

# Ground Water Assessment Plan



## **GROUNDWATER ASSESSMENT PLAN**

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## **Plan Maintenance**

### **Responsibility**

The accountability for the Groundwater Assessment Plan development and maintenance is a combined effort by the Trans Mountain Manager, Emergency Management and Manager, Environmental Services. This accountability is such:

- The document is owned by the Emergency Management Program as a supplemental plan to the Emergency Response Plan (ERP), however it is developed and maintained in cooperation with the Environment Protection Program who is responsible for the implementation of the Groundwater Assessment Plan during an emergency.
- The administrative management for the Groundwater Assessment Plan will be administered by the Emergency Management Program.

### **Plan Revisions**

All requests for change must be made through the Manager, Emergency Management using the Revision Request Form located in this section of the manual.

### **Revisions after Release or Exercise**

In the event that Trans Mountain experiences a release (worst case or otherwise), or conducts an exercise or training session, the effectiveness of the ERP and its supplemental plans will be evaluated and updated as necessary.

### **Changes in Operating Conditions**

If a new or different operating condition develops, or if new information which would substantially affect the implementation of the ERP and its supplemental plans is identified, then Trans Mountain will modify impacted Plans to address such changes.

## Revision Request Form

Requested by:	Date:
Dept/ Agency:	Phone No.:
Revision Type:      ___ Addition                      ___ Deletion                      ___ Correction	
Manual Section:	Page:
Revision (attach separate sheet if necessary):	
Signature of Requestor:	
Send to: Manager, Emergency Management Trans Mountain Corp 2700-300 - 5 <sup>th</sup> Avenue S.W. Calgary, AB T2P 5J2 Canada emergency_management@Transmountain.com	

To be completed by Manager, Emergency Management	
Date Received:	Comments:
Date Reviewed:	
Issued as Revision: Y/ N	
If No, reason for Rejection:	
Signature: Manager, Emergency Management	

## Control Sheet

<b>Revision Number</b>	<b>Date of Revision</b>	<b>Change(s)</b>	<b>Name</b>
1	May 2024	New Manual Issued	K. Malinoski
2			
3			
4			
5			
6			

## **1. INTRODUCTION**

The protection of groundwater in an emergency is a priority for Trans Mountain. Assessment, monitoring, and mitigation of impacts during the response to a release is the main focus of the Incident Management Team (IMT), which will be established, and located in, the Incident Command Post (ICP). The timely assessment of the hydrogeologic conditions within the vicinity of an emergency situation informs the IMT of the potential risk to groundwater and allows for the development of appropriate mitigations, as required.

The fundamental concepts of the Groundwater Assessment Plan are initiated upon declaration of an emergency through the Trans Mountain Alert System (TAS) process and are maintained until the development of the incident specific groundwater mitigation plan is completed. The incident specific groundwater mitigation plan evolves from the Groundwater Assessment Plan and will be scaled according to the magnitude of the incident.

The Groundwater Assessment Plan and incident specific groundwater mitigation plan will function as a “living documents” in which information collected during assessment and monitoring will be used to continuously update the response strategies and monitor their effectiveness to achieve the objectives as laid out in the Incident Action Plan (IAP).

### **1.1. Scope**

In the event of an emergency that impacts, or potentially could impact groundwater, the Groundwater Assessment Plan will be activated in conjunction with the appropriate Geographic Response Plan (GRP).

The Groundwater Assessment Plan is considered a subset of Trans Mountain’s ERP(s) and has been developed to align with the Incident Command System (ICS) used in conjunction with the applicable district GRP.

### **1.2. Objectives**

The objectives of the Groundwater Assessment Plan are to:

- 1) Assess the potential for impact to groundwater resulting from a release
- 2) Evaluate and monitor groundwater quality, if required
- 3) Evaluate and monitor potential risk to groundwater receptors, if required
- 4) Facilitate development of response strategies to protect groundwater and mitigate the impacts of the release
- 5) Facilitate assessment of the effectiveness of the response strategies used for the release

### **1.3. Implementation of the Groundwater Assessment Plan**

Activation of the Trans Mountain ERP and GRP will occur when an emergency is declared. Once an emergency has been declared, and a need identified for the assessment of impact to groundwater, the Groundwater Assessment Plan will be initiated.

The Groundwater Assessment Plan will be used in conjunction with other appropriate plans for the response phase of the incident until the incident specific groundwater mitigation plan is developed. These plans will be used during the transition from a response phase to the remediation phase as determined by Unified Command.

