This fact sheet summarizes the U.S. Environmental Protection Agency's Proposed Plans for cleanup of the Quendall Terminals Superfund site. The site is located on the southeastern shore of Lake Washington in Renton, Washington. The upland part of the site is called Operable Unit 1, or OU1. The offshore part is called Operable Unit 2, or OU2.

There are two Proposed Plans, one for each operable unit. The site is contaminated with creosote, coal tar, pitch, and other hazardous chemicals.

The Proposed Plans summarize the analysis of pollution at the site, and present cleanup options, including EPA's preferred alternative for each operable unit.

You are invited to submit your comments on the Proposed Plans any time during the 30-day comment period, **September 9, 2019 to October 9, 2019**.

You are also invited to an open house and public meeting to ask questions and provide comments in person. As a resident and area stakeholder, your knowledge and perspective are important to inform the final selection of a cleanup remedy.

The Proposed Plans are based on the 2012 Remedial Investigation, the 2016 Feasibility Study, and the 2017 Technical Memorandum. These documents, and the Proposed Plans, can be viewed under "Site Documents and Data" at: www.epa.gov/superfund/quendall-terminals.

Public Comment Period
Comments Due October 9, 2019

You can provide comment on the Proposed Plans in three ways:

1. **By Mail:**
   Kathryn Cerise
   EPA Region 10, 12-D12-1
   1200 Sixth Avenue, Suite 155
   Seattle, WA 98101
2. **By email:**
   cerise.kathryn@epa.gov
3. **In person:**
   Tuesday, September 24, 4:00-6:30 p.m. Open House
   Drop in to informally meet project representatives, see displays, and ask questions.

   6:30 p.m. EPA presentation and public comment
   EPA Presentation on the Proposed Plans; Formal Public Comment

   Location:
   Stan Head Cultural Center
   Aegis Gardens Newcastle
   13056 SE 76th Street
   Newcastle, WA 98056

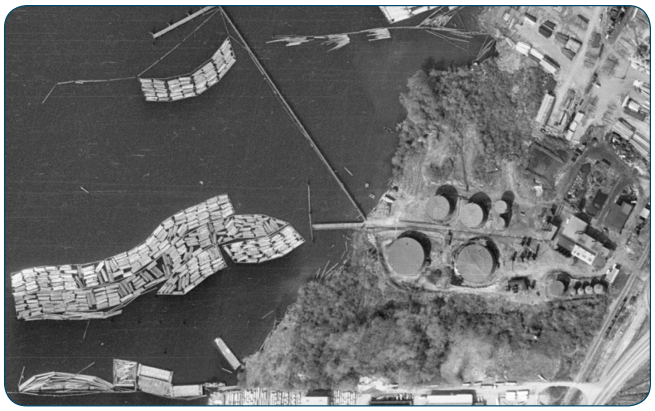
About Quendall Terminals

The Quendall Terminals Superfund site is on the southeastern shore of Lake Washington, near the I-405 exit 7. Creosote was manufactured at the Quendall Terminals site from 1916 through 1969.

Coal and oil-gas tar residues (called coal tars) were distilled into three fractions that were shipped off the site or transported to the neighboring J.H. Baxter & Co. for use in wood-treating operations.

Between 1969 and 1983, the site was used to store crude oil, waste oil, and diesel. From 1975 to 2009, it was used as a log-sorting and storage yard.

EPA added the site to the Superfund National Priorities List in 2006. The site is currently vacant and fenced to prevent public access.



Aerial Photo of the site in 1961.
Site Address: 4503 Lake Washington Blvd. N

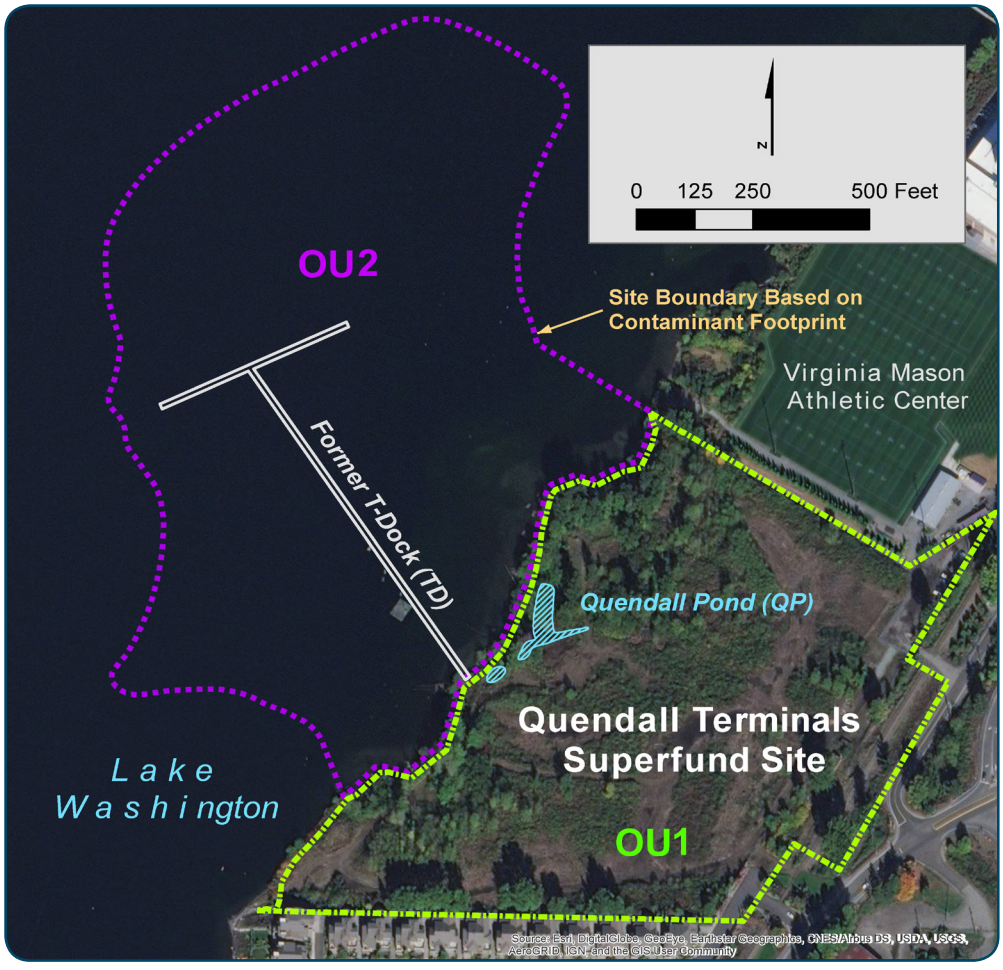
Contamination at the Quendall Terminals Site

