Comment Responsiveness Summary
Proposed Revisions to 18 AAC 75
May 17, 2016

Introduction

In August 2015 the Alaska Department of Environmental Conservation (DEC) proposed revisions to 18 AAC 75 updating compound-specific cleanup levels in soil and groundwater and procedures for how they are calculated at contaminated sites. In addition, to conform to the changes, two documents adopted by reference were also updated. The revisions were released for a 90-day public comment period on August 26, 2015. The end of the comment period was extended from November 26, 2015 to December 11, 2015, to correct a technical error in the amendments and allow the public additional time to comment.

Public Participation

The department held three well-attended public workshops- one in Anchorage, one in Fairbanks, and one by teleconference. In addition, the department received and responded to 40 questions in writing during the public comment period and posted these with other frequently asked questions on the Contaminated Sites Program's regulations web page. In response to requests, the department posted additional resources, tools and support documents during the comment period to facilitate the public's review and comment on the proposed amendments.

The responsiveness summary arranges similar comments into the categories below and summarizes or shortens some of the comments to their key points. The last column indicates whether changes were made based on each comment.

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No.	Comment	ADEC Response	Changes Made? (Y/N)
18 AAC 75.340 Soil Cleanup Levels; General Requirements			
1.	"The department will require groundwater, surface water, soil, or sediment monitoring to estimate contaminant flux rates and to address potential bioaccumulation of each hazardous substance at the site," While general monitoring requirements and determination of contaminant flux rates are generally straightforward the reference to "addressing potential bioaccumulation " is vague as to what is actually being required. Clarify what is required to "address" potential bioaccumulation.	This subsection has not been changed from the existing regulations. The biological sequestering of a substance at a higher concentration than that at which it occurs in the surrounding environment or medium is not captured with the flux information for addressing bioaccumulation. Predicting the higher concentration associated with the organism is necessary to ensuring receptors are protected through the food web. To evaluate bioaccumulation, the department may require a literature review, modeled concentrations or seek that actual tissue data be obtained.	**N**
2.	The revision of 18 AAC 75.340(d) is unclear and/or does not seem to preserve the original intent of this section.	The department respects that commenters find the revision unclear. To improve clarity, the section will be revised as follows: **The cleanup level that applies at a site is the most stringent of either the site-specific calculated level or, for a pathway where no site-specific value was calculated, the listed value for a hazardous substance in Table B1 of 18 AAC 75.341(c) or Table B2 of 18 AAC 75.341(d).** The meaning of the language is that the cleanup level that applies is the **most stringent** of the following: The site specific level, if it was calculated, for human health, or the site-specific value, if it was calculated, for the migration to groundwater, or the listed value in Table B1 for either the human health or migration to groundwater pathway value, for which no site specific value was calculated. For example, a site-specific value for migration to groundwater cannot apply if it exceeds the listed value for human health. The same is true for site-specific levels for compounds in Table B2.	**Y**
3.	The proposed regulations have eliminated the use of an approved fate and transport model for Table B1 compounds.	The unintended omission of Table B1 was a technical error in the formal amendment document issued in the August 26, 2015 public notice. It was corrected as noticed in the October 22, 2015 supplemental public notice, to read: "(2) the levels for the migration to groundwater pathway in Table B1 or Table B2, based on approved site-specific soil and groundwater data, an approved fate and transport model...."	**Y**

4.	The new soil cleanup levels use a single number ("human health") encompass multiple exposure routes (ingestion, inhalation and dermal contact). Some sites do not have all pathways complete, so would the department consider a site-specific cleanup level that eliminates pathways that are not complete?	If one or more of these exposure routes is not present at a site, a responsible party may propose a site-specific cleanup level under Method 3 by running the calculations with default parameters and reviewing the individual criteria for each pathway and providing a thorough justification for eliminating one or more pathways.	**N**
5.	The revision of 18 AAC 75.340(a) is unclear or does not preserve the original intent of this section.	The department will revise the text to clarify the intent, as follows: For each site... a responsible person shall propose soil cleanup levels for approval, shall base those cleanup levels upon an estimate of the reasonable maximum exposure expected to occur through one or more pathways that include the Table B1 human health or migration to groundwater pathways, and the Table B2 ingestion, inhalation, or migration to groundwater pathways under current and future site conditions...	**Y**
6.	ADEC needs to define the term 'sensitive subpopulations' more clearly in the regulation (18 AAC 75.990).Will subsistence hunters on the North Slope be considered in the definition of a sensitive subpopulation? What is meant by a 'site specific analysis?' This should be well defined in the revised 18 AAC 75.990 and clearly laid out in the Risk Assessment Procedures Manual (RAPM).	Infants, young children, pregnant women, and the elderly are common examples of sensitive subpopulations. When these subpopulations are exposed to contamination, additional assessment may be required to ensure the default cleanup levels are protective. It is correct that some RfDs do take sensitive subpopulations into consideration, but this is not the case for every compound. In addition, increased exposure may also occur which is not captured in the default exposure scenarios used to generate the default cleanup levels. As the scientific knowledge about the determinants of susceptibility expands, our ability to identify vulnerable subpopulations will improve. Due to unforeseeable variables, having to do with availability of toxicity information, the number of individuals affected, the duration, and the specific nature of their sensitivity (pregnancy, elderly, type of illness or other vulnerability), setting specific criteria would inevitably fail to anticipate all of these variables. The department must retain discretion to effectively apply this regulation on a case by case basis. Peer-reviewed data documenting how sensitive subpopulations are impacted by a chemical at a certain concentration would be required to develop a cleanup level (under Method 4) that is protective of said sensitive subpopulation. Any more prescriptive language to set specific criteria would inevitably fail to anticipate all of the variables that could be associated with the exposure and advancement in science and could ultimately have the effect of being overly burdensome on the regulated community. The department must retain discretion to effectively apply this regulation on a case by case basis. Subsistence hunters on the North Slope would have an increased intake rate of the contamination of potential concern that would be captured in the additional exposure pathways due to their lifestyle as noted in the RAPM and 18 AAC 75.340 (i) (D) but not the default cleanup values presented in the tables.	**N**

Cleanup Levels – Detection Limits			
7.	Please find attached a spreadsheet detailing TestAmerica's evaluation of the new 2016 limits. We have only listed compounds where we don't meet the new limits. In columns N, O, P we have classified how these limits might be met (definitions for "A, B & C" categories at the bottom of the table). Additional comments are in column Q and at the bottom of the table. We identified in column M if our LOD meets the limits (for DoD work in AK). If not, we identified in column Q if our MDL meets the limit (for commercial AK work).	The department thanks the commenter for providing this information as it improves our understanding of the capabilities of the laboratories.	**N**
8.	ADEC's stated intent is to make derivation of regulatory cleanup levels consistent for all compounds and applicable to human health risk levels. However, this approach leads to a number of cleanup levels that are not achievable given the currently available analytical technology. We recommend revising the approach to consider the currently available analytical technology. Different laboratories have different reporting limits and different analytical techniques, making data comparison of nondetects within a given site with data from different laboratories (a common practice) difficult at best. Rather, the ADEC should determine a feasible detection limit that all approved labs under the CS program are able to reach. In cases where that detection limit is greater than the cleanup limit, ADEC would then be able to develop a programmatic approach, making cleanup decisions that are much more legally defensible.	Where a reporting limit below the cleanup level cannot be achieved by any of DEC's approved labs, the RP may propose to set the cleanup level at the Practical Quantitation Limit (PQL) if the PQL is no greater than 10 times the MDL or no greater than PQL listed in methods set by SW-846, if available. In the absence of a method SW-846 PQL, DEC may determine the cleanup level has been met if the PQL is no greater than 10 times the MDL. DEC may also require one or more of the following: • The comparison of the Limit of Detection (LOD) to the cleanup level • The use of a surrogate compound to estimate the concentration • The use of a specialized method or procedure to reduce PQL's • Monitoring of the compound to ensure levels do not exceed PQL's over time It is important to recognize that laboratory analytical technology is an evolving field, with improvements in analytical detection continually occurring; therefore defaulting to the PQLs as the cleanup levels in the tables would not represent the state of the best available technology in laboratory analysis. If a consultant or RP has questions about a lab's ability to provide reporting limits below cleanup levels and thus, meet data quality objectives, they are invited to contact DEC technical staff for assistance.	**N**
9.	Several contaminants do not have available reference methods or are not defined. Antimony (metallic) Soil and Water Free Cyanide Soil Formaldehyde Soil and Water Hydrazine Mercury (elemental)	If a reference method is not available, the responsible party may propose an analytical method as part of the Sampling and Analysis Plan. The project manager and program chemist will review the reference method and lab standard operating procedure. The Department can then approve the Sampling and Analysis Plan.	**N**

	Analytical procedures generally yield total metals and cannot differentiate between metallic, elemental or other oxidation states. ADEC should reference valid methods for metallic antimony, elemental mercury, Hydrazine in soil and water, Formaldehyde in soil and water, and free cyanide in soil that can achieve reporting limits below the MCLs.		
10.	It is likely that most laboratories can achieve PQLs no greater than those established in EPA's SW-846 guidance. However, ADEC may determine that additional action is necessary to ensure projection of human health, safety or welfare of the environment. Of the four options listed, the most viable would be special collection or analytical procedures. What oversight is proposed to assure equitable application of approved PQLs for all responsible parties and ensure the "improved or modified" methods are based on sound, reproducible science and adequate peer review?	The Alaska Lab Approval Program approves the commonly used laboratory methods. For modified procedures the lab method is reviewed and approved by the Department before samples can be analyzed. The program chemist (often in consultation with EPA) reviews each "improved or modified" method and the lab's standard operating procedure to ensure that the method and procedure are based on sound, reproducible science.	**N**
11.	One accepted technique for lowering reporting limits for organic compounds by GC/MS is the use of selected ion monitoring, SIM. This technique involves the practice of monitoring and recording ion currents at one or more selected ion m/z values rather than recording the full mass spectra. Because the detector is integrating the signal for a longer time at the relevant ion, limits of detection can be lowered, but at the cost of increased susceptibility of the analysis to unexpected interference. EPA reference method 8270D Section 11.5.5 cautions: "The use of selected ion monitoring (SIM) technique is acceptable for applications requiring quantitation limits below the normal range of electron mass spectrometry. However, SIM may provide a lesser degree of confidence in the compound identification, since less mass spectral information is available. Although SIM analysis can lower reporting limits by 10X to 100X, petroleum contamination or naturally occurring biogenics can contribute to more false positives by the use of this technique.	Noted.	**N**
12.	Many of these cleanup levels are below what can be detected by commercial laboratories. How can ADEC expect us to demonstrate a site meets cleanup level requirements?	According to 18 AAC 75.355(c)(1), in cases where the practical quantitation limit (PQL) is greater than the cleanup level, the Department will determine a responsible party to have attained the cleanup level if the PQL is no greater than ten times the method detection limit (MDL) and the PQL is no greater than the PQL established in EPA's Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846). In cases where a contaminant is not listed	**N**

