



Ministry of  
Environment

# ***Protocol 12*** ***Site Risk Classification System***

**Stakeholder Update and Consultation Session**

May 21, 2009

Liliana Jerade

## ***A little bit of Background***

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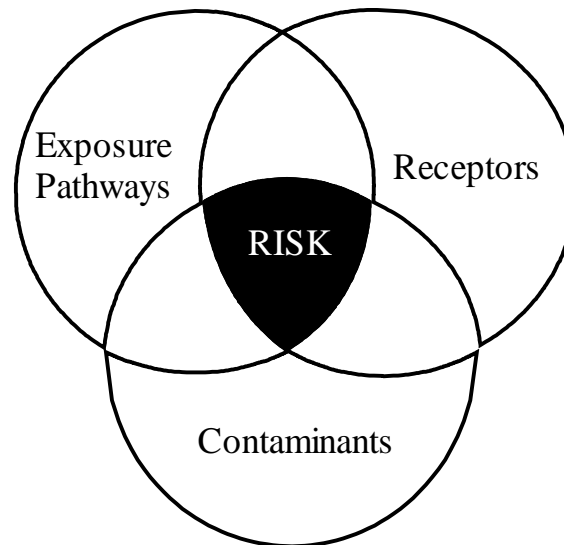
- Protocol 12's first draft was released for public comment in December 2006.
- Protocol 12's second draft was released in July 2008 with input provided from the stakeholder advisory committee represented by CPPI, CAPP, CSAP society, MOE, UBCM, and MAL.
- Current version of Protocol 12 is the third draft and will be circulated for comments to the stakeholder advisory committee .



# Protocol Purpose

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To classify sites where contaminants occur at concentrations and under conditions that pose high risks to the environment or human health.



## ***Protocol Objectives***

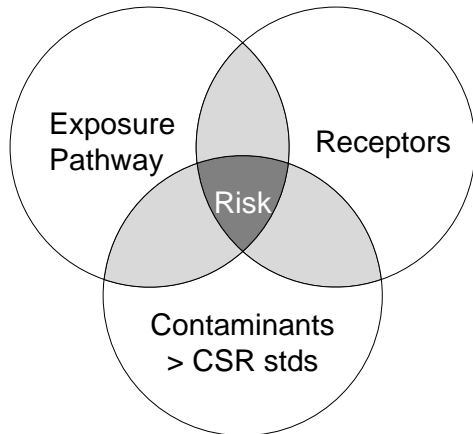
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- Ensure appropriate, timely investigation & remediation of high risk sites.
- Focus ministry regulatory effort on high risk sites (estimated 10% of sites).
- Clarify the scope of regulatory review that may be performed by Approved Professionals and the Oil and Gas Commission (OGC).

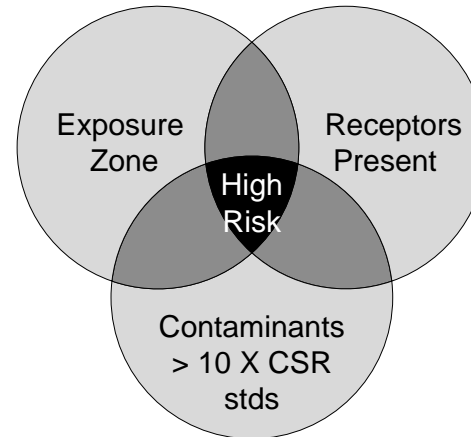
**This protocol focuses on Classification, Reclassification and Reporting for High Risk Sites**

