



THE STATE
of **ALASKA**
GOVERNOR BILL WALKER

Department of Environmental
Conservation

DIVISION OF SPILL PREVENTION AND RESPONSE
Contaminated sites Program

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File No: 2323.38.036

January 7, 2016

Sarah M. Kenshalo
ConocoPhillips Alaska Natural Gas Corporation
P.O. Box 100360
Anchorage, Alaska 99510-0360

Re: Decision Document: Phillips Petroleum LNG Plant-2002
Cleanup Complete Determination – Institutional Controls

Dear Ms. Kenshalo:

The Alaska Department of Environmental Conservation, Contaminated Sites Program (ADEC) has completed a review of the environmental records associated with the **Phillips Petroleum LNG Plant-2002** site, located adjacent to Cook Inlet near Mile 20 of the North Kenai Road, near Nikiski, Alaska. Based on the information provided to date, it has been determined that the contaminant concentrations remaining on site do not pose an unacceptable risk to human health or the environment, and no cleanup action will be required as long as the site is in compliance with established institutional controls (ICs) and conditions.

This decision is based on the administrative record for the Phillips Petroleum LNG Plant-2002 site, located in the offices of the ADEC in Soldotna, Alaska. This letter summarizes the decision process used to determine the environmental status of this site and provides a summary of the regulatory issues considered in this Cleanup Complete Determination - Institutional Controls.

Site Name and Location:

Phillips Petroleum LNG Plant-2002
48385 Kenai Spur Highway
Nikiski, Alaska

Name and Mailing Address of Contact Party:

Sarah M. Kenshalo
ConocoPhillips Alaska Natural Gas Corp.
P.O. Box 100360
Anchorage, Alaska 99510-0360

DEC Site Identifiers:

File No: 2323.38.036
Hazard ID: 3932

Regulatory Authority for Determination:

18 AAC 75

Landowners (2):

Kenai LNG Corp
ATTN: PTRRC Department ATO-1646
700 G St
Anchorage, Alaska 99501

ConocoPhillips Company
Property Tax & Real Estate & Claims
700 G St
Anchorage, Alaska 99501

Property Legal Descriptions (2):

Section 21, T 7N, R 12W, Seward Meridian, KN 0000672, Portion Tract 3 of USS 1095/HES 74 as described in Deed 55/326. Consisting of 10.14 acres. The owner of this parcel is Kenai LNG Corporation.

Section 21, T 7N, R 12W, Seward Meridian, KN 0000672, Portion Tracts 1, 2, & 3 USS 1095/HES 74 Lying West of North Kenai Rd as described in Deed 53/99 & excluding that portion as described in Deed 55/326. Consisting of 60.16 acres. The owner of this parcel is ConocoPhillips Company.

Site Description and Background

This site is located on two adjoining parcels of property on which ConocoPhillips Alaska Natural Gas Corporation (Facility Operator) operates the Kenai Liquefied Natural Gas Facility (LNG Facility) located near Mile 20 of the Kenai Spur Highway in Nikiski, Alaska. The LNG Facility receives natural gas from the Cook Inlet gas fields and liquefies this gas for export. The LNG Facility has been in operation for more than 30 years. The natural gas that enters the LNG Facility for processing into LNG contains trace amounts of arsenic.

In June 2002, an internal investigation of arsenic in the LNG production process was conducted by the Facility Operator. This investigation included quantifying arsenic concentrations in the LNG Facility process streams and in surface soils at the facility. Elevated arsenic concentrations were detected in surface soils. The Facility Operator's internal investigation suggested that the elevated arsenic concentrations identified in soils was likely due to historical disposal of spent carbon media from the sulfide carbon beds, which are used to reduce arsenic levels from the natural gas process stream. Following this internal investigation/report, the Facility Operator hired ENSR Corporation to perform an area-wide assessment of arsenic contamination in soils at the LNG Facility. ENSR performed this initial assessment work in October 2002, which confirmed arsenic contamination in surface and near surface soils.