		in SW-846, the responsible party must demonstrate that their DEC approved lab does not have a PQL that can meet the cleanup level. Procedurally, when the RP submits a Sampling and Analysis Plan, they should: • State that the cleanup level for a particular analyte can't be met with current technology • Cite the PQL listed in SW-846 • Ask the Department to approve an alternative cleanup level at that PQL By approving the Sampling and Analysis Plan, the Department will also be approving the alternative cleanup level.	
13.	At present, ADEC only supports the use of the medium level, methanol preserved method for VOCs in soil. The low level method with sodium bisulfate solution or freezing preservation is only allowed on a case by case basis. To even approach achieving the reporting limits required for some compounds the low level method must be allowed. This would require both low level and medium level samples to be collected and may necessitate both to be analyzed. It should be noted that 1,2,3- trichloropropane is not an analyte listed for SW-846 method 8011 and the water MCL of 0.0075 ug/l is below the pql of this method for analytes included. Of greater significance is that this method is clearly for water only and EPA Region 10 laboratory experts are very skeptical of adapting the method for soils.	As the commenter states, low level analysis is allowed on a site-by-site basis. Preservation with sodium bisulfate causes some compounds to degrade, so methanol preservation is also required. The Department is in the process of updating its Technical Memorandum regarding low-level VOC analysis to include additional preservation techniques as well as to clarify when methanol preserved sampling can be discontinued. The modified method 8011 for 1,2,3-TCP is not ideal, but is the best method available and is routinely used by both ADEC and EPA. ADEC will develop guidance on this and other methods in a technical memo.	**N**
Cleanup Levels - General			
14.	ADEC is proposing that when the proposed risk-based cleanup levels are too low to be analytically achievable, that the project cleanup levels will be determined by the ADEC PM on a site-specific basis. This would not constitute a consistent application of cleanup levels. If cleanup levels are not applied consistently, they do not meet the requirements to be considered ARARs. Under 40 CFR § 300.400(g)(4) only state standards that meet the following requirements can be potential ARARs: 1) promulgated; 2) identified by the state in a timely manner; and 3) are more stringent than federal requirements.	It is not anticipated that this will result in an inconsistent application of the regulations. The process for addressing the issue raised in the comment is outlined in 18 AAC 75. 355(c).	**N**

	In addition, to be considered ARARs, the requirement must be consistently applied by the state. [42 USC 9621 (d)(4)(E)] General goals that express legislative intent but are non-binding are not ARARs. State guidelines or advisories will not be ARAR but may be "to be considered" (TBC) guidance. [Ref 40 CFR § 300.400(g)(3)]		
15.	ADEC proposes to amend the cited rule to include the following sentence. "Where the department determines that toxicity data is [sic] insufficient to establish a cleanup level for a hazardous substance or a pollutant as defined under AS 46.03.90(20) that ensures protection of human health, safety, and welfare, and of the environment, the department may require a responsible person to provide an alternative source of drinking water for the affected parties or implement other institutional controls under 18 AAC 75.375 until a cleanup level is established under 18 AAC 75.345(b)(2), (b)(3) or (b)(4)." The proposed language provides no threshold criteria and ADEC offers no guidance regarding how it will determine that "toxicity data are insufficient to establish a cleanup level." Moreover, the proposed rule would appear to afford ADEC unbounded authority to require alternative drinking water for an indefinite period of time. ADEC should strike the proposed language because it fails to reflect best science (or any science for that matter), is vague, is contradictory to its own polices for deriving soil and groundwater cleanup levels, and is inconsistent with USEPA policy.	ADEC has established cleanup values for over 200 compounds thus the situation would be rare and applied to emerging contaminants that are not established in ADEC Tables. As noted in the Risk Assessment Procedural Manual in section 3.3.1, ADEC uses a toxicity hierarchy. When values are not available from a tier 3 source, criteria consistent with The Environmental Council of the States and EPA white paper on tier 3 toxicity values (ECOS, 2007 and USEPA, 2013a) would be a starting point. Many factors go into developing a toxicity value and its applied use. Experts from the field like EPA and/or the National Toxicology Program would need to be consulted. Setting specific criteria would inevitably fail to anticipate all of these variables, but justification for the decision would be provided when the determination is made.	**N**
16.	18 AAC 75.341 states that chloromethane is a toxicity surrogate for hydrazine and methyl mercury (Kd value only). These three chemicals do not have similar fate and transport properties.	The commenter is correct. Upon further research, the Department will use a hydrazine Koc of 2 L/kg based on the National Institute of Health's Hazardous Substances Databank. The Department will use a methyl mercury Kd of 2,700 ml/g based on U.S. EPA. 1997 Mercury Study Report to Congress. EPA-452/R-97-005. Office of Air Quality Planning and Standards and Office of Research and Development.	**Y**
17.	If soil cleanup levels are lowered for some of the proposed contaminants, it will sometimes be impossible to obtain backfill material that meets the new levels since background contaminants will exceed the cleanup levels.	The department agrees this is a concern and is developing guidance on how to address this type of situation.	**N**
18.	Lower soil cleanup levels likely will require more indoor air studies. Hopefully DEC will use common sense and not	The Department will continue to use the 2012 Vapor Intrusion Guidance to evaluate indoor air.	**N**

	require air studies at sites with low contaminant levels and/or low usage buildings.		
19.	ADEC proposes to amend 18 AAC 75.345(c) to add "the presence of sensitive subpopulations who respond biologically to lower levels of exposure to a hazardous substance" as a factor ADEC may consider to determine if a more stringent cleanup level than listed in Table C is necessary "to ensure protection of human health, safety or welfare, or of the environment . . . In addition, at 18 AAC 75.340(i)(2), ADEC adds to its reasons for requiring a site-specific analysis "the presence of sensitive subpopulations who respond to lower levels of exposure to [sic] hazardous substance." At 18 AAC 75.990, ADEC defines "sensitive subpopulation" to mean "a group of individuals that is at increased risk of some adverse health event or outcome after exposure to a contaminant." However, the ADEC definition offers no criteria or guidance as to when a "group of individuals is at increased risk of some adverse health event or outcome" and when ADEC would require use of a groundwater cleanup level lower than those listed in Table C. In fact, ADEC is already protecting sensitive subpopulations by using RfDs that are specifically designed to protect sensitive subpopulations. Some RfDs are derived from developmental toxicology studies in which pregnant laboratory animals are dosed during the gestation period at the critical time of organogenesis to determine if the developing fetus is harmed by the mother's exposure to the chemical. If so, then the RfD is derived from that study specifically to be protective of the sensitive subpopulation of developing fetuses. Such RfDs are applied to children and adult risk assessments even though protection of a developing fetus is not relevant for a six-year old child receptor. Such RfDs are used to set cleanup levels using the standard equations outlined in the *Risk Assessment Procedures Manual* (2015), and the cleanup levels listed in Table C are specifically derived to be protective of this most sensitive subpopulation. ADEC confirms in its response to Question #38 that it will use toxicity values that are only relevant to receptors of reproductive age to set cleanup levels based on	Due to unforeseeable variables having to do with availability of toxicity information, the number of individuals affected, the duration, and the specific nature of their sensitivity (pregnancy, elderly, type of illness or other vulnerability), setting specific criteria would inevitably fail to anticipate all of these variables. The department must retain discretion to effectively apply this regulation on a case by case basis. Peer-reviewed data documenting how sensitive subpopulations are impacted by a chemical at a certain concentration would be required to develop a cleanup level (under Method 4) that is protective of said sensitive subpopulation. Any more prescriptive language to set specific criteria would inevitably fail to anticipate all of the variables that could be associated with the exposure and advancement in science and could ultimately have the effect of being overly burdensome on the regulated community. Infants, young children, pregnant women, and the elderly are common examples of sensitive subpopulations. When these subpopulations are exposed to contamination, additional assessment may be required to ensure the default cleanup levels are protective. It is correct that some RfDs do take sensitive subpopulations into consideration, but this is not the case for every compound. In addition, increased exposure may also occur which is not captured in the default exposure scenarios used to generate the default cleanup levels. As the scientific knowledge about the determinants of susceptibility expands, our ability to identify vulnerable subpopulations will improve.	**N**

	exposure scenarios for children aged one to six if they are in the database used for the EPA Regional Screening Levels. ADEC addresses the issue of "sensitive subpopulations" in its response to Question #37, by stating that it will not establish any criteria beyond the criteria included in the definition found at 18 AAC 75.990. ADEC should expressly state so in the amendments.		
20.	The Department of Defense (DoD) welcomes the use of risk-based cleanup goals in our cleanup program as it is consistent with the Defense Environmental Restoration Program (DERP) objectives for cost-effective cleanup that is protective of human health and the environment. The DERP conducts environmental restoration activities in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), the National Contingency Plan (NCP) and Executive Order 12580 regarding lead agent authority. Please note that state environmental laws such as 18 AAC 75 and proposed revisions apply only as provided by CERCLA and judicial interpretations thereof. CERCLA 42 USC§ 9620(a)(l) and 42 USC§ 9621(d)(2) limit the role of state laws on federal facilities to the applicable or relevant and appropriate requirements (ARARs).	We thank you for your comment.	**N**
21.	The language of Section 18 AAC 75.345(d) would require actions to be taken when there is no ARAR and a potentially unacceptable risk has not (and cannot) be demonstrated. Furthermore, the only "exit strategy" for providing alternate drinking water could potentially either take years to be developed or may never be agreed to, so the state is essentially requesting that alternate drinking water be provided in perpetuity when no risk has been demonstrated. This type of action and resultant expenditure without an ARAR or a potential risk is not consistent with CERCLA and should be revised.	By statute (AS 46.03.020(10) and AS 46.03.900(20)), the department is authorized to develop standards and require cleanup of contamination that is potentially harmful to human health or the environment. When the public is exposed to contaminants that have suspected toxic effects, there is the potential for the harm from these effects to be irreversible if protection, such as an alternative source of drinking water, is delayed pending data to confirm those very health effects.	**N**
22.	The CSP lists 16 of the many PAHs, which are naturally occurring and found in food, petroleum, and products of combustion. Naphthalene is ~0.3% of typical Alaskan diesel fuel.	It is well documented that combustion can spread PAHs over a large area. As the commenter notes, the Department does not require sampling of asphalt where it is being used for its intended purpose, and discusses contribution from off-site PAH sources with responsible parties. The Department does not require responsible parties to remediate pyrogenic contamination.	**N**