# ***Risk Classification Differences***

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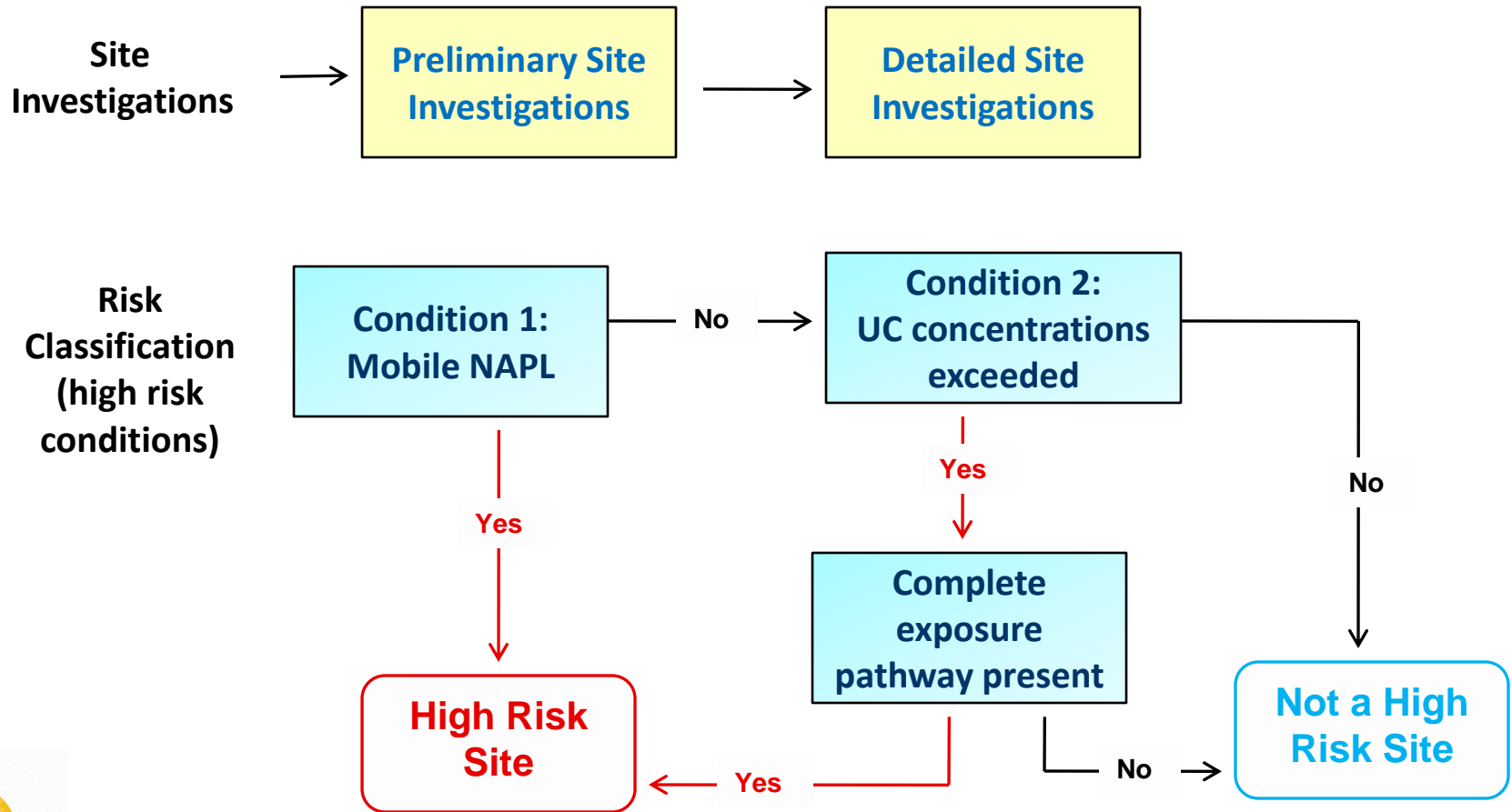


**Risk assessment under CSR**



**Risk Classification under Protocol 12**

# Process



## ***Condition 1– Mobile LNAPL***

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Mobile LNAPL is considered present when:

1. Product thickness in one or more monitoring wells increases over time,
2. Product plume advances over time, or
3. Product thickness exceeds exceeds those of new mobile LNAPL protocol - matrix based on soil composition

## ***Condition 1 - Mobile DNAPL***

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Mobile DNAPL is considered present when:

1. Product thickness in monitoring wells is  $>2$  mm.
2. Product plume advances over time.
3. Individual DNAPL substances are detected in water at  $>10\%$  of their theoretical solubility limit.



