

O&G PROJECT EXPERIENCE: OIL

Brazos Midstream

Bison Crude Oil Truck Terminal

FNI provided full design services for the Bison Crude Oil Terminal including geotechnical, grading, structural, process (PIDs), mechanical, and electrical design. FNI also provided procurement, project management, construction drawings and construction support. This Permian Basin facility is rated for 57,000 BPD with one (1) 30,000 Bbl EFR storage tank, six (6) 750 Bbl API tanks for blending, and LACT measurement for pipeline and truck volumes in and out of the terminal.



Brazos Midstream

Cross V Terminal - Tank Expansion

FNI provided services to expand the Cross V Crude Oil Terminal adding one (1) 30,000 Bbl tank and other facilities. The scope included a plot plan, site grading and berm containment designs, PIDs, pump sizing/selection, piping isometrics, tank design review, electrical design, project management and construction management support. This Permian Basin facility is now rated for 57,000 BPD and includes one (1) 30,000 Bbl EFR storage tank, ten (10) 1,000 Bbl API tanks for condensate blending, and LACT measurement for the multiple pipeline and truck volumes in and out of the terminal. This facility also possesses inter-terminal transfer capabilities with two (2) 250 HP vertical can transfer pumps rated to 31,000 BPD each.



Confidential Client

Permian Basin Crude/Condensate Terminals

FNI provided front-end engineering services for ten (10) Permian Basin crude/condensate terminals each containing receipt and header facilities for multiple incoming gathering trunklines, a cross-country pipeline delivery point, twelve (12) truck offloading spots with LACTs, one (1) 500 Hp pump rated to 33,000 BPD at 1,000 psig. FNI also designed nine (9) inline pump stations related to the terminal and pipeline projects. Flow rates ranged from 100 to 400 MBPD.



Navigator Energy Services, LLC

North Dakota Oil Terminals

FNI provided front-end engineering for three (3) Bakken Crude Oil Terminals feeding into the Dakota Access Pipeline (DAPL). Two (2) stations were rated for 150,000 Bpd throughput and 150 MBbl of API tank storage. There were six (6) incoming gathering trunklines, four (4) truck offloading spots with LACTs, and a series of 100 MBPD pumps. The third terminal was rated for 300,000 BPD with 300,000 Bbls of storage and pump rates to 150,000 BPD.



Navigator Energy Services, LLC

Pegasus Crude Oil Truck Terminal

FNI designed a 37,000 Bbl storage terminal (expandable to 74 MBbl) in Midland County, Texas. The project included truck offloading spots with LACTs, vertical turbine pipeline pumps, metering and controls. FNI's scope included grading plans, foundation designs, PIDs, pump selection, hydraulic calculations, review and approval of tank vendor drawings, procurement, capital cost estimating/tracking and coordination with the Client's construction manager.

Pioneer Natural Resources, Inc.

Tank Design and Pressure Study

FNI analyzed a 21-foot outside diameter (OD), 1,000 Bbl cone-roof tank and the structural impact of increasing its design pressure. We applied the API 12E and 650 standards independently to analyze the integrity of the proposed tank. A final report was issued indicating, subject to structural modifications in the base, walls and roof, the tanks could be pressured to 12 oz. with the appropriate safety factors. The final design allowed Pioneer to operate with larger pressure windows yielding a broader operating envelope and minimizing nuisance alarms.

O&G PROJECT EXPERIENCE: OIL

TexStar Midstream Services, LP

High 85 Project

Our Client needed to move oil from Eagle Ford well-head tank batteries to an outbound pipeline before the pipeline's gathering infrastructure was built-out. FNI designed a terminal allowing well-head volumes to be trucked into a central delivery point on the trunkline. Engine-driven pipeline pumps and gas generators ensured the lack of electrical power infrastructure in this part of the state did not slow the delivery of this new crude to market. Storage consisted of three (3) 93,000 Bbl storage tanks, one (1) blending tank, and one (1) sour tank. Terminaling consisted of ten (10) truck offloading spots with LACTs (with slots to expand to 20), three (3) 35,000 BPD pipeline pumps, and inbound and outbound pipelines. FNI's scope included site design, plot plan, PIDs, 3D pipe and equipment modeling, piping isometric drawings, electrical design, procurement, and construction management.