Implementation of the Groundwater Assessment Plan is a function of the Planning Section’s Environment Unit (EU).

## **2. ROLES AND RESPONSIBILITIES**

### **2.1. Environmental Unit Lead**

The Environmental Unit Lead (EUL) is responsible for environmental matters associated with the response including groundwater protection. The EUL is responsible for the implementation of the Groundwater Assessment Plan and communicating results and recommendations to the Planning Section Chief and subsequently Unified Command. Specific duties for this role can be found in Section 8.7 of the Trans Mountain ICS Guide.

### **2.2. Sampling Technical Specialist**

The Sampling Technical Specialist is part of the EU and is responsible for the development and implementation of the incident specific groundwater mitigation plan and coordination of any required mitigation measures including the Sampling and Monitoring Team.

This role also includes coordinating and collaborating with regulatory agencies and other stakeholders participating in the response, communicating the results of the sampling and monitoring activities to Unified Command via the EUL and Planning Section Chief, and identifying additional resource requirements including other specialist or subject matter experts (e.g., hydrogeologists) as necessary. Specific duties for this role can be found in Section 8.7.6.5 of the Trans Mountain's ICS Guide.

### **2.3. Sampling and Monitoring Team**

The Sampling and Monitoring Team is a part of the EU, reporting to the Sampling Technical Specialist. Third party contractors have been pre-identified to staff the Sampling and Monitoring Team, based on technical knowledge, relevant experience, and response times. Upon activation of the incident specific groundwater mitigation plan and in accordance with the Sampling and Monitoring Plan, the Sampling and Monitoring Team will mobilize to the location of the release and begin sampling and monitoring as soon as possible. Contractors are listed in the Incident Notification Guideline.

### **3. Applicable Reference Documents**

The following reference documents should be used to guide the assessment of groundwater impact and the development of the incident specific groundwater mitigation plan:

- *Canadian Council of Ministers of the Environment (CCME), Protocols Manual for Water Quality Sampling in Canada, 2011*
- *CCME, Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment, 2016*
- *United States Environmental Protection Agency, Guidance on Choosing a Sampling Design for Environmental Data Collection, 2002*
- *Canada Energy Regulator, Trans Mountain Expansion Project (TMEP), Condition 130*
- *British Columbia Environmental Assessment Office TMEP, Condition 26*
- *Health Canada, Canadian Drinking Water Quality Guidelines*
- *Alberta Tier 1 & 2 Soil and Groundwater Remediation Guidelines*
- *British Columbia Contaminated Site Regulation*
- *British Columbia Groundwater Protection Regulation*
- *Canada Energy Regulator Remediation Process Guide*

## **4. GROUNDWATER ASSESSMENT STRATEGY**

Once the ICP is established, the Sampling Technical Specialist, along with potentially affected Indigenous Communities, and local, regional, provincial, or federal agencies with jurisdiction present in the EU, will review the hydrogeological conditions associated with the location of the release and the presence of groundwater receptors to evaluate the potential for impact to groundwater and subsequent potential impacts to groundwater receptors. If groundwater, and/or its receptors, are deemed to be at risk of impact, an incident specific groundwater mitigation plan will be developed for review and approval by Unified Command. Once approved, the implementation of this incident specific groundwater mitigation plan will be the responsibility of the EUL and Sampling Technical Specialist including coordination of mitigation measures such as monitoring and sampling.

The incident specific groundwater mitigation plan will specify the most appropriate monitoring and protection strategies for the release and will identify which criteria, guidelines or standards are applicable to the release based on jurisdiction, appropriate land use and potential receptors. The protection strategies will be updated, as necessary, throughout the response.

### **4.1. Identification of At-Risk Aquifers**

An evaluation to identify at-risk aquifer(s) will be completed by way of a hydrogeological assessment involving a desktop review of the potential impact of the release through transport of product and dissolved hydrocarbon constituents into groundwater and subsequently to nearby receptors, including water wells and surface water bodies. When completing the hydrogeological assessment, a review of the following information sources is completed:

- The initial incident report (available in the ICS 201)
- Geographic Response Plans (GRPs)
- Response mapping (obtain from the Situation Unit)
- Release trajectory
- Aerial imagery and topographic maps
- Provincial aquifer mapping
- Provincial aquifer vulnerability classifications
- Provincial water use license registries
- TM Groundwater Monitoring Program (CER TMEP Condition 130)
- TM Enviro GIS database (field verified water wells, aquifer vulnerability mapping)

The review will be completed by a hydrogeologist or qualified environmental professional who will assess available information regarding the depth to the groundwater table, depth to bedrock, soil type and soil unit thicknesses. This information will be used to determine the potential risk to groundwater based on the potential pathway the release could travel to reach groundwater. If the hydrogeological assessment indicates that there is limited potential for impact to groundwater, no further assessment is required, and an incident specific groundwater mitigation plan will not be required. If the hydrogeological assessment indicates that there is potential for impact to groundwater, further assessment of potential groundwater receptors is required.

