

# Groundwater Assessment

## Under the Department of Interior Natural Resource Damage Regulations

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When conducting natural resource damage (NRD) assessments, designated trustees may use either the damage assessment process presented by the U.S. Department of the Interior (DOI) or the Department of Commerce's National Oceanic and Atmospheric Administration's (NOAA) process. The DOI regulations are for the assessment of NRD under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), whereas the NOAA regulations are applicable for NRD assessments under the Oil Pollution Act. The assessment procedures suggested in these regulations are not mandatory. However, assessments completed in accordance with the DOI or NOAA regulations fulfill requirements for the rebuttable assumption contained in CERCLA. When the rebuttable assumption criterion is met, the burden of proof shifts to the potentially responsible party to disprove the Trustee's assessment.

A majority of high-profile NRD claims have focused on damage to land, surface water, wildlife, and biota. However, in some cases injury to groundwater has been included in the NRD assessments. For example, damages at the Grand Calumet River NRD site in Indiana include discharges of groundwater containing PCBs, oil-related organic compounds, and trace metals to the Grand Calumet River, the Indiana Harbor Canal, and Lake Michigan.

To assess damage at NRD sites, the DOI regulations provide two types of procedures. Type A procedures are for simplified assessments requiring minimal field observations for coastal and marine environments and for Great Lakes environments. Type B procedures are alternative protocols for conducting assessments at individual cases. This article presents a brief summary of the damage assessment process for groundwater as described in the DOI Type B procedures. The damage assessment process is divided into three phases: injury determination, injury quantification, and damage determination.

### Groundwater Injury Determination

In the injury determination phase, the trustee must demonstrate that the injury to the resource has resulted from the discharge of oil or from a release of a hazardous substance. The exposure pathways to biota (if a claim for biota is made) must also be demonstrated in this phase. An injury to groundwater is defined as a change in its physical or chemical quality as measured by concentrations of substances in excess of federal or state laws or regulations. An injury can also be identified if other resources, such as surface water or biota, would be injured if exposed to the groundwater. The following types of information are generally collected during the injury determination phase:

- Hydrogeologic characteristics of aquifers and confining units.

- Direction and rate of groundwater flow.
- Concentrations of contaminants in impacted groundwater.
- Mobility and rate of transport of released substances.
- The connection of groundwater to surface water or other natural resources.

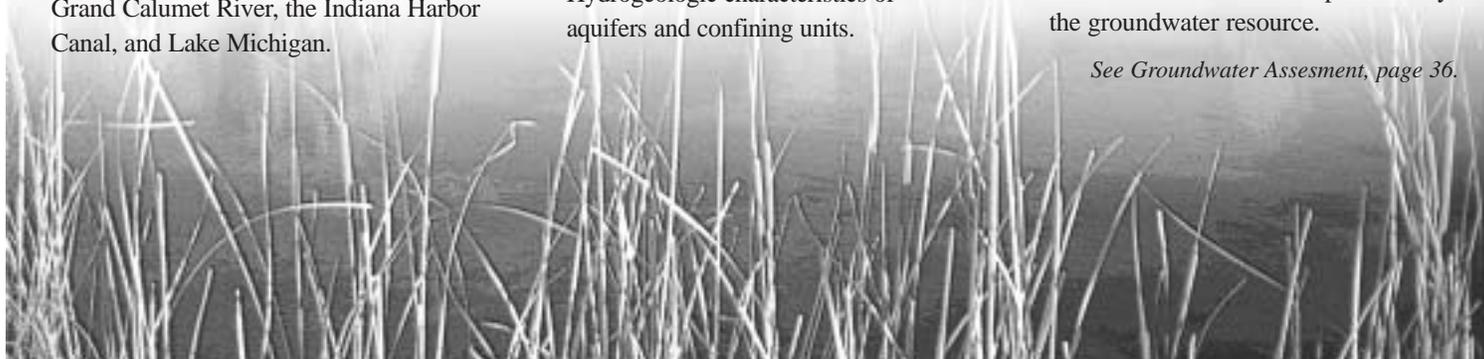
### Groundwater Injury Quantification

In the quantification phase, the effects of the discharge or release on the natural resource are quantified for use in determining the injury. The process involves characterizing the extent of the injuries identified in the injury determination phase and the associated reduction in services, which are defined as "the physical and biological functions performed by the resource." Services include human use, such as drinking water, as well as ecological uses, such as the support of biota in wetlands through groundwater springs.

Reduction in services is determined by comparing the baseline services to the services provided by the injured resource. Baseline is defined as "the condition or conditions that would have existed at the assessment area" in absence of a discharge. For groundwater resources, the following types of information are generally collected:

- The lateral and vertical extent of the released substance in the unsaturated zone and in groundwater.
- Determination of services provided by the groundwater resource.

*See Groundwater Assessment, page 36.*



According to the DOI regulations, the service determination may include “computation of the volume of water affected, volume of affected groundwater pumped from wells, volume of affected groundwater discharged to streams or lakes, or other appropriate measures.”

### ***Damage Determination***

According to the DOI process, damages sought can include:

- The cost of restoration, rehabilitation, replacement, and/or acquisition of the equivalent of the injured natural resource.
- Compensable value of the services lost to the public prior to attainment of restoration.
- Damage assessment costs.

A reasonable range of possible restoration alternatives must be considered and may include intensive actions that return the resources to baseline conditions as quickly as possible, as well as natural recovery with minimal action. Alternative selection must include, for example, consideration of technical feasibility, cost-benefit analysis, cost-effectiveness, and the resource’s natural recovery period.

The trustee can select from several cost estimating methodologies included in the regulations but must avoid double counting costs. In addition, the regulations stress that to avoid double counting, the effects of various response actions shall be factored into the analysis of damages. The natural resource damages are “the residual to be determined by incorporating the effects, or anticipated effects, of any response action.” In general, if more is spent to restore the resource rapidly, then less will be spent to compensate the public for lost resources during the recovery period. Although the regulations do not require that trustees select the most cost-effective method of restoring injured natural resources, cost-effectiveness is included as a consideration.