

Dakota Prairie Refining, LLC



Agenda

John Stumpf, VP Strategic Planning, MDU Resources

- Project Overview
 - DPR Project
 - By-Product Logistics

Karl Graham, PhD, Kestrel Engineering

- Pipeline Overview
 - Length
 - Design
 - Construction
 - Safety

Randy Duncan, Barr Engineering

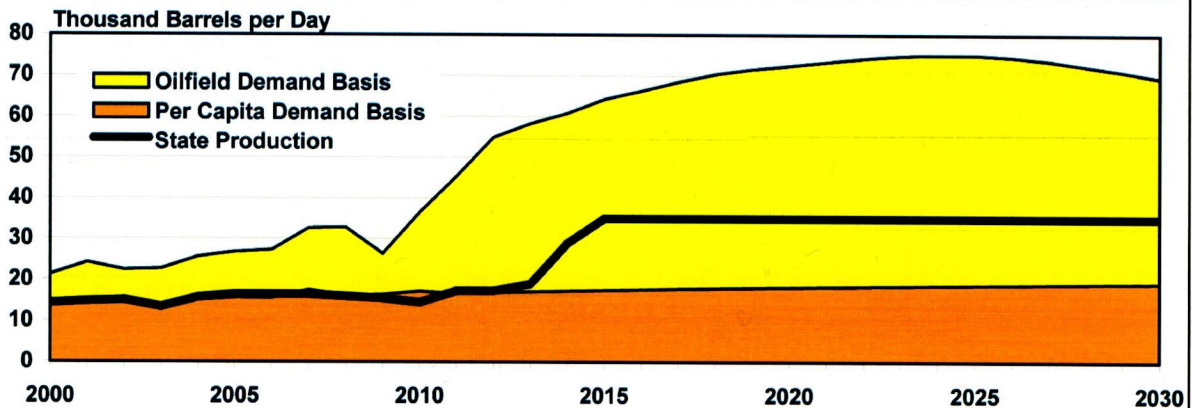
- Siting Criteria Review

- **Situation:** Ample supply of high quality crude oil within an underserved diesel market driven by energy and agriculture sectors.
 - No refined products pipeline in Dickinson region; all diesel must be trucked or railed in.
- This will be the first plant of its kind to be built in the U.S. since 1976.

