Alaska LNG provides more details on project construction

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(This update, provided by the Kenai Peninsula Borough mayor's office, is part of an ongoing effort to keep the public informed about the Alaska LNG project.)

Alaska LNG would have to move tens of thousands of sheets of paper for permits and tens of billions of dollars to construct a North Slope natural gas project. But all that can be moved electronically. It's the actual heavy moving on the ground, in the air and across the sea that is described in the project's latest filings with federal regulators.

On June 15, the project sponsors filed two of 12 of their second round of draft resource reports with the Federal Energy Regulatory Commission, with more planned for July and August. The General Project Description (Report No. 1) provides the most detailed look yet at how Alaska LNG would move construction material and workers into place and how they would build the most expensive energy project in North American history.

Though more specifics will come in later reports, Report No. 1 said:

- The project's preliminary list includes 30 construction camps, 53 pipeline storage areas, 10 contractor yards and eight short rail spurs to the Alaska Railroad. The camps would range in size from skid-mounted mobile facilities for up to 120 workers, to 1,200-person main camps — with an ever larger camp at Nikiski.
- During construction, the work would affect almost 72,000 acres, but just one-sixth of that area during operations.
- No more than 300 workers would be housed in local accommodations at any time during the **LNG plant** and **marine terminal** construction in Nikiski. A construction camp would be built at the site to accommodate up to 5,000 workers at its peak. The LNG facility is the largest single component of the project.
- Seward, a year-round, ice-free port, would be used primarily as a point of entry for pipe deliveries. The Alaska Railroad can deliver out of Seward to Anchorage, Fairbanks and the pipeline mileage in between. The project would need about 115,000 40-foot-long pipe sections delivered to the right site at the right time, and much of it would move through Seward.
- The steel pipe would come to Alaska with its protective coating already applied. After unloading, the pipe would be trucked or railed to a double-jointing plant near each port of entry and/or near Fairbanks for welding into 80-foot sections, which would be moved by rail or truck. Pipe destined for Beluga on the West Side of Cook Inlet and in Nikiski would be delivered by barge.

- Whittier, on Prince William Sound, would be used primarily for containerized cargo, pipe and fuel, with rail and road access out of town.
- "Anchorage would be the predominant point of entry for most of the project's general freight (non-modularized items). Once received at the port, the materials would be deployed … via rail, truck and barge."

IN-STATE GAS OFF-TAKES

Report No. 1 also identifies three of the five off-takes that would be built into the main pipeline to allow gas withdrawals for in-state consumption: Milepost 441 (measured from Prudhoe Bay) to serve Fairbanks, Milepost 763 to serve Matanuska Valley and Anchorage users, and the end of the line to allow off-take on the Kenai Peninsula. The state is responsible for selecting the off-take points.

"The size and location of the other interconnection points are unknown at this time," the report said. The off-take points would be a valve and T-connection; whatever else is needed to condition and move the gas to customers would be handled by parties other than Alaska LNG.

To build the North Slope gas treatment plant, 62-mile Point Thomson gas line and 804-mile main pipeline, compressor stations along the route and the liquefied natural gas plant in Nikiski and marine terminal, Alaska LNG has calculated it would need (preliminary numbers):

- About 340,000 truckloads of equipment, pipe, supplies, gravel and dirt.
- 15,000 railcar loads of pipe and construction materials.
- 51 barges in four years of sealifts to bring gas treatment plant modules to the North Slope.
- As many as 10 barges shuttling between the ports of Anchorage and Seward to bring material to the LNG plant site in Nikiski on a weekly basis for three years. In addition to barge traffic, the project estimates that 20,000 to 25,000 truckloads would be needed to haul materials from Seward and Anchorage to Nikiski.
- About 70 helicopter landing sites.
- Use of four airports: Anchorage, Fairbanks, Kenai and Deadhorse; and 10 landing strips: Beluga, Cantwell, Chandalar Shelf, Coldfoot, Galbraith Lake, Livengood, Nenana, Prospect Creek, Summit and Talkeetna. Other landing strips are under consideration.

