
Made at Fort McMurray, in the
Province of Alberta, on

February 06, 2023

ALBERTA ENERGY REGULATOR

The Alberta Energy Regulator (AER) orders, under sections:

- 113 and 241 of the *Environmental Protection and Enhancement Act* (EPEA)

Imperial Oil Resources Limited

("Imperial")

505 Quarry Park Blvd SE

Calgary, AB T2C 5N1

WHEREAS Imperial is the holder of an Environmental Protection and Enhancement Act (EPEA) approval granted by the Alberta Energy Regulator (AER), EPEA approval number 00046586-01-00 (the Approval);

WHEREAS Imperial was authorized by the AER to operate the Kearl Oil Sands Processing Plant and Mine (the Site) on the land legally described as Lease 6, 31A, 36, 87, 88A, and 88B;

WHEREAS the Site produces crude oil and industrial wastewater as a by-product;

WHEREAS industrial wastewater is known to cause an adverse effect to the environment and is a substance, as defined in section 1(mmm) of EPEA (Substance);

WHEREAS Imperial is a person responsible for the industrial wastewater, as defined in section 1(tt) of EPEA;

WHEREAS at approximately 10:37 a.m. on May 19, 2022, Imperial reported to the AER that discoloured surface water was found at locations both on the Site and to the north and northeast of the Site boundary (Off-site) (collectively, Impacted Area 1);

WHEREAS on May 20 and June 6th, 2022, the AER inspected the Site and confirmed the presence of the Substance at Impacted Area 1 (Release 1);

WHEREAS the Impacted Area includes muskeg and forested public lands inhabited by various species of wildlife;

WHEREAS Impacted Area 1 is in proximity to a fish-bearing waterbody known as Waterbody 3 and tributaries that feed the Firebag and Muskeg Rivers;

WHEREAS at approximately 2:19 p.m. on June 3, 2022, Imperial reported to the AER that surface water sampling results of the Substance indicated characteristics of industrial wastewater contaminated surface water;

WHEREAS from June to August 2022, with regulatory oversight from the AER, Imperial conducted a geochemistry study to determine the source and pathway of Release 1, developed and implemented an Interim Water Quality Sampling and Monitoring Plan, installed additional shallow groundwater monitoring wells, and developed a Conceptual Site Model;

WHEREAS on July 15, 2022, Imperial submitted an Interim Water Quality Sampling and Monitoring Plan for Release 1 which was approved by the AER on August 3, 2022;

WHEREAS Imperial implemented the Interim Water Quality Sampling Plan for Release 1 and reported to the AER every two weeks in accordance with this plan;

WHEREAS in its August 16, 2022 submission to the AER, it was found that chemistry of the Substance at Impacted Area 1 was consistent with that of industrial wastewater and that the Substance exceeds Alberta Environment and Protected Areas (AEPA) and Canadian Council of Ministers of the Environment (CCME) guidelines for constituents including but not limited to dissolved iron, total arsenic, F2 hydrocarbons, sulphate, total sulphide;

WHEREAS on September 2, 2022, the AER issued a Notice of Noncompliance to Imperial under EPEA Approval 00046586-01-00, sections 4.2.1 and 4.2.3 in respect of Release 1 for releasing a substance from the site to the surrounding watershed and for failing to manage and contain the industrial wastewater as per their EPEA approval;

WHEREAS on September 13, 2022, Imperial confirmed the source of the Substance in respect of Release 1 as process affected water, CST pore water and impacted shallow groundwater, which are defined as Industrial Wastewater under Imperial's EPEA approval;

WHEREAS from September to November 2022, Imperial continued water quality monitoring and investigation of the pathway of Release 1 to inform source control options of the Substance with regulatory oversight from the AER;

WHEREAS on November 29, 2022, Imperial Oil confirmed that the Substance in respect of Release 1 is industrial wastewater and is seeping from its External Tailings Area (ETA) through a common fill layer placed during construction, mixing with shallow groundwater, and coming to surface at locations on the Site and Off-site;

