range or pasture land, deciduous forest lands, wetlands, and aquatic habitats. A majority of the route corridor will cross cropland or other agricultural areas. Although cropland is undeveloped land that represents open space, it has limited value as wildlife habitat since vegetative cover and food sources are present primarily on a short-term basis due to seasonal harvesting and cultivation. Of the 2,~~929~~928 acres of construction ROW, approximately ~~734~~752 acres represent potential wildlife habitat.

Important wildlife habitats that will be crossed by the project route include approximately 0.5 mile of a SDGFD designated GPA and the Missouri River.

5.5.2.3 Potential Impacts to Wildlife

About ~~6368~~ percent of the approximately 3,~~524~~399 acres necessary for construction of the pipeline and ancillary facilities will consist of agricultural land that is tilled annually or already developed land. Rangeland, forestland, and wetlands together constitute about ~~37~~32 percent of the total disturbance. The effects of long-term habitat loss on native wildlife populations will be relatively small since the majority of habitat disturbance will be located in agricultural habitats.

Project construction will affect only a single big game species, white-tailed deer, since the ranges of other potential big game species are very peripheral to the project area and impacts to these wide-ranging species will be negligible or non-existent. Impacts to white-tailed deer will include the incremental loss of potential forage (native vegetation and croplands) and will result in an incremental increase in habitat fragmentation within the proposed surface disturbance areas. However, these incremental losses of vegetation will represent a small percentage (far less than 1 percent) of the overall available habitat within the project region. No sensitive habitats for white-tailed deer have been identified along the proposed route. Indirect impacts will result from increased noise levels and human presence during surface disturbance activities. Because white-tailed deer have adapted to human activities and land uses, displacement from construction areas are likely to be short-term.

Potential direct impacts to small game and non-game species could include nest or burrow abandonment or loss of eggs or young where construction occurs during the breeding season. Of greatest concern is the potential for loss of waterfowl nests if pipeline construction occurs in or near wetlands or surface water during the nesting and brood rearing season (approximately March 1 through August 31). Overall, losses of these species and their habitats will be relatively small since most habitat loss will occur within agricultural habitats. In addition, there is the potential for disturbance of pheasant habitat and nesting cover. However, if disturbance were to involve important habitat, such as greater prairie chicken leks, loss of this habitat could have a significant effect on local related populations.

Five raptor nests have been identified in the pipeline ROW in South Dakota. If surface disturbance activities occur during the breeding season for passerines, raptors, and other summer avian residents (approximately March 1 through August 31), nest or territory abandonment or the loss of eggs or young (loss of productivity) for the breeding season could result. Impacts to nesting birds will depend on the nest location relative to the proposed disturbance area, the phase of the breeding period, and the level and duration of the disturbance. Of the active nest sites that were documented during the 2006 raptor surveys, almost all were occupied by red-tailed hawks, Swainson's hawks, and great-horned owls. These species are known to be relatively tolerant of human activity and development. This is consistent with the observed presence of these species within the project area, which is characterized by intense agricultural activity. As a result, direct impacts to nesting raptors would be limited primarily to the incremental loss of potential nest structures within the construction ROW. Since the projects include very minimal tree clearing, this potential is minor. Impacts resulting from increased noise and human presence are expected to be minor.

Normal pipeline operations will have negligible effects on terrestrial wildlife resources. Direct impacts to wildlife species populations and habitats from extensive maintenance activities such as physical pipe inspections or ROW repair will be the same as those discussed above for construction. In order to reduce potential impacts to important wildlife resources as a result of

narrow and linear disturbance area that will be associated with pipeline construction is unlikely to have measurable adverse effects on local populations of sensitive species.

The majority of construction disturbance will occur within agricultural lands and these disturbances will be unlikely to affect populations of sensitive species. Preconstruction surveys for federally listed threatened and endangered species, which will be completed prior to surface disturbance activities, are still to be determined through consultation with the USFWS and state wildlife agencies. Once these surveys are complete and if important habitat or populations are identified, appropriate protection measures will be implemented in order to minimize potential impacts to these species.

In order to reduce potential impacts to sensitive wildlife species as a result of maintenance activities, Keystone will consult with the appropriate state wildlife or land management agency prior to the initiation of maintenance activities beyond standard inspection measures.

5.6 Aquatic Ecosystems

5.6.1 Wetlands

Wetlands and riparian areas were identified along the Keystone Mainline by completing field surveys and reviewing aerial photographs for areas where reroutes have been developed. Wetlands and waters of the U.S. along the proposed route were delineated in accordance with the direction provided by the USACE – Omaha District. Keystone coordinated with USACE representatives regarding features that needed to be field-checked and delineated.

Wetlands and riverine habitats occupy approximately 43 percent of the proposed pipeline route. Approximately 95 percent of the wetlands crossed are characterized as palustrine, which includes classifications such as marshes, bogs, and prairie potholes. The remaining 5 percent are riverine or areas that are contained within a channel. A portion of the palustrine wetlands potentially crossed by the ROW is identified as farmed wetlands. A number of wetland areas are located in actively grazed rangeland. None of the proposed pump stations will be located in wetlands, based on NWI mapping.

Effects on wetland vegetation will be greatest during and immediately following construction. To mitigate the potential for these impacts, Keystone will implement procedures as outlined in the CMR Plan. A summary of these protection measures also are discussed in Section 5.5.1.1.

5.6.2 Fisheries

Aquatic biology resources, categorized as "fisheries", include fish and invertebrate communities that inhabit perennial streams and pond/lake environments. The description of aquatic communities focuses on important fisheries, which are defined as species with recreational or commercial value or threatened, endangered, or sensitive status (i.e., special status). The study area for aquatic resources includes the perennial streams, rivers, and ponds/lakes that will be crossed by the proposed pipeline route.

Five perennial streams are crossed by the proposed pipeline route in South Dakota. The Missouri River is the largest waterbody and is classified as a warmwater permanent fishery. Of the other streams that have been classified, habitat is considered more limited as indicated by a warmwater semi-permanent (James River) or warmwater marginal (Wolf and Beaver Creeks) classification.

Potential sources for hydrostatic testing and dust control water could include the following streams that contain sensitive fish and mussel species: Rock Creek, Wolf Creek, James River and the Missouri River. Water use from any of these streams will result in a relatively small one-time flow reduction. Water withdrawal is expected to represent a relatively small percentage of base flow conditions. Therefore, impacts on fish or mussel habitat will be considered minor in the mid-size to large streams. The discharge of hydrostatic test water will follow state permit requirements, which will eliminate potential water quality effects on sensitive species.

The USDOT prescribes pipeline design and operational requirements that limit the risk of accidental crude oil releases (leaks or spills) from pipelines. Over the operational life of the Keystone pipeline there will be a very low likelihood of a crude oil release from the pipeline that could injure sensitive aquatic species and habitats.

5.7 Land Use and Local Land Controls

5.7.1 Existing Land Use

Of the 219.~~7~~9 mile route in South Dakota, all but 0.5 mile is privately owned. The 0.5-mile segment is state-owned and managed. No Tribal or federal lands are crossed by the proposed route.

Table 7 provides the overall miles of various land uses that will be crossed by the pipeline in South Dakota. These land use categories are consistent with those outlined in the PUC guidelines. The basis for these estimates of land uses affected is photointerpretation of high quality aerial photography, wetland field delineations, and field reconnaissance of native grasslands. The boundaries of the various land uses within the pipeline corridor were incorporated as polygons in the project GIS database. The land uses crossed are illustrated on maps at a scale of 1:24,000 in Exhibit A. The land use table and explanation below address each of the PUC land use categories. The explanation includes Keystone's interpretation of the land use category, the relative amount of the land use crossed, and other information.

Table 7 Land Uses Affected by Pipeline Corridor

Land Use	Miles Crossed	Acreage Disturbed During Construction
1. Land used primarily for row and nonrow crops in rotation	~~158~~160	2,~~112~~118
2. Irrigated Land	0.2	2
3. Pasturelands and Rangelands	~~44~~43	~~588~~604
4. Haylands	2	29
5. Undisturbed native grasslands	12	~~166~~168
6. Existing and potential nonrenewable resources	0	0
7. Other major industries	0	0
8. Rural residences and farmsteads, family farms, and ranches	0.23	3
9. Residential	0	0
10. Public, commercial, and institutional use	2	~~29~~30
11. Municipal water supply and water sources for organized rural water systems	0	0
12. Noise sensitive land uses	0.23	3

reservoirs. The pipeline will be installed under the Missouri River, which serves a municipal water supply upstream and downstream of the proposed crossing.

12. Noise sensitive land uses. Noise sensitive land uses are considered to be rural residences and farmsteads, and other residential areas. Eighteen residences are within 500 feet of the proposed centerline.

5.7.2 Displacement

No homes or residents will be displaced by the construction or operation of the Keystone Pipeline.

5.7.3 Compatibility with Existing Land Use and Measures to Ameliorate Adverse Impacts

The Keystone Pipeline will be compatible with the predominant land use, which is rural agriculture, because the pipeline will be buried to a depth of four feet in fields, and will not interfere with normal agricultural operations. In most locations, the pipeline will be placed below agricultural drain tiles and drain tiles that are damaged will be repaired. The only aboveground facilities will be pump stations and block valves located at intervals along the pipeline. The pipeline will be located away from existing rural residences and farmsteads, reducing the likelihood of interference with construction of future structures and installation of buried utilities.

Pump stations will be located in areas of low existing residential density where practical. The pump units generally will not be enclosed in buildings and will be connected via aboveground piping and valves. Other facilities will include an electrical transformer and a small control building to house electrical, measurement and control system components. The pump station site will be enclosed by a chain link fence approximately 6 feet high. **Exhibit 4** in Chapter 2.0 presents an artist's rendering of a typical pump station. A small utility building and aboveground piping will be evident at each site. The pump stations will be located near existing county roads, which will minimize interference with agricultural operations on adjacent land.

The electrical pumps represent the noise sources at the pump stations. Keystone will evaluate expected noise generation from these pumps. If necessary, Keystone will install noise attenuation to ensure that noise levels from Keystone's pump station facilities comply with applicable local regulations. **Table 8** describes the number of residential and other structures within 1 mile of the proposed pump stations.

Table 8 Structures within 1 Mile of Pump Stations

Stations State/County	Pump Station	MP of Pump Station	Distance to NSA (feet)	Direction from Pump Station	Number of Structures Within 1 Mile of Pump Stations
Sargent[1]	PS19	216.86	4,100	SE	54
Day	PS20	263.42	--	--	02
Beadle	PS21	310.42	3,550300	NE	357
Miner	PS22	358.48	--	--	0
Hutchinson	PS23	406.26	2,800300	SEN-NE	654

[1]PS 19 is in Sargent County, North Dakota, but is very close to the North Dakota/South Dakota border.

6.1.1.3 Local Labor Resources

Keystone expects that its construction contractors will hire temporary construction personnel from the local communities where possible. It is estimated that approximately 10 to 15 percent of the total construction workforce could be hired locally, with the remaining portion (85 to 90 percent or more) consisting of non-local personnel.

Utilization of available labor in South Dakota for pipeline construction will be limited to persons that are current members or join the referenced labor unions. Since pipeline construction is very specialized, it is likely most local hiring will be for office staff, general labor or truck drivers.

The number of construction workers that will be hired locally will vary by contractor and by the availability of specifically trained residents available for pipeline construction employment.

6.1.2 Agriculture

Impacts to agriculture and farms will be mitigated as follows:

6.1.2.1 Agricultural/Cropland

Agriculture is the predominant land use within proposed corridor in South Dakota. Construction of the pipeline will disturb approximately 2,~~169~~251 acres (~~75~~77 percent of the proposed corridor) of agricultural use lands. Keystone will implement mitigation measures to minimize short-term impacts on agriculture productivity. The mitigation measures will include:

- Burying the pipeline deeper than typical tillage depths;
- Cleaning heavy equipment to limit transport of weeds or soil pests prior to project use;
- Prohibiting construction during prolonged, heavy rainfall to minimize the potentials for soil compaction and reduced productivity;
- Deep tilling or chisel plowing soils or other landowner or land management agency approved method to alleviate compaction;
- Stripping and storing topsoil from over the trench line and returning topsoil to original horizon during backfilling;
- Implementing temporary erosion and sediment control BMPs during construction to minimize loss of soil due to wind or water erosion;
- Removing rocks exposed at the surface during clean-up to restore conditions present prior to construction as closely as practicable;
- Applying tackifier, if required due to excessively windy conditions, following the removal of the topsoil;
- Compensating landowners for crop loss and associated damages;
- Coordinating irrigation and drainage systems disruptions with landowners and compensating for damages and resulting lost production; and
- Repairing, replacing, or compensating landowners where irrigation and/or drainage systems are damaged by construction.

