THE STATE of ALASKA
GOVERNOR MICHAEL J. DUNLEAVY

Department of Environmental Conservation
DIVISION OF SPILL PREVENTION AND RESPONSE
Contaminated Sites Program
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File No.: 2245.26.004

May 13, 2019

Mr. Gene Roofe
Marvin D. Roofe Revocable Trust
P.O. Box 71
Kenai, AK 99611

Ms. Debra L. Killian
1700 Rae Lane
Palmer, AK 99645

Subject: **Decision Document, Former Four Corners Country Store**
Hazard ID: 22961 Corrective Action Complete Determination

Dear Mr. Roofe and Ms. Killian:

The Alaska Department of Environmental Conservation (ADEC) has reviewed the environmental records for the Former Four Corners Country Store, located at Mile 4.5 Palmer-Wasilla Highway in Palmer, Alaska. Based on the information provided to date, it has been determined that the contaminants remaining on site do not pose an unacceptable risk to human health or the environment and no further remedial action will be required unless new information becomes available that indicates residual contaminants may pose an unacceptable risk.

This decision is based on the administrative record for the Former Four Corners Country Store. 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 the Corrective Action Complete Determination.

Site Name and Location:
Former Four Corners Country Store
Mile 4.5 Palmer-Wasilla Highway
Palmer, AK 99645

Name and Mailing Address of Contact Party:
Mr. Gene Roofe
P.O. Box 71
Kenai, AK 99611

Ms. Debra Killian
1700 Rae Ln.
Palmer, AK 99645

DEC Site Identifiers:
File No: 2245.26.004
Hazard ID: 22961

Regulatory Authority for Determination:
18 AAC 75 and 18 AAC 78

Site Description and Background
In 1993, four underground storage tanks (USTs) and a fuel island were permanently removed from service at the Four Corners Country Store, a service station and convenience store on Lot 19, Block 1 of the Winding Brook Estates Subdivision (see attached figure). Two 4,000-gallon diesel fuel USTs were installed in 1979 and two 12,000-gallon gasoline USTs were installed in 1984. During removal of the USTs

petroleum contamination was discovered and the base of at least one of the USTs was observed at an elevation below the shallow water table approximately eight feet below ground surface.

Contaminants of Concern

During the course of the investigations and cleanup, soil and groundwater were analyzed for diesel range organics (DRO), gasoline range organics (GRO), residual range organics (RRO), benzene, toluene, ethylbenzene, and total xylenes (BTEX). The following contaminants of concern were identified during the course of the site investigations summarized in the Characterization and Cleanup Activities section of this decision letter:

- DRO
- GRO
- Benzene

Cleanup Levels

The applicable soil cleanup levels at this site are established in 18 AAC 75.341, Method Two, for the migration to groundwater pathway. The applicable groundwater cleanup levels are established in 18 AAC 75.345, Table C.

Table 1 – Approved Cleanup Levels

Contaminant	Soil (mg/kg)	Groundwater (mg/L)
DRO	300	1.5
GRO	250	2.2
Benzene	0.025	0.005

mg/kg = milligrams per kilogram
mg/L = milligrams per liter

Characterization and Cleanup Activities

In April 1993, confirmation samples collected from the initial UST excavation indicated the presence of soil contamination with volatile petroleum hydrocarbons (VPH, roughly equivalent to GRO) detected up to 12,400 mg/kg and benzene up to 412 mg/kg with the highest levels of contamination to the west and south. Approximately 200 cubic yards of contaminated soil were excavated from around the USTs and stockpiled at the site. Visibly contaminated groundwater was encountered at 8 feet below ground surface in the excavation. A monitoring well installed in the presumed downgradient area approximately halfway between the western edge of the excavation and the south-flowing Wasilla Creek did not contain detectable concentrations of contaminants.

Following the detection of benzene in the drinking water well on the adjacent property to the east (Lot 1), an emergency grant from the State of Alaska provided funding for additional excavation and groundwater monitoring. Four additional monitoring wells were installed and groundwater was determined to be flowing east and south east rather than west toward the creek. Three of the five monitoring wells were sampled and contaminants were not detected. Additional excavation to the west and south of the original excavation removed another 350 cubic yards of contaminated soil, however excavation was halted to protect the structural integrity of the store. Confirmation samples indicated that VPH and benzene were still in place with VPH up to 6,500 mg/kg and benzene up to 173 mg/kg.

