

# OVERVIEW OF RISK BASED DECISION MAKING AT DEQ

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# NEW AND BETTER FACT SHEET

- <http://www.deq.state.ok.us/factsheets/land/SiteCleanUp.pdf>
- The Oklahoma Department of Environmental Quality (DEQ) has adopted a risk based decision making process to provide a framework for determining cleanup requirements at contaminated sites. This process ensures that DEQ's cleanup decisions are protective of human health and the environment

# WHAT IT IS NOT

- Not Appropriate for Immediate Risks
  - Spills
- Not Appropriate for Visible Waste
  - Hydrocarbon stained soil
- Does Not Supercede Applicable or Revelant and Appropriate Requirments (ARARS)
  - State and Federal Laws and Regulations

# WHAT MUST BE INCLUDED

- Must Meet with DEQ Staff
- Must Evaluate Actual and Potential Risks at the Site
- Must be Based on Adequate Site Characterization

# GENERAL REQUIREMENTS

- Data Quality Objectives
- Identify all Contaminants of Concern
- Site Conceptual Model
- ARARS
- Engineering/Institutional Controls
- Consideration of Community Needs and Preferences
- Risk Management

# DETERMINING RISK BASED CLEAN-UP LEVELS

- In Consultation with DEQ
  - May Choose EPA Regional Screening Levels Appropriate for Land Use
  - May Choose Conservative Clean up Levels Calculated with Default Inputs
  - May Use a Risk Assessment to Determine Site-Specific Clean Up Goals

# MINIMUM REQUIREMENTS FOR CLEAN UP LEVELS OTHER THAN SCREENING LEVELS

- Risk Assessment Work Plan
- Calculations done using EPA Risk Assessment Guidance (RAGS)
- Use of EPA or DEQ Input Values
- Published Toxicity Factors
- Appropriate Exposure Scenarios

# DEQ ACCEPTABLE RISK LEVELS

- For Non-Carcinogens - Hazard Index equal to or below 1.0
  - Exception when more than more chemical with non-carcinogenic effects work on the same organ/organ system. Then the cumulative HI must be equal to or below 1.0
- For Carcinogens -  $1 \times 10^{-5}$  excess cancer risk
  - unless this number exceeds the appropriate non-cancer endpoint, is not protective of ground water, or leaves contamination in place that is characteristic or listed hazardous waste
  - Sites with multiple carcinogens must consider additive affect

# ACCEPTABLE INPUT VALUES

- Published EPA Values
- DEQ State Specific Inputs

Scenario	Input	Value
- Construction worker	Exposure Frequency	90 days/year
- Construction worker	Exposure Duration	1 year
- Construction worker	Soil Ingestion	200 mg/day
- Outdoor worker	Exposure Frequency	240 days/year
- Outdoor worker	Exposure Duration	25 years
- Outdoor worker	Soil Ingestion	100 mg/day
- Adult subsistence farmer	Exposure Frequency	350 days/year
- Adult subsistence fisherman	Exposure Frequency	Site specific
- Adult subsistence fisherman	Fish Tissue Ingestion	Site specific
- Recreational user	Exposure Frequency	Site specific
- Adolescent trespasser	Exposure Frequency	52 days/year
- Adolescent trespasser	Exposure Duration	6 years
- Adolescent trespasser	Body Weight	52 kg

# CLEANING UP TO SCREENING LEVELS

- **Pros**

- Published values provide easily understandable cleanup goals
- Developing work plans and cleanup goals are less time intensive
- Published values allow for a defensible cleanup
- Remedial action is straightforward
- Inexpensive long term maintenance
- Screening levels would be safe at any site
- Allows for early cost estimate of cleanup

- **Cons**

- Does not take into consideration site specific conditions
- May not accurately evaluate all Chemicals of Concern
- Contaminants may not have a published screening level or screening level may be so low that successful remediation may be difficult
- Remediation may be more expensive

# SITE SPECIFIC CLEAN-UP GOALS WITH DEFAULT EXPOSURE ASSUMPTIONS

- Pros
  - Cleanup levels are generally higher than screening levels
  - Remediation may be less expensive than cleaning to screening levels
- Cons
  - Cleanup levels may not be as protective as screening levels
  - Long term maintenance may be expensive
  - Quantitatively less powerful than formal risk assessment

# FORMAL RISK ASSESSMENT

- Pros
  - Most effective means of fully understanding the environmental risks
  - Remediation may be less expensive
  - Allows for the development of work plans to be focused on specific rather than general risks
- Cons
  - Time intensive
  - Quantitative methods and intensive jargon may be difficult to convey to the public
  - Expensive
  - Long term maintenance may be more expensive
  - May be less understandable and therefore less acceptable to the public