

Issue No.	Issue/ Section	Stakeholder Questions/Comments	Stakeholder Recommendation(s)	Ministry Response(s)
A - GENERAL				
A-3	Overcapture	<p>Capture too high Practitioners advise from 35 % to 75% of the sites would be classified as high risk. All indicate sites could not be fully evaluated due to no soil vapour data.</p> <p>Causes of overcapture General consensus that major items triggering “high risk” are default indicators</p> <ol style="list-style-type: none"> 1. Offsite migration of contaminants in soil, soil vapour, and groundwater at levels exceeding human health related upper cap concentrations. 2. Presence of mobile LNAPL or mobile DNAPL. <p>Other possible sources of overcapture may be:</p> <ol style="list-style-type: none"> 3. Vapours: uncertainty on extent of capture until criteria and procedures passed. 4. In upstream oil & gas, upper cap concentrations within 1 m of soil surface across > 5 m² likely cause of large capture (5,000 closed sites, majority may be captured). 5. Also on upstream oil & gas sites, capture high because applicable land use standards are stringent AL/PL (due to wildlands setting) and terrestrial habitat exists on all site so stringent eco upper cap concentrations apply on all sites. 	<p>See recommendations under Default Indicators</p> <ul style="list-style-type: none"> • Mobile LNAPL & DNAPL • Offsite ?> human health upper cap concentrations 	<p>The ministry has addressed these concerns in several ways in draft 8:</p> <ul style="list-style-type: none"> • Exposure pathway criteria have been relaxed from the draft released in December 2006. • New Protocol 11, “Upper Cap Concentrations for Substances Listed in the Contaminated Sites Regulation” has been developed to present all the upper cap concentrations so these would not have to be calculated each time. The upper cap concentrations have been relaxed by a factor of ten generally for vapour and aquatic life protection, and the upper cap concentrations for iron, aluminum and manganese in drinking water have been eliminated. • New Protocol 16 on the presence and mobility of nonaqueous phase liquids has removed the criterion classifying a site as high risk if light nonaqueous phase liquids are within 30 m of a drinking water well or high water mark of an aquatic habitat. • Draft 8 of Protocol 12 has been amended so that the migration of substances offsite would not be a trigger for the classification of a source site as high risk. Affected and potentially affected neighbouring sites would be addressed separately from source sites through a requirement by a Director for the submission of a Site Risk Classification Report. • Stakeholders should note that a site with upper cap concentrations would not be classified as high risk unless complete exposure pathways exist.
A-4	Remediation disincentive	<p>Stigma Will decrease the willingness of site owners to conduct investigations involving Approved Professionals because they will be required to report to the ministry if high risk indicators are present and then be forced into the remediation process even if the work is undertaken for</p>	<p>“When the ministry instituted requirements for reporting potential or known offsite migration and notifying property owners, many property owners refused to undertake further investigations and monitoring on many sites, rather than risk possible</p>	<p>We expect that the current draft would identify fewer sites as high risk and would reduce concerns about stigma.</p> <p>Sites classified as high risk are eligible for reclassification once high risk conditions have been removed. A notation</p>

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		due diligence purposes, contamination is contained onsite, and there is no short term intent to redevelop or sell the site.	actions in an uncertain regulatory environment.”	on the status would be changed in the Site Registry.
A-6	Approved Professional viability	<p>Economic viability of Approved Professionals will be put at risk</p> <p>Link to reclassification “Without the development, approval and implementation of the reclassification protocol in concert with Protocol 12, the financial viability of the Society of Contaminated Sites Approved Professionals is jeopardized, through significant loss of revenue.”</p> <p>Scope of risk assessment limited “only sites with substance concentrations in media that have complete exposure pathway indicators and that fall between applicable standards and 10x applicable standards would be eligible under Protocol 6 and require processing by a risk assessment specialist.”</p>	“implementation either before or after the commencement of operation of the Society without the reclassification protocol represents an unacceptable risk to the Society.”	<p>The issue relates to self-funding nature of Approved Professionals. We anticipate little change in the number of submissions to the CSAP Society after this Protocol is approved and in place. Under the current system Protocol 6 directs a majority of the applications for contaminated sites services to the Society and this is expected to continue.</p> <p>As well, Approved Professionals would still conduct site investigations, remediation and risk assessments for high risk sites. Approved Professionals would have a role in the following:</p> <p>Site risk reclassification</p> <ul style="list-style-type: none"> • Reclassification requirements are outlined in section 6 of draft 8 of Protocol 12. <p>Scope of risk assessment</p> <ul style="list-style-type: none"> • Approved Professionals would be able to oversee risk assessments where upper cap concentrations are exceeded and no complete exposure pathways are present
A-7	Ministry capacity	<p>“Potentially slow response times even for relatively routine actions due to large number of sites.”</p> <p>“Potentially long wait times especially for case-by-case decisions where protocols and procedures are not yet in place.”</p>		<p>Please refer to the response to item A-3. We do not anticipate a significantly different volume of sites being processed by ministry review. Our goal is to have a system in which a large proportion of the sites are overseen by Approved Professionals.</p> <p>About two thirds of the sites in the province are cleaned up by independent remediation. Of the independent remediation sites which are high risk, the ministry would take on an oversight role only when remediation of high</p>

Protocol 12 – Summary of Key Stakeholder Comments and Responses

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				<p>risk conditions continues beyond 90 days.</p> <p>Note also that the protocol has been simplified considerably in this latest version. There is no longer a preliminary classification stage and compared with the impact of the last draft would reduce the amount of effort both staff and consultants would need to spend on site risk classification.</p>
A-8	Cost and timelines	<p>“Protocol [12] will result in more files being reviewed by ministry staff resulting in higher costs and longer timelines for approval”</p>		<p>Please refer to the responses for items A-3 and A-7.</p>
A-10	Conflicts with Hazardous Waste Regulation and Contaminated Sites Regulation	<p>“More stringent, and in many cases much more stringent criteria will define these sites as ‘high risk’ than defined sites with hazardous wastes. “</p> <p>“Whereas CSR Sec. 13 references the commercial use (CL) standards and a factor of 10 to define hazardous waste for TDGR Appendix V substances, Protocol 12, Table 2, footnote 2, references ‘the site land use’ for upper cap concentrations that define high risk sites.”</p>		<p>CSR, Section 13 is no longer in effect and has been repealed because Section 9.2 of Transportation of Dangerous Goods Act Regulation was changed. Please see our Update of December 12, 2008 about these amendments.</p>

B – Definitions				
B-2	High risk	<p>High risk definition can attach very large liabilities to sites.</p> <p>Stigma “We would also be concerned with the potential stigma attached to properties that are captured by these policy thresholds, which could adversely impact property values, etc.”</p> <p>Confusion between science and administrative basis “The title of this protocol and the classification scheme suggests that risk to human and ecological receptors are known and sites can be classified based on them, when in fact, this is not the case.”</p> <p>“Secondly, the use of the classification could lead to confusion over whether a site is merely classified as ‘high risk’ (or ‘<i>potential</i> high risk’) and sites where quantitative risk assessments have actually been completed and found to be ‘high risk’.”</p> <p>High risk is not universally defined Our review of literature related to toxicology and risk has yet to reveal a magic threshold where there is unanimous agreement by scientists that the risk is ‘high’.</p>	<p>Even though the website states: “Protocol 12 is intended to establish the administrative risk-threshold...” throughout the document, including in the title, Protocol 12 used the term “high risk”.</p> <p>“Since, as outlined in the Introduction to the document, the aim of the classification is to determine the level of oversight and involvement of the Ministry staff, we suggest using the terms ‘supervision’ or ‘Ministry oversight/involvement’ rather than ‘risk’. Other less accurate, but more simplistic terms might be ‘concern’ or ‘priority’.”</p> <p>We recommend use of ‘high priority’ sites to more closely represent our understood intent of this document. Similarly, the protocol document could be altered to Site Requiring ministry Oversight, or something to that effect.</p> <p>We understand that the EMA and CSR currently refer to the term “high risk” and that changes would be required in the Act and the Regulation to follow through with our recommendation.</p>	<p>Please refer to the response in item A-3. As well:</p> <ul style="list-style-type: none"> • Significant changes made in this draft to develop more representative procedures more closely tied to accepted scientific measures of “high risk”. • The goal in preparing draft 8 was to create simple, clear, fair and flexible procedures. Sites classified as high risk would be classified on basis of well recognized risk factors and high thresholds when considered over a range of typical site conditions. • The draft has been amended so that it no longer classifies a source site as high risk because it has resulted in high risk contamination of a neighbouring site, even though the source site itself is not classified as high risk. • Authority has been provided in EMA to classify the risk levels of sites but not to classify sites based on the ministry’s opinion on which sites it should oversee. <p>Link to quantitative risk assessment and risk-based remediation</p> <ul style="list-style-type: none"> • Language has been added in section 2.0 to distinguish quantitative risk assessment and risk classification protocols to minimize confusion around the term “acceptable risk” versus “high risk”. The former is provided in sections 18 and 18.1 of the CSR in the form of risk-based standards for remediation while the latter would be established by Protocol 12.
B-3	High risk (present & future risk)	<p>“If there has to be consideration of potential exposures, then the Approved Professional member will have no choice but to designate all sites with concentrations in excess of upper cap numbers, as high risk, even if there is no current receptor and existing exposure.”</p>	<p>“SABCS in its report for identification of high priority contaminated sites recommended: “the evaluation would be based on a site’s current condition, not on a potential situation (i.e., is the site of concern given the current pathways and receptors?).”</p>	<p>Protocol 12 evaluates “future” in the exposure pathway on basis of close proximity of upper cap concentration contaminants to environments that support receptors. If the upper cap concentrations were left in situ, risks would have to be removed by putting in controls or by restricting land and water uses to prohibit future exposure.</p>