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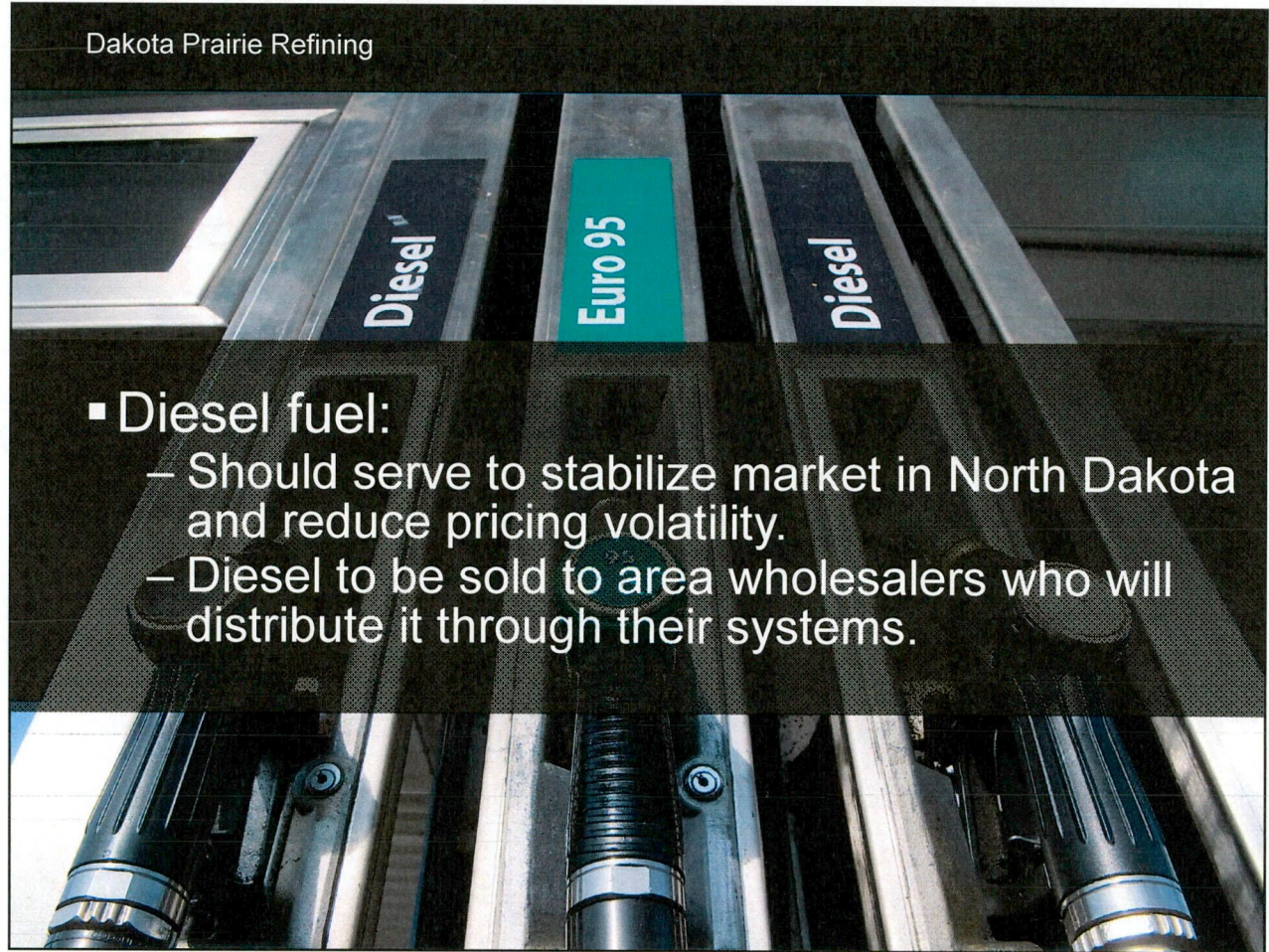
- North Dakota imports more than half of its diesel fuel
- Demand is now more than 53,000 bpd
- Expected to increase to more than 75,000 bpd by 2025
- State diesel production is now approx. 22,000 bpd

NORTH DAKOTA DIESEL SUPPLY AND DEMAND



- **Concept:** Process 20,000 bpd of Bakken crude (delivered to refinery by pipeline and/or truck)
- **Produce:**
 - Diesel about 7,000 bpd (294,000 gallons)
 - About 40 to 45 tanker truckloads per day
 - Naphtha about 6,500 bpd
 - Nine or ten rail cars per day
 - Atmospheric bottoms (ATBs) – about 6,000 bpd
 - Eight or nine rail cars per day
 - Also produces some natural gas liquids

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- Diesel fuel:
 - Should serve to stabilize market in North Dakota and reduce pricing volatility.
 - Diesel to be sold to area wholesalers who will distribute it through their systems.