Quendall Terminals was contaminated by releases of coal tars and distillate products from transport, production, storage, and disposal. Soil in the uplands and sediments on the lake bottom are both contaminated.

EPA guidance defines principal threat waste (PTW) as source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment should exposure occur.

The upland portion of the site (OU1) covers about 22 acres, including nearly 1,500 feet of Lake Washington Shoreline. The upland soils are contaminated with oily creosote and coal tars found in thick liquid form (dense nonaqueous phase liquid or DNAPL). Soil and sediment containing DNAPL have been defined by EPA as principal threat wastes (PTW). Contaminants leach out of this thick liquid into the groundwater.

The offshore portion of the site extending into Lake Washington (OU2) covers about 29 acres. Spills contaminated shallow sediment with oily creosote and coal tars. Creosote and coal tars are present in deeper sediment along the shoreline where it has moved from the uplands. The groundwater from the uplands also spreads the contamination into the nearby lake sediments where people and aquatic life can be exposed to it.



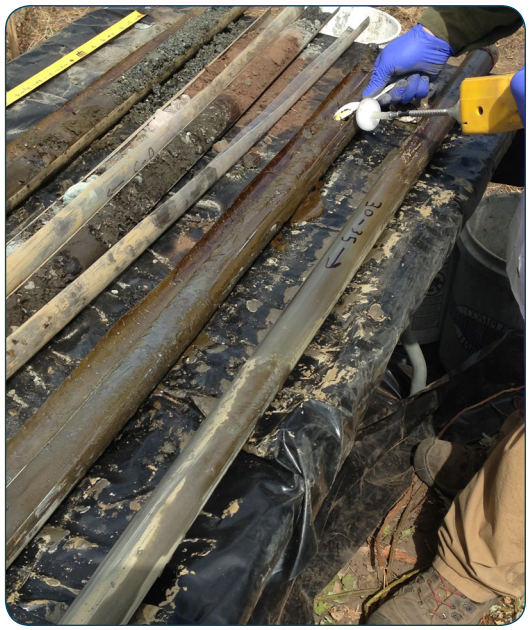
How was the site boundary in the lake determined?

The site boundary is drawn based on comparing contamination levels in sediment at Quendall to levels in sediment collected near, but not influenced by, the site.

The Problem

What is in creosote?

Creosote is a thick, oily liquid distilled from coal tar containing hundreds of chemicals, including benzene, naphthalene, and carcinogenic polycyclic aromatic hydrocarbons (cPAH), such as benzo(a)pyrene. Creosote was the primary product manufactured at the site.



Crews collect soil cores to learn about contamination underground.

Where is the contamination?

Upland, the creosote is found in the soil down to about 30 feet below the ground surface. Some of the liquid creosote continues to flow in the soil, but much of it has stuck to the soil and generally does not move.

Offshore, oily contamination in the lake is found in sediments along the former T-Dock and offshore of the Quendall Pond areas. Shallow sediments near the T-Dock are contaminated by past spills from offloading coal tar feedstock from boats. A large spill was reported to have occurred in the 1930s at the western end of the dock, and oily contamination has been found there, too. Contaminated groundwater, flowing from the uplands, is also contaminating some sediments near the shoreline.

Oily contamination in the lake sediment near the shoreline is between 7 and 16 feet below the lakebed.

Is the contamination spreading?

Yes. Upland, some chemicals leach into the groundwater as the water passes by the creosote in the soil. The groundwater then spreads the chemical contamination further, with some of the contamination reaching lake sediments.

Some of the deeper oily material in the uplands along the shoreline near Quendall Pond could also move and continue to impact sediments further into the lake.

Offshore, the area of contamination in the sediment is not changing much.

Are there contaminants other than creosote products?