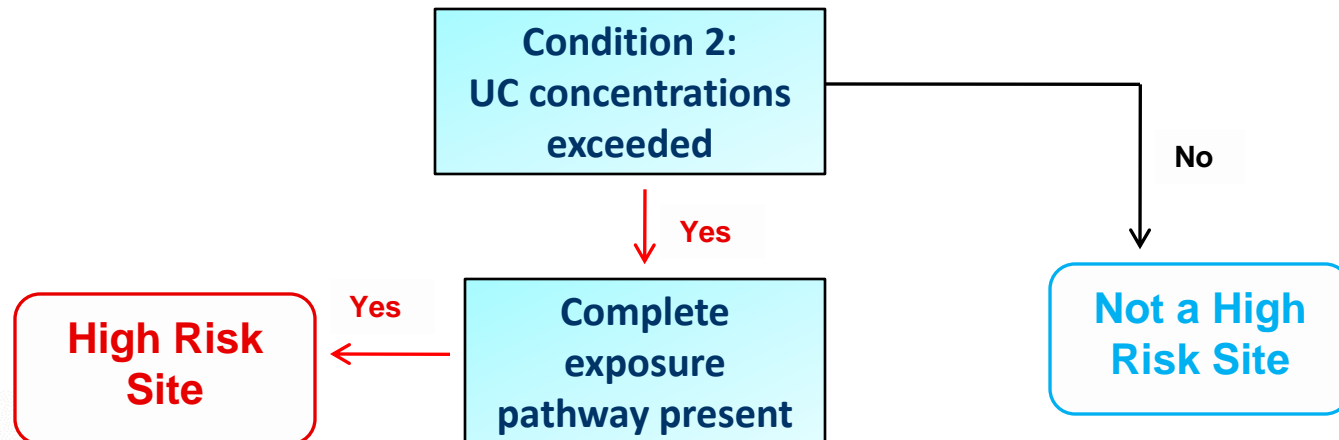
Mobile NAPL is defined in the Ministry's  
Protocol 16 (draft):

“Determining the Presence of and Mobility of  
Nonaqueous Phase Liquids and Odorous  
Substances”

## ***Condition 2 – Potential High risk exposure***

For a site to qualify as high risk under Condition 2, it must have:

1. Presence of Upper Cap concentrations
2. Complete Exposure Pathway



# Upper Cap Concentrations

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Media and Pathway	CSR Stds/Criteria	UC Multiplier
<b>Human Health Protection</b>		
Soil	Schedule 4 Schedules 5 & 10	10
Vapour	Air Conc. Criteria	100
Water	Schedule 6 Schedule 10	1
<b>Environmental Health Protection</b>		
Terrestrial soil	Schedule 4 Schedule 5	10
Aquatic life water	Schedule 6 Schedule 10	10
Livestock & Irrigation water	Schedule 6	10
Aquatic life sediment	Schedule 9	10