Groundwater is first encountered at depths from approximately 20 to 55 feet below ground surface (bgs). There are no drinking water wells located at the LNG Facility.

The first groundwater encountered beneath portions of the LNG Facility is contaminated with petroleum releases from the Tesoro Alaska Refinery, located to the east northeast of the LNG Facility. Groundwater in a deeper aquifer (identified as the upper unconfined aquifer), is not contaminated. The LNG Facility's current water supply source consists of two deep water wells

located east of the LNG Facility, under the regulatory approval of ADEC's Drinking Water Program.

Contaminants of Concern

'Contaminants of Concern' include any hazardous substances that exceed ADEC's most stringent soil or groundwater cleanup levels. These cleanup levels are designed to be protective of human health exposure pathways in residential settings, where groundwater may be used as a source of drinking water. Arsenic was the only contaminant of concern identified during the course of the site investigations, which are summarized in the **Site Characterization Activities** section of this decision letter.

Applicable Soil Cleanup Levels

The approved soil cleanup level for arsenic at this site is an alternative soil cleanup level that was developed under 18 AAC 75.340(e)(3), Method Three, Under 40-inch Zone, for Commercial/Industrial Exposure. This Method Three soil cleanup level is based on a "Direct Contact Outdoor Worker" exposure pathway.

- Arsenic 16 mg/kg

Groundwater Cleanup Level

The 18 AAC 75.345, Table C groundwater cleanup level for arsenic is set at 0.010 mg/L. The arsenic released at this site did not contaminate the groundwater. Arsenic is not a contaminant of concern in groundwater.

Site Characterization Activities

Site characterization activities conducted under the regulatory authority of ADEC began in 2002. These activities are described below.

In 2002, ENSR International completed site characterization work, including the collection of 318 soil samples from 159 locations. Samples were collected at each location at both the ground surface and at 1-foot bgs. These samples were analyzed for total arsenic by EPA test method 6029. Twenty of these soil samples were also analyzed for arsenic using the toxicity characteristic leaching procedure (TCLP) analysis. Two groundwater monitoring wells were sampled and tested for total arsenic using EPA test method 6020. Twenty three soil samples collected from 16 different locations contained total arsenic concentrations exceeding 16 mg/kg. All 20 soil samples analyzed by TCLP resulted in non-detection, with a detection limit of 50 ug/L. Neither of the two groundwater samples exceeded 0.010 mg/L total arsenic, which is the current ADEC groundwater cleanup level in 18 AAC 75.345, Table C.

In October 2011, Weston Solutions Inc. completed a second site characterization work effort, including the field screening of 106 soil samples using an x-ray fluorescence (XRF) field instrument, and the laboratory analysis of 20 soil samples. Thirty four of the XRF field-screened soil samples exceeded 16 mg/kg arsenic, at values ranging from 16 to 182 mg/kg. The XRF field-screened

sample values were adjusted based on a calibration of the XRF field instrument to the arsenic concentrations reported by the analytical laboratory. Nine of the 20 laboratory soil samples exceeded 16 mg/kg arsenic, with reported concentrations ranging from 16.0 to 175 mg/kg.

In October 2013, Weston Solutions Inc. completed a third phase of site characterization work, in the effort to better delineate areas with arsenic concentrations exceeding 16 mg/kg. Weston Solutions' staffs advanced 34 soil borings and collected and analyzed 103 soil samples with an XRF field instrument. Ten soil samples were delivered to an ADEC approved laboratory for analysis. Fourteen of the XRF field-screened soil samples exceeded 16 mg/kg arsenic, at values ranging from 16.7 to 36.4 mg/kg. One of the ten laboratory soil samples exceeded 16 mg/kg arsenic, with a concentration of 37.5 mg/kg.