Yes. Groundwater is also contaminated with arsenic. Due to changes in the groundwater conditions brought about by the creosote contamination, we believe naturally occurring arsenic in the soil has been released into the groundwater. Arsenic was historically used at the former Barbee Mill to the south of the Quendall site. Additional arsenic in the upland soils comes from years of arsenate-based herbicide use.

How can people and aquatic life be exposed?

No one is using the site now.

If people were on the site they could be exposed to contamination by breathing contaminated dust, ingesting contaminated soil or plants, or by getting creosote products on their skin from disturbing the soil.

Contamination in the sediment and surface water can accumulate in aquatic life. Eating fish or shellfish from the lake could expose people to contamination. People could also be exposed by direct contact with or incidental ingestion of sediment while fishing or swimming. Contact with sediment or incidental ingestion of lake water could occur on the beach as well.

Construction workers without proper protection could be directly exposed to creosote products when involved in activities like dredging, which could stir up sediments into the surface waters.

Groundwater contaminated by creosote can discharge into Lake Washington, affecting local aquatic life.

It's important to note that neither the groundwater nor Lake Washington is currently being used as a drinking water source. Also, the site does not pose a risk to the City of Renton's water supply.

Current and future land uses

Currently, the site is vacant and unused. The site could be redeveloped once it is cleaned up. To protect the cleanup, EPA may issue Institutional Controls, which restrict certain uses or activities. While EPA's cleanup may make the site suitable for redevelopment, EPA does not have jurisdiction over redevelopment decisions. Those activities are managed at the local level.

The cleanup is expected to disturb the habitat within the shoreline area. It is likely that the entire shoreline area would be re-contoured to create wetlands and new shoreline habitat after cleanup.

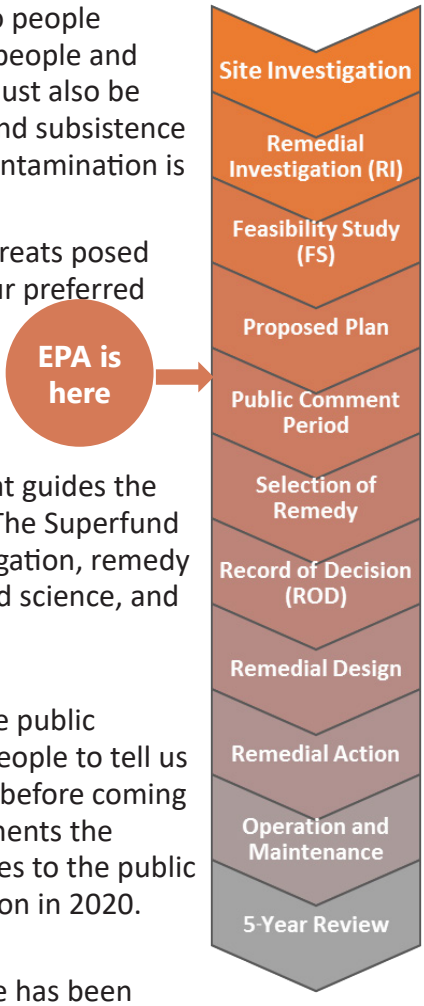
Current and future aquatic uses

Currently, the nearshore portion of the site is privately owned and anchoring boats is prohibited. The portion farther offshore is state-owned aquatic land managed by the Washington Department of Natural Resources. The aquatic portion of the Quendall Site is considered prime habitat for juvenile fish, such as salmon and trout. The site is also located within the Usual and Accustomed fishing grounds for the Muckleshoot Indian Tribe. The adjacent OU1 cleanup will allow redevelopment of the uplands, but beach habitat would be maintained at the shoreline.

Finding a Solution: Addressing Risk

Before the Quendall Terminals site can be developed, the health risk to people who may live or work at the site must be addressed. Likewise, risks to people and the environment from contamination in Lake Washington sediments must also be addressed. Risks to future recreational beach users, and recreational and subsistence shellfish consumers, exceed thresholds for human health unless the contamination is cleaned up. Risks to lake plants and wildlife are also unacceptable.

The OU1 and OU2 Proposed Plans describe actions that will address threats posed to people and the environment by contaminants related to the site. Our preferred alternative for cleanup involves cost-effective and long-term solutions that will leave the site ready for reuse.



What is CERCLA and Superfund?

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) is also known as Superfund. It is a federal law that guides the cleanup of some of the most contaminated sites in the United States. The Superfund process includes steps leading from discovery of a site, through investigation, remedy selection, and cleanup, as shown at right. Decisions are based on sound science, and cleanup actions will ultimately protect people and the environment.

Where is EPA in the cleanup process?

EPA's preferred alternatives to clean up the site are outlined below. The public comment period, open from September 9 through October 9, allows people to tell us what they think of our plans. EPA carefully considers public comments before coming to a final decision. We will issue a single Record of Decision that documents the cleanup methods for both operable units, and will include our responses to the public comments we receive during this period. We expect to issue the decision in 2020.

Who is involved?

Extensive research on the contamination at the Quendall Terminals site has been performed by Altino Properties, Inc., J.H. Baxter & Co., Quendall Terminals LLC, and their engineering contractors under the direction of EPA. The State of Washington and the Muckleshoot Indian Tribe have helped EPA oversee this work. EPA has also conducted supplemental studies at the site.