# ***Upper Cap Concentrations***

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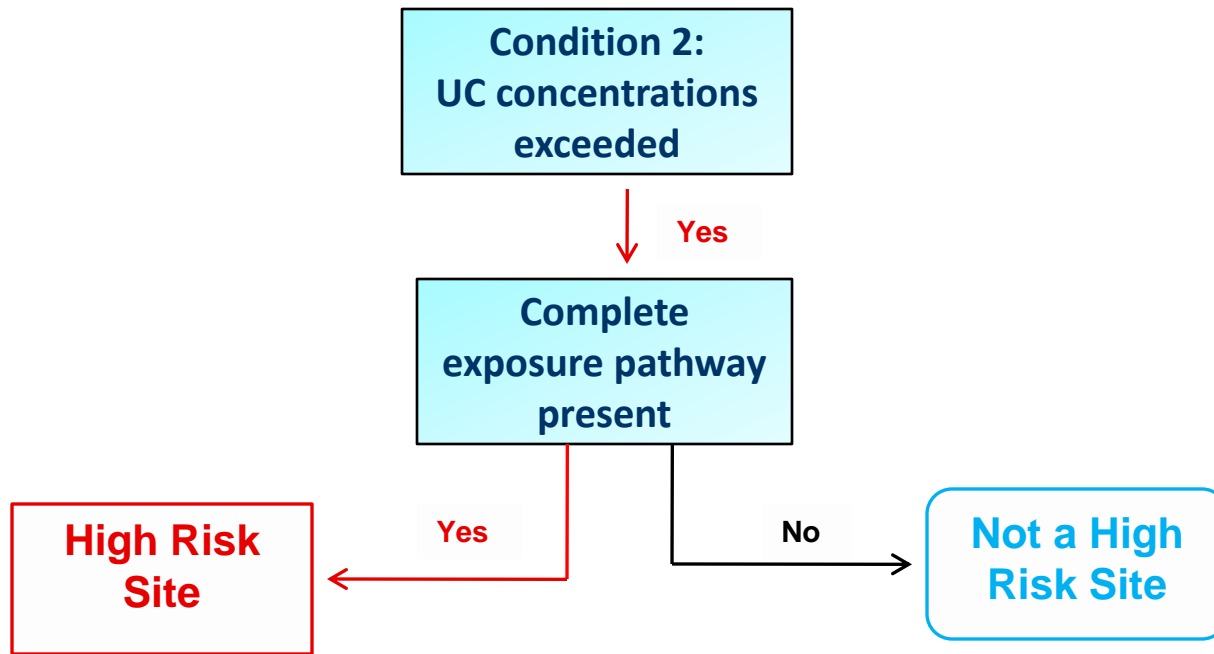
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Upper Cap concentrations for soil, water,  
sediment and vapour are established in  
Protocol 11 (draft)

“Upper Cap Concentrations for substances Listed  
in the Contaminated Sites Regulation”

## ***Condition 2 – Potential High risk exposure***

1. Presence of Upper Cap concentrations
2. Complete Exposure Pathway Present



# ***Exposure Pathway Indicators***

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## Eight Primary Exposure Pathways:

### Human Health

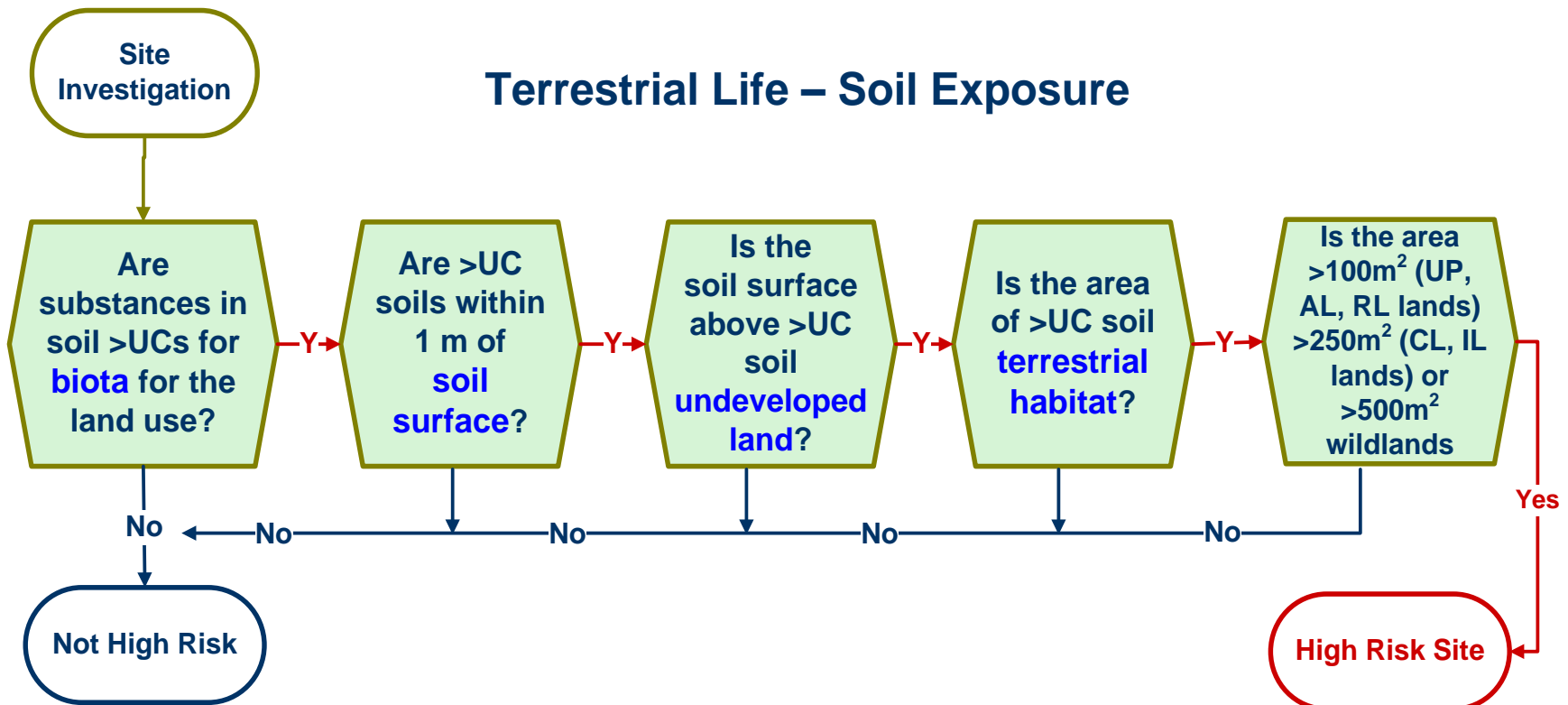
1. Soil
2. Soil vapour
3. Water (ground and surface)

### Environmental Health

4. Soil – terrestrial life
5. Water – aquatic life (ground and surface)
6. Sediment – aquatic life
7. Water – livestock (ground and surface)
8. Water – irrigation (ground and surface)