	PAHs are common constituents of asphalt and sealers, especially older coal tar based products. The CSP has an unwritten policy to simply not test asphalt, since it obviously exceeds limits for diesel and residual range organics. Milled recycled asphalt pavement (RAP) is commonly used for highways, driveways, and parking lots; it is difficult to visibly discern from gravel or by chemical analyses from the ubiquitous oil leaks and fuel spills. Soil in burned forest and tundra often exceeds proposed limits for naphthalene. Urban backgrounds often exceed limits for other PAHs, especially if coal was used. Soils impacted by forest fires exceed naphthalene and Cr(VI) levels, at least until naturally attenuated. Disposal of ash from any source onto land or unlined C&D landfills could require "a discussion with the CS project manager", etc.		
23.	If tested by EPA methods, asphalt and RAP will exceed cleanup levels for As, Cr, GRO/BTEX, DRO, RRO, and naphthalene. Since RAP is so widely distributed, expect "a discussion…", etc. for site characterizations near roads, driveways, parking lots, asphalt plants, and DOT facilities. "Cleaning" soil to CSP's proposed levels is ludicrous. The root cause is the CSP's presumption that a risk based screening level regardless of source can become a cleanup level by simply moving a decimal. While convenient, it avoids the all-important risk management, where common sense, cost feasibility, and balancing health vs remediation risks force modification of screening levels into site cleanup levels.	Reclaimed asphalt pavement (RAP) is a known building material and the department is aware that it contains metals and petroleum hydrocarbons. The department would not require a party to clean up a legally constructed driveway or parking lot. However, an illegal dump site filled with RAP would need to be made safe for human health, welfare, and the environment.	**N**
24.	340(e) (1) ….What is the purpose of the bold text that in the following excerpt: "a responsible person may propose for the department's approval **or the department may set** a site-specific alternative cleanup level"?	In cases where no responsible person can be found (i.e. orphaned sites) or where the responsible person has not set a cleanup level that is acceptable to the Department, the Department needs to be able to set a cleanup level at that site.	**N**
25.	Soil cleanup levels tables use units of mg/kg, whereas the groundwater cleanup levels table uses µg/L. Please use consistent units to avoid confusion and to be consistent with similar requests frequently received from ADEC personnel.	Soil is solid and groundwater is liquid, so unless groundwater is reported by mass it is impossible to use the same units. Some in the regulated community do not prefer the use of scientific notation and others do not prefer extended decimals such as 0.000700 mg/L. Since most labs report analytes in ug/L, and it avoids the aforementioned alternatives, the Department has chosen to use ug/L for groundwater. This also avoids conversion errors when lab data is transferred to data summary tables in environmental reports.	**N**

26.	"The department will develop a site-specific cleanup level for a hazardous substance not listed under 18 AAC 75.341(c) using the procedures set out in the department's Risk Assessment Procedures Manual adopted by reference…" This fails to establish a consistent cleanup standard and therefore would not be considered an ARAR. This applies to other areas of 18 AAC 75 that include determining cleanup levels on a site-specific basis.	The department does not concur with the statement of the commenter. The section cited prescribes a specific process to be used in developing a cleanup level for a contaminant that is not listed, a process which will be consistently applied.	**N**
27.	Cleanup levels for the most part are overly conservative to begin with and forcing sites into stricter cleanup mode is a waste of time and a waste of money. Remediating to the proposed soil cleanup levels would cause more harm than good at most sites.	In order to meet its statutory obligation, the department sets cleanup criteria that will ensure the protection of human health, welfare and the environment. To establish these criteria, the department uses a scientifically defensible process that is based on risk, except where risk-based concentrations exceed solubility or saturation levels, (free phase product). The generic cleanup criteria in Tables B1 and C are necessarily conservative to cover a range of hydrologic, soil and climatic conditions across a continental land mass that is more than half the size of the contiguous United States. If a responsible party deems the cleanup levels to be inappropriate for their specific site, they have the option to propose site-specific cleanup levels under method three for the department's review and approval.	**N**
28.	18 AAC 75.341(c) - Table B1 and 18 AAC 75 75.341(d) - Table C contain cleanup levels for Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonate (PFOS) that are based on draft criteria and documents from EPA, particularly EPA's February 2014 draft health effects documents for Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonate (PFOS). Until final versions of the health effects documents are published by EPA, the cleanup levels for PFOS and PFOA cannot be considered to be final. These draft EPA documents (dated February 2014) are stipulated as "Draft-Do not Cite or Quote." Therefore, cleanup levels based on draft documentation should be removed from the tables.	Because 2014 draft health effects documents cited are not yet final, the department has recalculated the cleanup criteria for these compounds based on EPA's 2009 subchronic reference doses, with an uncertainty factor of 10 to convert these to chronic values.	**Y**
29.	During the (Oct 14, 2015?) public meeting the ADEC said several times that they wanted the tables to be risk based. However, several of the Table B1 values use the Csat value in place of a risk based value, and several of the Table C values use the solubility value in place of a risk based value.	The commenter is correct. In some cases the risk-based cleanup level for compounds listed in Tables B1 and C exceeds the solubility of the compound, which results in the presence of free product. In these cases, the cleanup level is set at the solubility in conformance with 18 AAC 75.325(f).	**N**
30.	The FAQs state that cleanup levels are based on the toxicity values hierarchy; however some toxicity values do not meet the EPA classification of Tier 1, 2, or 3 values.	The majority of the toxicity values used to generate the proposed cleanup levels in 18 AAC 75 meet the criteria established in the DEC toxicity hierarchy However, in some cases surrogates or other justification are used and footnoted in the regulation table.	**N**

31.	345(b) (1) and 345(b) (2), and the PCCL lock in the use of the Andelman volatilization factor for Methods Two and Three. The Andelman volatilization factor appears to be overly conservative in that it has been documented to yield results above maximum theoretical vapor concentrations. The EPA regions that I talked to, use the Andelman volatilization factor for screening but not for risk calculations.	The Andelman approach is adequate for volatiles, but it will tend to overestimate exposure if semivolatile constituents are included. This is not the case for the proposed regulation as the Andelman is only applied to volatile organic compounds, but because the department did not explicitly state that in the PCCL some parties were not aware of it. A statement has been added to the PCCL to emphasize that the Andelman approach is only used for volatiles. To state the Andelman factor is not used in risk calculation is incorrect. The Andelman factor is routinely used in risk assessment and cited in EPA Risk Assessment Guidance for Superfund: Volume I - Human Health Evaluation Manual Part B, Development of Risk-based Preliminary Remediation for assessing the risk of volatiles from household water use. Several risk assessment performed in Alaska from Department of Defense sites have proposed the assessment of the pathway for volatile vapor from groundwater using the Andelman Factor in their work plan. Two recent ones are Galena Airforce Base and Fort Wainwright (which has EPA oversight and the work performed by the Army Corps of Engineers.). Experimental studies have demonstrated that the internal dose of VOC from showering can be comparable to the exposure dose resulting from drinking the water (Jo et al 1990 a and b) thus the inclusion of the pathway is important for determining preliminary cleanup goals in the cleanup tables. References: EPA Risk Assessment Guidance for Superfund Volume 1 Human Health Evaluation Manual (Part B) 1991 Jo WK, Weisel CP, Lioy PJ. 1990a. Chloroform exposure and the health risk associated with multiple uses of chlorinated tap water. Risk Analysis 1990 Dec; 10(4):581-5. Jo WK, Weisel CP, Lioy PJ. 1990b. Routes of chloroform exposure and body burden from showering with chlorinated tap water. Risk Analysis 1990 Dec; 10(4):575-80.	**N**
32.	ADEC has indicated their intent is to adopt risk-based values throughout the table rather than deferring to MCLs. However, it appears that a mathematical-only approach was applied across than board, not a risk-based approach. Some proposed cleanup levels are greater than pure products and less than current method detection limits. For example:	The error has been corrected.	**Y**

	Chromium III MTGW is 5.34E+08 =534,000,000. This is 534 million parts per million.		
Cleanup Levels - Metals			
33.	Cleanup levels are given for chromium (III), chromium (VI), and chromium (total). This is confusing. It is accepted that Cr(VI) is a carcinogen and is more toxic than the Cr(III) form. The risk-based values for total chromium assume that all chromium in soil or groundwater consists of hexavalent chromium. This assumption will be incorrect at many sites. In general, hexavalent chromium concentrations are low relative to trivalent chromium concentrations in surface water.	The Department has added a footnote into the Tables B1 and C that clarify that the trivalent chromium cleanup level applies at a site unless a hexavalent source has been identified or suspected.	**Y**
34.	The migration to GW standard for lead is 0 mg/kg. Is this a mistake?	This is not a mistake. There is no consensus RfD or CSF for inorganic lead, so it is not possible to calculate cleanup levels as we have done for other chemicals. EPA considers lead to be a special case because of the difficulty in identifying the classic "threshold" needed to develop an RfD. EPA therefore evaluates lead exposure by using blood-lead modeling, such as the Integrated Exposure-Uptake Biokinetic Model (IEUBK). The EPA Office of Solid Waste has also released a detailed directive on risk assessment and cleanup of residential soil lead. The directive recommends that soil lead levels less than 400 mg/kg are generally safe for residential use. For water, we use the EPA Action Level of 15 µg/L. We do not calculate a migration to groundwater cleanup level.	**N**
35.	Several of these compounds are part of the natural human diet. Some of these compounds are vital for human health. It is accepted that Cr(VI) is a carcinogen and is more toxic than the Cr(III) form, which is essential for human health.	The Department has added a footnote into the Tables B1 and C that clarify that the trivalent chromium cleanup level applies at a site unless a hexavalent source has been identified or suspected. The department concurs that Chromium III is an essential element in humans but the recommended daily intake of 0.050 to 0.200 mg/d is far lower than the reference dose of 1.5 mg/kg/d proposed for Cr III. At some appreciable level even essential metals can be toxic.	**Y**
36.	Arsenic and chromium are naturally elevated in many parts of the state and most aquifers are likely to exceed the cleanup value. Much soil also naturally exceeds the cleanup level. The arsenic and chromium cleanup levels are much too stringent. Are we going to have to do background studies at every site? Further clarification is warranted for Note 15 "Due to naturally occurring variable concentrations throughout the state, arsenic must be evaluated as a contaminant of potential	The Department has added a footnote into the table that clarifies that the trivalent chromium cleanup level applies at a site unless a hexavalent source has been identified or suspected. For arsenic, the concentrations at a site will be determined to be natural background unless anthropogenic contribution, through an activity, or mobilization via another introduced contaminant has been identified or suspected.	**Y**