Remedial Alternatives for OU1

Cleanup methods and technologies were evaluated for soil and groundwater in OU1, the upland portion of the site. Alternative 1 is "no action." Alternatives 7 through 10 were compared against a list of CERCLA criteria (see tables). Community acceptance will also be evaluated before EPA selects a final cleanup strategy.

All alternatives include land-use controls and monitoring to promote and verify remedy effectiveness. **Costs assume 100 years of monitoring and maintenance to make sure the remedy stays protective.**

Descriptions of the remedial components and the alternatives are provided below.

Soil cap: For all alternatives, about 3 feet of clean fill would be placed over areas where soil cleanup goals aren't met, to keep people and animals from coming into contact with the contaminated soil.

In situ self-sustaining smoldering combustion: Smoldering combustion is a thermal oxidation process that results in the destruction of the contaminants in place. The net products of smoldering combustion are carbon dioxide, carbon monoxide, water, and heat. This is a relatively new, but very effective way of addressing oily contamination underground with fewer impacts to the community (odors, noise) since there is limited need to disturb the ground surface compared to solidification or excavation.

In situ solidification: Using this technology, creosote/coal tar and contaminants in soil are solidified in place. This is done by injecting material very similar to cement into the ground and mixing it with the contaminated soil using large augers. This has become a common way of addressing contamination at sites with oil creosote and coal tar contaminants like Quendall Terminals.

Excavation and onsite thermal treatment: Excavated materials may be thermally treated (heated), either at the site or at an offsite facility, to destroy organic contaminants within the soil. This remedy would be used for alternatives that excavate large amounts of soil.

OU1 Remedial Alternatives

Alternative Number	Description	Estimated Present Value	Estimated Design/ Construction Time
1	No action	$0	--
2-6	These alternatives ranged from containment (capping) to various degrees of targeted solidification or removal of creosote/ coal tar in soil. They did not meet the remedial action objective to restore groundwater and associated Applicable or Relevant and Appropriate Requirements and were therefore eliminated from further consideration.		
7	Solidification of creosote/coal tar in soil (8.9 acres) and soil capping	$66.0 M	4.8 years
7a	Smoldering combustion and/or solidification of creosote/coal tar in soil (8.9 acres) and soil capping; **This is EPA's preferred alternative**	$66.1 M*	5 years
8	Excavation and onsite thermal treatment of creosote/coal tar in soil (8.9 acres) and soil capping	$100 M	4.3 years
9	Excavation and onsite thermal treatment of shallow creosote/coal tar and contaminated soil, solidification of deep creosote/coal tar and contaminated soil (14.2 acres), and soil capping	$219 M	9.3 years
10	Excavation and onsite thermal treatment of creosote/coal tar and contaminated soil (14.2 acres), active groundwater treatment, and soil capping	$309 M	11 years

* This cost estimate assumes about 60 percent of the creosote/coal tar DNAPL will be treated with smoldering combustion, and solidification will be used on about 40% of the DNAPL. The actual areas for smoldering combustion will be refined with additional data collection before and during the treatment process. The need for additional DNAPL treatment with solidification following combustion will be determined based on data collected after the combustion treatment is completed.

Criteria Evaluation of OU1 Remedial Alternatives

Overall protection of human health and the environment	Alternatives 7 through 10 would satisfy this criterion because all of the remedial action objectives would be met, including restoration of groundwater, because they treat or remove creosote/coal tar in soil, the primary source of groundwater contamination.
Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)	Alternatives 7 through 10 would satisfy this criterion, as EPA expects that where the creosote/coal tar is stabilized, destroyed, or removed, groundwater Maximum Contaminant Levels (MCLs) may be achieved in a reasonable timeframe.
Long-term effectiveness and permanence; reduction of toxicity, mobility, or volume of contaminants through treatment	Alternatives 7 through 10 remove or treat the creosote/coal tar in soil and are considered to be effective in the long-term. Alternative 7 uses solidification to immoblize contaminants in place, limiting leachability but it does not remove the contaminants. Alternative 7a uses a thermal technology to destroy a significant volume of creosote/coal tar in place, while avoiding the significant cost of contaminated soil removal included in Alternatives 9 and 10. Alternatives 9 and 10 remove or treat more contaminated soil, providing the greatest long-term effectiveness and permanence, but at the highest cost.
Short-term effectiveness	Alternative 7a is the most effective in the short-termbecause it requires the least amount of creosote/coal tar handling. Alternative 7 is less so because contamination is brought to the surface during the mixing process. Alternatives 8 through 10 are less effective in the short-term because they have long construction durations with higher levels of material handling.
Implementability	Alternatives 7 and 7a are easiest to implement because they treat contamination in place. Alternatives 8 through 10 are more difficult to implement because of the need for deep excavations and dewatering excavated soil over long time periods and the need for odor and air emission control for thermal soil treatment systems.