		<p>"A risk assessment evaluates a current situation. A potential situation is evaluated when a given scenario (i.e. for development) is provided."</p>	<p>"This issue was discussed at length within the SABCS, and I suggest the use of the SABCS recommendation as noted above."</p>	<p>Reclassification proceeds based on the same sense "future" use.</p>
B-4	<p>Aquatic habitat "means habitat defined in a protocol approved by the Director or as used by aquatic life defined in the Regulation"</p>	<p>"...the definition for "aquatic habitat" appears to remain undefined (i.e., "...<i>means habitat defined in a protocol approved by the Director...</i>"). Aquatic habitat is an important receptor in contaminated mine sites."</p> <p>"The Aquatic Life Water Exposure Pathway needs to be further defined. For example, is muskeg an aquatic receptor? What about ephemeral creeks? The number of upstream [oil and gas] sites considered to be high risk will depend on the definition of an aquatic receptor."</p>	<p>"Does a protocol exist that defines this term and if not, is one forthcoming shortly?"</p>	<p>This definition has now been moved to a new draft ministry Procedure "Definitions and Acronyms for Contaminated Sites".</p> <p>Currently there is no protocol or other formal policy describing what constitutes "aquatic habitat"</p> <p>Further review of this definition is beyond scope of Protocol 12 and would be addressed separately.</p>
B-5	<p>Exposure zone "means the zone in which receptors may come in contact with contaminants."</p>		<p>"For additional clarity it is suggested that the "Exposure Zone" be defined as the zone in which receptors may come in direct contact with contaminants (e.g., indoor air, surface soil, and surface water)"</p>	<p>The definition of "exposure zone has been modified as per this recommendation and is included in the definitions procedure document referred to in item B-4..</p>
C - Screening Indicators				
C-2	<p>Suspect industrial land uses</p>	<p>Bulk plants "It is assumed that petroleum bulk plants would not be included as a suspected industrial land use for high risk sites."</p> <p>Oil and gas "definition of 'Oil and Natural Gas – Large' should be expanded to specifically determine the types of facilities that are included or excluded. The existing terminology in the Appendix is not specific enough and may lead to inclusion or exclusion of sites."</p> <p>Hazardous Waste Management Does the def'n of hazardous waste management apply</p>		<p>The protocol has been simplified in this draft – suspect industrial land uses have been eliminated.</p>

		<p>only to hazardous waste facilities (landfills/treatment) or to simple presence of haz. Waste?</p> <p>It is unclear if the "Hazardous Waste Management" refers to Hazardous Waste as defined under the Hazardous Waste Regulation or only that material not exempt under Section 13 of the CSR.</p> <p>Home Based Businesses "Appendix 2 page 20 - I know the definition is from the Waste Discharge regulation however it should not exempt "home-based businesses". ministry staff and local governments are going after meth labs and antique finishers etc under this clause and the exemption takes away our ability to do this. Meth labs and their burying of materials lead to incredibly toxic sites and we need to be able to have these targeted and investigated regardless of the zoning. "</p>		
C-3	<p>Upper caps (screening vs. default indicators)</p> <p>"Concentrations of contaminants that, when present in the exposure zone, pose a high risk."</p>	<p>Confusion on application of upper cap concentrations and exposure zone "What is the difference in the scope or application of upper cap concentrations at the screening level and at the default level that distinguishes how upper cap numbers indicate <u>potential</u> on the one hand, and <u>confirm</u> high risk on the other?"</p>		<p>The protocol has been simplified in this draft – the use of indicators (both screening and default) has been eliminated.</p>
C-5	<p>Upper caps (VPH, LEPH, EPH)</p>	<p>Further justification required based on scientific basis for the selection of using a high risk multiplier of ten."</p> <p>In water (Schedule 6 x 10) For example the concentration of Vhw and EPH in Schedule 6 is considered LNAPL indicators, and if you multiply the number by 10 you end up with a very high value 150000 and 50000 ug/L. To get such a number the sample should contain visible LNAPL; however, standard practices and analytical laboratories will not analyze</p>		<p>Upper cap concentrations are now established in Protocol 11 as 10 x Schedule 6 standards for the aquatic life pathway in order to bring them into consistency with derivation of the remaining upper cap concentrations. Appendix 1 of that protocol describes in general how the upper cap concentrations were developed.</p> <p>The environmental quality standards in the CSR have not been developed on the basis of safety hazards but rather on toxicity. Thus safety hazards generally are not</p>

		<p>samples with visible LNAPL or even sheen in them, unless they get diluted. Depending on the level of concentration the dilution process can cause the laboratory detection limits to become higher than the applicable standards.”</p> <p>In Soil (App. 3) “In another case, during a routine asphalt milling activity for road work near a service station, the milling machine was lifted few inches up in the air due to vapour explosion. The vapour was trapped between the asphalt and the till like native material. The analytical results from the samples collected from the till had a VPH value of 1000 ug/g. If we use the 10 times multiplier for VPH you need a value of 2000 ug/g to consider the site a high risk site, although it took half that number to cause a an explosion.”</p>		<p>reflected in the upper cap concentrations in Protocol 11 because they are almost always multiples of the environmental quality standards. Language has been added in the introduction of this draft of Protocol 12 to clarify this point.</p>
C-6	Upper caps (surface water)	<p>“We are surprised that there are there no upper cap concentrations for "surface water".</p>		<p>Surface water is now evaluated in the most recent version of the Protocol for aquatic life and drinking water use. The ministry’s upper cap concentrations are provided in draft Protocol 11 and the upper cap multipliers are shown in Table 9 in Appendix 1 of that protocol.</p>
C-7	Upper caps (terrestrial soil exposure)	<p>“For purposes of this protocol, does 'Toxicity to soil invertebrates and plants' apply to all sites (i.e., if a site is entirely paved or built out, would this site-specific factor apply)?”</p> <p>“The most significant trigger to upstream sites will be the Environmental Health Terrestrial Soil Exposure upper caps, which, based upon our estimates, will trigger most of our sites if we assume that the agricultural (AL) or parkland (PL) land use standards apply. Soil contamination at oil and gas well sites is typically at or very near surface (i.e. < 1.0 m). The parameters which most often trigger the potential high risk status are ETX (ecological health upper caps range from 1mg/kg to 15</p>	<p>“Changing the screening indicator so that only human health risks applied would ensure that over capture of sites does not take place.”</p>	<p>In many cases sites which are entirely paved or build out would not qualify under the definition of “terrestrial habitat”. They would qualify under this definition only if they were close to “sensitive habitat” sites and if exposure pathways were complete.</p> <p>Screening indicators have been deleted from the document. Concentrations exceeding upper cap concentrations require a complete exposure pathway to be present to be a high risk condition. Measures could be taken to eliminate an exposure pathway.</p>

		mg/kg for AL) and PAHs (most often naphthalene with an ecological upper cap of 1.0 mg/kg).”		
C-8	Upper caps	<p>“The use of Schedule 4 standards to develop upper cap numbers (particularly for soil invertebrates and plants) illustrate the urgency to complete the CSST program and to develop Schedule 5 standards for those parameters currently listed in Schedule 4. “</p> <p>“Appendix 3 of the draft Protocol 12, nonetheless indicates upper cap numbers for close to 100 chemicals. “Blanket numbers” such as 0.5 mg/kg for all chlorinated phenols and 1.0 mg/kg for PAHs are certainly factors that may lead to the identification of many sites as “high risk”.”</p>	<p>“The Science Advisory Board for Contaminated Sites in British Columbia (SABCS) based on a contract during 2005 to review the CSST soil standards concluded that for now, there were minimal scientific data to support the derivation of upper cap numbers for soil invertebrates and plants. The contractor indicated that the data base to develop soil criteria for protection of plants and invertebrates was only adequate for cadmium, lead and PCP.”</p> <p>“For the purpose of a high risk evaluation, the SABCS hence suggested a biological assessment on an site to verify if there was direct evidence of stress on vegetation or lack of invertebrates/plants in undeveloped areas where such growth would normally be expected.”</p>	<p>Upper cap concentrations are now specified in draft Protocol 11. For Schedule 4 of the CSR that protocol splits the upper cap concentrations into two tables. Table 1 reflects human health protection in the context of soil ingestion exposure while Table 2 reflects environmental health, invertebrate, and plant soil exposure.</p> <p>Protocol 11 is based on “best available science”. Where science is still lagging, we strive to develop policies which are simple, clear, fair, and unambiguous.</p> <p>The SABCS’s recommendations for ecological assessment were subjective and in general consultants completing such an assessment would not be qualified to assess the significance and causes of impacts on vegetative health. The process would be similar to the “eco-assertion” formerly required for substances listed in Schedule 10 of the CSR and which was strongly opposed by environmental consultants due to the subjectivity required to provide this assertion.</p> <p>As an example, at Britannia, a solitary species of metal-tolerant algae grows along the shoreline. The algae, despite its apparent health, is an indicator of deteriorated conditions. Similarly, stressed vegetation may not always indicate toxic impacts.</p>
C-9	Upper caps	<p>Appendix 3 Schedule 4 upper cap concentrations are based on 10x the Schedule 4 concentrations however, the four human health columns appears to be based on other information not provided in Schedule 4. Are there any potential future changes to these numbers and if so, where can the human health data be found?</p> <p>“Appendix 3 note 2. Why is “therefore” used? Is use of</p>		<p>Upper cap concentrations are now specified in draft Protocol 11. For Schedule 4 of the CSR that protocol splits the upper cap concentrations into two tables. Table 1 reflects human health protection in the context of soil ingestion exposure while Table 2 reflects environmental health, invertebrate, and plant soil exposure.</p>