Upon review of all soil sampling locations and data, Weston Solutions identified six separate areas at the LNG Facility with arsenic concentrations exceeding the ADEC approved Method Three soil cleanup level of 16 mg/kg. These six areas have been labeled Zones 1 (two areas), 3, 3A, 3B, and 3C. These Zones are shown on Figures 2, 3, 4, 5, and 6 (see attachments). Weston Solutions has estimated the surface area exceeding 16 mg/kg arsenic within each Zone as follows:

- Zone 1 4,780 square feet (sf)
- Zone 3A 135 sf
- Zones 3B & 3 43,986 sf
- Zone 3C 4,400 sf

Worker exposure to these areas of arsenic contaminated soil will be controlled with institutional controls (ICs). The LNG Facility perimeter is entirely fenced to preclude public access. The LNG Facility is also a controlled access facility regulated by the Marine Transportation Safety Act under the jurisdiction of the United States Coast Guard. Access controls are governed by the current United States Coast Guard Maritime Security (MARSEC) level set for this jurisdiction. Additionally, the Facility Operator will establish and institute employee/contractor notification protocols to help ensure outdoor workers at the plant are informed of the locations of each arsenic contaminated area, and the health risks associated with working in these six areas. Outdoor worker notification protocols will include posting of health hazard signage around the perimeter of each area, and health and safety training and instruction to employee, and unescorted contracted, outdoor workers.

On February 12, 2015, ADEC received the Facility Operator's February 11, 2015, Plan for Arsenic Signage and Placement. ADEC approved this plan on February 12, 2015.

On February 13, 2015, ADEC received the Facility Operator's February 13, 2015, Arsenic Training Module. ADEC approved this training module on February 25, 2015.

The Plan for Arsenic Signage and Placement and the Arsenic Training Module are public records, available from ADEC under the Alaska Public Records Act, [AS 40.25.100-.220](#)

Cumulative Risk Evaluation

Pursuant to 18 AAC 75.325(g), when detectable contamination remains on-site, a cumulative risk determination must be made that the risk from hazardous substances does not exceed a cumulative carcinogenic risk standard of 1 in 100,000 across all exposure pathways and does not exceed a cumulative noncarcinogenic risk standard at a hazard index of one across all exposure pathways.

Based on a review of the environmental data, ADEC has determined that arsenic is the only contaminant of concern at this site. Groundwater beneath portions of the LNG Facility is contaminated with petroleum from an off-site source. A groundwater supply source unaffected by this petroleum, approved by ADEC's Drinking Water Program, currently provides drinking water to the LNG Facility; thus, there is no complete exposure pathway to the petroleum contaminated groundwater. There are no additional contaminants or exposure pathways that elevate risk above that posed by arsenic. The 16 mg/kg Method Three alternative soil cleanup level for arsenic does pose a 1 in 100,000 carcinogenic risk to outdoor workers, based on an industrial/commercial setting, and the six areas with higher concentrations of arsenic in soil would pose a higher risk.

Institutional controls (ICs) have been implemented to limit land use at the LNG facility to commercial / industrial activities only, and to control outdoor worker exposure to the six areas where arsenic concentrations in soil exceed 16 mg/kg. Outdoor workers should not be exposed to a carcinogenic risk exceeding 1 in 100,000 provided that the site is managed in compliance with the ICs and conditions established in the **ADEC Decision** section of this decision document.

Exposure Pathway Evaluation

Following the completion of site characterization work, exposure to residual Contaminants of Concern was evaluated using ADEC's Exposure Tracking Model (ETM). Exposure pathways are the conduits by which contamination may reach human or ecological receptors. ETM results show all pathways to be one of the following: De-minimis Exposure, Exposure Controlled, or Pathway Incomplete. A summary of this pathway evaluation is included in Table 1.

Table 1 – Exposure Pathway Evaluation

Pathway	Result	Explanation
Surface Soil Contact	Exposure Controlled	Exposure to contaminated surface soil will be controlled with ICs.
Sub-Surface Soil Contact	Exposure Controlled	Exposure to contaminated sub-surface soil will be controlled with ICs.
Inhalation – Outdoor Air	De-minimis Exposure	Outdoor workers are unlikely to be exposed to arsenic contamination over significant periods of time through this exposure pathway.
Inhalation – Indoor Air (vapor intrusion)	Pathway Incomplete	Arsenic contamination in soil has no potential to contact workers through this exposure pathway (vapor intrusion).