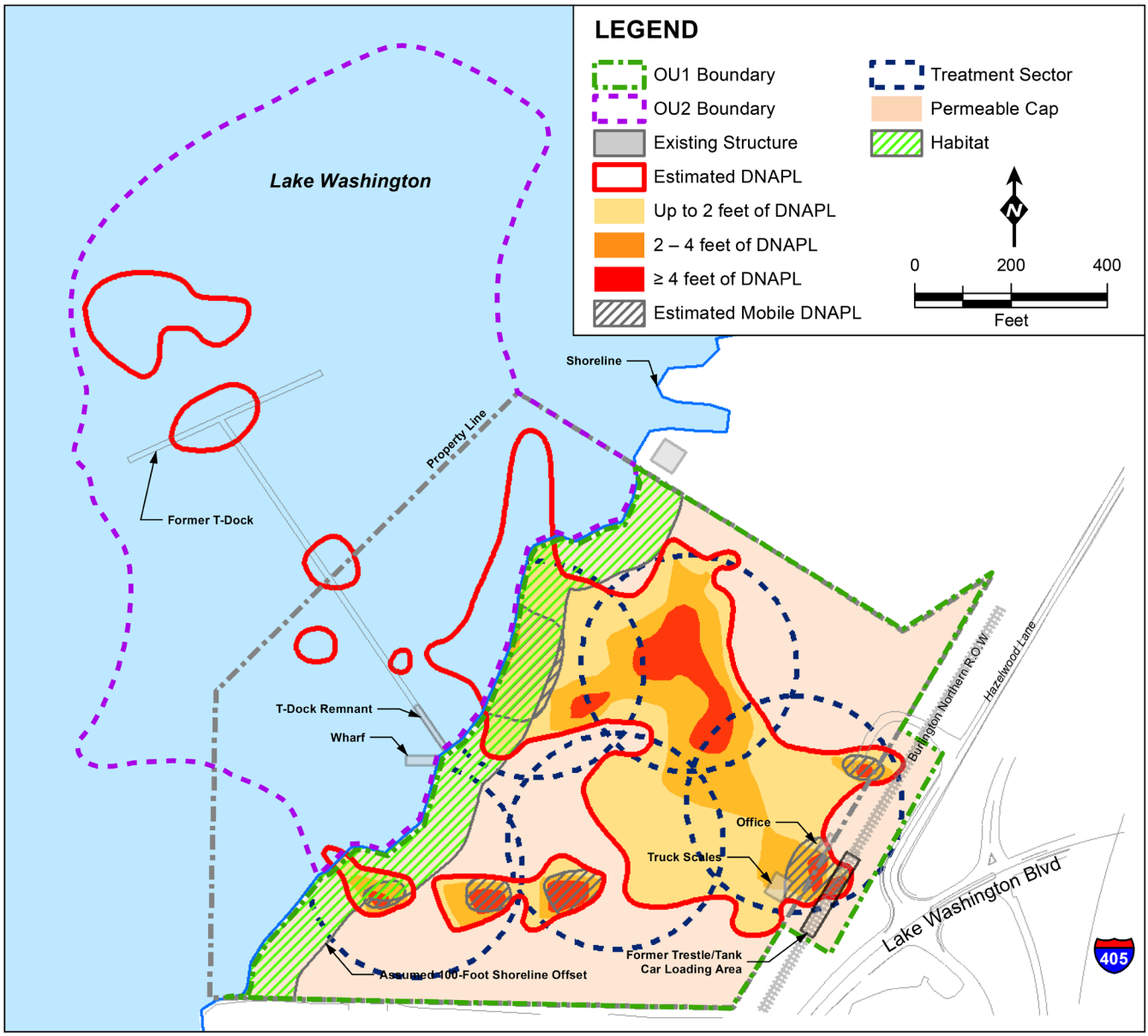
OU1 Preferred Alternative 7a

EPA proposes Alternative 7a as the Preferred Alternative for OU1 (the upland portion of the site). The primary objective of this alternative is to treat the main source of groundwater contamination at the site, which is the creosote/coal tar DNAPL (dense nonaqueous phase liquid) in soil.

Alternative 7a will use a phased approach to clean up the soils containing DNAPL. Smoldering combustion treatment would be completed and verified first (phase 1), then soil in areas not successfully treated by smoldering combustion, as well as those outside of target treatment areas, would be tested to decide whether solidification is necessary (phase 2). The figure below shows how smoldering combustion treatment would be completed one sector at a time.

A soil cap will also be placed in areas outside the DNAPL areas where soil contamination exceeds levels that protect human health and the environment. EPA believes this alternative provides the best balance of protection, effectiveness, and overall cost to implement. By including in-situ smoldering combustion, which destroys contamination, Alternative 7a is more effective and permanent than Alternative 7, which relies on solidification alone. It is also more timely and economical than Alternatives 8 to 10, which also address DNAPL in soil.

Currently the site is fenced and unused, except for visits by local deer.



Preferred Alternative for OU1: *Smoldering combustion and/or solidification of creosote/coal tar in soil, and soil capping*

Smoldering combustion cleanup technology tested last summer

In summer 2018, EPA conducted a field study of a smoldering combustion technology. The test results showed this technology to be an effective option for treating soil contamination at the Quendall Terminals site, consistent with other thermal technologies and solidification. The smoldering combustion reaction (similar to charcoal burning in a grill) treats certain types of contaminants like creosote and coal tar. The combustion process basically converts these chemicals into carbon dioxide, carbon monoxide, water, and heat. Other gases are captured and treated as part of the process.