Reclamation and revegetation will be in accordance with applicable permits. Land will be re-contoured to approximate pre-existing conditions and disturbed structures, ditches, bridges, culverts, fences, and slopes will be restored. Rocks that are exposed during construction activities, warning signs, and other construction materials will be removed. Temporary gates will be replaced with permanent fences unless the landowner requests otherwise. Additional mitigation measures are detailed in the CMR Plan.

Permanent impacts on agricultural production are not expected since the pipeline will be buried deep enough to allow continued use of the land. Agricultural production across the permanent ROW will be allowed to resume following final clean-up of pipeline construction. Keystone will be responsible for reclaiming all lands to an equivalent level of capability and will provide compensation for crop loss, diminished productivity and other damages to farmland.

6.1.2.2 Grassland/Rangeland

Construction of the pipeline will disturb approximately 633604 acres (21 percent of the proposed corridor) of grassland/rangeland. Grassland and rangeland areas are primarily a mix of tall to short grass prairie with occasional occurrence of non-native, cool season grasses. Grasslands in South Dakota primarily support native grass and forb species typically associated with the mixed grass prairie and are considered important habitat areas for special status plant and wildlife species. Dominant species include bluestem, blue grama, green needlegrass, needle and thread and Western wheatgrass.

The proposed project will impact grassland and rangeland areas by temporarily clearing vegetation in the corridor. These areas are expected to recover in one to three growing seasons after construction is completed. Long-term or permanent impacts are not expected. Keystone will promote recovery of these areas by removing and then restoring topsoil and reseeding all disturbed areas with grass mixtures approved by the local Natural Resource Conservation Service office or the landowner.

Ranches and rangeland will be mainly affected during construction by the prohibition of grazing on those lands required for pipeline construction, which may result in obstacles to livestock movement across construction areas. Once construction is completed, grazing and livestock movement over the permanent ROW may resume. Landowners will be compensated for the temporary loss of land use. Grazing may return to normal after vegetation is re-established.

To minimize the impacts to grazing and movement, the proposed project will implement the following measures, where applicable:

- Arrange with landowners to move or keep livestock to fields not affected by the proposed project;
- Cut and brace fences crossed by the pipeline or other activities;
- Install temporary fencing where appropriate to prevent livestock movement across the ROW;
- Leave access lanes for movement of livestock across the ROW during the construction period, where necessary;
- Strip the existing topsoil, where there is a well-established sod layer, up to a maximum depth of 12 inches, from over the trench only;

Surface disturbance associated with the construction and operation of the Keystone Pipeline Project is summarized in Table 2. In South Dakota, approximately 3,521 acres of land will be disturbed during construction. This total includes temporary construction workspace and approximately 1,331 acres that will be retained as permanent ROW. All disturbed acreage will be restored and returned to its previous use after construction, except for approximately 12 acres of permanent ROW, which will not be restored but will serve to provide adequate space for aboveground facilities, including pump stations and valves, for the life of the pipeline.

Table 2 Summary of Land Requirements in South Dakota Associated with the Keystone Pipeline Project

Facility	Land Affected During Construction (acres)	Land Affected During Operation (acres)
Pipeline ROW	2928	1,333
Lateral ROWs	0	0
Additional Temporary Workspace Areas	129 (approximate)	0
Pipe and Contractor Yards	320 (approximate)	0
Pump Stations	22	12

Additional temporary workspace will be required at areas requiring special construction techniques (e.g., river, wetland, and road crossings; horizontal directional drill entry and exit points; steep slopes; rocky soils) and construction staging areas.

Off-ROW extra workspace areas will be required during the construction phase of the project to serve as pipe storage yards and contractor yards. Pipe storage and staging yards will be used to stockpile pipe for use during construction of the pipeline. Pipe storage yards are located at approximately 30-mile intervals along the pipeline route and typically are located in proximity to existing railroad siding facilities. Pipe yards typically will occupy approximately 20 to 30 acres. Keystone has identified 12 possible locations for pipe storage yards. These potential pipe storage yard locations are near the following towns and cities: Hecla, Ferney, Doland, Iroquois, Fedora, Bridgewater, Utica, Claremont, Groton, Yale, Emery, and Yankton. It is unlikely that Keystone will use all identified potential sites. Actual sites will be determined following discussions with pipe suppliers and contractors.

Three to five contractor yards will be required and possible locations have been identified near the following towns and cities: Aberdeen, Mitchell, Yankton, Bath, and Huron. Contractor yards will reduce worker transportation requirements during construction and will occupy approximately 15 to 20 acres. To the extent practical, Keystone proposes to use existing commercial/industrial sites or sites that previously have been used for construction. Existing public or private roads will be used to access each yard. Both pipe storage yards and contractor yards will be used on a temporary basis and will be restored upon completion of construction.

crossed using one of four techniques: the open-cut wet method (Keystone's preferred method), open-cut flume method, open-cut dam-and-pump method, or Horizontal Directional Drill (HDD) method. When crossing waterbodies, Keystone will adhere to the guidelines outlined in Keystone's CMR Plan (Exhibit B). Additional information on waterbody crossings is provided in Section 5.4.1.

2.2.6.3 Wetland Crossings

Data from wetland delineation field surveys, aerial photography, and National Wetland Inventory (NWI) map data were used to identify wetlands crossed by the proposed Keystone Mainline in South Dakota. Approximately 97 acres of wetlands will be disturbed by the construction corridor. Wetlands are classified as palustrine emergent, palustrine forested and palustrine shrub-scrub. All wetland areas that will be affected have been categorized as palustrine emergent (wet meadows) except for 0.2 acre of palustrine forested and 1.2 acres of palustrine shrub-scrub. Pipeline construction across wetlands will be similar to typical conventional upland cross-country construction procedures, with several modifications where necessary to reduce the potential for pipeline construction to affect wetland hydrology and soil structure. Specific protection measures for wetlands are described in Section 5.5.1.1

2.2.6.4 Fences and Grazing

To minimize the impacts to grazing and livestock movement, Keystone will implement protective measures on rangeland. Detail on these protective measures can be found in Section 6.1.2.2 and in the CMR Plan. All work on pasture and farmlands including access and removal of bevel shavings, litter, and garbage will be in accordance with applicable permits. Temporary gates used for access will remain closed at all times. The temporary gates will be replaced with permanent fence.

Keystone will prohibit feeding or harassment of livestock or wildlife, firearms, and pets on the construction ROW. Food and food wastes will be stored and secured.

Once construction is completed, grazing and livestock movement over the permanent ROW may resume. Landowners will be compensated for the temporary loss of land use. Grazing may return to normal after vegetation is re-established.

2.3 Operation and Maintenance

Keystone will operate and maintain the project facilities in accordance with the USDOT regulations in 49 CFR Parts 194 and 195 and other applicable federal and state regulations. Operation and maintenance of the pipeline system in most cases will be accomplished by Keystone personnel. Keystone estimates that operation of the pipeline may require a small number of permanent employees for the South Dakota segment of the pipeline. Keystone may utilize contractors to perform other services including ROW maintenance and emergency response.

2.3.1 Normal Operations and Routine Maintenance

The pipeline will be inspected periodically from the air and on foot as operating conditions permit but no less frequently than as required by 49 CFR Part 195. These surveillance activities will provide information on possible encroachments and nearby construction activities, erosion, exposed pipe, and other potential concerns that may affect the safety and operation of the pipeline. Evidence of population changes will be monitored and HCAs will be identified as required by federal regulations. HCAs, as defined by 49 CFR Section 195.450, are high population areas (urbanized

Table 3 Impact Summary

Resource	Impact Summary
	aquatic life and downstream water users. Hydrostatic test water will be discharged to the land surface at an approved location. Discharged water may evaporate or infiltrate into the soil or drainage where the water is released.
	• Pipeline construction will disturb a total of 103 acres of wetlands, river systems and open water in South Dakota. Of this total, approximately 97 acres are wetlands and 6 acres are located in river systems and open water. It is estimated that vegetation cover in palustrine emergent wetlands will recover in three to five years; recovery of forested wetlands will require 20 to 50 years. No permanent loss of wetlands will occur as a result of this project.
Vegetation	• Pipeline construction will disturb a total of 3,399 acres including 653 acres of native and modified grassland and 2.4 acres of forested land. It is estimated that vegetation cover in native and modified grasslands will recover in 3 to 5 years, while recovery of forests and woodlands will require 20 to 50 years in the temporary workspace. Trees will not be permitted to grow on approximately 1.2 acres of currently forested woodlands during pipeline operations to allow for aerial surveillance.
Wildlife	• Approximately 752 acres of upland and wetland wildlife habitats will be cleared during pipeline construction and then will recover over short- and long-term time frames (see Wetlands and Vegetation above).
	• Wildlife displacement from the construction ROW is expected to be short-term. No long-term displacement impacts from increased human activity are expected.
	• There may be a potential loss of bird eggs and young from pipeline clearing activities or increased human presence, if these activities occur during the breeding season, along the entire length of the pipeline.
	• Power lines will be constructed to serve the pump stations. The power lines represent a collision hazard for waterfowl and other birds similar to existing electrical distribution lines.
Aquatic Resources	• Based on the implementation of mitigative measures at watercourse crossings, the project will experience only short-term (1 to 2 days) effects on fish and fish habitat at the four perennial river and stream crossings designed for open cut water-course crossing. These effects will consist of potential increases in total suspended solids and sediment deposition downstream from channel excavation.
Sensitive Species	• There will be a potential reduction in sensitive wildlife and aquatic species habitats as the result of pipeline construction. These habitat changes are described for wildlife and aquatic resources above.
	• Keystone received the USFWS and state wildlife agency lists of species to be evaluated for project effects. In 2006, Keystone initiated habitat and occurrence surveys for several federally listed and state sensitive species. Keystone will continue these surveys in 2007.

Table 3 Impact Summary

Resource	Impact Summary
	• Keystone will coordinate with the USFWS and state wildlife agencies to estimate direct and indirect impacts to federally listed and sensitive species and to identify pipeline route adjustments, and construction procedures that will avoid or minimize effects to these species. Keystone has adjusted its proposed pipeline route at several locations in South Dakota to reduce the length of wetland and native prairie crossings.
Land Use (including noise, transportation)	• Approximately 1,345 acres will not be permitted to be occupied by residential or other structures within the permanent pipeline ROW and pump station sites over the life of the project. Agricultural uses (cropland) will be allowed to continue as before except at the pump station and other aboveground facility sites.
	• A small parcel of state land (approximately 0.5 acre of surface disturbance) will be crossed in South Dakota. This state land is used for wildlife management purposes. Keystone has and will continue to consult with the state manager of this land to develop site-specific crossing plans to maintain public access and existing land uses.
	• Construction noise will be generated and potentially heard at nearby (generally 0.5 mile or less) residences during daytime construction activities over a period of several weeks.
	• Long-term operational noise from pump stations will be maintained at acceptable noise level thresholds.
	• Aboveground facilities (pump stations, power lines, valves, densitometers) will exist for the life of the project. The majority of these facilities will be located in rural areas. Power lines will be located along county roads and, therefore, will pass within the view of roadside residences.
	• Short-term obstruction or temporary disruption to local roads may occur during construction across those roads. Major highways will be bored. There will be no long-term impacts to transportation.
Cultural Resources	• Keystone developed study plans that were approved by the State Historic Preservation Office. Keystone then initiated field surveys in 2006 to determine the locations of prehistoric and historic cultural resources that could be affected by surface disturbance caused by pipeline and ancillary facility construction. Cultural resource impacts could include physical disturbance of archaeological sites or architecturally significant structures and features, and introduction of visual or audible elements (e.g., pump stations) that would alter the setting of a cultural resource feature.
	• Impacts to sites that are eligible for the National Register of Historic Places (NRHP) will be mitigated by one or more of the following measures: avoidance through use of pipeline realignments and facility relocations; approved data recovery from sites that cannot be avoided; and use of landscaping or other techniques to minimize or eliminate effects on the historic setting or ambience of standing structures.
	• Construction activities could adversely affect undiscovered archaeological sites. If previously undocumented sites are discovered during construction within the construction corridor, work that could adversely affect the discovery will cease until consultation with appropriate cultural preservation agencies is completed. If a previously unidentified site is recommended as eligible to the NRHP, impacts will be mitigated through the procedures included in an Unanticipated Discovery Plan.

drilling and enlarging the hole, a slurry consisting mainly of water and bentonite clay will be circulated to power and lubricate the down-hole tools, remove drill cuttings, and hold the hole open. Pipe sections long enough to span the entire crossing will be staged and welded along the construction work area on the opposite side of the waterbody and then pulled through the drilled hole. Ideally, use of the HDD method results in no impact on the banks, bed, or water quality of the waterbody being crossed.

