

TECHNICAL REVIEW COMMENTS
Updated Conceptual Site Model and Remedial Alternative Evaluation
For the 1987 Hot Oil Pipeline Release
Tesoro Alaska Company, LLC. Kenai, Alaska
August 17, 2020

The US Environmental Protection Agency (EPA) received the *Updated Conceptual Site Model and Remedial Alternative Evaluation For the 1987 Hot Oil Pipeline Release, Tesoro Alaska Company, LLC. Kenai, Alaska (Report)*. The Report was prepared by Trihydro Corporation for Tesoro Alaska Company, LLC (Tesoro) and dated June 25, 2020. EPA received the Report electronically on June 26, 2020. General and specific comments are presented below.

GENERAL COMMENTS

In general, EPA agrees with the updated Conceptual Site Model that discusses the “Hot Oil” (#2 diesel) release and remediation history, the site hydrogeological settings to identify a perched groundwater zone and the deeper water table aquifer, the NAPL migration pathways through subsurface soil to the bluff face and beach, and the NAPL plume fate and transport.

The focused remedial alternatives (corrective measures) evaluation discusses the pros and cons for several potential remedial alternatives for addressing the bluff face and beach seep sheen releases. However, EPA disagrees with the recommended Alternative 2, Natural Source Zone Depletion (NSZD), as the proposed final corrective measure. Source containment and/or in-situ treatment must be implemented together with the NSZD alternative. So in addition to the alternatives as presented, the corrective measures evaluation must include alternatives combining Alternative 2 with source containment and/or treatment technologies.

The remedial alternative evaluation emphasizes negative impacts and ineffectiveness of a proactive source control measure and minimizes risks to human health and environment

associated with future beach NAPL releases when a passive and reactive measure such as Alternative 2 is implemented. The total free and residual NAPL mass under the release points near the bluff is unknown, but not insignificant because releases through bluff face and beach seeps have been occurring 32 years of the “hot oil” pipeline release. The effectiveness of the NSZD and its long cleanup timeframe are unacceptable to EPA.

SPECIFIC COMMENTS

1. Page 1-1, Section 1.0, first paragraph:

The Report identifies the source of the beach sheen and the bluff seeps as the “hot oil pipeline” releases that occurred in 1987. The Report must clarify that the “hot oil pipeline” is the same “Fuel Pipeline Corridor” identified in Figures 1 and 2. The time (month and year) for the Fuel Pipeline decommission and soil excavation during decommission must be discussed. The release points (i.e., the documented “pinhole leaks”) and removed section of the pipeline must be identified in Figures 1 and 2.

2. Page 2-1, Section 2.1, 1987 Release and Mitigation:

The text states that “t[T]he ensuing investigation identified an apparent pinhole leak of #2 diesel fuel of a pipeline....” The pinhole leak spot/location is not identified in either Figure 1 or Figure 2. The 1987 pipeline release location must be described and demonstrated in the figures (such as Figure 1 or 2). In addition, the mitigation effort included replacement of 100 feet pipeline, removal of several cubic yards of soil, and trenching and installing open drums filled with gravels along the bottom of the bluff. The locations of pipeline replacement, soil excavation, and trenching at bottom of the bluff must also be identified in Figures 1 and/or 2.

3. Page 2-1, Section 2.1, 1993 Sheening and 1994 Mitigation:

The locations of 1993 stained soil and hydrocarbon sheen observation must be identified in a figure/map. EPA recommends that a new figure of historical release observation and mitigation locations be generated to show the “hot oil” release location, soil excavations, all bluff hydrocarbon daylighting and beach sheen observations. This figure will help to trace and demonstrate the “hot oil” fate and transport and its migration pathways in the past years.

4. Page 2-6, Section 2.4.1, last paragraph:

The Report states that the footprint of hydrocarbon impacts at the beach is approximately 25 feet wide, parallel to the shoreline, and approximately 100 feet long. However, Figure 5 (and Figure 2) shows that impact area is approximately 60 to 70 feet wide with the area narrowing toward the Cook Inlet. This text description must be corrected accordingly.

