

MEMORANDUM

State of Alaska

Department of Environmental Conservation
Division of Spill Prevention and Response
Contaminated Sites Program

TO: Contaminated Sites Program Staff

DATE: August 30, 2016

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FROM: Jennifer Roberts
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SUBJECT: Site Closure/Cleanup Complete

Purpose

This memorandum describes how the Contaminated Sites Program (CSP) will make closure determinations for sites regulated under Underground Storage Tank regulations, Title 18 Alaska Administrative Code 78 (18 AAC 78, Articles 2 and 6), and the Oil and Hazardous Substance Site Cleanup Rules (18 AAC 75.325 - 75.390).

This document is intended to help ensure consistency in making site closure decisions under the Site Cleanup Rules and the UST regulations. It does not create any requirements, obligations or rights. CSP reserves the right to use discretion in making site-specific decisions that may differ from this memorandum.

Summary

The site closure criteria for leaking underground storage tank (LUST) sites are provided in 18 AAC 78.276, *Final corrective action reporting requirements and site closure* and for non-LUST contaminated sites are in 18 AAC 75.380, *Final reporting requirements and site closure*. Under these sections the CSP makes a written determination that *corrective action is complete* (LUST sites) or *cleanup is complete* (contaminated site cleanup rules) when it finds that a site has achieved the regulatory criteria. For simplicity, the generic term "Cleanup Complete" will be applied to both LUST and non-LUST contaminated sites rather than using two designations (Corrective Action Complete and Cleanup Complete). The CSP will consider available site-specific information, conditions and factors when reviewing a site for closure.

At sites where residual hazardous substances do not currently pose an unacceptable risk to human health, safety, welfare or to the environment, but where the CSP determines limitations on future land or water use are necessary to prevent activities that could result in exposure and increased risk or the spread of contaminants, institutional controls will be required (18 AAC 75.375(a) and 18 AAC 78.265(a)).

Site Closure Designations

Cleanup Complete: Sites in this category meet approved cleanup levels that are protective for unrestricted residential land use, groundwater use as drinking water, and do not need institutional controls (ICs) to prevent unacceptable risk to human health, safety, or welfare, or to the environment.

Cleanup Complete with Institutional Controls: ICs must be applied to sites where a cleanup complete decision is being made and current or potential future exposure to contaminated media (soil, groundwater, sediment, surface water and/or air) could pose an unacceptable risk to human health, safety, or welfare, or to the environment. This includes sites where contamination remains in place above applicable cleanup levels in soil and/or groundwater; sites with approved alternative cleanup levels developed under methods 3 or 4 that are based on assumed limitations on future land or groundwater use; and sites where maintenance of engineering controls such as a cap over contaminated soil, signs or fencing are necessary. If ICs are required, the CSP must validate their effectiveness through periodic reporting by the responsible person or landowner.

Reopener Provision

The determination that a cleanup is complete may be subject to a future determination that the cleanup or applicable ICs are not protective of human health, safety or welfare, or of the environment, per 18 AAC 75.380(d)(2) and/or 18 AAC 78.276(f)(2). If the CSP makes a determination that conditions at a site are no longer protective, the site will be reopened and additional action will be necessary to meet the requirements of the UST regulations or site cleanup rules. Examples of conditions under which the CSP may reopen a site include, but are not limited to, the following:

- Information becomes available that demonstrates that characterization or cleanup was incomplete, resulting in the presence of hazardous substances above applicable cleanup levels;
- The responsible person fails to maintain and enforce ICs restricting land use or requiring action by the current and future occupants of the site;
- The responsible person fails to meet standard conditions required for a *Cleanup Complete* determination (18 AAC 75.325(i) and other standard conditions);
- The responsible person violates any terms of a CSP decision document or agreement applicable to the site; or
- New information (i.e., toxicological, chemical parameters, or exposure data) results in a regulatory update of applicable cleanup levels and hazardous substances are present above those levels and/or additional exposure pathways are found to be complete. For example, updated toxicological information may show that existing contaminant levels at a site pose a vapor intrusion risk, or are no longer safe for using groundwater for drinking, vegetable garden irrigation, aquaculture, or another beneficial use.

Site Closure Procedures and Criteria

Project managers are to use the following procedures when closing a site: a) review the site for closure per 18 AAC 75.380 or 18 AAC 78.276 to ensure that regulatory requirements have been met; and b) conduct a final Exposure Tracking Model (ETM) evaluation. All potential exposure

pathways should be in the ETM categories of “exposure controlled,” “pathway incomplete,” or “de-minimis exposure”.

For sites to be eligible for a *Cleanup Complete*, with or without *Institutional Controls (ICs)*, the following conditions must be met, except in rare instances where the CSP Program Manager (EPM III) makes a determination under 18 AAC 75.325(d)(1) that residual contaminants from the discharge or release do not pose a threat to human health, safety, or welfare, or to the environment.

