Regional Citizens' Advisory Council / "Citizens promoting environmentally safe operation of the Alyeska terminal and associated tankers."

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January 7, 2019

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Re: PWSRCAC's Comments on Alyeska Pipeline Service Company, Valdez Marine Terminal Oil Discharge Prevention and Contingency Plan - 2019 Plan Renewal

Dear Ms. Carey, Ms. Reed, Mr. Carr, Mr. Lehman, CDR Franklin, Mr. Gilliam, and Mr. Hicks:

The Prince William Sound Regional Citizens' Advisory Council (PWSRCAC or Council) submits the enclosed comments on Alyeska Pipeline Service Company's (APSC) Valdez Marine Terminal Oil Discharge Prevention and Contingency Plan (VMT C-Plan). These comments pertain to the 2019 plan renewal.

PWSRCAC is an independent, non-profit corporation whose mission is to promote environmentally safe operation of the Valdez Marine Terminal and associated tankers. The Oil Pollution Act of 1990 (OPA90) and the Council's contract with APSC guide our work. PWSRCAC's 18 member organizations consist of communities in the region affected by the 1989 *Exxon Valdez* oil

spill, as well as commercial fishing, aquaculture, Native, recreation, tourism, and environmental groups.

These comments are being provided to the following agencies together with APSC as the plan holder:

(1) Alaska Department of Environmental Conservation (ADEC),
(2) United States Bureau of Land Management (BLM),
(3) United States Coast Guard (USCG),
(4) United States Environmental Protection Agency (EPA),
(5) United States Department of Transportation (DOT).

PWSRCAC directs these comments to all federal and state agencies responsible for oil spill prevention and response oversight at the Valdez Marine Terminal and requests each agency carefully review PWSRCAC's recommendations contained in these comments when formulating individual agency responses, requirements, or approvals of this renewal.

PWSRCAC participates in the public review of the VMT C-Plan as a function of our OPA90-mandated role as a citizens' oversight group and our contract with APSC. PWSRCAC has over 28 years of experience and expertise with the Valdez Marine Terminal spill prevention and response activities. The Council's work is supported by technical experts that have provided advice, recommendations, and have produced reports regarding the concerns raised in our comments.

Our detailed comments are attached. Most of PWSRCAC's comments and recommendations are not new. The Council has raised many of these concerns and recommendations to APSC and regulating agencies via letters, reports, through participation in the VMT C-Plan Coordination Workgroup, and through meetings and oral conversations.

The five-year plan review cycle provides an opportunity to consider the entire plan and associated documents (as they are available) holistically rather than through the amendment process. The enclosed comments are intended to provide all federal and state agencies as well as the plan holder with a comprehensive listing of areas where we believe prevention and response for the terminal warrants attention to meet regulatory and practical requirements for the safest possible operations.

Of the many issues identified in the enclosed comments, we highlight the following 10 to outline the type of concerns, requests for additional information, and recommendations contained in our comments. The following list is in no way meant to detract from the other important issues we have identified in the comments. We respectfully request that all of the issues and concerns in the attached document, in their entirety, are reviewed and given equal weight beyond what is listed below.

1. **The 1997 Solomon Gulch Hatchery and Valdez Duck Flats Sensitive Area Protection Mobilization Decision Matrix (Decision Matrix) should be the only Decision Matrix included in the VMT C-Plan and in Scenarios 2, 4 and 5.** This is in keeping with the December 29, 2017 decision made by then-ADEC Commissioner Hartig to grant the stay requested by Valdez Fisheries

Development Association such that the 1997 Decision Matrix would remain in force during the pendency of the proceedings of the administrative appeal filed by the City of Valdez, Prince William Sound Regional Citizens' Advisory Council, Prince William Sound Aquaculture Association and the Valdez Fisheries Development Association.

2. **Make all documentation incorporated by reference available for public review.** A growing number of documents – now numbering more than 70 – have been incorporated by reference into the three volumes of the VMT C-Plan. The fact that these documents are inaccessible for public review means that the public cannot verify information contained within these documents. It is also unclear whether information related to the VMT C-Plan that is included in these documents may be changed unilaterally by the plan holder, without notification to the state and federal agencies, or the public. All information pertinent to verifying state and federal regulatory compliance should be included in the three planning volumes or be otherwise made accessible to the public in keeping with public review requirements.

3. **Ensure response training is conducted before it may need to be used, is regularly refreshed, is adequate for the role personnel may be asked to play, and adequately documented.** The enclosed comments include several requests for additional information regarding how to ensure that personnel will be adequately prepared for response assignments given changes made in recent amendments and the removal of past information developed following a 2004 out of compliance notification issued by ADEC. Information regarding prevention-related training is similarly incomplete.

4. **Secondary containment liner does not meet state and federal requirements.** Work in the East Tank Farm area in recent years has revealed that the buried secondary containment liner has cracks and holes which at least in some instances go through the entire thickness of the material. In order to ensure that the liner can achieve the state's "sufficiently impermeable" standard, and the state and federal government's "impervious" standards, a comprehensive inspection is warranted. Until such time that the integrity of the liner can be ensured, the State of Alaska's 60 percent prevention credit for the response planning standard should be reconsidered.

5. **Ensure the use of realistic trajectory modeling for the worst case discharge in Scenario 5.** Underestimating how an oil spill in the Port of Valdez will spread undermines and inaccurately captures the plan holders' ability to demonstrate the measures that would be implemented to meet the state's response planning standard in Scenario 5. In particular, more information is needed on the inputs used to model the potential spill trajectory, with updated vapor modeling in summer conditions.

6. **Accurately represent personnel numbers demonstrated at drills in the VMT C-Plan documents.** There are inconsistencies within the VMT C-Plan sections regarding the exact Incident Management Team positions that would be filled during a major response (specifically, Scenario 5). None of these representations of personnel needs reflects the number that are typically used in exercises and

drills for a similar scale response,. All required response personnel positions should be clearly identified with organizational charts down to the Unit and Strike Team levels in the plan, and be demonstrated in drills and exercises. In addition to ensuring that all necessary roles are identified, the plan should indicate how sufficient numbers of appropriately trained personnel will be available, considering unavailability due to vacations or other absences, and the need for shift changes.

7. **Scenario 5 should assume an instantaneous release from the largest tank.** Worst Case Discharge volumes are not based on a risk assessment of a particular facility or vessel, but are established in state and federal regulation. It is common practice that plan holders demonstrate their response to a worst case discharge or response planning standard-sized spill to be an instantaneous release from the largest tank by volume, and reflect this in equipment and personnel mobilization and delivery times. The largest tank at the terminal is Tank 11, not Tank 1, and the scenario should reflect an instantaneous release from this tank and location.

8. **Facility oil piping information is incomplete.** Requirements for facility oil piping changed in 2006, and it is unclear from the information what facility oil piping was installed after those regulations took effect in 2008, which piping segments are subject to which state and federal requirements, and how any applicable requirements are being met. Additional details regarding our concerns about the lack of documentation on facility oil piping are outlined in detail in the attached comments.

9. **Ensure that the Best Available Technology analysis of corrosion survey methods for buried metal piping is complete.** Currently, this section does not reference the use of smart pigs or robotic crawler tools for inline inspection and corrosion surveys of buried metal piping. Both of these methods have been applied at the Valdez Marine Terminal since 2016 on buried crude oil piping and should be addressed in the VMT C-Plan.

10. **Improved containment and recovery capacity for any Drainage 58 Scenarios.** Scenario 5 assumes that by Hour 12, a total of 155,000 barrels have spilled into Port Valdez via drainage 58 at an average flow rate of 22,500 barrels per hour for nine hours. Only two skimmers on one Oil Spill Response Barge are assigned to recover this oil inside containment by Berth 1, and given their pump rates, this means only a very small fraction of that oil could actually be recovered. To keep up with the incoming spilled oil volumes, more skimming capacity is needed at Drainage 58, including larger boom and a secondary booming system to better contain spilled oil.

The VMT C-Plan describes APSC's commitment to the VMT C-Plan Coordination Workgroup, a group led by APSC that includes state and federal agencies (ADEC, USEPA, BLM, USCG), and PWSRCAC participation. The VMT C-Plan states the coordination workgroup is used to identify and resolve plan issues, review and discuss amendment and renewal applications, develop drill and exercise plans, examine Best Available Technology (BAT), and identify and implement oil spill prevention and response improvements for the terminal.

The Council is concerned about workgroup ineffectiveness, as can be seen from the magnitude of unresolved issues listed in our attached comments. For this renewal, the Council never saw many of the proposed changes during the workgroup process. These proposed changes (with the exception of Scenario 5) were not discussed in the workgroup; and no consensus among workgroup participants was achieved before the renewal application was submitted. While the Council did participate in the Scenario 5 revision discussions, many of our Scenario 5 concerns were dismissed.

This workgroup was formed well over a decade ago to resolve significant and complicated issues. In the early days of the workgroup history, there was successful resolution of several issues including source control, waste management, oil spill response training, and hatchery and sensitive area protection, among others. A review of historical communications will show consensus workgroup products were produced, and the Council issued letters of support for those resulting VMT C-Plan amendments. The Council would like to work with APSC and the involved state and federal regulators on ways to improve the workgroup process, to make it more effective and meaningful towards working through and resolving issues prior to proposed plan changes being submitted.

Thank you for your attention to the enclosed comments. As always, we look forward to continuing to work on these issues with APSC and all of the state and federal regulatory partners to achieve, sustain and promote the best possible oil spill prevention and response preparedness possible for Valdez Marine Terminal operations.

Sincerely,

Donna Schantz
Executive Director

cc: Graham Wood, ADEC
Ron Doyel, ADEC
Craig Ziolkowski, ADEC
Andres Morales, APSC
Kevin Kearney, BLM
Steve Weeks, BLM
Calvin Terada, EPA

Enclosures:

a) PWSRCAC Comments on Alyeska Pipeline Service Company 2019 Valdez Marine Terminal Oil Discharge Prevention and Contingency Plan Renewal, January 7, 2019
b) PWSRCAC Annual 2017 Drill Report

Alyeska Pipeline Service Company
2019 Valdez Marine Terminal
Oil Discharge Prevention and Contingency Plan Renewal

Comments Submitted to the
Alaska Department of Environmental Conservation
United States Bureau of Land Management
United States Coast Guard
United States Environmental Protection Agency
United States Department of Transportation

Submitted by:

Prince William Sound Regional Citizens' Advisory Council (PWSRCAC)

January 7, 2019

Table of Contents

1. Purpose

The Prince William Sound Regional Citizens' Advisory Council ("PWSRCAC" or "Council") is an independent, non-profit corporation whose mission is to promote environmentally safe operation of the Valdez Marine Terminal (VMT) and associated tankers. The Oil Pollution Act of 1990 (OPA 90) and the Council's contract with Alyeska Pipeline Service Company (APSC) guide our work. PWSRCAC's 18 member organizations consist of communities in the region affected by the 1989 *Exxon Valdez* oil spill, as well as commercial fishing, aquaculture, Native, recreation, tourism, and environmental groups.

The purpose of this document is to provide comments to all federal and state agencies responsible for oil spill prevention and response oversight at the VMT, including: the Alaska Department of Environmental Conservation (ADEC), the United States Bureau of Land Management (BLM), the United States Coast Guard (USCG), the United States Environmental Protection Agency (EPA), the United States Department of Transportation (DOT), and APSC with comments on the Valdez Marine Terminal Oil Discharge Prevention and Contingency Plan (VMT C-Plan).

PWSRCAC's comments are listed in the order presented in the VMT C-Plan.

2. Regulatory Basis for Comments

The following comments are based on state and federal laws and regulations pertaining to the Valdez Marine Terminal including:

1. Title 46 of the Alaska Statutes;
2. Title 18, Chapter 75 of Alaska Administrative Code;
3. 49 CFR Part 194, DOT's Regulations for Response Plans for Onshore Oil Pipelines;
4. 33 CFR Part 154, Subpart O, USCG Regulations for Facility Response Plans;
5. 40 CFR Part 112, EPA Regulations for Facility Response Plans;
6. Oil Pollution Act of 1990; and,
7. TAPS Grant and Lease.[1]

3. Documents Incorporated by Reference

The VMT C-Plan includes three volumes of information required to meet state and federal compliance and incorporates over 70 external documents by reference. Most of the documents incorporated by reference are not available for public review. The VMT C-Plan contains hyperlinks to access these documents; however, the hyperlinks are disabled in the public review version.

It is the Council's understanding that incorporating a document by reference means the document content is part of the VMT C-Plan and would therefore would fall under the statutory requirements of the c-plan. If the information contained in over 70 referenced documents is required to comply with state and federal requirements, it should be provided for public review.

[1] Renewal of the Agreement and Grant of Right-of-Way for the Trans-Alaska Pipeline and Related Facilities between The United States of America and Amerada Hess Pipeline Corporation, BP Pipelines (Alaska) Inc., ExxonMobil Pipeline Company, Phillips Transportation Alaska, Inc., Unocal Pipeline Company, and Williams Alaska Pipeline Company, LLC, 2003.

PWSRCAC is also concerned compliance information contained in those external documents (and part of the VMT C-Plan) may be unilaterally revised without regulatory approval.

RFAI #3a: *PWSRCAC requests all documents incorporated by reference be provided for public review and comment and/or the material in that document (required by regulation) be included in the VMT C-Plan and that section of the amended plan be provided for public review and comment.*

PWSRCAC finds the bibliography in Volume 1, Section 3.12 incomplete. The information in these referenced documents is inconsistent (e.g., author, date, and version are missing). For example, AMS-011-01 Valdez Oil Spill Response Training Program is a document authored by APSC (yet the author is unlisted), the date of first publication is unspecified, and current version/revision number is unspecified (yet there are at least 12 versions of this manual). It is not possible to verify which version of the document is incorporated by reference.

RFAI #3b: *PWSRCAC requests the bibliography be revised and resubmitted for public review and comment. All documents in the bibliography should contain complete bibliographic information, including title, author, document date and version/revision numbers.*

4. 1997 Solomon Gulch Hatchery and Valdez Duck Flats Sensitive Area Protection Mobilization Decision Matrix, Commissioner Stay Order and Opposition to 2017 Matrix

In November 2017, PWSRCAC, the City of Valdez, and Prince William Sound Aquaculture Corporation (PWSAC) (collectively "Requesters") filed an administrative appeal on ADEC's October 23, 2017 decision on VMT C-Plan Amendment 2017-1 (OAH No. 17-1219-DEC). Valdez Fisheries Development Association (VFDA) filed a separate appeal on ADEC's decision (OAH No. 17-1218-DEC).[2] This amendment removed the 1997 Solomon Gulch Hatchery (SGH) and Valdez Duck Flats (VDF) Sensitive Areas Protection Mobilization Decision Matrix from Volume 3, Table 9.0-1 *Solomon Gulch Hatchery and Valdez Duck Flats Sensitive Area Protection Mobilization Decision Matrix* in Scenario 4, and replaced it with a 2017 Decision Matrix that did not provide the same level of protection to the SGH and VDF. Extensive opposition to the 2017 Decision Matrix was submitted to the Office of Administrative Hearings. ADEC has access to the administrative appeal; therefore, PWSRCAC's entire suite of administrative appeal documentation is incorporated by reference into these comments.

On December 29, 2017, upon request by VFDA to stay the 1997 Decision Matrix, former ADEC Commissioner Hartig decided the 1997 Decision Matrix would remain in force during the pendency of the appeal. In December 2018, as part of a mediated settlement, the Requesters, ADEC and APSC agreed in principal to enter into a collaborative process to resolve this matter. The mediated agreement is currently being reviewed by all parties, and is pending execution. However, an important part of that agreement includes a provision for the 1997 Decision Matrix to remain in place until that collaborative process is complete. Therefore, the VMT C-Plan should include the 1997 Decision Matrix (and remove all references to the 2017 Decision Matrix) until the collaborative process is complete.

[2] For the purposes of the administrative appeal, the two cases have been combined, and VFDA is considered a party to the Requesters.

APSC's November 2018 VMT C-Plan renewal application includes a confused mix of Decision Matrix references. APSC proposes to amend Volume 3, Table 9.0-1, Scenario 4, to include the 2017 Decision Matrix. However, Scenario 2 (Table 2.1-3 *Scenario 2 - Day 1, Response Actions and Tactics* on p. 2.1-11) still references the 1997 Decision Matrix scoring 28 (not possible with the 2017 Matrix), and Scenario 5 is internally inconsistent scoring 13 points (Table 5.1-3 *Scenario 5 - Day 1, Response Actions and Tactics* on p. 5.1-13) presumably referring to the 2017 Decision Matrix, yet references a 36-point score (Table 5.9-1 *Scenario 5 - Day 1, Response Actions and Tactics – Summer* on p. 5.9-6) that could only accrue using the 1997 Decision Matrix.

APSC's November 2018 renewal application does not propose immediate SGH and VDF booming for a 2,500,000-gallon Scenario 4 spill (based on the 2017 matrix), yet correctly proposes to immediately boom for a smaller 2,100-gallon spill in Scenario 2.

RFAI #4a: *In accordance with former Commissioner Hartig's December 29, 2017 stay decision and the mediated agreement, the VMT C-Plan renewal application should be revised to remove all references to the 2017 Decision Matrix, use only the 1997 Decision Matrix, and adjust the scenarios to rapidly protect the SGH and VDF using the 1997 Decision Matrix scoring. The plan should be amended to address this concern, and provided for public review and comment.*

5. Volume 1, Part 1, Section 1.7 and Volume 1, Part 3, Section 3.7, Non-Mechanical Response Options

PWSRCAC long-standing position on dispersants and in situ burning endorses mechanical recovery as the primary response strategy; therefore, PWSRCAC supports APSC's proposed change to Volume 1, Part 1, Section 1.7 to remove non-mechanical methods at the VMT.

6. Volume 1, Part 3, Section 3.9, Response Training

There is insufficient information in the C-Plan to understand APSC's proposed oil spill response training program.

Volume 1, Part 3, Section 3.9 references APSC's Valdez Oil Spill Response Training Management Program (VOSRTMP; AMS-011-01). Presumably the information in AMS-011-01 is offered by APSC to demonstrate compliance with oil spill response training requirements under 18 AAC 75.425(e)(3)(I). However, AMS-011-01 was not provided for public review; therefore, the Council has been unable to review this information. Additionally, it is unclear what version of AMS-011-01 APSC is proposing to incorporate by reference. PWSRCAC remains concerned about incorporating critical oil spill response information by referencing a manual that sits outside the approved C-Plan that is not provided for public review. It is important that the document be provided for public review and the version be specified, so that it is not unilaterally amended by an applicant without regulatory approval. The Council recommends that a specific version of APSC's Valdez Oil Spill Response Training Management Program (VOSRTMP; AMS-011-01) be approved, and that APSC be required to obtain agency approval before amending the program since it is used to comply with 18 AAC 75.425(e)(3)(I).

Improvements required to APSC's Response Training Program stem from a June 18, 2004 out of compliance notification issued to APSC by ADEC. ADEC's notification required APSC to include a detailed description of training programs for response personnel in the VMT

C-Plan to comply with state regulations. On January 31, 2007, APSC submitted an amendment to the VMT C-Plan that included details on APSC's Response Training Program. On June 6, 2007, ADEC issued a decision on the Response Training Program amendment, approving and incorporating by reference Version 1 of AMS-011-01 into the VMT C-Plan. Since that time, APSC appears to have made numerous revisions to AMS-011-01, and the Council is concerned some of the changes may have diminished the quality of the program since 2007.

PWSRCAC requests ADEC compare the first version of AMS-011-01 required by ADEC with the current version to ensure the same quality of training information has been retained. The Council found the original version of the Oil Spill Response Training Management Program to be robust; however, APSC has revised its internal documentation 12 times since the first version was developed. Since the first version of AMS-011-01 was required by ADEC to meet 18 AAC 75.425(e)(3)(I), it is important to compare it to the currently proposed version to determine what has been added/deleted/modified, and for the agency to determine whether the program it approved in 2007 is still as robust.

The Council requests the C-Plan clearly state that all response personnel will be trained before filling a response position. The Council does not support APSC's proposed change to Volume 1, Part 3, Section 3.9.1, Table 3.9-5 *Response Training Program* on p. 3.9-11 that allows 180 days for personnel to obtain training before serving in a particular response role and allows APSC to set unspecified training compliance dates in APSC's Learning Management System (p. 3.9-3). This could result in untrained personnel filling these roles. The plan should clearly state response personnel must be trained before filling that position.

RFAI #6a: *The Council requests information on how APSC ensures its contractors are trained and qualified for the positions they fill before they are assigned to serve in that oil spill response capacity*. The system APSC uses to verify contractor training and qualifications before they serve in a particular role is unclear. ADEC has also raised concerns in the past about the process APSC uses to verify contractor training before they fill a response position. ADEC issued a letter to APCS on April 13, 2012 requiring APSC develop a procedure to verify that contractors have the same level of training as APSC employees in the same role/position. It is unclear if this procedure was ever developed, and if it was, it is not well described in the VMT C-Plan.

RFAI #6b: *The Council requests information on the number of personnel trained for each oil spill response position, which course(s) personnel are required to take and why, and information on how APSC tracks the training program to ensure personnel have the required training before they are assigned that role.* For example, the Field Responder Training Table on p. 3.9-8 through 3.9-10 proposes specific training classes for specific positions but appears incomplete:

- Training proposed for each position does not appear to adequately prepare that person for that position (e.g., the Nearshore Group Supervisor is not given "nearshore" training; the Open Water Group Supervisor is not given "open water crucial skimmer" or "open water Valdez Star training"; Firefighting, Safety and Security Officers are not given any "HAZWOPER" training; and Wildlife Personnel are not provided "wildlife training", etc.).

- The training courses listed in Table 3.9-5 *Response Training Program* on p. 3.9-11 to 3.9-29 are not listed on the Field Responder Training Table (p. 3.9-8 to 3.9-10).

Therefore, it appears APSC offers these courses but it is not clear that any field responder is actually required to take some of the courses (e.g., SRV127, SRV 303, SRV 018, SRV 305, etc.).

RFAI #6c: *The Council requests information on training frequency and refresher training for responders.* Training is offered as "initial training", but it is not clear that responders receive "refresher" training.

RFAI #6d: *The Council requests information on how APSC resolves training deficiencies remain in the plan.* The Council does not support APSC's proposal to delete language in Volume 1, Part 3, Section 3.9.1 *Training Program Overview*. APSC proposes to delete training tracking method descriptions and APSC's method to resolve training deficiencies. Some of the tables have been changed/replaced; however, the rationale for the change is not explained and is unclear.

Recommendations: *PWSRCAC requests ADEC analyze APSC's Oil Spill Response Training Program to verify that the program it approved in 2007 has not degraded or become proprietary to the point where the program no longer meets ADEC's requirements and cannot be understood by the public. All personnel (APSC staff and contractors) should be trained and qualified before they fill a response role, and there should be a tracking system to ensure this happens. Response personnel should receive all the training required for their position and routine refreshers. The information in the RFAIs should be provided and addressed in the plan.*

PWSRCAC requests all the information requested above be provided and the oil spill response training program be revised to address the concerns raise herein and the amended plan be resubmitted for public review and comment.

7. Volume 1, Part 2, Section 2.1.1, Oil Spill Prevention Training

Oil spill prevention training is a critical C-Plan element. PWSRCAC finds proposed Volume 1, Part 2, Section 2.1.1 Oil Spill Prevention Training incomplete and does not meet the requirements of 18 AAC 75.020 or 18 AAC 75.425(e)(2)(A). As can be seen from past comments, PWSRCAC has recommended oil spill prevention training improvements since 2003. State regulations at 18 AAC 75.020 were updated in December 2006, and PWSRCAC has consistently advocated to add detail to prevention training to meet state regulations.

RFAI # 7a: Finding No. 13 in ADEC's November 21, 2014 approval indicated ADEC had performed a detailed review of the proposed prevention training program. *PWSRCAC requests a copy of this review as part of the RFAI process,* so the Council can better understand how APSC's proposed program measures up to state requirements.

The proposed training program lacks sufficient detail to verify compliance with 18 AAC 75.020(a). The C-Plan only generically describes how APSC's personnel and contractors are trained and qualified to perform job duties directly involving inspection, maintenance or operation of oil storage and transfer equipment regulated under 18 AAC 75.005 - 18 AAC 75.085. Currently, the VMT C-Plan, Volume 1, Part 2, Section 2.1.1.1 lists eight positions, but does not describe each position with job duties listed under 18 AAC 75.020(a) detailing how the oil spill prevention requirements of 18 AAC 75.005 - 18 AAC 75.085 and the training and level of knowledge appropriate to that position are met.