The Missouri River has been designated a National Recreational River at the proposed crossing at the North Dakota/South Dakota border near Yankton, South Dakota and the Niobrara/Missouri National River Area is crossed at this location. Keystone's preliminary HDD plan will avoid direct land disturbance within the NPS WSRA administrative boundary associated with this Missouri River crossing. The NPS administers, but does not own, land at the proposed crossing location. The HDD entry point will be located on City of Yankton land on the north shore; the HDD exit point will be located on private land on the south shore. Keystone conducted preliminary discussions with the NPS and the City of Yankton in February 2006. A meeting was held in Yankton on May 19, 2006, to discuss the proposed directional drill under the Missouri River. Preliminary crossing drawings were provided. A Special Use Permit was obtained from the NPS to conduct geotechnical drilling near the banks of the river. Keystone submitted copies of NPS consultation documents to the DOS in the September 15, 2006 filing. A site-specific crossing plan utilizing HDD methods has been developed, which will maintain public access to the river, and avoid disturbance of existing land uses and designations.

5.4.2 Groundwater

Based on a review of published wellhead maps and aquifer protection areas, the pipeline will cross near a water supply well in Marshall County and will cross an aquifer protection area in Kingsbury County (see Table 5).

Table 5 **Public Water Supplies within 1 Mile of Pipeline Centerline (CL)**

County	Approximate MP Marker (mi)	Well Distance From CL (mi)	Well Cardinal Direction from CL	PWS Name	Well ID
Kingsbury	326.7	Not Applicable	Not Applicable	Zone B Aquifer Protection Area	None

The pipeline corridor also will pass through areas where shallow and surficial aquifers exist. "Shallow" and "surficial" aquifers are considered to have the greatest potential for yielding significant quantities of water for municipal, industrial, and agricultural purposes.

Since the pipeline will be buried at a shallow depth, it is unlikely that the construction or operation of the pipeline will alter the yield from any aquifers that are used for drinking water purposes. Keystone will investigate shallow groundwater when it is encountered during construction to determine if there are any nearby livestock or domestic wells that might be affected by construction activities. Appropriate measures will be implemented to prevent groundwater contamination and steps will be taken to manage the flow of any groundwater encountered. In the event that construction of the pipeline damages a landowner's well, Keystone will either re-establish the well or provide compensation. Pipeline construction in areas with known surficial aquifers or wetlands will be

5.5 Terrestrial Ecosystems

5.5.1 Vegetation Communities

Vegetation types crossed by the Keystone Pipeline Project were delineated based on the review of aerial photographs, general observations made during field reconnaissance activities, and detailed information collected during wetland and waters of the U.S. delineation activities and grassland assessment surveys. Seven major vegetation types or general land use categories are crossed by the proposed route including cropland, grassland/rangeland, upland forest, non-forested wetland, forested wetland, open water and developed land. The predominant vegetation community is agricultural/cropland followed by grassland/rangeland, wetland/riparian and forest. Descriptions of the cropland, grassland/rangeland, and developed land are presented under Land Use in Section 5.7.

5.5.1.1 Wetland/Riparian

Construction of the pipeline will disturb approximately 98 acres (3 percent of the proposed corridor) of wetland/riparian areas. These wetlands are almost entirely palustrine emergent wetlands (wet meadows) – only 0.22 acre of forested wetlands will be affected. Effects on wetland vegetation will be greatest during and immediately following construction. To mitigate the potential for these impacts, Keystone will implement specific procedures as outlined in the CMR Plan. The construction ROW width will typically be reduced to 85 feet through wetlands with saturated soils to minimize potential effects. Keystone will restore or mitigate impacts to wetlands affected by construction activities, to the extent practicable. Pipeline construction through wetlands must comply, at a minimum, with USACE Section 404 permit conditions. Section 404(b)(1) guidelines restrict the discharge of dredged or fill material into wetland areas where a less environmentally damaging practicable alternative exists.

Smaller streams and ephemeral or intermittent drainages will likely be open cut and wetlands located in these areas will be crossed by trenching. However, no installation of surface facilities will occur in wetlands and no permanent loss of wetlands will occur as a result of this project. Herbaceous vegetation in palustrine emergent wetlands is expected to reestablish to pre-construction levels within 3 to 5 years following the completion of reclamation, resulting in a short-term loss of vegetation and available habitat for some wildlife species. Trees in forested wetlands will recover in 20 to 50 years.

As described in the CMR Plan, specific construction techniques will be used to retain the hydrological and vegetation characteristics of wetlands that will be disturbed by construction. These techniques will include:

- Narrowing the ROW for certain wetlands;
- Minimizing the duration of construction-related disturbance within wetlands to the extent practicable;
- Attempting to use no more than two layers of timber riprap to stabilize the construction ROW;
- Cutting vegetation off at ground level leaving existing root systems in place and remove it from the wetland for disposal;

Keystone will monitor revegetation success along the pipeline ROW in accordance with applicable permits and agency guidance.

5.5.2 Wildlife

5.5.2.1 Biological Consultations

Keystone developed general wildlife habitat and occurrence information from published sources and interviews with state agency staff. This information is included in the Environmental Reports provided in **Exhibit D**. Keystone coordinated with the USFWS and the South Dakota Game and Fish Department (SDGFD) to identify listed, candidate, and species of special concern that could be affected by pipeline construction and operation. Keystone obtained a list of species from both the USFWS and the South Dakota Natural Heritage Programs (SDNHP). Based on the information received, Keystone initiated biological surveys in the summer of 2006, and the winter of 2006-2007.

Keystone also initiated wetland surveys in 2006 along the pipeline as support for the U.S. Army Corps of Engineers (USACE) Section 404 permit applications. Estimates of acreages of wetlands affected by construction by type have been included in filings to the DOS.

A summary of Keystone's consultations with respect to biological resources and wetlands is provided in **Exhibit D**.

The following biological reports are included in **Exhibit D** in chronological order.

- October 2006. A Field Survey of the Keystone Pipeline Project Construction Corridor in North and South Dakota for Dakota Skipper (Hesperia dacotae), Western Prairie Fringed Orchid (Platanthera praeclara) Habitat, and for Native Grassland. Prepared by ENSR Corporation. Fort Collins, Colorado.
- October 2006. Keystone Pipeline Project Progress Report for Wetlands Surveys. Prepared by ENSR Corporation, Fort Collins, Colorado.
- March 2007. Bald Eagle and Raptor Nest Survey Report. Prepared by ENSR Corporation, Fort Collins, Colorado.

In 2007, Keystone will collect additional biological data on proposed South Dakota pump station sites, short pipeline reroute segments, proposed access roads, and on mainline pipeline segments for which access was denied in 2006.

5.5.2.2 Wildlife Habitat

Wildlife habitats along the proposed route consist of cropland, native prairie, range or pasture land, deciduous forest lands, wetlands, and aquatic habitats. A majority of the route corridor will cross cropland or other agricultural areas. Although cropland is undeveloped land that represents open space, it has limited value as wildlife habitat since vegetative cover and food sources are present primarily on a short-term basis due to seasonal harvesting and cultivation. Of the 2,928 acres of construction ROW, approximately 752 acres represent potential wildlife habitat.

Important wildlife habitats that will be crossed by the project route include approximately 0.5 mile of a SDGFD designated GPA and the Missouri River.

5.5.2.3 Potential Impacts to Wildlife

About 68 percent of the approximately 3,399 acres necessary for construction of the pipeline and ancillary facilities will consist of agricultural land that is tilled annually or already developed land. Rangeland, forestland, and wetlands together constitute about 32 percent of the total disturbance. The effects of long-term habitat loss on native wildlife populations will be relatively small since the majority of habitat disturbance will be located in agricultural habitats.

Project construction will affect only a single big game species, white-tailed deer, since the ranges of other potential big game species are very peripheral to the project area and impacts to these wide-ranging species will be negligible or non-existent. Impacts to white-tailed deer will include the incremental loss of potential forage (native vegetation and croplands) and will result in an incremental increase in habitat fragmentation within the proposed surface disturbance areas. However, these incremental losses of vegetation will represent a small percentage (far less than 1 percent) of the overall available habitat within the project region. No sensitive habitats for white-tailed deer have been identified along the proposed route. Indirect impacts will result from increased noise levels and human presence during surface disturbance activities. Because white-tailed deer have adapted to human activities and land uses, displacement from construction areas are likely to be short-term.

Potential direct impacts to small game and non-game species could include nest or burrow abandonment or loss of eggs or young where construction occurs during the breeding season. Of greatest concern is the potential for loss of waterfowl nests if pipeline construction occurs in or near wetlands or surface water during the nesting and brood rearing season (approximately March 1 through August 31). Overall, losses of these species and their habitats will be relatively small since most habitat loss will occur within agricultural habitats. In addition, there is the potential for disturbance of pheasant habitat and nesting cover. However, if disturbance were to involve important habitat, such as greater prairie chicken leks, loss of this habitat could have a significant effect on local related populations.

Five raptor nests have been identified in the pipeline ROW in South Dakota. If surface disturbance activities occur during the breeding season for passerines, raptors, and other summer avian residents (approximately March 1 through August 31), nest or territory abandonment or the loss of eggs or young (loss of productivity) for the breeding season could result. Impacts to nesting birds will depend on the nest location relative to the proposed disturbance area, the phase of the breeding period, and the level and duration of the disturbance. Of the active nest sites that were documented during the 2006 raptor surveys, almost all were occupied by red-tailed hawks, Swainson's hawks, and great-horned owls. These species are known to be relatively tolerant of human activity and development. This is consistent with the observed presence of these species within the project area, which is characterized by intense agricultural activity. As a result, direct impacts to nesting raptors would be limited primarily to the incremental loss of potential nest structures within the construction ROW. Since the projects include very minimal tree clearing, this potential is minor. Impacts resulting from increased noise and human presence are expected to be minor.

Normal pipeline operations will have negligible effects on terrestrial wildlife resources. Direct impacts to wildlife species populations and habitats from extensive maintenance activities such as physical pipe inspections or ROW repair will be the same as those discussed above for construction. In order to reduce potential impacts to important wildlife resources as a result of

narrow and linear disturbance area that will be associated with pipeline construction is unlikely to have measurable adverse effects on local populations of sensitive species.

The majority of construction disturbance will occur within agricultural lands and these disturbances will be unlikely to affect populations of sensitive species. Preconstruction surveys for federally listed threatened and endangered species, which will be completed prior to surface disturbance activities, are still to be determined through consultation with the USFWS and state wildlife agencies. Once these surveys are complete and if important habitat or populations are identified, appropriate protection measures will be implemented in order to minimize potential impacts to these species.

In order to reduce potential impacts to sensitive wildlife species as a result of maintenance activities, Keystone will consult with the appropriate state wildlife or land management agency prior to the initiation of maintenance activities beyond standard inspection measures.

5.6 Aquatic Ecosystems

5.6.1 Wetlands

Wetlands and riparian areas were identified along the Keystone Mainline by completing field surveys and reviewing aerial photographs for areas where reroutes have been developed. Wetlands and waters of the U.S. along the proposed route were delineated in accordance with the direction provided by the USACE – Omaha District. Keystone coordinated with USACE representatives regarding features that needed to be field-checked and delineated.

Wetlands and riverine habitats occupy approximately 3 percent of the proposed pipeline route. Approximately 95 percent of the wetlands crossed are characterized as palustrine, which includes classifications such as marshes, bogs, and prairie potholes. The remaining 5 percent are riverine or areas that are contained within a channel. A portion of the palustrine wetlands potentially crossed by the ROW is identified as farmed wetlands. A number of wetland areas are located in actively grazed rangeland. None of the proposed pump stations will be located in wetlands, based on NWI mapping.

Effects on wetland vegetation will be greatest during and immediately following construction. To mitigate the potential for these impacts, Keystone will implement procedures as outlined in the CMR Plan. A summary of these protection measures also are discussed in Section 5.5.1.1.

5.6.2 Fisheries

Aquatic biology resources, categorized as "fisheries", include fish and invertebrate communities that inhabit perennial streams and pond/lake environments. The description of aquatic communities focuses on important fisheries, which are defined as species with recreational or commercial value or threatened, endangered, or sensitive status (i.e., special status). The study area for aquatic resources includes the perennial streams, rivers, and ponds/lakes that will be crossed by the proposed pipeline route.