Smoldering combustion is expected to be more effective, easier to implement, and less disruptive to the community than other technologies. It may also allow for the site to be redeveloped sooner and with fewer restrictions than other cleanup technologies.

Remedial Alternatives for OU2

For the in-water portions of the site, Alternatives A through E represent the five from the sitewide Feasibility Study. They have been compared against a list of CERCLA criteria (see tables). Community acceptance will also be evaluated before EPA selects a final cleanup method.

All alternatives include land use controls and monitoring to promote and verify remedy effectiveness. Costs assume 100 years of monitoring and maintenance to make sure the remedy stays protective.

Remedial components include:

Dredging and Offsite Disposal: Areas with creosote/coal tar in sediment may be dredged (sediments removed) using either hydraulic or mechanical means. Dredged materials would be disposed of at an offsite landfill.

Dredging and Onsite Thermal Treatment: Dredged sediment may be thermally treated (heated) at the site to destroy contaminants within the soil. This remedy would be used for alternatives that dredge large amounts of sediment.

Reactive Core Mat (RCM) and Amended Sand Caps: Areas with creosote/coal tar left in sediment may be capped with a RCM or amended sand cap. These covers contain materials that sorb oil and contaminants, controlling migration to surface waters.

Engineered Sand Cap/Enhanced Natural Recovery (ENR): An engineered sand cap would be placed in areas outside those with creosote/coal tar in sediment (that are either capped or dredged) that may continue to be impacted by nearshore upwelling contaminated groundwater. Farther offshore, a thin layer of clean sand will be placed over sediment to accelerate the rate of natural recovery.

OU2 Remedial Alternatives

Alternative	Description	Sitewide FS Alternative	Estimated Present Value	Estimated Design/ Construction Time
–	No action	1 (No Action)	$0	--
A	Amended sand cap and RCM cap over areas with creosote/coal tar in shallow and deep sediment (5.6 acres), engineered sand cap (6.2 acres), and ENR (17.6 acres)	2 and 3	$11.7 M	1.4 years
B	Targeted dredging and offsite disposal of creosote/coal tar in shallow sediment (2.7 acres), amended sand cap and RCM caps over areas with creosote/coal tar in deep sediment (2.7 acres), engineered sand cap (6.2 acres), and ENR (17.6 acres)	4a	$17.0 M	2.1 years
C	Targeted dredging and offsite disposal of creosote/coal tar in shallow and deeper sediment (3.4 acres), RCM cap (2 acres), engineered sand cap (6.4 acres), and ENR (17.6 acres)	4, 5, and 6	$23.0 M	2.8 years
D	Dredging and offsite disposal of creosote/coal tar in sediment (6.4 acres), engineered sand cap (5.5 acres), and ENR (17.6 acres); **This is EPA's preferred alternative**	7 and 8	$39.9 M	4.1 years
E	Dredging and onsite thermal treatment of creosote/coal tar and contaminated sediment (8 acres), engineered sand cap (3.9 acres), and ENR (17.6 acres)	9 and 10	$96.4 M	7.6 years

Criteria Evaluation of OU2 Remedial Alternatives

Overall protection of human health and the environment	Alternatives A through E would meet this threshold criterion to protect humans and the environment; however, Alternatives A through C will leave creosote/coal tar in sediment. Alternatives D and E are more protective.
Compliance with ARARs	Alternatives A through E would comply with Applicable or Relevant and Appropriate Requirements (ARARs).
Long-term effectiveness and permanence; reduction of toxicity, mobility, or volume of contaminants through treatment	Alternative A is the least effective as it mostly relies on containment technologies. Alternatives B and C are more effective as they remove a significant amount of creosote/coal tar in sediment, but creosote/coal tar left in place can continue to release contaminants to the surface waters if capping is insufficient or damaged. Alternatives D and E remove creosote/coal tar in sediment and are most effective.
Short-term effectiveness	All alternatives protect the community and workers during construction. Alternatives A and B have the least short-term impact as it has short construction duration and limited material handling. Alternatives C and D take longer and require more material handling, while Alternative E has a significantly longer construction duration with the most material handling.
Implementability	Alternatives A and B are easily implemented as they involve mostly capping and little dredging. Alternatives C and D are more complex because of the need to install and remove sheetpile, and remove relatively deep sediments. Alternative E is the most difficult to implement because it includes removing significantly more sediment and onsite thermal treatment of a large volume of contaminated material.

