



THE EXPOSURE TRACKING MODEL

April 2015

HISTORY / BACKGROUND

The Exposure Tracking Model (ETM) is an intra-agency web-based application developed by the Department of Environmental Conservation (DEC) Contaminated Sites Program (CSP) as an internal tool to evaluate and track risk reduction at contaminated sites and to prioritize staff workload. The CSP implemented the ETM in the spring of 2007 as a replacement for the Alaska Hazard Ranking Model (AHRM) used previously to conduct a preliminary evaluation, rank, and prioritize contaminated sites. The AHRM was intended to be a one-time ranking model, making reprioritization difficult. The ETM evaluates potential exposure of receptors to contaminants through an analysis of exposure pathways.

PURPOSE / INTENT

The CSP uses the ETM to identify priority exposure pathways and track the ongoing decision making process used to evaluate and prioritize contaminated sites. Progress at sites can be tracked over time so that the prioritization can be updated as assessment and cleanup work are completed.

As a CSP management tool the ETM:

- Acts as a standardized mechanism for CSP staff to evaluate potential exposure of receptors to contaminants in accordance with applicable laws, regulations, guidance, and policy;
- Identifies potentially complete exposure pathways at contaminated sites through a pathway assessment;
- Determines potential exposure of human and ecological receptors to hazardous substances for each pathway identified as complete, using both quantitative and qualitative decision points;
- Provides a platform for intra-agency deliberation and decision making;
- Supports an independent agency review and verification of technical site-specific information provided by responsible parties;
- Categorizes potential exposure results based on currently available information in order to reflect up-to-date CSP determinations;
- Promotes consistent prioritization of contaminated sites based on site-specific information either documented or assumed at the time of evaluation;
- Allows for re-ranking of contaminated sites throughout the cleanup process to show changes in exposure potential over time;
- Focuses CSP staff and other state resources on potentially high risk issues through the workload prioritization process; and
- Assists with measuring CSP performance by providing a standard evaluation of potential exposure at contaminated sites for which CSP staff have oversight responsibility.

DESIGN / RESULTS

The ETM estimates potential receptor exposure by posing questions about exposure pathways to CSP staff in a flow-chart structure. The application design combines components of a conceptual site model with qualitative and quantitative CSP decision points to evaluate confirmed or potential exposure of human and ecological receptors to hazardous substances.

Exposure pathways assessed through the ETM include:

- Direct Contact with Surface Soil (0 to 2 feet below ground surface)
- Direct Contact with Subsurface Soil (>2 to 15 feet below ground surface)
- Outdoor Air Inhalation
- Groundwater Ingestion
- Surface Water Ingestion
- Wild or Farmed Foods Ingestion
- Indoor air Inhalation (Vapor Intrusion)
- Other Pathways (user-defined)
- Ecological (Aquatic and Terrestrial)

Using the best available information about the site, entered by CSP staff, the model identifies an exposure category for each complete exposure pathway:

<u>Exposure Category</u>	<u>Category Description</u>
➤ Current Exposure	Analytical data indicate receptors are being exposed above a pathway-specific action level. Exposure at the exposure point (e.g. a drinking water well, etc.) is assumed.
➤ High Potential Exposure	Analytical data are not sufficient to determine if exposure is a concern, or exposure is not occurring presently due to a temporary control that could fail.
➤ Future Exposure	Receptors could be exposed above a pathway-specific action level under future conditions.
➤ Low Potential Exposure	Analytical data are not sufficient to determine if exposure is a concern but site conditions indicate it is unlikely.
➤ Exposure Controlled	DEC-approved institutional controls are in place to prevent exposure.
➤ De Minimis Exposure	Determination by DEC that exposure to receptors is negligible due to nature of hazardous substance, and/or magnitude or location of contamination.

The model then identifies the controlling pathways for a site, i.e. the exposure pathways with the greatest exposure potential. A relative exposure estimate of the controlling pathways is also completed through a scoring assessment that addresses land use, chemical toxicity, and the magnitude of contamination to further refine site and workload priorities.

For more information, contact Evonne Reese at evonne.reese@alaska.gov or (907) 465-5229.

DEC Contaminated Sites Program
P.O. Box 111800, Juneau, AK 99811-1800