Five perennial streams are crossed by the proposed pipeline route in South Dakota. The Missouri River is the largest waterbody and is classified as a warmwater permanent fishery. Of the other streams that have been classified, habitat is considered more limited as indicated by a warmwater semi-permanent (James River) or warmwater marginal (Wolf and Beaver Creeks) classification.

Potential sources for hydrostatic testing and dust control water could include the following streams that contain sensitive fish and mussel species: Rock Creek, Wolf Creek, James River and the Missouri River. Water use from any of these streams will result in a relatively small one-time flow reduction. Water withdrawal is expected to represent a relatively small percentage of base flow conditions. Therefore, impacts on fish or mussel habitat will be considered minor in the mid-size to large streams. The discharge of hydrostatic test water will follow state permit requirements, which will eliminate potential water quality effects on sensitive species.

The USDOT prescribes pipeline design and operational requirements that limit the risk of accidental crude oil releases (leaks or spills) from pipelines. Over the operational life of the Keystone pipeline there will be a very low likelihood of a crude oil release from the pipeline that could injure sensitive aquatic species and habitats.

5.7 Land Use and Local Land Controls

5.7.1 Existing Land Use

Of the 219.9 mile route in South Dakota, all but 0.5 mile is privately owned. The 0.5-mile segment is state-owned and managed. No Tribal or federal lands are crossed by the proposed route.

Table 7 provides the overall miles of various land uses that will be crossed by the pipeline in South Dakota. These land use categories are consistent with those outlined in the PUC guidelines. The basis for these estimates of land uses affected is photointerpretation of high quality aerial photography, wetland field delineations, and field reconnaissance of native grasslands. The boundaries of the various land uses within the pipeline corridor were incorporated as polygons in the project GIS database. The land uses crossed are illustrated on maps at a scale of 1:24,000 in Exhibit A. The land use table and explanation below address each of the PUC land use categories. The explanation includes Keystone's interpretation of the land use category, the relative amount of the land use crossed, and other information.

Table 7 Land Uses Affected by Pipeline Corridor

Land Use	Miles Crossed	Acreage Disturbed During Construction
1. Land used primarily for row and nonrow crops in rotation	160	2,118
2. Irrigated Land	0.2	2
3. Pasturelands and Rangelands	43	604
4. Haylands	2	29
5. Undisturbed native grasslands	12	168
6. Existing and potential nonrenewable resources	0	0
7. Other major industries	0	0
8. Rural residences and farmsteads, family farms, and ranches	0.3	3
9. Residential	0	0
10. Public, commercial, and institutional use	2	30
11. Municipal water supply and water sources for organized rural water systems	0	0
12. Noise sensitive land uses	0.3	3

reservoirs. The pipeline will be installed under the Missouri River, which serves a municipal water supply upstream and downstream of the proposed crossing.

12. Noise sensitive land uses. Noise sensitive land uses are considered to be rural residences and farmsteads, and other residential areas. Eighteen residences are within 500 feet of the proposed centerline.

5.7.2 Displacement

No homes or residents will be displaced by the construction or operation of the Keystone Pipeline.

5.7.3 Compatibility with Existing Land Use and Measures to Ameliorate Adverse Impacts

The Keystone Pipeline will be compatible with the predominant land use, which is rural agriculture, because the pipeline will be buried to a depth of four feet in fields, and will not interfere with normal agricultural operations. In most locations, the pipeline will be placed below agricultural drain tiles and drain tiles that are damaged will be repaired. The only aboveground facilities will be pump stations and block valves located at intervals along the pipeline. The pipeline will be located away from existing rural residences and farmsteads, reducing the likelihood of interference with construction of future structures and installation of buried utilities.

Pump stations will be located in areas of low existing residential density where practical. The pump units generally will not be enclosed in buildings and will be connected via aboveground piping and valves. Other facilities will include an electrical transformer and a small control building to house electrical, measurement and control system components. The pump station site will be enclosed by a chain link fence approximately 6 feet high. **Exhibit 4** in Chapter 2.0 presents an artist's rendering of a typical pump station. A small utility building and aboveground piping will be evident at each site. The pump stations will be located near existing county roads, which will minimize interference with agricultural operations on adjacent land.

The electrical pumps represent the noise sources at the pump stations. Keystone will evaluate expected noise generation from these pumps. If necessary, Keystone will install noise attenuation to ensure that noise levels from Keystone's pump station facilities comply with applicable local regulations. **Table 8** describes the number of residential and other structures within 1 mile of the proposed pump stations.

Table 8 Structures within 1 Mile of Pump Stations

Stations State/County	Pump Station	MP of Pump Station	Distance to NSA (feet)	Direction from Pump Station	Number of Structures Within 1 Mile of Pump Stations
Sargent[1]	PS19	216.6	400	E	4
Day	PS20	263.2	--	--	2
Beadle	PS21	310.2	3,300	NE	57
Miner	PS22	358.8	--	--	0
Hutchinson	PS23	406.6	2,300	N-NE	54

[1]PS 19 is in Sargent County, North Dakota, but is very close to the North Dakota/South Dakota border.

6.1.1.3 Local Labor Resources

Keystone expects that its construction contractors will hire temporary construction personnel from the local communities where possible. It is estimated that approximately 10 to 15 percent of the total construction workforce could be hired locally, with the remaining portion (85 to 90 percent or more) consisting of non-local personnel.

Utilization of available labor in South Dakota for pipeline construction will be limited to persons that are current members or join the referenced labor unions. Since pipeline construction is very specialized, it is likely most local hiring will be for office staff, general labor or truck drivers.

The number of construction workers that will be hired locally will vary by contractor and by the availability of specifically trained residents available for pipeline construction employment.

6.1.2 Agriculture

Impacts to agriculture and farms will be mitigated as follows:

6.1.2.1 Agricultural/Cropland

Agriculture is the predominant land use within proposed corridor in South Dakota. Construction of the pipeline will disturb approximately 2,251 acres (77 percent of the proposed corridor) of agricultural use lands. Keystone will implement mitigation measures to minimize short-term impacts on agriculture productivity. The mitigation measures will include:

- Burying the pipeline deeper than typical tillage depths;
- Cleaning heavy equipment to limit transport of weeds or soil pests prior to project use;
- Prohibiting construction during prolonged, heavy rainfall to minimize the potentials for soil compaction and reduced productivity;
- Deep tilling or chisel plowing soils or other landowner or land management agency approved method to alleviate compaction;
- Stripping and storing topsoil from over the trench line and returning topsoil to original horizon during backfilling;
- Implementing temporary erosion and sediment control BMPs during construction to minimize loss of soil due to wind or water erosion;
- Removing rocks exposed at the surface during clean-up to restore conditions present prior to construction as closely as practicable;
- Applying tackifier, if required due to excessively windy conditions, following the removal of the topsoil;
- Compensating landowners for crop loss and associated damages;
- Coordinating irrigation and drainage systems disruptions with landowners and compensating for damages and resulting lost production; and
- Repairing, replacing, or compensating landowners where irrigation and/or drainage systems are damaged by construction.

Reclamation and revegetation will be in accordance with applicable permits. Land will be re-contoured to approximate pre-existing conditions and disturbed structures, ditches, bridges, culverts, fences, and slopes will be restored. Rocks that are exposed during construction activities, warning signs, and other construction materials will be removed. Temporary gates will be replaced with permanent fences unless the landowner requests otherwise. Additional mitigation measures are detailed in the CMR Plan.

Permanent impacts on agricultural production are not expected since the pipeline will be buried deep enough to allow continued use of the land. Agricultural production across the permanent ROW will be allowed to resume following final clean-up of pipeline construction. Keystone will be responsible for reclaiming all lands to an equivalent level of capability and will provide compensation for crop loss, diminished productivity and other damages to farmland.

6.1.2.2 Grassland/Rangeland

Construction of the pipeline will disturb approximately 604 acres (21 percent of the proposed corridor) of grassland/rangeland. Grassland and rangeland areas are primarily a mix of tall to short grass prairie with occasional occurrence of non-native, cool season grasses. Grasslands in South Dakota primarily support native grass and forb species typically associated with the mixed grass prairie and are considered important habitat areas for special status plant and wildlife species. Dominant species include bluestem, blue grama, green needlegrass, needle and thread and Western wheatgrass.

The proposed project will impact grassland and rangeland areas by temporarily clearing vegetation in the corridor. These areas are expected to recover in one to three growing seasons after construction is completed. Long-term or permanent impacts are not expected. Keystone will promote recovery of these areas by removing and then restoring topsoil and reseeding all disturbed areas with grass mixtures approved by the local Natural Resource Conservation Service office or the landowner.

Ranches and rangeland will be mainly affected during construction by the prohibition of grazing on those lands required for pipeline construction, which may result in obstacles to livestock movement across construction areas. Once construction is completed, grazing and livestock movement over the permanent ROW may resume. Landowners will be compensated for the temporary loss of land use. Grazing may return to normal after vegetation is re-established.

To minimize the impacts to grazing and movement, the proposed project will implement the following measures, where applicable:

- Arrange with landowners to move or keep livestock to fields not affected by the proposed project;
- Cut and brace fences crossed by the pipeline or other activities;
- Install temporary fencing where appropriate to prevent livestock movement across the ROW;
- Leave access lanes for movement of livestock across the ROW during the construction period, where necessary;
- Strip the existing topsoil, where there is a well-established sod layer, up to a maximum depth of 12 inches, from over the trench only;

2-6

Data Request:

Are further route changes anticipated? If yes, please provide a date as to when the route will be finalized.

Response:

Keystone has been working with landowners and regulatory agencies in order to locate the pipeline in the location that minimizes impact to both landowners and the environment. Keystone has completed the major route changes needed in South Dakota from an environment, engineering and construction point of view. Keystone is currently acquiring right-of-way easements in South Dakota, which involves detailed discussion with landowners. In certain cases, these discussions can result in minor route refinements to accommodate specific landowner concerns. These changes are typically minor and involve the same landowners. This process will continue until just prior to construction.

Response prepared by: Michael James Koski

2-7

Data Request:

Will initial emergency response to a pipeline spill be conducted by Keystone employees or a contractor or both? Please fully explain.

Response:

Keystone will utilize both employees and contractors as emergency responders within its initial response efforts in the event of a pipeline spill. In the case of contractors and other spill response organizations, Keystone will have agreements in place identifying and ensuring the availability of the specified personnel, consistent with industry practice and in compliance with the applicable regulations, including 49CFR Part 194 and 49CFR Part 195.

Response prepared by: Brian Thomas

2-8

Data Request:

Where will the emergency responders in question 2-7 be based?

Response:

Due to its proximity to the Missouri River pipeline crossing and other operational reasons, Keystone has identified Yankton, South Dakota as a location for a pipeline maintenance facility and will have emergency responders and other resources based accordingly. Keystone will base other emergency responders consistent with industry practice and in compliance with the applicable regulations, including 49CFR Part 194 and 49CFR Part 195. Consequently, emergency responders will be based in closer proximity to the following areas:

- Commercially navigable waterways and other water crossings;
- Populated and urbanized areas, and
- Unusually sensitive areas, including ecological, historical and archeological resources and drinking water locations.

The specific locations of other emergency responders will be determined upon conclusion of the pipeline detailed design and the completion of Keystone's Emergency Response Plan (Oil Spill Response Plan). This Plan will be completed by the first quarter of 2009 and submitted to the U.S. Department of Transportation's ("DOT") Pipeline and Hazardous Materials Safety Administration ("PHMSA") prior to commencing operations.

Response prepared by: Brian Thomas

2-9

Data Request:

What kinds and number of emergency response equipment will be pre-positioned and where will it be located in the event of a spill in South Dakota?