Additional ports such as Homer and industrial docks in the Kenai area "may also be used in a limited capacity" until the project builds its material offloading facility in Nikiski. The project could potentially use Port MacKenzie on Knik Arm as a distribution center for the concrete-coated pipe that would be laid across Cook Inlet, but that would be "dependent upon completion" of the Alaska Railroad spur line to the port, Report No. 1 said.

MORE INFORMATION IN JULY, AUGUST

The construction logistics information in Resource Report No. 1 does not provide a detailed discussion of how the project would and could affect Alaska's transportation system, such as how the project would manage its truck traffic so as not to overwhelm existing roads. It's a listing, not an impact study. That will come in Report No. 5, Socioeconomics, which Alaska LNG told FERC it plans to submit in July.

That second draft of Report No. 5 will contain some impact and mitigation measures, with the final report, still expected late this year, to provide a more complete description of how the massive construction project will affect communities and what the sponsors propose to reduce those impacts. Alaska LNG's May newsletter said Report No. 5 would weigh in at 3,500 pages.

In addition to the General Project Description, the June 15 filing included Report No. 10, Alternatives, which explains why Alaska LNG picked Nikiski, on the Kenai Peninsula, as the best site for the LNG plant to produce and ship up to 20 million metrics tons of LNG per year, rather than the North Slope, Valdez or elsewhere in the state.

Reports expected in July are Water Use and Wastewater Discharge (No. 2); Fish, Wildlife and Vegetation (No. 3); Cultural Resources (No. 4); Socioeconomics (No. 5); Geological Resources (No. 6); Soils (No. 7); Land Use, Recreation and Aesthetics (No. 8); and Air and Noise Quality (No. 9). Alaska LNG's June 15 letter to FERC did not specify when the reports would be filed in July.

A second draft of Reliability and Safety (No. 11) will be filed in August, along with the project's first draft of Engineering and Design (No. 13) for the LNG plant. Alaska LNG notified FERC in the June 15 letter that it would not file another daft of PCB Contamination (No. 12) because the project footprint has not changed since the first draft, which determined no PCB contamination sites would be affected.

The June 15 filing provides preliminary engineering design and project footprints, and additional details on construction execution and schedule. Included in the more than 500 pages are maps for the entire length of the pipelines, open-cut and directional-drilling drawings for waterbody crossings, pipeline right-of-way and ice road construction sketches, drawings for the trestle to deep-water loading berths in Nikiski and an illustration of the pipe-laying barge that would be used in Cook Inlet.

Report No. 1 also provides Alaska LNG's responses to public and government agency comments that were submitted last year to FERC after the project's first round of draft reports were filed in February 2015.

Alaska LNG's second round of drafts comes a few months later than originally expected, though the project's June 15 report to FERC still shows submittal of final resource reports and a full

project application possible in the fourth-quarter 2016. That would trigger FERC preparation of an environmental impact statement, which Alaska LNG expects could take two years.

PARTNERS UNDECIDED ON NEXT STEP

The state's partners in Alaska LNG — North Slope producers ExxonMobil, BP and ConocoPhillips — have indicated they might "not necessarily" move ahead as planned next year to the full front-end engineering and design (FEED) stage of the project, a commitment to spend almost $2 billion to obtain permits, final designs and prepare for a construction decision by 2019, according to the state. Low oil prices and weak cash flow are among the reasons for the companies' hesitancy, Keith Meyer, newly hired head of the Alaska Gasline Development Corp., told Alaska reporters in June.

In addition, an oversupplied global LNG market and weak prices in Asia — the anticipated destination for Alaska gas — are not encouraging signs for the project's $45 billion to $65 billion investment decision.

The state is exploring its options to keep the project on track to first LNG production mid-2020s, including possibly taking a larger stake in Alaska LNG or even embarking on a state-controlled, state-financed North Slope gas project.