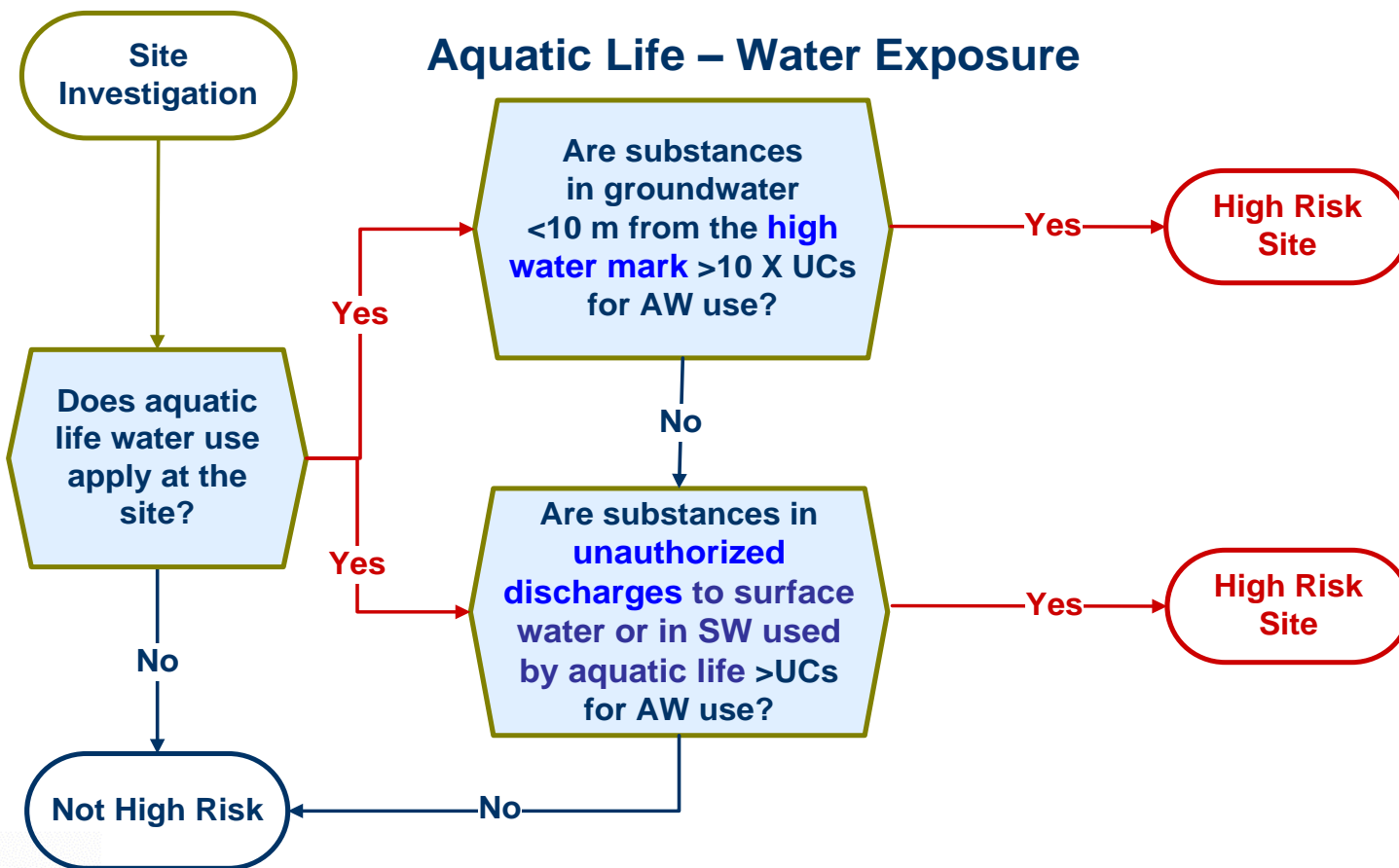
# Exposure Pathway Indicators

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# Exposure Pathway Indicators

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# ***High Risk Classification***

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## ***Additional Considerations***

- Contaminated sites where High Risk Site Conditions 1 and/or 2 have not been indentified are *not high risk sites*
- Site risk classifications are based on current land use
- Sites at which high risk site conditions are remediated using in situ risk management will remain classified as *high risk sites*
- High risk sites are not eligible for review by Approved Professionals (Protocol 6).
- Sites previously classified high risk are eligible for Contaminated Sites Approved Professionals (CSAP) review if Director's requirements have been satisfied and a Director's decision of "not high risk" has been obtained.

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# *Reporting*

**Table 1: Notification Requirements**

<b>Notification Trigger</b>	<b>Not High Risk Site</b>	<b>High Risk Site</b>
<b>Notification of initiation of independent remediation</b>	<ul style="list-style-type: none"> <li>• <b>Site Risk Classification Report</b></li> </ul>	<b>Refer to Table 2</b>
<b>Site investigation report ordered or required by Director</b>		<ul style="list-style-type: none"> <li>• <b>Site Risk Classification Report</b></li> <li>• <b>Exposure Pathway Questionnaire (if UC concentrations are exceeded)</b></li> <li>• <b>Summary of Site Condition</b></li> </ul>
<b>Notification of Offsite Migration</b>		<ul style="list-style-type: none"> <li>• <b>Site Risk Classification Report</b></li> <li>• <b>Exposure Pathway Questionnaire (if UC concentrations are exceeded)</b></li> <li>• <b>Summary of Site Condition</b></li> </ul>
<b>Service application – Approved Professional review</b>		<b>Not applicable</b>
<b>Service application – ministry review</b>	<b>Not applicable</b>	<ul style="list-style-type: none"> <li>• <b>Site Risk Classification Report</b></li> <li>• <b>Exposure Pathway Questionnaire (if UC concentrations are exceeded)</b></li> </ul>
<b>Site Risk Classification Report for site associated with potential or actual high risk offsite migration</b>	<ul style="list-style-type: none"> <li>• <b>Site Risk Classification Report</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Site Risk Classification Report</b></li> <li>• <b>Exposure Pathway Questionnaire (if UC concentrations are exceeded)</b></li> <li>• <b>Summary of Site Condition</b></li> </ul>
<b>Site Risk Classification Report</b>		<ul style="list-style-type: none"> <li>• <b>Site Risk Classification Report</b></li> <li>• <b>Exposure Pathway Questionnaire (if UC concentrations are exceeded)</b></li> <li>• <b>Summary of Site Condition</b></li> </ul>