WHEREAS in December 2022, Imperial commenced installation of additional seepage interception wells and delineation groundwater wells along the perimeter of the Site;

WHEREAS on December 22, 2022, and January 27, 2023, Imperial submitted action plans for source control, delineation, and remediation in respect of Release 1;

WHEREAS in its December 22, 2022, submission, Imperial provided an action plan to the AER that included actions on both the Site and Off-site to prevent further release of the Substance, however, the timelines for off-site actions would not allow for the work to be completed before spring freshet;

WHEREAS on January 27, 2023, Imperial submitted an alternate action plan for only actions on the Site, and identified concerns regarding the effectiveness of using only on-Site interception techniques to completely prevent the further release of the Substance to the environment;

WHEREAS to date, Release 1 continues to actively release the Substance into Impacted Area 1;

WHEREAS the AER has determined that additional work is required to ensure that source control of the Substance is in place prior to spring freshet to prevent further environmental impact;

WHEREAS on February 4, 2023, Imperial reported to the AER an additional release of the Substance (Release 2) near Release 1 (collectively, the Releases) due to an overflow of an industrial wastewater storage pond;

WHEREAS on February 5, 2023, the AER inspected Release 2, and observed that the area affected includes the Site and areas outside the Site including muskeg and forested area (Impacted Area 2);

WHEREAS on February 5, 2023, at the time of the AER inspection Imperial estimated Release 2 released 5300 m³ of the Substance;

WHEREAS Imperial has completed source control measures for Release 2, but has yet to complete delineation and remediation work;

WHEREAS Candace MacDonald, Director, Field Operations Northeast has the authority to order under sections 113 and 241 for the purpose of issuing orders under the EPEA;

WHEREAS the Director is of the opinion that releases of a substance into the environment have occurred, and the substance has caused, is causing, or may cause an adverse effect, and remedial work is required to mitigate adverse effects on Impacted Area 1, including both on Site and Off-site areas, and Impacted Area 2;

Therefore, I, Candace MacDonald, Director, Field Operations Northeast, under sections 113 and 241 of EPEA, do hereby order Imperial to do the following:

Immediate Action

1. Provide an updated Source Control and Containment Plan detailing the actions required in the short-term to effectively intercept and contain the Substance from the Releases prior to spring freshet to the satisfaction of the Director on or before 4:00 p.m. on February 10, 2023;
2. Implement the short-term actions in the Source Control and Containment Plan as authorized in writing by the Director;

Communications

3. Immediately identify and report to the Director any potentially affected parties that could be adversely affected by the Releases including but not be limited to domestic, indigenous, agricultural and recreational users of lands and waterbodies potentially affected;
4. Submit a Communications Plan for notification of and regular updates to the potentially affected parties identified in Clause 3, including through a publicly accessible website, to the satisfaction of the Director on or before 4:00 p.m. on February 10, 2023;
5. Implement the Communications Plan as authorized in writing by the Director;

Control, Containment, and Delineation

6. On or before 4:00 p.m. on February 28, 2023, submit to the satisfaction of the Director, an updated Source Control and Containment Plan referenced in paragraph 1. The plan shall address source delineation, control, and containment of the Substance from the Releases, and shall include, at a minimum:
 - a. A Source Control and Containment Plan, prepared and implemented by a qualified professional, detailing interception of impacted groundwater and surface water at Impacted Area 1 and Impacted Area 2. These plans must be informed by vertical and lateral delineation of the Substance;
 - b. Written confirmation that the Engineer of Record (EOR) has reviewed and confirmed that any proposed excavation work in proximity to the toe of the dam will not impact the structural integrity of the ETA;
 - c. Methods and techniques for delineation of the Releases;
 - d. Monitoring (soil, surface water and groundwater) to evaluate the effectiveness of the source control/containment measures, including:
 - i. Monitoring frequency, monitoring locations, testing suites, confirmation of methodologies etc. (as above); and
 - ii. Identification of triggers indicating failure of the source control/containment measures and details of the responses to these.
 - e. A schedule of implementation for the Source Control and Containment Plan;
7. Implement the Source Control and Containment Plan as authorized in writing by the Director;