Groundwater Ingestion	Pathway Incomplete	Arsenic contamination was only detected in the near surface soils. There is no evidence that groundwater has been contaminated with arsenic. The LNG Facility's current drinking water source consists of two offsite groundwater wells which are regulated and approved by ADEC's Drinking Water Program.
Surface Water Ingestion	Pathway Incomplete	Residual contamination has no potential to contact surface waters, and surface water is not used as a source of drinking water.
Wild Foods Ingestion	Pathway Incomplete	Wild foods are not harvested or consumed by workers at this site.
Exposure to Ecological Receptors	De-minimis Exposure	The arsenic contaminated soil is unlikely to affect ecological receptors.

Notes to Table 1: "De-minimis Exposure" means that in ADEC's judgment receptors are unlikely to be affected by the remaining contamination. "Pathway Incomplete" means that in ADEC's judgment contamination has no potential to contact receptors. "Exposure Controlled" means there is an administrative mechanism in place limiting land or groundwater use, or a physical barrier in place that deters contact with residual contamination.

ADEC Decision

Arsenic contamination remains in surface and sub-surface soil above the approved alternative cleanup level in six areas on two adjoining properties; however ADEC has determined there is no unacceptable risk to human health or the environment provided that exposure to these areas is properly controlled, and the contamination is properly managed. Therefore, we are issuing this "*Cleanup Complete - Institutional Controls*" determination.

The ICs and conditions established under this determination are as follows:

1. Land use at the LNG Facility must remain limited to commercial / industrial activities, as that was the basis for the alternative soil cleanup level.
2. The two attached Notice of Environmental Contamination (NEC) documents identify the nature and extent of contamination on each property and the ICs and conditions that the owners and operator are subject to, in accordance with this decision document. These NECs must be signed by authorized landowner representatives and then recorded in the Kenai Area Land Recorder's Office, serving as a deed notice.
3. Signs shall be placed and maintained around the perimeter of each area of arsenic contaminated soil exceeding the alternative soil cleanup level in order to provide workers visual identity of the six affected areas, and to provide notification of the health risks these areas pose to outdoor workers. The location of the signs, and the verbiage printed on the signs, shall be in accordance with the ADEC approved plan. ADEC received, reviewed, and approved a copy of the Facility Operator's February 11, 2015, Plan for Arsenic Signage and Placement. Any substantial modifications to the February 11, 2015, Plan for Arsenic Signage

- and Placement must be provided to ADEC for purposes of agency review, approval, and documentation.
4. The Facility Operator shall maintain an arsenic training module, mandatory for both employee, and unescorted contracted, outdoor workers. The training shall inform outdoor workers of the six areas of arsenic contamination, the associated outdoor worker exposure risks, and establish access restrictions in order to control outdoor worker exposure. ADEC received, reviewed, and approved a copy of the Facility Operator's February 13, 2015, Arsenic Training Module. Any substantial modifications to the February 13, 2015, Arsenic Training Module must be provided to ADEC for purposes of agency review, approval, and documentation.
 5. Any excavation, transport, movement, treatment, or disposal of soil in any of the six arsenic contaminated areas requires prior ADEC notification and approval. An environmental site assessment and soil management plan may be required. Soil movement and management may be required to be observed and monitored by a qualified environmental consultant, and also reported to ADEC by the qualified environmental consultant. Pursuant to 18 AAC 75.325(i)(1) and (2), ADEC approval is required prior to moving soil that is, or has been, subject to the site cleanup rules found at 18 AAC 75.325-.370. In addition to the six areas with arsenic concentrations exceeding 16 mg/kg, this also includes soil exceeding 3.9 mg/kg from other areas at the LNG Facility, prior to moving those soils outside of the LNG Facility perimeter fence.
 6. Any future change in land use may impact the exposure assumptions considered in ADEC's decision to not require cleanup operations. If land use and/or ownership changes, these ICs and soil management conditions may not be protective and ADEC may require additional assessment and/or remediation, and/or revised ICs and conditions. Therefore, ConocoPhillips Company and Kenai LNG Corporation (current land owners), and any future land owner, shall report to ADEC every three years to document land use and continued compliance with these ICs; or report as soon as they become aware of any change in land ownership and/or use, if earlier. **The report can be sent to the local ADEC office or electronically to DEC.ICUnit@alaska.gov.**