ARM Energy Management, LLC

Salt Creek Midstream Pad Sites

FNI designed four (4) oil metering sites including a positive-displacement pump and LACT unit.

XTO Energy

James Ranch Unit Developments

FNI provided services for a 30,000 BPD terminal in the Delaware Basin which included three (3) 10,000 Bbl storage tanks, two (2) 6,000 BPD stabilization units, and inlet/outlet LACT measurement. FNI's scope included grading plans, foundation designs, PIDs, 3D pipe modeling, isometric piping drawings hydraulic calculations, and reviewed vendor drawings.

XTO Energy

Ross Draw Oil CDP

FNI provided services for a 35,000 BPD terminal in the Delaware Basin which included four (4) 750 Bbl off-spec product storage tanks with skimming and reinjection to sales, as well as, inlet/outlet LACT measurement. FNI's scope included grading plans, PIDs, 3D pipe modeling, isometric piping drawings hydraulic calculations, full electrical design, and reviewed vendor drawings.

SERVICES AND CAPABILITIES

PROCESS ENGINEERING

- Process Simulation: Design and Optimization
- Process Flow Diagrams and PIDs
- Process Data sheets, Equipment Specifications
- Cause and Effect Diagrams, Control and Shutdown Philosophies
- Due Diligence Analysis

DESIGN DRAFTING

- 3D CADWorx Facility Modeling
- Bill of Materials
- Piping, ISOGEN
- As-Builts
- GIS Mapping Services

FACILITY ENGINEERING

- Pump Station Design and Optimization
- Terminal Loading and Unloading Design
- Liquid Storage Specifications
- Condensate Stabilization
- Well Site Standardization Support Services
- Project Management
- Electrical Design
- Instrumentation, Controls, and SCADA Design
- Civil and Structural Design
- Foundation Design
- Site Grading Plans
- LIDAR Technology

ENVIRONMENTAL

- Geotechnical Investigations
- NEPA Documentation
- Archeological, Environmental Assessments and Impact Statements
- Section 404/10 and 208/408 Permits
- Threatened and Endangered Species Surveys
- Wetland Delineations
- Environmental Mitigation
- Phase I/II Site Assessments and Remediation
- Air, Wastewater, and Hydrostatic Permitting
- Annual emissions reporting
- GIS Analysis

PIPELINE ENGINEERING

- System Design for Oil Gathering
- Hydraulic Analysis Single- and Multi-Phase Pipelines
- Industry Leading Surge Modeling
- Alignment Sheets
- HDD Design
- Railroad and Highway Crossing Permit
- Regulatory Approvals and Permit Acquisition
- Right-of-Way Coordination
- Utility Coordination, Relocations, Conflict Analysis

O&G PROJECT EXPERIENCE: GAS

Brazos Midstream

Barstow, Miller, Pecos, Utah and Wilson Compressor Stations

FNI designed five (5) compressor stations varying slightly in number and type of compressors and drivers. The stations included TEG dehydration, a four (4) tank battery, flare and vent. FNI's scope includes site grading and drainage design, plot plan, equipment, piping, and control valve sizing, PIDs, 3D pipe modeling, bill-of-material, isometric piping drawings, and full electrical design. FNI also provided procurement assistance.



RKI Exploration and Production, LLC

State Line Compression Station and Discharge Pipeline

FNI designed and managed the construction for a 60 MMCFD compressor station in West Texas. The station included inlet separation, compression, dehydration, fuel gas conditioning, API tank battery, raw condensate storage, flare and instrument air. Controls were local pneumatic with a pneumatic ESD loop. FNI also designed and managed the construction of 7 miles of 10-inch HP pipeline from the subject compressor station to a third-party gathering trunkline. The delivery point included raw condensate separation and terminaling.