	concern on a site-specific basis". This could be interpreted along with the 2009 technical memo, "Arsenic in soil" to mean that only sites with a known or suspected source of anthropogenic arsenic would require background studies for arsenic or arsenic sampling however, this isn't stated in the proposed regulations.	The 2009 memorandum *Arsenic in Soil* will be updated and clarified to reinforce this point and more clearly define the evaluation process required by responsible parties.	
37.	The 2015 proposed groundwater cleanup value for arsenic is 0.52 ug/L which has been lowered from the existing level of 10 ug/L. The new cleanup level is significantly less than the EPA drinking water MCL of 10 ug/L which was adopted in 2006.	See general response on the question of MCLs versus cleanup levels. Specific to arsenic, EPA has established a Maximum Contaminant Level Goal (MCLG) of 0. The proposed ADEC cleanup level is greater than zero, and corresponds to a cancer risk of no greater than 1 in 100,000.	**N**
		Cleanup Levels - MCLs	
38.	At federal facility sites, the cleanup levels of 18 AAC 75 are potential CERCLA ARARs. They do not, however, constitute a basis for action in a remedial investigation at federal facility sites. A basis for action for groundwater requires that a federal or state non-zero Maximum Contaminant Level Goal or Maximum Contaminant Level (MCL) is exceeded and there is a potential or actual exposure pathway; or ecological risk is determined unacceptable; or cumulative cancer risk exceeds one in ten thousand (10^4); or the non-cancer risk exceeds a hazard index (HI) of 1. Since 18 AAC 75 no longer uses MCLs, a DoD remedial action (following a Remedial Investigation) will generally only be triggered at federal facility sites when a federal or more stringent State MCL or non-zero MCL goal is exceeded, or a risk assessment finds that cumulative cancer risk exceeds 10^{-4}, or a non-cancer HI exceeds 1.	The department does not concur with the statement of the commenter. State ARARs are not limited to MCLs or MCLGs, but also include other standards where established and available at the state level, such as Table C values for groundwater in 18 AAC 75.345.	**N**
39.	In some cases, cleanup levels are more stringent than the EPA's Maximum Contaminant Level (MCL) standards for drinking water. I can't think of any situations where the groundwater cleanup levels for metals should be more stringent than drinking water standards as drinking water represents a more direct pathway to a receptor.	The drinking water Maximum Contaminant Levels (MCLs) are not calculated consistently based on risk. Some of the MCLs are less protective than the department's 1 X 10^{-5} risk standard, others are more stringent. MCLs are not routinely updated in line with the most recent available toxicity information. The values do not accommodate all exposure risks for children, do not account for mutagenic risks, and do not account for the exposure to volatile compounds through the inhalation pathway during bathing. Finally some MCLs are based on the best available technology to treat the water. As a result of these factors and varied approaches for how MCLs are derived, the department has selected a single consistent approach for setting groundwater cleanup levels that are safe for adults and children based on current information about exposure and toxicity.	**N**
40.	The proposed groundwater cleanup levels contain values less than EPA drinking water standards. MCLs for protection of	The department does not concur with the statement of the commenter. State ARARs come into play when the standards are more stringent, and are not limited	**N**

	human health for groundwater consumption would not be consistently applied by the state if these new cleanup levels are adopted, potentially causing issues with legality of application of groundwater ARARs.	to MCLs or MCLGs, but also include other standards where established and available at the state level, such as Table C values for groundwater in 18 AAC 75.345.	
41.	The elimination of EPA Maximum Contaminant Levels as cleanup goals, as implemented by Table C in Section 18 AAC 75.345(b) causes a vast discrepancy between different regulatory programs that establish "safe" levels. Since Alaska relies on the EPA MCLs for drinking water protection, the state is essentially sending mixed messages regarding "safe" levels in groundwater and in drinking water. For example, 18 AAC 70 allows the Municipality of Anchorage to discharge wastewater with arsenic concentrations of 36 µg/L dissolved. 18 AAC 75 does not allow the use of dissolved metals values or concentrations exceeding 0.517 µg/L. Consistent application of regulations is not happening	The drinking water Maximum Contaminant Levels (MCLs) are not calculated consistently based on risk. Some of the MCLs are less protective than a 1 X 10^{-5} risk standard, others are more stringent. MCLs are not routinely updated in line with the most recent available toxicity information. The values do not accommodate all exposure risks for children, do not account for mutagenic risks, and do not account for the exposure to volatile compounds through the inhalation pathway during bathing. Finally some MCLs are based on the best available technology to treat the water. MCLs or MCLGs that are more stringent may be considered under 18 AAC 75.345 (c)(4). The example cited by the commenter is referring to a permitted discharge, not a contaminated site. Groundwater cleanup levels apply to unpermitted discharges.	**N**
Cost of Complying with the Regulations			
42.	The economic analysis is insufficient. More sensitive analysis for analytes will be significantly more expensive. Other factors resulting in additional costs include the potential for more site-specific risk assessments, additional sampling, and collection of site-specific parameters for soil background levels, and hydrogeologic conditions. Additional long term management costs will be incurred. Promulgation of the new rules should be postponed until a better evaluation of the cost to the regulated community has been completed.	The Department (including an Economist III) conducted an economic analysis to the best of its ability, but lacks the necessary cost information on various factors, options and alternatives to provide a quantitative estimate with any degree of accuracy of the cost to municipalities, state agencies and private persons of implementing the proposed regulations versus the cost of not implementing the regulations. Costs to municipalities, state agencies and private persons with the changes: The lower cleanup levels may require additional sampling, more sophisticated laboratory analysis, potentially more waste disposal of contaminated soil and water, and/or increased operation of remediation technologies. However, an array of alternatives exist for addressing contaminated sites. These include using the default cleanup levels under method two, proposing site specific cleanup levels under method three including the option of using a fate and transport model; or proposing cleanup levels under a method four risk assessment. In addition, a wide variety of remediation alternatives exist for addressing contaminated sites. Furthermore, an RP can propose a commercial industrial cleanup scenario, or a cleanup that includes the use of engineering and other institutional controls to control exposures at a site. With these alternatives and variables, it becomes difficult to estimate the costs of one alternative over another in conjunction with the changes in the cleanup criteria. In addition, the department is not provided information about the costs incurred by responsible parties in their cleanup of	**N**

		contaminated sites. Finally, for cleanup levels that have become less stringent, cleanup costs may be reduced. Costs to municipalities, state agencies and private persons without the changes: The current regulations are not protective of children. Due to their smaller body mass, children are more susceptible to harm from pollutants. The new cleanup levels are protective of children. The Department does not have data such as types of medical treatments needed or medical costs for childhood cancer treatment needed to calculate the cost of the increased childhood illnesses and deaths. In addition, due to out of date toxicity information and equations, current cleanup levels and existing regulatory language are not adequately protective of the general population, for example for emerging contaminants where health risks are suspected but limited toxicity information is available.	
43.	ADEC has proposed changes without fully explaining the basis for, offering a rationale for, or why the changes need to be made at this time. A justification besides that new science and new toxicity data (and draft toxicity data) has become available is warranted. During this economically challenging time for Alaska, and by your own admission that private businesses are more likely to face additional costs, these changes need to be postponed until the price of oil goes back up as the price of natural resources (oil, natural gas) directly effects Alaska's economy both in and out of the oil industry (e.g. the three legged stool). Toxicity data alone and change for the sake of change does not justify the significant additional expenses private businesses will incur when there has been no evidence of real impacts (e.g. cancer clusters or other health impacts in the population).	The department provided the detail of the changes in the August 26, 2015 public notice; the reason for the proposed action in the Additional Regulations Notice Information; in the Summary of Proposed Modifications, Section-by-Section Analysis; in the Frequently Asked Questions posted on the DEC Contaminated Sites Program regulations page; and at a series of three public workshops. The department is charged with protecting human health and the environment; this responsibility includes setting contaminant cleanup levels that are safe for human exposure based on sound science.	**N**
		General Comments	
44.	I think it would benefit everyone (ADEC, RPs, consultants, and the public) to have input from environmental professionals outside ADEC, in a working group format, while ADEC is developing the revisions to the regulations and guidance documents (i.e. prior to the public comment period). I think this approach would help ADEC, RPs and consultants vet technical problems, provide solutions to problems (instead of identifying a potential problem but not providing guidance for how to solve the problem), wordsmith documents, improve understanding and communication regarding what the issues are, and facilitate implementation of the regulations once they are promulgated.	The Department seeks input from responsible parties, environmental professionals, and the public through a number of channels, including public scoping and public comment periods on proposed regulations packages. The Department also receives continuous input from responsible parties and environmental professionals during the day-to-day operations of the CS program. Working groups are another avenue for regulations development, but they are not the best option for every regulations package and in this case, the Department chose other methods for obtaining input and feedback. The Department may consider the use of workgroups for future efforts.	**N**

45.	There is not enough discussion of the changes and there are no examples of the changes to understand how the proposed changes will work. Several proposed changes identify an issue but don't provide information on how to analyze or resolve the problem (e.g. background metals concentrations, compounds with cleanup levels below reporting and/or detection limits).	It is not clear what types of examples they commenter seeks, but the Department provided the detail of the changes in the August 26, 2015 public notice; the reason for the proposed action in the Additional Regulations Notice Information; in the Summary of Proposed Modifications, Section-by-Section Analysis; in the Frequently Asked Questions posted on the DEC Contaminated Sites Program regulations page; and at a series of three public workshops. Background metals and cleanup levels below laboratory detection limits are both discussed above.	**N**
46.	325(g)……The words "*Instructions for determining*" cumulative risk have been inserted into 325(g) (but not into 325(H)). I assume this change is intended require that cumulative risk be calculated essentially, exactly as shown in the cumulative risk document -- however, the cumulative risk document is technically in error. Changes to the cumulative risk document need to be made and the regulations don't need to require that the cumulative risk calculation is performed as shown in the cumulative risk document. Was there a real problem with the old wording of the regulation?	The minor language change is to remove the term "guidance" and clarify that the procedures for calculating cumulative risk in the adopted by reference document are a regulatory requirement. The commenter does not provide specific comments about what is deemed to be "technically in error" with respect to the document, so the department is unable to provide a response to this portion of the comment.	**N**
47.	What is shown in the proposed regs following 340(e) (2) and currently listed as 340(e) (2) (D) appears to be mislabeled. Should it be listed as 340(e) (3) or 340(f) or 340(e) (2) (A)?	We have reviewed the proposed changes and find that they are correct; however, if there are numbering errors with existing unchanged sections, it will be corrected prior to filing.	**N**
48.	"(2) human exposure from ingestion, dermal [DIRECT CONTACT] or inhalation of particulates or a volatile hazardous substance must be attained in the surface soil and the subsurface soil to a depth of at least 15 feet, unless an institutional control or site conditions prevent human exposure to the subsurface soil;" Depth to "at least 15 ft" is open ended. The compliance depth should either be tied to a trigger to extend the depth from the preset minimum as necessary or should be set at a fixed depth. Using the same clean up value from surface to 15 ft depth seems overly conservative in that residential and recreational exposures would be limited to a much shallower depth. The 15 ft depth exposures would only be associated with construction activities utilizing heavy equipment where the exposure would probably be of relatively short duration. Risk analysis of that exposure would likely result in a higher clean up number.	The language cited by the commenter has not changed since it was adopted in 1999. The 15 feet is the conservative estimate of the maximum depth for typical construction activities. The language will be changed to state "a depth of 15 feet", removing the words "at least".	**Y**