The VMT C-Plan also lacks sufficient detail to verify compliance with 18 AAC 75.020(b). The descriptions of licenses, certifications, or other prerequisites needed to hold each position

listed in 18 AAC 75.020(b) are vague or incomplete. There is no list of training objectives and the means of achieving them, including training subjects, training schedules, frequency, and type.

Furthermore, the list of positions in VMT C-Plan, Volume 1, Part 2, Section 2.1.1.1 is incomplete. For example, it does not include the Marine Operations Marine Technician, Ballast Water Treatment Operations Technician, and Power Generation and Vapor Recovery Technicians who all play important roles in oil spill prevention. For example:

- *The list of key VMT positions found in Volume 1, Section 2.1.1.1, should include who is responsible for security measures and surveillance required under 18 AAC 75.007(f); who is responsible for the oil and fuel transfer requirements under 18 AAC 75.025; and should specific the training credentials required to effectively carry out this oil spill prevention measures.*

- *18 AAC 75.020 (d) and (e) require APSC to maintain oil spill prevention recordkeeping. The proposed C-Plan does not include, but should, a prevention training plan for these personnel or list of personnel assigned to carry out these duties.*

18 AAC 75.075 requires APSC to maintain personnel trained and qualified to carry out secondary containment system integrity verification, maintenance and repair. Proposed Section 2.1.1 does not describe the positions responsible for secondary containment, nor does it provide a detailed explanation of the training and qualifications required for those positions. There is no information on any training on the oil spill prevention requirements listed in Section 2.1.7 of the C-Plan (Secondary Containment). The VMT C-Plan should provide prevention training information on secondary containment in Section 2.1.7 Secondary Containment Requirements for Aboveground Oil Storage Tanks.

18 AAC 75.080 requires APSC to provide personnel trained and qualified to carry out facility oil piping integrity verification, maintenance and repair. The proposed C-Plan states that "Inspection Personnel" are qualified and maintain applicable certifications per internal APSC document AMS-031-01 Qualifications and Certifications of Inspection Personnel. This document was not made available for public review; therefore, it is unclear if the requirements of 18 AAC 75.080 have been met or the information required in 18 AAC 75.020(b)(1), (2), or (3) is included. There is no information on any training on the oil spill prevention requirements listed in Section 2.1.8 of the C-Plan (Facility Oil Piping). The VMT C-Plan should be revised to clearly explain the training and qualification program for facility oil piping integrity verification, maintenance and repair.

VMT C-Plan, Volume 1, Part 2, Table 2.1-1 Description and Frequency of Oil Spill Prevention Training only offers three oil spill prevention classes. This list of training is inadequate to ensure all the terminal oil spill prevention requirements of 18 AAC 75.005 - 18 AAC 75.085 and the training and level of knowledge appropriate to positions are met. The plan lists some oil spill prevention training required of APSC's contractors, but it may not be adequate based on the type of work they are assigned to do, and it is unclear how APSC verifies that training is met before contractors do work at the terminal.

***RFAI #7b**: PWSRCAC requests additional information be provided to justify that three oil spill prevention classes are sufficient to regulatory standards (or provide additional courses to meet this need), and provide information on how contractors are trained in oil spill prevention.* This VMT C-Plan should be amended to include this information.

Recommendations: *PWSRCAC has the following recommendations*:

The VMT C-Plan should be amended to clearly describe the job position that is responsible for carrying out each oil spill prevention measure required by regulation, what training and qualifications are required, and on what frequency the training is obtained to serve in that position.

The VMT C-Plan should be amended to clearly list the positions responsible and provide all the information required by 18 AAC 75.020 (b) for inspection, maintenance, or operation of oil storage and transfer equipment regulated under 18 AAC 75.005 - 18 AAC 75.085.

The VMT C-Plan should be amended to make a clear link between inspection, maintenance, or operation of oil storage and transfer equipment requirement regulated under 18 AAC 75.005 - 18 AAC 75.085 and the job positions specifically assigned and responsible to carry out that oil spill prevention measure.

The VMT C-Plan should be amended to correlate the training required for inspection, maintenance, or operation of oil storage and transfer equipment regulated under 18 AAC 75.005 - 18 AAC 75.085 to the list of training courses.

The VMT C-Plan should be amended to clearly indicate where contractors are used to perform these roles/services, and describe measures taken by APSC to ensure satisfaction of the training, certification, and licensing requirements for personnel and contractors.

PWSRCAC requests all the information requested above be provided and the oil spill prevention training program be revised to address the concerns raised herein and the amended plan be resubmitted for public review and comment.

8. Volume 1, Part 2, Section 2.1.6, Crude Oil and Fuel Storage Tank Inspections

APSC's proposed Volume 1, Table 3.1-*1 VMT Tankage (greater than 10,000 gallons)* lists 20-year internal inspection intervals for most of the 40+ year old crude oil storage tanks. As indicated in past comments, PWSRCAC does not support long inspection intervals for large, aging crude oil storage tanks located in an environmentally sensitive and economically important area with known seismic risk and secondary containment structure integrity issues. Inspection frequency should be increasing as these key pieces of infrastructure at the terminal age.

ADEC regulations provide the state with the authority to require inspection intervals that are shorter than currently specified by API 653 for tanks that are 30 years and older.[3] RCAC believes ADEC should use this authority to optimize oil spill prevention.

ADEC relies on the API 653 inspection standard for determining storage tank inspection intervals. The API 653 inspection standard recommends a nominal 10-year inspection schedule be adjusted based on tank floor corrosion rates and other suitability for service factors (e.g., external roof load, wind, seismic conditions, tank foundation conditions, operating conditions, fire systems, and other tank appurtenances, etc.).[4] Historically, both

[3] 18 AAC 75.065(b) *"Inspection intervals for a field constructed aboveground oil storage tank may be reduced by the department (A) for field-constructed aboveground oil storage tanks older than 30 years."*

[4] API 653, Section 4, Suitability for Service.

APSC and ADEC have focused only on the tank floor condition, without giving due consideration to the other suitability for service factors required by API 653. PWSRCAC requests consideration be given to not only tank floor corrosion rates but to other suitability for service factors (as required by API 653) in determining inspection intervals.

While the floors on Crude Oil Tanks 1-14 have been replaced since original construction, the shell, roof, and columns supporting the roof have not been replaced since they were originally installed in the 1970s. Side shell piping penetrations and roof pressure vacuum valve locations have been identified by numerous inspections as areas of potential risk. Additionally, upper shell and roof corrosion has been identified on both internal and external inspections. The current external inspection program only collects data from a few shell locations readily accessible by the tank stairs. Side shell piping penetrations and most of the shell condition is not examined during a 5-year external inspection (this work is not done until the internal inspection).

Basing an internal inspection interval on the newest tank component (tank floor that has been replaced) does not adequately consider the age and condition of the older tank components. For example, APSC's contractor, Alaska Anvil Inc., pointed out that tank roof condition for tanks using a vapor recovery system is a critical inspection issue. More specifically, in 2002 Alaska Anvil, Inc concluded that internal tank roof corrosion, coupled with heavy snow loads, is a concern and a potential spill risk: *"The corrosion is occurring on the roof underside where uncoated plate and rafters are exposed to the crude oil vapors, humidity and blanket gas. Due to heavy snow loads, combined with other loads and internal corrosion, roof strength is a concern. Partial or cascading roof failure risks damage to the tank shell and tank integrity, including possible spillage of product."*[5] Alaska Anvil Inc. also concluded that: *"…snow loading at VMT imposes loading well beyond 'normal' API design criteria.*"

Earthquakes pose a major hazard in the Valdez area. Tank inspection intervals in Valdez should be more conservative to ensure a robust structure is in place that can withstand the largest anticipated earthquake. PWSRCAC considers this reasonable in light of the 1964 earthquake in Alaska, and the numerous large earthquakes in Alaska since that time.

In addition to the state's requirements, the federal government requires the *"frequency of and type of testing must take into account container size and design."*[6] As the crude oil storage tanks at the terminal have a capacity of more than 500,000 barrels each, container size must be considered when setting the internal inspection frequency of these tanks.

The Council does not believe other suitability for service factors have been given appropriate risk weighting by APSC in determining internal tank inspection intervals. PWSRCAC recommends that <u>all</u> tank risk factors be taken into account per suitability for service instructions found in API 653 when setting tank inspection intervals, not just tank floor conditions.

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[5] Valdez Marine Terminal Tank Roof Calculations, Alaska Anvil, Inc., APSC Project No. X052, November 1, 2002.

[6] *40 CFR 112.8 (c)(6) <u>Test each aboveground container for integrity on a regular schedule</u>, and whenever you make material repairs. The <u>frequency of and type of testing must take into account container size</u> <u>and design</u>…You must combine visual inspection with another testing technique such as hydrostatic testing, radiographic testing, ultrasonic testing, acoustic emissions testing, or another system of non-destructive shell testing. You must keep comparison records and you must also inspect the container's supports and foundations. <u>In addition, you must frequently inspect the outside</u> of the container for signs of deterioration, discharges, or accumulation of oil inside diked areas;*

The Council provided a similar internal tank inspection interval recommendation during the last 5-Year VMT C-Plan renewal (2013-2014). ADEC's November 21, 2014 Findings Document (Issue No. 9) concluded the proposed 20-year internal tank inspection intervals were in compliance with the API 653 industry inspection standard, but did not address any of the concerns raised by the Council above. Additionally, ADEC found "*the cost to APSC would not be outweighed by the benefit or increased inspection frequencies,"* but no economic or risk analysis was provided to support this conclusion.

RFAI #8a: *PWSRCAC requests ADEC provide a copy of the technical, regulatory, economic and risk analysis work completed to support its ADEC's November 21, 2014 Findings Document (Issue No. 9) and conclusion that the cost of more frequent tank inspections would not be outweighed by the benefit.*

The Council believes that ADEC has the regulatory authority and ample technical reasons to implement the Council's internal tank inspection interval recommendation. PWSRCAC requests the VMT C-Plan be revised to require more frequent tank inspection intervals.

Recommendation*: PWSRCAC requests all the information requested above be provided and the tank inspection program be revised to address the concerns raised herein and the amended plan be resubmitted for public review and comment.*

9. Volume 1, Part 2, Section 2.1.6.3, BWTF Leak Detection Monitoring

18 AAC 75.065(h)(1) requires field-constructed oil storage tanks to be equipped with leak detection or spill prevention systems, including the Ballast Water Tanks and the Recovered Crude Oil Tank in the Ballast Water Treatment System. To meet this standard, APSC has been using gauging systems. For the Ballast Water Treatment System tanks, APSC's currently approved VMT C-Plan includes four specific steps to meet this requirement:

1. *Operators record the levels and status of the BWT and recovered crude tanks every 4hours. The level readings are taken from an electro-mechanical tank level indicator.*
2. *At midnight, operators compare the ballast water effluent outfall flow meter reading to the total BWT tank drop (as recorded every 30 minutes on the VMT mainframe computer supervisory control system). If the two readings are not within ±5 percent, the BWT Control Room Operator will investigate the cause of the difference.*
3. *BWT operators record the beginning and ending tank levels of the BWT and recovered crude tanks every time a tank's on-line or off-line status is changed. This record enables the operator to account for tank volume changes.*
4. *Operators perform daily inspections inside the BWT and recovered crude tank secondary containment areas for leaks from tanks, piping, and valves. Running water or evidence of sheen around the tanks or piping indicates damage.*

APSC proposes to delete steps 1-3 from this renewal application and retain step 4 (visual leak observation only).

Recommendation: *PWSRCAC recommends retaining steps 1-3 to meet the gauging system requirement to ensure a tank bottom leak that may not be visible at the surface is identified in a timely manner. Alternatively, PWSRCAC recommends automated leak detection systems be installed on these tanks to routinely report tank levels to the automated control system.*

10. Volume 1, Part 2, Section 2.1.8, Facility Oil Piping Prevention Plan

18 AAC 75.425 requires the VMT C-Plan to include a Part 2 Prevention Plan to demonstrate compliance with 18 AAC 75.080 Facility Oil Piping regulations. 18 AAC 75.080 includes facility oil piping requirements that apply to VMT piping including crude oil piping, ballast water piping, industrial waste water system (IWWS), recovered crude oil piping and fuel lines, and any other piping containing oil or fuel at the terminal. 18 AAC 75.080 requirements depend on facility piping type, installation date, and location (aboveground or buried). Therefore, for the VMT C-Plan, Volume 1, Part 2, Section 2.1.8 to meet the informational requirements of 18 AAC 75, the C-Plan should to include specific information for the piping segments installed at the VMT for ADEC and the public to: (1) explain if there is facility oil piping that meets the piping type, installation date, and location requirements of 18 AAC 75.080 or if the facility oil piping is exempt from these requirements; and, (2) provide sufficient information on each applicable piping segment to demonstrate compliance with 18 AAC 75.080. PWSRCAC finds the proposed VMT C-Plan does not contain the information required by the regulations.

Volume 1, Part 2, Section 2.1.8 describes the VMT's Facility Oil Piping Plan. It does not provide sufficient and specific information on the amount, size, length, location, or type of facility oil piping that is covered by ADEC's regulations, or any indication on the amount of piping that is exempt. The VMT C-Plan does not provide any statistical, inspection, or compliance data on any facility oil piping at the terminal. Regulatory personnel or a member of the public do not have sufficient information on the type or how much facility oil piping is installed at the terminal, whether it is covered under the regulations, or whether it is exempt from regulation.

The VMT C-Plan offers almost no insight to the amount of piping installed in the 1970's (during original terminal construction), and offers no information on whether that piping has been repaired or replaced, or whether other piping has been added that may be subject to ADEC's piping regulations promulgated in the 1990's and 2000's. The VMT C-Plan should explain how much piping exists, which piping segments are subject to which state and federal requirements, and how those are met. However, this information is not contained in the plan.

Additionally, APSC offers no insight on the condition of the facility oil piping. APSC's plan describes moderate, high, and severe corrosion. The plan provides no indication of whether any VMT piping meets those definitions, and if corrosion is found, what has been done (or will be done) to repair or replace this piping. Instead, the VMT C-Plan provides the public with extremely limited, to no, information on the amount or condition of the facility oil piping. In this renewal application, APSC offers the same generic oil spill prevention program with no indication whether this program is working, whether it should be improved, or whether it meets best industry standards or practices for specific oil piping. The public has a right to know what piping is installed at the facility, the condition of the VMT piping, the potential for oil spill risk, and what APSC is doing to mitigate that risk.

Volume 1, Part 2, Section 2.1.8 offers a generic facility oil piping plan, referencing numerous internal company documents not available to the general public (see comments in #3 above) where reportedly additional facility oil piping prevention plan details may be found. Through PWSRCAC's contract with APSC, the latest versions of MP-166 referenced in Section 2.1.8 were obtained and reviewed by PWSRCAC. Those documents are equally generic, with no specific detail on the amount, type, date, or location of piping, and no specific information on the actual condition of the piping.

In the past, ADEC required APSC to provide more detailed information for crude oil and fuel oil tanks, but not for facility oil piping. It is inconsistent for ADEC to require certain information for oil storage tanks but not facility oil piping. There is nothing in state statutes or regulations that suggests detailed information is only required for tanks and not piping, nor do state regulations allow specific information on facility oil piping (under 18 AAC 75.080) to be withheld.

APSC is required to have a facility piping prevention plan (18 AAC 75.080) described in the VMT C-Plan, and meet specific requirements based on the installation date, type and installation location (buried or aboveground). Furthermore, 18 AAC 75.425 requires the VMT C-Plan to, *"contain enough information, analyses, supporting data, and documentation to demonstrate,"* APSC's ability to meet the requirements of 18 AAC 75.080. Absent table(s) detailing facility oil piping data, the C-Plan lacks information to know: (1) which piping has an applicable standard; (2) whether those piping segments are meeting the applicable standard; and, (3) how much piping was installed prior to the more stringent standards. It is impossible for the agencies and the public to know which piping is located at the facility, and how APSC plans to meet the 2tate's regulatory standard without listing the piping segments, providing basic structural and preventive data about the piping, and a providing technically sound plan for inspection, repair and/or replacement.

In 2014, ADEC concluded that VMT tanks subject to ADEC's regulations requiring compliance with API 653 must be listed in a table with sufficient technical data to identify the tank name, installation date, construction specifications, and the date of the last inspection, and date of next planned inspection. However, ADEC came to a completely different conclusion for facility oil piping that must comply with API 570 and other ADEC piping standards. Incongruously, ADEC decided the C-Plan could omit information on the amount and type of facility oil piping installed at the terminal, and that APSC did not have to submit information on the date that piping was installed, inspected, repaired or replaced, nor did APSC have to submit any planned dates for the next inspection. The C-Plan suggests this information can be found in the referenced operations manual MP-166, but that information is not found there. It is hard to understand how the agency requires this level of information for tanks, but does not require it for facility oil piping.

Without sufficient information regarding facility oil piping in the C-Plan, and ADEC's 2014 acknowledgement that it does not review the details of most of the prevention documents incorporated by reference (see ADEC 2014 Findings Document Issue No. 1), it is unclear how ADEC verifies facility piping compliance. Regarding the VMT C-Plan, in 2014 ADEC wrote, *"The department reviews and approves very few documents incorporated by reference and only in very specific instances."* It is not reasonable for the agency to approve a plan without reviewing documents incorporated by reference, or to approve a plan that provides no specific information on how state regulations are met for specific piping segments, especially for piping in such a risky environment.

During PWSRCAC's appeal of the 2017 VMT C-Plan amendment, APSC took the position that any information not contained in the VMT C-Plan (and submitted as part of the application) is not available to the public, even upon appeal during discovery. While PWSRCAC's counsel disagrees with APSC's position, it reinforces the importance of APSC clearly articulating within its VMT C-Plan application how it will meet each state and federal regulation, because APSC now claims that if it is not required to submit this information as part of the C-Plan application, it is not discoverable upon appeal. PWSRCAC finds the VMT C-Plan does not meet the basic requirements of 18 AAC 75.080, and that

ADEC would be unable to enforce the proposed generically offered program due to the lack of specific information and commitments in the plan.

RFAI #10a: *The VMT C-Plan should be amended to include table(s) listing each piping segment (including each crude oil, ballast water, recovered crude oil, vapor recovery, IWWS, and fuel piping). The tables(s) should provide sufficient information to demonstrate compliance with state and federal regulatory requirements. The table(s) should include each piping segment name, piping material type, installation date (age), diameter, length, buried/aboveground length, insulated/uninsulated length, inspection classification and inspection standard used (e.g. Class 1, 2, or 3 based on API 570), applied inspection methods (e.g. UT, ILI, radiographic, guided-wave), date of last inspection, date for next inspection, highest measured corrosion rate and associated inspection date (based on most recent inspection), corrosion threshold for repair or replacement, number of corrosion coupons, number of corrosion inhibitor injection locations, and type(s) of cathodic protection and/or protective coatings.*

RFAI #10b: *The VMT C-Plan should be amended to include annual reporting requirements to provide evidence that APSC is meeting the requirements of 18 AAC 75.080. The proposed C-Plan does not include specific information on piping integrity record keeping and reporting, more information is needed. The plan should clearly list the name of the report that will document the findings of each required inspection and monitoring program, and include routine provision of these findings in annual report(s) to the agencies and the Council.*

RFAI #10c: *The VMT C-Plan should be amended to include firm piping inspection dates and clear criteria for when the next inspection would be due or when maintenance, repair, or replacement would be required. Instead, the plan proposes those decisions be left to APSC alone without agency approval of when the inspections should take place, or any changes to the inspection plan. The Council does not support APSC's proposal to keep the piping integrity inspection schedule and corrosion control program in an internal company document that APSC can change without agency approval or public oversight. A member of the public reading this proposed C-Plan does not know how much piping of what type, age and condition exists at the terminal, or when it will be inspected, if inspections have been completed on time, and future plans for maintenance, repair, replacement, and when piping would be taken out of service due to integrity concerns.*

RFAI #10d: *The VMT C-Plan should be amended to include piping drawings showing each piping segment covered by regulation. Appendix B of the proposed C-Plan includes some piping drawings, but drawings are generally poorly labeled, not drawn to scale, marked confidential, and show no relation to nearby water, sensitive environment, or land features. For example, Appendix B, Figure B.1-5 (IWWS Piping) is completely blacked-out in the public review version as confidential information. There is a Ballast and Crude Piping Schematic (Appendix B, Figure B.1-3) that provides a very basic schematic of the facility piping, however, the drawing is not done to scale, lacks labels for piping and tank names, and has no information about piping length or size (diameter) or nearby land or water features. Figure B.1-3 does not show whether the piping is located above or below ground. This is critical information to ascertain regulatory requirements that differ for above/below ground pipe and for response personnel.*

Federal regulations require facility diagrams that mark the location of each tank and label the contents and all connecting pipelines.[7] State regulations require pipelines to be "*clearly marked*" on a facility diagram.[8] For comparison, the Council reviewed several North Slope C-Plans for oil and gas facilities with complex facility piping and found high quality Geographic Information System (GIS) diagrams drawn to scale with facility piping, tanks and facilities accurately and legibly-marked overlaying water and land features. *The VMT C-Plan should include facility diagrams of this quality.*

The proposed C-Plan only generically describes a variety of piping types and piping segments including: crude oil, ballast water, recovered crude oil, vapor recovery, industrial wastewater, fuel lines, firewater lines, and other piping systems. It is not clear which inspection, repair, replacement, or corrosion control method described in the text applies to which piping or how it meets the specific regulatory criteria that hinges on installation date and location (above ground or buried). Whenever piping is described in the VMT C-Plan, piping should be given a specific piping segment name to indicate piping service

Recommendation: *PWSRCAC requests all the information requested above be provided and the facility oil piping section be revised to address the concerns raise herein and the amended plan be resubmitted for public review and comment.*

11. Volume 1, Part 2, Section 2.1.10, Preventive Maintenance

Volume 1, Part 2, Section 2.1.10 states: "*APSC maintains a preventive maintenance database for VMT equipment and facilities*," and lists examples of preventive maintenance that might be performed. 18 AAC 425(e)(2)(A) requires: "*a description and schedule of regular oil discharge prevention…maintenance programs in place at the facility…*". Based on this regulation, the VMT C-Plan should provide a detailed list of routine, scheduled preventative maintenance. For example, the proposed plan states: "*berth loading arms are checked for functionality and leakage;*" but does not specify the frequency or method. The plan also states "*equipment is inspected for corrosion*," but there is no information on frequency or method. A robust preventative maintenance program is essential in preventing spills, and PWSRCAC requests a schedule of preventative maintenance be included in the plan in accordance with state regulations.

RFAI #11a: *Provide a detailed list of preventative maintenance items completed at the terminal for oil spill prevention which specifies the equipment, frequency, methods, and what action is taken when integrity problems are found.*

RFAI #11b: *Provide the name of the preventative maintenance database used for VMT equipment and facilities or recordkeeping and reporting systems used to document problems found and resolution.*

Recommendation: *PWSRCAC requests all the information requested above be provided and the preventive maintenance program be revised to address the concerns raise herein and the amended plan be resubmitted for public review and comment.*

[7] 40 CFR § 112.7 (a)(3) Describe in your Plan the physical layout of the facility and include a facility diagram, which must mark the location and contents of each fixed oil storage container and the storage area where mobile or portable containers are located. The facility diagram must identify the location of and mark as "exempt" underground tanks that are otherwise exempted from the requirements of this part under §112.1(d)(4). The facility diagram must also include all transfer stations and connecting pipes, including intra-facility gathering lines that are otherwise exempted from the requirements of this part under §112.1(d)(11).

[8] 18 AAC 75.425(e)(1)(H).

12. Volume 1, Part 2, Section 2.1.12, Surveillance and Monitoring

The proposed C-Plan, Volume 1, Part 2, Section 2.1.12 states APSC has a surveillance program to visually inspect the facility foundation and slope stability, leaks and spills, structural damage, encroachments and vandalism, and snow load damage. The plan does not provide specific information on surveillance plan methods, frequency, or what action is taken when integrity issues are found, nor does the plan provide specific information on recordkeeping or reporting methods. PWSRCAC is concerned that APSC proposes to remove the commitment to monitor foundations by periodic surveys from permanent benchmarks.