XTO Energy

St. John's Compressor Station

FNI designed the St. John's Compressor Station by relocating the compressors from the Johnson Ranch Compressor Station and dehydration equipment Night Train Compressor Station from the Barnett Field to the Permian Basin. As the station already existed, FNI's scope included a full redesign of the station utilizing new and surplus equipment and the original pipe rack. We provided grading plans, plot plan, containment designs, foundation designs, pipe and control valve sizing, PIDs, PHA support, 3D pipe model, isometric pipe drawings, field as-built coordination and full electrical design.



XTO Energy

Raider, Wolverine and Bronco Compressor Stations

FNI designed three (3) 100 MMCFD three-stage compressor stations each with twelve (12) gas- and electric-driven units. Facilities include two (2) 100 MMCFD slug catchers, TEG dehydration, tank battery, emergency flare, utility flare, fuel gas treating and instrument air compression. FNI's scope included grading plans, plot plan, containment sizing, foundation designs, hydraulic, PSV, and control valve sizing, PIDs, PHA support, 3D pipe model, and isometric pipe drawings. This design included multiple process simulations for summer/winter and rich/lean conditions.



Rosetta Resources Inc.

Gates 2 Expansion

In two (2) phases, FNI designed a rich gas separation facility and compressor station. The final configuration topped out at 200 MMCFD capacity. Station units included slug catcher, raw condensate bullet storage, filter/coalescers, compression, fuel gas conditioning, tank battery, and utility flare. FNI's scope included facility layout/plot plan, helical pier location plan, PIDs, 3D piping model, piping isometrics, bill-of-material, and full electrical design.



USA Compression

Modular Compressor Station

FNI developed a standard compressor station design including general layout/plot plan, skid drawings and PIDs.

Various USA Compression Clients

Various Compressor Stations

FNI provided site-specific plot plans, foundation location plans and foundation design drawings, 3D piping model, bill-of-material, piping isometric drawings for the fall-off, and full electrical design.



Aethon Energy

Golf Lake Amine Plant

FNI provided a Balance-of-Plant design (BOP) for a 28 MMCFD, 150 gpm, Kinder Morgan amine unit. We provided geotechnical services, foundations and structural designs, PIDs, 3D pipe modeling, bill-of-material, and full electrical design. FNI provided procurement assistance on various parts of equipment.

O&G PROJECT EXPERIENCE: GAS

Cardinal Midstream, LLC

Buffalo, Remington, Silver Pigeon,
Territory Compressor Stations

FNI executed grading plans, foundation designs and drawings, foundation location plans and full electrical design for four (4) compressor stations.

EnLink Midstream

Alamo, Charro, Corral Canyon,
Desperado, Eleanor Rose, Hazle, Macy
J, Horned Frog, Pecan, Rico, Ripley, and
UL Compressor Stations

Survey, grading plans, foundation designs and drawings, foundation location plans for twelve (12) compressor stations.

Lucid Energy Group

Silver Gas Plant

FNI provided mechanical design for the relocation of a 20 MMCFD, 1981-vintage Randall, refrigerated TXP plant near Big Lake, Texas. Deliverables included a plot plan, PIDs, 3D pipe modeling, isometric piping drawings, bill-of-material, and full electrical design.

TexStar Midstream Services, LP

Highway 97 Inlet Facility

FNI provided designs for a 200 MMCFD/2000 BPD inlet gas/raw condensate separation facility in the Eagle Ford play.

TexStar Midstream Services LP

Pettus Inlet Facility

FNI provided designs for a 300 MMCFD/12,000 BPD inlet gas/raw condensate separation facility in the Eagle Ford play.



SERVICES AND CAPABILITIES

FACILITY ENGINEERING

- Compressor Stations
- Amine Treating Plants
- Sour Gas Treating Facilities
- Gas Processing (Cryo, JT)
- Condensate Stabilization
- Well Site Standardization
- Interconnects and Meter Stations
- Electrical Design
- Instrumentation, Controls, and SCADA Design
- Civil and Structural Design
- Foundation Design
- Site Grading Plans
- LIDAR Technology

PROCESS ENGINEERING

- Process Simulation: Design and Optimization
- Process Flow Diagrams and PIDs
- Process Data sheets, Equipment Specifications
- Cause and Effect Diagrams, Control and Shutdown Philosophies
- Due Diligence Analysis