49.	Although cleanup levels for petroleum hydrocarbons are not being changed at this time, the often associated site contaminants (BTEX, PAH's) are changing, thereby affecting many hydrocarbon impacted sites. It is misleading to imply to the public that hydrocarbon impacted sites would not be effected by these regulation changes.	The department concurs that sites where groundwater is contaminated with BTEX compounds, for example, may have a longer period of remediation to reach criteria for unrestricted closure. However, when bulk hydrocarbon contamination in soil is removed, it typically removes most if not all of the individual constituents in BTEX and PAHs that are associated with petroleum hydrocarbon contaminated sites.	**N**
50.	This package is being released too close to the 2016 field season. For sites already underway and in the investigation phase, any approved workplans and reports should be grandfathered and follow the existing regulations. Remedial actions at ongoing remediation sites with approved work plans should be allowed to use the previous cleanup levels and/or previous methodology. It is recommended that the effective date of these revised regulations should be pushed to 2017.	Although there is no ideal time to issue new regulations, as a site may be at any stage in the cleanup process at a given time, the department is aware of the challenges for the regulated community when regulations are amended. The Contaminated Sites Program will be working with responsible parties to determine how to apply the changes considering the circumstances at each site and its stage in the cleanup process.	**N**
51.	This regulations package should be combined with other regulations packages, such as revisions to the Risk Assessment Procedures Manual and revisions to the petroleum cleanup levels.	Large regulation packages take longer to develop and are burdensome on the public by providing too many changes to review and comment on. If the package takes longer than a year to reach the filing stage, the project is deemed "stale". The Department strives to find a balance between larger complex packages that at times may be necessary, and those that cover distinct topic areas that allow the public to focus their review and comments on particular subject. The department gives careful thought to each set of regulation changes it develops and the impact on the public to review those changes.	**N**
52.	In general, we are not in favor of ADEC opening any closed site when new regulations are promulgated. While we recognize that regulations can change based on both science and policy, we think it is generally unfair to re-open a site that was closed under a previous closure regime unless some physical condition(s) changes at the site such as a change in use, subdivision of parcels, new observations of contaminants/contamination, or other possible concerns. The Department already has a mechanism in place for these events since all "closure" letters have a "re-opener" clause. In the case of existing closed sites, we think it will be better for all parties, including the Department, to not try to re-evaluate the previous results compared to the new standards. Property owners and/or Responsible Parties should only be held to the laws and regulations that were in place when the "offence" occurred. We recommend that the Department	The Department understands the concern with re-opening closed sites. Closed sites will be carefully evaluated before a decision to re-open is made. This will include a review the concentrations remaining at the time of closure; whether there is a complete human health exposure pathway present, such as consumption of groundwater that had been documented to be impacted; and determining if additional sampling should be conducted or institutional controls applied, before a decision will be made to re-open a site. However, if this occurs, the department does have the authority to re-open a site where a confirmed risk is identified, as the commenter acknowledges.	**N**

	considers a "wait-and-see" approach on how the closure process changes with the revised regulations and then potentially re-evaluate sites that have on-going ICs.		
53.	ADEC PMs are inconsistent and overly conservative. ADEC representatives indicated that a responsible party working to clean up a site would be able to work the with appropriate ADEC project manager to reach clean up decisions. Yet, without clear guidance via regulations, each ADEC project manager may see the same site differently. This is especially problematic when considering personnel changes. The proposed regulations are subject to considerable discretion in application and will result inconsistent cleanup decisions. For example, subjective decisions will be made when routine cleanup limits are not analytically achievable. A more formal procedure is needed to enable project decisions to be made more clearly, efficiently, robustly, and consistently.	If a responsible party disagrees with a project manager's decision or an interpretation of the regulations, the responsible party is encouraged to raise the matter with the project manager's supervisor. In addition, for federal organizations such as the commenter, the Department enters into Federal Facility Agreements (FFAs) with the responsible party. Those FFAs specifically include a dispute resolution process.	**N**
54.	The individual 'known' historical fuels such as gasoline, diesel, arctic diesel, and other fuel oils are the predominant types of spills at old sites and do not require metals analysis, but it is nearly impossible to prove the negative and ensure no waste oil, used oil, or unknowns were spilled as a particular historical site, thus leading to regulatory project managers pushing for metals analysis at many sites	The determination of potential compounds of concern at a site begins with an evaluation to identify current and past activities, periods of activity, products used or generated, and other sources. If metals are determined to be a potential compound of concern based on the evaluation, then analysis is required. If results indicate metals concentrations that are indicative of natural background, then a background determination can be made. If agreement with the project manager on compounds of potential concern cannot be reached, the responsible party is encouraged to raise the matter with the project manager's supervisor.	**N**
55.	In general I support the proposed changes. I do regret not attending the public workshop.	Comment noted.	**N**
56.	(c) says the department may set a more stringent cleanup level than the applicable level under (b) of this section, if the department determines that a more stringent cleanup level is necessary to ensure protection of human health, safety, or welfare, or of the environment, and based on actual onsite and actual or likely offsite uses of the groundwater that are likely to be affected by the hazardous substance. This is not substantive and will be difficult to apply consistently; therefore it likely will not be an ARAR.	The department does not concur with the statement by the commenter. The department believes that this is a substantive requirement and will be applied consistently.	**N**
57.	Sections 18 AAC 75.325(g) and 18 AAC 75.325(h) call for estimated cancer risk and non-carcinogenic hazards to be rounded to one significant figure. The proposed Alaska cleanup levels are reported to three significant figures. This assigns an artificial level of precision and accuracy to both the calculations and the analytical laboratory methods that will be	The department has modified the cleanup levels to a maximum of two significant figures.	**Y**

	used to compare to the risk-based cleanup levels. It is recommended to round the proposed cleanup levels to a maximum of two significant figures since requiring three significant figures in a promulgated standard overstates the accuracy of both the cleanup levels and laboratory analytical methods.		
58.	While not a proposed revision, text in sentence three of 18 AAC 75.345(i) states "Unless otherwise approved by the department, a responsible person shall conduct monitoring quarterly for at least one year to establish the concentration trend." Considering some sites may be inaccessible or have frozen wells, or might already have existing data to establish concentration trend, it should not be necessary to collect additional quarterly data for these sites.	Comment noted; alternatives for obtaining groundwater data that represent the site conditions may be discussed with the assigned project manager.	**N**
59.	After the public comment period ends, the ADEC will either adopt the proposed regulation changes or other provisions dealing with the same subject, without further notice, or decide to take no action. By ADECs own admission, the language in the final regulations may be different from that of the proposed regulations. If that in fact becomes the case, and significant changes in the final regulations are made, then a new public comment period should be announced before the new regulations are promulgated.	While changes made to address the comments received do not require additional public notice, the Department is nevertheless re-issuing the revised package for additional public review and comment.	**N**
		Institutional Controls	
60.	18 AAC 75.340 (e)(3)(D) Consent of and agreement to create, maintain, and abide by institutional controls from each landowner who is affected by the contamination at the site that a cleanup level less stringent than a cleanup level appropriate to residential land use is appropriate for the site. Requiring land owners affected by contamination to create and maintain institutional controls where a cleanup level is less stringent than a level appropriate for unrestricted land use is impractical and will delay many cleanup efforts in negotiations, especially when the landowner is the Department of Natural Resources or the Bureau of Land Management (which is the case in much of the North Slope of Alaska). Additionally, some clarification and an example of a form is needed regarding the type of agreement that would be appropriate between the land owner and the RP (e.g. simple written agreement, notarized agreement, legal agreement).	The department has decided not to adopt the proposed changes in 18 AAC 75.340 and 345 but rather to maintain the language in these sections as currently written.	**Y**

61.	The additional language proposed in 18 AAC 75.340(e)(3)(D) and 18 AAC 75.340(f)(2) would also seem appropriate for inclusion in 18 AAC 75.345(f) unless use of the term "concurrence" in 18 AAC 75.345(f) differs from the use of "consent of' along with ADEC's proposed amendment language in 18 AAC 75.340(e)(3)(D) and 18 AAC 75.340(f)(2).	The department has decided not to adopt the proposed changes in 18 AAC 75.340 and 345 but rather to maintain the language in these sections as currently written.	**Y**
62.	Under current 18 AAC 75, a responsible person may propose site-specific alternative cleanup levels per 18 AAC 75.340(e) and 18 AAC 75.340(f) under Methods Three and Four, respectively, provided certain requirements are met. As a condition, per 18 AAC 75.340(e)(3)(D) and 18 AAC 75.340(f)(2), the responsible party must obtain "consent of and agreement to create, maintain, and abide by institutional controls from each affected landowner." Clarification is needed regarding the type of agreement that is proposed amendments - a simple written agreement, a notarized agreement, a legal agreement, an ADEC approved agreement, or some other agreement. Recommend that if the department will require a written agreement, that a template be developed by the department and reviewed by the Attorney General's Office so that the agreements are consistent statewide.	The department already requires the responsible party to gain the consent from affected landowners for applying a site-specific cleanup level that is less protective than residual, and to sign a document agreeing to institutional controls. The intent of the language was to provide clearer direction about responsibilities for institutional controls; however, the department has decided not to adopt the proposed changes and maintain the language in these sections as currently written.	**Y**
63.	For ICs on adjacent parcels, the new regulations and FAQ page suggest that the Department will develop a mechanism so that ICs can be recorded on non-source properties upon consent from the affected landowners. Overall, we think recording documents on non-source parcels is a bad idea. At a minimum, needs much more exploration and explanation to consultants and other parties at any site that it is considered. Has the Department fully evaluated the legal ramifications of recorded documents on adjacent non-source properties with Title Insurance Companies before these changes are finalized? What will be the course of action if adjacent landowners will not consent to ICs and it is not feasible to remediate a site to below the required cleanup levels? While we understand the Department's need to obtain landowner consent and facilitating the discussion in these cases, we think it is important that the Department explore these areas completely so as to avoid the inadvertent damage to property value through unclear or improperly worded recorded documents.	Although he department has decided not to adopt the proposed changes in 18 AAC 75.340 and 345, 18 AAC 75.375 currently requires consultation with each affected landowner prior to establishing institutional controls. This includes non-source properties that are impacted. To comply with this regulation, the department requires signed agreements acknowledging the institutional controls being established on affected, non-source properties. If signed agreements are not forthcoming from affected landowners, the source property cannot be issued a cleanup complete determination. If the site cannot be remediated to the required cleanup levels, the site will remain open. Comments about clarity and properly worded deed notices are noted.	**N**