In 1995, the store structure was moved to continue excavation to the south and another 500 cubic yards of contaminated soil were removed and stockpiled on site. Confirmation samples indicated that benzene up to 0.627 mg/kg and VPH up to 592 mg/kg remained in place in a narrow strip of material between the first and third excavation. Stockpiles generated by the three excavations were staged on Lots 1 and 2. Soil samples collected from the stockpiles did not contain contaminants above cleanup levels

In 1997, samples collected from the stockpiled material indicated that the material met cleanup levels and could be spread in place on Lots 1 and 2. A sample of drinking water from the well on Lot 1 (see attached figure) exceeded cleanup limits for benzene at 0.0079 mg/L. A replacement drinking water well was installed, but benzene contamination was detected up to 0.032 mg/L. In 1998 samples were collected from four of the monitoring wells and the five drinking water wells on Lots 1, 2, 19, and 20. Both the old and new wells serving Lot 1 exceeded cleanup levels for benzene and the State of Alaska began supplying water and ice to the lounge located on Lot 1. Benzene was detected at 0.0052 mg/L in MW3 within the original excavation footprint.

In 1999 the property owner received a Continuation Cleanup Grant from the State of Alaska. Six additional soil borings were advanced and completed as monitoring wells. Monitoring well MW8, about 150 feet south east of the original excavation, had soil concentrations of benzene at 0.027 mg/kg, likely associated with a groundwater smear zone. Benzene and GRO were not detected in groundwater in MW8 during this sampling event however they were detected above cleanup levels in monitoring well MW6 on Lot 20 to the south east. Benzene was also detected in both the old and new lounge wells. Contaminant concentrations in the old well were below cleanup levels (and had been for a year) but the new lounge well exceeded cleanup levels. The State of Alaska discontinued supplying water and ice to the lounge and the lounge began using water from the old well again. All of the monitoring wells were sampled a second time that year. Wells MW3 and MW6 exceeded cleanup levels for benzene and GRO. A sample of the drinking water well on Lot 2 (southeast of Lot 20) had benzene and gasoline that exceeded cleanup levels.

In 2000, monitoring well MW12 was installed, followed by MW13, MW14, and MW15 in 2001. All of the monitoring wells were sampled in 2001. Wells MW3, MW6, and MW15 had exceedances of benzene and GRO above cleanup levels. Wells MW3 and MW15 also had exceedances of DRO. Benzene, GRO, and DRO were not detected in the drinking water well on Lot 2. With this investigation, the extent of groundwater had been delineated. Contaminants were detected on Lots 19 and 20 above cleanup levels. Contaminants in groundwater on Lots 1 and 2 were below cleanup levels.

Groundwater and drinking water well sampling conducted in 2002 and 2003 found the highest levels of contaminants on Lots 19 and 20. Contaminants were not detected in samples from the drinking water wells.

Remediation efforts began in 2003 with the installation of nine Oxygen Release Compound (ORC) injection wells in the source area. Wells MW3, MW6, MW15, and MW16 were sampled 3 times in May 2003 to assess efficacy of ORC injection. The ORC injection was not an effective remediation technique and no significant change was noted.

In 2004 a Vapor Stripping and Circulation (VSC) system installed at the source area consisting of four VSC wells. The VSC wells removed contaminated water from the subsurface and distributed the water to a below ground infiltration gallery upgradient of the source area. Contaminant vapors were removed from the infiltration gallery through a vapor extraction system.

The VSC system began operation in 2005 and operated for about two months, until sometime after the 2005 sampling event. Groundwater monitoring conducted in 2005 found benzene in MW6 and MW15 at 0.005 mg/L and 0.046 mg/L, respectively. GRO was also detected in MW15 above cleanup levels at 3.32 mg/L. The source area property was transferred in 2010 and groundwater monitoring was not conducted again until 2015.