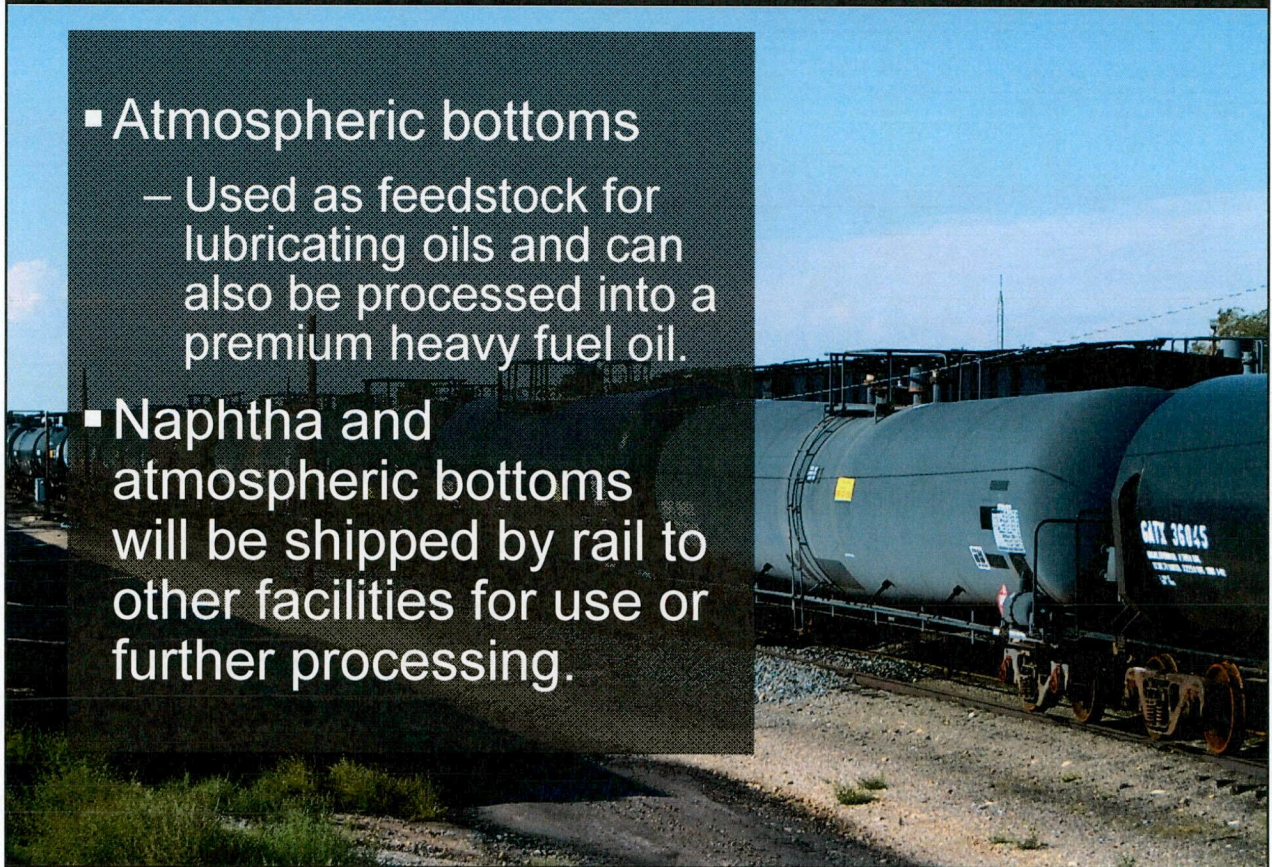
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▪ Naphtha:

- Used primarily as feedstock for producing high octane gasoline
- Diluent for Canadian tar sands crude
- Also used in chemical industry for solvents, cleaning products, lighter fluid, fuel for camp stoves, etc.

- Atmospheric bottoms
 - Used as feedstock for lubricating oils and can also be processed into a premium heavy fuel oil.
- Naphtha and atmospheric bottoms will be shipped by rail to other facilities for use or further processing.



- It is a “topping plant.”
 - Strips out easily refined components, processes them and ships remaining components off to other refineries for complete processing.
 - Typically smaller than full-scale refineries.
 - Usually located near the primary market.

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- Cost: \$300 million
- 400 to 500 employees during peak construction
 - About 90 permanent employees when operating
 - Operations to run 24/7

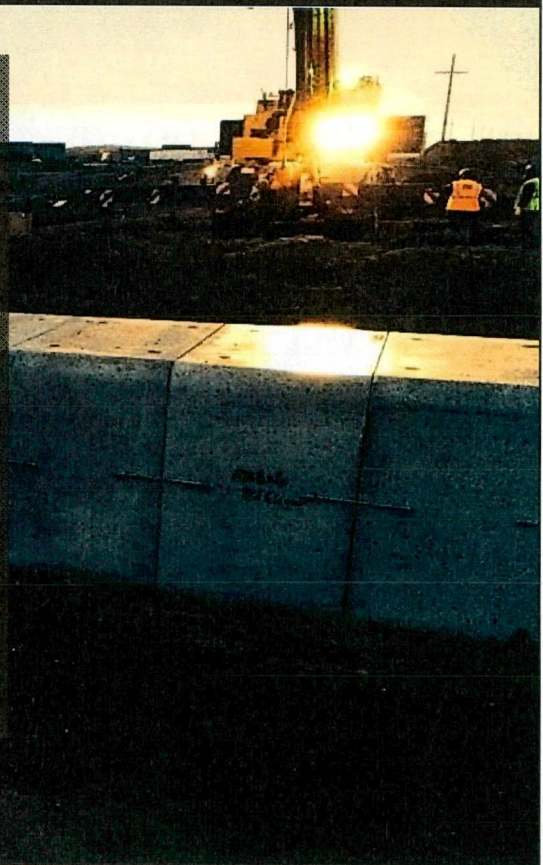
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- Westcon Industries – general contractor
- Ventech Engineering – primary equipment and technology provider
 - Modular components built at Texas facility and transported to the site