Regardless of any potential change in the project development plan, and in preparation for the final reports and full application to FERC, Alaska LNG crews are out in the field for the fifth summer, surveying and walking about 7,000 acres of the project footprint, focusing on wetlands and cultural sites as they wrap up field work. In the first four seasons, crews covered more than 40,000 acres.

PROJECT SCHEDULE

If Alaska LNG sticks to the preliminary schedule in its latest draft of Resource Report No. 1; if it obtains FERC authorization and all other permits on time; and if the project partners can resolve their differences over commercial agreements, project operations and taxes:

- Site preparation at the LNG plant and initial construction camp development would start in the third and fourth quarters 2019. "A significant number" of the LNG plant facilities would be built as modules offsite and delivered 2021 through 2024.
- Pilings and concrete foundation work at the LNG plant site in Nikiski would start in 2020.
- Site prep and construction start-up at the material offloading facility in Nikiski would start late 2019, with work to begin 2022 on the terminal's 3,300-foot-long trestle to twin loading berths for LNG carriers.
- The first of three liquefaction trains would start operations fourth-quarter 2025. The last of the three trains would start commercial operations in 2027.

- After site preparations are complete, North Slope gas treatment plant construction would start with the first sealift delivery of production modules in 2023, continuing through 2027.
- The 62-mile, 32-inch-diameter Point Thompson-to-Prudhoe gas pipeline would be built 2021-2022.
- Construction of the 804-mile, 42-inch-diameter pipeline from Prudhoe Bay to Nikiski would be split into four "spreads" (manageable lengths), working at the same time from fourth-quarter 2022 to third-quarter 2024, with borrow sites, access roads, work pads and right-of-way preparations starting in 2020.
- The North Slope spread would start at Prudhoe Bay and lay 209.3 miles of pipe to south of the Dietrich River crossing. The Interior spread would work 192 miles, to Livengood on the south side of the Elliott Highway. The 195.6-mile Alaska Range spread would extend to south of Antimony Creek. The Southcentral spread would build the final 177.8 miles to Nikiski. "Clearing activities would typically occur in the winter season, and one to three years prior to each scheduled construction season," the report said.
- The eight compressor stations (at 23 to 29 acres each) would be built 2021-2025 at: Sagwon, Milepost 76; Galbraith Lake, Milepost 147.1; Coldfoot, 240.5; Ray River, 332.9; Minto, 421.7; Healy, 518.2; Honolulu Creek, 596.9; and Rabideux Creek, 674.7. A heater station would be built at Jack River, Milepost 561.6.
- The pipeline work would require about 17 million cubic yards of granular material (gravel, shot and crushed rock, sand). A potential list of existing and new material sites will be included in Report No. 6. In addition, 11.4 million cubic yards would be needed for the North Slope gas treatment plant, with more details to come in Report No. 6.
- The 28.4 miles of pipe along the bottom of Cook Inlet would be set in place 2022-2023, with work during ice-free months only.

LNG PLANT and MARINE TERMINAL

The LNG plant site is 900 acres onshore, with an additional 80 acres for a temporary work camp adjacent to the site. As of June 20, Alaska LNG had purchased about 600 acres at the site, as recorded with the Kenai Peninsula Borough. The project is continuing discussions with property owners to assemble the remaining parcels.

Alaska LNG does not expect any dredging would be required for the **deep-water twin-berth loading facility**. But substantial dredging would be required for the material offloading facility (MOF) along the shore just north (about 1 mile) of the trestle, to provide clearance for barges and ships to deliver pipe, modules and other large components to the plant site. The offloading facility — sheet piles and all — would be dismantled when the job is done.

Approximately 21 LNG carriers a month would load up in Nikiski when all three liquefaction trains are in production. In addition to producing LNG, the plant would remove from the gas stream about 1,100 barrels of condensate a day, which would be piped or trucked to customer(s).

During site preparations, approximately 5 million cubic yards of material would be scraped and dug up at the site, with most of it reused as fill material. In addition, granular material such as gravel needed for the site "would be sourced from local quarries where practical. … there are multiple quarries within a 20-mile radius of the site."