In 2015, a well survey was conducted to determine the condition of the remaining wells (monitoring, VSC, ORC). Some wells could not be found and others were damaged beyond repair. Wells MW3, VSC1, MW15, MW6 and the drinking water well on Lot 20 were sampled. Samples were analyzed for GRO and BTEX. MW16 was too damaged to sample, so VSC1 nearby, was used in its stead. Benzene and GRO were not detected in VSC1. Benzene was detected in MW3 and MW6 but below the cleanup level. GRO was not detected. In MW15, GRO was detected below the cleanup level however benzene exceeded the cleanup level at up to 0.00943 mg/L. Neither contaminant was detected in the Lot 20 drinking water well.

Well MW-15 was replaced with MW-15R in 2016 and groundwater monitoring continued until 2019 when benzene contamination fell below the Table C cleanup levels for two consecutive sampling events. Although soil contamination remains in a small portion of the property above the migration to groundwater cleanup levels, ADEC has determined that the remaining soil contamination is in steady state equilibrium and will not migrate to groundwater

Cumulative Risk Evaluation

Pursuant to 18 AAC 78.600(d), when detectable contamination remains on-site following a cleanup, 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 non-carcinogenic risk standard at a hazard index of one across all exposure pathways.

Based on a review of the environmental record, ADEC has determined that residual contaminant concentrations do not pose a cumulative human health risk.

Exposure Pathway Evaluation

Following investigation and cleanup at the site, exposure to the remaining contaminants 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 Exposure Controlled, De-Minimis Exposure or Pathway Incomplete. A summary of this pathway evaluation is included in Table 2.

Table 2 – Exposure Pathway Evaluation

Pathway	Result	Explanation
Surface Soil Contact	Pathway Incomplete	The source of contamination was a leaking underground storage tank. Surface soil was not affected.
Sub-Surface Soil Contact	De Minimis Exposure	Contaminated subsurface soil remains at one discrete location, but at concentrations below human health cleanup levels.
Inhalation – Outdoor Air	De Minimis Exposure	Remaining contaminants in subsurface soil were not detected above human health cleanup levels.

Inhalation – Indoor Air (vapor intrusion)	De Minimis Exposure	Concentrations of benzene in groundwater during the last sampling event did not exceed groundwater screening levels for vapor intrusion
Groundwater Ingestion	De Minimis Exposure	Groundwater monitoring indicates contaminants are not present in groundwater Above Table C cleanup levels
Surface Water Ingestion	Pathway Incomplete	Surface water is not used as a drinking water source in this area.
Wild Foods Ingestion	Pathway Incomplete	Wild foods are not collected from the area impacted by contamination at the site
Exposure to Ecological Receptors	Pathway Incomplete	Contaminants of concern do not have the potential to bioaccumulate in plants or animals.

Notes to Table 2: "De-Minimis Exposure" means that in ADEC's judgment receptors are unlikely to be affected by the minimal volume or concentration of 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

Contamination in soil and groundwater at this site resulted from a release of petroleum from a UST system that was removed in 1993. Following the release, contamination was cleaned up and monitored until 2019, however residual contamination remains in soil in one discrete area near the former Four Corners Country Store building. ADEC has reviewed the environmental records regarding this site and determined there is no risk to human health or the environment from exposure to residual contamination that remains and this site will receive a "Corrective Action Complete" designation on the Contaminated Sites Database, subject to the standard conditions noted below.

This determination is in accordance with 18 AAC 78.276(f) 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.

Standard Conditions

1. Any proposal to transport contaminated soil or groundwater from a site that is subject to the site cleanup rules or for which a written determination from the department has been made under 18 AAC 75.380(d)(1) that allows contamination to remain at the site above method two soil cleanup levels or groundwater cleanup levels listed in Table C requires ADEC approval in accordance with 18 AAC 78.600(h). A "site" as defined by 18 AAC 78.995(134) means an area that is contaminated, including areas contaminated by the migration of hazardous substances from a source area, regardless of property ownership.

2. Movement or use of contaminated material in a manner that results in a violation of 18 AAC 70 water quality standards is prohibited.

3. Groundwater throughout Alaska is protected for use as a water supply for drinking, culinary and food processing, agriculture including irrigation and stock watering, aquaculture, and industrial use. Contaminated site cleanup complete determinations are based on groundwater being considered a potential drinking water source. In the event that groundwater from this site is to be used for other purposes in the future, such as aquaculture, additional testing and treatment may be required to ensure the water is suitable for its intended use.

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.

Sincerely,

Bill O'Connell
Environmental Program Manager