Response:

Consistent with industry practice and in compliance with the applicable regulations, including 49CFR Part 194 and 49CFR Part 195, the types of emergency response equipment that will be pre-position for access by Keystone are highlighted below:

- Pick-up trucks, one-ton trucks and vans;
- Vacuum trucks;
- Work and safety boats;
- Containment boom;
- Skimmers;
- Pumps, hoses, fittings and valves;
- Generators and extension cords;
- Air compressors;
- Floodlights;
- Communications equipment including cell phones, two way radios and satellite phones;
- Containment tanks and rubber bladders;
- Expendable supplies including absorbent booms and pads;
- Assorted hand and power tools including shovels, manure forks, sledge hammers, rakes, hand saws, wire cutters, cable cutters, bolt cutters, pliers and chain saws;
- Ropes, chains, screw anchors, clevis and other boom connection devices;
- Personnel Protective Equipment ("PPE") including rubber gloves, chest and hip waders and H_2S, O_2, LEL and benzene detection equipment; and
- Wind socks, signage, air horns, flashlights, megaphones and fluorescent safety vests

Additional equipment including helicopters, fixed wing aircraft, all-terrain vehicles ("ATV's"), snowmobiles, backhoes, dump trucks, watercraft, bull dozers and front-end loaders may also accessed depending upon site specific circumstances. Other types, numbers and locations of equipment will be determined upon conclusion of the pipeline detailed design and the completion of Keystone's Emergency Response Plan (Oil Spill

2-9

Response Plan). This plan will be completed in the first quarter of 2009 and submitted to the U.S. Department of Transportation's ("DOT") Pipeline and Hazardous Materials Safety Administration ("PHMSA") prior to commencing operations.

2-10

Data Request:

How many responders would be on the emergency response team?

Response:

The number of emergency responders comprising specific response teams will be determined upon completion of Keystone's Emergency Response Plan (Oil Spill Response Plan) in the first quarter of 2009. Emergency responders will meet or exceed the requirements of 49 CFR Part 194.115, as further described within Keystone's response to Staff's Data Request 2-12.

Typically, emergency response teams would be comprised of Hazardous Waste Operations and Emergency Response ("HAZWOPER") trained personnel as follows:

Tier 1: 8 HAZWOPER trained personnel (includes Emergency Site Manager and Command Post Safety Officer).

Tier 2: 12 HAZWOPER trained personnel.

Tier 3: 24 HAZWOPER trained personnel.

Response prepared by: Brian Thomas

2-11

Data Request:

What are the positions on the emergency response team and the qualifications and training needed for each position?

Response:

Keystone's training requirements for key personnel are shown in the preliminary Emergency Response Plan (Oil Spill Response Plan) that was filed as Exhibit A to the Keystone Application. Keystone's response organization will follow the industry accepted Incident Command System ("ICS") and will typically consist of personnel both on site and within an established remote or Regional Emergency Operations Center ("EOC").

Positions and training requirement for on site personnel have been identified as follows:

Position	Specialized Training to Meet Oil Spill Response Duties
First Responders	• Hazardous Waste Operations and Emergency Response (HAZWOPER) training to Hazmat Technician Level 3 with annual refresher, as required • Keystone Emergency Management System ("EMS") training • National Fire Protection Association ("NFPA") training
Emergency Site Manager – Qualified Individual	• HAZWOPER training to Hazmat Level 4 Specialist with annual refresher, as required • ICS Communication training • Keystone EMS training • NFPA training
Command Post Media	• Keystone EMS training • Keystone Media Relations training
Command Post Safety	• Keystone EMS training • Advanced safety related training
Command Post Documentation	• Keystone EMS training
Command Post Site Security	• Keystone EMS training

Response prepared by: Brian Thomas

2-11

Position	Specialized Training to Meet Oil Spill Response Duties
Command Post Resource Mobilization	• Keystone EMS training
Command Post Technical	• Keystone EMS training
Command Post Staging Leader	• Keystone EMS training
Command Post Evacuation Coordinator	• Keystone EMS training

Positions and training requirements for the personnel related to the Regional Emergency Operations Center have been identified as follows:

Position	Specialized Training to Meet Oil Spill Response Duties
Regional EOC Manager – Qualified Individual	• HAZWOPER training to the Level of Hazardous Materials Specialist with annual refresher, as required • ICS training • Keystone EMS training
Regional EOC Media Contact	• Keystone EMS training • Keystone Media Relations training
Regional EOC Communications	• Keystone EMS training
Regional EOC Documentation	• Keystone EMS training
Regional EOC Security	• Keystone EMS training
Regional EOC Technical	• Keystone EMS training
Regional EOC Resource Mobilization	• Keystone EMS training
Regional EOC Community Evacuation Leader	• Keystone EMS training
Regional EOC Administration Support	• Keystone EMS training

2-12

Data Request:

What is the expected response time to a possible spill in South Dakota located farthest away from the emergency responders?

Response:

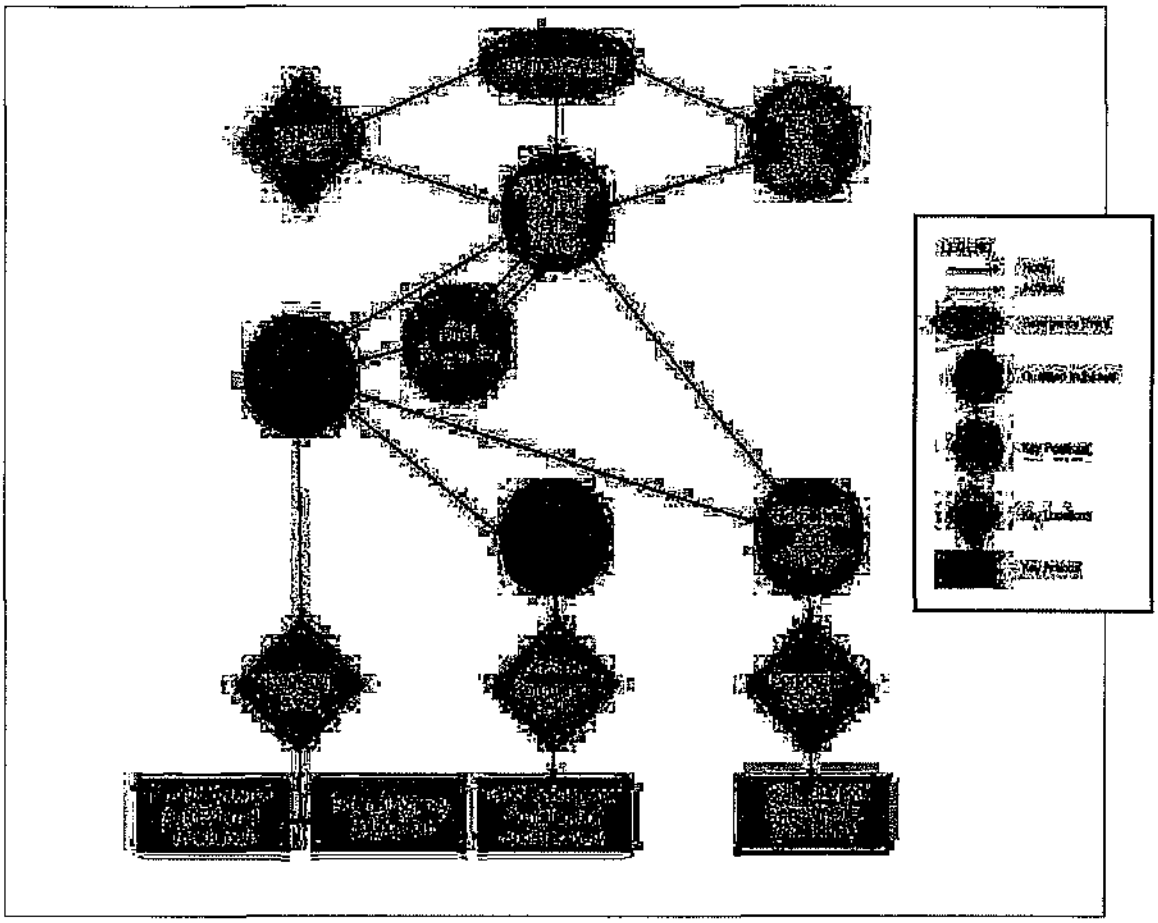
Keystone's Operations Control Center ("OCC") operator will follow prescribed procedures in responding to possible spills that may be reported from sources such as:

- Abnormal pipeline condition observed by OCC operator;
- Leak detection system alarm;
- Employee reported; and
- Third party reported.

Upon receipt of notification as outlined above, the OCC operator will execute the following procedures:

- Follow prescribed OCC operating and response procedures for specific directions on abnormal pipeline condition or alarm response;
- Dispatch First Responders;
- Shutdown pipeline within a predetermined time threshold if abnormal conditions or leak alarm can not be positively ruled out as a leak; and
- Complete internal notifications as outlined below:

2-12



Estimated time to complete an emergency pipeline shutdown and close remotely operable isolation valves are as follows:

- Stop pumping units at all pump station locations: 9 minutes
- Close remotely operable isolation valves: 3 minutes
- Total time: 12 minutes

2-12

Consistent with industry practice and in accordance with regulations including 49 CFR Part 194.115, Keystone's response time to transfer such additional resources to a potential leak site will follow an escalating or tier system. Dependant upon the nature of site specific conditions and resource requirements, Keystone will meet or exceed the following requirements, along the entire length of the pipeline system:

49 CFR Part 194	Tier 1 Resources	Tier 2 Resources	Tier 3 Resources
High volume area*	6 hours	30 hours	54 hours
All other areas	12 hours	36 hours	60 hours

* High volume area means an area with an oil pipeline having a nominal outside diameter of 20 inches or more crosses a major river or other navigable waters, which because of the velocity of the river flow and vessel traffic on the river, would require a more rapid response in the case of a worst case discharge or the substantial threat of such a discharge.

Tier 1, 2 and 3 resources will typically include equipment as described in response to Data Request 2-9, along with additional HAZWOPER trained response personnel, as required to effectively respond to site specific conditions and as directed by the Emergency Site Manager (Qualified Individual).

The primary task of the Tier 1 response team is to minimize the spread of product on the ground surface or water in order to protect the public and unusually sensitive areas, including ecological, historical and archeological resources and drinking water locations. Following an assessment of the site specific conditions such as:

- The nature of the spilled product;
- Source of the spill;
- Direction(s) of spill migration;
- Known or apparent impact of subsurface geophysical feature that may be affected;
- Overhead and buried utility lines, pipelines, etc.;
- Nearby population, property or environmental feature that may be affected; and
- Concentration of wildlife and breeding areas.

The Emergency Site Manager (Qualified Individual) will request additional resources in terms of personnel, equipment and materials, from the Tier 2 and if necessary the Tier 3 response teams. Once containment activities have been successfully concluded, efforts are then directed toward the recovery and transfer of free product. Site cleanup and restoration activities then follow, all of which are conducted in accordance with the authorities having jurisdiction.

2-13

Data Request:

Please explain with details of spill volume, personnel, equipment, response time and procedures to a spill at the Missouri River crossing at Yankton.

Response:

The following outlines a typical response scenario including the strategies for containment, recovery of product and site restoration activities for a potential spill in the vicinity of the Missouri River crossing near Yankton, South Dakota.

Upon notification of a potential spill, as described in the response to Data Request 2-12, Keystone's Operations Control Center ("OCC") operator will perform an emergency pipeline shutdown and close remotely operable isolation valves. Estimated time to complete an emergency pipeline shutdown and close remotely operable isolation valves are as follows:

- Stop pumping units at all pump station locations: 9 minutes
- Close remotely operable isolation valves: 3 minutes
- Total time: 12 minutes

In the case of the Missouri River crossing, Keystone will install a remotely controlled isolation valve on the upstream side of the crossing and an emergency flow restricting device ("EFRD") or check valve on the downstream side of the crossing. This EFRD automatically closes and prevents flow in the reverse direction to further limit any potential spill volume associated with product drain down.

In addition, as indicated in response to Staff Data Request 2-7, Keystone will have pipeline maintenance facility located at Yankton. Accordingly, emergency responders including a Regional Emergency Operations Center ("EOC") Manager and other resources more fully described in response to Staff Data Request 2-8 will also be based in Yankton.

Following execution of the emergency pipeline shutdown, the OCC operator will perform internal notifications as described in the response to Staff Data Request 2-12 and dispatch first responders to the location identified. Key individuals would then be notified and Keystone's Oil Spill Response Plan activated as follows:

2-13

First Responder

- Notification of potential spill and dispatch received from OCC;
- Spill verified;
- Notification of Emergency Services, if required; and
- Verify with OCC:
  - Pipeline shutdown and status;
  - Pipeline segment isolation; and
  - Regional EOC Manager and Qualified Individual (QI) notified.

Regional EOC Manager (QI)

- Notification received from OCC;
- Notification of spill details received from First Responder;
- Oil spill response plan activated;
- Emergency Site Manager (QI) notified;
- Regional EOC activated
- Mobilize response resources requested by Emergency Site Manager (QI);
- Corporate EOC Manager contacted; and
- Agency contacts including the National Response Center and other State and Local agencies contacted.