RFAI #12a: *The VMT C-Plan should include a complete description of the surveillance and monitoring items completed at the terminal for oil spill prevention including the equipment, frequency, methods and what action is taken when integrity issues are found. This information is missing.*

RFAI #12b: *The VMT C-Plan should include the name of the surveillance and monitoring database, or recordkeeping and reporting system used to document problems found and resolution. This information is missing.*

Recommendation: *PWSRCAC requests all the information above be provided and the surveillance and monitoring program be revised to address the concerns raise herein and the amended plan be resubmitted for public review and comment.*

13. Volume 1, Part 2, Section 2.3, Risk Assessment, Potential Discharge Analysis

18 AAC 75.425(e)(2)(C) requires "*an analysis of potential oil discharges, including size, frequency, cause, duration, and location, and a description of actions taken to prevent a potential discharge.*" Volume 1, Part 2, Section 2.3 *Potential Discharge Analysis* includes information from a risk assessment completed in 2001 and a limited risk assessment study completed in 2011. The 2011 risk assessment only examined incremental changes made at the terminal since 2001. The 2011 risk assessment study analyzed the risk associated with changes made to the terminal since 2001 but did not address the risk associated with the age and condition of the 40+ year old facility ("aging infrastructure'). Aging infrastructure and procedures in place prior to 2001 were not re-examined in 2011 to determine if the risk profile changed. Thus, the proposed 2019 C-Plan renewal application relies on an 18-year-old risk assessment with a minor update in 2011.

Det Norske Veritas (DNV), a respected international classification society, updated the risk assessment for APSC in two phases (one in 2009 and another in 2011), and identified nine recommendations for action. ASPC implemented a number of those recommendations, but did not implement DNV's recommendation "*to conduct a first principles risk assessment of the VMT.*" DNV found[9] that an incremental analysis of risk change since 2001 was insufficient to evaluate VMT risk, and that a comprehensive updated risk assessment was needed for the entire VMT facility. PWSRCAC agreed with DNV's assessment. Today, almost eight years later, these risk assessments have still not been updated. PWSRCAC requests these risk assessments be updated for oil spill prevention planning purposes.

[9] Letter from Mark Swanson (PWSRCAC Executive Director) to Joe Kuchin (APSC Senior Manager Valdez Operations), Regarding July 21, 2011 Meeting on Det Norske Veritas (DNV) Energy Report – VMT Oil Spill Risk Assessment Update – Phase 2, 651.105.110909.APSCdnvRA, September 9, 2011.

ADEC and BLM also expressed concerns about the risk assessments. BLM's 2013 Annual Approval of the VMT C-Plan raised questions about the need for an improved risk assessment. BLM's approval stated:

> *The BLM believes the adequacy of the existing risk assessments for the VMT needs review. This issue may be addressed during the ongoing DEC Plan Approval Process, however, if not, at a minimum, APSC should identify by November 30, 2014, all operational changes at the VMT not related to altered or modified systems or that have not been already analyzed for risk contributions. This list can then be used to determine whether there is sufficient cause to revisit the risk assessment during the next annual cycle.*[10]

ADEC 2014 Findings Document Issue No. 12 indicated that ADEC agreed that "*... it is prudent to identify potential impacts of changes in facility operations with changes to secondary containment, low flow conditions and aging infrastructure….*" but deferred to BLM for resolution.

Recommendation: *PWSRCAC requests ADEC and BLM follow DNV's advice and require APSC to conduct a first principles risk assessment of the entire VMT as soon as practicable, and revise subsequent C-Plans to include the results of the assessment, including the incorporation of specific oil spill prevention measure improvements identified and recommended.*

14. Volume 1, Part 2, Section 2.4.5, Docking Tugs

Volume 1, Section 2.4 describes conditions that might increase risk of discharge. 18 AAC 75.425(e)(2)(D) requires the C-Plan to describe navigational hazards and other site-specific factors that might increase risk of discharge and mitigating measures to reduce the risk. VMT C-Plan Volume 1, Section 2.4.5 describes vessel traffic, navigational hazards, and mitigation measures used, including use of docking tugs. The plan currently requires two docking tugs for tankers of 150,000 dead-weight tons or less, and three docking tugs for tankers of more than 150,000 dead weight tons, using tugs described in Volume 3, Appendix A. For example, VMT C-Plan Volume 1, Section 2.4.7 describes the importance of docking tugs as a spill mitigation method during high winds. APSC is proposing to delete the docking tug information in its renewal application with no justification. In addition, the tugs at the terminal use their bow winches for undocking the tankers.

Recommendation: *The Council does not support removal of docking tugs as docking tugs are a critical oil spill prevention measure, and requests docking tug information remain in the C-Plan.*

15. Volume 1, Part 3, Section 3.3, Command System

Proposed Volume 1, Part 3, Figure 3.3-1, *Valdez IMT*, does not match the actual staffing observed at drills needed to perform the duties required of the scenarios. The number of personnel shown in Figure 3.3-1 is important to capture accurately as this personnel count is used in Scenario 5 to estimate the number of personnel required for that scenario. Figure 3.3-1 assumes the IMT would only have 33 positions which does not reflect the 14 other

[10] December 20, 2013, United States Department of Interior, Bureau of Land Management, letter to APSC on Valdez Marine Terminal Oil Spill Contingency Plan Review – Annual Approval.

positions listed below that would be needed for a Scenario 5 spill. These positions are routinely filled and used by APSC/SERVS to resource large VMT spill response drills and exercises.

PWSRCAC has identified the following 14 positions missing from Volume 1, Part 3, Figure 3.3-1. While some of these positions are shown in later organization charts on Pages 3.3-9 through 3.3-12, those organization charts are not used to develop an IMT head count of 33 people used in Scenario 5. It is the only organization chart listed in Volume 1, Part 3, Figure 3.3-1 that is used to reach the 33-person count.

1. Deputy Section Chief positions for Finance and Logistics in the IMT structure;
2. Waste Management Task Force Leader in Operations;
3. Open-water Group Supervisor in Operations;
4. Nearshore Group Supervisor in Operations;
5. Onshore Group Supervisor in Operations;
6. On-land Group Supervisor in Operations;
7. Source Control Task Force Leader in Operations;
8. Firefighting Task Force Leader;
9. Safety Task Force Leader in Operations;
10. Communications Unit Leader in Logistics;
11. Computer Support Unit Leader in Logistics
12. Support Branch Unit Staff (to support air, vessel, security and facility units);
13. Planning Section (additional technical specialists and field observers); and
14. Operations Section (assistant to Nearshore Group Supervisor).

Adding 14 positions listed above brings the total count to at least 47 IMT personnel. This information should be corrected throughout the VMT C-Plan in all the organization charts and the resource tally charts that only list 33 people.

Table 3.3-1 *Incident Management Team Lead Personnel, Command, and General Staff Contact List* identifies a primary and an alternate person filling some of the IMT positions. Not all the positions listed in Figure 3.3-1 are listed in Table 3.3-1. Table 3.3-1 should be expanded to match Figure 3.3-1. The Council is concerned that APSC does not have the capability to adequately man an IMT for a major oil spill, especially in light of recent staff reductions.

The tables in this section are incomplete; the tables do not match the positions in the organization chart figures, nor do they list actual people that are trained and qualified to serve in that position with the necessary redundancy. The tables only list *"potential"* operating positions assigned by job type. Without names assigned, it is unclear if there are sufficient trained and qualified personnel to fill all these positions with redundancy for illness, business travel, vacation, or other absences. It also makes verification of response training difficult because no specific personnel commitment is made in the C-Plan.

RFAI #15a: *The VMT C-Plan should be revised to include complete organization charts, updated tables that list all the positions in the organization charts as indicated above, and maintain a roster of personnel that can be verified by regulators that there are sufficient trained and qualified personnel. The plan currently lacks this information.*

Recommendation: *PWSRCAC requests the correct number of IMT personnel is captured accurately throughout the plan and in the scenarios, and tables are updated accordingly. PWSRCAC requests all the information above be provided and command system and*

scenarios that rely on this personnel count information be revised to address the concerns raise herein and the amended plan be resubmitted for public review and comment.

16. Volume 1, Part 3, Section 3.9.4, Five Year Drill and Exercise Program

Volume 1, Part 3, Section 3.9.4 proposes a generic three-year drill schedule. During the last renewal, PWSRCAC recommended a more detailed five-year drill and exercise program similar to the one required by ADEC and BLM for the Trans-Alaska Pipeline (TAPS) C-Plan[11] be included in the VMT C-Plan, and that the program include winter and foul weather exercises.

> *ADEC Findings Document Issue No. 18: ADEC agrees a detailed exercise program (similar to the plan developed by APSC for TAPs would be beneficial), but will not require it. ADEC will work this issue within the VMT C-Plan Coordination Workgroup if APSC decides to pursue it.*

It is unclear why ADEC recognized a more detailed plan would be a benefit for TAPS, but not request the same details for the terminal plan. The Council reiterates the recommendation for a detailed drill and exercise program, and suggests ADEC require this improvement to be made as part of the renewal application revision process.

APSC proposes to eliminate the following information from Volume 1, Part 3, Section 3.9.4:

> ~~*A triennial drill schedule is maintained to meet PREP requirements. APSC provides a schedule to ADEC and routinely updates the schedule as necessary. The basis of this schedule is shown in Table 3.9-3.*~~

APSC provided no justification for deleting this information.

Historically, the VMT has conducted its two required drills per year during the summer or early fall months and has not introduced more challenging scenarios such as drills during the winter and spring seasons. Testing spill response only during favorable weather and during summer and early fall does not test APSC's capability or maintain APSC's proficiency to respond at a terminal that operates year-round. Advanced planning will ensure a variety of drill types are conducted over this period.

Additionally, field and IMT activities are often conducted on separate days as separate events, such as the August 2018 exercise. While only one of the required exercises must have a field component, both exercises must have an IMT component. PWSRCAC requests the field component be run at the same time as the IMT function, consistent with how it would work in an actual spill response. Exercising both field and IMT components simultaneously would add realism to exercises, and allow communication systems to be tested. If IMT and field activities are run separately, the Council suggests that field demonstration be held first, and these timing numbers be used with the IMT process that following day, as field operations and field data drive the IMT process, not the other way around. During the recent August 2018 VMT exercise, certain field operations took much longer than the IMT played them out to be.

PWSRCAC requests a detailed five-year drill and exercise program similar to the one required by ADEC and BLM for the Trans-Alaska Pipeline (TAPS) C-Plan be developed and

[11] APSC, Oil Spill Response Exercise Program for the Trans-Alaska Pipeline System, January 1, 2012 to December 31, 2016.

included in the VMT C-Plan to address the concerns raise herein and the amended plan be resubmitted for public review and comment. PWSRCAC recommends this plan include:

PWSRCAC recommends the following drills and exercises be considered:

- ***Drainage 58**: Deployment exercises to test improved Drainage 58 boom and anchor systems and additional skimming capacity tactics.*

- ***Edison Chouest Offshore (ECO) Transition and Post-Transition:** Continue to conduct exercises that test equipment and crew capability to work in all conditions at the VMT. This is critical with ECO as the new marine service provider.*

- ***Operating in Darkness and Dense Fog:** Exercise in periods of reduced visibility, including exercising fishing vessels, response crews, and advanced spill tracking equipment.*

- ***Sensitive Area Protection & Nearshore Response:** Exercise both nearshore and sensitive area protection. Nearshore response systems are designed to intercept and recover oil as it gets close to shore by working the leading edge of the spill. Sensitive area protection is needed to get out ahead of the spill and boom sensitive areas before the oil reaches those areas. It is important to realize the goals of these exercises are different despite similar and/or shared resources and management.*

- ***Sensitive Area Protection:** The new addition to the Valdez boat harbor will change the Valdez Duck Flats protection scheme, so exercising this is important.*

- ***Nearshore Response:** Continuing to exercise fishing vessels with available equipment is critical.*

- ***Unannounced Exercises**: PWSRCAC recommends the practice of unannounced exercises continue, including further testing in darkness and cold, in PPE, using radio communications with PPE, and decontamination.*

- ***Technical Manual Tactics:** PWSRCAC recommends an effort be made to systematically exercise each of the tactics in the VMT Technical Manual, especially in light of ECO as the new marine service provider.*

- ***Fishing Vessels:** PWSRCAC recommends exercises be conducted to verify availability of vessels and crews during periods when most fishing vessels are inactive in the winter months. Additionally, opportunities are needed for fishing vessel to become and remain response proficient.*

17. Volume 1, Part 4, Section 4.3, Best Available Technology (BAT) Source Control Piping

Volume 1, Part 4, Section 4.3 provides APSC's BAT review for source control procedures for a leak from piping and crude oil tanks. Table 4.3-1 *Source Control Procedures for a Leak – Piping* proposes two source control methods to control a spill from a leaking pipe at the VMT. Method 1 uses valves to isolate the pipe contents. Method 2 involves temporary pipeline patching/repair.

According to Section 4.3 of the plan, a key element of source control BAT is "*prompt detection of an oil discharge*." However, Section 4.3 lacks information on the BAT leak detection method for each piping segment, clarification on whether there is an automated leak detection system installed on the piping, the name of the system, and what technology is used to promptly detect a leak. There is no information on the time required to detect the leak, the sensitivity of the leak detection system, and the amount of oil or fuel that may be spilled prior to piping isolation. Since it is a crucial part of piping source control, this technical information should be included in this BAT review section.

Without specificity, the proposed BAT analysis provides an overly broad analysis pertaining to all piping at the terminal with no specific BAT assessment. The BAT analysis does not specify which piping is under consideration, or which method would apply to which piping. Some terminal piping is installed above ground and some is located below ground. Some piping may have isolation valves installed, some may not (e.g., Method 1 would not be a BAT method for piping without isolation valves; therefore, the plan needs to make clear which piping this method would even work on). Some piping is buried, and Method 2 would be a very slow and ineffective source control method. PWSRCAC suggests consideration be given to a faster method of evacuating the piping contents (this method is not discussed at all in the source control section).

More technical information is needed to understand the site-specific BAT methods proposed for the VMT to make better informed recommendations for improvement, or to assess the adequacy of current piping source control methods. The piping source control BAT analysis needs to be specific to the equipment it addresses.

The following discussion provides some detailed context regarding why more technical information is needed to describe piping source control BAT methods.

Source Control Method 1 proposes pipeline isolation valves to control the spill. However, it is unclear: (1) which VMT piping segments have isolation valves installed; (2) where the isolation valves are located on each piping segment; and (3) how effective this source control method would be at containing oil in various VMT piping segments. If isolation valves are not installed, this method would not work. A BAT assessment that concludes isolation valves are BAT is an incomplete assessment until the plan holder verifies it has actually installed BAT-quality isolation valves on each of the terminal piping segments. Isolation valves installed a long distance away from each other (with a piping leak in between) may not be effective in achieving source control if the leak continues to gravity drain or leak under pressure between the isolation valves. A technically solid BAT assessment should include more information on the location, type and spacing of these isolation valves, and the amount of oil that could actually be controlled using this method (this would take into account pipe capacity, pressure, elevation and terrain, etc.).

Source Control Method 1 does not address removing oil or fuel from a leaking pipe once isolated valves have been shut. Shutting in isolation valves may only be the first step in source control. Oil or fuel could continue to leak from the piping by gravity drainage or under pressure through the leak location between the isolation valves. The source is not controlled until the oil or fuel stops leaking; therefore, the BAT Source Control method must assure the "source" is actually controlled. Because trapped oil or fuel could continue to leak unabated (even when isolation valves are shut), the method must include isolation (to immediately arrest incoming flow) combined with a method to rapidly remove pipe contents to a point where the leak source is controlled. A source is not controlled if it continues to leak.

Source Control Method 2 presupposes the piping can be rapidly accessed; however, buried piping or piping under insulation may not be immediately accessible or provide rapid source control. This is the case for much of the terminal piping. Until the insulation can be removed or the buried piping excavated, it is critical that source control is achieved by removing the oil in the line so it does not continue to leak unabated while the temporary patch/repair is completed. Since Method 2 is only applicable to some VMT piping, information should be included in the BAT analysis describing the piping segments where it is effective and piping segments where it is not effective.

The BAT analysis of isolation valves needs to provide specific details on whether the valves are installed on piping segments, where the isolation valves are installed, and how a leak located between isolation valves would be controlled until gravity drainage and pipeline pressure dissipates.

RFAI #17a: *More information is needed to make specific recommendations for BAT improvements at the VMT. PWSRCAC requests this BAT section be revised to address the concerns raised herein and provide for additional public review and comment. A summary of the information improvements to be included follow:*

- *APSC should verify isolation valves are actually installed on all piping segments since this is APSC's primary BAT Source Control Method for piping. Isolation valve installation and type should be confirmed.*

- *PWSRCAC recommends that any newly installed isolation valves be automated, remotely operated motorized valves as those features are BAT, and this commitment be listed in the plan.*

- *The BAT analysis should address piping that does not have isolation valves, valves set too far apart, and/or valve upgrades or replacements (due to age and condition). Alternate BAT methods should be specified for that piping in the plan.*

- *The volume of oil that could be trapped between two isolation valves using Method 1 should be computed for each VMT piping segment. This information could be used to optimize isolation valve distance and identify piping locations where isolation valves should be installed.*

- *Evaluation of BAT methods needs to consider removal of oil trapped between isolation valves where source control still has not been achieved as oil continues to leak due to pressure dissipation or gravity drainage.*

- *Evaluation of BAT methods needs to consider to removal of oil trapped in buried or insulated piping where Method 2 would be delayed or impossible.*

- *Inclusion of table(s) listing the name of each piping segment, piping length, diameter, age, leak detection, and source control method currently installed be added to the plan. These table(s) should indicate whether the piping segment is installed above ground or buried, whether it is insulated, where isolation valves are installed, if the isolation valves are manually operated or remotely operated motorized valves, the age and condition of the isolation valves, and identify locations that can be tapped to remove oil during a source control operation. The type of isolation valves installed is important to understand*

the time it would take to isolate the piping segment, and the potential spill volume before valve actuation.

- *The only alternative BAT method evaluated was use of a 48-inch clamp. This alternative only applies to 48-inch piping; it does not provide an alternative BAT assessment for any other smaller diameter piping at the terminal. Alternative BAT analysis for source control of smaller diameter VMT piping should be conducted.*

18. Volume 1, Part 4, Section 4.3, BAT, Source Control for Fuel Storage Tanks

Volume 1, Part 4, Section 4.3 provides APSC's BAT review for fuel tank source control. Table 4.3-3 *Source Control Procedures for a Leak – Fuel Storage Tank* proposes two fuel tank source control methods. Method 1 involves de-inventorying the tank into another tank or tanker truck. Method 2 involves spilling fuel into secondary containment. No other alternative methods are considered.

This BAT analysis is not specific to the equipment it addresses. For example, do each of these methods apply to all the diesel and gasoline tanks at the VMT? Without specificity, the proposed BAT analysis provides an overly broad analysis pertaining to fuel tanks at the terminal with no tank-specific BAT assessment.

RFAI #18a: PWSRCAC has concerns with Method 1. APSC ranks Method 1 as *"feasible,"* but then goes on to explain the infeasibility of Method 1 for some tanks stating: *"this may not be practical for some tanks that are remotely located where there is no spare tankage in which to discharge." Specific information is needed in the plan to explain for which fuel tanks Method 1 is BAT, and for which fuel tanks this method is not feasible.*

RFAI #18b*: For tanks where Method 1 is infeasible, another environmentally sound method needs to be proposed.*

The Council does not support Method 2 which is the proposal to let oil spill into secondary containment. The Council opposes allowing fuel to spill into a lined secondary containment area that may not be impermeable based on the evidence currently available regarding the integrity of the catalytically blown asphalt (CBA) liner.[12] Additionally, PWSRCAC opposes any source control method where fuel would be moved outside of containers where hydrocarbon vapors could be reasonably controlled.

RFAI #18c: *More information is needed to make specific recommendations for BAT improvements at the VMT. PWSRCAC requests this BAT section be revised to address the concerns raised herein and provide for additional public review and comment. A summary of the information improvements to be included follows:*

- *Specific information is needed in the plan to explain for which fuel tanks Method 1 is BAT, and for which fuel tanks this method is not feasible.*

[12] This information is contained in four reports written by Golder Associates regarding catalytically blown asphalt liner testing that was conducted in the East Tank Farm from 2015-2017. In particular, the results of the visual testing show that existing damage was found in at least 18.6 percent of excavations uncovering the buried catalytically blown asphalt liner. This evidence supports the Council's hypothesis that more existing damage likely exists elsewhere in the liner where it has not yet been uncovered and visually examined.

- *There are no tactics in the VMT Tactics Manual for de-inventorying fuel tanks as a source control method. If this fuel tank source control method is actually planned for use, such tactics should be included in the VMT Tactics Manual, and the fuel tanks that can be controlled using this method should be listed.*

- *The BAT analysis should list each fuel tank and explain which de-inventorying method (e.g., into another tank or into a tanker truck) is feasible for that tank, where the fuel would be transferred to, the potential rates of transfer, and the time it would take to empty the tank.*

- *Limited information is provided on fuel tank transfers in Volume 1, Part 1, Section 1.6.7.2; however, this section does not provide the fuel transfer pump rate, the time it would take to de-inventory any specific tank, the rate or time it would take to transfer fuel to tanker trucks, or the availability of tanker trucks and pumps to do this work. There is no information on whether APSC owns these tanker trucks and pumps, or whether APSC would contract for them, where this equipment is located, or how long it would take to procure this equipment.*

- *Remove Method 2 and replace it with an environmentally sound alternative that safely transfers fuel and mitigates air pollution and prevents the possibility of hydrocarbon leakage to ground water and soils. The BAT analysis only considered removal of fuel already contained in a tank, and did not consider BAT methods to arrest inflow of oil into a leaking or overfilling tank. BAT source control methods should include consideration of tank fill shutdown valves that are automatically activated by an overfill alarm. This equipment is used in other regulated tank facilities in Alaska.*

19. Volume 1, Part 4, Section 4.3, BAT, Source Control for Crude Oil Tanks

Volume 1, Part 4, Section 4.3 provides APSC's BAT review for crude oil storage tank source control. The Council appreciated ADEC's acknowledgement during the last C-Plan renewal that the BAT analysis was deficient because it did not provide a BAT method to de-inventory the crude oil tanks if a tanker was not present at berth or a method to transfer oil from a lower elevation tank to a higher elevation tank. The Council appreciates the improvements made to Table 4.3-2 *Source Control Procedures for a Leak – Crude Oil Tank* to address the Council's concern that a method is needed to move oil from a lower elevation tank to a higher elevation tank. Method 2 now describes use of existing crude oil transfer pumps (55-P-1A and B) to pump oil from lower elevation tanks to higher tanks. However, the pump transfer rate is only 7,430 barrels per hour per pump. While this is an improvement over the prior BAT assessment, PWSRCAC recommends APSC install additional crude oil transfer pumps.

Existing crude oil transfer pumps (55-P-1A and B) were installed in the 1970's are now over 40 years old. The combined transfer rate is 14,860 barrels per hour for these two old pumps. It would take about 34 hours for a tank of approximately 510,000 barrels of oil (typical maximum fill level) to be transferred at 14,860 barrels per hour. This transfer rate is about six times longer than the transfer rate (up to six hours) to transfer a tank by gravity feed to a lower tank or tanker where the transfer rate is estimated to be approximately 100,000 barrels per hour.

Table 4.3-2 *Source Control Procedures for a Leak – Crude Oil Tank* includes an Alternative Method to add an additional crude oil transfer pump capacity of 14,860 barrels per hour which would reduce the time it would take to complete the tank-to-tank transfer from 34

hours to 18 hours. Adding pump capacity would be prudent for two reasons: (1) it would expedite source control, and (2) would provide new, redundant pump capacity to either supplement or replace pump capacity if the existing 1970 vintage pumps fail during an emergency. It is PWSRCAC's understanding that the estimated cost of installing these pumps is $3.5 million and is compatible with existing operations. It is not clear why this BAT option was not adopted, and the Council recommends ADEC require this BAT option.

The Council strongly opposes Method 3 which allows hydrocarbons to be intentionally spilled into secondary containment.[13] Additionally, PWSRCAC opposes any source control method where oil would be moved outside of containers where hydrocarbon vapors could be reasonably controlled.