Sampling and Monitoring

8. On or before 4:00 p.m. on February 28, 2023, submit to the satisfaction of the Director, an updated Sampling and Monitoring Plan for the Releases. The plan shall follow Environmental Site Assessments Standard, March 2016 (Phase II) and address the sampling and monitoring of soil, water, groundwater, vegetation, waterbodies, wetlands, and shall address, at a minimum, the following:
 - a. The locations and sampling frequency of all surface water and groundwater samples that will be taken, including new wells north of the Site boundary and surrounding the water body known as Waterbody 3;
 - b. Sample parameters for surface water must include hydrocarbons (including BTEX, F1-F4 fractions, and Polycyclic Aromatic Hydrocarbons (PAHs) at Waterbody 3, with chromatography included for F2-F4 hydrocarbons), routine (including nutrients and major ions), physical (pH, conductivity and salinity), naphthenic acids, total and dissolved metals, and acute and chronic bioassay testing at Waterbody 3 post-freshet;
 - c. The surface water sampling program must follow an approved methodology with a detection limit below the relevant environmental standards, which may include the environmental quality standards (EQS) for surface water, unless otherwise authorized in writing by the Director;
 - d. Sample parameters for groundwater must at minimum follow the Key Indicator Parameters listed in the Kearl Oil Sands Mine, Groundwater Monitoring Plan (Advisian 2018), located in Appendix 2 and Table G of the Kearl Oil Sands Mine 2017 Groundwater Summary Report;
 - e. The groundwater sampling program must follow the Monitoring and Sampling at Groundwater Wells Preferred Operating Procedure, Kearl Oil Sands Mine Site-Specific, report located in Appendix 3 of the Kearl Oil Sands Mine 2017 Groundwater Summary Report;
 - f. Confirmation that all samples will be analysed at a laboratory accredited through the Canadian Association of Laboratory Accreditation Inc. (CALA-accredited laboratories), by qualified personnel or by other specialists appropriate to the sample type;
 - g. Timelines for drilling and first sampling event from groundwater monitoring wells;
 - h. Proposed changes to current surface water sampling plan, including additional monitoring and delineation locations, with consideration of how surface hydrology may affect movement of the Substance; and
 - i. A program to monitor for new surface seeps around the perimeter of the Site.

9. Implement the Sampling and Monitoring Plan as authorized until otherwise directed by the Director in writing;

Wildlife Mitigation and Monitoring Plan

10. On or before 4:00 p.m. on February 10, 2023, submit to the satisfaction of the Director a Fish and Wildlife Mitigation Plan, which shall include, at a minimum:
 - a. The steps taken to locate and assess impacts to fish and wildlife, and their habitat;
 - b. The steps taken to prevent impacts to fish and wildlife, and their habitat;
 - c. A plan for the rehabilitation of impacted fish and wildlife, and their habitat;
 - d. A plan for the humane euthanasia of impacted fish and wildlife (note that permits relating to euthanasia may be required from other regulatory agencies); and
 - e. A plan for the reporting of the results and associated timelines to the Director.
11. Implement the Fish and Wildlife Mitigation Plan as authorized in writing by the Director;