		<p>this word supposed to flag use of an i.e. internal MoE policy used to establish upper cap concentrations? Is there something magic about 20 per cent? Use the word only if its use is required.”</p>		
D - Default Indicators				
D-1	General	<p>“default factors in Table 3 would make most hydrocarbon contaminated sites high risk sites, notwithstanding...that most experts knowledgeable in the area would not consider them sites that require additional scrutiny or oversight by the Ministry.”</p>	<p>Default indicators be considered as indicators of a “high probability of an adverse risk” and that additional factors must be present to trigger a high risk designation.</p>	<p>The terms “default,” “screening,” and “indicators” have been eliminated in draft 8 of Protocol 12. In this draft, a site would be classified as high risk if mobile nonaqueous phase liquids are present or potential a high risk exposure exists (where upper cap concentrations must be exceeded and complete exposure pathways must be present).</p>
D-2	<p>Reports & Declarations</p> <p>“official reports by designated health or environmental officials of significant adverse effects on human health or the environment from site contaminants.”</p>	<p>Confusion on application</p> <p>“Table 3, default indicators a through d – If a declaration was made by DFO that a site was having an adverse effect on an aquatic life species or habitat, should that be captured by the default indicators as a high risk site?”</p> <p>“How do practitioners/Approved Professionals verify/look for such Reports and Declarations for sites?”</p> <p>“Is the MoE intending to set-up a centralized database or are there existing specific databases that could be searched?”</p> <p>“Clarify who “designated” health or environmental officials are; clarify the difference between these and “non-designated” health or environmental officials. If you don’t need to use “designated” don’t.”</p>		<p>This trigger of a report by health or environmental officials has been eliminated from this draft of Protocol 12.</p>
D-4	<p>Upper cap concentrations in exposure zone (Sediment)</p>	<p>“In addition to the above, bullet #2 for default indicators does not include “sediments” in the bracketed text, although sediments are included in Table 3. Recommend including in the text for consistency.”</p>		<p>Soil and sediment now have area distribution thresholds in the exposure pathway assessment process in this draft of Protocol 12.</p>

<p>D-5</p>	<p>Upper cap concentrations in exposure zone (representative measurement)</p>	<p>“Occurrence of upper cap concentrations – Category 2 of the Screening criteria states: “These are concentrations of contaminants that, when <u>present</u> in the exposure zone...”, thus indicating a single sample result can cause a high risk classification.”</p>	<p>“Will any statistical parameters (singly or in combination) be applicable relative to upper cap concentrations (e.g., U95%CL less than; 90th percentile less than; no value > 2X)?”</p>	<p>Contaminant volumes or areas are included in Protocol 12 to address such concerns.</p>
<p>D-7</p>	<p>Upper cap concentrations for utilities</p>	<p>“In the future, there will have to be consideration of impact on utility lines. I’m not sure there is any agreement among utilities regarding possible upper cap numbers.”</p>		<p>In the future if utilities and other safety issues are addressed under the CSR, Protocols 11 and 12 could be reviewed and amended to reflect those changes.</p>
<p>D-8</p>	<p>Mobile LNAPL “mobile LNAPL is considered present when temporal sampling indicates increasing thickness of LNAPL in monitoring wells, advancement of LNAPL across a monitoring well network, or the presence of LNAPL in monitoring wells at thicknesses exceeding 0.15 m.”</p>	<p>15 cm LNAPL too restrictive “LNAPL indicator of 15 cm of product is very restrictive as a trigger to classify a high risk site.”</p> <p>“A site is considered to be high risk if it had 0.15 m of LNAPL (or above 10% theoretical solubility limit of DNAPL). The definition implies that one occurrence anytime of LNAPL greater than 0.15 m will cause a trigger. It is our opinion that this is too conservative. “</p> <p>Only too restrictive for DNAPL “Mobile NAPL is a default indicator. I don’t have a problem with this. However your definition of “mobile DNAPL” has nothing to do with mobility. It seems only the presence of DNAPL constitutes a default situation.”</p> <p>Representative measurement “one well on a site (or many?), one measurement (or many?), does it include historic data?”</p> <p>“Increased LNAPL thicknesses are a common effect during seasonally low water tables. It may require many months of monitoring to acquire the necessary reliable information to document that a site is not actually high risk based on this criterion.”</p> <p>“The LNAPL thickness in monitoring wells should be dependent on the lithology of the area and should be</p>	<p>“Flexibility could be considered if it can be shown that product is not migrating offsite then the site should not be classified as high risk.</p> <p>“Mobile LNAPL would be better defined based on other field indicators such as expansion of an LNAPL plume or increase in dissolved groundwater concentrations in wells located down gradient of an LNAPL plume (i.e. Follow guidance in the draft LNAPL HAT)”</p> <p>“there is also considerable difference in potential risk if the 15 cm of product is encountered in sand and gravels vs. clay aquifers.” E.g. 15 cm LNAPL in clay may be bailed and never re-appear.</p> <p>“Suggested alternatives would include one or more of the following moderators: 1) LNAPL greater than 0.15 m off site; 2) LNAPL accumulations of greater than 0.15 m, within 24 hours (or alternate time) of bailing; or 3) LNAPL accumulations of greater than 0.15 m in more than one well.”</p> <p>“Alternatively, we suggest changing this trigger from a default indicator to a screening indicator.”</p> <p>“We suggest the definition include some “weight of</p>	<p>Mobile NAPL is considered a key criterion for classifying a site as high risk. Mobile NAPL is serious cause of long-term subsurface degradation and is usually a primary focus of remediation effort and cost. Mobile NAPL should be identified and addressed quickly.</p> <p>NAPL mobility is described in Protocol 16 and it provides lithology-based criteria based on the Assessment Guidance for Mobile LNAPL Characterization prepared for the ministry by Golder Associates in 2008 (http://www.env.gov.bc.ca/epd/remediation/reports/pdf/LNAPL-guidance.pdf)</p> <ul style="list-style-type: none"> • Visible sheens have been dropped from the definition. • Regarding reclassification, the removal of mobile and potentially mobile LNAPL would be recommended to assist with the reclassification of a high risk site. If mobile LNAPL is the sole reason for the site’s high risk classification it could be addressed using routine recovery methods. However, the knowledge base is still growing on mobile LNAPL and characterization criteria and management strategies may evolve.

		<p>graded from coarse sand and gravel to till and clay. A value of 0.05 to 0.2 m may be more appropriate.”</p> <p>“The definition of LNAPL includes “visible sheens” found in monitoring wells or on soils and the definition of mobile LNAPL includes advancement of LNAPL (i.e. a visible sheen) across a monitoring well network. This definition is not practical since a “visible sheen” is highly subjective.</p> <p>EPH as indicator - clarification “mobile LNAPL” If concentrations of VHW(6-10) and EPHW(10-19) exceeding the Schedule 6 standards advancing across a monitoring well network, does this fit the definition of “mobile LNAPL”. If so, this should be clarified in the definition of “mobile LNAPL”.</p> <p>Link to Reclassification “What happens if LNAPL is removed during source removal measures? We assume this will be one of the off-ramps to declassify a high risk Site.”</p>	<p>evidence” (e.g., average of a set number of events over a period of time).”</p> <p>“We suggest that the reference to visible sheens be removed.”</p> <p>“We suggest that if the definition remains that consideration be given to applying this trigger as a screening indicator with a simple reclassification process rather than as a default indicator.”</p>	
<p>D-9</p>	<p>Mobile DNAPL “mobile DNAPL is considered present when measurable thicknesses are found in monitoring wells, free liquid is observed in soil, or individual DNAPL substances are detected in water at concentrations exceeding 10% of their theoretical solubility limit.”</p>	<p>“With respect to the determination of DNAPL at concentrations exceeding the solubility limit, a single spurious laboratory result should not be the basis of determining a high risk site;</p>		<p>Data verification and appropriate follow-up and reporting where spurious laboratory results occur are part of the environmental site investigation and reporting process. However:</p> <ul style="list-style-type: none"> • Protocol 12 does not address interpretation of long-term data or concentration trends that show a decline to below Protocol 12 risk criteria. • The Golder Associates assessment guidance for mobile LNAPL provides that determination of mobile LNAPL may be based on most current 2 years of quarterly data where improving trends are observed. • Site assessment guidance specific to Protocol 12 may be required to address issues such as long-term trends, anomalous data and soil and sediment volume characterizations.

<p>D-10</p>	<p>Offsite > human health upper cap concentrations (overcapture)</p>	<p>Key criteria by which sites are captured as high risk – too conservative</p>		<p>Please refer to the response provided in A-3.</p>
<p>D-11</p>	<p>Offsite > human health upper cap concentrations (Clarification)</p>	<p>Link to applicable land use Capture too broad if upper cap concentrations based on non-applicable land and water uses (i.e. drinking water use)</p> <p>Why human health only “Section 3.1, Default indicators, bullet #3 – It is not clear why offsite migration only considers risk to human health. If offsite concentrations / migration exceeded ecological upper cap concentrations, and did not exceed applicable concentrations onsite (e.g., IL onsite, PL or ‘wildlands’ offsite), would the site be captured by the protocol?”</p> <p>Risk vs. administration “It is unclear how this default criterion for offsite migration relates to the Figure 1 Risk Classification Screening Indicators for Human Health Water Exposure (i.e. the criteria for DW are 10 times the upper cap concentration if within 30m of a well, but equal to the upper cap concentration if offsite. This indicates that a site can still be classified as high risk 31m from a well if the concentrations are equal to the upper cap concentration and offsite)”</p>	<p>This indicator should be based on “applicable” land and water use standards.</p> <p>Revise the offsite soil, groundwater, and soil vapour data from comparison to human health upper cap values, to comparison to the applicable site-specific land and water use upper cap values.</p>	<p>Protocol 11 (which deals with upper cap concentrations) indicates that the applicable land, water, sediment and vapour uses are to be determined in the same manner as the applicable numerical standards under the CSR and any other guidance and protocols guiding the determination of applicable uses.</p> <p>In this draft the migration of substances offsite is not a trigger for the classification of a source site as high risk. Also the risk classification scheme has been simplified significantly and the former Figure 1 has been eliminated and replaced with a new figure.</p>
<p>D-12</p>	<p>Offsite > human health upper cap concentrations (Reference on forms)</p>	<p>“the document states offsite migration above human cap is an indicator however this item is not repeated very clearly on the forms - should have it outlined on a form so it is not missed - i.e. form 1 asked about exposure pathway indicators onsite or offsite and refers to form 2 & 4 - form 2 has no mention of offsite - form 4 is the remediation schedule - so the question of offsite migration above human cap levels is never clearly and succinctly addressed - maybe even adding that to one of the forms is all that is needed so it is not missed.”</p>		<p>In this draft the migration of substances offsite is not a trigger for the classification of a source site as high risk.</p>