DESIGN DRAFTING

- 3D CADWorx Facility Modeling
- Bill of Materials
- Piping, ISOGEN
- As-Builts
- GIS Mapping Services

PIPELINE ENGINEERING

- System Design for Gas Gathering
- Transmission and Distribution System Modeling
- Hydraulic Analysis Single- and Multi-Phase Pipelines
- Industry Leading Surge Modeling
- Alignment Sheets
- HDD Design
- Railroad and Highway Crossing Permit
- Regulatory Approvals and Permit Acquisition
- Right-of-Way Coordination
- Utility Coordination, Relocations, Conflict Analysis
- Potholing Plans and Permitting

ENVIRONMENTAL

- Geotechnical Investigations
- NEPA Documentation
- Archeological, Environmental Assessments and Impact Statements
- Section 404/10 and 208/408 Permits
- Threatened and Endangered Species Surveys
- Wetland Delineations
- Environmental Mitigation
- Phase I/II Site Assessments and Remediation
- Air, Wastewater, and Hydrostatic Permitting
- Annual emissions reporting
- GIS Analysis

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O&G PROJECT EXPERIENCE: PIPELINE

Gemini Midstream

Natural Gas Gathering System

FNI designed eleven (11) natural gas pipelines of Gemini's gathered system in East Texas consisting of more than 50 miles. FNI also designed 18 surface sites. The pipelines were all modeled and designed to meet CFR 192 and ANSI 600 standards. Pipeline diameters ranged from 36 to 8 inches. FNI provided all the alignment sheet and all of the bill of materials.



Gemini Midstream

Pipeline Realignment Plan

FNI developed a written realignment plan for a 24-inch diameter pipeline. The American Petroleum Institute (API) 1117 was used as a guide for the overarching process. FNI also wrote a specific procedure for determining and documenting the straightening and replacement of the pipeline.



Pioneer Natural Resources, Inc.

Natural Gas Gathering System

FNI designed the gas gathering system and central delivery point facilities. The scope of work included three (3) low pressure gas gathering systems with inlet facilities, including site development, slug catchers, three-phase separation, measurement, air systems, and storage of produced water and oil. The gathering system design consisted of more than sixty (60) pipelines and more than 100 miles. Surface sites were designed to meet initial and future demand. Pipeline diameters ranged from 20 to 6 inches.



Lucid Midstream

Gas and Oil Pipelines

FNI designed and provided construction management of approximately 150 miles (15 pipelines) of natural gas gathering pipelines, natural gas liquids, and oil pipelines in West Texas. Project included route review, alignment sheet preparation, pipeline design calculations, horizontal directional drilling bore designs, material specifications and construction management, such as authorization for expenditure preparation and bill of materials development/procurement.



Atmos Energy Corporation

City of Fort Worth Gas Pipeline Relocations

FNI provided the design and coordination of 21 projects that were either new pipeline projects, replacement pipeline projects or pipeline relocation projects, including the new gas pipeline servicing the Texas Rangers ballpark in Arlington, Texas. FNI provided the following services based on the individual needs of each project:

- Survey coordination
- Subsurface Utility Engineering (SUE) study plans
- Pothole permit plans
- TXDOT coordination
- Utility relocations
- Conflict analysis, including coordination with third parties
- Transmission/distribution system modeling
- Pipe design/alignment sheets
- Road bore design
- Route development/planning and engineering
- ROW acquisition and coordination
- Environmental studies
- Hydro-test plans and discharge permitting
- As-built drawings
- Regulator station design



EOG Resources

Natural Gas and Water Pipeline Modeling

FNI provided engineering services, which included creating a hydraulic model of existing and proposed gas and water pipelines in the Barnett Shale, using PipeSim to model the pipelines connecting more than 1,200 wells. Line sizing, line looping, and volumes were recommended to the client based on the results of the modeling effort.