5. Page 2-7, Section 2.4.3, last paragraph:

The last line on this page, “the bluff groundwater maximum of 12,500 µg/L ADEC TGPS” is unclear and must be deleted.

6. Page 2-10, Section 2.5, first and third bullets on this page:

The Report refers a “deep groundwater zone” below the perched groundwater zone. This “deep groundwater zone” appears to be continuous with the regional water table aquifer, which is referred to as the A-aquifer or the unconfined aquifer (combined A- and B-aquifers) at the Tesoro Site. EPA recommends define the “deep groundwater zone” as “the water table aquifer” to avoid confusion to the regional deeper aquifer zones. The water table aquifer likely discharges to Cook Inlet in the intertidal zone (seeps daylighting on the beach during ebb tide).

7. Page 2-10, Scenario 2:

EPA recommends replace terms “deep groundwater” and “deep groundwater zone” with “water table aquifer” or “unconfined aquifer zone”. The “deep groundwater” discussed in this Report is relative to the perched groundwater zone at the local area. Because several regional aquifer zones (including the A-, and B-aquifers, the combined unconfined aquifer, and the confined aquifer) exist at the site, using term of “deep groundwater” may lead to confusion.

8. Page 3-3, Section 3.0, third paragraph:

EPA agrees that visual monitoring and mitigating any petroleum sheen on the beach for the entire duration of the remedy is a common component of each remedial alternative. But we do not agree that NSZD will be effective to continue degrading the NAPL plume behind the bluff. The known source release occurred in 1987, and petroleum hydrocarbon product still discharged on the face of the bluff and beach over 32 years later. It is unknown how massive the free and residual NAPL product is behind the bluff and how many more years it will take for NSZD to completely degrade the NAPL plume. The Report must be revised to state that NSZD may be occurring but it is not in itself effective or fast enough to cleanup NAPL product released in 1987.

9. Page 3-3, Section 3.2, first paragraph of the section:

The Report states that “a[A]t this site, NSZD is appropriate because much of the remaining NAPL is no longer mobile, there is a low dissolution to groundwater risk, and a large portion is inaccessible to other options”. EPA acknowledges that site accessibility is an issue. However, there is little data to support NAPL immobility and low dissolution. It is possible that a portion of the free NAPL product is trapped above the perched water, which was revealed on the face of the bluff when bluff erosion cut through the perched water zone. Whether NAPL mass migrated to the deeper water table

aquifer is unknown; it is only visible via beach sheen when the tide is sufficiently low to expose beach seeps. The NAPL discharging flux may be constant but low enough so that the sheen is only visible when beach seeps are exposed on the beach.

10. Page 3-4, Section 3.2, third bullet:

The Report must specify what available data suggest NSZD is viable and has been occurring. To make NSZD a viable alternative, more quantitative data analysis must be conducted and presented to estimate the timeframe of cleanup. NSZD has not been effective for the last 32 years during which bluff face and beach seep sheens have occurred multiple times.

11. Page 3-4, Section 3.2, Limitations:

EPA agrees that the greatest limitation of Alternative 2 is that the timeframe for the site cleanup will be long and possibly over a hundred years, given that the NSZD has been working for 32 years without clear end point in sight. An additional important limitation for Alternative 2 is that the mitigation measures are reactive to bluff and beach releases rather than proactive to prevent potential releases. EPA believes that Alternative 2 is only viable with source removal, containment, and/or in-situ treatment measures.

12. Page 3-5, Section 3.3, Limitations, seventh bullet:

It is true that Alternative 3 (Sheet Pile Wall Extension Containment) does not address NAPL contamination within the intertidal zone, but neither do other alternatives unless active in-situ subsurface soil remediation is conducted on the beach (such as Alternative 6). As stated in the limitations for Alternative 6, challenges and safety concerns may prohibit beach subsurface soil excavations and treatments. Alternative 3 will likely cut off most of the NAPL sources under the bluff, which makes NSZD a viable component of the corrective measure.

13. Page 3-6, Section 3.3, Cost Estimate:

An important cost benefit for Alternative 3 (and Alternative 4) is that the sheet pile wall extension is likely needed to protect the bluff shoreline and prevent further erosions of the bluff at the western portion of the Kenai Liquified Natural Gas (KLNG) Plant. The capital cost of the sheet pile wall extension may be a necessary investment for the safety and maintenance of other infrastructures along the western portion of the Plant.