D-13	Offsite > human health upper cap concentrations (aesthetic standards)	"There are sites where offsite concentrations of manganese exceed the upper cap concentration concentrations for drinking water, however manganese is an aesthetic concern, not a human health risk and the offsite concentrations may not be due to onsite activities or conditions."	"will likely classify a number of sites that do not pose real risk to human health as 'high risk.'	Upper cap concentrations for iron, manganese and aluminum in drinking water (aesthetic standards) have been eliminated in Protocol 11
E – Exposure Pathway Indicators – Human Health				
E-1	General (Section 3.1, first paragraph last sentence)		revise the sentence as follows " <i>Where the combined risk factors of a particular exposure pathway (e.g., groundwater used for drinking water) are exceeded present at a site, site conditions are considered to pose a high risk.</i> "	The concept incorporated in draft 8 of Protocol 12 – see section 4.1.2.
E-2	General (worker exposure)	"worker exposure to contamination is a concern - when crews need to do work on existing underground utilities or even if say street planting (trees etc) are proposed - need to know risk to workers has been taken into consideration - also whether vegetation could even live in the area - i.e. vapours etc in soil."		<p>In general, worker safety is not addressed by CSR numerical standards or Protocols 11 or 12. The responsibility for worker safety lies with WorkSafe BC. An exception occurs with the upper cap concentrations in Protocol 11 where Threshold Limit Values for the protection of workers have been adopted in some instances. Appendix 1 in draft Protocol 11 provides some details.</p> <p>Also the area thresholds of upper cap concentration contamination are now 50 m² (urban park land, agricultural land, residential land) and 125 m² (commercial and industrial land) so boulevards may or may not be identified as a pathway. Protocol 12 applies at all times. If the site land use changes to a more sensitive use (e.g., commercial to urban park land), Protocol 12 must be revisited for more the sensitive use. Impacts could occur on vegetation at < upper cap concentration concentrations or < 50 m2 and these would have to be addressed through a CSR-based risk assessment if plan was to manage contamination in situ.</p>
E-3	General		"soil surface must be defined more explicitly, and	Unlike Protocol 13, Screening Level Risk Assessment,

	(soil surface) “means the upper surface of the soil layer below open air or constructed surface covers (e.g., pavement) other than buildings”		possibly stated that material may not be added to a site to mitigate this qualifier.”	draft Protocol 12 does not consider anything other than buildings as a permanent barrier to exposure. This broader capture of sites is narrowed somewhat in the exposure pathway section by only considering “terrestrial habitat”. Protocol 12 considers permanent surface covers as a valid barrier for the environmental health exposure pathway but not for the human exposure pathway.
E-4	General (Screening vs. exposure path)	“It is understood that if the exposure pathway analysis indicates no high risk even though there were screening indicators, the site is confirmed as “not high risk” and is no longer considered “potential high risk”.		Correct, unless the site qualifies as high risk because mobile nonaqueous phase liquids are present. Note that indicators are not used in this draft of Protocol 12.
E-5	Soil exposure (Areal extent > 5m ² - cost and logistics)	“Is it intended, for example, that if 10 cm over a 5 m ² area (i.e., 0.5 m ³) of soil is present, then the whole site is classified as a high risk site?” “Costs of investigations would increase trying to delineate impacts to every 2.25 m.” “For sites with small hot spots of less than 5 m ² , plotting contours on drawings (usually of large ratio scales) will be challenging and impractical.”	“currently existing guidance documents for in situ pre-classification of Hazardous Waste suggest step outs of 5 m (i.e., accuracy of 25 m2)” “We suggest increasing this area to make it realistic in terms of high risk Classification.”	In this draft all areas in the exposure pathway analysis section have been increased significantly – see new Figure 1 and the Exposure Pathway Questionnaire.
E-6	Soil exposure (Areal extent > 5m ² – overcapture)	“This requirement may end up capturing a considerable number of small sites with small sources including sites with fuel oil tanks only.”		In this draft all areas in the exposure pathway analysis section have been increased significantly – see new Figure 1 and the Exposure Pathway Questionnaire.
E-7	Soil exposure (Areal extent > 5m ² - science-basis)	“The purpose of the high risk assessment is to determine sites that require Ministry oversight, and in my view, there would have to be exposure to warrant Ministry involvement.”	“the Board recommended an assessment of current exposure (as there would be in a risk assessment).” “Conditions for exposure were indicated, e.g. exposure within 10 m of an area where the 90 th percentile of any parameter exceeds human health	This draft of Protocol 12 classifies a site as high risk if there are potential high risk exposures at a site. For example, for the human health exposure pathways humans must be present at the site for greater than 2 hours per day, one day per week for the soil and vapour exposure pathways or must have drinking water uses which apply. These are exposures that the ministry

			<p>high priority screening values for soil, and, for example, exposure by residents to the area in excess of 1.5 hours per day.”</p> <p>The approach of the Protocol 13 risk assessment undertakes an assessment of human exposure (i.e., HV-1- can humans come within 30 m lateral distance of soils) and Protocol 12 should be consistent and also consider actual exposure.</p>	<p>considers relevant in developing a scheme to classify site risk.</p>
E-8	Soil exposure (depth < 1m)	<p>Link to definition of soil surface</p> <p>Comment 1</p> <ul style="list-style-type: none"> • Will all satisfactory investigations now require early-stage investigations below all constructed surfaces? • If below-constructed surface investigations are not/cannot be carried out at an early stage so that firm information is available re high risk classification indicators, will the site classification default to ‘high risk’? • For a site that is classified as high risk due to conditions below a constructed surface, and since a remediation plan is required within 60-days, is it intended that removal be carried out? • If not, why would the exposure indicators process not satisfactorily address that exposure is not probable due to overlying constructed surfaces?” <p>Comment 2</p> <p>“On what basis the ministry chosen 1 meter depth to be the measurable mark for HS2, HV2? Did you take into consideration road work trench excavation?”</p>		<p><u>Response to comment 1</u></p> <ul style="list-style-type: none"> • All site investigations should assess conditions below constructed surfaces where there are reasonable grounds to suspect contamination • Section 3.0 of draft 8 of Protocol 12 contains requirements for completing investigations needed to confirm high risk • Mandatory notification of Director within 60 days of discovering high risk conditions at a site has been eliminated in this draft • Amendments to our administrative process for tracking Notifications of Offsite Migration with “potential high risk” status” are currently under development • If a soil exposure pathways is not complete, site is not considered a high risk for that pathway <p><u>Response to comment 2</u></p> <ul style="list-style-type: none"> • Road work trenches were not taken into consideration in setting the 1 m depth. • In general, draft Protocol 12 does not address worker exposures or link to requirements of WorkSafe BC for worker protection on high risk contaminated sites.(see response in E-2 above)
E-9	Vapour exposure	<p>Link to air concentration criteria</p> <p>“the definition of volatile constituents may capture a lot of sites.”</p>	.	<p>Vapours standards are now in effect in Schedule 11 of the regulation and these have replaced the former air concentration criteria.</p>

		<p>"The definition of what is 'volatile and toxic' refers to the draft Air Concentration Criteria. Many of the chemicals listed in this document are not volatile. "</p> <p>"Are there background concentrations established by BC MoE for both indoor air (solvents/cleaning liquids stored and used) or ambient air (operating service station or vehicle operation) to adjust the measured concentrations for true site contamination related concentrations?"</p>		<p>The ministry has developed draft guidance on site vapour investigation and remediation which is available on our website which responds to many of these questions at: http://www.env.gov.bc.ca/epd/remediation/guidance/technical/pdf/tg04-draft.pdf. Please note that it has a section which deals with background vapour issues.</p>
E-10	Vapour exposure (Clarification/ editorial)	<p>VI-3, VI-4 (in line HV-2) It is not clear as what these refer to or mean.</p> <p>"HV-2 should refer to soil vapour. As it is written, it implies that soils with volatile chemicals within one meter of surface are of concern (soil with volatiles below 1 m is not of concern)."</p> <p>"In HV-1, we suggest adding groundwater to the question 'Are volatile and toxic substances present in site soils or ambient air as groundwater could be a source of volatile chemicals?"</p> <p>"Is testing required for both indoor air and ambient air prior to using this protocol?"</p> <p>Figure 1: In the first box of the human health vapour exposure path, do you want to say "present" or "exceeds standard"?"</p> <p>"In the third box of the human health vapour exposure path, shouldn't it say "significant potential" instead of potential?"</p>		<p>See response to item E-9. Also, in response to stakeholder comments the figure and the Exposure Pathway Questionnaire have been significantly updated in draft 8 of Protocol 12.</p>
E-11	Groundwater exposure (drinking water pathway)	<p>"Do groundwater concentrations within 30 m of a drinking water well exceed 10 times the upper cap concentration for drinking water?" "mean 10x10x CSR Schedule 6?"</p> <p>"HW-2 – text should be revised to indicate groundwater concentrations that exceed the upper cap."</p>		<p>Due to concerns regarding the drinking water pathway, with the exception of the standards for iron, manganese and aluminum (which were deleted), the drinking water upper cap concentration was reduced to the equivalent of the CSR drinking water standard. The groundwater exposure pathway was changed to include risk criteria for the well (= upper cap concentration) and at a 10 m</p>