O&G PROJECT EXPERIENCE: PIPELINE

BASF Pipeline

Port Freeport Hydrogen Import Pipeline

FNI provided engineering design and construction services for a 2.5 mile 8-inch hydrogen pipeline and a 400 foot nitrogen pipeline for BASF in Brazoria County. The design included bore permit drawings for TXDOT, UPSR Railroad, and the water district (canal). FNI also provided tie-in drawings, alignment sheets, permit application, design engineering review, site construction support and inspection, as-built drafting, and data book preparation of a hydrogen pipeline system.

Noble Energy

Gates Ranch Hydrology

FNI provided services for a hydrology and hydraulics analysis for the Espejo Creek in Webb County, Texas. The scope of services includes a phase 1 analysis to determine road crossing options.

BlueStone Natural Resources

Transmission Line Relocation

FNI provided the engineering design for the relocation of a 12-inch transmission line for the BNSF Railroad expansion. FNI prepared a bore design and alignment sheets and tie-in drawings for the pipeline movement. FNI also developed a set of pipeline construction standards and construction bid document.

Empire Pipeline

Natural Gas Gathering System

FNI designed the relocation of an 8-inch diameter pipeline in Cresson, Texas. The relocation involved an HDD bore design and a lowering of the pipeline to a 14-foot depth.

Empire Pipeline

Natural Gas Gathering System

FNI provided a new route design to avoid the construction of a residential development. FNI provided the design and alignment sheets for a 1,400 foot relocation of a 8-inch pipeline in Hudson Oaks, Texas.

CPS Energy

2018 Projects

FNI provided the design of multiple small gas service line relocations in San Antonio, Texas.

SERVICES AND CAPABILITIES

PIPELINE ENGINEERING

- System Design for Oil and Gas Gathering
- Transmission and Distribution System Modeling
- Hydraulic Analysis Single- and Multi-Phase Pipelines
- Industry Leading Surge Modeling
- Alignment Sheets
- HDD Design
- Railroad and Highway Crossing Permit
- Regulatory Approvals and Permit Acquisition
- Right-of-Way Coordination
- Utility Coordination, Relocations, Conflict Analysis
- Potholing Plans and Permitting

PROCESS ENGINEERING

- Process Simulation: Design and Optimization
- Process Flow Diagrams and PIDs
- Process Data sheets, Equipment Specifications
- Cause and Effect Diagrams, Control and Shutdown Philosophies
- Due Diligence Analysis

DESIGN DRAFTING

- 3D CADWorx Facility Modeling
- Bill of Materials
- Piping, ISOGEN
- As-Builts
- GIS Mapping Services

ENVIRONMENTAL

- Geotechnical Investigations
- NEPA Documentation
- Archeological, Environmental Assessments and Impact Statements
- Section 404/10 and 208/408 Permits
- Threatened and Endangered Species Surveys
- Wetland Delineations
- Environmental Mitigation
- Phase I/II Site Assessments and Remediation
- Air, Wastewater, and Hydrostatic Permitting
- Annual emissions reporting
- GIS Analysis

FACILITY ENGINEERING

- Pump Station Design and Optimization
- Compressor Stations
- Terminal Loading and Unloading Design
- Project Management
- Electrical Design
- Instrumentation, Controls, and SCADA Design
- Civil and Structural Design
- Foundation Design
- Site Grading Plans
- Drone Equipment
- LIDAR Technology

O&G PROJECT EXPERIENCE: WATER

Jetta Operating Company, Inc.

Arco State 10-28 20D SWD Facility
Section 57-20D SWD Facility
Future SWD Facility

FNI provided design services for salt water disposal (SWD) facilities each with 25,000 BPD capacity. The primary scope includes two (2) trains with desanders, engineered gun barrels, six (6) total water storage tanks, three (3) oil tanks, charge pumps, two (2) 800 HP injection pumps (H-Pumps), poly pipe and plastic coated steel pipe, and ozone treatment (provided by Hydrozonix). Services also include mechanical and electrical design for the gathering pipeline network, as well as a design that allows for shop-fabricated pipe (both steel and poly) to allow for quick field installation.



Jetta Operating Company, Inc.