Emergency Site Manager (QI)

- Notification received from Regional EOC Manager (QI);
- On site First Responder contacted to obtain briefing on spill;
- On Site Command Post activated;
- Regional EOC advised of resource requirements; and
- First Responder relieved.

Response efforts are first directed to preventing or limiting any further contamination of the waterway, once any concerns with respect to health and safety of the responders have been addressed. This is typically accomplished primarily with containment booms and berms. The Emergency Site Manager assumes responsibility for selecting the appropriate locations for construction of berms and deployment of booms as well as communicating any additional resource requirements to the EOC Manager.

2-13

Efforts are initially directed toward containing any spilled product on land prior to it reaching the waterway. With the approval of authorities having jurisdiction, activities such as digging ditches and building berms would be undertaken on the down slope of the spill site, to prevent any overland flow of spilled product from entering the waterway. In some cases it may be possible to use a combination of ditches and berms to divert the overland flow of spilled product to a collection point.

To contain the spilled product once it has reached the waterway, efforts are typically directed toward the deployment of containment boom as close as practical and safe downstream of the of the spill location. With the approval of the authorities having jurisdiction, the Emergency Site Manager assumes responsibility for selecting a suitable location for the deployment of containment booms, based upon the waterway site specific conditions, including flow velocity and avoidance of rapids and falls to ensure the effectiveness of the containment booms.

Product is typically recovered from the surface of water and transferred to containment facilities by a combination of mechanical skimming, vacuum recovery and sorbent materials. While typical methods for the recovery and transfer to containment facilities for product spilled on land include vacuum recovery and sorbent materials.

The cleaning of shorelines and other affected natural or manmade structures is typically performed by traditional methods including, wiping, hot water and low or high pressure wash down and the use of surfactants and emulsifiers or other agents. Water and other liquids used for wash down purposes for onshore applications are typically contained and collected using a combination of ditches and berms as described above. All site specific cleaning methods and materials to be utilized are subject to the approval of the authorities having jurisdiction.

Product laden soils are typically either removed or treated with bioremediation in the event such intrusive cleanup techniques are not appropriate. These and other methods of clean up including natural recovery, burning, dispersants and other chemical usage can be considered in accordance with and at the discretion of the authorities having jurisdiction.

Site restoration activities including the sampling and analysis of the remaining soils and water vary considerably dependant upon site specific conditions and are coordinated with the various Federal, State and Local authorities having jurisdiction.

2-14

Data Request:

Please provide a copy of the spill assessment conducted on 100 foot intervals that was discussed by the applicant at the public input hearings.

Response:

Full details of the spill assessment study methodology and environmental consequences can be found within Exhibit C that was submitted as part of the Application. It is contained in the "3 risk assessment 03-30-07.pdf" and "4 DNV Report RA Appendix A deliverable.pdf" files found in the "ExhibitC_DOS filing\5 March 2007 filing\Risk Assessment" folder.

With respect to the State of South Dakota, Figure 1 and Figure 2 below provide both the calculated risk profile of the pipeline due to potential excavation damage, as well as the potential spill volumes associated with such an event. Excavation damage was identified within the spill assessment study as the leading pipeline threat and is discussed further in this response.

Spill volumes were calculated based upon the potential leak rate, time to isolate the pipeline and draindown occurring within the isolated pipeline segment. The assessment does not take in to account any reduction in spill volume due to actions to control the source aside from pipeline shutdown and closure of isolation valves. Consequently, procedures to reduce spill volume involving depressurization and draindown are not estimated or included.

In assessing the distribution of damage sizes, the failure mechanism and pipe material properties were also considered. The size of the damage is a function of many factors.

In Figure 1 and Figure 2, Mile Post 0 represents the North Dakota and South Dakota border, while Mile Post 218 represents the South Dakota and Nebraska border.

2-14

Figure 1:

South Dakota Combined Risk Profile for Excavation Damage

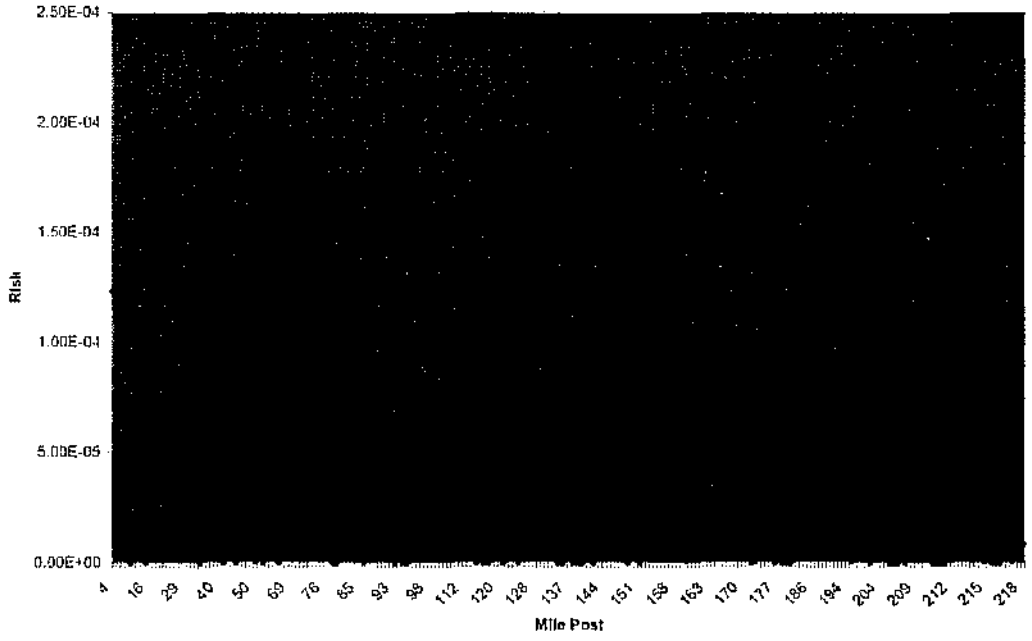
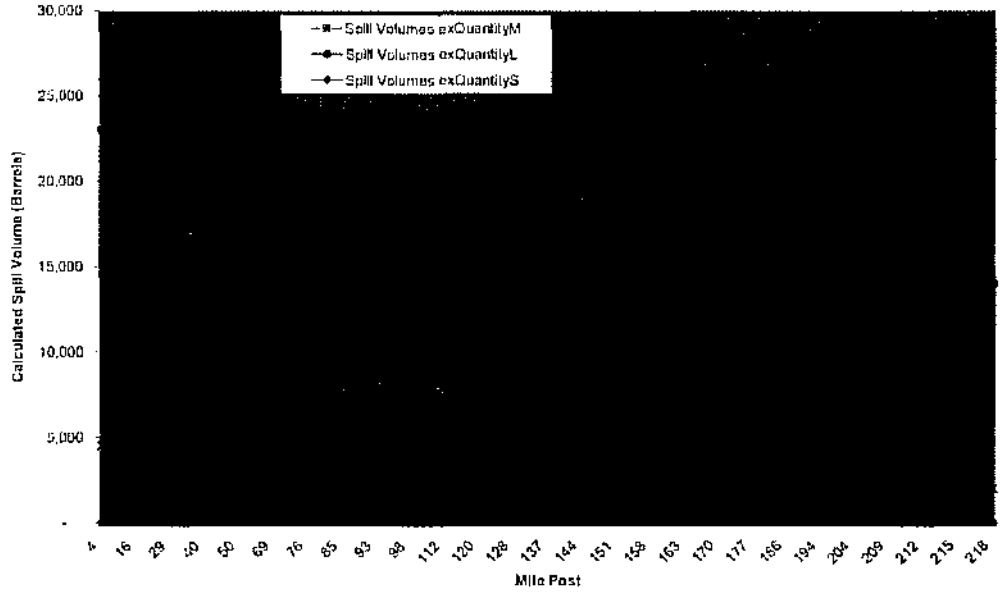


Figure 2:

Calculated South Dakota Spill Outflow Volume due to Excavation Damage



2-14

In comparing the figures, we can take the following examples which represent points of largest potential outflow:

Mile Post	Risk	Risk of Failure in terms of years	Large Leak Spill Volume (bbl)
12.29	5.73 E-07	> 1,000,000 years	25,995
57.29	2.01E-04	5000 years	19,841
202.29	5.73 E-07	> 1,000,000 years	27,094

The risk of failure is low due to the design features Keystone will implement. With respect to the excavation damage prevention and mitigation, these features include:

- High strength steel;
- Burial depth of four feet ;
- Installation of signage;
- Public awareness and damage prevention programs;
- Participation in South Dakota One Call Program; and
- Periodic Aerial Patrol.

The potential spill volume is minimized with the installation of mainline automated isolation valves along the route.

Keystone will perform this assessment annually during operations to confirm the likelihood continues to remain very low. In addition, Keystone's Emergency Response Plan (Oil Spill Response Plan) will be based upon the spill volumes associated with the large volume scenario.

2-15

Data Request:

Please provide the spill volumes and possible spill containment scenario for a catastrophic failure of the pipeline along the South Dakota portion of the route.

Response:

The spill volumes corresponding to the large event size provided in response to Staff's Data Request 2-14 are considered representative of a catastrophic failure.

With respect to the possible spill containment scenario, Keystone's containment strategies will include:

Land based:

- Confining the affected site to as small an area as possible;
- Preventing any spilled product from migrating off site;
- Preventing any spilled product from reaching waterways or water bodies; and
- Blocking any culverts, manholes or other possible means for further product migration.

Water based:

- Confining the spill as close as possible to the spill source;
- Containing the spill prior to it becoming wider and more difficult to effectively contain;
- Preventing the spilled material form reaching rivers, streams and other water bodies; and
- Protecting sensitive area in the direction of spill movement.

Typical containment techniques utilized to contain potential land spills will include:

Land based:

- Earthen dikes;
- Sorbent dikes;
- Snow/ice dikes; and
- Trenches and sumps.

2-15

Water based:

- Containment booms;
- Diversion booms;
- Sorbent booms;
- Containment weirs;
- Earthen dikes.

2-16

Data Request:

Please provide a date when an updated Emergency Response Plan that includes all the information left blank in the version filed with the application will be available.

Response:

Keystone will commence updating its Emergency Response Plan (Oil Spill Response Plan) in the first quarter of 2008 and complete the Plan within the first quarter of 2009. As per the applicable regulatory requirements including 49 CFR Part 194, submission of this Plan to the U.S. Department of Transportation's ("DOT") Pipeline and Hazardous Materials Safety Administration ("PHMSA") is required prior to commencing operations.

Accordingly, the schedule as referenced above will provide Keystone with the appropriate time to train personnel and to conduct tabletop and field oil spill related exercises, prior to commencing line fill operations in the third quarter of 2009.

Response prepared by: Brian Thomas

2-17

Data Request:

Please confirm whether there will be 15 valves as noted in the application or 13 as counted on the route maps provided with the application.

Response:

The map in Exhibit 2 of the application correctly reflects the proposed 14 mainline valves to be located in South Dakota, including the four to be located at pump station sites. Page 9 of the application that states 15 mainline valves is incorrect and a corrected page is attached. Additionally, the route maps included in Appendix A have been checked and correctly show the 14 mainline valves at the following approximate milepost locations:

Valve Number	Milepost
1.	240.2
2. PS-20	263.0
3.	277.2
4.	293.7
5.	301.9
6. PS-21	310.0
7.	331.9
8.	354.6
9. PS-22	358.0
10.	373.7
11.	389.2
12. PS-23	406.5
13.	419.3
14.	431.8

Response prepared by: L.A. Gray

2.2.2 Pump Stations

The four pump stations in South Dakota (Pump Stations 20, 21, 22, and 23) will be located in Day, Beadle, Miner, and Hutchinson counties. (Locations are indicated on the route maps provided in **Exhibit A**.) For the initial 435,000 bpd nominal capacity, each station will consist of two or three pumps driven by electric motors, an electrical building, electrical substation, a small maintenance building, and parking area for station personnel. Keystone will purchase electric power for its pump stations from local power providers. An additional one to two pumps will be added at each pump station if the pipeline's flow rate is increased to 591,000 bpd.

Pump stations will utilize electric power for all pumps, lights, and heating in the buildings. Pump stations will be fully automated for unmanned operation. Remote start/stop, set point controls, unit monitoring equipment, and station information will be installed at each location. The pipe entering and exiting the pump station sites will be located below grade; however, some of the piping within the pump station yard (after entering and prior to exiting the pump station facilities) will be aboveground. **Exhibit 4** shows a typical pump station layout.