The ADEC Contaminated Sites Database will be updated to reflect the change in site status as detailed above, and will include a description of the contamination remaining at the site. ICs may be modified in the future if documentation is provided to support an ADEC determination that arsenic concentrations in soil meet the ADEC approved Method Three arsenic soil cleanup level, and may be removed if arsenic concentrations are determined to no longer pose an unacceptable risk to human health and the environment under all land uses.

This determination is in accordance with 18 AAC 75.380 and does not preclude ADEC from requiring additional assessment and/or cleanup action if future information indicates that this site may pose an unacceptable risk to human health or the environment.

It should be noted that movement or use of potentially contaminated material in a manner that results in a violation of 18 AAC 70 Water Quality Standards is prohibited.

Appeal

Any person who disagrees with this decision may request an adjudicatory hearing in accordance with 18 AAC 15.195 -18 AAC 15.340 or an informal review by the Division Director in accordance with 18 AAC 15.185. Informal review requests must be delivered to the Division Director, 410 Willoughby Avenue, Suite 303, Juneau, Alaska 99801, within 15 days after receiving the department's decision reviewable under this section. Adjudicatory hearing requests must be delivered to the Commissioner of the Department of Environmental Conservation, 410 Willoughby Avenue, Suite 303, Juneau, Alaska 99801, within 30 days after the date of issuance of this letter, or within 30 days after the department issues a final decision under 18 AAC 15.185. If a hearing is not requested within 30 days, the right to appeal is waived.

If there are questions about this Decision Document, please contact me at (907) 262-3422, or via e-mail at paul.horwath@alaska.gov

Sincerely,



Paul Horwath
Engineer I, DEC

Attachment A: Cleanup Complete – ICs Agreement and Signature Page

Attachments: Figures 2, 3, 4, 5, and 6

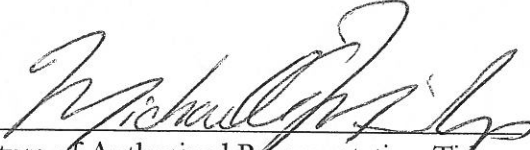
Notice of Environmental Contamination – Kenai LNG Corp

Notice of Environmental Contamination – ConocoPhillips Company

Cc: Weston Solutions, Inc.


Attachment A: Cleanup Complete-ICs Agreement and Signature Page*

ConocoPhillips Alaska Natural Gas Corporation agrees to the terms and conditions of the Cleanup Complete Determination – Institutional Controls, as stated in the decision letter for the Phillips Petroleum LNG Plant-2002 site, dated January 7, 2016. Failure to comply with the terms and conditions of the determination may result in ADEC reopening this site and requiring remedial action in accordance with 18 AAC 18 AAC 75.380.



Signature of Authorized Representative, Title
ConocoPhillips Alaska Natural Gas Corporation

1-12-16
Date



Printed Name of Authorized Representative, Title
ConocoPhillips Alaska Natural Gas Corporation

Note to Responsible Person (RP):

After making a copy for your records, please return a signed copy of this form to the ADEC project manager at the address on this correspondence within 30 days of receipt of this letter.

ADEC File No.: 2323.38.036
Hazard ID: 3932
Current ADEC Project Manager: Paul Horwath

For ADEC's Internal Use Only

***Attention ADEC Administration Staff:** Please follow the procedure below after Attachment A is signed and returned to ADEC.

1. Log-in and Date Stamp *Attachment A*.
2. Scan and Save to the appropriate electronic folder on the network drive.
3. File the hard copy in the appropriate project/site file Correspondence Folder.
4. Provide the Correspondence folder (with the signed *Attachment A* hard copy) to the ADEC Project Manager so that the PM can update the CS database.