Larger and harder rock to protect the shoreline will be needed too. "Granite (armor rock), if required," would be an exception to the 20-mile radius. "Local quarries do not contain armor rock of sufficient hardness," Report No. 1 said. "Kodiak Island, approximately 300 miles from Nikiski, is the closest known commercial source for granite."

NIKISKI CONSTRUCTION CAMP

A construction work camp would be built adjacent to the northeast corner of the LNG plant site, with capacity for up to 5,000 workers, though that would be the peak census, not the everyday count.

Double-steel-wall storage tanks (five) would be built to hold 50,000 gallons of diesel and gasoline. Freshwater storage tanks (two) would be capable of holding 690,000 gallons each. And two concrete batch plants would be installed at the site, each capable of producing 120 cubic yards of concrete an hour.

Alaska LNG has not decided on its freshwater source for construction or plant operations, but plans to conduct aquifer tests at the site later this summer to help determine if it could draw from underground wells without harming the aquifer and local wells. The project expects 300,000 gallons a day would be its peak need during construction, with about half that flow needed during plant operations.

Results of the project's groundwater studies will be included in the full application to FERC.

KENAI SPUR HIGHWAY RELOCATION

The LNG plant site would require removing 1.33 miles of the Kenai Spur Highway for safety and security, according to the June 15 report from Alaska LNG. The road would end with north and south gates to the plant site, and the highway would be relocated east of the site.

"It is anticipated that the relocation would be completed prior to the start of project construction," Alaska LNG said, particularly important since equipment and materials hauled up from the waterfront dock would have to cross the existing highway.

Though it is discussed in Report 1, the highway move is outside the jurisdiction of FERC and will not be reviewed as part of its environmental impact statement. State and Kenai Peninsula Borough approval would be required.

Alaska LNG proposes a two-lane replacement highway, with alternative routes "being evaluated with a variety of criteria including environmental features, potential impacts to local residents and businesses, right-of-way acquisition, traffic considerations, utilities relocation, geotechnical features, road design and construction timing." Report No 1 includes a **map of "preliminary options under consideration,"** updated from the multiple-options map the project presented to the public last fall.

The map shows eight recommended alternatives, with the designations (ADF, AFH, KJF, etc.) reading north to south. For example, ADF would start near Milepost 26 on the Kenai Spur Highway and generally follow Island Lake Road to Miller Loop Road, before turning west and reconnecting to the highway south of Milepost 19.

Alaska LNG said it would provide additional information on the highway relocation in its application to FERC.

POINTS OF ENTRY

Report No. 1 said "the majority of materials and equipment would come by sea," through the ports of Anchorage, Seward, Whittier and Valdez; by sealifts to Prudhoe Bay; and by direct delivery to the LNG plant site in Nikiski. The Alaska Highway also would be used to bring material into the state, through Canada.

"A detailed discussion on the existing conditions of Alaska's transportation infrastructure and potential impacts" will be covered in Report No. 5 in July. However, even though the mainline would not pass through Fairbanks, Report No. 1 noted, "The Fairbanks area would serve as a logistics hub for the project construction activities given its central location in the state and existing transportation infrastructure (i.e., highway, railroad and air)."

The report acknowledges that additional highway pull-outs, road widening, weigh station expansions, truck staging and waiting areas may be needed, and will be identified at a later time — such as a dock laydown yard and storage area expansion in Seward for parking, turning and accommodating the heavy volume of pipe-hauling trucks. It refers to such work as "project-related third-party activity," without specifying the third-parties that would undertake the highway, rail spur and port improvements.

Report No. 1 said the ports of Seattle and Tacoma would be major hubs for moving materials to Alaska. "Other key ports are anticipated to be Houston, Texas, and Panama City, Florida." Seattle-Tacoma International Airport "would likely be a personnel hub and collection point for other Lower 48 and international labor pools for consolidated transportation to Alaska."

The Kenai airport "would function as the primary point of entry for personnel" at the LNG plant construction job, arriving aboard charter aircraft. "Project personnel from out of state, as well as the local Anchorage-based labor pools," also would use charters to reach "Fairbanks, Deadhorse or local airfields along the mainline corridor," the report said.