OU2 Preferred Alternative D

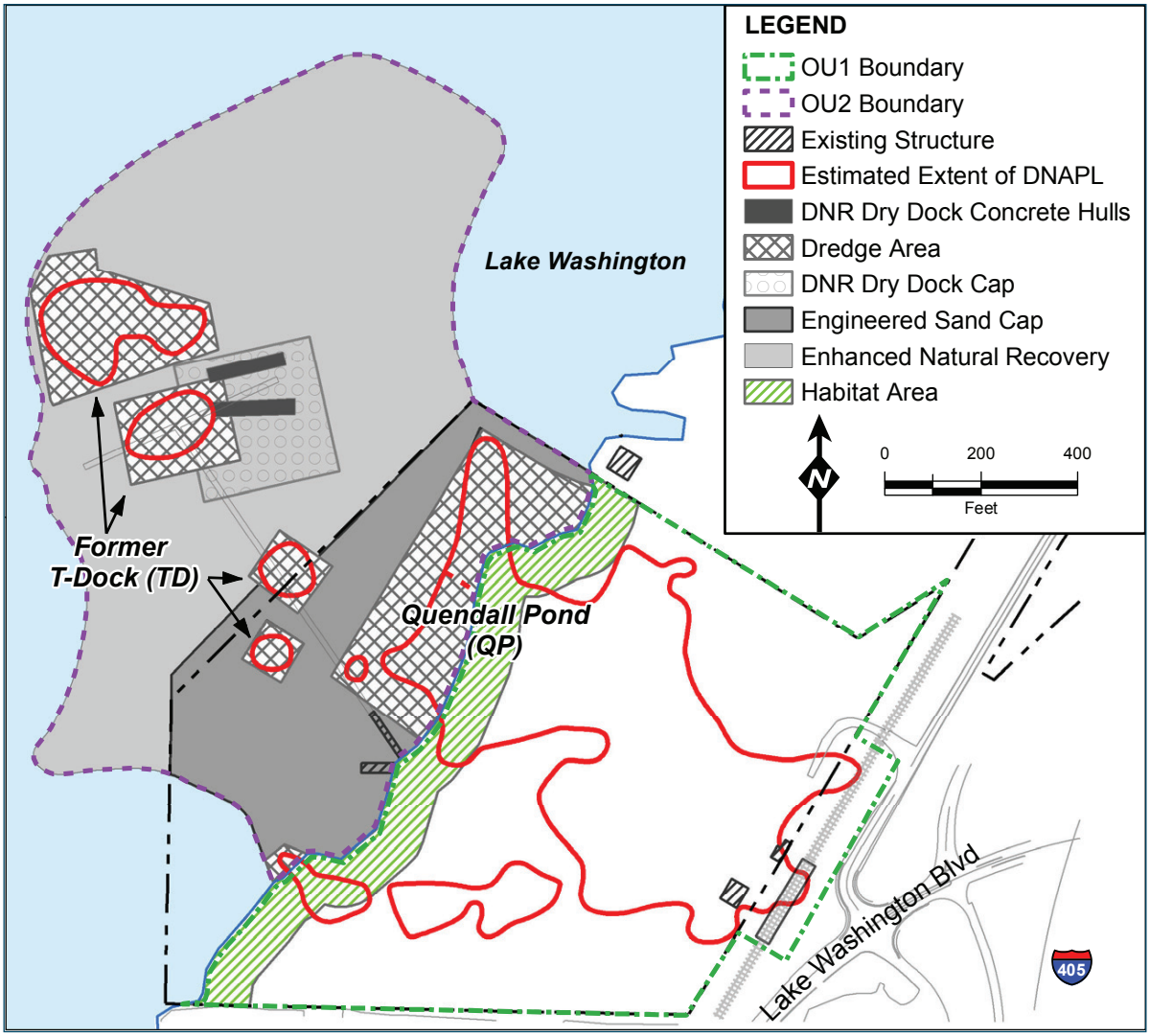
EPA proposes Alternative D as the Preferred Alternative for OU2 (the offshore portion of the site). The primary objective of this alternative is to remove (dredge) creosote/coal tar-containing sediments along the lake shore and along the former T-Dock. After removing the creosote/coal tar-contaminated sediment a reactive cover would be placed, if necessary, to manage small amounts of contamination that could remain.

An engineered cap would be placed over sediments that are within a zone of upwelling groundwater from the upland portion of the site. The remaining contaminated sediments will be addressed with a 6-inch sand cover, described as enhanced natural recovery.

The remedy will be monitored to verify that the remedy is performing as intended (that is, concentrations of contaminants of concern are decreasing over time).

EPA believes Alternative D provides the best balance of protection, effectiveness, and overall cost to implement. By removing the creosote/coal tar in sediment, it has a higher degree of protectiveness and long-term effectiveness than Alternatives A to C. It is also more timely and economical than Alternative E, which also removes creosote/coal tar in sediment, as well as other contaminated sediment.

Historical Quendall outbuilding



Preferred Alternative for OU2: *Dredging and offsite disposal of creosote/coal tar in sediment, engineered sand cap, and enhanced natural recovery*

Keeping the Community Informed and Involved During the Cleanup

EPA has prepared a **Community Involvement Plan** tailored for the local community. It lays out how EPA will provide information and engage with community members on the Quendall Terminals cleanup. Involving the community is a priority for EPA. We understand that our activities at this site may affect many people.

As we work to make the site a healthier place for people and the environment, we are committed to working in a positive way with residents and other stakeholders. We welcome suggestions at any time. Find the plan online at www.epa.gov/superfund/quendall-terminals. Or, request a hard copy from Kay Morrison at 206-553-8321 • morrison.kay@epa.gov.

EPA will accept comments on the Quendall Terminals site OU1 and OU2 Proposed Plans until October 9, 2019. We will make our final decision on the cleanup only after considering public comments. EPA will summarize the comments received from the public, and responses to those comments, in a Responsiveness Summary published with the final cleanup decision. EPA will place all comments and the Responsiveness Summary in EPA's Administrative Record for the Quendall Terminals Superfund site.

