

Petrinex Oil Forecast Tool Overview

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Audience: All Alberta Forecast Tool Petrinex Users

Purpose: This tip is to provide Alberta industry marketing and forecasting staff with an overview of the Petrinex Oil Forecast Tool (OFT), to assist with their monthly forecasting activities. It is assumed that users of this document understand marketing and forecasting processes or have read the Petrinex tip titled "[Petrinex OFT Processes for Oil Marketing Users](#)".

Key Principles:

What is the Petrinex Oil Forecast Tool?

The OFT is a set of Petrinex tasks and processes that Industry can use to assist in the calculation and forecasting of the Alberta Crown oil royalty take-in-kind conventional oil volume. The Petrinex OFT menu tasks include:

1. Edit Oil Forecast
2. Query Oil Forecast
3. Edit User Forecast Facility View List
4. Query User Forecast Facility View List
5. Submit Report Request
 - a. Oil Forecast – Facility View List Report
 - b. Oil Forecast – Gross and Crown Forecast Report
 - c. Oil Forecast – Variance Report

What does the Oil Forecast Tool do?

1. Based on the **gross** well production forecast for a given well, the OFT will calculate, at the well level, the Crown royalty take-in-kind volume.

2. The initial gross forecast for each individual well is pre-populated by the OFT from the most recent historical well volumetric data available in Petrinex. Based on this initial gross well production forecast (and the most current royalty attributes available in Petrinex), Petrinex calculates an initial Crown royalty volume forecast for each well.
3. The OFT allows users to update the initial gross volumetric data based on their knowledge of actual field operations so the gross and Crown royalty volume will be calculated using more current/updated data.
4. The OFT incorporates the latest information into its calculations including:
 - a. Current PAR Price
 - b. Correct royalty formula for each well
 - c. Latest status available regarding royalty program status

Note: Facility operators can override the benefit program based on operational knowledge if they have determined that the program will expire earlier than the OFT indicates. See the Petrinex Tip titled "[OFT Enhancement - Remove a well from Royalty Program](#)" for more information.

5. The OFT allows users to input/update gross production forecast volumes at three different levels:
 - a. **Well Level** (most detailed forecasting approach)
Since royalties are calculated at the well level, entering your forecast of gross production at the well level provides Petrinex with the best starting point to accurately calculate the well's Crown royalty volume.
 - b. **Producing Battery Level** (mid-level detail forecasting approach)
Forecasters could alternatively enter their gross production forecasts at the producing battery level. If production forecasts are entered at the producing battery level, Petrinex will automatically prorate any changes (versus the initial pre-populated forecast in Petrinex) to all wells producing into that production battery. This prorating process saves time versus forecasting at the well level but can lead to erroneous Crown royalty calculations since all of the wells producing to the production battery may not in fact be contributing proportionately to the change in the battery's forecast production.

- c. **Facility View List (Group) Level** (least detailed forecast approach)
Forecasters may enter their gross production forecast at what Petrinex calls the “Facility View List” level. The facility view list is a collection of production sources (e.g. producing batteries and/or wells). Facility view lists are established by the Petrinex user and often include the wells/producing batteries that flow production to a “Form A battery”.

If production forecasts are entered at the facility view list level, Petrinex will automatically prorate any changes (versus the initial pre-populated forecast in Petrinex) to all wells that flow production into that facility view list (or Form A battery). This prorating process saves time versus forecasting at the well level or the producing battery level but can lead to erroneous Crown royalty calculations since all of the wells producing to that Form A battery may not in fact be contributing proportionately to the change in the Form A battery’s forecast production.

From the above, it should be noted that the OFT generates the most accurate forecasts when it is provided accurate gross production forecasts at the well level. Entering gross production forecasts at the producing battery or facility view list (Form A battery) level increases the potential for erroneous royalty calculations due to the requirement for the OFT to prorate high-level gross production volume changes to individual wells.

[Attachment 1](#) provides examples of how depending on whether the user provides information at the well, producing battery or facility view list level, the same total change in a gross volume forecast can lead to very different Petrinex Crown royalty volume forecasts.

What does the Oil Forecast Tool NOT do?