Construction Update:

- Project is now 25 percent complete
- One reportable safety incident
- 342,000 man hours worked
- Targeted completion is December 2014



Current Status of Construction Activities:

| <u>Activity</u> | <u>% Complete</u> |
|---------------------------|-------------------|
| Administration Building | 100 |
| Bridge | 100 |
| Storm Water System | 95 |
| Site Excavation | 90 |
| Foundations & Footings | 90 |
| Refinery Firewater System | 90 |
| Other Below Ground Piping | 90 |
| Tank Farm Tanks | 55 |
| Shop & Warehouse | 25 |

Current Status of Construction Activities:

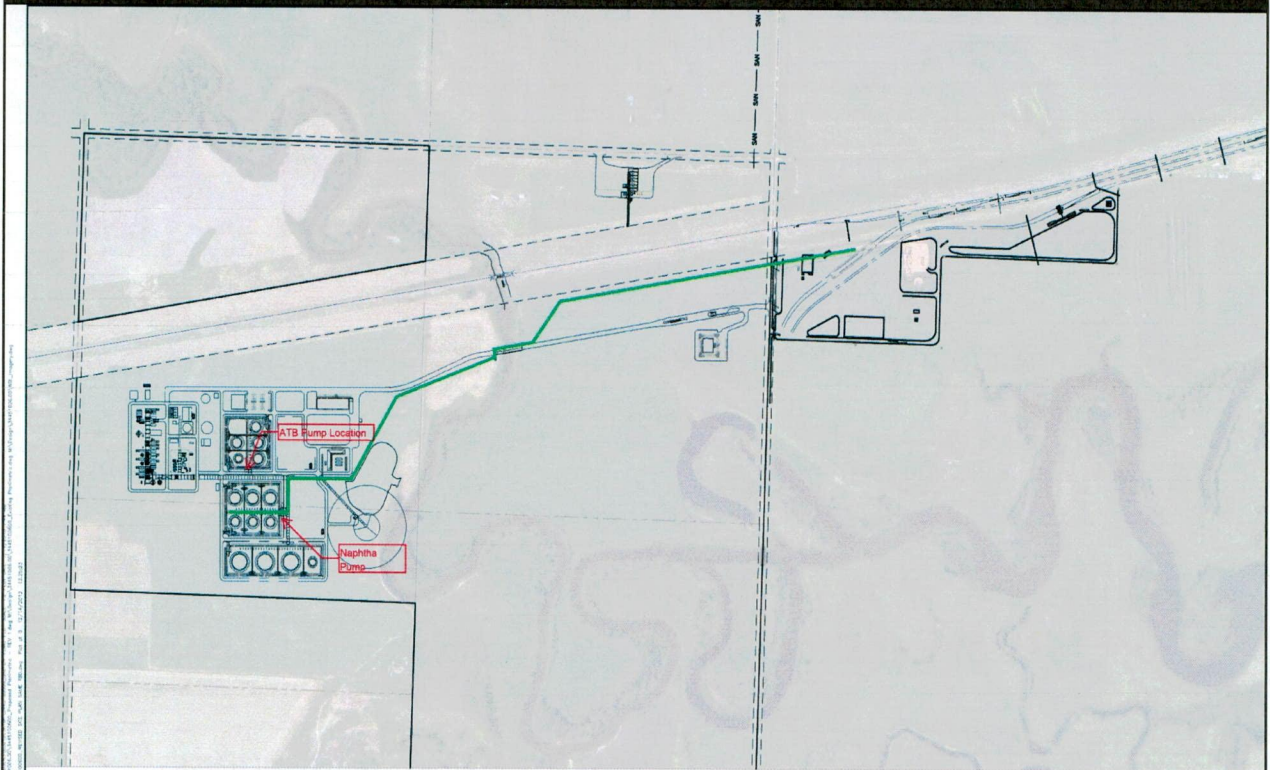
| <u>Offsite Utilities</u> | <u>% Complete</u> |
|---------------------------------------|-------------------|
| Industrial Water | 100 |
| Potable Water | 100 |
| Waste Water | 65 |
| Main Plant Batteries (Houston) | 45 |