		<p>“why a short distance was selected for HW2 - 30 meters plus the factor of 10 times exceedance of the criteria, are those numbers based on any scientific basis or references?”</p>		<p>separation distance from the well (=10 x upper cap concentration). Also criteria were added to protect surface water intakes used for drinking water)</p> <p>The Exposure Pathway Questionnaire and Figure 1 now uses “exceed” throughout in the context of upper cap concentration concentrations.</p>
E-12	<p>Groundwater exposure (applicable groundwater standards)</p>	<p>Link to policy Re: application of groundwater standards “We also note the scenario where groundwater contamination reported within a shallow aquifer (e.g., till at the ground surface and a drinking water well is in bedrock 300 feet below the ground surface, but within 30 m of the contamination). Under this scenario the site is considered “high risk” regardless of any other data.”</p>		<p>The review of policy and procedures for determining applicable groundwater standards is outside scope of Protocol 12. Issue is being addressed by the ministry and we expect proposed new policies for determining groundwater use will be released for public review and comment this year.</p>
E-13	<p>Groundwater exposure (drinking water of surface water)</p>	<p>“...no consideration was provided for human health water exposure via surface water licenses and direct intake for rivers, creeks etc. Surface water licenses are common in many parts of B.C. and many industries (e.g., mining, forestry) are located upgradient of these water sources or within the watershed.</p>		<p>Surface water has been added as a pathway (HW-3 in Figure 1 and the Exposure Pathway Questionnaire)</p>
<p>F - Exposure Pathway Indicators – Environmental Health</p>				
F-1	<p>Terrestrial soil exposure (potential terrestrial habitat < 200 m from RL/CL & 300 m from IL)</p>	<p>Link to Habitat Definition in Screening Level risk assessment “Examples of application of TS-1 to TS-4 will be required, given that many sites will be adjacent to, or close to “terrestrial habitat” as per the protocol definition.”</p> <p>“For example, I am assuming for assessment of an industrial site not adjacent to the Fraser River but within 300 m of the river, will require offsite soil samples and offsite monitoring wells at the high water mark. Is this likely, given the possible need for permission from the adjacent landowner and given the requirements for Federal permission for activities (such as placement of a</p>		<p>Site investigations would proceed as they do now with source areas identified, contamination above CSR standards delineated and additional investigations being conducted as needed to develop remediation plans. Investigations to allow completion of Protocol 12 would also delineate upper cap concentrations for all relevant pathways. If upper cap concentrations extend within the separation distances of an exposure pathway or are near site boundaries, then some further investigations may be required to confirm whether or not exposure pathway criteria have been exceeded or upper cap concentrations exist offsite.</p>

		<p>monitoring well) within the shoreline of the Fraser River?”</p> <p>“It would appear that if there is a site with > 5 m² of impacted soil within the top 1 m exceeding upper cap concentration, then that site would be a high risk site. Numerous sites along waterways could get unnecessarily captured as high risk based on this definition. For example, 300 m from False Creek would capture sites up to 2nd Avenue near Southeast False Creek, which seems unnecessarily conservative.”</p>		<p>The distance of groundwater within 30 m of the high water mark has been changed to 10 m in this draft.</p> <p>In the case of the example cited, the investigations indicated would only proceed where there is reason to believe upper cap concentration concentrations exist within 10 m of the high water mark or in the sediment.</p> <p>In general there are issues in accessing and addressing offsite contamination under the CSR. Where concentrations are above human health upper cap concentrations or substances with ecological upper cap concentrations are in contact or near contact with terrestrial/aquatic receptors, ministry involvement is appropriate to ensure contamination is dealt with in a timely and appropriate manner.</p> <p>The terrestrial exposure pathway is changed in this draft. The areal extent of upper cap concentration contamination was raised significantly from 100 m² to 500 m² based on land use.</p>
F-2	Terrestrial soil exposure (sensitive habitat)	<p>“page 4 "sensitive habitat" item b - you refer to some basic riparian area-based setback information.</p> <p>“RAR is just for fish and does not address wildlife habitats, terrestrial areas, intertidal zones etc.”</p>	<p>“I think this would be better linked to other ministry information that better defines sensitive habitat - the link to a more common definition and more relevant information that is in the industry is www.env.gov.ca/sei/ there is no need to reinvent what others are doing and this way all use the same definition when identifying sensitive areas - you could possibly even remove items c, d & e as would be redundant as all are covered in the website documents listed above.”</p>	<p>The SEI website was reviewed and the information was not considered adequate at this time to address other conditions. The definition of terrestrial habitat may be modified following further review of this website and discussions with ministry biologists.</p>
F-3	Terrestrial soil exposure (clarification)	<p>Figure 1. In the first box of the environmental health terrestrial soil exposure path, clarify the meaning of “immediately adjacent”. Different workers will interpret this fuzzy wording differently.</p>		<p>“immediately adjacent” has been removed</p>

<p>F-4</p>	<p>Aquatic life exposure (clarification)</p> <p>Re: “groundwater wells installed at the last point of land nearest the high water mark are considered representative of concentrations at the high water mark.”</p>	<p>“This statement is confusing. Is it intended to imply that the groundwater quality in monitoring wells installed at the last point of land nearest the high water mark should be considered to not have 10 fold dilution available (i.e., groundwater chemistry is compared to BC WQG rather than CSR aquatic life standards)? If this is the case, then the distance of 30 m seems unreasonably conservative.</p> <p>“the applicable standards or criteria for surface water that is or could be biological habitat is the ministry approved and working water quality guidelines (criteria or ambient criteria). However, this protocol does not address the surface water exposure pathway and may further confuse the correct application of appropriate standards for assessing surface water quality.”</p> <p>“Table 2 references Technical Guidance 6, which deals with surface water from the perspective of groundwater travel time to a surface water body. Another important example is Default Indicator “h” provided in Table 3 which states “Surface water concentrations in an aquatic habitat that are above upper cap concentrations for the protection of aquatic life”. This gives the impression that surface water samples should be compared to 10x the Schedule 6 aquatic life standards, which is incorrect (unless you have a standing surface water body that does not support biological habitat such as a puddle, ditch, etc.). “</p> <p>“it is often possible when adjacent to marine environments, to approximate the degree of dilution that has occurred in a sample (through measurement of conductivity or salinity). In situations when you can demonstrate that no significant dilution has occurred in a sample, then there should be a provision to allow continued application of CSR aquatic life standards within this distance.”</p>	<p>“While I like your idea of monitoring at the high water mark, logistics may require an option to place monitoring wells at the high water mark i.e., the use of the groundwater modelling protocols suggested in the SAB high priority report.”</p>	<p>In draft 8 of the Protocol aquatic life upper cap concentrations have been changed to 10 x the Schedule 6 standards and the exposure pathway risk criterion now reads 10 x upper cap concentrations at 10 m from the high water mark in groundwater or upper cap concentrations “in surface water” with aquatic life use.</p> <p>The requirement to delineate aquatic life upper cap concentrations within 10 metres of the high water mark is considered reasonable for differentiating sites requiring ministry oversight.</p> <p>If upper cap concentrations are delineated and are not present within 10 metres of the high water mark, the aquatic life pathway is deemed not high risk. If upper cap concentrations are present within 10 metres of the high water mark, Protocol 12 directs delineation up to high water mark for full assessment of the aquatic life pathway or in the case of surface water directly at the point of contaminant discharge.</p>
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G - Site Investigations				
G-1	CSR Investigations and site classification (clarification)	<p>“Will the requirement for classification define and “drive” the extent of investigations, or is the intent that Stage 1 & 2 PSI, DSIs, etc. will be triggered by other factors as currently, and high risk classification will occur with whatever information has been obtained for other reasons? “</p> <p>“The Protocol does not state for example:</p> <ul style="list-style-type: none"> • If a Stage 1 PSI will be required to apply the ‘Screening indicators’ • If a Stage 2 PSI or DSI will be required to apply the category 2, 3 & 4 ‘Default indicators’ or the ‘exposure pathway indicators’” <p>“Clarify</p> <ul style="list-style-type: none"> • “Are all levels of classification to be attempted at any stage of investigation? • Are all levels to be attempted with any type of information that is available at a given time? • Are all levels to be attempted whenever any of the CSR notices are triggered that are listed in Table 4?” 	<p>“The protocol states that “Risk classifications reached under this protocol must be supported by evidence. That evidence can be obtained from someone with adequate site knowledge and through appropriate investigations conducted in accordance with ministry procedures and guidance and best professional practice.”</p> <p>“The expected quality level of source information to be used appears to require clarification as it can range from: “a person with adequate site knowledge” to “appropriate investigations...per ministry procedures and best professional practice”.”</p>	<p>Section 3.0 of draft 89 of Protocol 12 addresses the requirements for site information needs in the context of site risk classification:</p> <p>“The conditions in this protocol for classifying site risk levels require simple, objective measurements for characterizing primary contributors to environmental and human health risk (contaminant toxicity, exposure pathways and receptors). They are intended to enable sites to be classified on the basis of limited and readily obtainable site data.</p> <p>The level of information necessary to determine the risk classification of a site will vary on a site-by-site basis depending on the nature and extent of contamination, site geology and hydrogeology and site proximity to receptors. In general, information needed to classify site risk may be obtained at any stage of the investigation and remediation process. When required, further detailed site information should be obtained at the earliest opportunity to enable a risk classification to be determined.</p> <p>Risk classifications determined under this protocol must be supported by appropriate, satisfactory site information obtained in accordance with ministry procedures, protocols, guidance and standard professional practice.”</p> <p>Here are some additional points on this issue:</p> <ul style="list-style-type: none"> • Where high risk conditions are suspected or found during normal site investigations, the investigations should be adjusted to allow proper evaluation of high risk conditions at any point during the investigations. • If a site where upper cap concentrations were found at the PSI stage is being reported as not a high risk site, there would have to be sufficient site information to substantiate the assertion. In most situations,