Note, compliance with the soil cleanup levels is evaluated using the maximum concentrations measured in samples representative of soil remaining at a site unless the CSP approves use of a mean soil concentration at the 95th percent upper confidence level (18 AAC 75.380(c)). Compliance with groundwater cleanup levels is evaluated using the maximum concentrations detected in final confirmation samples (18 AAC 75.380(c)); groundwater cleanup levels must be attained throughout all the groundwater unless alternative points of compliance are approved, in which case the cleanup levels must be achieved at the alternative points of compliance.

Delegated Authorities for Closure Decisions

Basis for Closure Determination	EPM III	EPM II	EPM I
Method I, II, or III soil cleanup levels and Table C groundwater cleanup levels achieved and site suitable for residential land use			X
Commercial / Industrial land use and ICs *		X	
Migration to groundwater pathway incomplete or residual contaminants do not pose a migration to groundwater risk		X	
Alternative point of compliance for groundwater cleanup levels located on-site and ICs			X
Alternative point of compliance for groundwater cleanup levels located off-site and ICs		X	
Health-based soil cleanup levels not met throughout top 15’ of soil but risk controlled through ICs *	X		
Groundwater not a potential drinking water source (350 determination)	X		
Determination under 75.325(d) that site doesn’t pose an unacceptable risk and cleanup levels do not need to be achieved	X		

* - written consent required from each affected landowner

For all sites:***(Check ALL of the following:)***

1. The extent of hazardous substance contamination must be properly characterized (18 AAC 75.335. Site characterization) and/or adequate characterization of the horizontal and vertical extent of petroleum contamination in soil, groundwater, and surface water (18 AAC 78.235. Release investigation);
2. Free product must be recovered to the maximum extent practicable (18 AAC 75.325(f)(1)(B) and 18 AAC 78.240(b));
3. Surface soil staining must be evaluated and cleaned up to the maximum extent practicable (18 AAC 75.325(f)(1)(E));
4. The maximum allowable petroleum (GRO, DRO, RRO) cleanup levels for soil must be achieved unless the responsible party has demonstrated the contaminants will not migrate and will not pose an unacceptable risk to human health or the environment; and
5. There are no unacceptable risks to sensitive subpopulations, if present.

Cleanup Complete (without ICs) is appropriate when the criteria below have been met.

1. Hazardous Substance Concentrations in Soil***(Check ONE of the following:)***

- A. Method 2 or approved Method 3 alternative “migration to groundwater” cleanup levels have been achieved;
- B. The migration to groundwater pathway is determined to be incomplete because:
 - o the site is in the arctic zone;
 - o a substantial thickness of permafrost overlies groundwater beneath the site; or
 - o CSP determined the site is underlain by competent bedrock and there is not a contaminant migration pathway to groundwater; or
- C. Sufficient site characterization has been completed and the CSP determines that contaminants in soil have achieved steady-state equilibrium and will not migrate to groundwater, this determination requires EPM (II) approval and results in a decision that residual contaminants in soil do not pose an unacceptable migration to groundwater risk.

AND

(Check ALL of the following:)

- A. Method 2 “direct contact”, “ingestion”, “inhalation” and “outdoor air inhalation” cleanup levels, or approved Method 3 or 4 site specific residential land use cleanup levels protective for these exposure pathways have been achieved throughout the top fifteen feet of soil, unless site conditions prevent exposure, which requires Program Manager (EPM III) approval and consent from the landowner;
- B. The maximum allowable cleanup levels for GRO, DRO and RRO have been achieved;
- C. There is no unacceptable vapor intrusion risk;

- D. There are no unacceptable ecological risks; and
- E. There are no concerns over the potential for contaminant migration from polluted soil to surface water that could result in a violation of the water quality standards (18 AAC 70).

2. Hazardous Substance Concentrations in Groundwater

(Check ALL of the following:)

- A. Table C groundwater cleanup levels, or site-specific calculated cleanup levels for contaminants not listed in Table C, have been achieved throughout the groundwater beneath the site; and
- B. Residual contaminants in groundwater do not currently, and are not expected to, cause a violation of the water quality standards in nearby surface waters nor pose an unacceptable ecological risk, nor pose an unacceptable vapor intrusion risk.

3. Cumulative Risk Standards

(Check the following:)

- Cumulative risk standards defined in 18 AAC 75.325(g) and 18 AAC 78.600(d) have been met for an unrestricted residential land use scenario.

Cleanup Complete with ICs is appropriate when the criteria below have been met.

1. Hazardous Substances in Soil

(Check ONE of the following:)

- A. Approved migration to groundwater cleanup levels have been achieved;
- B. CSP has determined that the contaminant plume has achieved a point of steady-state equilibrium and that additional soil cleanup is not necessary to facilitate groundwater cleanup nor to prevent leaching to groundwater, this determination requires EPM II approval and results in a decision that residual contaminants in soil do not pose an unacceptable migration to groundwater risk; or
- C. CSP determined that groundwater beneath the site is not a current, nor reasonably expected potential future, source of drinking water (18 AAC 75.350) and that the migration to groundwater cleanup levels are not applicable.