There also may be a small gasoline powered emergency generator at each pump station, which will be housed in a small enclosure. The generator will supply electrical power if the local utility power supply is disrupted. The generator's primary purpose will be to maintain communications between the pump station and the pipeline control center, provide lighting and to provide power for minor facility procedures. Estimated operating hours for the generator are less than 20 hours per year. Emergency generators that utilize a petroleum product for fuel are exempt from air permitting requirements in South Dakota.

2.2.3 Mainline Valves

Keystone plans to construct ~~15~~ 14 MLVs along the pipeline in South Dakota. The approximate locations for these valves are shown in the route mapping presented in **Exhibit A**. MLVs will be installed at each pump station and along the right-of-way (ROW). MLV intervals will have an average spacing interval of approximately every 15 miles. When not located at a pump station, MLVs will be sectionalizing block valves constructed within a fenced 50 feet-wide by 50 feet-long site located within the pipeline construction ROW and centered on the 50 feet-wide permanently maintained ROW. The spacing intervals between the MLVs along the ROW are based upon the location of the pump stations, waterbodies greater than 100 feet in width, HCAs, densely populated areas, and other topographic and environmental considerations. Remotely activated valves are located at pump stations, upstream of major river crossings, and upstream of sensitive waterbodies. In the unlikely event of a system upset, these valves can be quickly activated to isolate sections of the pipeline in the event of an emergency to minimize environmental impacts in the unlikely event of a system upset.

2.2.4 Land Requirements

Keystone will construct the Keystone Pipeline using 30-inch-diameter pipe within a 110-foot-wide corridor, consisting of both a temporary 60-foot-wide construction ROW and a 50-foot permanent ROW. Additional temporary work space will be required for stream, road and railroad crossings, hilly terrain, etc. **Exhibit 5** illustrates the typical construction ROW and equipment work locations in most areas. Keystone will reduce the construction ROW width to 85 feet in certain wetlands to minimize impacts.

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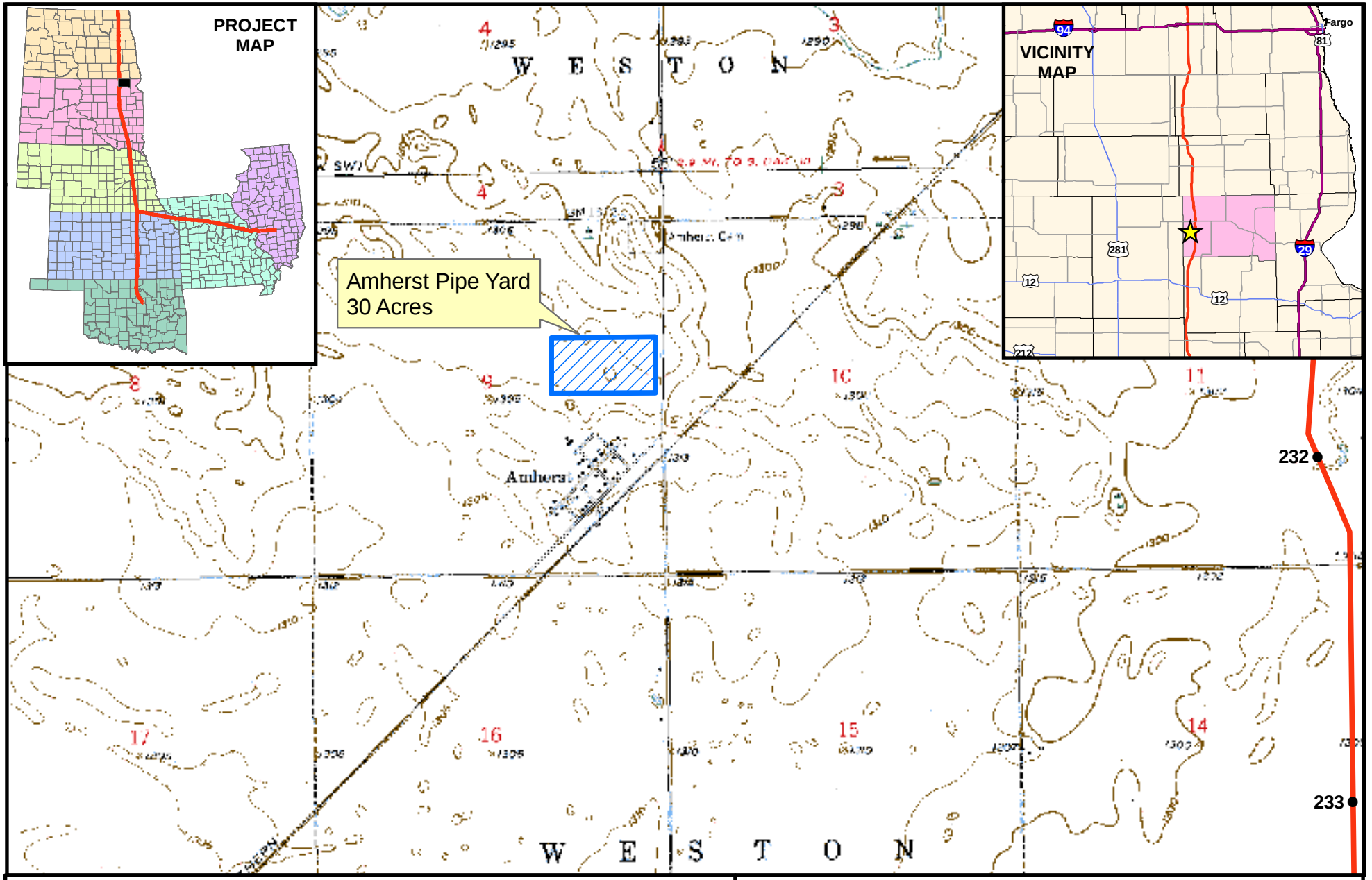


Marshall County, South Dakota
T126N R59W Sec 9
Amherst Pipe Yard

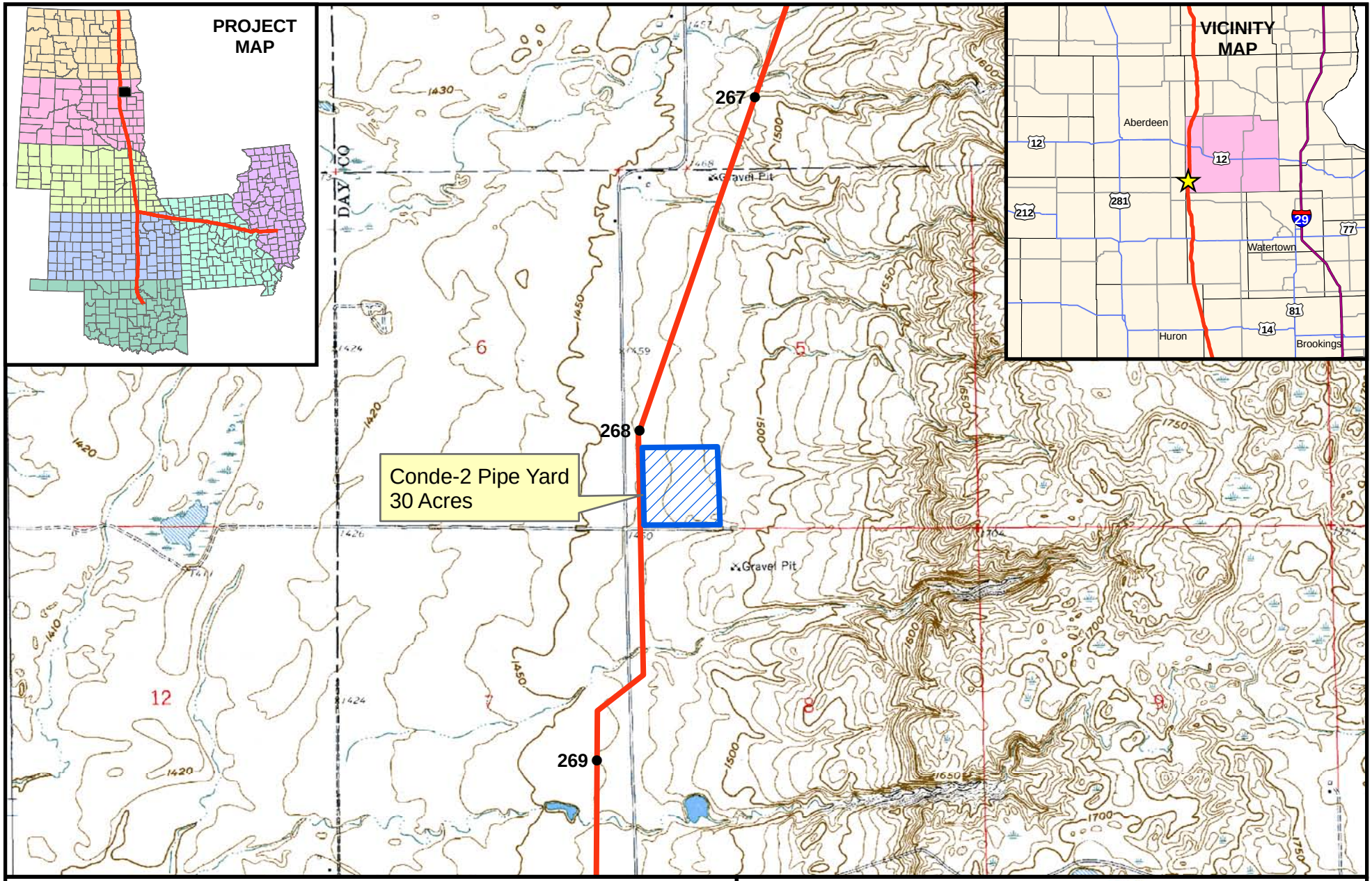
0 0.25 0.5 1 Miles

NOTE:
Yard Area: 30 Acres
Current Land Use:
Agricultural

PREPARED BY:
UNIVERSAL ENSCO, INC.

TransCanada
In business to deliver
KEYSTONE PIPELINE PROJECT

PROJECT:	SCALE	DRAWN BY	DATE	DWG #
9347	1=24,000	LKS	09/27/2007	SD-PY-8.9 REV # 1



Day County, South Dakota
T120N R59W Sec 5
Conde-2 Pipe Yard

0 0.25 0.5 1 Miles

NOTE:
Yard Area: 30 Acres
Current Land Use:
Agricultural

N

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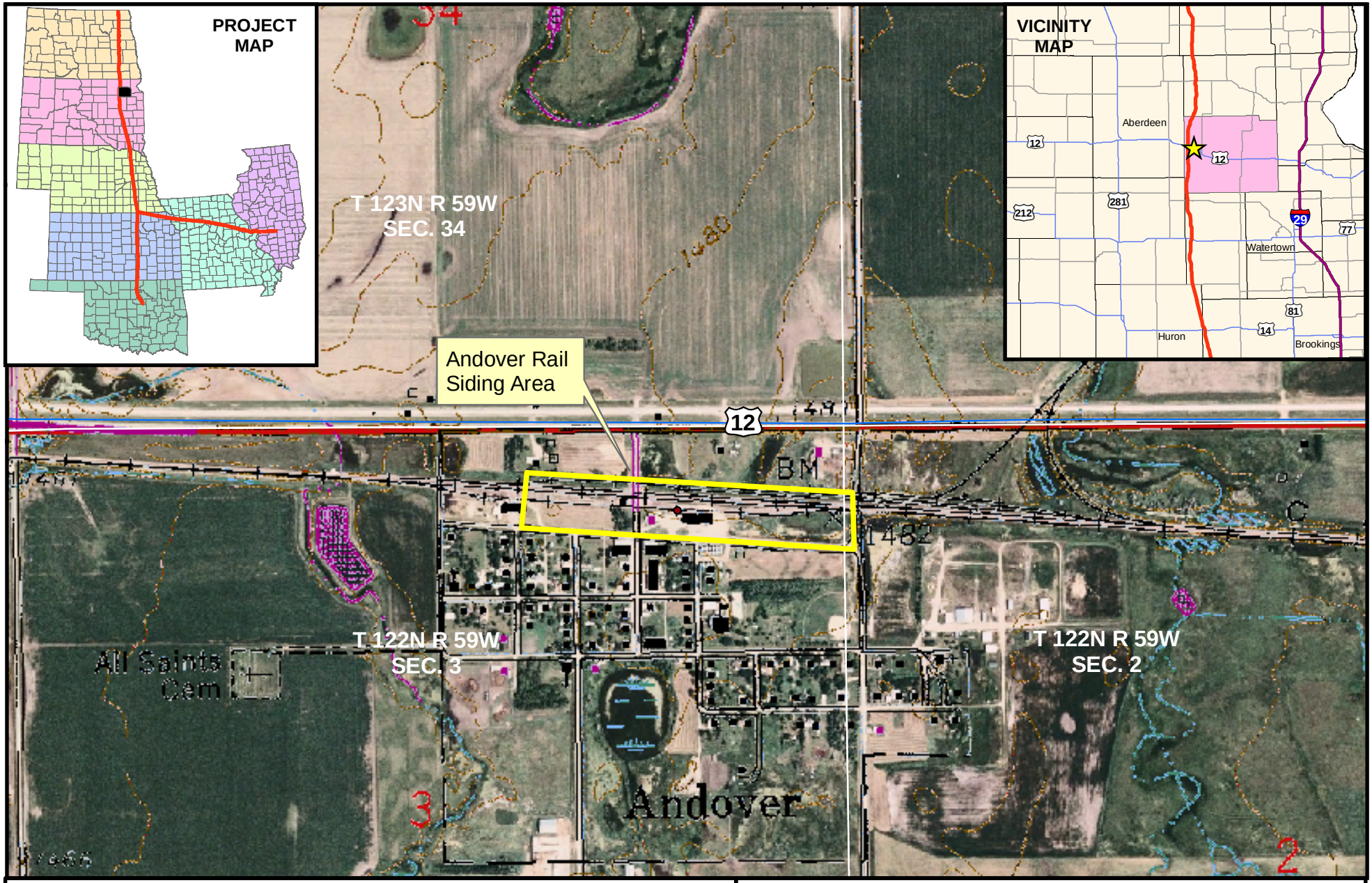
KEYSTONE PIPELINE PROJECT