Water Gathering System
Infrastructure Designs

FNI developed standard designs for saltwater system pipeline facilities such as risers, launchers, receivers and mainline valve installations. The scope included hydraulic calculations, environmental assessments, and electrical infrastructure review and upgrade.



Global Shale Partners (GSP)

Permian Basin Water Supply Study,
Design and Pipeline

The client desired to take brackish groundwater from an aquifer and distribute the flow through the heart of the Permian Basin oil and gas play for use in oilfield completions. FNI evaluated multiple configurations and pump/line sizes. Designs also included on-site power generation due to the thin power utility infrastructure. FNI developed 30 percent design documents and cost estimates to support GSP/Hitachi in the evaluation of project economics and contract negotiations with potential producer customers. The final proposal included thirteen (13) water supply wells, a gathering system, storage, and a 165-mile pipeline. Study components included conceptual engineering design, pipeline hydraulic analysis, line sizing, schedule development, and cost estimates.



Confidential Client

Standardized SWD Facilities

FNI developed a standard design which was then utilized to build at least eleven (11) saltwater disposal (SWD) facilities each with 25,000 BPD capacity. The primary scope includes two (2) trains with desanders, engineered gun barrels, six (6) water storage tanks, three (3) oil tanks, three (3) charge pumps, two (2) 800 HP injection pumps (H-Pumps), HDPE pipe and plastic-coated steel pipe, and ozone treatment. Services include mechanical and electrical design for shop-fabricated pipe (both steel and poly) to allow for quick field installation. Designs favored bolt-together shop-fabrications for quick on-site installation. Alloy materials were implemented to mitigate corrosion, including duplex stainless steel piping and valve internals.



Black Bayou Operating LLC

Waterflood Infrastructure

FNI designed the infrastructure for a waterflood project. The buildout included four (4) production facilities, a saltwater injection facility, and gathering pipelines. The electrical scope included power transmission models, a distribution system to the saltwater disposal facility and oil wells, low-flow demand load and fault-current studies, and VAR compensation capacitors to minimize inductive reactance of transmission lines.

Confidential Client

Scott Field Produced Water
Treatability Study

FNI provided a water quality characterization study and evaluated the results from bench-scale studies performed by three different service providers using different treatment methods. FNI provided a study in response to prior unsuccessful chemical approaches to address the produced water emulsion that was forming a solid within phase separation tanks (gun barrels) preventing recovery of the merchantable hydrocarbon fraction and causing operational issues at the salt water disposal sites.

O&G PROJECT EXPERIENCE: WATER

Confidential Client

Liquefaction (SPL)
Water Supply Evaluation

FNI developed a hydraulic model of a water distribution system for a city in Southeast Texas. This model included the recently constructed and client-funded program infrastructure to deliver treated water to the client's SPL facility. FNI calibrated the hydraulic model to SCADA data provided by the City, as well as, field-collected pressure information. Hydraulic analyses were performed to assess available water delivery to the SPL facility under multiple water demand and water line failure scenarios. FNI developed a risk model, incorporating the likelihood of failure (LOF) and consequence of failure (COF) scores, which were calibrated to the client's risk management standard and corporate risk policy. FNI developed three (3) system improvement recommendations based on the hydraulic and risk assessments in the study. A secondary focus on the study was to evaluate three (3) additional water supply options for the client's SPL facility: groundwater supply development at the facility location; surface water supply transfer from the Lower Neches Valley Authority's (LNVA) canals to the facility; surface water supply transfer from Louisiana to the facility.

Devon Energy

Saltwater Gathering System Asset
Integrity Assessment

FNI provided an engineering analysis of the saltwater batteries and gathering facilities within the Barnett Shale assets. FNI made recommendations to enhance functionality of facilities and prevent pipe failures, and implementation measures to mitigate the effects of a potential failure. Our project team reviewed corrosion resistant piping materials based on service, maintenance, longevity, and material and construction costs. FNI also performed a hydraulic analysis, using H₂O Map Water, on the existing high-density polyethylene pipeline gathering system to determine if the pipeline was suitable for anticipated rates of future flows. In addition, we reviewed the system's existing valving and controls, and leak detection safety measure recommendations were identified to prevent and mitigate effects of a pipeline failure.