AND

(Check ONE of the following:)

- A. Risk-based (direct contact, ingestion, inhalation) residential use cleanup levels have been achieved to a depth of fifteen (15) below the ground surface, but some other limitation triggers the need for ICs;
- B. Site specific risk-based (direct contact, ingestion, inhalation) alternative cleanup levels based on a commercial/industrial or other non-residential land use have been approved under Methods 3 or 4 and have been achieved within fifteen (15) feet below the ground surface and residential use of the site can be prevented through ICs; or

- C. Risk-based (direct contact, ingestion, inhalation) cleanup levels have not been achieved in soil within 15' below the ground surface, but CSP has determined the cleanup has been conducted to the maximum extent practicable or necessary and that potential exposure to remaining subsurface contaminants can be prevented through ICs;

AND

(Check ALL of the following:)

- A. If a cleanup level less stringent than a level protective of residential land use is being considered for approval, written consent has been obtained from each affected landowner (18 AAC 75.340(e) and (f));
- B. Any potential vapor intrusion risks have been addressed;
- C. There are no unacceptable ecological risks; and
- D. There are no concerns over the potential for contaminant migration from polluted soil to surface water that could result in a violation of the water quality standards or pose an ecological risk.

2. Hazardous Substances in Groundwater

(Check ONE of the following:)

- A. Contaminant concentrations in groundwater meet applicable cleanup levels throughout the groundwater beneath the site;
- B. Contaminant concentrations in groundwater meet applicable cleanup levels at alternative points of compliance approved by CSP in accordance with 18 AAC 75.345(e) and ICs can prevent groundwater use as drinking water within the upgradient, impacted area; or
- C. CSP determined that groundwater beneath the site is not a current source of drinking water nor a reasonably expected potential future drinking water source (18 AAC 75.350) and that ICs can prevent such use.

AND

(Check ALL of the following:)

- A. The groundwater contaminant plume is shown to be steady state or shrinking (if alternative points of compliance have been approved, this applies to water up-gradient to the points of compliance);
- B. Groundwater contaminant concentrations are decreasing (if alternative points of compliance have been approved, this applies to water up-gradient to the points of compliance);
- C. All other potentially complete human health exposure pathways (e.g., vapor intrusion) have been addressed;

- D. Residual contaminants in groundwater do not currently, and are not expected to, cause a violation of the water quality standards in nearby surface waters, nor pose an unacceptable ecological risk; and
- E. The CSP determined the residual contamination does not pose a current unacceptable risk to human health, safety or welfare, or to the environment and that potential future risk can be mitigated through institutional controls.

3. Cumulative Risk Standards

(Check the following:)

- Cumulative risk standards in 18 AAC 75.325(g) or 18 AAC 78.600(d) have been achieved for the current and intended future land use scenarios, or institutional controls are in place to prevent exposure to contaminants that pose potential risk above the standards.

4. Landowner Consultation

(Check the following:)

- The CSP has consulted with each landowner of the site on the need for and provisions in any institutional controls (note, landowner consent is needed to approve cleanup levels that are not protective of residential land use).

Standard Site Closure Provisions

The standard conditions which apply to all site closure decisions include the following:

1. Any proposal to transport soil or groundwater off-site requires CSP approval in accordance with [18 AAC 75.325(i) or 18 AAC 78.600(h)]. A “site” [as defined by 18 AAC 75.990 (115) or 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 uses, unless it has been reclassified in a specific area (18 AAC 70.050). Contaminated site cleanup complete determinations are based on groundwater being considered a potential drinking water source. If groundwater is to be used for other purposes in the future, for example aquaculture, additional testing and cleanup may be required to ensure the water is suitable for its intended use. {Note, this text would need to be revised for any site closure decisions where a groundwater use determination was made under 18 AAC 75.350.}

Institutional Control Provisions

Project managers should consult the CSP guidance, *Using Institutional Controls in Oil and Other Hazardous Substance Cleanups*, to determine the appropriate IC mechanism and reporting requirements for sites where ICs are necessary to meet regulatory requirements to ensure:

1. compliance with an applicable cleanup level;
2. protection of human health, safety, or welfare, or the environment; or
3. the integrity of site cleanup activities or improvements.

Enforcement

Failure to comply with ICs or conditions identified in the *Cleanup Complete* determination letter may result in reopening of the site and potential enforcement actions.

Removal of Institutional Controls

Requirements for terminating conditions or ICs shall be included in the *Cleanup Complete* determination letter.

If the concentrations of all residual hazardous substances remaining at the site are subsequently determined to be below the levels that allow for unrestricted use and that the site does not pose a potential unacceptable risk to human health, safety or welfare, or to the environment, the CSP will approve the elimination of the ICs.