## ***Table 2: Independent Remediation – High Risk Sites***

<b>Type of Requirement</b>	<b>Requirements for remediation of high risk conditions within 90 days</b>	<b>Requirements for remediation of high risk conditions taking more than 90 days</b>
<b>Reporting at initiation of independent remediation of high risk conditions</b>	<ul style="list-style-type: none"> <li>• Confirmation that remediation of high risk conditions will occur within 90 days</li> <li>• Site Risk Classification Report</li> <li>• Exposure Pathway Questionnaire</li> </ul>	<ul style="list-style-type: none"> <li>• Site Risk Classification Report</li> <li>• Exposure Pathway Questionnaire</li> <li>• Summary of remedial methods and schedule for remediation</li> <li>• Summary of Site Condition signed by Approved Professional</li> </ul>
<b>Interim reporting</b>	<b>Not required</b>	<ul style="list-style-type: none"> <li>• Progress reports as required by the Director</li> </ul>
<b>Reporting at completion of remediation of high risk conditions</b>	<ul style="list-style-type: none"> <li>• Site Risk Classification Report confirming site is no longer high risk</li> </ul>	<ul style="list-style-type: none"> <li>• Site Risk Classification Report confirming site is no longer high risk</li> <li>• Summary of Site Condition signed by an Approved Professional</li> </ul>

## **Reporting for off-site migration**

If migration from a site is present or likely present, a separate site risk classification report must be submitted to the Director for each offsite parcel which would be, or would likely be classified as high risk.

## **Reporting for part site remediation**

Where a Notification of Independent Remediation has been submitted for a part of a large site, the attached site risk classification report must indicate the presence of all parts of the site that are potentially or known to be high risk and provide a general schedule for remediating all high risk parts of the site.

Once all high risk site conditions have been removed or otherwise satisfactorily addressed, a site can be reclassified as not high risk.

Reporting requirements for obtaining a reclassification decision are as follows:

- A site risk classification report confirming that no high risk conditions remain onsite;
- A Summary of Site Condition where remedial actions to address all high risk site conditions exceeded 90 calendar days in duration; and
- Approved Professional signoff of the above reports.

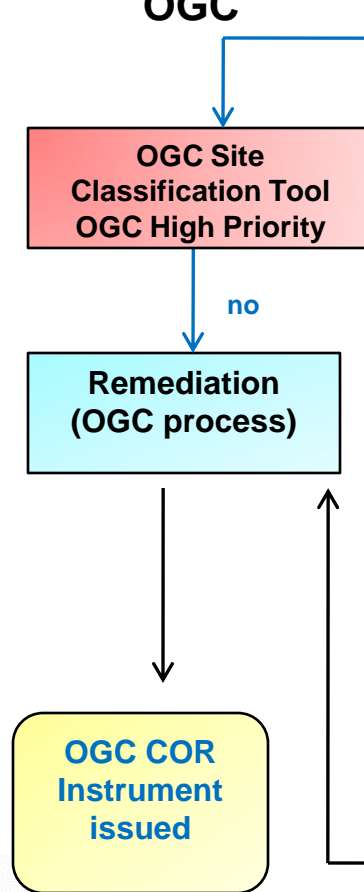
The Ministry of Environment has worked closely with the Oil and Gas Commission to try to make the **“OGC Site Classification tool”** and **Protocol 12** fit together