64.	(8) The proposed regulation requires responsible parties to obtain concurrence from affected property owners for the creation and maintenance of institutional controls if proposing to not meet the unlimited use and unrestricted exposure cleanup levels beyond the property boundary. In exercising its CERCLA authorities the DoD components do seek to negotiate voluntary Land Use Controls (LUCs) with off-installation property owners whose property has been contaminated by our on-installation releases. This can, where necessary, include the negotiated purchase of restrictive easements and other similar property interests using authority granted under 42 USC §96040). However, in cases where a property owner unreasonably declines to grant permission, the same CERCLA provision grants us authority to condemn property interests where necessary to conduct remedial action and ensure protectiveness. The State of Alaska and ADEC may not impede this statutory authority of condemnation by always requiring an owner's consent. Also, this and other additional LUCs requirements may cause substantial costs to DoD which may need to be evaluated and negotiated on a site-specific basis.	The department has decided not to adopt the proposed changes in 18 AAC 75.340 and 345 but rather to maintain the language in these sections as currently written.	**Y**
65.	"consent of and agreement to create, maintain, and abide by institutional controls from each landowner who is affected by the contamination at the site that a cleanup level less stringent than a cleanup level appropriate to residential land use is appropriate for the site." This requirement may not be achievable and is not consistent with CERCLA authority. USACE has no authority to force a landowner to comply with or agree to land use controls.	The department already requires the responsible party to gain the consent from affected landowners for applying a site-specific cleanup level that is less protective than residential, and to sign a document agreeing to institutional controls. The intent of the language was to provide clearer direction about responsibilities for institutional controls; however, the department has decided not to adopt the proposed changes and maintain the language in these sections as currently written.	**Y**
66.	If an alternative point of compliance is approved, this section requires that the cleanup levels must be met at the property boundary unless a responsible person gains concurrence from any affected neighboring property owner for the creation and maintenance of institutional controls. A responsible party cannot ensure that adjacent property owners will remain compliant with the ICs, this should be the responsibility of the ADEC. What protection does the RP have if the adjacent property owners are lax with IC compliance?	The department already requires the responsible party to gain the consent from affected landowners for applying a site-specific cleanup level that is less protective than residual, and to sign a document agreeing to institutional controls. The intent of the language was to provide clearer direction about responsibilities for institutional controls; however, the department has decided not to adopt the proposed changes and maintain the language in these sections as currently written.	**Y**
Issues not related to the current package			
67.	Revisions to the Risk Assessment Procedures Manual substantially change the calculation of hydrocarbon (DRO,	These comments are related to issues that are not part of this regulations package. They have been noted and will be considered for future packages.	**N**

	GRO and RRO fractions) risk, and therefore have the potential to change cleanup levels and site closure at many DoD sites.		
68.	In the past, ADEC has required methanol preservation for volatile analytes via method SW846-5035A. Published detection limits for the applicable analytical method (SW846-8260B/C) are greater than the proposed clean up limits for several volatile compounds, notably the chlorinated compounds. How does the ADEC intend to address this deviation to the published EPA method?	These comments are related to issues that are not part of this regulations package. They have been noted and will be considered for future packages.	**N**
69.	UST Procedures Manual Table 1 requires that VOCs by 8260B be preserved with Methanol. Note 1 requires the use of EPAs Test Methods for the Evaluation of Solid Waste be used. 2012 September 14th Letter to All Laboratories Performing AK101 and VOC in Soil, Re: Alaska Volatile Organic Compound Soil Preservation Requirements. Requires the use of Methanol for preservation of VOC samples. "If the methanol analysis cannot meet Alaska regulatory cleanup levels and/or project specific action, low level collection and analysis can be approved on a site specific basis for those Compounds of Concern not meeting required levels with the methanol analysis." The EPA has classified the use of 5035A methanol extraction for high level concentration samples, greater than 200 ppb. ADEC has set their program up to require the use of Methanol extraction for regulatory cleanup limits well below 200 ppb. Thus requiring the use of other extraction methods to generate high quality analytical data. But restrict the use of the low level extraction methods to a site specific basis with approval from ADEC. The UST Procedures manual, 18 AAC 75, and laboratory certification program must be brought into sync so that required data can be generated using methods approved by EPA.	These comments are related to issues that are not part of this regulations package. They have been noted and will be considered for future packages.	**N**
70.	It is not clear how the percentages of aromatics and aliphatics were derived. As petroleum products greatly vary in composition and there is no explanation of how the percentages were determined, the percentages seem arbitrary. Even if the percentages are correct (e.g., are 95% upper confidence limits of average values), as toxicity greatly varies by individual compound, small differences in percentages of select compounds at a particular study area can give	These comments are related to issues that are not part of this regulations package. They have been noted and will be considered for future packages.	**N**

	significantly different risk outcomes. Therefore, the scientific defensibility of the approach seems highly questionable. Recommend ADEC present additional technical rationale for the approach being used to evaluate TPH. In particular, explain (a scientifically defensible rationale) how it determined the percentage of aromatics and aliphatics should sum to 120.		
71.	ADEC Implementation of ICs without Landowner Approval and ICs on Adjacent Parcels: Earlier in the year and related to a separate discussion, I was informed that ADEC had an opinion from the AG's office that ADEC could record a Notice of Environmental Contamination (NEC) on a property without the consent/participation of the landowner. During that discussion, I provided my opinion that I could see where that could be helpful with some landowners that utilize stalling/delaying tactics with the Department and try to sell property without disclosing the environmental concern. Based upon a review of the Department's February 2011 Guidance on Using Institutional Controls in Oil and Other Hazardous Substance Cleanups, it is our understanding that these deed notices cannot be removed from the title history, but the effect can be terminated by recording a second notice. If the Department is going to continue with this line of thought, I recommend limiting the number of individuals authorized to approve and implement this type of document recording. Furthermore, has the Department consulted with Title Companies to confirm that such notices will not prevent the transfer of property and issuance of title insurance if the landowners affected by this type of IC or a more stringent IC is imposed because of contamination on a neighboring property?	These comments are related to issues that are not part of this regulations package. They have been noted and will be considered for future packages.	**N**
72.	The following requirement is not scientifically defensible "The point of compliance where groundwater cleanup levels must be attained is throughout the site from each point extending vertically from the uppermost level of the zone of saturation to the lowest possible depth that could potentially be affected…." Chronic risk depends on the mean concentration of the Exposure Unit (EU). A sampling design can defensibly demonstrate the mean concentration of the EU (estimated from a set of samples that represent the Exposure Unit) is less than a decision limit (e.g., risk based	The language the commenter remarks on is not a proposed revision in this set of amendments. This section means that a portion of a site may not exceed cleanup levels and still be considered for closure. Groundwater that is sampled and monitored in a manner that is representative of the contaminated area, determined through a fate and transport analysis, and that, through those date points is shown to meet groundwater cleanup criteria, is determined to meet its point of compliance.	**N**

	threshold or cleanup goal). However, owing to temporal variability and spatial heterogeneity, without exhaustively sampling all of the groundwater, no sampling design can show "point-by-point" compliance (i.e., the contaminant concentration in every possible aliquot of groundwater in the population/aquifer meets the cleanup objective). Recommend revising this requirement to state the mean concentration of the groundwater EU or Decision Unit (DU) must be demonstrated to be less than the cleanup or risk-based thresholds.		
73.	The Alaska Department of Environmental Conservation (ADEC) has proposed to revise several portions of regulation 18 AAC 75.325 that involve a general protectiveness standard. The DoD does not consider a general protectiveness standard to meet the definition of an ARAR, since a state requirement must be specific to the hazardous substance involved to constitute a level or standard of control. A state law stating that all cleanups must achieve a specified cumulative cancer risk level for all contaminants and pathways does not establish a chemical specific requirement, but rather is a generic protectiveness level. Also, even if it is stated that a state protectiveness requirement applies to all individual contaminants present, as 18 AAC 75.325 does, such a general standard is not specific to an individual chemical and therefore not considered a valid ARAR. This pertains solely to remedial actions conducted pursuant to CERCLA. It is noted that at DoD sites where remedial action is conducted pursuant to CERCLA, the proposed Soil and Groundwater Cleanup Levels for chemicals listed in the tables of 18 AAC 75 regulations, once promulgated by Alaska, will constitute valid ARARs as they are chemical specific levels/standards of control, but only if they provide a more stringent level of cleanup than federal standards.	The department does not concur with the statements made in this comment; however, the commenter appears to be providing comments on section 18 AAC 75.325 which is not being proposed for revision under the proposed amendments, except for the update of a document that is adopted by reference.	**N**
Procedures for Calculating Cleanup Levels			
74.	The section states "If a responsible person uses method two for chemicals other than petroleum hydrocarbons under 18 AAC 75.340, the soil cleanup levels must be based on Table B1". The last column of this table has soil cleanup values for the migration to groundwater pathway. A dilution attenuation	The default dilution attenuation factor (DAF) of 13.2 is derived by multiplying the default dilution factor (DF) by the default attenuation factor (AF). These factors, along with a number of other Alaska-specific parameters, were developed by DEC contractor, Harding Lawson Associates in the late 1990s. The department has chosen to use Alaska-specific input parameters when possible rather than EPA	**Y**

	factor (DAF) is used in calculating these soil cleanup values. ADEC used a DAF of 13.2; shown in the ADEC document "Procedures for Calculating Cleanup Levels" dated July 15, 2015. However, this calculation requires several assumptions for site hydrogeological conditions to calculate this DAF: (a) Considering that hydrogeological conditions vary from site to site and these values could be significantly different than in the ADEC calculation, it is recommended including appropriate text in the note for Table B 1 to inform the public that site specific conditions should be used for calculating the DAF and for developing soil cleanup levels for the groundwater migration pathway; (b) EPA uses default DAF of 20 in soil screening guidance documents which state this value to be protective. ADEC documents do not provide reasoning for using a lower value than EPA. It is recommended that ADEC provide appropriate text to clarify the use of a 13.2 DAF instead of the EPA default value.	defaults. Nevertheless, the commenter is correct that site-specific conditions can influence the DAF, therefore responsible parties have the option under method 3 of calculating a site specific DAF for their site using the equations in the Procedures for Calculating Cleanup Levels. The Harding Lawson report has been added to the list of references and Table of Standard Default Factors in the PCCL.	
75.	The Procedures for Calculating Cleanup Levels document needs to identify that the soil inhalation calculations and migration to groundwater calculations for the organic compounds are not correct when NAPL is present.	The cleanup levels evaluate the risk from a contaminant in the soil, vapor or aqueous phase and are necessarily conservative to account for a wide range of soil and hydrologic conditions statewide. The four-phase approach preferred by the commenter may be proposed on a site-specific basis using an approved fate and transport model.	**N**
76.	The relative bioavailability factor (RBA) of 0.6 should be included in the soil ingestion cleanup level for arsenic, consistent with the RSL calculations.	The RBA was included, but due to a formatting error, the table listing the chemical specific parameters was inadvertently truncated. The table has been corrected to show the appropriate RBA.	**Y**
77.	Section 5.4 discusses situations in which VF-based cleanup levels exceed the soil saturation limit. For liquid contaminants, VF-based cleanup levels are set equal to the Csat if greater than Csat. Cleanup levels are described in Section 1.0 as risk-based values. The Csat is not a risk-based concentration and should therefore not be incorporated as a risk-based value. An alternative recommendation is to provide risk-based cleanup levels with a notation for VF-based values to indicate that free-phase product may be present at concentrations above Csat and additional evaluation may be necessary.	The department has added a statement in the introduction of this document stating that cleanup levels are calculated based on risk, but for those where the risk level exceeds the saturation or solubility of the compound, the cleanup level is capped at Csat or at solubility limit.	**Y**
78.	A discussion of soil cleanup levels above the ceiling limit of 10^5 (10% of sample by weight) should be included to make the user aware that assumptions for direct contact may be	A footnote has been provided for risk based calculations that may violate assumptions for soil contact due to the theoretical ceiling limit.	**Y**