				<p>DSI-type information would be required to delineate the extent of upper cap concentrations.</p> <ul style="list-style-type: none"> • Any qualified professional would be able to complete the exposure assessment and sign the Site Risk Classification Report. Approved Professionals are not required for these functions. • The Site Risk Classification Report requires professional signatures confirming adequacy of investigations. • Reclassification applications would require Approved Professional signoff. • Approved Professionals are responsible for appropriate classification of all sites that are reviewed under Protocol 6, "Eligibility of Applications for Approved Professional Review". • Where notices are triggered under Table 1 of draft Protocol 12, the status of the site as a high risk site would be reported as known based on available site information. The information would vary depending on the type of notification provided. • Where submissions are triggered by a Notification of Offsite Migration, only the presence of upper cap concentrations may be suspected or known.
<p>G-1</p>	<p>CSR investigations and site classification</p>	<p>Link to site profiles "Although the protocol recognizes the information will be limited during the early stages of the project;</p> <ul style="list-style-type: none"> • it is unclear if there is no information available for a particular question (no investigation data during site profile submission) would that make the site Potential high risk? • it seems inconsistent to expect an owner to have to submit a Form 3/4 based on information that may be available at the Site Profile stage." 		<p>Suspect industrial land use and notice at the site profile submission stage have been eliminated in this draft.</p>

<p>G-2</p>	<p>Sampling rigour – soil</p>	<p>“Requirement to complete Forms 1, 2 and 3/4 indicates a need for information to the level of DSI which might hinder the development of some sites where investigations have not been previously conducted and may not have significant contamination.”</p> <p>“If yes, this will impose a financial burden on all industrial property owners who may not have any or much contamination and delay re-developments.”</p> <p>What is the expectation for characterizing volumes of soil for comparison to upper cap values?</p> <p>Is it necessary to sample the upper 1 m of soil to disprove contamination > upper cap concentrations?</p>		<p>Protocol 12 was developed to minimize the additional investigative obligations except where high risk conditions are suspected or found. The ministry considers it reasonable and appropriate to require additional effort to delineate contamination above upper cap concentrations or where mobile NAPL may be occurring. This is analogous to the requirements in Technical Guidance 1, “Site Investigation and Confirmation Testing” which requires additional and tighter delineation of hazardous waste soils.</p> <p>Note that the forms have been amended in draft 8 of the Protocol and only the Site Risk Classification Report (SRCR) and Exposure Pathway Questionnaire (EPQ) have been retained.</p> <p>All areas of potential environmental concern should be investigated per current CSR guidelines. Where soil contamination is identified at surface or within or near the upper 1 m of the soil profile, appropriate investigations should be completed to confirm that either upper cap concentrations do not exist, or that the contaminated area does not extend over a combined total area of greater than 50 m² (urban park land, agricultural land, or residential land) 125 m² (commercial land or industrial land) or 500 m² wildlands or the area limits for terrestrial health exposure pathway. In addition to delineating for CSR standards, contaminants would have to be delineated for 10 x CSR standards.</p>
<p>H - General</p>				
<p>H-1</p>	<p>General</p>	<p>Link to Spill Reporting and Independent Remediation “protocol [12] will impose burdensome reporting requirements for sites captured” as high risk.”</p> <p>“spill reporting and notification of offsite migration, are sufficient to capture high risk sites.”</p>	<p>Our company “manages onsite contamination as part of our ongoing business practices and does not see the need to provide external reports of managed contamination.”</p>	<p>The reporting requirements under draft 8 of Protocol 12 have been simplified. For sites which are not high risk, Site Risk Classification Reports and, if required, Exposure Pathway Questionnaires must be submitted if their submission is triggered as described in Table 1 of the protocol. A Summary of Site Condition would be required in addition for high risk sites.</p>

				<p>Spills are exempt under S. 57(2) of CSR from notifications of commencement of independent remediation and the information received by the ministry spill response staff is insufficient to characterize the risk classification of the spill site under this protocol.</p> <p>The ministry is developing internal procedures for the referral of spill sites to the Land Remediation Section separately from the development of this protocol.</p>
H-1	General (clarification)	<p>“When investigations are carried out for purposes not normally involving submitting a site profile,... if conditions indicating potential or confirming high risk classification are identified, who will be responsible to report the potential high risk condition, for example:</p> <ul style="list-style-type: none"> • The property owner even if it was another party conducting or commissioning the investigation (e.g., a potential purchaser)? • The lender if it was the lender who required the investigations? • The individual / firm conducting the investigations? <p>This provision needs to be emphasized, rather than buried in a footnote.</p> <ol style="list-style-type: none"> 1. Who is responsible for providing Notification to the Ministry if a high risk site is identified? 2. What are the consequences of not providing Notification? 3. What, if any, commitment is required along with the schedule of remediation, which must accompany Notification? <p>Difficult to get owner's signature where property is leased.</p>	<p>“Note: Many Stage 1 & 2 PSI and even DSI investigations are carried out or supervised by individuals not using ministry procedures and guidance or best professional practice, and that are not Approved Professionals.”</p>	<p>The site risk classification triggers and timing of related reports are provided in Table 1 of draft Protocol 12. The responsibility for reporting is the same as the responsibility for each trigger, e.g., for a Notification of Offsite Migration the person responsible is the “responsible person” for the site under the CSR.</p> <p>There would be no onus on consultants to reveal a site's risk classification to the ministry simply upon identification. Submissions under any of the triggers would have to include the reports specified in Tables 2 and 3 of Protocol 12.</p> <p>A Site Risk Classification Report would be signed by a qualified environmental consultant.</p> <p>Draft 8 of Protocol 12 also identifies an oversight framework depending on risk classification and planned cleanup (see Table 3). Non-compliance with Protocol 12 reporting requirements would be an offence. Compliance with the broader requirements of the CSR and <i>EMA</i> is not addressed in Protocol 12 except for statements of regulatory expectations. A Land Remediation Section compliance strategy for these requirements is being developed separately and would likely focus resources on high risk sites.</p>
H-4	Reporting requirements	<p>“Section 4.0 and Table 4 of the draft protocol require that Forms 1, 2 and 3 be completed and submitted to the</p>	<p>“Thus, any of the sites we may have in our inventory, which have not undergone any CSR</p>	<p>The formal category “potential high risk” sites has been eliminated in draft 8 of the Protocol.</p>

	<p>(forms and schedule of site investigation or remediation for sites identified potential or confirmed high risk)</p>	<p>ministry for any site identified as “Potential High-Risk”.</p> <p>“...the draft protocol suggests that the reporting requirements may only be applicable to sites under active investigation and remediation. For example:</p> <p><input type="checkbox"/>Section 3.2, first sentence, which states <i>This protocol applies at all times on sites undergoing investigation and remediation.</i></p> <p><input type="checkbox"/>Section 3.2, last sentence, which states <i>Risk classifications reached under this protocol must be supported on the basis of appropriate investigations and satisfactory site knowledge obtained in accordance with Ministry procedures and guidance and best professional practice.</i>”;</p> <p>Section 4.0, first sentence, which states “<i>At any time that high risk indicators (screening, default, or exposure pathway) are identified during the site investigation process, the reporting requirements of this protocol apply.</i>”;</p> <p>and</p> <p>Table 4, note 9, which states “<i>Where none of the Contaminates Sites Regulation notices are triggered, the Director must be notified within 60 days of identifying a high risk condition during site investigations.</i>”.”</p>	<p>related site investigation, would not be captured by this protocol.”</p>	<p>Triggers for reporting are tied to CSR-notifications, applications or site-specific requirements of the Director. Investigations in themselves would not trigger high risk site notifications unless offsite migration of contamination is or may be occurring. However, it would be prudent for all site investigations to assess both the presence of contamination and the site’s risk classification as the information is now integral to the regulatory process.</p>
<p>H-5</p>	<p>Responsibility of Approved Professionals</p>	<p>“Form 1 requires the signatory to confirm that the individual has “demonstrable experience of the type reviewed above”. This suggests that the responsible person and/or site owner are not the intended signatory to the document?”</p> <p>“The shift in onus to the Approved Professional from the site owner / generator for reporting of ‘high risk’ conditions” is of concern.”</p> <p>“It appears that there is no requirement of an Approved Professional to sign-off on the document which precedes the SLRA document (Protocol 13) which requires an Approved professional to sign off on.”</p> <p>“The question is what is demonstrable experience and would that be adequate to identify what is or isn't a high</p>	<p>“We request Form 1 be modified as follows:</p> <p>1) Part 4, Stn 1: delete “to a high standard of professional quality” and insert “to generally accepted professional standards” or delete reference to professional quality altogether.</p> <p>2) that the form also be signed by the RP/site owner.”</p> <p>“change wording “high standard of professional quality” to “normal standard of professional care” or similar wording.”</p>	<p>Please refer to the response in item G-1 for information on responsibility for signing forms.</p> <p>Requirements for professional qualifications (demonstrable experience) exist within section 63 of the CSR relative to investigations as well as remediation where a contaminated sites legal instrument is sought.</p> <p>Language in the Site Risk Classification Report now reads that the investigations have been conducted “<i>in accordance with approved procedures, guidance and standard professional practice</i>”.</p> <p>The Exposure Pathway Questionnaire and Site Risk Classification Report should be completed by a qualified professional. Final forms should ensure confirmation by signoff by the professional involved.</p>