RFAI #19a: *More information is needed to make specific recommendations for BAT improvements at the VMT. PWSRCAC requests this BAT section be revised to address the concerns raised herein and provide for additional public review and comment. A summary of the information improvements to be included follow:*

- *Add pump capacity*
- *Remove Method 3 and replace it with an environmentally sound alternative that safely transfers oil and mitigates air pollution and prevents the possibility of hydrocarbon leakage to ground water and soils.*

20. Volume 1, Part 4, Section 4.3, BAT, Source Control for Other Tanks Containing Oil

Volume 1, Part 4, Section 4.3 does not include a BAT source control method for the Ballast Water Treatment Facility's (BWTF) gravity separation and recovered oil tanks. A BAT source control analysis is needed for the BWTF gravity separation and recovered oil tanks. The Council raised this concern during the last renewal, but this concern was not addressed.

RFAI #20a: *More information is needed to make specific recommendations for BAT improvements at the VMT. PWSRCAC requests this BAT section be revised to address the concerns raised herein and provide for additional public review and comment.*

21. Volume 1, Part 4, Section 4.4, BAT, Trajectory Analyses and Forecast

VMT C-Plan, Volume 1, Part 4, Section 4.4 describes APSC's planned BAT approach for real-time oil spill trajectory analysis and forecasting. APSC proposes a combination of: (1) human visual surveillance and hand calculations; (2) tracking buoys; and, (3) the use of real-time surveillance data input into a computer-based predictive trajectory model. APSC is currently using the Oil Spill Model and Response System (OILMAP) for its computer-based predictive trajectory model.

Volume 1, Part 4, Section 4.4.2.1 states APSC plans to use visual surveillance and hand calculations as one BAT method and describes the importance of wind moving oil at three percent of the wind speed. However, this method does not address water current data.

[13] CBA liner integrity is addressed in four reports written by Golder Associates regarding catalytically blown asphalt liner testing conducted in the East Tank Farm from 2015-2017. In particular, the results of the visual testing show that existing damage was found in at least 18.6 percent of excavations uncovering the buried catalytically blown asphalt liner. This evidence supports the Council's hypothesis that additional damage may exist elsewhere in the liner where it has not yet been uncovered and visually examined.

Water current speed and direction are the primary drivers of oil movement on the water (oil moves at 100 percent of the current's speed). The Council recommends the BAT assessment stress the importance of collecting water current speed and direction data for use in hand computations and model inputs to more accurately predict the trajectory forecast during an actual oil spill.

Volume 1, Part 4, Section 4.4.2.3 describes the OILMAP model. APSC lists this model as BAT, however, PWSRCAC questions whether this model is BAT for Port Valdez. Expert work completed by Dr. Merv Fingas during the VMT C-Plan 2017-1 Amendment Administrative Appeal suggests that OILMAP severely under-predicts oil spreading in Port Valdez. Dr. Fingas' work verified OILMAP: (1) does not accurately model water current speed and direction near the terminal; (2) under-predicts oil spreading thus failing to accurately predict the timing and location of oil movement in Port Valdez; and, (3) under-predicts the timing and location of oiling environmentally sensitive and economically important areas.

The scenarios in the VMT C-Plan use OILMAP to develop oil trajectory maps. As explained in the Council's comments on Scenarios 4 and 5, OILMAP does not accurately map the potential oil spill impact area and produces oil spill trajectories that severely underestimate likely oil movement and provide unrealistic assessments of oil spread.

RFAI #21a: *More information is needed to make specific recommendations for BAT improvements at the VMT. PWSRCAC requests this BAT section be revised to address the concerns raised herein and provide for additional public review and comment. Specifically, this revision should address the following:*

- *BAT analysis for trajectory analyses and forecast be updated to address the concerns raised above, and ADEC work with APSC to improve or replace OILMAP to provide a more accurate method for predicting oil spill trajectories.*
- *All water current speed and direction data collected by APSC be cited in the VMT C-Plan; be provided to the Council as part of this review; be considered in all the Scenario modeling; and be documented in Volume 1, Part 3, Section 3.4 and in this BAT analysis.*

22. Volume 1, Part 4, Section 4.6, BAT, Crude Oil Tank Leak Detection

18 AAC 75.065(h)(1) requires field-constructed oil storage tanks be equipped with a system "*that an observer from outside the tank can use to detect leaks in the bottom of the tank.*" VMT crude oil tanks are *"field constructed oil storage tanks"* that can contain over a half-million barrels (over 22 million gallons of crude oil) each. Without a BAT leak detection system, crude oil could leak undetected through the tank bottom.

In Volume 1, Section 2.1.6.3, APSC offers a gauging system that is not accurate enough to detect a slow, continuous leak through the tank bottom that falls below the +/- 3,000 barrels (126,000 gallons) system detection threshold and cannot rapidly identify which tank is leaking.

In Volume 1, Part 4, Section 4.6 and Volume 1, Section 2.1.6.3, APSC proposes continued use of its tank gauging system without improvement. However, ADEC BAT regulations require periodic review of such systems to determine whether previously approved tank leak detection systems are BAT.

Volume 1, Part 2, Section 2.1.6.3 states a tank bottom leak would only be visually detected if oil seeped to the surface or was evident in the snow. This conclusion presumes oil would

leak through the tank bottom and be captured in lined secondary containment and pool around the tanks to been seen visually or smelled.

Volume 1, Part 2, Section 2.1.6.3 states:

> *The ground in secondary containment areas around each tank is normally frozen (during winter) or covered with a layer of water.* ***There is no specific tank-bottom leak detection system; however, leakage from a tank may be visible on the surface or in the snow****. Olfactory recognition may replace visual in the case of very deep snow. [Emphasis added].*

A crude oil tank leak detection system that does not trigger until a leak of more than 126,000 gallons has spilled and/or has created a large enough pool of oil around the tank that it can be seen or smelled is not best technology.

18 AAC 75.065(h)(1)(A) requires oil storage tanks placed into service before May 14, 1992 to have:

> *A leak detection system that an observer from outside the tank can use to detect leaks in the bottom of the tank, such as a secondary catchment under the tank bottom with a leak detection sump, a* ***sensitive gauging system*** *or other leak detection system approved by the department.*

APSC's tank gauging system does not trigger a leak until more than 126,000 gallons of oil has been spilled and cannot identify which tank has the leak is not a "sensitive gauging system." Rather, it must fall under the category of another leak detection system approved by the department (18 AAC 75.065(h)(1)(D)).

Use of a cathodic protection system (18 AAC 75.065(h)(1)(B)) is not a leak detection method. Tank bottom crude oil leak detection cannot be satisfied by a cathodic protection system, as that system does not detect leaks; it protects the tank from corrosion.

PWSRCAC assumes the current gauging system offered by APSC falls under 18 AAC 75.065(h)(1)(D). As such, a BAT analysis is required under 18 AAC 75.425(e)(4)(A)(ii) following the instructions in 18 AAC 75.425 (k)(3) for an eight-prong BAT analysis. Neither APSC nor ADEC appear to dispute this interpretation as APSC includes an eight-prong BAT analysis in Volume 1, Part 4, Section 4.6, and ADEC requires it.

Therefore, the issue is whether the BAT analysis in Volume 1, Part 4, Section 4.6 is complete, or whether there are additional BAT technologies that can, and should, be considered. The Council finds this BAT analysis incomplete and recommends alternate BAT methods be evaluated for installation and use. PWSRCAC is particularly concerned about the need for accurate leak detection systems on the crude oil storage tanks due to the known secondary containment system integrity issues and the currently approved long internal tank inspection intervals. As indicated elsewhere in these comments, there is no assurance a crude oil tank bottom leak would not leak through the liner to the subsurface groundwater.

The current gauging system is not accurate enough to detect a slow, continuous leak through the tank bottom that falls below the +/- 3,000 barrels (126,000 gallons) system detection threshold, and because the system relies on a combined 14 tank volume balance, it is slow to identify which of the 14 crude oil tanks might be leaking. For example, the

overall system net gain or loss is calculated every 30 minutes and is monitored by OCC each hour. The C-Plan states the anomaly is only investigated if the leak rate exceeding +/- 3,000 barrels occurs in a one-hour period for the overall system. This seems to imply oil could leak through the tank floor undetected if the leak rate is less than 3,000 barrels every hour (or 3,000 barrels cumulative in a 24-hour period). While the system examines the cumulative leak potential and alerts the OCC Controller if a cumulative leak of 3,000 barrels is indicated within 24 hours, it could potentially allow a slow-release spill of up to 126,000 gallons before the OCC Controller is prompted to resolve the discrepancy.

Volume 1, Part 2, Section 2.1.6.3 proposes that in the event a 3,000-barrel leak is indicated, "*the OCC Controller resolves the difference by verifying tank level gauge readings, meter accuracies, and measurement of cargo loaded aboard tankers.*" This work could take substantial time and delay source control and spill response actions, leading to more oil spilled before action is taken. The C-Plan then proposes that if the OCC Controller is unsuccessful in resolving the inventory discrepancy, APSC management will be notified for further review. This process, while reasonable for checking meter and gauge anomalies, would further delay source control and spill response actions in the event of a spill or leak without visual indication.

While briefly mentioned in the narrative of Section 4.6.1, the proposed BAT analysis in Table 4.6-1 *Prevention and Control System for Existing Tanks* did not examine known, proven tank bottom leak detection systems. For example, among others, one proven alternative for consideration is a double tank bottom (a new tank floor installed over the existing tank floor with an interstitial space for hydrocarbon monitoring with a leak detection and monitoring system placed between the existing floor and a newly installed tank floor called interstitial monitoring). In the introductory narrative in Section 4.6.1, APSC indicates that *"tank double bottoms"* were considered along with other leak detection systems, but ultimately decided not to include such an analyses as part of the BAT review because they determined such methods *were "not well proven in the TAPS operating environment and too disruptive for an existing installation."* Double tank bottoms have been installed in other existing installations and should be further analyzed in the BAT section.

Other tank farms in Alaska have installed double tank bottoms, and other improved leak detection options could be considered for use at the terminal. PWSRCAC recommends APSC evaluate all these BAT options. Other gauging systems could be evaluated to identify leaks at a lower threshold than 3,000 barrels (126,000 gallons) and accurately and quickly identify which of the 14 tanks is actually leaking (the current system does not). Instead, the current system involves an arduously slow and complex inventory reconciliation and management review before any action is taken to even identify which tank is leaking and control the spill source.

This concern was raised in the 2014 VMT C-Plan renewal. ADEC's 2014 Finding No.11 acknowledged the Council's concern, but did not require APSC to take any action.

The Council disagreed with ADEC's 2014 finding on this matter. 18 AAC 75.425(e)(4)(A)(ii) requires a BAT assessment for tank leak detection systems of 18 AAC 75.065(h)(1)(D), using 18 AAC 75.445(k)(3).

It is unreasonable for a terminal of this size to operate 40+ year old tanks with a tank-bottom leak detection system that can only identify a leak after 126,000 gallons of oil is spilled, and cannot identify which of the 14 large crude oil tanks the leak is coming from unless oil is pooling around the tank and is visually discovered by staff on their monitoring

rounds. Improved BAT assessment of tank leak detection systems for this terminal is needed.

RFAI #22a: *Please confirm the correct numbers are included in* Table 4.6.1 *Prevention and Control System for Existing Tanks.*

RFAI #22b: *More information is needed to make specific recommendations for BAT improvements at the VMT. PWSRCAC requests this BAT section be revised to address the concerns raised herein and provide for additional public review and comment.*

23. Volume 1, Part 4, Section 4.9, BAT, Aboveground External Corrosion Control

Volume 1, Part 4, Section 4.9, Table 4.9-2 *Aboveground External Corrosion Control Technologies* provides APSC's BAT review of aboveground external control technologies. This analysis does not explain how BAT is actually applied to specific facility equipment and piping at the terminal. The proposed BAT analysis puts all equipment and piping into one table, and provides an overly broad analysis with no specific BAT assessment by equipment and piping segment. Specifying BAT but being unclear about where that BAT is actually applied defeats the purpose of assigning BAT requirements in a C-Plan. It is unclear if all current methods shown in each table are applied to all piping and equipment, or if only some of the methods are used on some of the piping and equipment. Which method is actually BAT for that specific VMT equipment or piping? There is insufficient information to verify compliance and understand specifically where, on what specific equipment, the selected BAT method is actually used. For example, Table 4.9-2 *Aboveground External Corrosion Control Technologies* states that APSC requires metallic coatings, polymeric protective coatings, tape wrapping, and primer paste coatings; however, it is unclear if these BAT methods are applied to all piping, or if only some of the methods are used on some of the piping (more information is needed). Fusion Bond Epoxy Coating is clearly BAT and should not be listed as an *"alternate method."* APSC needs to clearly explain which existing pipe can benefit from Fusion Bond Epoxy Coating and which will be upgraded to meet this BAT standard. It appears that APSC will use Fusion Bond Epoxy Coating on all new pipe, but that needs to be clear in the final plan.

RFAI #23a: *More information is needed to make specific recommendations for BAT improvements at the VMT. PWSRCAC requests this BAT section be revised to address the concerns raised herein and provide for additional public review and comment.*

24. Volume 1, Part 4, Section 4.10, BAT, Internal Corrosion Control

Volume 1, Part 4, Section 4.10, Table 4.10-1 *Internal Corrosion Control Technologies* provides APSC's BAT review for internal corrosion control technologies. Similar to BAT for aboveground external corrosion control above, this analysis does not explain how BAT is actually applied to specific facility equipment and piping at the terminal. The proposed BAT analysis puts all equipment and piping into one table and provides an overly broad analysis, with no specific BAT assessment by equipment and piping segment. Specifying BAT but being entirely unclear about where that BAT is actually applied defeats the purpose of assigning BAT requirements in a C-Plan. It is unclear if all current methods shown in each table are applied to all piping and equipment, or if only some of the methods are used on some of the piping and equipment. Which method is actually BAT for that specific VMT equipment or piping? There is insufficient information to verify compliance and understand specifically where, on what specific equipment, the selected BAT method is actually used. For example, Table 4.10-1 states that APSC requires chemical

injection (inhibitors and biocides), internal coatings, and internal linings; however, it is unclear if these BAT methods are applied to all piping or if only some of the methods are used on some of the piping. More information is needed.

RFAI #24a: *More information is needed to make specific recommendations for BAT improvements at the VMT. PWSRCAC requests this BAT section be revised to address the concerns raised herein and provide for additional public review and comment.*

25. Volume 1, Part 4, Section 4.12, BAT, Corrosion Surveys of Buried Metal Pipe

Volume 1, Part 4, Section 4.12 provides APSC's BAT review for corrosion surveys of facility buried metal piping containing oil.

The Council recommends that the non-destructive, in-line inspections of buried metal piping, utilizing both smart pigs and robotic crawler tools equipped with magnetic flux leakage sensors, be addressed in a table within this section. Not only are these methods technically and economically viable, but they have been used by APSC at the VMT since 2016 on buried crude oil piping.

RFAI #25a: *More information is needed to make specific recommendations for BAT improvements at the VMT. PWSRCAC requests this BAT section be revised to address the concerns raised herein and provide for additional public review and comment.*

26. Volume 1, Part 4, Section 4.13, BAT, Cathodic Protection Surveys

Volume 1, Part 4, Section 4.13, Table 4.13-1 *Cathodic Protection Survey Technologies* provides APSC's BAT review of cathodic protection survey technologies. This BAT analysis does not clearly explain the proposed program for different portions of the facility equipment and piping at the terminal. The proposed BAT analysis lumps all equipment and piping into one table and provides an overly broad analysis with no specific BAT assessment by equipment and piping segment. It is unclear if all current methods shown in each table are applied to all piping and equipment, or if only some of the methods are used on some of the piping and equipment. For example, Table 4.13-1 states that APSC requires a multiplicity of corrosion testing and monitoring methods including rectifier readings, test point potential survey, and close interval potential. However, it is unclear if these BAT methods are applied to all piping, storage tanks, and equipment, or if only some of the methods are used on some of the piping, storage tanks, and equipment.

This version of the BAT analysis removed or altered some of the time commitments for this work; those changes are not redlined but were found by comparing this draft to prior VMT C-Plan versions. This is problematic as any changes made to the plan before it is approved by regulation must be clearly shown in the renewal submission version of the plan in order for the public and regulatory authorities to be able to accurately review the current and proposed plans.

RFAI #26a: *The Council recommends that the cathodic protection survey time commitments be retained in the plan in order to address this problem, and further, that this BAT section be improved and resubmitted for additional review and comment. All changes should be indicated as required by 18 AAC 75.408(c)(7). This recommendation incorporates the information above.*

27. Volume 2, Scenario 2, Sensitive Area Protection

Volume 2, Scenario 2 involves a 50-barrel (2,100 gallon) oil spill from a failed tanker loading arm clamp at Berth 4 at 7:00 PM in October. Visibility is poor, and there is sleet, rain and snow.

Table 2.1-1 *Scenario 2 – Overall Objectives* states the Overall Objectives include protection of sensitive resources (including environmentally and economically sensitive resources). The Solomon Gulch Hatchery is located approximately two miles from the terminal and meets the criteria of an environmentally and economically sensitive resource.

The Solomon Gulch Hatchery and Valdez Duck Flats Sensitive Area Protection Mobilization Decision Matrix for Scenario 2 scores a 28, meaning protection is recommended for both the hatchery and Duck Flats. However, Table 2.1-3 *Scenario 2 – Day 1, Response Actions and Tactics* contradicts the Decision Matrix and instead states: *"Hatchery protection evaluated but no threat exists."* Figure 2.3-1 mobilizes a sensitive area protection strike team (SAP ST1) to protect the Duck Flats, and mobilizes a second sensitive area protection strike team (SAP ST2) but does not use that strike team to protect the hatchery.

In September 2017, the terminal suffered a 146-gallon oil spill. Both the hatchery and Duck Flats were protected. The volume in Scenario 2 of 50 barrels (2,100 gallons) is more than 20 times larger than the September 2017 spill. It does not make sense for APSC to propose no hatchery protection for a 50 barrel (2,100 gallon) spill, when in reality, it would (and did) deploy both Duck Flat and hatchery protection for a smaller spill.

One of the Operations tactical objectives for both Days 1 and 2 (in Table 2.1-2. *Scenario 2 - Day 1, Tactical Objectives* and Table 2.2-1.*Scenario 2 - Day 2, Tactical Objectives)* in this scenario is to "*Maximize use of vessels for sensitive area protection*". However, in Hours 0-5, only six support vessels are assigned to sensitive area protection, and by Hours 12-24 only one support vessel is being used for sensitive area protection. Only two sensitive area sites are identified for protection throughout this scenario even though other Geographic Response Strategies (GRS) sites are closer to the spill area than the Duck Flats. APSC's fishing vessel program would be mobilized during the initial five hours but not used in the scenario response.

RFAI #27a: *Please explain how having one support vessel dedicated to sensitive area protection after Hour 12 accomplishes the objective "Maximize use of vessels for sensitive are protection".*

RFAI #27b: *PWSRCAC requests Scenario 2 be revised to provide immediate protection for the Solomon Gulch Hatchery using sensitive area protection strike team (SAP ST2). PWSRCAC requests this section be revised to address the concerns raised herein and provide for additional public review and comment.*

28. Volume 2, Scenario 4, Response Improvements Recommended

Volume 2, Scenario 4 depicts a 59,000 barrel (2,478,000 gallon) spill to Port Valdez marine waters from a Berth 5 pipe leak. PWSRCAC has identified a number of concerns with this scenario (in no particular order) as follows:

1. Scenario Assumption Justification. Scenario 4 involves a spill that occurs during the month of March. Scenario assumptions need further technical and scientific justification as

weather varies throughout the day and is rarely consistent over a 72-hour period (as proposed in the scenario). Favorable sustained wind conditions (north-east winds of 7 knots) were selected, and an ebb tide moving water away from shore at 0.5 knots was used. There is no information provided on the water current speed and direction which are critical when developing oil spill trajectory maps. APSC did not provide NOAA or other oceanographic or meteorological data or analysis to support its selected model input variables, nor reference recently completed work such as Dr. Shelton Gay's circulation study in Port Valdez. PWSRCAC recommends this work, as well as any work completed by APSC be referenced. Scenario 4 also lacks information on ice conditions in Port Valdez and along the shoreline. Ice can impede spill response operations, particularly reaching and connecting shore anchor points, and can reduce response effectiveness for boom and skimming systems.

RFAI #28a: *The Council requests APSC develop more realistic assumptions for Scenario 4 to reflect actual variation in March weather based on historical oceanographic or meteorological data, and provide supporting evidence for the assumptions.*

2. Opposition to Use of 2017 SGH/VDF Decision Matrix. PWSRCAC, City of Valdez, PWSAC and VFDA filed an administrative appeal on VMT C-Plan Amendment 2017-1 that proposed to remove the 1997 Solomon Gulch Hatchery (SGH) and Valdez Duck Flats (VDF) Sensitive Areas Protection Mobilization Decision Matrix from Volume 3, Table 9.0-1 *Solomon Gulch Hatchery and Valdez Duck Flats Sensitive Area Protection Mobilization Decision Matrix* and Scenario 4, and replace it with a 2017 Matrix which did not provide the same level of protection to the SGH and VDF. On December 29, 2017, former ADEC Commissioner Hartig agreed with VFDA and stayed the 1997 Decision Matrix, deciding the 1997 Decision Matrix would remain in force during the pendency of the appeal. During a mediated settlement in December 2018, the parties agreed to retain the 1997 Decision Matrix until an alternative is agreed upon through a collaborative process. Therefore, the 1997 Decision Matrix scoring system should be returned to Scenario 4, and the Scenario be revised to immediately protect the SGH and VDF. Execution of the settlement agreement is still underway, however, the agreement in principle was to remove the 2017 Decision Matrix and return the 1997 Decision Matrix until ADEC makes a final decision on Duck Flats and Hatchery protection after the collaborative process is complete.

The proposed application uses the 2017 Decision Matrix for Scenario 4 resulting in delaying boom to protect SGH and VDF when approximately 2.5 million gallons of oil is spilled in Port Valdez. Scenario 4 proposes no immediate SGH or VDF response, even though these environmentally sensitive and economically important areas are located only two miles and four miles away from the terminal respectively. Based on the scoring from the 2017 Decision Matrix, it is not until the 12-24-hour operational period that resources are deployed to boom SHG, and booming is not complete until 24-36 hours after the spill. It is not until the 36-48-hour operational period that resources are deployed to boom VDF, and booming is not complete until the 48-60 hours after a spill. History clearly shows that during the substantially smaller 1994 *Eastern Lion* oil spill of 8,400 gallons (295 times smaller than Scenario 4), oil spread both east and west, reaching the SGH in 18 hours and the VDF in 36 hours. Using the approach offered in Scenario 4, these sensitive areas would not be protected before oil reaches them.

APSC proposes no immediate SGH or VDF response for a Scenario 4 spill of approximately 2.5 million gallons of oil, yet proposes to immediately boom the VDF for a 2,100-gallon spill in Scenario 2. The Council supports immediate protection in Scenario 2 for both the VDF and SGH, but does not support delaying boom for SGH and VDF for a substantially

larger oil spill (1180 times larger).

RFAI #28b: *PWSRCAC recommends in accordance with former Commissioner Hartig's December 29, 2017 stay, the VMT C-Plan renewal application should be revised to include the 1997 Decision Matrix, and adjust the scenarios to rapidly protect the SGH and VDF using the 1997 Decision Matrix scoring. PWSRCAC requests this scenario be revised to address the concerns raised herein and provide for additional public review and comment.*

3. Increase Number of Sensitive Area Protection Strike Teams (SAP ST). Scenario 4 assigns three SAP STs, yet there are over a dozen sensitive areas in Port Valdez that would likely be impacted by a 59,000-barrel spill that reaches marine waters including SGH, VDF, Valdez Small Boat Harbor, Seal Island, Mineral Creek, Gold Creek, Shoup Bay, Mineral Flats, Valdez Narrows, Anderson Bay, Seven Mile Beach, Sawmill and Salmon Creeks, Allison Creek, Lowe and Robe Rivers, etc. State regulations require C-Plan holders to both protect environmentally sensitive areas and areas of public concern (per 18 AAC 75.445(d)(4)) and ensure there are resources for containment, control, recovery, transfer, and storage to clean up a Response Planning Standard (RPS)-sized spill (per 18 AAC 75.445(d)(5)). According to state regulations, ASPC is required to have sufficient resources to clean up the spill and have sufficient resources to simultaneously protect all sensitive areas that would likely be impacted if a discharge occurred, and that may be reasonably expected to suffer an impact from a spill of the response planning standard volume. There is nothing in regulations that allows a plan holder to sacrifice protection of one area by limiting the number of SAP ST to protect only a few of the many sensitive areas as time allows.