	violated at or above this level, and such values should be noted in Table B1.		
79.	The source(s) of chemical-specific parameters (other than toxicity values) in Table 6 should be provided. Although a hierarchy of sources for toxicity values is provided in the *Procedures for Calculating Cumulative Risk*, identifying the sources of toxicity values in the subject document (following Table 6) would also be helpful.	The individual parameters will not be cited, but the hierarchy of sources for chemical specific parameters has been added. All questions about sources for a specific parameter or value, or related information, can be addressed to and will be answered by CS program staff.	**Y**
80.	In section 5.3 it is assumed that the default PEF is 1.36 x 10^9 and not 1.36 x 109 as currently indicated, but this should be corrected to avoid confusion.	Text has been corrected	**Y**
81.	The Introduction section (pg. 1) refers to Table 8 in Appendix B, but there is no Table 8 in the document.	Text has been corrected	**Y**
82.	Section 3.1.3 and other inhalation equation sections should be renamed to incorporate inhalation of vapors as well as particulates, particularly for Section 3.4.3 since the vinyl chloride equation includes only vapor and not particulate inhalation.	Inhalation of volatiles and inhalation of particulates are both included in the inhalation equations. Since both are included in the section, it is titled simply "Inhalation".	**N**
83.	The source of each individual toxicity values for each hazardous substance in the Tables of Section 18 AAC 75.34l(c) should be clearly identified. While the FAQs state that DEC employs a tiered approach to determining toxicity values, it is not at all transparent as to when a toxicology value was determined to be unavailable.	The hierarchy of sources (with the date) for toxicity values has been added to the PCCL. All other questions about sources for a specific parameter or value, or related information, can be addressed to and will be answered by CS program staff.	**Y**
84.	The EPA's 2011 Exposure Factors Handbook could be used to estimate more realistic body weights for the various age classes in the mutagenic risk equation. Assuming that children in the 0-2 age class have an average weight of 15 kilograms is unnecessary (same as with some other age class weight assumptions). Representativeness of all exposure factors should be reviewed.	The average weight is used for simplicity and reflects the EPA RSL equation and handbook data. The data is a weighted average from the exposure factor handbook with 0-2 yrs at 11.4 kg, 2-3 yrs at 13.8 kg and 3-6 yrs at 18.6 kg from Table 8-1. The resulting weight is rounded to 15 kg.	**N**
85.	Some discussions included in the document appear to be incomplete. For example, the Introduction section (pg. 2) indicates that an age-adjusted approach is used for the soil ingestion exposure pathway. This approach should also be used to calculate cleanup levels for carcinogens based on other exposure pathways and media. It is assumed that such discussion was simply omitted from the document and that this process is followed, but the document should include a more complete discussion.	The introduction section provides a brief discussion on the reasoning for adjustment to soil exposure for children and adults. However intake for water should also be included. The section was rewritten for more clarity for intake rates for child and adult but detail discussion was not provided as the intention is to provide how numbers are calculated and not a detail discussion of all the parameters. A sentence will be added directing one to the equations for what parameters were used for carcinogenic and noncarcinogenic.	**Y**

	Section 1-The Introduction section (pg. 2) indicates that an age-adjusted approach is used for the soil ingestion exposure pathway. It should also be stated that age-adjusted exposure factors are also used to calculate cleanup levels for carcinogens based on other exposure pathways and media (e.g., groundwater ingestion) as shown by the equations in Sections 2 and 3.		
86.	Section 5.1- The model given in this section assumes an infinite mass of chemicals in soil. VFs based on this model may violate the principle of conservation of mass (there may be insufficient mass to achieve the modeled VF over the assumed exposure duration). Many other regulatory agencies include finite source models to check whether conservation of mass is violated. Please include appropriate finite source models (see ODEQ 2003, Risk-Based Decision Making for the Remediation of Petroleum Contaminated Sites, September 22; Interstate Technology Regulatory Council (ITRC) guidance, http://www.itrcweb.org/risk-3/; etc.).	Method 2 is designed to be conservative to ensure protectiveness across a broad range of site conditions. Site-specific data may be used to develop a site-specific cleanup value if the responsible party deems that to be more representative. If the responsible party has a reliable estimation of the contaminant mass at the site, the department will consider a proposal under Method Three.	**N**
87.	Section 5.1- Default dermal absorption values for water exposures are reported to come from EPA's 2004 Supplemental Guidance for Dermal Risk Assessment. In Appendix B of this EPA guidance document, chemicals with physical properties that fall outside the predictive domain of the model used to estimate dermal absorption are identified. Please remove the dermal absorption values that are outside the model's predictive domain from Table 6 because quantification of health risks using these values is highly uncertain (see Appendix B of EPA's 2004 Supplemental Guidance for Dermal Risk Assessment).	The calculations did not include values outside of the model's predictive domain. To clarify this, the Kp values outside the predictive domain have been removed from the Table 6 of the PCCL.	**Y**
88.	For much of the public comment period, the information presented in Appendix A, Table 6 was not fully legible as the parameters appearing on the right side of the table were cropped. ADEC recently corrected this presentation error on December 4, 2015 after Question #52 was submitted on December 1, 2015. Prior to December 4, 2015, reviewers could not review the table in its entirety. ADEC should extend the public review and comment period to ensure that the public has a meaningful chance to review and comment.	Although the truncated columns had a minimal impact on the calculation of cleanup levels, this document, along with the other proposed changes in this regulations package, is being issued for a second round of public comment in May 2016.	**N**

89.	As noted below, there are discrepancies between certain default parameters that are listed for estimation of the volatilization factor for soil in Section 6.4 compared to the parameters presented in Appendix B Table 7 of the Procedures for Calculating Cleanup Levels, which ADEC proposes to adopt as a regulation. The table below outlines errors and discrepancies that require correction by ADEC.	Q/C Section 6.4 corrected to 101.5958 Basis for A, B, and C added to Table 8 used to calculate Q/C, but do we need them in 6.4? T in Section 6.4 corrected to 8.2×10^8 n in Section 6.4 corrected to 0.43 θ_w Table 8 corrected to 0.15 θ_a Section 6.4 and Table 8 corrected to 0.28 F_{oc} definition corrected to 0.1% in Table 8	**Y**

Parameter	**Arctic Zone Soil Value in Section 6.4**	**Arctic Zone Soil Value in Appendix B Table 7**
Q/C (inverse of mean conc. at the center of a 0.5 acre square source)	100.13	101.5958
A (Dispersion Constant)	Not defined	7.144 (undefined basis)
B (Dispersion Constant)		31.1784 (undefined basis)
C (Dispersion Constant)		382.6078 (undefined basis)
T (exposure interval)	9.5×10^8	8.2×10^8
n (total soil porosity) calculated as 1- (ϱ_b/ ϱ_s)	0.434	0.43
θw (water filled soil porosity)	0.15	0.3
θa (air filled soil porosity) Calculated as n- θw	0.284	0.42 (this value is in error and

	Foc (organic carbon content of soil) — 0.001 (defined in text as 0.1%) — should be 0.133)[1] 0.001 (defined in table as 1%)		
90.	An incorrect averaging time term for a resident (ATress) is listed in the equations in Section 3.1. The correct averaging time term is ATressc.	ATress typo has been corrected to ATressc	**Y**
91.	The averaging time for an adult resident (AT_{ressa} or 9490 days) as defined in Appendix B Table 7 is incorrect. The correct value for AT_{ressa} is 7330 days (ED of 20 years x 365 days per year).	Definition of AT_{ressa} corrected 365 x ED_{ress}	**Y**
92.	Three dispersion constants (A, B, and C) were used to estimate the Q/C term (inverse of the mean concentration at the center of a 0.5-acre-square source), which was then used to estimate zone-specific PEFs and chemical and zone-specific VFs. Three different constants are defined for each of the dispersion factors in Appendix B Table 7 depending upon the soil zone, citing EPA 2002 as the source but with no other explanation. The rationale for selecting dispersion constants associated with three disparate locations to represent climate conditions in Alaska is not described anywhere in the Department's documentation. We recommend that ADEC revise its Procedures for Calculating Cleanup Levels to explain the rationale for the use of these dispersion coefficients and to afford the commenting parties a more meaningful opportunity to comment on this aspect of the guidance.	The dispersion constants along with a number of other Alaska-specific parameters were determined by Harding Lawson and Associates when the cleanup level zones (arctic, under 40 inch, and over 40 inch) were originally created and promulgated. The dispersion constants have been used consistently to calculate cleanup levels in every preceding cleanup level update. The Harding Lawson study has been added to Table 8 and to the list of references in the PCCL.	**Y**
93.	The proposed regulations at 18 AAC 75 give soil and groundwater cleanup levels for both 1,1,2,2- and 1,1,1,2-tetrachloroethane. However, this document only lists 1,1,2,2-tetrachloroethane and not 1,1,1,2-tetrachloroethane.	The Appendix has been revised to include parameters for 1,1,1,2-tetrachloroethane.	**Y**
94.	The Procedures for Calculating Cleanup Levels document needs to acknowledge that the migration to groundwater calculations are not correct when the contaminant is in the saturated or seasonally zone.	Method 2 is intended to be a streamlined, conservative approach which assigns a cleanup level to a large precipitation zone. Responsible parties have the opportunity to propose cleanup levels under Method 3.	**N**
Procedures for Calculating Cumulative Risk			
95.	Vinyl chloride is mentioned in Section 1.2 as having a unique set of risk equations. Trichloroethene (TCE) also has a	Text has been revised to reflect this.	**Y**