2014 Construction Milestones:

| | |
|---|--------------------|
| Crude Distillation Tower | February |
| Other Plant Battery Modules | February - July |
| Oil Movements & Pipeline Commissioning | September |
| Mechanical Completion | November |
| Plant Start-up & Commissioning Process | October – December |

*Everything is Critical Path - Schedule Management is
Paramount!*

Dakota Prairie Refining – By-Products Logistics



PLAN: DAKOTA PRAIRIE REFINERY OVERALL SITE PLAN

SCALE IN FEET

PRELIMINARY DRAFT
NOT FOR CONSTRUCTION

| NO. | BY | DATE | REVISION DESCRIPTION |
|-----|----|------|----------------------|
| | | | |
| | | | |
| | | | |
| | | | |

| | | |
|---|----------------|-------------|
| BARR BARR ENGINEERING CO. 3128 14TH AVENUE EAST TARBORO, NH 08748 TEL: 603-271-1500 FAX: 603-271-1500 WWW.BARR.COM | Project Office | 45, SICKLES |
| | Date | 07/18/2013 |
| | Sheet | 285 |
| | Project | |

DAKOTA PRAIRIE REFINING, LLC
BISMARCK, NORTH DAKOTA

20,000 BPSD DAKOTA PRAIRIE REFINERY
DICKINSON, NORTH DAKOTA

34/45-1008
CLIENT PROJECT NO.

REV. NO. REV. BY

SKETCH 1 A

Dakota Prairie Refining



By-Product Logistics

- Initially DPR planned to have its own rail loading system for by-products
- As project evolved – rail traffic congestion and traffic management issues became problematic
- By-product logistics evolved into a pipeline transportation system to the neighboring BOE facility and development of a Rail Transload System built by BOE specifically for DPR
- Agreement Reached with BOE on Sept. 3rd

By-Product Logistics (continued)

Lario Shipping LLC (LSL)

- LSL will develop rail shipping facility dedicated to DPR

- DPR will transport by-products (Naphtha & ATB) to a LSL custody transfer point via two above-ground pipelines

- Pipelines located entirely on property owned by either DPR or LSL; no third party properties affected by pipeline route

By-Product Logistics (continued)

- LSL shall have facility completed no later than December 1, 2014

- Capacity to handle daily throughput volume of 22,000 barrels per day; normal operations will be within a range of 12,000 to 13,000 barrels per day (17 to 20 rail cars per day)

- Facility designed to receive, stage and release 88 rail tank cars

- By-product volumes metered at the rail rack; volume movement monitored continuously

By-Product Logistics (continued)

- DPR responsible for use and maintenance of the pipelines. ATB pipeline will be insulated and heat traced; both the ATB and Naphtha pipeline are mostly above-ground

Pipeline Design Basis

- Must transfer 6,500 bpd Naphtha (average flow of 190 gpm) and 6,000 bpd ATB (average flow of 175 gpm) to BOE safely.
- Loading is not continuous. Multiple rail cars are located at loading stations, configured for fill, filled, disconnected, and removed.
- Design flow.
- Rate for both products is 750 gpm to allow for intermittent operation.
- Depending on filling operation, byproduct flow is variable, though majority of time flow is expected to be either 0 or 750 gpm.