Scenario 4 is also deficient in identifying and putting to use available response resources. There are approximately 40 contracted vessels in Valdez, with roughly half of these being Tier 1 who could respond to a spill within in six hours. It is not clear why those resources are not used to protect sensitive areas.

PWSRCAC is concerned that current Scenario 4 modeling inaccurately under-predicts the speed and magnitude of Port Valdez oiling that is likely to occur in a spill of this size. The first step is to remedy the oil spill trajectory modeling problems (as recommended below) to develop a more accurate estimate of sensitive area impact timing, and assign sufficient SAP STs to ensure protection before oiling occurs at these sites.

In a significant oil spill such as Scenario 4, all Port Valdez sensitive areas will require protection. A plan should be in place for simultaneous protection of all these areas, as well as oil recovery at the leading edge of the spill. Scenario 4 currently lacks a rapid and immediate plan to protect all Port Valdez sensitive area sites. Sensitive Area Protection Strike-Team 1 (SAP ST1) is assigned to boom Seal Island and then protect Seven Mile Beach. SAP ST2 is assigned to protect Sawmill and Salmon Creeks, then is sent to boom SGH, then the VDF. SAP ST3 is not even operational until about hour 12 and finally heads to protect Anderson Bay. This approach uses too few Sensitive Area Protection Strike Teams, and takes too long to protect environmentally and economically sensitive areas nearby; these areas will be oiled before they are protected.

RFAI #28c: *Scenario 4 should be revised to include sufficient resources to protect all environmentally sensitive areas before oil reaches those areas. PWSRCAC requests this scenario be revised to address the concerns raised herein and provide for additional public review and comment.*

4. Oil Spill Trajectory Modeling Underestimates Spill Impact. The Council is concerned

that modeling methods used in Port Valdez incorrectly underestimate spill size and spread, and produce inaccurate trajectory maps. Dr. Merv Fingas, an expert in oil spill trajectory modeling; and Vince Mitchell, an expert oil spill response consultant with 13 years of experience working for APSC in Port Valdez; Susan Harvey, PWSRCAC's consultant; and PWSRCAC staff reviewed the proposed changes to the assumptions in Scenario 4 and the revised oil spill trajectory modeling. The following concerns and requests for additional information were identified:

Information is needed to support proposed wind speeds and directions. Volume 1, Table 3.4-2 *Wind Speed Data – Valdez, Alaska* provides Valdez wind speed and direction data showing the prevailing wind direction from 1992-2006. Table 3.4-2 data is out of date. NOAA has more recent data for Port Valdez that should be used.[14]

RFAI #28d: *More information is needed to support proposed wind speeds and directions as no justification is provided. Volume 1, Table 3.4-2 should be updated and APSC should provide scientifically sound justification for Scenario 4 wind speed and direction assumptions used in the trajectory modeling. PWSRCAC requests this scenario be revised to address the concerns raised herein and provide for additional public review and comment.*

The selection of water current speed and direction in Scenario 4 needs further justification. An ebb tide (outgoing) of 0.5 knots is assumed in Scenario 4. Volume 1, Section 3.4 *Realistic Maximum Response Operating Limits (RMROL)* [*18 AAC 75.425(e)(3)(D)*]) does not provide any specific technical data on Port Valdez water currents.

RFAI #28e: *APSC should provide specific technical data in Volume 1, Section 3.4 and justify the assumptions used for water current speed and direction in Scenario 4. The Council requests a copy of the scientific data collected by APSC to support the water current speed and direction assumptions by season, including current meter data collected with the new tugs. PWSRCAC requests this section be revised to address the concerns raised herein and provide for additional public review and comment.*

Trained and qualified spill responders know that oil typically moves at 100 percent of the water current speed and direction and only three percent of the wind speed; therefore, it is critically important that the oil spill modeling correctly and accurately model water current speed and direction. APSC uses OILMAP to produce its oil spill trajectory models, and that program contains a water current speed and direction algorithm.

It appears OILMAP's water current speed and direction algorithm severely underestimates the water current speed near the terminal and is inconsistent with reported 0.5 knot assumption proposed for Scenario 4. Instead, it appears OILMAP's algorithm unrealistically assigns a *"dead zone"* of approximately 0.05 knots in front of the terminal that artificially predicts spilled oil will stagnate in front of the terminal. This contradicts APSC's proposed 0.5 knot scenario assumption, because it appears OILMAP is not actually using a 0.5 knot water current speed estimate throughout Port Valdez and near the terminal. Rather, it appears OILMAP artificially assigns a very low water current near the terminal. This is inconsistent with stronger water current data collected in Port Valdez that shows currents of one knot or more are common, moving marine waters in a counter-clockwise pattern. It is misleading and inaccurate if the scenario assumptions list a 0.5 knot water current and actually use a lower water current speed inside the OILMAP model.

[14] https://tidesandcurrents.noaa.gov/met.html?id=9454240

***RFAI #28f**: The Council requests information be provided on OILMAP's water current speed and direction algorithm and a copy of the scientific data used to develop that algorithm. PWSRCAC requests this section be revised to address the concerns raised herein and provide for additional public review and comment.*

Vince Mitchell is an oil spill response expert with over 30 years of direct oil spill prevention, preparedness and response experience, and has specific Port Valdez and VMT experience working for APSC in Port Valdez as Vessel Operations Team Leader, Mechanical Response Team Leader, Oil Spill Specialist, and Vessel Supervisor for over 13 years. Mr. Mitchell was the owner and operator of a charter fishing company operating two vessels out of Valdez for 16 years. In Mr. Mitchell's experience, water currents near the terminal exceeded 0.5 knots and frequently were 1.0 knots and greater. Mr. Mitchell finds the proposed Scenario 4 modeling and assumptions significantly underestimate oil spread due to substantially underestimated water current and speed values used in OILMAP.

Austin Love, PWSRCAC staff, has been working in Port Valdez for three years conducting environmental monitoring research at the Valdez Marine Terminal deploying near-shore environmental monitoring equipment, collecting mussel samples onshore, and collecting sediment samples from the seafloor. Mr. Love's experience offshore Saw Island (west side at Berth 4), Jackson Point (east side near Berth 3), and about 200 yards offshore of Berth 4 during May, June, July, September and December, has involved a wide range of water current experiences from fairly calm to strong. Mr. Love concludes the proposed Scenario 4 modeling may significantly underestimate oil spread due to underestimated water current speed and inaccurate direction assumptions.

As currently modeled, the Council believes Scenario 4 significantly underestimates the impact of oil spread in Port Valdez and the impact to environmentally sensitive areas such as the Solomon Gulch Hatchery, Valdez Duck Flats and other sensitive sites.

***RFAI #28g**: Additional information is needed to accurately model water current speed and direction to ensure oil spill trajectories in Scenario 4 are not artificially underestimating oil spill spread and impact zones.*

***RFAI #28h**: No Scenario 4 vapor modeling was provided to support the 10 ppm benzene estimate. The Council requests a copy of the vapor modeling work completed for Scenario 4.*

***RFAI #28i**: The selection of wave height assumption in Scenario 4 needs further justification. Volume 1, Section 3.4 does not provide any specific technical data on Port Valdez wave heights. The Council requests a copy of the scientific data collected by APSC to support their wave height assumptions.*

Spill trajectory modeling provided in Scenario 4 shows silvery-gray to dark gray shading to indicate oil spill trajectory spread. Proposed oil spill trajectory maps significantly underestimate oil spread to the north, east, and west. APSC's proposed oil spill trajectory maps at Hour 12 artificially assume oil is either captured in, recovered, or remains thickened and stacked against the terminal shoreline, and that no significant oil sheen occurs by Hour 12. PWSRCAC does not agree with this assessment. PWSRCAC's calculations show that a significant amount of oil would have likely escaped containment by Hour 12 (depending on how quickly the oil travels within the Port and how quickly the boom is deployed), and that oil would travel north, west, and east with tidal fluctuations, wave action, and the typical counter-clockwise Port Valdez current. Escaped oil would not remain thickened and stacked along the terminal shoreline (as shown in APSC's proposed

trajectory). Instead, it is expected the oil would spread quickly into a thin sheen in Port Valdez. In the 1994 *Eastern Lion* oil spill (295 times smaller than Scenario 4), sheens were observed to the east and west ends of Port Valdez. Oil spill trajectory mapping developed for Scenario 4 that assumes no significant oil sheens in the first days is highly unlikely. Figure 4.1-4 *Scenario 4, 24-Hour Spill Trajectory with Containment Booming and Recovery* on p. 4.1-6 shows very little oil sheen in Port Valdez, no oil at Berth 4, and no oil northwest and northeast of Seal Island.

Additionally, Scenario 4 shows no response resources are assigned to recover the leading edge of the spill to the north (Berths 4 and 5) or to the east.

RFAI 28j: *The Council recommends oil spill trajectory planning assumptions be improved using local knowledge from mariners, fishermen, and local residents, coupled with NOAA data and other oceanographic and meteorological data to include more representative ranges of weather conditions and how those conditions vary during each day and over the 72-hour period. Oil spill trajectory mapping should be revised to more accurately show the area that would actually be oiled. PWSRCAC requests this scenario be revised to address the concerns raised herein and provide for additional public review and comment.*

5. Inadequate Offshore Recovery Resources. Additional skimming capacity would be needed to keep up with spilled oil volumes in Scenario 4. In reality, currents of 0.5 knots or higher coupled with wave heights of 2-3 ft. and wind would spread oil much farther than modeled. As indicated above, oil movement in Scenario 4 is not accurately modeled. Instead, APSC's modeling assumes oil stagnates along the terminal shoreline and to the west. Scenario 4 assumes an immediate release of 59,000 barrels into Port Valdez, and by hour 12, only a very small fraction of that oil has been recovered (6,600 barrels). Maximizing offshore oil recovery early in the spill is critical to protecting sensitive areas and areas of public and economic importance. "*Maximize the use of mechanical resources to minimize the impact of spilled oil*" is an objective in Vol. 2, Scenario 4, Table 4.2-2 *Scenario 4 - Day 2, Response Actions*, yet it does not appear that all on-water resources available to APSC/SERVS would be used. In a real oil spill, the Unified Command would require APSC to use the entire APSC/SERVS inventory and call in additional resources from numerous response organizations in and around Prince William Sound. It is highly unlikely that high capacity skimming barges would sit on anchor at Naked Island and Port Etches, and that none of the other Alaska oil spill response organizations would join in the response. Scenario 4 needs to be revised to bring all available assets to bear, including calling in other Alaska response resources which would be done in a real event.

Improvements are needed to offshore oil recovery resources early in the spill response in Scenario 4. APSC/SERVS has response resources on contract that should be assigned to offshore recovery to improve Scenario 4. More skimming capability would be needed and additional on-water task forces should be added. Oil will likely escape booming, and could be transported out of Port Valdez and into Prince William Sound and the Gulf of Alaska before boom is installed. Boom containment inefficiencies may result in oil spreading to the north, west and east. Oil spill recovery task forces would be needed at the north and east sides of the spill's leading edge.

As currently planned, Scenario 4 only assigns two Crucial Barges (OWTF1 and OWTF2) with a combined de-rated capacity of 2,516 bbls/hr, plus OWTF5 (700 bbls/hr), and OWTF7 (396 bbl/hr) for a total recovery rate of 6,588 bbls/hr the first response operating period (Hours 0-11). There are more open water task forces available in Valdez that could be assigned which would be expected in a real spill. Again, it is unlikely to assume several open water

task forces would be left idle after a significant oil spill. Other oil spill response organizations would likely be called out to respond. Scenario 4 states that operations begin evaluating out-of-region resources right away (Table 4.1-2 *Scenario 4 - Day 1, Tactical Objectives*); however, Scenario 4 is silent after that on out-of-region resource arrival and use.

***RFAI #28k**: Scenario 4 should be revised to maximize oil recovery using any and all resources available. This recommendation incorporates information above. PWSRCAC requests this scenario be revised to address the concerns raised herein and provide for additional public review and comment.*

6. Nearshore Response Resources. Nearshore response is delayed until Hour 12 (one task force) and the other task force is not operable for a full day. There are approximately 40 contracted vessels in Valdez, with roughly half of these being Tier 1 vessels who could respond within in six hours.

***RFAI #28l:** PWSRCAC recommends Scenario 4 be revised to expedite nearshore response asset activation. PWSRCAC requests this scenario be revised to address the concerns raised herein and provide for additional public review and comment.*

7. Dedicated Solomon Gulch Hatchery and Valdez Duck Flats Protection. Scenario 4 assigns Sensitive Area Protection Strike Team 1 (SAP ST1) to deploy Sawmill Creek and Salmon Creek for protection, and then routes this task force to SGH Sensitive Area Protection, and eventually to VDF protection. This delays SGH protection by a day and delays VDF protection by two days. SGH and VDF booming can take 10 hours to deploy and oil escaping containment boom can rapidly spread to these locations.

***RFAI #28m**: Protection of SGH or VDF should be prioritized earlier in the scenario as these sites are located only two and four miles away from the terminal, respectively. PWSRCAC requests this scenario be revised to address the concerns raised herein and provide for additional public review and comment.*

8. Oil Escaping Port Valdez through the Narrows. Scenario 4 does not address the possibility that oil reaches open water, escapes the Port of Valdez, and reaches Valdez Narrows and Prince William Sound. In the event that oil escapes the Port of Valdez, response would be needed in downstream communities.

***RFAI #28n**: The scenario should be revised to identify response measures that would be implemented if oil escaped the Port of Valdez. Response measures should be identified that would be implemented if the oil were to travel further into Prince William Sound and threaten downstream communities. PWSRCAC requests this scenario be revised to address the concerns raised herein and provide for additional public review and comment*

9. Personnel Count and Organization Charts. A careful review of personnel count is needed to ensure there are sufficient personnel assigned to the scenario to carry out the tasks listed. Historically, PWSRCAC has participated in drills/exercises where substantially more personnel were physically required to carry out Scenario 4 than are listed in the plan. Complete ICS Organization Charts for Scenario 4 used to be in the C-Plan for each major operational period (Days 1, 2, 3) of the 72-hour spill response. That way, it was possible to verify which positions were assigned and personnel could be tracked during drills and exercises. Some of this important information has been removed from the C-plan, and it is much more difficult to track APSC's personnel commitment. The Council is concerned

about the decrease of positions at the terminal due to APSC restructuring, and is particularly concerned about how this reduction in onsite personnel may impact the ability to staff an IMT for a Scenario 4-sized spill, especially in the first day.

RFAI #28o: *Full organization charts should be included in all scenarios. Scenario 4 only includes a fraction of the personnel required. A full set of personnel and organization chart information should be provided to verify sufficient personnel are available to respond down to the unit and strike team levels. PWSRCAC requests this scenario be revised to address the concerns raised herein and provide for additional public review and comment*

29. Volume 2, Scenario 5, RPS and Prevention Credit

Scenario 5 is the State of Alaska's Response Planning Standard (RPS) scenario. 18 AAC 75.432(b) requires the RPS oil spill volume to be from the largest tank which is Tank 11. For oil terminal facilities with *"sufficiently impermeable secondary containment with a dike capable of holding the contents of the largest tank,"* 18 AAC 75.432(d)(4) allows a 60 percent prevention credit to reduce the RPS volume.

Volume 1, Part 5, Section 5.1 *Calculation of the Applicable Response Planning Standard* provides APSC's proposed RPS calculation. The volume of Tank 11 is 548,281 barrels which is the starting point for the RPS volume. APSC receives a five percent credit for drug and alcohol testing, and a two percent credit for in-line leak detection system, reducing the RPS volume from 548,281 barrels to 510,450 barrels when credits are applied. APSC also receives a 60 percent prevention credit for a sufficiently impermeable secondary containment liner to further reduce the RPS from 510,450 barrels to 204,180 barrels.

ADEC requires secondary containment systems to be sufficiently impermeable.[15] ADEC regulations at 18 AAC 75.990(124) define "sufficiently impermeable" to mean:

> *…for a secondary containment system, that its design and construction has the* ***impermeability necessary to protect groundwater from contamination*** *and to contain a discharge or release until it can be detected and cleaned up; for design purposes for a new installation, "sufficiently impermeable" means using a layer of natural or manufactured material of sufficient thickness, density, and composition to produce* ***a maximum permeability for the substance being contained of 1 x 10-6 cm per second at a maximum anticipated hydrostatic pressure****, unless the department determines that an alternate design standard protects groundwater from contamination and contains a discharge or release until detection and cleanup…*[16]
> [Emphasis added.]

From past work that was done to repair the Industrial Waste Water System (IWWS) in the East Tank Farm, there is sufficient evidence to show the CBA liner installed at the crude oil tank farm does not meet the state's *"sufficiently impermeable"* standard. For example, in 2016 during an opportunistic inspection of the CBA liner in Dike Cell 4 where the liner was uncovered during another maintenance activity, APSC found at least 4,000 square feet (sq. ft.) of cracked liner. This damage was not created during the overburden removal. The liner cracks were present prior to excavation. While some of the cracks were surface cracks, others penetrated through the liner. Other inspections have found multiple instances

[15] 18 AAC 75.075 (a)(2). Secondary containment requirements for aboveground oil storage tanks.

[16] 18 AAC 75.990 (124) Definition of sufficiently impermeable.

where the liner was either superficially or critically damaged (e.g., holes, gaps, or cracks all the way through the liner).

The CBA liner is opportunistically exposed and inspected when other work is underway in the East Tank farm. These opportunistic inspections have consistently found significant damage like openings, holes, gaps, or cracks that go all the way though the liner, as well as superficial damage like indentations. Such damages are categorized as "existing" damage, meaning they were present prior to any of the excavation work done to uncover the buried CBA liner. This is different from damage that may be caused during the excavation itself.

A very small percentage of the CBA liner in the East Tank Farm has been visually inspected in the last five years. From 2014 through 2017, approximately 23,000 sq. ft. of CBA liner was visually inspected in the East Tank Farm.[17] The total area covered by secondary containment liners in the East Tank Farm is 2,372,853 sq. ft.[18] Not all of that area is underlain with CBA liner, some is covered with other liner types such as XR-5 geomembrane and Hypalon. PWSRCAC does not know the exact percentage covered by CBA liner, XR-5, and Hypalon respectively, but has been informed by APSC that most of that area has a CBA liner. Therefore, if at least 80 percent of the total area is underlain by CBA liner, only about 1.2 percent of the CBA liner in the entire East Tank Farm was visually inspected from 2014 through 2017.

From 2014 through 2017, Alyeska made a total of 43 excavations to accommodate IWWS repair work in the East Tank Farm. The CBA liner was inspected in parallel with that repair work where adjacent CBA liner was uncovered. Various types of damage were found during visual inspection of the exposed CBA liner. Some of the damage was confirmed to have caused a through hole, crack, or gap in the liner. Eight out of the 43 total excavations (18.6 percent) revealed existing holes, cracks, or gaps that went <u>all the way through</u> the CBA liner. Some of those excavations had multiple existing holes, cracks, or gaps. The holes and gaps ranged in size from as small as 0.09 sq. ft. (4-inch diameter hole) to as large as 8.33 sq. ft. (20 by 60-inch rectangle). One of those eight excavations exposed a cracked area of CBA liner covering at least 4,000 sq. ft., some of which were superficial and some which had penetrated through the liner. Based on the 2014-2017 East Tank Farm inspection findings, 18.6 percent of the liner was damaged all the way through, meaning there is solid evidence that the liner does not meet the state's sufficiently impermeable standard or the federal impervious standard.

State and federal governments under the Stipulations for the Agreement and Grant of Right-of-Way for the Trans-Alaska Pipeline also require secondary containment systems to meet a more stringent *"impervious"* standard:

> *3.11.1 Permittees shall provide oil spill containment dikes or other structures around storage tanks at pump stations and at the Valdez terminal…such structures shall be constructed to withstand failure from earthquakes in accordance with Stipulation 3.4 and* ***<u>shall be impervious</u>*** *so as to provide* ***<u>seepage-free storage</u>*** *until disposal of their contents can be effected safely without contamination of the surrounding area…*[19] [Emphasis added.]

[17] This value was calculated from information contained in reports by Golder Associates to Alyeska Pipeline Service Company pertaining to liner inspections that occurred from 2014 through 2017.
[18] Alyeska Pipeline Service Company. April 4, 2016. Government Letter No. 34904. Attachment 2.
[19] Exhibit D Stipulations for the Agreement and Grant of Right-of-Way for the Trans-Alaska Pipeline, Section 3.11.

Section 24 of the Grant and Lease includes a duty to abate any physical or mechanical procedures, event or condition that could adversely affect the environment.[20] Grant and Lease Stipulation 1.2.3 requires "full" compliance with the agreement and stipulations; Stipulation 3.11.1 requires impervious secondary containment systems *("seepage-free")*; Stipulation 2.2 requires compliance with pollution control measures; and Stipulation 3.9.1 requires operations to be conducted to avoid or minimize environmental impact.[21]

In the past, the Council has inquired about BLM's interpretation of its requirement for *"*impervious and seepage-free*"* secondary containment. BLM reported that "impervious and seepage-free" means no escape of hydrocarbons through porous material or small holes. BLM staff have explained the liner would be considered *"*impervious and seepage-free*"* as long as it could contain oil for the time required to clean up a spill. Past CBA liner testing in the lab has shown a thick, undamaged section of liner could hold oil for a wide range of days (the shortest duration, worst case being 3 days) before hydrocarbons would damage the liner and leak through it. Based on the 2014-2017 inspection data provided above that identifies an 18.6 percent through hole damage percentage, oil would leak through the liner much faster than the lab testing predicted for undamaged liner. There is no scenario in the proposed plan that demonstrates APSC can clean up the worst case discharge spilled to a damaged secondary containment before oil would leak through it and impact the soil and ground water.

EPA regulations also require secondary containment systems to be impervious:

> *40 CFR 112.8 (c)(2) Construct all bulk storage tank installations (except mobile refuelers) so that you provide a secondary means of containment for the entire capacity of the largest single container and sufficient freeboard to contain precipitation.* ***You must ensure that diked areas are sufficiently impervious to contain discharged oil.*** [Emphasis added.]

Based on the 2014-2017 inspection results, it does not appear that the CBA liner installed at the VMT meets the Grant of Right-of-Way and EPA secondary containment standards.

Volume 1, Part 2, Section 2.1.7 of APSC's C-Plan asserts the CBA liner meets the state and federal secondary containment requirements for hydrocarbon storage,[22] yet the data provided is evidence to the contrary.

Since July 31, 2008, APSC has operated under a Notice of Violation (NOV) for crude oil storage tank secondary containment failures related to the IWWS system.[23] On August 28, 2014, APSC and ADEC entered into a Compliance Order by Consent (COBC) to establish

[20] Agreement and Grant of Right-of-Way for the Trans-Alaska Pipeline, Section 24.
[21] Exhibit D Stipulations for the Agreement and Grant of Right-of-Way for the Trans-Alaska Pipeline.

[22] A CBA liner is installed under all Crude Oil Storage Tanks and Ballast Water Treatment Storage Tanks. The CBA liner is located below grade and serves as the base of the containment system. The walls of the Crude Oil Storage Tank Secondary Containment System are made of soil covered by geomembrane liner and concrete; the CBA is attached to the geomembrane or concrete at the base of the wall. The walls of the Ballast Water Treatment Storage Tanks Secondary Containment System are made of soil covered by geomembrane liner and exposed bedrock; the CBA is attached to the geomembrane liner or exposed bedrock at the base of the wall.

[23] ADEC Notice of Violation, Rebecca Spiegel (ADEC) to Joseph Robertson (ASPC), Failure to Comply with State Regulations for Secondary Containment for Crude Oil Storage Tanks, Valdez Marine Terminal (VMT) Oil Discharge Prevention and Contingency Plan (C-Plan), ADEC Plan No. 08-CP-4049, July 31, 2008.

specific requirements to bring the IWWS System into compliance.[24] While APSC has made the requested repairs the IWWS system in the East Tank Farm, the CBA liner itself has only been repaired as damage is found, and inspections have continuously revealed damage to the CBA liner.

PWSRCAC has repeatedly raised concerns with APSC and regulators about whether the CBA liner type, age, and condition meet the state and federal secondary containment liner standards after over four decades of use. In 2012, for example, PWSRCAC sent a letter to ASPC, with a copy to the agencies, requesting the integrity of the CBA liner be verified and shown to meet both state and federal requirements.[25] PWSRCAC submitted formal written comments on the last five-year C-Plan renewal (2013-2014) on this topic. The State responded that work on the IWWS system was underway and it did not have sufficient evidence to revoke the 60 percent prevention credit, yet no evidence was provided to verify the 60 percent prevention credit was earned and warranted. The Council requests ADEC either verify the 60 percent prevention credit is warranted, or reconsider the 60 percent prevention credit.