	unique set of equations that should be used to calculate mutagenic cancer risks for TCE. This should also be discussed in this section.		
96.	ADEC states that a cumulative risk assessment be performed using the single maximum groundwater concentration of a constituent. EPA recently issued guidance for CERCLA and RCRA sites directing that groundwater EPCs be based on the 95% UCL of the mean concentration among the highest detected concentrations in recent groundwater samples collected from a minimum of three monitoring wells within the same aquifer or plume. (EPA. 2014. Determining Groundwater Exposure Point Concentrations, Supplemental Guidance. OSWER Directive 9293.1-42. March 11.) ADEC should not depart from EPA guidance for the development of groundwater EPCs for the purposes of its approach to cumulative risk assessment. ADEC addresses this issue in its response to Question #50 and states that: "DEC currently accepts and will continue to accept EPA's ProUCL software as an appropriate statistical method." Arcadis recommends that ADEC clarify Section 2.2.3 by revising bullet (d) to add the word "groundwater" as follows: "maximum groundwater concentration or the mean soil concentration at the 95th percent upper confidence limit (UCL) remaining on-site following cleanup" and remove footnote #2, which states: "To employ the mean soil concentration at the 95% UCL under 18 AAC 75.380(c)(1), the department must approve an appropriate statistical method." From its answer to Question #50, it appears that ADEC does not require approval of a "statistical method." The document requires determining "the maximum concentration or the mean soil concentration at the 95th percent upper confidence limit (UCL)." Thus depending on the sample size and shape of the distribution, the sample maximum will not necessary provide coverage of the population mean. The sample maximum is not necessarily a "conservative" estimate of the population mean; it is not comparable to a 95% UCL of the mean. In fact, the sample maximum will likely underestimate the population mean when the sample size is small and the distribution is positively skewed. ADEC should require exposure point concentrations	18 AAC 75.380 (c) (2) requires the maximum groundwater concentration be used for compliance. ADEC is aware of the EPA guidance but has more stringent requirement in the cited regulation. While ProUCL is an accepted program for use in calculating upper mean, approval is still required as noted in the regulation. In some cases the maximum concentration is still used due to distribution or an insufficient data set.	**N**

	to be based on the 95% UCLs of the population mean unless a technical rationale to do otherwise is presented (e.g., the data set consists of non-detects)		
97.	In Section 2, COPCs are introduced in the second list item. It is unclear whether the term COPCs is meant to refer to chemicals with concentrations greater than one tenth of the cleanup level, as discussed in the first list item, or if a different meaning is intended here. The term COPCs as applicable to this document should be further defined.	Agreed. This has been clarified.	**Y**
98.	Section 5.2 discusses the WHO as the leading recommended source of TEFs for dioxin like compounds and refers to Appendix C. However, this is not discussed in Appendix C; this discussion should be added to the appendix. Other specific sources of toxicity information should also be discussed.	The reference to the appendix is removed as it is not a typical assessment on toxicity but an approach for using a surrogate. Details can be obtained from the cited document.	**Y**
99.	Section 5.4 discusses chemicals not found in ADEC tables. The recommendation is to consult the RSL table, but additional recommendation is not provided for chemicals not found in the RSL table. The procedure for evaluating such chemicals should also be described in this section.	Additional language is added to consult with risk assessment staff in the event no chemical is listed in either tables.	**Y**
100.	Section 2.2.2 -The term Chemicals of Potential Concern (COPC) is introduced in "Procedures" (Section 2.2.2). It appears that a COPC is meant to refer to a chemical with a concentration greater than one-tenth of its cleanup level. The term COPC, as applicable to this document, should be better defined, preferably in Section 2.2.1.	Agreed. This will be clarified.	**Y**
101.	ADEC states in Section 1.3 that the Hazard Index (HI) can only be segregated by target organ despite the fact that ADEC states in that same section that "[t]o accurately assess the possible effects of noncarcinogenic compounds, the HI can be segregated by target organ or system endpoint and mechanism of toxicity consistent with EPA's Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part A) – Interim Final (USEPA, 1989), Guidelines for the Health Risk Assessment of Chemical Mixtures (USEPA, 1986), and Supplemental Guidance for Conducting Health Risk Assessment of Chemical Mixtures (USEPA, 2000)." Moreover, ADEC further states in Section 2.5 that "[t]he hazard index (HI) is the summation of all HQs across all pathways that are affecting the same target organ or system endpoint." The	For consistency with the RAPM the language has been clarified, "since the mechanism of toxicity is not well understood for many compounds, the department will evaluate segregation of the HI by target organ or system endpoint."	**Y**

	document should clarify that the HI can be segregated by organ or organ system as stated in Section 2.5.		
102.	Heart, lung, and spleen are organs, and chemicals for which the sensitive endpoints are based on heart, lung and spleen can be grouped. However, some chemicals have RfDs that are based on different aspects of an organ system, such as the immune system. The organs of the immune system include the thymus, bone marrow, spleen, lymph nodes, and others. An adverse effect on the immune system can be noted by effects on these organs or also on effects that result from organ damage, like modifications to the numbers of circulating lymphocytes or decrease in number of antibody forming cells against sheep red blood cells in male mice. Similarly, chemicals can adversely affect the nervous system and manifest the damage in different ways. RfDs based on adverse effects of the central nervous system, peripheral nervous system, brain, myelin, or specific nerve cells should be considered an organ group for endpoint-specific HI calculation. Another example is the reproductive organ system groupings. Some RfDs are based on "reproductive toxicity," changes in sperm count or sperm motility, or adverse effects in the testes. These chemicals should all be grouped to derive a HI for male reproductive effects. Accordingly, ADEC should clarify effects to organ system groupings are consistent with USEPA guidance as cited. ADEC addresses this issue in its response to Questions #46 and #47, by stating: "In a method four risk assessment, segregation of hazard indices is allowed. See the 2015 Risk Assessment Procedures Manual on our technical guidance page for details." Arcadis agrees that the Risk Assessment Procedures Manual allows for segregation of hazard indices by target organ or system endpoint. Arcadis recommends that ADEC revise Section 1.3 of Procedures for Calculating Cumulative Risk to delete the last sentence in Section 1.3, which reads "Since the mechanism of toxicity is not well understood for many compounds, the department will evaluate segregation of the HI by target organ alone." This statement is inconsistent with the Risk Assessment Procedures Manual.	For consistency with the RAPM the language has been clarified, "since the mechanism of toxicity is not well understood for many compounds, the department will evaluate segregation of the HI by target organ or system endpoint."	**Y**

103.	ADEC has proposed language to allow a responsible party to avoid a cumulative risk assessment under certain circumstances: "The cumulative risk standard must be met upon completion of site cleanup work, but contaminant levels established during a thorough site characterization effort may be sufficient to rule out a cumulative risk, with ADEC approval." However, ADEC offers no threshold criteria or standard by which a responsible person may propose and justify, or ADEC decide, that a cumulative risk analysis is not necessary. We recommend that ADEC provide criteria for identifying the circumstances in which a cumulative risk assessment is not needed. ADEC addresses this issue in its response to Question #48, but the response is inconsistent with the proposed language, which states: "...contaminant levels established during a thorough site characterization effort may be sufficient to rule out a cumulative risk, with ADEC approval."	Cumulative risk is a calculation (not a risk assessment) and it can be calculated by the CS project manager or the consultant, or both, as soon as after site characterization if the data is found to be adequately representative of the site. If the cumulative risk calculation is done on those concentrations and cumulative risk is met, then it doesn't have to be done again, unless new data indicates that it may be exceeded. In any event, calculating cumulative risk always has to be done at some point for a site. The text will be revised to state that if adequate data is available following site characterization, the cumulative risk may be calculated at that time.	**Y**
104.	The following statement at Section 2.2.3 is incorrect: "The RBCs differ from Table B1 and Table C in that individual exposure pathways are shown rather than the most protective value of all the pathways as listed in the Tables." They are, in fact, the composite human health values that include all three exposure pathways (ingestion, dermal and inhalation). For each compound, the RBC represents the more protective of the carcinogenic composite RBC and the noncarcinogenic composite RBC.	The sentence in section 2.3 has been clarified to state, "The RBCs differ from Table B1 and Table C in that individual exposure pathways are shown rather than the cumulative risk from the respective media listed in the Tables."	**Y**
105.	The proposed regulations at 18 AAC 75 give soil and groundwater cleanup levels for both 1,1,2,2- and 1,1,1,2-tetrachloroethane, as does the online calculator. However, this document only lists 1,1,2,2-tetrachloroethane and not 1,1,1,2-tetrachloroethane.	1,1,1,2-tetrachloroethane will be added.	**Y**
106.	The proposed regulations at 18 AAC 75 give soil and groundwater cleanup levels for tri-n-butyl tin hydride (CAS# 688-73-3), as do the Procedures for Calculating Cleanup Levels, dated July 15, 2015, and the online calculator. However, the Procedures for Calculating Cumulative Risk, dated July 15, 2015, also presents human health risk based concentrations for soil for tri-n-butyl tin chloride (CAS# 56573-85-4). These human health risk based concentrations are based on carcinogenic effects, but this chemical is not classified as carcinogenic by EPA. The only toxicity factor	The commenter is saying tri-n-butyl tin chloride (CAS# 56573-85-4), but the table in the PCCR actually says "tributyltin" (CAS#56573-85-4). This entry was erroneously included in the PCCR and has been deleted.	**Y**

	listed in the online calculator and Procedures for Calculating Cleanup Levels is a noncarcinogenic Reference Dose. EPA does not list any carcinogenic slope factor for either tributyltin compounds or tri-n-butyl tin hydride (CAS# 688-73-3). It is recommended that ADEC remove all reference to tri-n-butyl tin chloride (CAS# 56573-85-4) in Procedures for Calculating Cumulative Risk.		
107.	The cumulative risk document appears to require the use of the RBCs presented in Appendix B, however, the inhalation RBCs presented in Appendix B for the organic compounds are not correct for most sites because the inhalation RBCs for soils do not account for 4-phase partitioning with Raoult's Law.	The 4-phase partitioning with Raoult's Law is not being proposed in setting the default method two cleanup values in Table B1. A 4-phase approach may be proposed on a site specific basis under Methods 3 or 4.	**N**
108.	The first paragraph of Section 3.0 says "*Unless it is shown that the groundwater at the site is not used or could not potentially be used for human consumption,* ***it should be assumed that these groundwater pathways are complete***". The text should be edited to differentiate between sites where the groundwater pathway is currently complete, versus sites where the groundwater pathway is potentially complete in the future. The revised text needs to clarify that site closure, IC requirements and potentially the need for remedial action will be based on the assumption that the pathway is complete, but the short term risk communication, short term risk management and potentially rapid response should be based on whether the pathway is currently complete. This is consistent with the CSM guidance	The PCCR document is not intended to discuss the details associated with pathways, site closure, IC requirement or risk communication.	**N**