# Comparing the OGC and MOE Process

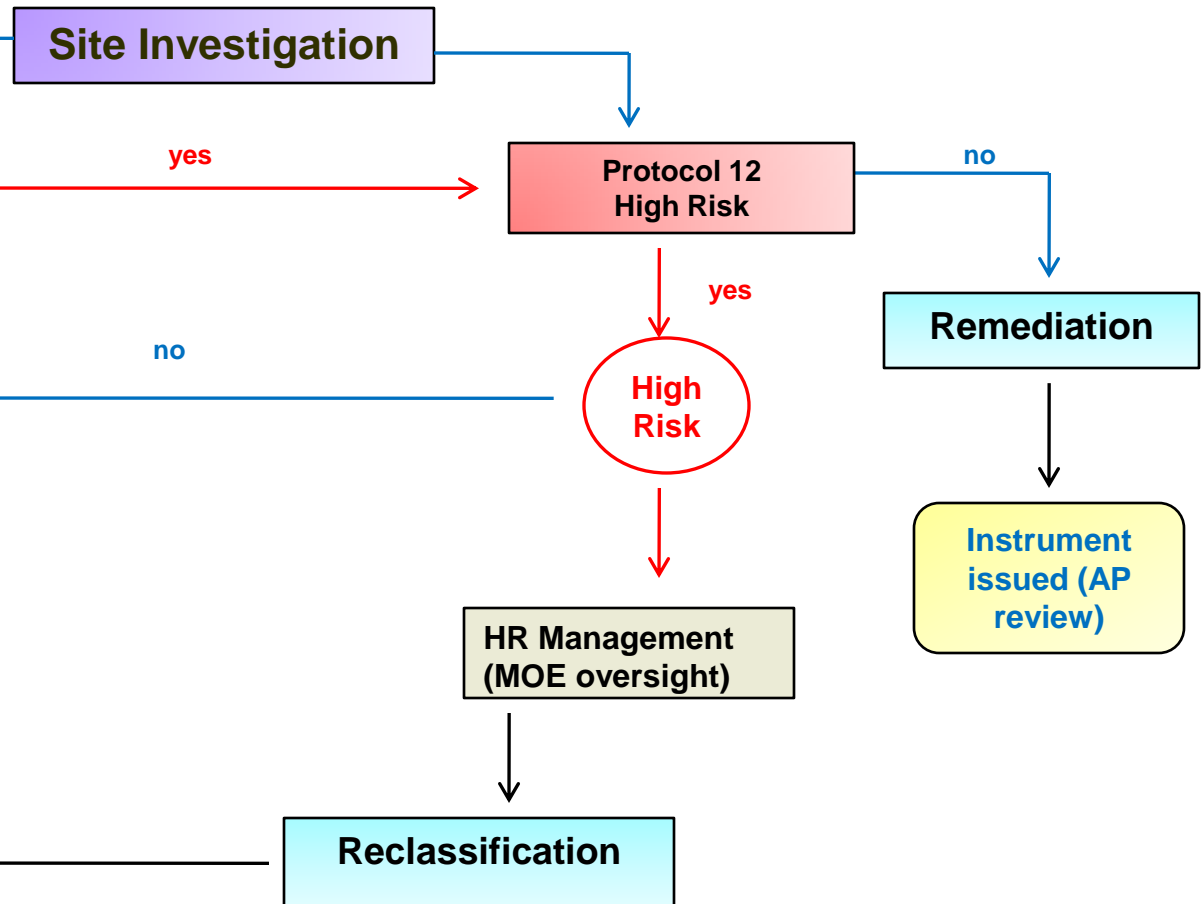
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## Independent Remediation

OGC



## AP / MOE Overseen Remediation



## *Next Steps*

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- Circulate latest draft to the stakeholder advisory committee for review
- Release draft on internet for 6 weeks public review
- Before the end of 2009, release Protocol 12 in final form
- Protocol 12 will come in to effect 6 months after release date

***Thank you!!!***

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*Questions*