1. The OFT cannot forecast gross production volume and field operation changes.
 - Petrinex provides an initial starting gross volume forecast based on historical production (forecast month minus two months). **Identifying changes to this initial gross forecast is the responsibility of the forecaster.**
2. The OFT does not calculate volumes for individual shippers other than the Alberta Crown (APMC).

- Note that changes to the forecasted Crown share of production changes the volume available to all other shippers in the stream as well.
3. The OFT uses the latest data supplied by the DOE at the time the OFT calculates the forecast. The OFT cannot forecast
 - royalty attribute changes that may have changed since the last month of actual production reported in Petrinex, or
 - royalty attribute changes that may occur during the forecast month. Royalty program and C* thresholds can be met during the month being forecasted and can have significant impacts on the royalty calculation.
 4. The OFT cannot identify multiple destinations for the same Crown royalty volume.
 5. The OFT does not create the Forms A/C/B used in the COLC process.

What should users do and understand to ensure the OFT works most effectively?

- Operators should **learn how to manage and regularly maintain their facility view lists.**
 - The facility view list is a feature of the forecast process that allows users to create a group of facilities (producing batteries) so that the gross production forecast can then be edited and/or displayed at the group level. As many BA's have different groupings of facilities to help their staff work only on the facilities that are assigned to them, multiple facility view lists can be created. It is important to understand that using this group level is the least accurate level to generate forecasts. This is due to the requirement to pro-rate changes made at this level to the batteries and wells flowing to the facility view list. The facility level forecast process is the better process for prorating to the wells in the battery, and as discussed, the best Crown forecasts are generated when gross production is forecast at the well level.
 - Operators should review the movement of product and **ensure facility view lists are updated**, as necessary, to reflect the current movement from one facility to another. Facility view lists are maintained by the user and are not automatically updated by Petrinex.
 - For more information on the User Facility View list, review the learning aid titled "[How to Create Groups of Batteries for the Petrinex Oil](#)"

- [Forecast Tool Functions](#)” on the Petrinex Website - Learning Centre – Learning Job Aids – Oil Forecasting.
- Operators should ensure batteries that deliver to multiple destinations are not on a Facility View List.
 - Operators should **review and adjust gross production volume forecasts** based on field operation changes (ideally at the most detailed level possible).
 - Operators should request and review the Oil Forecast – Gross and Crown Forecast Report, available in Petrinex, in order to determine if changes are required to the gross production volumes or the facility view list. Once changes have been submitted to Petrinex, the forecast will be generated again with adjusted production volumes and updated Crown royalty volumes. This updated information will also be available on the Oil Forecast - Gross and Crown Forecast Report.
 - Operators should **incorporate the OFT-calculated Crown royalty volume** when completing their initial Form A(s) and corresponding Form C(s) or an amended Form A(s) and the associated Form B(s).
 - Operators should understand that the OFT allows for uploading volumes from a BA’s **Field Data Capture System** via the Petrinex batch up load process.
 - The initial gross volume well-level forecast populated by Petrinex is based on the most recent data available in Petrinex, however this is two months “out of date”. A more recent source of well production data may be available through your company’s field data capture system.
 - See the learning job aids:
 - [Oil Forecast Submissions Upload Specifications](#)
 - [Oil Forecast Submissions Upload Templates](#)
 - Operators should understand the **timing of when information is available in Petrinex and how this integrates with your forecasting and reporting activities**.
 - The graphic below illustrates when changes to the OFT can be performed and the associated dates involved for the forecast month of January. For example, adjustments to the facility view list (Form A battery) groupings can start on October 27th. These facility view lists (groups) need be set up or modified as soon as possible each month so they are included on the initial Oil Forecast - Gross and Crown Forecast Report. The January initial Petrinex Oil Forecast is calculated on November 27th. This is the same night that the latest

royalty attribute data related to royalty programs is uploaded to Petrinex from the DOE.

- o Gross production volume forecast adjustments submitted after the OFT initial forecast calculations, are submitted to Petrinex by on-line editing or using batch files with data from the field, potentially from the operator’s Field Data Capture (FDC) system. Petrinex will recalculate the oil forecast for the Crown royalty volume based on the updated gross production volume entered by the user.