PRUDHOE BAY DOCK

Constructing the gas treatment plant at Prudhoe Bay to remove carbon dioxide and other impurities from the gas stream would require large modules brought to the North Slope by sealift. Alaska LNG proposes to build a new dock to accommodate the sealift barges, and a new staging area.

The dock would be built adjacent to the seawater treatment plant at Prudhoe Bay, with about 1,000 feet of dock face, five or more berths and 28 acres dedicated to project activities. Dredging would be required. An onshore staging area of 86 acres also would be built.

POINT THOMSON

Point Thomson, about 60 miles east of Prudhoe Bay, would supply about 25 percent of the initial gas reserves for the Alaska LNG project. But it would take more drilling to put the estimated 8 trillion cubic feet of gas into production.

After years of work, Point Thomson in April started producing 5,000 barrels of condensate a day, sending the flow through a new pipeline toward Prudhoe Bay, where the product is added to the trans-Alaska oil pipeline. It cost operator ExxonMobil and its partners about $4 billion to develop the field, which is currently recycling its gas back into the reservoir.

To turn Point Thomson into a gas production operation to feed Alaska LNG would require seven new production wells from three new pads, according to the June 15 filing with FERC. The report did not provide a cost estimate. The U.S. Army Corps of Engineers would take the lead in the Point Thomson Gas Expansion Project environmental review. The expanded Point Thomson operation would be designed to produce 920 million cubic feet of gas per day and approximately 57,000 barrels a day of condensate, according to Alaska LNG's filing with FERC.

ALTERNATIVES

"Early in the process," the Alternatives Report (No. 10) said, the partners eliminated the North Slope as an option for the LNG plant site for multiple reasons:

- The annual ice-free window for LNG carriers "is only about two to three months," and providing reliable delivery schedules for customers outside that opening would require specialized ice-breaking carriers.

- The Beaufort Sea is very shallow near shore, and a loading facility "would need to be either located tens of miles offshore" or pipelines inside an undersea tunnel would need to reach out to a loading platform 3 to 5 miles offshore.
- Extensive dredging, fill and shore work would impact whales, other marine mammals and fish.
- Building the gas treatment plant and LNG plant at the same location would greatly increase the number of modules that need to delivered by sealifts to the site, extending to eight years or more the time needed for all the sealifts.
- "The impracticalities as well as significantly higher costs eliminated the North Slope from further consideration," Report No. 10 said. A North Slope LNG plant also would eliminate the pipeline that could deliver gas to Fairbanks and Southcentral Alaska, and everywhere in between.

The project also looked at building the LNG plant in Valdez (Anderson Bay), but determined the costs would be prohibitive, along with other challenges:

- The site to the south side of Anderson Bay rises steeply, and terracing (benching) would be required to prepare a level surface for the plant, the report said. "To accomplish this, extensive earthworks including blasting would be required over several years." Alaska LNG estimated it would have to move 39 million cubic yards or rock and overburden.
- Building the facility would require 200 acres of permanent fill in the bay. "In addition, there would be more than 60 acres of wetland lost in the development of the site, and the need to fill in or reroute an anadromous fish stream."
- A Coast Guard-required safety zone around loaded LNG carriers in transit would restrict other vessel traffic through the less-than-mile-wide Valdez Narrows, affecting LNG deliveries if carriers have to wait for the waterway to clear of traffic.
- Federal conservation designations since a 1988 environmental impact statement recommended Valdez for an LNG project now make the option much more difficult (the National Park Service designated the Gulkana and Delta as Wild and Scenic Rivers).
- The trans-Alaska oil pipeline uses the best route through the steep slopes of Thompson Pass into Valdez. "There are many locations where that additional space is unavailable, making this routing technically unfeasible without creating a new right of way down the mountain pass."
- And although a pipeline route to Valdez would bring the mainline closer to Fairbanks, it would be much farther from Anchorage and the Matanuska Valley.