Remedial Action Plan

12. On or before 4:00 p.m. February 28, 2023, submit to the satisfaction of the Director an updated Remedial Action Plan, which shall include, at a minimum:
 - a. A Remediation Plan with details of the remedial measures (i.e., the proposed mechanism) that will be taken to remove or remediate the Substance from Impacted Area 1 and Impacted Area 2 with details of transportation and disposal if needed and the timeline for removal and/or treatment;
 - i. The remedial work shall be informed by the results of the delineation completed (vertical and lateral) of the Substance, in the groundwater, soil, waterbodies, wetlands, required by clause 6 (Control, Containment, Delineation); and
 - ii. The remedial work described in the Remedial Action Plan shall ensure that soil, surface water and groundwater meet the applicable criteria (i.e., Alberta Tier 1 or 2 Soil and Ground Water Remediation Guidelines, as amended). When Tier 2 criteria applies, the following must be included:
 - a. Identification of any receptors and distances from the contamination; and
 - b. Evidence and interpretation about how the contamination is moving/behaving in the soil and groundwater.
 - b. A risk management/exposure control plan that shall include, at a minimum:

- i. Outline of any measures needed to prevent receptors being exposed to the Substance (in addition to the Control and Containment Plan, Wildlife Mitigation Plan etc.);
 - ii. Any communication with any potentially affected parties identified in clause 3 and confirmation that any agreements required are in place; and
 - iii. A receptor monitoring system to ensure effectiveness of risk management measures.
 - c. Monitoring (soil, surface water and groundwater) to evaluate the effectiveness of the remedial measures and exposure control/containment measures, including:
 - i. Monitoring frequency, monitoring locations, testing suites, confirmation of methodologies etc. (as above);
 - ii. Identification of triggers indicating failure of the remedial measures and details of the responses to these; and
 - d. A schedule of implementation for the Remedial Action Plan.

13. Implement the Remedial Action Plan as authorized in writing by the Director;

Reporting

14. On or before 4:00 p.m. on Wednesday February 15th and every Wednesday thereafter, Imperial shall submit to the Director a weekly report (Weekly Report) summarizing the work completed in the approved Source Control and Containment Plan and Remedial Action Plan, as well as provide an analysis of the sampling and monitoring results;

15. Imperial shall submit to the Director a final report (Final Report) within 60 days of the completion of all the work required by this Order, summarizing such work and including verification that the work has met all standards and criteria as specified by the Director;

16. Imperial shall conduct and submit to the Director and make publicly available a root cause analysis within 3 months from the date this Order is issued, identifying the root cause of the Releases and the steps necessary to prevent similar releases in the future;

General

17. In carrying out the requirements of this Order, Imperial shall obtain and comply with all required federal and provincial permits and governing legislation and provide to the AER all authorizations obtained immediately upon receipt;

18. All Plans required and work to be performed required by this Order must be prepared and implemented by a qualified professional;
19. All Plans and Reports to be submitted to the Director under this order shall be submitted to FieldOpsNortheast@aer.ca and Candace.Macdonald@aer.ca.
20. Where a deadline has been specified in this Order, the Director may authorize in writing a different deadline or reporting frequency as applicable.

Dated at the City of Fort McMurray in the Province of Alberta, the 6th day of February 2023.

< original signed by >

Candace MacDonald
Director Field Operations North, Compliance and Liability Management
Alberta Energy Regulator

In complying with this order, the party or parties named must obtain all approvals necessary, notwithstanding the above requirements.

This order in no way precludes any enforcement actions being taken regarding this matter under 113 and 241 of the *Environmental Protection and Enhancement Act* (EPEA) or any other provincial or federal legislation, or by any other regulator with jurisdiction.

All enforcement actions issued by the AER may be subject to a follow-up review to confirm previous commitments have been completed and measures have been implemented, to ensure similar noncompliances are prevented in the future. The AER may request any information that demonstrates steps have been taken to prevent repeat noncompliances from occurring.

Under the *Responsible Energy Development Act*, an eligible person may appeal decisions that meet certain criteria. Eligible persons and appealable decisions are defined in section 36 of the *Responsible Energy Development Act* and section 3.1 of the *Responsible Energy Development Act General Regulation*. If you wish to file a request for regulatory appeal, you must submit your request according to the AER's requirements. You can find filing requirements and forms on the AER website, www.aer.ca, under Regulating Development: Project Application: Regulatory Appeal Process.