		<p>risk site?”</p> <p>“Form 2 does not require a signatory suggesting that the form may be completed by any individual who has in their possession the information required to respond to the questions.”</p>		<p>Please note the revision of the forms (from draft 4) in this draft of the Protocol.</p>
H-7	<p>Form 2 (Clarification of footnotes)</p>	<p>“Form 2 notes. For nos. 1 and 6, “best” professional practice likely means different things to different people unless you identify explicitly what it means. Most investigations are carried out to “typical” professional practice standards.</p> <p>For no. 3, derivative procedures are not identified in Table 2 and need to be.</p> <p>For no. 4, please clarify what an “appropriate” cross section is. If you require specific features shown you better identify them or you are asking for trouble.</p> <p>For no. 5, please clarify what an “appropriate” contour map is.</p> <p>For no. 10 define “proximity” and use of the term “appropriate”. Why is “should” used? Is submission of the information optional? If not, use “must”.</p> <p>For no. 12, define “aquatic resource”. Is it the same as water used by aquatic life?”</p>	<p>“Requiring best practice is patently unreasonable and unenforceable.”</p>	<p>“Best professional practice” has been replaced by <i>in accordance with ministry procedures and guidance and standard professional practice</i></p> <p>For “appropriate” cross sections and plans for all media and “appropriate” contour maps please use professional judgement. In most cases, the same cross-section might be used to delineate contamination and upper cap concentration exceedances. This is the documentary record upon which an environmental consultant’s decision regarding site classification is based. This record is more critical where upper cap concentration exceedances are close to the areal, depth and/or distance criteria of an exposure pathway, so more detailed cross-sections and plans may be needed where this is the case.</p> <p>“Should” has been replaced by “must” where there is a clear requirement.</p> <p>“Aquatic habitat” is defined in ministry procedure document “Definitions and Acronyms for Contaminated Sites”.</p>
H-8	<p>Form 3</p>	<p>“What information is required for the column “Completion Date (yy-mm-dd) (if incomplete)”? Is this looking for an anticipated completion date?”</p> <p>“For offsite site investigations the time to complete investigations generally depend on the timing for obtaining authorizations from third parties (i.e. land owners, local, provincial government). It may be difficult for site owner’s</p>	<p>“Should this be the responsible person submitting these forms rather than the owner?”</p>	<p>Form 3 has been eliminated in this draft.</p>

		to provide firm schedule. The same form requires the owner to sign off on this form.”		
H-9	Form 4 notification within 60 days	<p>“due to site conditions, such as remoteness and surface access, this requirement is likely not feasible for lease sites for oil and gas exploration.”</p> <p>What level of remedial plan/schedule is required to be submitted to the Ministry w/i the 60 day time limit?</p> <p>“The requirement to provide Remediation Plans with 60 days appears to be unreasonable. It may take several months or years to complete the required investigations prior to development of a Remediation plan.”</p>	“Would a plan indicating that contamination at an active high priority service station site would be addressed at such time as the station is decommissioned by acceptable?”	Form 4 has been eliminated in this draft.
I – Administrative Issues				
I-1	Response Times	<p>“There are no requirements for ministry response times to high risk classification submissions or for review of associated remediation plans.”</p> <p>As a result, projects potentially dealt with by Approved Professionals could be delayed.”</p>		Please see our comments under A-7, ministry capacity.
I-2	Remediation timelines (requirements onerous for large inventory RPs)	“The issue with the protocol is that there is a potential requirement to further investigate or remediate in a timely manner sites that we have identified as lower risk (relatively) and which may not receive additional funding for a long period of time. “	“Obviously timing could be an issue with these requirements, although I suspect we could provide sufficient rationale as to why remediation needs to be delayed until further investigation can be completed.”	Where there are large inventories of high risk sites and high costs, timelines, resources, etc. to remediate all sites, a broad strategy that indicates how sites will be prioritized and staged for investigation and remediation should be provided to the Director.
I-3	Site profiles	<p>Table 4 indicates reporting requirements when a Site Profile is submitted.</p> <p>“Will the requisite forms be submitted with the Site Profile to a municipality, or separately only to the ministry?”</p> <p>“Will the requisite Protocol 12 forms be considered / processed by the ministry concurrent with Site Profile</p>	The effect of high risk classification on the Site Profile process requires clarification.	The site profile trigger has been dropped from this draft.

		<p>referrals?”</p> <p>“If high risk classification is assigned by the ministry at the Site Profile processing stage:</p> <ul style="list-style-type: none"> • Will the options for “release” for the “approving authority” be precluded? • Will Independent Remediation be precluded consistent and the option of release per Independent Remediation also be precluded? • Will further investigations and remediation under ministry supervision for an AIP or COC application with ministry review be the only option for “release” of the approving authority? <p>Will amendments be made to the <i>Local Government Act, Land Title Act, Vancouver Charter, Islands Trust Act</i> or will the “Procedure: Site Profile Processing” only be amended to provide the requisite instruction?</p>		
<p>I-4</p>	<p>Independent remediation</p>	<p>“Will the “required Notification of Independent Remediation (NIR) within 3-days of the start of remediation,</p> <ul style="list-style-type: none"> • Trigger the reporting (per Table 4); • Require the classification of the site as high risk; • Trigger the recording by the ministry of the site as a high risk site; and • Prevent this expeditious remediation until it is authorized and carried out per oversight by ministry personnel?” <p>“Will there be opportunity for, or prohibitions against remediation of portions of sites causing them to be high risk, within 30-days [60 days] of investigative findings to prevent:</p> <ul style="list-style-type: none"> • Required reporting of a site? • Classification as high risk?” <p>“Upon review of the EMA and CSR, we did not note the requirement for determining “high risk” in this site investigation and remediation process. Please note that several operating industrial sites have (or will) “Notify of</p>	<p>“We recommend removing the requirement to submit the high risk forms along with a Notification of Independent Remediation as it would likely dissuade operators from this beneficial ongoing clean up of contaminated areas. We note that under the EMA, the ministry has authority to review all work conducted under the Independent Remediation process through compliance enforcement.”</p>	<p>The interpretation regarding Notifications of Independent Remediation is generally correct — Notifications of Independent Remediation will trigger the submission of information on site risk classifications. Depending on the nature of the contamination and proposed remediation strategy, owners may be allowed to proceed with the remediation of high risk sites under independent remediation. See Table 3 for requirements.</p> <p>The breakpoint for a change in reporting requirements for the remediation of high risk conditions has been changed from 60 days to < 90 days (refer to Table 3). If high risk conditions could be remediated in less than 90 days then owners could undertake independent remediation and provide notice that the high risk condition existed and has been remediated.</p> <p>Once the site is no longer a high risk site procedures described in section 6 of the protocol could be used for reclassification.</p>

		Independent Remediation” during clean up of drum storage areas, during UST removals; during housekeeping operations, maintenance; etc.”		
I-5	Site classification and remediation	Section 3.3, last sentence of paragraph 3 – suggests that a quantitative human health and ecological risk assessment must be completed to select an appropriate remediation strategy. This would conflict with source removal as a remedial strategy where risk assessment is not conducted or required.		Differentiation between Protocol 12 and quantitative risk assessment added in introduction to draft 8. The referenced sentence has been removed.
I-6	Reclassification	<p>“There are no clear off-ramps for declassifying a site as high risk and releasing it to be processed under Protocol 6, or whether this is in fact the intent.”</p> <p>“To have criteria for classifying sites as high risk, but no criteria or conditions for acceptable solutions / resolution will unnecessarily delay and frustrate property transactions, municipal approvals and property developments, and even site investigations to determine the nature of conditions and risks.”</p>	<p>“Without such protocols, it initially appears that all sites classified as high risk will require submission of a remediation plan to the ministry for its review and approval.”</p> <p>“We suggest not applying this protocol until the off-ramps are available.”</p>	The reclassification process has been redefined and is explained in Section 6.0.
I-7	Reclassification (by quantitative risk assessment)	“process for declassifying sites should be expanded. I suspect that detailed risk assessment can be used to declassify sites from High Priority as per Table 4.1 in the SAB report. This point should be clarified as a means to declassify high risk Sites is as important as a system to classify high risk Sites.”		<p>For context, there are a number of high risk sites in B.C. that have been remediated using in situ management and long-term monitoring. These sites are still considered high risk due to the complexity of measures and level of effort required to ensure risks are properly managed. However, at some of these sites, easily remediated portions have been addressed using source removal and these portions have been separately identified and are not considered high risk. For these portions, CSR instruments were issued under Protocol 6.</p> <p>In situ management of high risk conditions as basis for reclassifying sites was considered and not adopted in this draft. This is consistent with ministry policy regarding long-term management of more heavily contaminated sites and use of institutional controls such as restrictive</p>

				covenants, financial security, and conditional requirements of regulatory instruments.
I-8	Extent of ministry reviews	<p>“Once remediation has been completed, will the ministry need to review the confirmation of remediation?”</p> <p>“Nothing in Protocol 6 appears to authorize or address high risks sites once they have been designated as such and, in the absence of other protocols to allow reclassification of a site from high risk to low to moderate risk, it appears that such sites do not qualify to be processed under Protocol 6.”</p>		<p>Yes to the first question as long as the question refers to high risk sites. Reporting requirements for a site reclassification are explained in Section 6.0</p> <p>If high risk conditions were removed, the site could be reclassified and reviewed by an Approved Professional under Protocol 6.</p>
I-9	Role of Approved Professionals	<p>“The authority for and requirements of Approved Professionals in regard to responsibilities under Protocol 12 appear to require further clarification.</p> <p>“Is it intended that where Approved Professionals are involved, they will have the role of presenting information and recommending a classification, but the ministry will issue the decision (e.g., as for AIPs, COCs)?”</p>		<p>See comments under A-6, Approved Professional viability, H-1, H-5 - Responsibility of Approved Professionals and above.</p> <p>We expect that Protocol 12, when in effect, will become the basis of Protocol 6, “Eligibility of Applications for Review by Approved Professionals” rather than the administrative procedures currently used in Protocol 6 to classify site risk.</p> <p>The current plan is for the Director to continue issuing contaminated sites legal instruments.</p>
I-10	Sites currently under investigation	<p>“What will be the requirements for existing sites that fall into this category, where investigations have been completed, but no trigger (e.g. offsite migration) to notify the ministry applies?”</p> <p>Uncertainty has potential to interfere with ongoing investigation/remediation, Approved Professional activities and to add time and cost.</p> <p>“Would this protocol be applicable to existing sites ? If yes, how would it be applied?”</p>		<p>Where there is no trigger to notify the ministry, the ministry does not expect to receive reports about the classification of site risk. Land owners would be welcome to apply the protocol to determine the risk classifications of sites for their own use.</p> <p>When the protocol is approved, we expect that there would be an effective date (perhaps 6 month later) after which it would apply to all sites in B.C. Some different procedures might apply to oil and gas drilling sites depending on the results of future discussions between the ministry and the Oil and Gas Commission.</p>

		“Will there be a warning of the effective date (or grandfather period) to allow for applications to be made for Ministry instruments where investigation/reporting time-frames will not otherwise be able to accommodate implementation of the new documents?”		
I-11	Retroactivity	“Are sites that are currently in the Site Registry (but inactive) exempt or grandfathered from notifying the Director within 60 days of identifying a high risk condition during site investigation?”		See comment in I-10. Sites are in the registry for many reasons. Some would likely be identified, others not.
I-12	Appealable decision	Will the decision on high risk classification be an appealable decision of the Director?		This is a legal question beyond the scope of these responses.
I-13	Public notice (Site Registry)	Where will the classification of a site as high risk be recorded (e.g., Site Registry? another database?) and will reports and documents relating to the investigations and decision process be available? “Will there be a process for the ministry to deal with inquiries or will inquiries be referred to the property owner or his/her consultant / agent?”		The status of site risk classifications would be identified by notation in the Site Registry. Information requests would be processed the same as they are now.