More Information

Website: epa.gov/superfund/quendall-terminals

Site Documents:
Renton Public Library • 100 Mill Avenue South • Renton, WA 98057 • 425-430-6610

Contacts:

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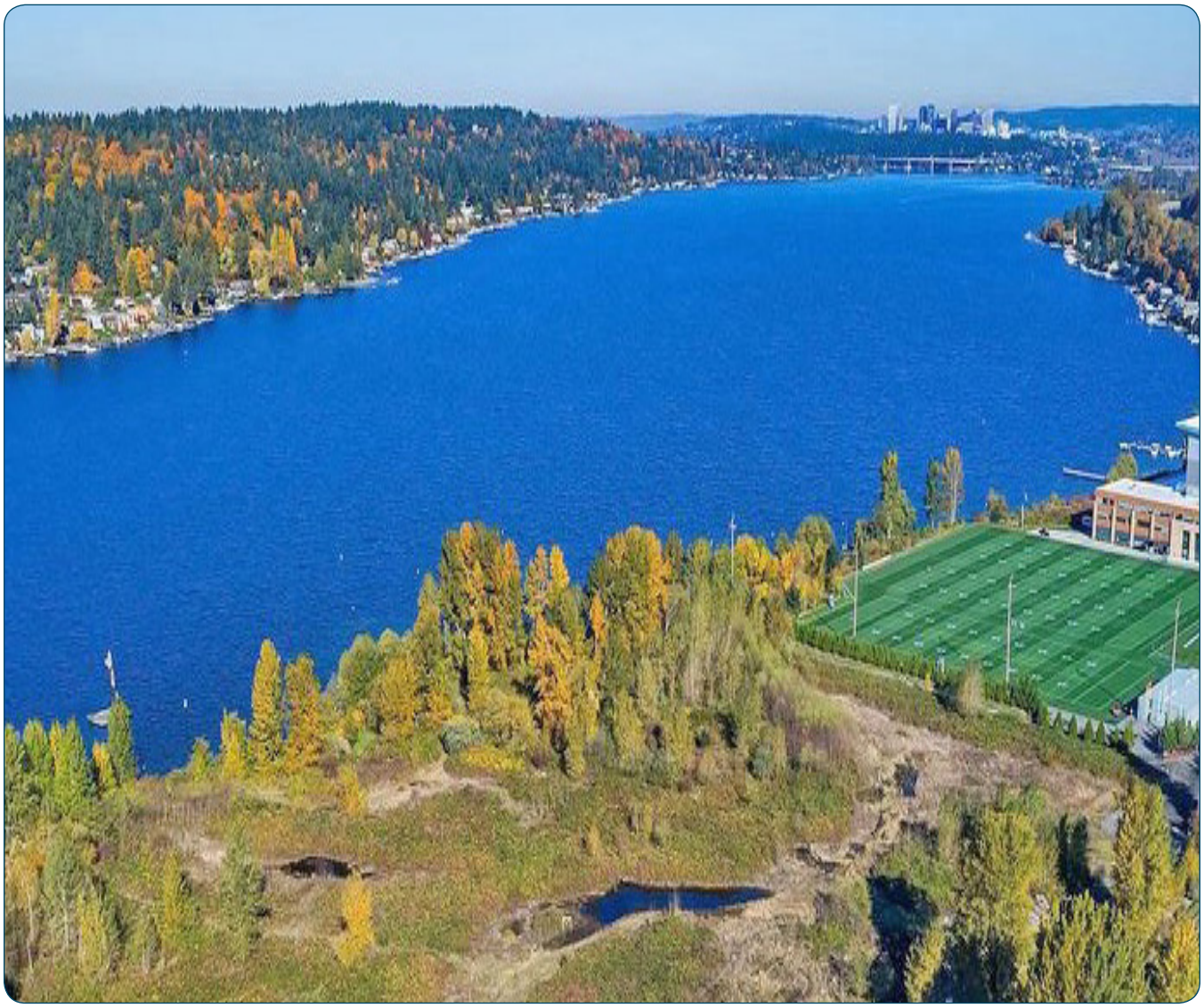
Cerise.Kathryn@epa.gov

EPA Community Involvement Coordinator
Kay Morrison
206-553-8321
Morrison.Kay@epa.gov

EPA provides reasonable accommodation to individuals with disabilities where appropriate. If you need a reasonable accommodation to participate in the public meetings, such as requiring information in a certain format (Braille, large print), please notify Kay Morrison, at 800-424-4372, ext. 8321 or by email at morrison.kay@epa.gov.

TTY users: please call the Federal Relay Service: 800-877-8339 and ask for Kay.



Quendall Terminals site (foreground) on the shore of Lake Washington

United States Environmental Protection Agency

1200 Sixth Avenue, Suite 155, RAD-123
Seattle, Washington 98101-3140

September 2019

EPA Proposes Cleanup Plans

Public Comments Due:
October 9, 2019

Open House and Public Meeting:
September 24, 2019

Read inside for details

EPA Proposes Cleanup Plans for Quendall Terminals Superfund Site

Public Comments Due October 9

Open House and Public Meeting: September 24, 2019

Look Inside for

- Background about the site
- Details about the contamination
- Options for cleaning up the site
- Ways to comment