14. Pages 3-9 and 3-10, Section 3.6, Alternative 6:

Alternative 6 appears to only addresses beach level NAPL migration to Cook Inlet above the water table aquifer. It is also the only alternative or remedy component to address beach sheen issue. Alternative 6 cannot be applied alone because the NAPL sources in both perched groundwater zone and the water table aquifer are not cut off and the NAPL flux from these sources may be continuous. Alternative 6 can be applied as a component of a remedy combined with source control measures.

15. Page 4-1, Section 4.1, first paragraph:

Alternative 2 alone is not a viable alternative as a corrective measure at the site. Without source control measures (containment and/or treatment), there is too much uncertainty and it will take too long for the NSZD to degrade the remaining NAPL sources in both the perched water zone and the deeper water table aquifer. The possibility for another future bluff face or beach sheen release event is high, and therefore risks to human health and environment are high. A source containment measure (such as Alternative 3), an in-situ source treatment measure (such as Alternative 5), or combination of the containment and treatment (such as Alternative 4) must be implemented to cut off/control the NAPL sources in the perched groundwater and water table zones. Alternative 2 will be effective and viable in combination with other source control measures. Tesoro must evaluate the effectiveness of an alternative which combines Alternative 2 with source containment and/or treatment technologies.

16. Page 4-1, Section 4.1, second paragraph:

The first sentence states that “[T]he other remedial alternatives evaluated do not provide additional treatment to contain or remediate intertidal NAPL seeps.” EPA disagrees with this statement. Intertidal NAPL seeps are likely groundwater discharge from the water table aquifer with NAPL product. Sheet pile wall extension will cut off the bulk of NAPL plume and impacted subsurface soil in both perched groundwater and the water table aquifer. In-situ treatment on the bluff (such as Alternative 5) should also be designed to target both the perched groundwater and water table zones. These source control and treatment measures are widely applied successfully and will significantly reduce, if not eliminate, the beach seep occurrences in the intertidal zone,. This paragraph over-emphasizes negative impacts and ineffectiveness of source control measures, and must be revised.

17. Figure 1, Site Vicinity and Area:

The location and boundaries of the Site Map (Figure 2) must be identified in Figure 1 so that the beach seep investigation area, boring and monitoring well locations, historical fuel pipelines, and other important site features can be easily identified and viewed in the overall facility area.

18. Figure 2,

A legend box must be added to the figure. The site features and symbols are not fully explained. For example, the blue squares on the beach are defined as “seep sample location and number, TPY”, which is confusing. It appears that the blue triangles are the seep samples. All the symbols must be clearly identified and defined in a legend box included in the figure. The seep sample ID and numbering must also be consistent with the table (Table 7) sample numbers.

19. Figure 4, Cross Section:

The approximate elevations of the bluff face seeps (assuming discharged from the perched water zone behind the Bluff) must be rechecked and corrected accordingly. The bluff face seep elevation is identified as 25 to 30 feet above mean sea level (AMSL). However, the bluff face seep area identified in Figure 2 shows an elevation approximately from 45 to 55 feet AMSL. Elevation of the bluff seep area shown in Figure 3, Bluff and Beach Panoramic Photo, is generally consistent with Figure 2. In addition, EPA recommends interpretation and connection of both perched groundwater levels and water table levels observed in different wells (continuous lines) on the cross-section. It appears that water levels in wells B-1, B-2, and E-258A represent a perched groundwater zone and its elevation coincides with the bluff face seeps. Water levels in E-257B and E-258 appear to represent water table elevations below the perched water zone, which most likely discharges to the beach seeps at elevations of approximately 10 to 15 feet AMSL. A minor correction: the arrow for “Soil Boring Location and Number TYP.” should point to the ground surface and boring ID, not to the well casing.

20. Figure 5:

A legend box must be added to the figure to explain the symbols (such as seep samples, soil borings, temporary wells, and permanent monitoring wells), lines, color codes, and other important site features.