If the GRP indicates there is a vulnerable aquifer present as defined by TM's Groundwater Monitoring Program, an incident specific groundwater mitigation plan will be developed.

### **4.2. Identification of Receptors**

When a potential risk to groundwater has been identified, an evaluation of the presence of potential groundwater receptors will be completed. Potential groundwater receptors include water wells, points

of diversion, and surface water bodies. Potential receptors within 1 km of the incident are identified through review of provincial water use databases, consultation with provincial and local agencies as well as with local communities. If no receptors are identified within 1 km of the incident, no further steps in the groundwater assessment or development of an incident specific groundwater mitigation plan are required. If receptors are identified, further groundwater assessment will be required to inform development of an incident specific groundwater mitigation plan. Once that is completed the next step is to determine whether any of the identified receptors lie downgradient of the incident.

### **4.3. Determination of Risk to Receptors**

Once receptors have been identified, further assessment will be completed to determine the potential risk to the receptors posed by the release. Hydrogeologists will consider many factors including the distance between the release and the receptors, the potential for the release impacts to travel in the direction of the receptors, the time it will take for the release to reach the receptors, the anticipated contaminant concentrations that can be expected at the receptor's location, etc. Once these factors have been examined, they will be used to determine appropriate mitigation strategies to be incorporated into the development of the incident specific groundwater mitigation plan.

## **5. INCIDENT SPECIFIC GROUNDWATER MITIGATION PLAN**

The incident specific groundwater mitigation plan will present the groundwater receptors and associated mitigation strategies to ensure their protection. The incident specific groundwater mitigation plan often includes a strategy for groundwater monitoring and sampling as it is the most effective means of identifying impacts to groundwater and receptors. Groundwater monitoring and sampling will target existing means to obtain groundwater samples such as sampling domestic or irrigation wells, existing monitoring wells, springs, etc. Groundwater monitoring wells may need to be installed to facilitate groundwater monitoring and sampling. If impacts to groundwater are identified through groundwater monitoring and sampling, a remedial action plan will be developed in accordance with the [CER's Remediation Process Guide](#). Remedial strategies typically include pump and treat systems or in-situ remediation options which target enhancement of naturally occurring bioremediation in the groundwater. Where receptors are likely to be impacted or are found to be impacted, alternate domestic water supplies will be provided to ensure the safety of the receptor.

### **5.1. Development of Public Safety Measures**

The EU will work with local health authorities and other regulatory agencies in making public safety recommendations regarding groundwater quality by providing sampling and monitoring data and recommendations from the Sampling Technical Specialist. If required, public safety recommendations will be provided to the Planning Section Chief to bring forward to Unified Command.

**Note:**

- 1) Trans Mountain does not have the authority to independently issue public safety orders (i.e., water use restrictions). Public safety orders will be issued by the appropriate government authority under the advisement of Unified Command.
- 2) Public safety authorities may independently issue public safety orders based on their own interpretation of the sampling and monitoring results.

Protocols and supplemental strategies, including the Liaison Officer community and agency briefings and the Trans Mountain Crisis Communications Plan, will be utilized to distribute the messaging, in coordination and collaboration, with participating communities, jurisdictions and regulatory bodies.

### **5.2. Reporting Requirements**

Groundwater sampling result updates will be produced by the third-party contractor summarizing the monitoring and sampling results. These updates will be submitted to the Sampling Technical Specialist as the analytical data is received and interpreted.

Updates regarding the groundwater sampling and monitoring data will be communicated to the Planning Section Chief for inclusion in situational updates provided to Unified Command. The frequency of the sampling and monitoring updates will be determined by the EUL.

## **6. GROUNDWATER ASSESSMENT PLAN DEACTIVATION**

Sampling and monitoring will continue until a consensus is determined between the Environment Unit, Regulators, and impacted communities, that the agreed upon end points have been achieved.

In cases where an aquifer has been impacted, it is likely that sampling activities will continue beyond the response phase and into the subsequent remediation phase.

## **7. RECORDS AND RECORD MAINTENANCE**

All related incident specific groundwater mitigation plan will be maintained in the incident file as outlined in the ERP.