PROJECT	SCALE	DRAWN BY	DATE	DWG #
9347	1=24,000	LKS	09/12/2007	SD-PY-9.4 REV # 0



Day County, South Dakota
T122N R59W Sec 3
Andover Rail Siding

0 0.1 0.2 0.4 Miles

NOTE:
Rail Siding
Approx. 2.4 miles
east of MP 255.3

N

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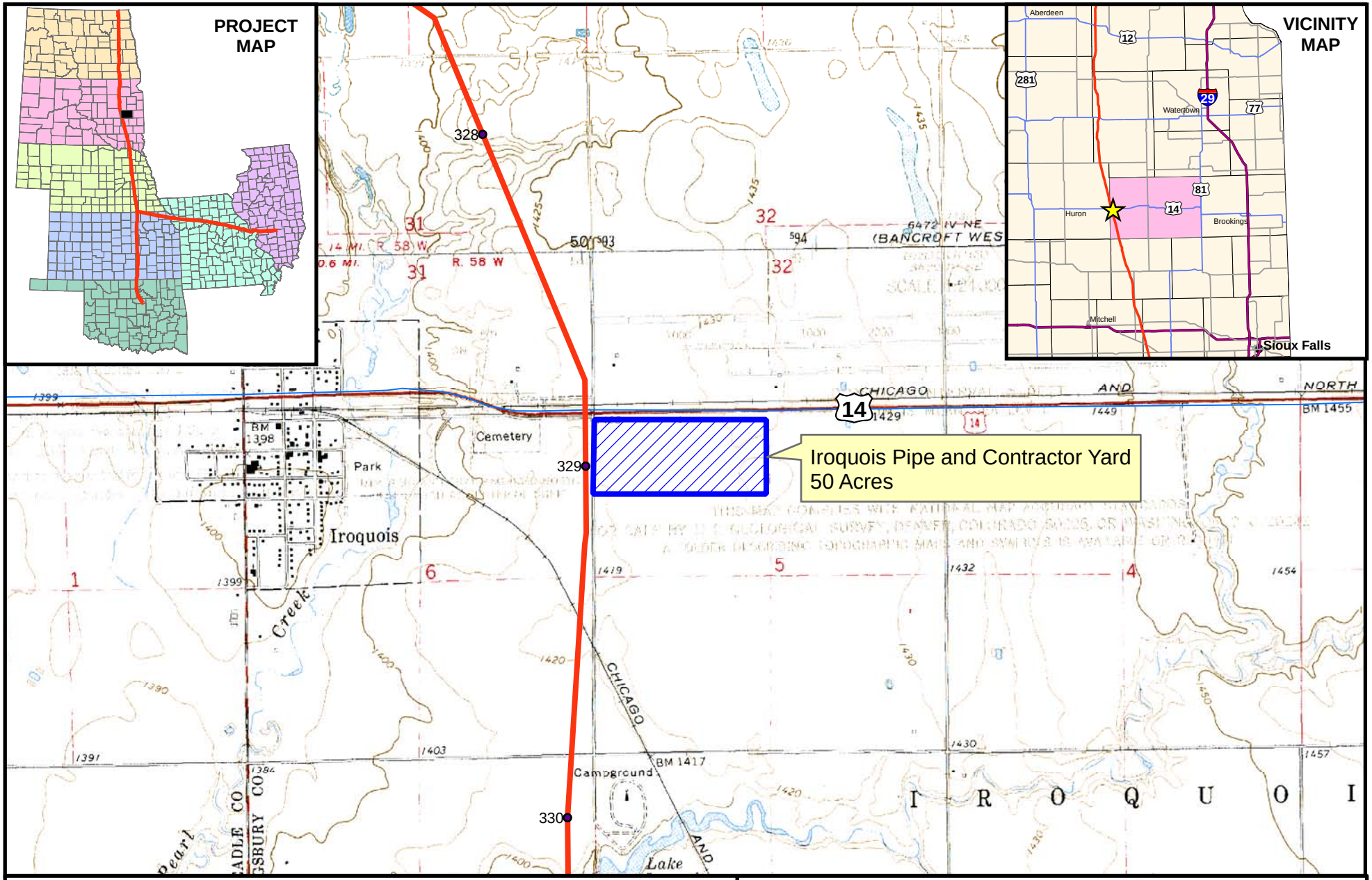
PROJECT	SCALE	DRAWN BY	DATE	DWG #
9347	1=10,000	LKS	09/28/2007	SD-RS-9.5 REV # 0



Kingsbury County, South Dakota
T110N R58W Sec 5
Iroquois Pipe and Contractor Yards

0 0.25 0.5 1 Miles

N

NOTE:
Yard Area: 50 Acres
Current Land Use:
Agricultural

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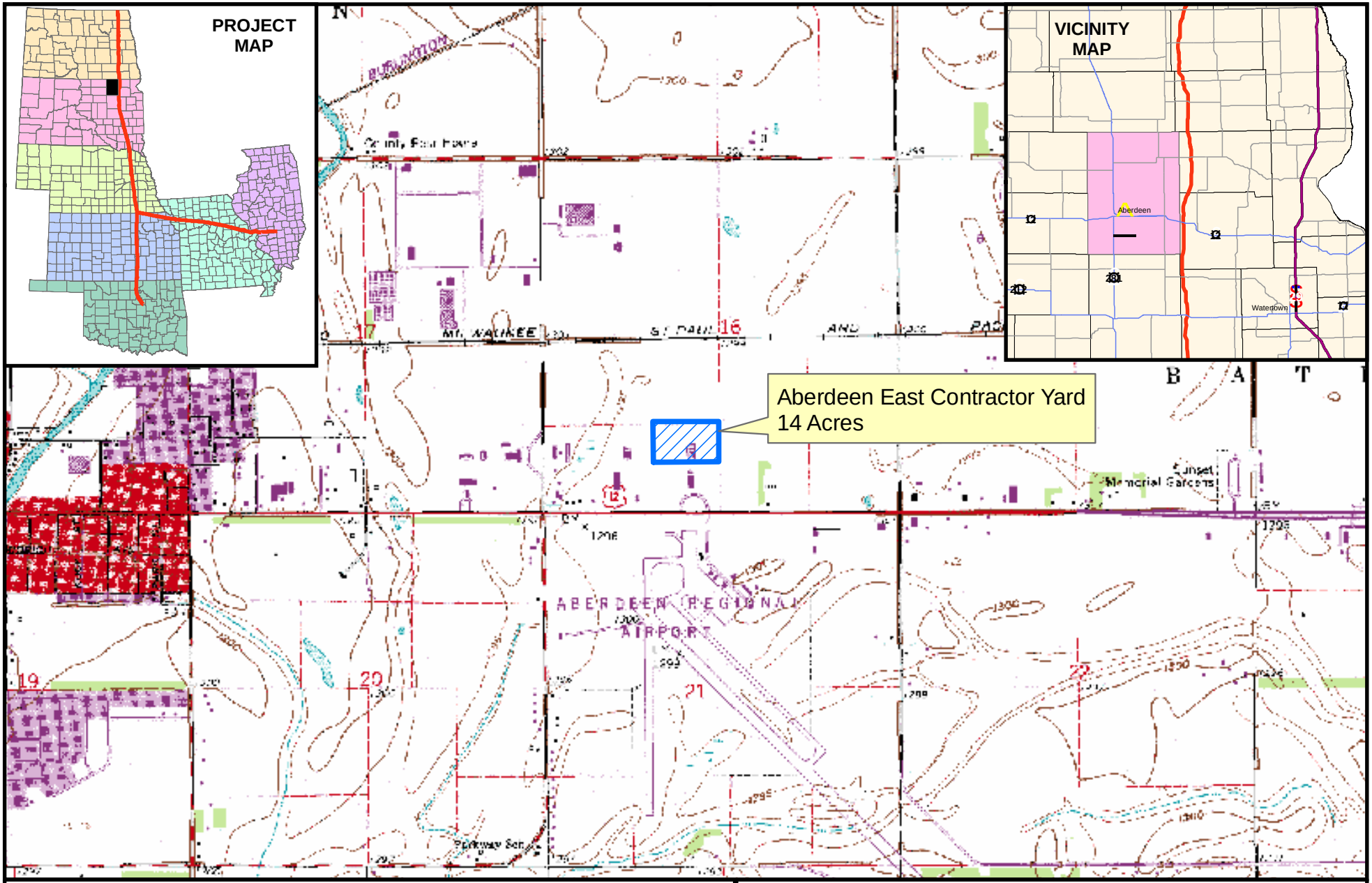
KEYSTONE PIPELINE PROJECT

PROJECT	SCALE	DRAWN BY	DATE	DWG #
9347	1=24,000	LKS	01/10/2007	SD-PC-1.0 REV # 0



Brown County, South Dakota
T123N R63W Sec 16
Aberdeen East Contractor Yard

0 0.25 0.5 1 Miles

NOTE:
Yard Area: 14 Acres
Current Land Use:
Industrial Lot

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KEYSTONE PIPELINE PROJECT

PROJECT	SCALE	DRAWN BY	DATE	DWG #
9347	1=24,000	LKS	09/24/2007	SD-CY-6.5 REV # 0

NORTH DAKOTA

TO THE OAKS PIPE YARD/RAIL SIDING

AMHERST PIPE YARD

AMHERST RAIL SIDING

KEYSTONE PIPELINE

Ball Diamond

MATCHLINE

MATCHLINE

MATCHLINE

MATCHLINE

BROWN COUNTY

MARSHALL COUNTY

DAY COUNTY

PIPE YARD NOTE TEXT

RAIL SIDING NOTE TEXT

LINE CONSTRUCTION RELATED NOTE TEXT

OFF-MAP FEATURE RELATED NOTE TEXT

ROADS W/ SUSTAINED CONSTRUCTION TRAFFIC

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KEYSTONE PIPELINE PROJECT
MARSHALL & BROWN COUNTIES, SOUTH DAKOTA
PIPE YARD COMPOSITE MAP

PROJECT	DRAWING
9347.0000	1805-03-ML-00-811
DATE: 09/28/07	
DRAWN BY: ABH	CHECKED BY: JCB
APPROVED BY: LAG	

NO.	REVISION	DATE
0	ISSUED FOR SUSTAINED CONSTRUCTION TRAFFIC FLOW	09/28/07

SHEET 1 OF 2

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UNIVERSAL ENSCO, INC.

KEYSTONE PIPELINE PROJECT

MARSHALL, BROWN, & DAY COUNTIES
SOUTH DAKOTA
PIPE YARD COMPOSITE MAP

PROJECT: 9347.0000	DRAWING: 1805-03-ML-00-811	
DATE: 09/28/07		
DRAWN BY: ABH	CHECKED BY: JCB	APPROVED BY: LAG

NO.	REVISION	DATE
0	ISSUED FOR SUSTAINED CONSTUCTION TRAFFIC FLOW	09/28/07

PAGE: **SHEET 2 OF 2**