

# Title: **Davis Refinery North Dakota**

**Date:** 2015-2016

**Scope:** Engineering Studies

**Location:** North Dakota, USA.

## **About Meridian Energy Group:**

Meridian is focused on the development of innovative and environmentally-compliant oil refining facilities. Our current focus is on the development of the "Davis Refinery" (49,500 BPD) on a 715-acre plot just outside Belfield, North Dakota in the heart of the Bakken. The plant is currently in the design phase with groundbreaking set for fall 2018. Plant completion is expected by 2019.

## **Executive Summary:**

Process Screening for a new 55,000 BPD refinery based on market opportunities. The proposed refinery consists of the following:

Refining Design Capacity:

### **55,000 BPSD Products:**

- Gasoline
- Jet Fuel
- Ultra Low Sulfur Diesel
- Fuel Oil
- LPG

### **Refinery Units:**

- Crude Topping (2X27,500 BPSD)
- Gas Plant (2 x 9,500 BPSD)
- Naphtha Hydrotreater (18,500 BPSD - Axens License)
- Catalytic Reformer (16,300 BPSD - Axens License)
- Diesel Hydrotreater (19,000 BPSD – Axens License)
- Benzene Saturation (8,300 BPSD - Axens License)
- Gas Sweetening/Sulfur Recovery (11 LTPD – Merichem License)
- Vacuum Distillation (16,800 BPSD)
- Hydrocracker (14,400 BPSD - Axens License)
- Sour Water (80 GPM)

One of the most important tasks was the development of documentation to comply with national and federal permitting requirements. These activities comprised a thorough emissions inventory, air emissions dispersion modeling and potential impact analysis, in order to submit an application for a Permit to Construct (PTC) as a Synthetic Minor Source of Air Pollution.

## **Challenges**

Refineries over 50,000 BPSD are traditionally considered Major Sources of criteria pollutants, using industry accepted, long established EPA emission factors based on statistical data of actual emissions from refineries more than 20 years old. Approval of a PTC for a Major Source takes on average over 2 years. Meridian has been willing to expedite this time by exploring process design and emissions control technologies that challenge this capacity constraint.

The Davis refinery is being planned for a location that is only 3.5 miles away from a National Park. This has brought additional attention from environmentalist groups who wish to stop its construction. Consequently, Vepica must provide strong proof that the proposed emission levels using the proposed technologies and controls can be achieved in practice.

## **Vepica Solutions**

Vepica has partnered with two other companies: one company specializes in environmental issues (ZIA) and the other manages the interface with the State regulatory agency and handles local/county permits as well as Civil design (SEH).

Vepica has worked in close connection with its partners to evaluate and provide the process design and the emissions control technologies to ensure that the 55,000 BPSD refinery falls below the limits required to apply for a PTC as a Minor Synthetic Source. Working together with different equipment providers (fired heaters, boilers, flares, etc.) has produced the information required to support this claim, and to finally submit the application in Q3-2017. Vepica is currently working to provide answers to over 10,800 comments received after the application was released for public scrutiny, and continues to lead the current effort of the Meridian Team to achieve the goal of PTC approval by mid-2018.