



OVERVIEW

Encana Corporation (Encana) is the owner and operator of the Deep Panuke natural gas development, located in the marine environment approximately 175 kilometres (km) offshore Nova Scotia. The development includes facilities required to produce natural gas from the Deep Panuke field, such as the offshore platform (production field centre or PFC), subsea wells, flowlines, control umbilicals and protection structures for subsea equipment. Natural gas is processed offshore and transported via a subsea pipeline to shore near Goldboro, Nova Scotia for further transport to markets using the Maritimes & Northeast Pipeline (M&NP). The Deep Panuke development is reaching the stage of declining production; therefore, Encana has begun to plan decommissioning activities.

DECOMMISSIONING PROCESS

It is currently Encana's plan to generally complete the decommissioning of the Deep Panuke development as follows:

- cessation of production operations
- decommissioning of the offshore platform (PFC), subsea structures, flowlines, umbilicals, gas export pipeline, and onshore facilities
- well plugging and abandonment
- PFC removal and final field survey

DECOMMISSIONING ACTIVITIES

<p>Wells</p> <ul style="list-style-type: none"> • Plug and abandon four production wells • Plug and abandon one injection well • Remove subsea production trees 		<p>Gas Export Pipeline (GEP)</p> <ul style="list-style-type: none"> • Flush and clean export pipeline • Disconnect and remove subsea isolation valve (SSIV) • Remove above ground onshore facilities • Abandon GEP in place
<p>Subsea Facilities</p> <ul style="list-style-type: none"> • Flush and clean flowlines • Disconnect flowlines and umbilicals; abandon in place • Remove wellhead protection structures 		<p>Production Field Centre (PFC)</p> <ul style="list-style-type: none"> • Flush and clean • Remove

Production Field Centre (PFC) Decommissioning and Removal
 Decommissioning of the PFC (i.e., the platform) will essentially be a reverse of the installation process. The PFC and the processing equipment will be shutdown, flushed, and cleaned. The PFC will then be disconnected from the subsea infrastructure, jacked down, and removed from the site via barge or de-installation vessel.

Wells Plugging and Abandonment
 For each of Deep Panuke’s four subsea production wells and one subsea injection well, a drill rig will install a series of permanent barriers to plug and isolate the producing/injection zones; these barriers are

typically a combination of steel plugs with cement on top.

The subsea trees (structure that sits atop the wellhead to control the flow of production fluid) will be removed by either a drilling rig as part of the well plugging and abandonment scope, or by a construction support vessel (CSV) as part of the subsea decommissioning activities (see below).

Subsea Facilities
 The well flowlines will be depressurized, flushed, and cleaned, and disconnected from the PFC riser. Flowlines and umbilicals, which are trenched (buried), will be abandoned in place below the seafloor.

Gas Export Pipeline (GEP)

The offshore GEP, approximately 175 km in length, will be abandoned in place after it is depressurized, flushed, and filled with seawater.

Stabilization features (mattresses, grout bags, concrete tunnels, rock, etc.) will be left in place on the seabed and provide habitat for fish and invertebrates (“reef effect”) as documented during Encana’s annual environmental effect monitoring surveys. An example of “reef effect” is shown in the images to the right. Additional stabilization features (e.g., rock bags and/or concrete mattresses) will be added to secure items abandoned in place, as required.



A typical concrete mattress, pre- and post-deployment, is shown in the above images (arrow points to a lobster).

Onshore Facilities Decommissioning

Aboveground structures associated with the onshore pipeline, such as the beach valve station and the GEP terminus, will be removed. The buried onshore pipeline will be flushed, water removed, capped, and abandoned in place. Plugs will be installed at strategic locations to prevent ground subsidence and unnatural drainage of wet areas. The onshore pipeline right-of-way was re-vegetated after construction in 2010 and has been allowed to return to a natural state.

Onshore, aboveground infrastructure is shown in the image to the right.



Top left photo: GEP terminus building
 Top right photo: GEP terminus connection to M&NP
 Bottom photo: GEP terminus pig receiver

REGULATORY PROCESSES

Decommissioning of the Deep Panuke development will require approvals from the Canada-Nova Scotia Offshore Petroleum Board (CNSOPB) and the National Energy Board (NEB). The CNSOPB will issue Operations Authorizations and well approvals to approve the decommissioning of Deep Panuke facilities. The NEB will issue a Leave to Abandon for the Deep Panuke gas export pipeline and onshore facilities.

Decommissioning activities were previously assessed and approved as part of a 2006-2007 Environmental Assessment (EA) by the Canadian Environmental Assessment Agency. Proposed decommissioning activities remain the same as described in the 2006-2007 EA and will meet all commitments made in the original assessment.

Encana will prepare an Environmental Study (ES) to update the 2006-2007 EA. While proposed decommissioning activities remain the same as in the 2006-2007 EA, additional project details and environmental information are now available. It is anticipated that the preparation of the ES report will meet regulatory requirements for both the CNSOPB and the NEB.

SCHEDULE

While Encana has not set a date for the cessation of production operations or for the formal commencement of decommissioning activities, Encana anticipates conducting decommissioning activities during the 2019-2021 timeframe.

CONTACT

A key component of this information update is to provide up-to-date information on key activities. Encana is available to meet with interested groups that would like to discuss potential effects, concerns, and interests related to the decommissioning activities so that these may be considered in the decommissioning planning process.

For additional information, please feel free to contact:

Jay Hartling

Advisor, Indigenous Relations

jay.hartling@gmail.com

Christine Jeans

Engagement Support

Christine.jeans@stantec.com