In 2018, PWSRCAC undertook a project to investigate the feasibility of non-destructive testing methods. PWSRCAC's geotechnical contractor, Geosyntec Consultants, Inc., identified one prominent technology that is commercially available and used to test buried secondary containment liners called "electrical leak location testing." That method has also been previously identified by APSC's own geotechnical contractor, Golder Associates, for potential consideration. Both geotechnical contractors came to similar recommendations that APSC should conduct a field test at the VMT in order to prove the use of electrical leak location testing given the environmental and as-built conditions at the facility, as well as the unique characteristics of a buried catalytically blown asphalt liner at the VMT. Geosyntec also identified tracer gas testing as another non-destructive test method that could be effectively used to evaluate the integrity of the CBA liner. However, to date, none of these non-destructive liner testing methods have been implemented or field-tested at the VMT.

Any effort to reevaluate the 60 percent prevention credit should consider that damage in the CBA liner can be caused by two primary pathways - mechanical and chemical. Mechanical damage includes holes and tears made from heavy equipment, shovels, rocks, etc. Mechanical damage has been identified or hypothesized as the cause of both existing and excavation-related damage observed in the CBA liner in the East Tank Farm. Since the liner is made of asphalt, it is also susceptible to chemical degradation from prolonged contact with hydrocarbons like crude oil and diesel fuel. As recent chemical durability testing done by Golder Associates has shown, prolonged contact (184 days or less) with crude oil can dissolve apparently defect-free samples of CBA liner to the point where it is no longer impermeable. Since there are multiple known instances of hydrocarbon contamination that have existed for many years in the East Tank Farm, there are regions of the CBA liner that may have been significantly damaged due to chemical degradation over time. Additionally, during the 2014-2017 work to repair the IWWS in the East Tank Farm, previously unknown or undocumented hydrocarbon contamination was found. Therefore, any ADEC effort to reconsider the 60 percent prevention credit should consider both of

[24] Alaska Department of Environmental Conservation, Compliance Order by Consent, In the Matter of State of Alaska, Department of Environmental Conservation (Complainant) vs. Alyeska Pipeline Service Company, August 28, 2014, Enforcement Tracking # 08-0603-50-0002, File #304.80.

[25] August 29, 2012 Letter from Mark Swanson, PWSRCAC Executive Director to Scott Hicks, APSC VMT Director, Re: Valdez Marine Terminal Tank Secondary Containment System Catalytically Blown Asphalt (CBA) Liner Integrity Review, PWSRCAC Document No. 651.105.120829.CBACoverLet.

these potential pathways of damage, and recognize that there are likely areas of the liner where currently undiscovered mechanical or chemical damage exists.

RFAI #29a: *PWSRCAC requests Volume 1, Part 2, Section 2.1.7, the RPS Section, and Prevention Credits applied to the RPS volume in Scenario 5 be revised to address the concerns raised herein and provide for additional public review and comment. These sections should either be revised as requested, or ample technical and scientific evidence should be provided to justify the prevention credit. The full 60 percent prevention credit is only warranted if evidence can be provided by APSC that reasonably demonstrates all of the buried CBA liner meets applicable federal and state regulatory standards.*

RFAI #29b: *PWSRCAC requests more information and analysis be completed on other option to inspect, improve, or replace the liner, such as:*

- *Implement field tests of the non-destructive asphalt liner testing methods recommended by Golder Associates and Geosyntec Consultants in the VMT's West Tank Farm and make necessary repairs to the damage found by those tests; or*
- *Forgo the cost of further testing, and simply replace the CBA liner in the East Tank Farm by installing a new geosynthetic liner on top of the CBA liner and abutting it to the external tank walls.*

30. Volume 2, Scenario 5, Spill from Largest Tank

Scenario 5 is the RPS scenario regulated under 18 AAC 75.432(b); the RPS spill volume is the capacity of the largest tank:

> *The response planning standard volume for a crude or non-crude oil terminal facility is* ***equal to the capacity of the largest oil storage tank at the facility covered by the plan****, unless there are specific natural or man-made conditions outside the facility which could place the facility at an increased risk of an oil discharge affecting one or more storage tank. [Emphasis added.]*

The largest tank currently in service at the VMT is Tank 11 with a capacity of 548,281 barrels. This information is provided in Volume 1, Section 3.1.1.2, Table 3.1-1. *VMT Tankage (greater than 10,000 gallons).* Scenario 5 uses a spill from Tank 1 (546,153 barrels) whose capacity is less than Tank 11.[26] Per regulation, Scenario 5 should show a spill from Tank 11, not Tank 1.

PWSRCAC raised this issue in the 2014 VMT C-Plan renewal comments, requesting Scenario 5 use Tank 11 not Tank 1. ADEC responded to PWSRCAC's concern in its November 21, 2014 VMT C-Plan Findings Document at p. 43 of 60 by explaining ADEC has the discretion to allow the source of the scenario to be different if the volume remains the same. PWSRCAC does not find any regulation that allows a tank spill to come from a smaller tank location, even if the volume matches the largest tank. The location of the largest tank spill is important. Tank 11 would spill to Drainage 51 towards an active loading Berth #4, Tank 1 would not. Tank 1 would spill oil down Drainage 58 towards two inactive berths.

[26] See the VMT C-Plan (approved July 18, 2018), Volume 1, Part 3, Table 3.1-1 for a table listing the storage capacity of each VMT tank.

Furthermore, it is not accurate to assign a 548,281-barrel capacity to Tank 1 because Tank 1's capacity is further reduced by operating limits set by DOT. This tank is a TAPS pressure relief tank that must maintain available storage capacity for that function. Not only does Tank 11 have larger capacity by 2,128 barrels (89,376 gallons), but the actual volume of oil stored inside is typically substantially greater.

A review of the currently approved Trans-Alaska Pipeline System (TAPS) C-Plan shows the RPS computation for each of the currently active Pump Station Tanks to be based on a catastrophic release from the largest tank. For example, the TAPS C-Plan Volume 1, Section 5.2.1 shows RPS volumes are based on a catastrophic release from the largest tank at each Pump Station: PS1 (Tank 110), PS3 (Tank 130), PS4 (Tank 140), PS5 (Tank 150), PS7 (Tank 170), PS9 (Tank 190), and PS12 (Tank 220). TAPS C-Plan Scenario 2 is based on catastrophic release from the largest tank (Tank 11) due to a side shell split along a weld seam on the north side near the tank bottom. It is inconsistent for APSC to have a scenario in the TAPS C-Plan using the largest tanks but not in the VMT C-Plan.

The spill volume for Scenario 5 does not match the EPA Worst Case Discharge (WCD) volume. Volume 1, Appendix C lists EPA requirements and provides a cross reference table to show how the VMT C-Plan meets EPA requirements. Appendix C indicates Scenario 5 is used to meet EPA's WCD requirement from a tank failure as required by 40 CFR 112.20(h)(5)(i). EPA's WCD volume is based on a spill from Tank 11 (548,281 barrels); see EPA Worst Case Discharge Analysis Worksheet Figure C.2-2 *Worksheet to Plan Volume of Response Resources for Worst Case Discharge* on p. C.2-11. The EPA worksheet analysis estimates 274,140 barrels of oil spilled to Port Valdez, and the remainder is spilled to land. EPA's WCD volumes listed in the VMT C-Plan in Volume 1, Appendix C differs from those listed in Scenario 5 in Volume 2 (204,180 barrels spilled, and 155,000 barrels to Port Valdez). It is not clear why the VMT C-Plan cross references Scenario 5 as meeting EPA's WCD when the volumes are not the same.

Both ADEC and EPA require the largest tank (Tank 11) be used in the VMT C-Plan. Scenario 5, as currently written, does not satisfy either ADEC or EPA requirements. There is no regulatory basis to for ADEC to allow APSC to use a smaller volume tank. Additionally, the volume reaching marine waters (274,140 barrels or 155,000 barrels) should be reconciled between the state and federal agencies.

RFAI #30a: *The Council requests Scenario 5, the RPS scenario, be revised to show a catastrophic release from Tank 11, the largest tank at the VMT. This scenario should be revised to address the concerns raised herein and be provided for additional public review and comment.*

31. Volume 2, Scenario 5, Spill Rate

PWSRCAC does not support APSC's proposed change to slow the Scenario 5 spill rate by 50 percent from 45,000 barrels per hour to 22,500 barrels per hour, further weakening the RPS Scenario.

As pointed out in the previous section, the RPS Scenario for an Oil Terminal Facility must be equal to the capacity of the largest oil storage tank at the facility. Tank 11 is the largest tank at the VMT. [AS 46.04.030 (k)(1); 18 AAC 75.432]. ADEC has consistently interpreted this requirement to be a catastrophic tank failure of the tank itself, not a leak from an adjoining pipeline. Scenario 5 proposes to leak the contents from Tank 1 via a leak in a connecting pipeline (not a failure of the tank itself). Scenario 5 should be a failure of Tank

11.

The currently approved VMT C-Plan Scenario 5 includes a 45,000 barrel per hour spill rate. Using this rate, APSC estimated oil would flow down Drainage 58 and reach Port Valdez within 30 minutes with onshore vapor concentrations exceeding 10 ppm for 12 hours. The proposed revision to Scenario 5 slows the spill rate by 50 percent to 22,500 barrels per hour, assuming a slower leak would occur from a 13-inch hole in the pipeline attached to Tank 1 over a nine-hour period. Under this proposed revision to Scenario 5, oil would reach Port Valdez through Drainage 58 in 3.2 hours with onshore vapor concentrations exceeding 10 ppm for 15 hours. In this revised scenario, vapor concentrations are exceeded for three additional hours, further slowing down the onshore response. Slowing the leak rate provides more time to mobilize the response and contain oil, and potentially reduces response resources needed for the RPS scenario. PWSRCAC is concerned that slowing the spill rate down presents a less challenging response, and is counter to the intent of a worst-case discharge spill scenario. Additionally, APSC's proposed 3.2-hour timeframe for the proposed 22,500-barrel rate does not match the faster time estimates listed in Volume 3, Section 14.11, Table 14.11-3 *Time To Reach Port in Hours.*

Neither state statute nor regulation specify the release rate from a tank failure; however, both clearly specify the tank must be the largest oil storage tank at the facility and the entire contents of that tank must spill. Additionally, neither state statute nor regulation provide for RPS spill from the largest tank to originate from a connecting pipeline at a substantially slower leak rate.

Examples listed below show where ADEC has consistently required C-Plan applicants to develop catastrophic tank failure scenarios to meet 18 AAC 75.432 and has not allowed slower pipeline leaks from auxiliary piping connected to the tank. Other ADEC-approved tank spill scenarios involve a catastrophic failure of the tank (immediate release of contents), either by weld failure, tank collapse, tank damage by impact with other machinery, or a natural disaster (earthquake, meteorite, etc.). A review of C-Plans in Alaska did not show RPS scenarios for an Oil Terminal Facility that involved a leak of the RPS Tank volume from adjoining pipe at a slower rate.

A review found existing approved ADEC-SPAR C-Plans include:

- Anchorage Tesoro Terminal C-Plan RPS WCD (worst case discharge) Scenario involves a catastrophic tank weld failure.
- USAF Eareckson and King Salmon C-Plan RPS WCD Scenario involves earthquake damage to tank and secondary containment.
- Crowley Fuels Fort Yukon C-Plan RPS WCD Scenario involves storage tank wall failure.
- Delta Western Naknek C-Plan RPS WCD Scenario involves a meteorite hit that destroys a tank.
- Teck Resources Red Dog Mine C-Plan RPS WCD Scenario involves a tank rupture and implosion.
- BP Prudhoe Bay C-Plan Tank Scenario involves a storage tank failure.
- Eni Nikaitchuq C-Plan Tank Scenario involves fork lift damage to a tank and catastrophic release of the tank contents.
- North Slope Borough Village Tank Farms C-Plan RPS WCD Scenario involves a storage tank rupture.
- Crowley Fuels Ketchikan C-Plan RPS WCD Scenario involves a structural failure of a tank.
- Petro 49 Inc. Ketchikan RPS WCD Scenario involves a tank shell rupture.
- Delta Western Juneau RPS WCD Scenario involves a tank weld seam rupture.

- Delta Western Haines RPS WCD Scenario involves tank brittle fracture.
- Hillcorp Cook Inlet RPS WCD Scenario involves a catastrophic tank failure.
- City of St. Paul RPS WCD Scenario involves a catastrophic tank failure.
- Trident Seafoods Sandpoint RPS WCD Scenario involves a catastrophic tank failure.
- Flint Hills North Pole Terminal RPS WCD Scenario involves a catastrophic tank failure.
- Conoco Phillips Kuparuk RPS WCD Scenario involves a catastrophic tank rupture.
- Savant Badami RPS WCD Scenario involves a catastrophic tank rupture.
- Crowley Fuels Juneau RPS WCD Scenario involves a catastrophic tank rupture.
- PetroMarine RPS WCD Scenario involves a catastrophic tank failure of the tanks upper shell.

RFAI #31a: *The Council requests Scenario 5 be revised to show an immediate catastrophic release from Tank 11, the largest tank at the VMT, consistent with the tank failure RPS scenarios approved by ADEC-SPAR for other Alaska C-Plans. This scenario should be revised to address the concerns raised herein and be provided for additional public review and comment.*

32. Volume 2, Scenario 5, Oil Spill Trajectory Modeling and Scenario Assumptions

As the RPS scenario in the plan, Scenario 5 establishes the minimum oil spill response resources (personnel and equipment) for the terminal. APSC proposed a number of changes to Scenario 5 that PWSRCAC does not support.

The Council participated in the Scenario 5 workgroup in 2018, but was not given access to model input parameter data and assumptions or trajectory modeling output through the workgroup process. Trajectory models inputs were eventually shared with the Council, but it wasn't until after the workgroup process ended. Therefore, the Council was not able to provide input on the trajectory analysis during the workgroup process, and finds a number of concerns with the new modeling work that should have been resolved, through the workgroup process. The Council believes modeling methods used in Port Valdez incorrectly underestimate spill size and spread, and have produced incorrect trajectory maps.

As indicated in PWSRCAC's comments above, planning for a larger spill quantity would significantly impact the trajectories in Scenario 5. The prevention credit issue and RPS volume should be addressed, along with from which tank the spill originates, and Scenario 5 planning would be based on those decisions accordingly. Changes to oil spill trajectories would also be needed if a spill originates from Tank 11 rather than Tank 1.

Dr. Merv Fingas, an expert in oil spill trajectory modeling; Vince Mitchell, an expert oil spill response consultant and prior APSC employee; Susan Harvey, PWSRCAC's consultant and prior ADEC regulator; and, and PWSRCAC staff reviewed the proposed changes to Scenario 5's assumptions, and the revised oil spill trajectory modeling and identified a number of significant concerns that warrant additional information and plan revision.

The Council requests all the RFAIs and Scenario 5 improvements listed below be made, and that an improved Scenario 5 be provided again for public review and comment.

RFAI #32a*: Justification for the wind speed and direction in Scenario 5 for the winter and summer scenarios is needed.* The winter scenario in February shows NE winds up to 12 knots (Day 1); NE to ENE winds up to 4 knots (Day 2); and SW winds up to 2 knots changing

to N-NNE winds up to 18 knots (Day 3). There is no specific information provided on the wind speed and direction used for the summer addendum, but that data should be listed. The plan only states that the winds differ.[27] It is well known that west winds are more prevalent in the summer.

RFAI #32b: Volume 1, Table 3.4-2 *Wind Speed Data – Valdez, Alaska* provides Valdez wind speed and direction data showing the prevailing wind direction from 1992-2006, but the data is over 10 years old. *The Council requests this table be updated with more recent data from NOAA for Port Valdez.*[28]

RFAI #32c: *PWSRCAC recommends summer oil spill trajectory maps be included in the scenario.*

RFAI #32d*: Additional information is needed on water current speed and direction for winter and summer.* The winter (February) scenario assumes an incoming tide of 0.5 knots with more than 2 hours left on the flood tide. There is no specific information provided on the water current speed and direction used for the Summer Addendum other than "*summer currents push oil north across Port of Valdez."* Volume 1, Section 3.4.3 Wind, Sea State, Tide and Current does not provide any specific technical data on Port Valdez water currents. *The Council requests a copy of the scientific data collected by APSC to support APSC's water current speed and direction assumptions by season, including current meter data collected by the new tugs.*

RFAI #32e: Volume 1, Section 3.12 Bibliography indicates that APSC uses OILMAP to produce its oil spill trajectory models. It is PWSRCAC's understanding that the OILMAP program contains a water current speed and direction algorithm. It appears OILMAP's water current speed and direction algorithm underestimates the water current speed near the terminal and is inconsistent with the 0.5 knot assumption proposed for Scenario 5. Instead, it appears OILMAP's algorithm unrealistically assigns a *"dead zone"* of 0.05 knots in front terminal that artificially predicts spilled oil will stagnate in front of the terminal. *The Council requests information on OILMAP's water current speed and direction algorithm and a copy of the scientific data used to develop that algorithm.*

RFAI #32f: Vapor modeling for Scenario 5, addressed over a decade ago, was based on the spill volume and rate for the plan at that time. APSC has proposed to slow the spill rate and modified its benzene estimates in Scenario 5 but this information was not available to the workgroup. Once the prevention credit issue is resolved and the RPS volume is decided, the modeling work may need further revision to adjust for a higher spill volume. That modeling work should be provided along with the modeling work completed to support this application.

RFAI #32g: Vapor levels for the Summer Addendum were not mentioned in the revised scenario, but should be.

RFAI #32h: *Clarification on wave height assumption is needed for both the winter and summer scenarios.* The winter scenario (February) has wave heights of 2-3 feet, while there is no specific information on wave height for the Summer Addendum.

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[27] Proposed Scenario 5 states: *"Prioritization of sensitive areas for protection differs somewhat in the summer as prevailing winds and summer currents push the oil north across the Port of Valdez, rather than holding it close to the southern shore and spreading westward."*

[28] https://tidesandcurrents.noaa.gov/met.html?id=9454240

RFAI #32i: Scenario 5 lacks information on ice conditions in Port Valdez and along the shoreline. Ice can impede spill response operations, particularly reaching and connecting shore anchor points, and can reduce response effectiveness of boom and skimming systems. *The Council requests APSC provide information on the ice assumptions used in the winter and summer scenarios.*

RFAI #32j: Scenario 5 lacks information on visibility. Poor visibility (e.g., darkness, fog, low clouds) can slow response efforts and make oil tracking impossible from aircraft overflights, impede actual observations from vessels, and hinder an initial responder's ability to know where the oil is heading. It is critical to understand the visibility assumptions used in Scenario 5 to determine if recovery rate assumptions are realistic. *The Council requests APSC provide information on the visibility assumptions.*

RFAI #32k: The Council requests Scenario 5 include a tanker loading at Berth and address the safety and response issues associated with loading shut-down, undocking the tanker, and response involving active loading during a spill.

RFAI #32l: OILMAP trajectory assumptions show a large quantity of oil would be contained by the Drainage 58 boom system that would exceed the CSI boom capability. PWSRCAC requests that any Drainage 58 spill scenario use a *more robust, Ro-boom style boom to capture oil spilling into Port Valdez*

RFAI #32m: APSC's proposed Hour 12 spill trajectory in Scenario 5 (Figure 5.1-1 *Scenario 5, 12-Hour Spill Trajectory with Containment Booming and Recovery*) assumes oil is either captured or recovered from Drainage 58 containment, remains thickened and stacked to the north and west of Drainage 58, and that no significant oil sheen occurs by Hour 12. A significant amount of oil would likely have escaped containment by Hour 12 (depending on how quickly oil travels to the Port and how quickly boom is deployed), and that oil would travel north, west, and east with tidal fluctuations, wave action, and the typical counter-clockwise Port Valdez current. Escaped oil would not remain thickened and stacked along the terminal shoreline (as shown in APSC's proposed trajectory), but would quickly spread into a thin sheen covering most of Port Valdez. The Council requests the spill trajectory to be revised to address these concerns, or more information be provided to justify the oil spill trajectory modeling assumptions and estimates.

RFAI #32n: It is assumed that by Hour 12, a total of 155,000 barrels of crude oil have spilled into Port Valdez and only a small fraction of that oil has been recovered. Only two skimmers are assigned to recover oil at Drainage 58 at a combined de-rated capacity of 1,258 barrels per hour. Table 5.3-7 *Scenario 5 - Response Planning Standard Calculation and Assumption for On-Water Recover Capacity* indicates skimmers start operation in three hours. By Hour 12, the skimmers would have been operating nine hours. At a skimming capacity of 1,258 barrels per hour for nine hours, only 11,322 barrels of oil would be removed; this leaves 143,678 barrels that has either escaped Drainage 58 containment or is in containment. The trajectory modeling should reflect expected oil movement. The Council requests the spill trajectory to be revised to address these concerns, or more information be provided to justify the oil spill trajectory modeling assumptions and estimates.

RFAI #32o: APSC's proposed hour 12 spill trajectory (in the red outlined, color coded Figure 5.1-2 *Scenario 5, 12-Hour Spill Trajectory without Containment Booming and Recovery)* has a number of technical problems:

- Proposed Figure 5.1-2 shows oil barely spreading to the north and west of Drainage 58 and not to the east. There is no boom containment or recovery assumed in this figure, so oil would be expected to spread north, west and east with Port Valdez winds, currents, tidal cycle, and wave action.
- Proposed Figure 5.1-1 (that assumes Drainage 58 containment and recovery) shows oil spreading further north of Drainage 58 than Proposed Figure 5.1-2 where no containment or recovery is assumed. This does not reflect reality. How can contained oil result in a larger spread to the north?
- Proposed Figure 5.1-2 assumes there would be no oil sheen north, west or east of Drainage 58. It is not realistic to assume there would be no significant oil spreading and oil sheen by Hour 12.
- Proposed Figure 5.1-2 shows thick oil (less than a ¼ mile north) piled up in front of the terminal between Berths 1 and 3 with no oil sheen to the north at all. Oil spill trajectories for actual oil spills do not have thickened oil transitioning to zero sheen. In reality, the sheen for a 155,000barrel, uncontained oil spill would likely fill Port Valdez the first day.

The Council requests the spill trajectory to be revised to address these concerns or more information be provided to justify the oil spill trajectory modeling assumptions and estimates.

RFAI #32p: APSC's proposed Hour 24 spill trajectories (in the red outlined, color coded Figures 5.1-3 *Scenario 5, 24-Hour Spill Trajectory with Containment Booming and Recovery* and 5.1-4 *Scenario 5, 24-Hour Spill Trajectory without Containment Booming and Recovery*) are concerning. Proposed Figure 5.1-4 shows uncontained and unrecovered oil spilled in 2-3 foot waves, with a water current of 0.5 knots and several tide changes, would merely cause thick oil moving only 0.6 miles north of the terminal with a sheen up to a mile north. The trajectory assumes there would be no eastward movement of oil at all, which is not how oil would be expected to spread. Oil would spread north, west, and east. The oil sheen would be substantially larger than modeling shows in proposed Figure 5.1-4 for an uncontained spill. The problems with proposed Figures 5.1-3 and 5.1-4 is further reinforced by proposed Figure 5.1-3, where containment and recovery is assumed incongruously and inconsistently and shows more oil spread to the north and east than proposed Figure 5.1-4 where no containment or recovery is assumed. The spreading depicted in these proposed figures for Scenario 5 is not realistic or physically possible. The Council requests the spill trajectory to be revised to address these concerns or more information be provided to justify the oil spill trajectory modeling assumptions and estimates.

RFAI #32q: APSC's proposed Hour 36, 48, and 60 oil spill trajectories (in the red outlined, color coded Figures 5.2-2 [*Scenario 5, 36-Hour Spill Trajectory without Containment Booming and Recovery]*, 5.2-4 [*Scenario 5, 48-Hour Spill Trajectory without Containment Booming and Recovery*] and 5.3-2 [*Scenario 5, 60-Hour Spill Trajectory without Containment Booming and Recovery*]) unrealistically show a spill with little to no sheen, with thick oil hugging the southern shore and not spreading into Port Valdez. This is unrealistic, as the spill is uncontained and would spread with greater magnitude, especially given 2-3 foot wave conditions, a counter-clockwise current of 0.5 knots, and multiple tide changes. Only Proposed Figure 5.3-2 (Hour 60) shows any significant oil sheening likely, and even this amount of sheen is underestimated given that an uncontained and unrecovered spill of 155,000 barrels would sheen the Port by Hour 60. The Council requests the spill trajectory

to be revised to address these concerns or more information be provided to justify the oil spill trajectory modeling assumptions and estimates.