Devon Energy

New Mexico SWD Facilities

FNI supplied an optimization study for Devon's New Mexico saltwater disposal facilities. Our team provided recommendations in three (3) areas: facility optimization, operational efficiency and methods to streamline construction. Facility optimization recommendations focused on applications that would help the facility function at its peak water-handling and oil-capturing performance. Operational recommendations aimed to confirm that the facility is designed in such a way to minimize operator requirements and efforts, reducing operation and maintenance needs. We performed a detailed 3-D model of the facility, producing isometric piping drawings for accurate facility construction.

Confidential Client

Water Management Plan

FNI's has been assisting the client over a three-year period with water system planning for three (3) of their drilling operations - The Eagle Ford play in South Texas, the Haynesville play in East Texas and Louisiana, and the Avalon play in West Texas.

SERVICES AND CAPABILITIES

WATER MANAGEMENT

- Fresh and Produced Water System Planning
- Water Quality Treatability Studies
- Storage Pits
- Saltwater Gathering and Disposal Facilities

FACILITY ENGINEERING

- Pump Station Design and Optimization
- Terminal Loading and Unloading Design
- Liquid Storage Specifications
- Well Site Standardization

- landE Design, Controls and SCADA Design
- Structural Design
- Foundation Design
- Site Grading Plans
- LIDAR Technology

PROCESS ENGINEERING

- Process Simulation: Design and Optimization
- Process Flow Diagrams and PIDs
- Process Data sheets, Equipment Specifications
- Cause and Effect Diagrams, Control and Shutdown Philosophies
- Due Diligence Analysis

DESIGN DRAFTING

- 3D CADWorx Facility Modeling
- Bill of Materials
- Piping, ISOGEN
- As-Builts
- GIS Mapping Services

ENVIRONMENTAL

- Geotechnical Investigations
- NEPA Documentation
- Archeological, Environmental Assessments and Impact Statements
- Section 404/10 and 208/408 Permits
- Wetland Delineations

- Environmental Mitigation
- Phase I/II Site Assessments and Remediation
- Air, Wastewater, and Hydrostatic Permitting

PIPELINE ENGINEERING

- System Design for Water Gathering
- Hydraulic Analysis Single- and Multi-Phase Pipelines
- Surge Modeling
- Alignment Sheets
- HDD Design
- Regulatory Approvals and Permit Acquisition
- Right-of-Way Coordination

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O&G PROJECT EXPERIENCE: ENVIRONMENTAL

Pioneer Natural Resources USA Barnett Shale and Permian Basin

FNI provided comprehensive services for all environmental permitting required for pipelines, central delivery point stations and compressor stations. These services included:

- Waters of the US determinations and wetland delineation
- Endangered species habitat surveys
- Section 404 permits, including Nationwide Permit 12 Utility Line Activities
- Statewide Rule 8 permits, including hydrostatic test water discharge
- 40 CFR 112 permits, including Spill Prevention, Control, and Countermeasure (SPCC) plans
- Regulatory coordination with US Army Corps of Engineers (USACE), Railroad Commission, Texas Historical Commission and US Fish and Wildlife Service
- GIS mapping of assets



Anadarko Petroleum Corporation (Occidental)

Eagleford, Haynesville and Wattenberg Assets

FNI helped obtain water rights and designed distribution to drill pad sites to use for well completion. FNI designed infrastructure for both surface water and groundwater sources to provide water for drilling and production. This work included water rights advising; water system modeling and design; planning and modeling of water transmission systems to supply drilling operations; design of river intake pump station; and feasibility studies.



Global Shale Partners

Permian Basin Water Supply

FNI performed a due diligence study of a project to develop a brackish groundwater aquifer and conveyed the water through the heart of the Permian Basin oil and gas play to supply water for well completions. The project involved an evaluation of multiple alternatives for system configurations to optimize pipe size versus capacity to avoid the need for intermediate pumping. Because of the remote location of the well field utility, power is not available and the evaluation considered on-site power generation. FNI developed 30-percent design documents and cost estimates to support GSP/Hitachi in the evaluation of project economics and contract negotiations with potential producer customers. The proposed project included water supply well field (13 wells), gathering system, storage, and approximately 165-mile pipeline. Study components included conceptual engineering design, pipeline hydraulic analysis, line sizing, schedule development, and cost estimates.