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Summary of Key Stakeholder Comments and Responses

July 14, 2009

Issue #	Issue/ Section	Question/Comment	Stakeholder Recommendation(s)	Ministry Response(s)
A – Exposure Pathways				
A-1	Exposure Pathways	The aquatic life exposure questions (AW-2 and AW-3 questions) are somewhat unclear and it would help if additional information /instructions were provided		The ministry will be pleased to consider developing guidance in applying the Protocol if we receive substantive comments indicating such a need.
A-2	Groundwater transport	Consideration of groundwater transport, as proposed, may not be practical	The Science Advisory Board for Contaminated Sites in B.C. (SABCS) proposed several procedures to predict whether a dissolved contaminant would reach the receiving environment at a concentration of the SABCS proposed high priority limits.	Please refer to Footnotes 12 and 13 of the Exposure Pathway Questionnaire for clarification of groundwater investigation and delineation requirements near a receptor.
A-3	Groundwater exposure pathway	Aquatic life in exposure zone resulted in 9 sites being classified as High Risk.	Consider limiting this exposure to surface water only	Upper cap concentrations for aquatic life have been increased by a factor of 10 and this would reduce the proportion of sites classified as high risk. Please note that groundwater is still considered an exposure pathway.
A-4	Off-site migration and human health exposure pathway	Clarification should also be made for the offsite land upper cap concentrations for soil media, specifically regarding depth. It does not seem reasonable that if offsite soil concentrations exceed upper cap concentrations, but the soil impacts are situated for example 20 metres below ground surface that the site be classified a "high risk"		UC concentrations above human health limits alone are not considered high risk conditions unless a complete exposure pathway is present for both onsite and offsite situations. Also the draft Protocol has been amended so that a source site would not be classified as a high risk site solely because it was the origin of high risk contamination offsite.
A-5	Soil exposure pathway	Soil upper cap exceedances - the 1 m depth seems too low. Is it not possible to have some risk at a site immediately below 1 m, if upper cap soil concentrations are exceeded?		The 1 m depth was an administrative rather than a scientific decision to prevent the over classification of sites as high risk.
B – Site Risk classification Report				
B-1	Site risk classification	Section V of the site risk classification form should allow for a "don't know" or "unknown" response. In cases where only preliminary risk classification has been conducted, many of these answers would not be		A "likely" check box has been added in the questions where there is the potential for missing information. Note that this section has been renumbered IX.

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Summary of Key Stakeholder Comments and Responses

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Issue #	Issue/ Section	Question/Comment	Stakeholder Recommendation(s)	Ministry Response(s)
		known.		
C - Reporting				
C-1	Notification triggers	We are concerned with the requirement to complete a site risk classification (SRC) report anytime a notice of independent remediation is filed with the Ministry.		Well over 50% of the sites remediated in the province are cleaned up by independent remediation. Land Remediation staff have been required in our ministry service plan to focus on the remediation of high risk sites. Without information on the site risk classification of sites undergoing independent remediation the Section would be unable to fulfill its mandate. Accordingly, we are proposing that the requirement to submit a Notification of Independent Remediation be considered a trigger for reporting a Site Risk Classification Report.
C-2	Table 3 footnote 7	I am not sure what is meant in Footnote 7		This footnote has been removed from draft 8 of the Protocol.
D – Upper cap concentrations				
D-1	Upper cap concentrations	The upper cap concentrations for groundwater are such that a contaminant in groundwater is somehow considered more hazardous than a contaminant in a point source discharge.		Upper cap concentrations have been increased to 10 x Schedule 6 aquatic life standards at 10 m from the receiving environment (100 x ambient water quality guidelines). The upper cap concentrations are provided in Protocol 11 “Upper Cap Concentrations for Substances Listed in the Contaminated Sites Regulation”.
D-2	Aesthetic criteria	Should aesthetic criteria for DW be included in UCC limits (e.g. Fe, Mn)?		Upper cap concentrations for iron, manganese and aluminum in drinking water (aesthetic standards) have been eliminated in Protocol 11.
D-3	Aesthetic criteria	Offsite ground or surface water > Human UCC if Drinking Water applies, resulted in 11 sites being classified as High Risk. Some of these were due to exceedances of Fe or Mn.		Upper cap concentrations for iron, manganese and aluminum in drinking water (aesthetic standards) have been eliminated in Protocol 11.
D-4	Vapours	The analysis excluded the vapour triggers, as these are still unclear until Schedule 11 and associated technical guidance (with attenuation factors) are published. However, we are concerned that many sites will be unnecessarily labeled as high risk as a result of this indicator.		Upper cap concentrations for vapours have been increased considerably (100x) in Protocol 11 for many substances. This would decrease the proportion of sites identified as high risk.

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Issue #	Issue/ Section	Question/Comment	Stakeholder Recommendation(s)	Ministry Response(s)
E - Groundwater				
E-1	Groundwater releases	The approach for controlling groundwater releases to a water body is inconsistent with previous ministry policies for controlling point source releases.		Upper cap concentrations have been increased to 10 x Schedule 6 aquatic life standards at 10 m from the receiving environment (100 x ambient water quality guidelines). The upper cap concentrations are provided in Protocol 11 "Upper Cap Concentrations for Substances Listed in the Contaminated Sites Regulation".
F- General				
F-1	Grace period	If a site qualifies for P6 submission now but if the draft P12 doc has been finalized during the P6 review period (sometimes months), and at the time of the submission the site no longer qualifies for P6, then the consulting efforts will have been wasted.	I would suggest a six month to one year phase in or grace period. The benefit of such a policy is that the many owners will not be dissuaded from carrying out work presently.	We expect to establish a 6 month period between the release date of Protocol 12 and the date when it comes into effect.
F-2	High risk	Still a lot of concern about the terms "High Risk site" and "Non High Risk site".	Obviously our group would prefer names like "Ministry Process Site" and "AP Site" or something less alarming	The term "high risk site" is defined in EMA and the ministry does not have authority to change this terminology.
G- NAPL				
G-1	DNAPL presence	Under the definition for "DNAPL", I would change the word "theoretical" to "effective".		The ministry evaluated this proposed change in definitions, however found it to be too conservative so the recommendation was not implemented. The presence of DNAPL is now explained in Protocol 16 "Determining the Presence and Mobility of Nonaqueous Phase Liquids and Odorous Substances"
G-2	LNAPL definition	Is the term "free-phase LNAPL" the best to use for the conditions where saturation > residual? After all, even residual LNAPL is in its separate phase.	Delaware uses the term "free LNAPL" which I find preferable and less confusing.	Section 3.1 of draft Protocol 16 amends the previous terminology and refers to free phase liquids in the context of defining when LNAPL and DNAPL are present.
G-3	Mobile LNAPL definition	Draft 7 uses the term "mobile LNAPL", which is different from the terminology in the MOE NAPL guidance		A definition of mobile LNAPL is now provided in Protocol 16 "Determining the Presence and Mobility of Nonaqueous Phase Liquids and Odorous Substances" and is consistent with guidance

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Issue #	Issue/ Section	Question/Comment	Stakeholder Recommendation(s)	Ministry Response(s)
				prepared by Golder Associates.
G-4	Mobile LNAPL thicknesses	Rationale and Guidance for mobile LNAPL thicknesses and sampling		Please refer to guidance from Golder Associates for rationale and guidance on LNAPL thicknesses.
G-5	Mobile LNAPL definition		Clarify that V _{Hw} and E _{Hw} are not indicators of mobile LNAPL	This clarification will be included in Protocol 16 "Determining the Presence and Mobility of Nonaqueous Phase Liquids and Odorous Substances"
G-6	Mobile NAPL	<p>1) It is unclear the way the definition of mobile DNAPL and mobile LNAPL are written in the document</p> <p>2) Additionally, there should also be the option available to perform higher level studies of the potential occurrence of mobile LNAPL/DNAPL at a site. If it can be shown through such higher level work that the LNAPL/DNAPL is not mobile, the site should not be characterized as "high risk"</p>		<p>The definitions of mobile NAPL have been revised and are included in Protocol 16</p> <p>Please refer to our answer in G-7 for our response to comment 2.</p>
G-7	Mobile NAPL and screening indicators	<p>If higher level site specific work has been completed to assess LNAPL/DNAPL mobility, the results should be considered such that a site is not prematurely classified as "High Risk". We consider it more appropriate that if mobile LNAPL or DNAPL is identified according to their respective definitions that they be considered "Screening Indicators" rather than "Default Indicators". Then more detailed site work must be completed to either confirm or refute the presence of mobile NAPL. If the NAPL is determined to be mobile shouldn't exposure pathways for the mobile NAPL be considered prior to defining the site as high risk?</p> <p>We are concerned that currently the presence of mobile NAPL is a "de facto" indicator of high risk which we do not consider warranted.</p>		<p>The terms "screening and default" indicators have been removed from Protocol 12 draft 8.</p> <p>Mobile NAPL is considered a key criterion for classifying a site as high risk. Mobile NAPL is serious cause of long-term subsurface degradation and is usually a primary focus of remediation effort and cost. Mobile NAPL should be identified and addressed quickly.</p> <p>Mobile NAPL remains as a condition in determining high risk sites. However, if mobile LNAPL is the sole reason for the site's high risk classification it could be addressed using routine recovery methods, and would be a candidate for site risk reclassification.</p>