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Forecast Month January	Activities	In Petrinex	CALENDAR DATES				
			October	November	December	January	February
	Form A initial and amendments	N				4 → 31	
	Facility View List Edits	Y	1 → 31				
	Royalty Attribute Info	Y			27		
	OFT - Initial Calculation	Y			27		
	OFT - FDC to update Calc	Y			27 → 31		
	Pipeline Splits	Y					13
	Actual Production Volumes	Y					20

- **Operators should carefully consider the impact of “over-forecasting” as a mechanism to manage apportionment.** Inflated gross forecasts will lead to inflated, inaccurate Crown share estimates.

Summary and Conclusions:

- While forecasts are only forecasts and can never be 100% accurate, accurately forecasting the Crown’s conventional oil royalty share of production is the responsibility of the operator. Inaccurate forecasting can have negative financial consequences for the operator.
- The process of forecasting the Crown’s royalty share is complex. It requires accurate forecasting of gross production and accurate calculation of royalties using correct formulae and the best available royalty calculation inputs.

- The Petrinex oil forecast tool was developed to assist in calculating forecasted Crown take-in-kind royalties.
- With the accurate forecast of gross volumes at the well level and current royalty attributes the OFT consistently calculates accurate royalty share outputs.
- Operators in some cases cannot forecast at the detailed well level. Petrinex is designed to permit entry of higher-level forecast levels (production battery level and Facility View List level) however this functionality requires the OFT to “make assumptions” (prorate). This prorating can lead to erroneous outputs. Ultimately, the tool and all of its functionality and limitations have to be understood and effectively managed by the operator.
- Field data capture system data can be imported to Petrinex and may generate more accurate forecasts.

The Petrinex Business Desk and Petrinex Industry Team are available to help operators fully lever the capabilities of the Petrinex Oil Forecast Tool.

More information:

Petrinex Business Desk
Phone: 297-6111 (Toll Free 1-800-992-1144)
E-mail: Petrinexsupport@petrinex.ca

Attachment 1: Example of the impact of reporting forecasts at the available various levels.

The Crown royalty take-in-kind volume is calculated by the APMC/DOE based on the each individual well's production volume. All wells are associated with a producing battery and many industry companies provide their forecasts at the Form A delivery facility (Facility View List/group) level. The OFT allows for three levels of forecasting.

The following is an example demonstrating impact of different approaches to using the Oil Forecast Tool:

Scenario:

Total production has increased from 780 m3 to 1000 m3 from the previous “actual” period that was used to generate the “starting forecast” in the OFT for the current forecast period.

Did this significant increase (220 m3) come from one well or an overall improvement in field productivity?

1. If the change is input by the forecaster at the Form A Delivering Facility (Facility View list) level, the OFT will prorate that change in volume across all wells and producing batteries associated with that Form A battery (Facility View list).
2. If the change is input at only one Producing Battery that delivers to the Form A battery, the OFT will prorate that change in volume across the all wells producing to just that battery.
3. If the change is input at the Well Level, the OFT does not need to “make assumptions”.

Results:

The forecast Crown share of production changes significantly based on the information provided to the OFT. The following are the results as calculated by the OFT using the three different approaches:

1. Form A Delivering Facility: 1,000.0 Gross Calculated Crown = 92.4 m3 (9.24%)
2. Producing Battery Level: 1,000.0 Gross Calculated Crown = 114.5 m3 (11.45%)
3. Well Level: 1,000.0 Gross Calculated Crown = 130.5 m3 (13.05%)

In addition to the Crown's royalty volume share, all other owners and shippers will be impacted based on the forecasting approach taken:

<u>Scenario and Shipper/Owner shares</u>		<u>1.</u>	<u>2.</u>	<u>3.</u>
Crown	Shipper APMC	92.4	114.5	130.5
WIO A 50.0%	Shipper D	453.8	442.7	434.8
WIO B 25.0%	Shipper D	226.9	221.4	217.3
WIO C 25.0%	Shipper E	<u>226.9</u>	<u>221.4</u>	<u>217.3</u>
Total Production		1000.0	1000.0	1000.0