Chesapeake Operating, Inc.

Barnett and Eagleford Shale Gas Gathering Infrastructure

FNI provided environmental and program management support for the development of more than \$1 billion in gas gathering for both the Barnett Shale and Eagleford Shale plays over a period of eight years. The work included:

- Project management services to oversee pipeline planning projects across 30 Texas counties in the Barnett and Eagleford shales.
- Municipal permitting services for all development in the Barnett Shale (more than 1,100 permits) in rural and urban areas
- Full-time GIS analysis for infrastructure planning, route development and route updates
- Section 404 permitting
- Tree surveys
- Waters of the US determinations
- Stormwater pollution prevention plans development



O&G PROJECT EXPERIENCE: ENVIRONMENTAL

Buckeye Partners LP

South Texas Gateway Terminal

FNI provided the USACE permitting support for the South Texas Gateway Terminal. The scope of work included Section 404 Permitting, Section 408 Permission, wetland investigations and mitigation site planning for an oil terminal along the Corpus Christi Ship Channel. FNI is presently assisting with the construction oversight for environmental aspects of the project, including hazardous waste management, compliance with stormwater pollution prevention plans, spill plans and other environmentally sensitive issues, such as training for threatened and endangered species reporting.

Sprint Pipeline

Port Freeport Hydrogen Import Pipeline

FNI performed the permit application, design engineering review, site construction support and inspection, as-built drafting, and data book preparation of a hydrogen pipeline system in Brazoria County, Texas.

Jetta Operating Company, Inc.

West Texas Scott Field Infrastructure Update

FNI provided engineering and construction management services for oil field system upgrades. These upgrades included a produced-water gathering system, consisting of 29 miles of 20-, 12-, 10- and 4-inch diameter pipe; a 5,000 barrels per day capacity oil terminal; and electrical infrastructure upgrades.

Atmos Energy Corporation

Odessa Gas Supply

FNI provided an environmental assessment of a relocation pipeline and two (2) TXDOT permit drawings.



SERVICES AND CAPABILITIES

ENVIRONMENTAL

- Geotechnical Investigations
- NEPA Documentation
- Archeological, Environmental Assessments and Impact Statements
- Section 404/10 and 208/408 Permits
- Threatened and Endangered Species Surveys
- Wetland Delineations
- Environmental Mitigation
- Phase I/II Site Assessments and Remediation
- Spill Response and Remediation
- Air, Wastewater, and Hydrostatic Permitting
- Annual emissions reporting
- GIS Analysis

FACILITY ENGINEERING

- Compressor Stations
- Amine Treating Plants
- Sour Gas Treating Facilities
- Gas Processing (Cryogenic plants and Joule-Thomson (JT) Plants)
- Condensate Stabilization
- Well Site Standardization
- Interconnects and Meter Stations
- Electrical Design
- Instrumentation, Controls, and SCADA Design
- Civil and Structural Design
- Foundation Design
- Site Grading Plans
- LIDAR Technology

PROCESS ENGINEERING

- Process Simulation: Design and Optimization
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- Cause and Effect Diagrams, Control and Shutdown Philosophies
- Due Diligence Analysis

DESIGN DRAFTING

- 3D CADWorx Facility Modeling
- Bill of Materials
- Piping, ISOGEN
- As-Built
- GIS Mapping Services

PIPELINE ENGINEERING

- System Design for Gas Gathering
- Transmission and Distribution System Modeling
- Hydraulic Analysis Single- and Multi-Phase Pipelines
- Industry Leading Surge Modeling
- Alignment Sheets
- HDD Design
- Railroad and Highway Crossing Permit
- Regulatory Approvals and Permit Acquisition
- Right-of-Way Coordination
- Utility Coordination, Relocations, Conflict Analysis
- Potholing Plans and Permitting

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