Pipeline Layout

▪ Length

- Overall length of 5,928 ft. for ATB; 5,907 ft. for Naphtha
 - ATB line is 648 ft. greater than one mile threshold
 - Naphtha line is 627 ft. greater than one mile threshold
- DPR property length of 5,390 ft. for ATB; 4,493 ft. for Naphtha
- BOE property length of 600 ft. for both pipelines

▪ Routing

- Starts in DPR tank farm
- Cross the plant road west of bridge in a buried culvert
- Cross river on bridge in a protected piperack
- Routed parallel to railroad right of way
- Cross county road 116th Ave. SW underground
- Route across BOE property to rail loading rack
- Terminate at rail loading rack

Mechanical Design – Naphtha Line

- 6 inch, schedule 40, seamless ASTM A53 grade B, carbon steel piping with 150 class raised face weldneck flanges, designed according to the ASME Code for Pressure Piping, B31.3.
- Above-ground piping to be primed and painted. Below ground piping to be wrapped and cathodically protected.
- Operating and design pressures
 - Normal pressure at design flow will range from 163 to 25 psig.
 - Maximum pump outlet pressure is 187 psig.
 - Design rating per DPR standard for 150 class piping is 285 psig.
 - Pressure rating of pipe if designed per ASME B31.4, Pipeline Transportation Systems for Liquids and Slurries is 1,650 psig.

Mechanical Design – ATB Line

- 8 inch, schedule 40, seamless ASTM A53 grade B, carbon steel piping with 300 class raised face weldneck flanges, designed according to ASME Code for Pressure Piping, B31.3.
- Above-ground piping to be primed, painted, electrically traced and insulated. Below ground piping to be wrapped and cathodically protected.
- Operating and design pressures
 - Normal pressure at design flow will range from 141 to 25 psig.
 - Maximum pump outlet pressure is 155 psig.
 - Design rating per DPR standard for 300 class piping is 760 psig.
 - Pressure rating of pipe if designed per ASME B31.4, Pipeline Transportation Systems for Liquids and Slurries, is 1,514 psig.

Above Grade Installation

- Pipe is routed at an elevation that is 3 to 17 feet above grade, with pipe supports spaced no greater than 20 feet apart.
- Approximately 10 expansion loops will be incorporated into the design to ensure that it is installed within the stresses permitted according to the ASME Code for Pressure Piping, B31.3.

Below Grade Installation

- Pipe is below grade only at the road crossing at 116th Ave. SW. between the two properties.
- Road crossing is to be approximately 400 feet long, at a depth adequate to avoid interference with the roadway and existing utilities.

Safety Provisions

- Pipeline design pressures are substantially above the intended maximum pump output pressures.
- The majority of the line is above grade and visible at all times making regular visual inspection possible.
- Above-ground piping will be subject to regular thickness monitoring via the plants' mechanical integrity program.
- Bridge crossing is designed to divert any leak off the bridge and away from the river.
- Below ground piping is minimal and will be wrapped and cathodically protected.
- Should a leak occur, it could be stopped immediately by simply shutting down the transfer pump.

Minimal Adverse Effect

- Pipeline length
 - ATB line 5,928 ft.; 648 ft. greater than threshold length
 - Naphtha line 5,907 ft.; 627 ft. greater than threshold length
- Land owned by Dakota Prairie Refining / Lario Shipping, LLC-No third party property impact
- Zoned industrial, previously agricultural
- Route corridor disturbed by refinery, rail hub, oil well, and road
- Primarily above-ground construction

No Exclusion Areas within Route

- No national, state or county parks, landmarks, monuments or wilderness areas or nature preserves
- No known historic resources or significant archaeological sites
- No areas of threatened, endangered, unique or rare plant or animal species
 - Stark County Federally Listed Species
 - Whooping Crane
 - Black-footed Ferret
 - Gray Wolf
- No ICBM launch or control facilities

No Avoidance Areas within Route

- No known historical districts or resources
- No geologically unstable areas
- No designated forests or grasslands areas
- No designated wildlife areas, wildlife or game refuges or management areas
- No designated or registered wild, scenic, or recreational rivers
 - Crosses Heart River on bridge
- No areas of recreational significance
- No reservoirs, municipal or rural water districts supplies
- No irrigated land
- No residences within 500 feet

Selection Criteria

- No adverse impact on agriculture, including drainage patterns
- No impact on wetlands or woodlands
- No sound or visual impact on adjacent land uses
- No impact on radio, television or other communication and electronic control facilities
- Facility design minimizes impacts to the environment and minimizes risks to human and animal health and safety
- Minimal impact to plant life

Policy Criteria

- Above-ground design allows for quickest discovery and response to potential issues
- Connection of DPR and BOE avoids construction of redundant railroad facilities
- Parallels existing railroad ROW corridor
- Beneficial impact of refinery