33. Volume 2, Scenario 5, Personnel Count

Personnel count should be reviewed carefully in Scenario 5 to ensure there are sufficient numbers of personnel assigned to carry out the tasks listed. The Council finds the number of personnel has been reduced by 92 people (a 38 percent reduction) since year 2006.

Volume 2, Scenario 5, Figure 5.5-1 *Scenario 5, - Resource Requirements* indicates that 148 people are needed to respond to a 48,000-barrel spill on land and a 155,000-barrel spill to water. Only 148 people to respond to a Scenario 5 spill does not match the 180 people actually assigned to the Scenario 5 drill/exercise held in 2002, the 240 people assigned by APSC to a Scenario 5 drill/exercise held in 2006, or August 2018 VMT scenario 5 exercise where Form OCS-209 lists 421 Responsible Party and contracted responders spread across the field and command post. Nor does it match the 286 people required to respond to the September 2017, 2.4 barrel Berth 5 spill.

The 148 personnel count also is low compared to the number of people who have worked on other actual Alaska oil spill responses. For example, the Gathering Center #2 pipeline oil spill on the North Slope in March 2006 required 135 people to respond to a 5,600-barrel spill to land. Scenario 5's on land spill volume alone is nine times larger than this, let alone the 155,000 barrels spilled to water. The *MV Selendang Ayu* spill in December 2004 was 7,650 barrels of intermediate fuel oil and 350 barrels of marine diesel to water which tasked 129 responders. The Scenario 5 on water volume alone is 20 times larger than this. The September 2017 Berth 5 spill documentation shows a headcount of 149 Responsible Party and contracted responders during Operational Period 1 was required to respond to a spill of only 2.4 barrels, which increased to 286 responders near the end of this spill response.

Previous versions of the C-Plan contained complete Scenario 5 ICS Organization Charts for each major operational period (Days 1, 2, 3) of the 72-hour spill response. Positions and personnel could be tracked during drills/exercises. Some of this important information has been removed from the C-plan; it is now much more difficult to track APSC's personnel commitment.

The Council is concerned about APSC's restructuring and reduced personnel at the terminal. This reduction in onsite personnel may impact the ability to staff a Scenario 5 sized spill, especially in the first day.

Full organization charts should be included in each scenario. Scenario 5 only includes IMT and Operations Section organization charts (Figures 5.6-1 and 5.7-1) which is only a fraction of the personnel required. A full set of personnel and organization chart information should be provided to verify there are sufficient personnel to meet the RPS Scenario.

RFAI #33a: *The Council requests Scenario 5 be revised to include sufficient personnel to effectively and efficiently respond to this oil spill, and the number of people assigned be justified. This scenario should be revised to address the concerns raised herein and be provided for additional public review and comment.*

34. Volume 2, Scenario 5, Response Improvements Needed

Volume 2, Scenario 5 is the State Response Planning Standard (RPS) oil spill scenario. It is important that this Scenario is realistic, technically sound, scientifically supported, and consistent with regulatory requirements as this scenario establishes the minimum oil spill response resources (personnel and equipment) for the terminal. The Council has a number of recommended improvements to Scenario 5.

The Council requests the following information on Scenario 5 and the scenario be reissued for public review and comment.

***RFAI #34a:* Spill Volume.** *Increase spill volume [see PWSRCAC's comments on Scenario 5 Catastrophic Tank Spill Volume, and PWSRCAC comments on Scenario 5 RPS and Prevention Credit].*

***RFAI #34b:* Spill Rate.** *Change spill scenario to a catastrophic tank failure scenario modeled at an instantaneous release rate [see PWSRCAC's comments on Scenario 5 Spill Rate].*

***RFAI #34c:* Spill Location.** *Change the spill location to Tank 11 showing oil traveling to Drainage 51 reaching Port Valdez near Berth 4 [see PWSRCAC's comments on Scenario 5 Catastrophic Tank Spill Volume and Location].*

***RFAI #34d:* Assumption Justifications.** *Provide scientific and technical justification for scenario assumptions including wind speed and direction, water current speed and direction, wave height, visibility (including darkness) and ice conditions (winter scenario).* Oil spill trajectory planning should also be based on local knowledge. Current speed, direction, and circulation patterns that have been studied by PWSRCAC should be included to improve oil spill trajectories [See PWSRCAC's comments on Scenario 5 Oil Spill Trajectory Modeling and Scenario Assumptions].

***RFAI #34e:* 2017 SGH/VDF Decision Matrix.** *Replace the 2017 Decision Matrix with the 1997 Decision Matrix and related scoring in Scenario 5.*

***RFAI #34f:* Update Vapor Modeling.** *Update vapor modeling to match improved Scenario 5 assumptions for both winter and summer seasons and provide modeling work and assumptions used.*

***RFAI #34g:* Winter Scenario 5 Modeling and Trajectory Maps.** *Update spill trajectory modeling and maps for the winter scenario to address concerns raised in PWSRCAC's Modeling and Trajectory Mapping comments [See PWSRCAC's comments on Scenario 5 Oil Spill Trajectory Modeling and Scenario Assumptions].*

***RFAI #34h:* Summer Scenario 5 and Trajectory Maps.** *Update spill trajectory modeling and maps for the Summer Addendum, including consideration of increased wildlife (particularly birds nesting at terminal facilities), tourism in the area, and commercial and recreational fishing activities.*

***RFAI #34i:* Adequate Offshore Recovery Resources.** *Maximize offshore oil recovery early in the spill.* It is critical to protect sensitive areas and areas of public concern early in a spill. Planning a Scenario 5 response should include all available open water recovery and containment resources.

***RFAI #34j:* Nearshore Response Resources.** *Activate nearshore response earlier than Hour*

12. Consideration should be given to use the contracted fishing vessels in Valdez, as there are approximately 40 contracted vessels in Valdez, with roughly half of those being Tier 1 vessels that would be available by Hour 6 of the response.

RFAI #34k: Dedicated Solomon Gulch Hatchery Protection. *Assign a dedicated SGH protection strike team to protect the hatchery earlier in the response.* Scenario 5 assigns Sensitive Area Protection Strike Team 1 (SAP ST1) to deploy Drainage 58 containment boom for recovery operations. SATP ST1 then is assigned to protect SGH. This delays protection of the hatchery by several hours. Considering that booming at the SGH can take up to 10 hours to deploy and the volume of the spill, the Council is concerned oil will have escaped Drainage 58 containment boom by this time. It is critical that a dedicated SAP ST be assigned early in a response in order to protect this site before oil reaches it, and to avoid what occurred during the 1994 *Eastern Lion* spill where the hatchery was oiled. Separate task forces should be assigned to achieve simultaneous recovery operations and sensitive area protection deployment.

RFAI #34l: Increase Number of Sensitive Area Protection Strike Teams (SAP ST). *Include sufficient resources to protect all environmentally sensitive areas before oil reaches those areas.* Three Sensitive Area Protection Strike Teams are assigned to Scenario 5 yet there are over a dozen sensitive areas in Port Valdez that would likely be impacted by a 155,000-barrel spill that reaches marine waters (SGH, VDF, Valdez Small Boat Harbor, Mineral Creek, Gold Creek, Shoup Bay, Mineral Flats, Valdez Narrows, Anderson Bay, Seven Mile Beach, Sawmill and Salmon Creeks, Allison Creek, Lowe and Robe Rivers, etc.). State regulations require C-Plan holders to both protect environmentally sensitive areas and areas of public concern (per 18 AAC 75.445(d)(4)), and to ensure there are resources for containment, control, recovery, transfer, storage, and to clean up a Response Planning Standard-sized spill (per 18 AAC 75.445(d)(5)). This means ASPC is required to have sufficient resources to **both** protect local sensitive areas and clean up the spill simultaneously for a planning standard volume event. There are more contracted vessels readily available locally in Valdez, and APSC/SERVS can contract other vessels needed to fulfill its regulatory obligations.

As discussed in PWSRCAC's Oil Spill Modeling and Trajectory Mapping comments above, the Council believes that Scenario 5 modeling under-predicts the speed and magnitude of Port Valdez oiling that is likely to occur in a spill of this size. The first step in determining how many Sensitive Area Protection Strike Teams are needed is to remedy the oil spill trajectory modeling problems, determine a conservative estimate of sensitive area impact timing, and assign sufficient SAP STs to ensure protection before oiling occurs at these sites. Scenario 5 currently lacks an aggressive plan to protect all Port Valdez sensitive area sites due to trajectories which do not accurately predict oil movement. While protection of the VDF and SGH occurs in the first day, resources to protect other Port Valdez sensitive areas are not mobilized until day 2 and active until day 3. In reality, this would be too late because oil would have likely contaminated many of these areas. The need for a more aggressive protection plan would be warranted by more realistic oil spill trajectories.

RFAI #34m: Oil Escaping Port Valdez Through the Narrows. *Revise Scenario 5 to identify measures that would be implemented if oil were to escape Port Valdez.* Scenario 5 does not address the possibility that oil reaches open water, escapes the Port of Valdez, and reaches the Narrows and Prince William Sound. In the event oil escapes the Port of Valdez, response would be needed in downstream communities.

RFAI #34n: Personnel Count and Organization Charts. *Ensure sufficient number of*

personnel are assigned to Scenario 5 response. [See PWSRCAC comments on Scenario 5, Personnel Count].

RFAI #34o: Waste Management. *Return waste management details to Scenario 5.* In 2003, ADEC agreed with PWSRCAC that the Scenario 5 Waste Management Plan was inadequate and required it to be improved. ADEC's April 2003 Basis for Decision (See Issue No. 5) ADEC wrote:

> *… PWS RCAC also provided numerous detailed comments, questions and recommendations for further revisions to the new section. Their primary concern was that the plan did not clearly demonstrate how Alyeska would respond to an RPS volume discharge for both on-land and on-water waste management. Their comments pointed out that the RPS oil spill scenario requires Alyeska to process 390,000 barrels of oil spilled on-land and temporary storage capacities remained undefined and that numerous processes (pumping, transfer, solid/liquid separation, oil/water separation) were not clear. For on-water waste management, PWS RCAC identifies specific concerns for temporary storage of recovered oil and oil/water mixtures as well as raises questions about the processes that would be used to manage on-water waste concurrent with on-land operations.* ***The Department agrees that there are many outstanding questions and that the waste management section does not, as presently written, adequately demonstrate Alyeska's capability to provide waste management for an RPS volume oil discharge.*** *The work group identified in the plan's Compliance Section will be tasked with addressing compliance related issues as it develops an RPS scenario specific waste management plan. The Department will request the PWS RCAC provide a representative to be part of the waste management work group. The detailed comments provided will be an excellent resource for the work group and will assist in providing a framework for developing an effective waste management plan.*

In 2003, ADEC required a detailed waste management plan for Scenario 5 and provided the regulatory justification for this decision. As directed by ADEC in 2003, the VMT C-Plan Workgroup developed a substantially improved Waste Management Plan for Scenario 5 and the VMT C-Plan as a whole. Information on waste management has been removed by APSC during scenario updates despite PWSRCAC's opposition. During the Scenario 1, 2, 3 and 4 revisions, PWSRCAC again raised the need for a more detailed waste management plan in the scenario to estimate the total waste volume and determine if there is sufficient storage and waste handling capacity. The Council finds a very strong regulatory history and basis for the Scenario 5 Waste Management planning detail, and finds no regulatory justification to reverse ADEC's 2003 decision. Waste Management details should be returned to confirm there are adequate waste handling resources.

RFAI #34p: Temporary Pipelines. *Address the use and construction of temporary pipelines in the resource mobilization chart as a critical waste management requirement.*

RFAI #34q: Improved Skimming Capacity and Larger Boom at Drainage 58 Containment Area. If the spill route remains at Drainage 58, PWSRCAC recommends the following changes. However, as indicated above, state regulations clearly require the spill to originate from Tank 11 which would flow down Drainage 51 towards Berth 4. *Add additional skimming capacity and larger boom at Drainage 58.* To keep up with the incoming spilled oil volumes, more skimming capacity is needed at Drainage 58, including larger boom and a secondary booming system to contain spilled oil.

Scenario 5 assumes that by Hour 12, a total of 155,000 barrels have spilled into Port Valdez via drainage 58 at an average flow rate of 22,500 barrels per hour for nine hours. Only two skimmers are assigned to recover this oil inside containment, and given their pump rates, means only a very small fraction of that oil could actually be recovered. Table 5.3-7 *Scenario 5 - Response Planning Standard Calculation and Assumption for On-Water Recover Capacity* notes skimmers start operation in three hours just as oil reaches the Port. The two skimmers used in Drainage 58move 1,258 barrels per hour. This still leaves a recovery deficit of 21,242 barrels per hour that is beyond what skimmers can ingest assuming the derated capacity of 629 bbls/hr/skimmer is met. Additional skimming capacity should be considered as there is no way for oil to be taken in fast enough with only two skimmers. For example, by Hour 12 both skimmers are assumed to have run for nine hours (starting at Hour 3), only 11,322 barrels of the full 155,000 barrels total will have been captured. The remaining 143,678 barrels will simply not stay in containment and will escape.

Scenario 5 estimates 21,954 barrels are recovered by Hour 11 (by OWTF1, OWTF2, and OWTF5, see Table 5.3-3), meaning 133,046 bbls (of the 155,000 bbls spilled) are either in Drainage 58 containment or has escaped Drainage 58. As currently designed, there is insufficient room in the Drainage 58 boom configuration tactic to store 133,046 barrels of oil. Oil would be so thick it would spill over the top of the boom or escape under it. These problems are not addressed in Scenario 5, and trajectory maps incorrectly assume oil would remain trapped against the terminal and western shoreline. The scenario assumes oil recovery will be so unrealistically efficient that there will be little to no oil spread to the north or east.

Working with the full 155,000-barrel figure, calculations show that in the polygon area created by the 2000-ft. boom section and shoreline, the depth of oil would be over 1.7 ft. thick. Even lowering the assumption of containment to 100,000 barrels of oil (assuming some oil escapes or is recovered), this still equates to oil that is 1.1 feet thick meaning there would be over-topping and likely entrainment under the 8-in. tall boom used in the Drainage 58 containment tactic. Adding to this concern is that currents will be present at 0.5 knots or higher, and the scenario states wave heights of 2-3 ft. could be expected. The combination of skimmers not being able to keep up with the amount of oil to be skimmed, containment boom that is inadequate and too small, and environmental variables like winds, waves and current could mean a substantial volume of oil will escape containment.

35. Volume 2, Scenario 6, Earthquake Preparedness

The VMT C-Plan must meet the requirements of 18 AAC 75.430:

> *Notwithstanding the response planning standards set out in 18 AAC 75.430 - 18 AAC 75.442, **the plan must demonstrate the general procedures to clean up a discharge of any size, including the greatest possible discharge that could occur**, subject to the provisions of AS 46.04.020 and AS 46.09.020. [Emphasis added.]*

18 AAC 75.432(b) requires the RPS oil spill volume to be the largest tank, unless there are natural or man-made conditions that increase the risk of a multiple tank failure. 18 AAC 75.432(b) reads:

> *The response planning standard volume for a crude or noncrude oil terminal facility is equal to the capacity of the largest oil storage tank at the facility covered by the plan, **unless there are specific natural or man-made conditions outside the facility which could place the facility at an increased risk of an oil discharge affecting***

one or more storage tank. *[Emphasis added.]*

The VMT is located in an earthquake zone, and multiple crude and fuel tank failure risk exists. The *"greatest possible discharge that could occur"* would be multiple tank failures due to an earthquake or other natural disaster.

VMT C-Plan, Volume 2, Page xiv states Scenario 6 is intended to satisfy 18 AAC 75.430. However, Scenario 6 only contains four paragraphs of generic information. Scenario 6 does not *"demonstrate the general procedures to clean up a discharge of any size, including the greatest possible discharge that could occur…",* includes no useful procedures, and does not describe the greatest possible discharge. Instead, Scenario 6 arbitrarily assumes the *"greatest possible discharge that could occur"* would be 900,000 barrels. There is no justification provided for this assumption. A spill of 900,000 barrels would be a volume equivalent to two crude oil tanks that are not full. The VMT has 14 operating crude oil tanks, and numerous other fuel tanks that could result in over 7 million barrels (over 314 million gallons) of hydrocarbons spilling if all tanks failed simultaneously due to a large earthquake. APSC did not explain how it arrived at the assumption that only two partially full tanks could fail simultaneously or provide any engineering or risk assessment to justify such an assumption.

The purpose of 18 AAC 75.430 is to aid plan holders in thinking through how a very large oil spill would be handled, and to provide oil spill responders with a useful set of general procedures that could be used in an emergency. Scenario 6 does not meet this standard. No useful information that could be used by oil spill responders during an actual emergency is included in Scenario 6.

General procedures to clean up a potential of 7 million barrels, including source control, response actions, waste management, and callout of out-of-region response organizations, should be described. Oil trajectory maps should be included to provide a general estimate of the magnitude of the spill and how fast it will move to provide some sense of the amount of personnel and equipment that would be required both from within PWS and from out of region. PWSRCAC recommends these improvements be developed for Scenario 6, and the revised scenario be provided for public review and comment.

Similar concerns were raised by the Council in the 2013-2014 VMT C-Plan renewal, and the Council's concerns were dismissed. ADEC's November 2014 Findings Document, Issue No.21 Oil Spill Response Scenarios stated:

> *PWS RCAC requested the department require revisions to Scenario 6 to provide additional planning details and increase the discharge volume to all the crude oil storage tanks at the facility. The department has not determined there is an increased risk for the VMT as per 18 AAC 75.432(b) that would warrant requiring a scenario for a spill from all 14 tanks in the East Tank Farm simultaneously. Further, the department does not agree that additional information, steps and procedures are necessary for Scenario 6 as the potential procedures, tactics and the general response organization are presented in the plan with sufficient detail to allow the department to determine APSC has the ability to respond with existing resources and access to additional resources.*

A large earthquake could result in a simultaneous, catastrophic tank spill, and neither Scenario 6 nor anywhere else in the VMT C-Plan describes the required *"general procedures to clean up a discharge of any size, including the greatest possible discharge that could*

occur."

Alaska's November 30, 2018's major earthquake was a wake-up-call and reminder for earthquake preparedness. Not only is Scenario 6 inadequate, there is very little information in the VMT C-Plan on earthquake preparedness.

- Volume 1, Page 1.1-4 states that if an oil spill is caused by an earthquake, safety of personnel is addressed in EC-71-VT, Emergency Contingency Action Plan for the VMT; a plan incorporated by reference in the VMT C-Plan that was not provided for public review or access. This is another example of where the public is prohibited from reviewing those procedures and does not know what APSC has planned during an earthquake.

- Volume 1, Page 2.1-40 states the terminal is equipped with accelerometers that might trigger a shutdown protocol of transfer operations outlined in BE-20, the VMT Berth Operating Manual; a plan incorporated by reference in the VMT C-Plan that was not provided for public review or access. Again, the public is precluded from reviewing procedures and does not know what APSC has planned.

- Volume 1, Section 2.3.2.2 states earthquakes could cause tank rupture, and piping and piping support failure. This section clearly indicates the possibility of multiple tank failure occurrence. Volume 1, Section 2.4 lists earthquakes and associated tsunamis as a condition that might increase the risk of discharge.

- Volume 1, Section 2.4.1 states the VMT was constructed in 1976-1977 to meet an 8.5 Richter earthquake; however, there is no information in the VMT C-Plan on the actual condition today (2019) of the terminal's 40+ year old equipment (aging infrastructure). Does the terminal equipment still meet an 8.5 Richter earthquake standard today considering corrosion loss and equipment age and wear? Merely stating the terminal was originally built to a certain standard is inadequate information to know if that equipment is corroded or worn and would not meet that same standard today. More information is requested on the actual infrastructure and the earthquake standard it would meet today with thinner tank and pipeline walls due to corrosion wall loss, etc.

- Volume 1, Appendix A.7 *Out-of-Region Equipment Contacts* provides a list of out-of-region equipment contacts. Volume 1, Section 3.8.1 *Contractor/Vendor List* states: "Major contracts are described in Volume 3, VMT Technical Manual, Tactic VMT-LP-3, '*Accessing Contract and Non-Obligated Resources and Out-of-Region Equipment.'*" Volume 1, Section 3.6 *Response Equipment* states: "The time frame for delivery and startup of response equipment and trained personnel located out of region is described in Volume 2, Scenarios, and in the logistics and planning tactics in Volume 3, VMT Technical Manual." Yet, no information was found in Scenario 6 on any estimated "time frame for delivery and startup of response equipment and trained personnel located out of region" at all. Neither Volume 2 nor Volume 3 provide procedures to respond to an oil spill resulting from a major earthquake. Volume 2 Scenarios 2 through 6 merely state responders should evaluate the need for additional out-of-region equipment with no procedures for doing that or bringing in out-of-region personnel or equipment of the magnitude needed for a major earthquake response.

At the February 15, 2018 VMT C-Plan Coordination Workgroup meeting, the USCG asked APSC if they had done an exercise where the spill was caused by an earthquake, and APSC staff were unsure. PWSRCAC does not recall any recent drill or exercise where APSC/SERVS

examined a multiple tank failure due to an earthquake.

RFAI #35a: *The Council requests Scenario 6 be improved to address the concerns listed above and be provided for public review and comment. Additionally, the Council recommends ADEC require a drill to test earthquake preparedness.*

36. Volume 3, Consistent Dataset for Each Tactic

Past VMT C-Plan comments have recommended a consistent dataset for each tactic. PWSRCAC recommended each tactic contain the following information:

- Purpose and description;
- Task Force Equipment and Personnel Specifications;
- Support Equipment and Personnel Specifications;
- Planning Assumptions including:
    - time required to mobilize equipment and personnel;
    - time required to deploy equipment and personnel;
    - number of task forces required to construct, implement, or recover on a per-unit basis.
- Operational Limitations and Considerations (Advantages and Disadvantages).

Some tactics contain this information although many do not. A number of the tactics do not contain any planning assumption data that can be used to estimate the number of task forces that would be required on a per unit basis. By comparison, this type of information has been included in two other major tactics manuals approved by ADEC (including the Alaska Clean Seas (ACS) Tactics Manual for On Land Tactics, and the TAPS Tactics Manual for a description of deployment considerations that describe the tactic limitations, and advantage and disadvantage guidance sections).

RFAI #36a: *The Council requests the tactics be improved to address the concerns listed above and be provided for public review and comment.*

37. Volume 3, Source Control Tactics

The Alaska Incident Management System Guide (AIMS) identifies source control as a critical function of the Operations Section.[29] Additionally, state regulations require all response actions to be included, which would include source control and the best technology for source control, including 18 AAC 75.425 (e)(1)(F)[30] and 18 AAC 75.425(e)(4). In past comments, the Council's RFAIs have inquired why the Technical Manual does not provide source control tactics, maps, and diagrams showing source control equipment and procedures (e.g., source control tactics for leaking tanks and piping). Source control equipment is not listed in Volume 3, Appendix A. The ICS Organization Charts listed in Volumes 1, 2, and 3 do not include source control as an Operations Section responsibility; yet, the source control function should be included in the Operations Section to be consistent with AIMS.

[29] AIMS Guide, Page B-23, November 2002.

[30] 18 AAC 75.425 (e)(1). The response action plan must provide in sufficient detail to clearly guide responders in an emergency event, all information necessary to guide response to a discharge of any size, up to and including a discharge that is equal to the applicable response planning standard set out at 18 AAC 75.430 - 18 AAC 75.442.

RFAI #37a: *The Council requests source control tactics be included in the Technical Manual to address the concerns listed above and be provided for public review and comment.*

38. Volume 3, Section A.1, Tug Bow Winches

Volume 3, Section A.1 lists the specifications of the ASD 4517 and ASD 3212 tugs, including a forward bow winch and an aft towing winch on each tug type. APSC has proposed to delete the forward bow winch on each tug type without providing any basis for this change, and these bow winches are used to dock and undock tankers. PWSRCAC opposes this change, and recommends APSC be required to provide accurate details and specifications pertaining to major equipment, along with technical, scientific and regulatory justification for all changes made to an existing approved C-Plan.

The 4517 tug descriptions should also include the workboats (used in U and J configurations), skimmers (e.g., Terminator page A2.5) and tracking buoys (page A.12-1) as this equipment is carried on these vessels.

RFAI #38a: *PWSRCAC is opposed to removing the specifications on the bow winch, and requests accurate details and specifications pertaining to major equipment be included in the plan. The Council requests this section be revised and reissued for public review and comment.*

39. Volume 3, Section 5, Nearshore Tactics

Volume 3, Section 5 addresses nearshore tactics. There would be a need for more nearshore task forces (NSTF) in the event of a large spill. There are more readily available personnel, equipment, and vessels than reflected in the plan. For example, in a Scenario 5 spill, a far greater nearshore response would be used, and that should be reflected in the nearshore tactics.

The NSTF described in SV-140 (Tactics Manual) as part of the Prince William Sound Tanker Oil Discharge Prevention and Contingency Plan (PWS Tanker C-Plan) are more robust (include more people and equipment). It is not clear why the NSTFs were downsized for the terminal plan. The NSTFs already exist because they are required for the PWS Tanker C-Plan response, and if there was a Scenario 5 spill, the reality is that the NSTFs set up for the tanker spill would be used.

Recommendation: *PWSRCAC recommends a mechanism or process be developed to bring in more nearshore task forces in the event of a large spill, and incorporates the information above.*

40. Volume 3, Section 7.2.2, Recommended Modeling Inputs

Volume 3, Section 7 lists recommended modeling input, but does not list all of the required input into an oil spill trajectory model, specifically water current speed and direction, and wind speed and direction are missing.
Figure 7.2-1 *Typical Mean Spring Seasonal Current* shows the typical mean spring seasonal current to be 1 knot. However, this higher water current is not reflected in any VMT C-Plan Scenario. The Council agrees the current can be 1 knot or higher, and this should be reflected in the scenarios .

***RFAI #40a**: PWSRCAC requests water current speed and direction, and wind speed and direction be included in the bulleted list of Recommended Modeling Inputs and this table be reissued for public comment and review.*

41. Volume 3, Section 9, Sensitive Area Protection Tactics

The currently approved version of Volume 3, Section 9.0.5 references the Port Valdez Sensitive Areas Tactical Guide (TG-900) for tactics related to the Valdez Small Boat Harbor, Mineral Creek, Gold Creek, Shoup Bay, Valdez Narrows, Anderson Bay, Seven Mile Beach, Sawmill and Salmon Creeks, Allison Creek, Lowe and Robe Rivers, along with specific Port Valdez Anchor Points and VMT Shoreline Anchor Points. TG-900 has been incorporated by reference in the VMT C-Plan to comply with sensitive area protection requirements under 18 AAC 75.425(e)(3)(J). ASPC proposes to delete TG-900 from Volume 1 and Volume 3 and instead rely on Geographic Response Strategies (GRS) maintained by ADEC to accomplish this same function.

PWSRCAC stresses the importance of retaining the details contained in TG-900 in GRS. PWSRCAC also stresses the importance of a review process to incorporate changes to protecting these sensitive areas. As part of that review, parties that rely on GRS should have an understanding of that process and how it works.

***Recommendations:** PWSRCAC recommends the following, contingent upon that detailed information contained in the current TG-900 for Port Valdez sensitive areas be retained in the GRS maintained by ADEC.*

- *That ADEC ensure a process is in place for managing and approving GRS.*
- *That lessons learned from GRS deployments by any plan holder or oil spill response organization be captured in the GRS process.*
- *That responders relying on the State of Alaska GRS information have an understanding of the GRS testing and review process.*
- *That ADEC consider requiring APSC to periodic testing of these sites, similar to what is required in the Prince William Sound Tanker Oil Discharge Prevention and Contingency Plan (PWS Tanker C-Plan).*

42. Volume 3, Section 10, Wildlife Tactics

Volume 3, Section 10, Table 10.1-1 *Examples of Possible Task Force Response Resource Allocation* lists LP-7, Table 12-43 for personnel count, but there is no LP-7, Table 12-43.

Volume 3, Section 10 does not include onshore wildlife hazing of terrestrial mammals. PWSRCAC recommends this tactic be added.

VMT-W-1 though VMT-W-4 Offshore Wildlife Tactics for a typical offshore wildlife task force have substantially less resources assigned than the same type of Offshore Wildlife Tactics used in the PWS Tanker C-Plan (SV-140 Offshore Wildlife Tactics (PWS-W-1 though PWS-W-4)). For example, APSC commits one fishing vessel (compared to seven) for capture and transport of birds and otters in SV-140, two fishing vessels (compared to four) for bird and otter carcass retrieval, and two fishing vessels (compared to three) for hazing. Additionally, the number of support vessels was reduced for each tactic.

While Alyeska may have claimed in the past that less wildlife may be expected on the water near the terminal, PWSRCAC does not agree and thinks it is prudent to plan for a response

similar to what is contained in the PWS Tanker C-Plan. Wildlife populations increase in the summer months with bird nesting and activity. PWSRCAC does not see any benefit of eliminating known resources from the plan when those resources would be called upon during an actual spill.

***RFAI #42a**: PWSRCAC requests onshore wildlife hazing of terrestrial mammals be included in the plan, the wildlife tactic resources match those listed in the tanker plan, and that a mechanism or process be developed to bring in more wildlife task forces in the event of a large spill. The Council requests these changes be made and this section be reissued for public review and comment.*

43. Volume 3, Section 11, Waste Management

Volume 3, Section 11 of the VMT Technical Manual includes a small portion of the Waste Management Plan developed through the VMT C-Plan Coordination Workgroup over an extensive and in-depth technical workgroup process. The Council reiterates its opposition to APSC's deletion of the work completed by the VMT C-Plan Coordination Workgroup on Waste Management in 2003. The Compliance Section of the approved 2003 VMT C-Plan included a requirement for APSC to develop, submit an improved waste management program (which happened and was approved by the agency. The Council does not find any basis for eliminating this work from the C-Plan, and does not understand ADEC's reversal of its prior position.

***RFAI#43a**: PWSRCAC requests the waste management information contained in the previously approved versions of VMT C-Plan be included in the waste management section, and that this revised section be reissued for public review and comment.*

44. Volume 3, Section 12, Major Equipment List

As explained in the Council's comments on Volume 2, Scenarios, PWSRCAC is concerned resources allocated to response (in Volume 3, Section 12) represent an artificially low sub-set of the resources available to APSC/SERVS in Prince William Sound. In reality, all available PWS equipment and available contract resources would be used to respond to a terminal spill. The Council sees little benefit in developing a response plan that only uses a fraction of known and available resources. The plan should reflect the response actions that would actually occur.

Volume 3, Table 12.4-1 *VMT Major Equipment* must be accurate as the equipment on this list is critical to respond to a major spill and requires specific written notification to ADEC (18 AAC 75.475) if it is taken out of service for repair, extended maintenance, or dry-dock service for more than 24 hours. This equipment includes boom, skimmers, large pumps, and power packs dedicated to vessels/barges, as well as vessels and barges identified in this section. Similarly, APSC must submit "return-to-service notifications" on this major equipment when it is brought back into service.

Volume 3, Table 12.4-1 does not contain all the major response equipment required by Scenario 5 (ADEC's RPS Scenario), Scenario 4 (USCG Worst-Case Discharge Scenario), and does not appear to include all the equipment required to demonstrate response to EPA's Tier 1, 2, and 3 Contracted Volume requirements. In comparing the equipment used in Volume 2, Scenario 5 Figure 5.4-1 *Scenario 5, Equipment and Personnel Mobilization Chart* to Volume 3, Table 12.4-1 *VMT Major Equipment,* the lists do not match. For example, the

nearshore and sensitive area protection equipment is not listed, nor is the wildlife equipment listed.

Additionally, the Council has made numerous recommendations for improving Scenario 5 that may require more equipment to address a larger spill volume, improve oil spill response effectiveness, and response timing [see comments above]. These equipment improvements will need to be added to Volume 3, Table 12.4-1.

***RFAI #44a**: PWSRCAC requests Volume 3, Table 12.4-1 VMT Major Equipment be revised to address the concerns raise above and be reissued for public review and comment.*

45. Volume 3, Section 15.4, VMT-BO-4 Drainage 58 Tactic

Volume 3, Section 15.4 includes Tactic VMT-BO-4 *Drainage Containment Booming Tactic* which shows the boom configuration APSC plans to use to capture oil moving down Drainage 58 into Port Valdez. The tactic involves booming, containing, and skimming spilled oil from the boomed area. This tactic was designed specifically to aide in the response to a Scenario 5 oil spill of 155,00 barrels to water. This tactic will not contain 155,000 barrels of oil.

Field demonstrations have shown this tactic could be improved. Large gaps have been observed at shore connection points which would allow oil to escape. PWSRCAC recommends more robust and larger boom in general, and the use of additional specialty boom (shore seal) for the east end, and a tidal slide for west end connections. PWSRCAC also recommends a second layer of boom be added, and with greater skimming capability to reduce the amount of oil escaping the boomed area.

PWSRCAC brought this matter to APSC's attention in February 21, 2017 letter to APSC. This issue has also been discussed with the agencies and APSC over the past several years as well as through the Scenario 5 revision workgroup process. PWSRCAC believes this issue is still unresolved and warrants attention given the large volume of oil in Scenario 5.

***RFAI #45a:** PWSRAC requests TacticVMT-BO-4 be revised to include all the changes listed below, and be reissued for public review and comment:*

1. *Use a tide slide anchor system on the vertical Fluor Dock retaining wall connection point, similar to the system used on the Valdez Container Terminal. This will create a significantly tighter seal at this point.*
2. *Use shore seal boom with a beach connection point adjacent to the rock jetty to better eliminate tidal driven gaps. A permanent anchor for the shore seal boom end plate would likely be ideal.*
3. *Use a larger boom with a greater buoyancy to weight ratio than currently in place to contain potentially large crude oil spill volumes (e.g., Scenario 5 volumes), to mitigate drainage and entrainment, and to handle potential wave action. The pre-staged CSI boom on the Fluor Dock, while lighter and easier to work with, could easily be overwhelmed because it is designed for use in protected waters. The CSI boom is not designed to handle large spill volumes and significant wave action, and the Council believes a lighter gauge Ro-Boom would be more prudent.*

The following two photos were taken by PWSRCAC at the August 30, 2018 Annual VMT Exercise. The photos show the west side of the VMT-BO-4 tactic deployment. APSC/SERV acknowledged the significant boom gap and placed sorbent materials to capture escaping oil. This remedy would be highly ineffective in a large spill as oil would escape the gap and quickly overwhelm the sorbent material. The use of sorbents to plug the water/shore gap is an emergency action only, and should not be the default plan to remedy a poorly configured tactic.

The following two photos were taken by PWSRCAC to show a different view of the same deployment tactic on June 17, 2018 (left) and October 27, 2016 (right) and the problem with the shore connection gap. Boom is tied off the lower most concrete corner of the Fluor Dock. A tide slide on this vertical wall would offer a far better seal, though sorbents would likely still be used at this area.

The following photo shows the east side of the Drainage 58 on-water VMT-BO-4 deployment completed at the August 30, 2018 VMT exercise. The boom is tied to a rock outcrop, but a better seal would be created by using a shore seal style boom next to this rock outcropping.

At high tide, the vessel/crew setting this boom can get very close to the rock outcropping (photo below on right); however, when tides drop there would inevitably be a gap as this rock tie off point is approximately 5 feet above the beach (see photo below on left). When deployed at a low tide, there is also inevitably a gap since the towing vessel cannot navigate close enough to this rock outcropping (photo below on left). A heavy-duty neoprene style shore seal boom used at this location would generally improve containment during a range of tide cycles and this beach is well suited to this style boom (especially if some of the rocks were simply moved.)

Finally, as demonstrated with field exercises, the "CSI" style Boom (see VMT C-Plan, Volume 3, Figure A.3-9. Protected-Water (American Marine) Boom Optimax in the technical manual) staged at the Fluor Dock and used in this tactic is not intended to contain potentially large volumes of spilled oil nor is it designed for potentially significant wave action. CSI Boom

only has 8 inches of freeboard with a 12-inch skirt below the waterline. Given the estimated oil volume spilled in Scenario 5, oil would likely flood over the top of this boom and would certainly exit via the large observed shore gaps. This tactic would not be effective in containing large oil volumes. PWSRCAC recommends a heavier Ro-Boom style and use of two boom strings placed in parallel to address entrainment.

46. Control Copies for PWSRCAC

PWSRCAC requests that APSC provide two hard copies of the final controlled version of the VMT C-Plan be provided to the following:

Linda Swiss	Donna Schantz
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Prince William Sound RCAC Annual Drill Monitoring Report

2017

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Prince William Sound Regional Citizens' Advisory Council

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February 16	752.431.170216.SawD58Crucial.pdf	Saw Island & Barge 450-6
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April 4	752.431.170411.OtterHosp.pdf	VMT Otter Hospital
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December 1	752.431.171201.ShotgunCoveTF.pdf	Shotgun Cove Sensitive Area Protection Exercise

2017 Exercise Summary

Prince William Sound Regional Citizens' Advisory Council (PWSRCAC) staff observed and evaluated 17 drills and exercises in 2017. In addition to the drills and exercises, staff also participated in Alyeska's Ship Escort Response Vessel System (SERVS) 2017 fishing vessel trainings. All of these reports fall into the categories described below.

Tanker Towing Exercises

Six tanker towing exercises were conducted in 2017. The goal for SERVS is to conduct eight of these exercises on an annual basis, but meeting this goal is dependant on tanker schedules and the willingness of the tanker captains to take the time to participate. These exercises consist of a tanker simulating a rudder and engine failure, having the primary escort tug maneuver to its stern, passing the tether line of the tanker, and then bearing down via indirect and direct forces to turn the tanker and stop its forward momentum. The secondary escort tug then passes a towline to the bow of the tanker, and begins to tow the tanker to safety for five minutes at a steady heading. The exercise requires significant teamwork and communication from all vessels as this series of events unfolds very quickly.

Open-Water Response Exercises

Open-water exercises are conducted using one of the four TransRec barges, the Barge 450-6 with the Crucial skimmer, or the Valdez Star skimming vessel. These exercises typically include fishing vessels to tow boom in a U and/or gated U configuration in order to concentrate the oil for the skimming system. The tug Alert also conducted an open water U/J oil recovery deployment this year. Four open-water exercises were covered by the PWSRCAC staff.

Nearshore Response and Sensitive Area Protection Exercises

SERVS nearshore response system requires the most coordination because of the geographic area it must cover and the number of fishing vessels involved. Each nearshore task force generally has 27 fishing vessels assigned to it and there are eight task forces expected to be on scene in the first 72 hours, for a total of 216 fishing vessels. This does not include the fishing vessels associated with the wildlife and sensitive area protection task forces, which incorporate another 29 vessels that are managed by the Nearshore Group Supervisor. The management and logistical support for this many vessels can be challenging and complex.

Staff attended five exercises that were associated with the nearshore and sensitive area protection response system. Two of those exercises were in Port Valdez and focused on sensitive area protection at the Solomon Gulch Hatchery and Valdez Duck Flats. Whittier hosted an exercise, which was conducted in Shotgun Cove and which used the spill equipment staged at SERVS Whittier response center. The Whittier exercise in December included a logistical component of moving all of the needed equipment from the connex staging area

to the docks to be loaded on the fishing vessels. The other two exercises were conducted near Cordova at Nelson Bay and Simpson Bay.

SERVS also conducted a series of Geographic Response Strategy (GRS) deployments in the Valdez Arm area in September, but PWSRCAC staff was unable to participate in these deployments. GRS tactics are developed prior to a response to protect highly sensitive areas and include information on both booming and recovery strategies. When SERVS deploys these sensitive area protection strategies, they evaluate the potential effectiveness of these sites and provide input to Alaska Department of Environmental Conservation (ADEC) via the GRS evaluation report. ADEC hosts these GRS sites and deployment information online for the benefit of all, and these strategies are meant to provide sensitive area information for any event or operator, not just Alyeska/SERVS. As such, they are referenced in AK regional plans and the general PWS area plans in addition to Alyeska contingency plans.

Valdez Marine Terminal Drills

The Valdez Marine Terminal (VMT) conducted four exercises in 2017. Three of these were equipment deployment exercises, including an oil recovery demonstration at Drainage 58 by Berth 1, a large and small vessel decontamination demonstration, and assembly of the Otter Hospital at the VMT's Emergency Reasponse Base. Alyeska also conducted their annual incident management team tabletop drill.

The highlight of these VMT exercises for PWSRCAC staff was the training event associated with the Otter Hospital. Many years had passed since the last time the Otter Hospital had been assembled (staff did not observe any of this set-up). It is a large and expensive effort to assemble this facility and contingency plans speak to a 72 hour timeframe to do so. Alyeska provided an excellent training and demonstration and the sea otter rescue and rehabilitation contractors that Alyeska has on contract were brought in to deliver this training and conduct the walkthrough. This group of contractors included the same veterinarians and sea otter researchers that developed the facility and were involved with the program during the Exxon Valdez spill.

Annual Prince William Sound Shipper's Exercise

Polar Tankers and ConocoPhillips conducted the Prince William Sound Shipper's exercise for 2017 on October 3-5. This exercise scenario was a spill near Glacier Island and Point Freemantle. The simulated spill's trajectory initially went towards the Village of Tatitlek and Ellamar, which facilitated the involvement and activation of the Regional Stakeholders Committee. This exercise also included the issue of having ice mixed in with the oil spill response operations.

SERVS Fishing Vessel Training

PWSRCAC staff attended several in- and out-of-region fishing vessel trainings. There are 400+ contracted fishing vessels participating in SERVS' program. Trainings were held in Kodiak, Homer, Seward, Whittier, Cordova, and Valdez.

Suggested Focus for Future Exercise Activity

Many of the drill and exercise issues that need to be considered remain consistent from past years. The list of exercise types below does not include all of the areas that could be focused on, but should be considered a good place to begin.

Edison Chouest Offshore (ECO) Transition and Post-Transition

Many exercises have occurred, and will continue to occur, that involve the new equipment and crews brought into the Alyeska and Prince William Sound Shippers oil spill prevention and response system. This is the largest transition of equipment, boot-on-the-ground responders, and management that the Prince William Sound system has seen since it was first developed in the early 1990s. Everyone must recognize that when complex equipment such as the new tugs and barges are built, and these assets begin work, there will be mechanical issues and other complications. This is the same with new crews, and there will be a learning curve, as responders gain proficiency and get to the point that they fully understand the prevention and response system, the geographic area, the equipment they are using, and their roles and responsibilities. More training and exercises will have to be conducted to test the equipment and crews' ability to work in all of the conditions in which they are required to operate in Prince William Sound and the Gulf of Alaska.

Tanker-Towing Exercises

Six tanker-towing exercises were conducted in 2017 and all of these were during periods of daylight in the summer. As mentioned above, SERVS has a goal to conduct eight of these exercises a year. This is twice the number required in the tanker contingency plan and shows SERVS is committed to keeping the tug and tanker crews proficient for operations. We would like to see some of these exercises conducted during different times of the year and in periods of darkness to help crews prepare for an event we all work hard to prevent.

Open-Water Response

In many ways, the open-water response assets are becoming less complicated thanks to the duplication and standardization of the new ECO OSRB barges and the equipment they carry. This standardization will allow crews to transfer between platforms easier, for SERVS leadership to conduct exercises, and for contracted FVs to work with these platforms as well. In addition, new skimmers and the Ocean Buster boom systems are simply more advanced and represent faster and more efficient clean-up technology. One suggestion for building further competence into the system is that vessels and crews from Cordova and Whittier should be provided more opportunity to work with these new platforms. The bulk of the recent open-water deployments have centered around Port Valdez and have used Valdez fishing vessels and it's important to remember there are Tier 1 vessels on contract in both Cordova and Whittier.

Operating in Darkness and Dense Fog

Operating in darkness has been included in this list for the last several years. Exercise in periods of reduced visibility provided valuable training for those participating and, since most of the winter is in darkness, this was good practice for those crews. Alyeska should continue to include more fishing vessels and response crews so proficiency of working in the dark throughout the system is improved. In addition, the new tug fleet brings more advanced spill tracking equipment (FLIR cameras and Rutter Radar spill processing) and this gear should be incorporated into training activities as well.

Valdez Marine Terminal

The Valdez Marine Terminal's oil spill prevention and contingency plan just went though the approval of a major amendment and will be up for a new plan review and approval in another year. While the inclusion of the new ECO resources did not impact the VMT plan as much as the Prince William Sound Tanker Plan, these new systems still must be incorporated and used within the VMT's operations. Exercises using the ECO equipment should be conducted during all of the conditions that will be required to respond to potential oil spills at the VMT.

Sensitive Area Protection & Nearshore Response

There is a difference between nearshore response and sensitive area protection components in spill response. The missions of these two components are not the same, though response equipment, vessels, asset management, and training are very similar and overlap. Nearshore response systems should be designed to intercept and recover oil, as that oil gets close to shore, by working the leading edge of the spill. The mission of the sensitive area protection function is to get out ahead of the spill, and boom sensitive areas prior to oil reaching and threatening those areas. The management and logistical support for both of these operations can be challenging and complex, but it's important to realize that they have different goals despite similar and/or shared resources and management.

Sensitive Area Protection

The new addition to the Valdez boat harbor will change the Valdez Duck Flats protection scheme. This will cause the need for more training of the local response crews as they determine the best tactic for protecting one of Port Valdez's most sensitive areas. The sensitive area protection task forces established in the last tanker contingency plan approval should be exercised more, so as to better refine and work though the associated logistical challenges and determine if enough resources are dedicated to this critical task.

Nearshore Response

Nearshore response exercises will always be addressed as needed future work simply because of the sheer volume of fishing vessels associated with this response area. All of these vessels need to be proficient with the equipment and equipment does continue to change to some degree;

take the internalized mini barge pumps or new 13 disc Crucial skimmers for example.

Nearshore response as described in the PWS Tanker Contingency Plan will operate for twelve hours a day. Therefore, many of those hours will require operating in reduced visibility during the months of October to March. This aspect of the operation is rarely practiced and is not very well defined as to what operations can be safely conducted in periods of darkness. More exercises are needed to refine this aspect of the spill response.

Dispersant/ISB related

Dispersant, SMART monitoring, and ISB related exercises tend to be practiced as individual components, and while practice is always good, the separation of these components does not necessarily reflect how these tactics would be employed in a real event. For example, it's possible that both aircraft and tug based spray dispersant spray system would be in play at the same time and this would need to be in conjunction with SMART monitoring and the spotter aircraft. Rather than run an individual aircraft based event, and a SMART monitoring training separate, perhaps these training events could be piggy-backed to complement one another and offer a more complete picture of operations.

Unannounced Exercises

Unannounced drills provide the only real measure of a planholder's ability to respond at a point in time and at a moment's notice. These drills have the ability to test areas of a response that cannot easily be tested otherwise, such as personnel readiness and resupply capabilities. While there are benefits to having announced exercises, PWSRCAC recommends that an unannounced drill be conducted each year. There could even be unannounced aspects to a known event, such as working PPE and Decon, and asking that responders truly demonstrate they have this needed gear and can work in it.

Technical Manual Tactics

Both the Prince William Sound Tanker and VMT contingency plans utilize technical manuals to define tactics expected during a spill response. These technical manuals are well laid out and identify equipment and personnel needed to perform each tactic. The transition to ECO has changed several of the tactics that were used in the past. While some of these tactics are deployed frequently, others have not been exercised very often, if at all. A concerted effort should be made to systematically exercise each of the tactics in the technical manuals within five years of each planning cycle.

Fishing Vessels

The SERVS Fishing Vessel Program is the backbone of the oil spill response system in Prince William Sound. While the SERVS fishing vessel program appears to be healthy in regards to the number of participating vessels, PWSRCAC recommends exercises be conducted to verify availability of vessels

and crews during periods when most fishing vessels are inactive in the winter months.

Most fishing vessel crews only receive the annual training and do not get called out for additional drills. It is difficult to maintain proficiency when only practicing with the equipment once a year. There are many aspects of the open-water, nearshore, and sensitive area protection systems that have limited opportunities for even the Tier 1 vessels to practice and become proficient with these tasks. These activities include working in periods of darkness with open-water barges and in the nearshore environment, managing nearshore task forces for more than a single day exercise, and implementing sensitive area protection strategies ahead of the response area. More opportunities are needed for fishing vessels to become, and remain, response proficient.