

A photograph of a cave entrance looking out onto a river and a golf course. The cave's interior is dark and rocky, framing the view. Outside, a river flows through a lush, green landscape with trees and a golf course in the distance. The scene is bright and sunny.

# What Makes a Good Groundwater Use Pathway Evaluation

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What Role does MGS play in the MRBCA process?

1. Groundwater Use Pathway
2. Delineation of Groundwater COCs
3. Ecological Risk

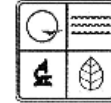
## Today's Goal

Redirect focus is a “back to basics” way to Figure 6-1 of the MRBCA Guidance document.

## **Two Potential Benefits:**

1. Promotes Efficiency
2. Potential Cost Savings

# Missouri Risk-Based Corrective Action Process for Petroleum Storage Tanks



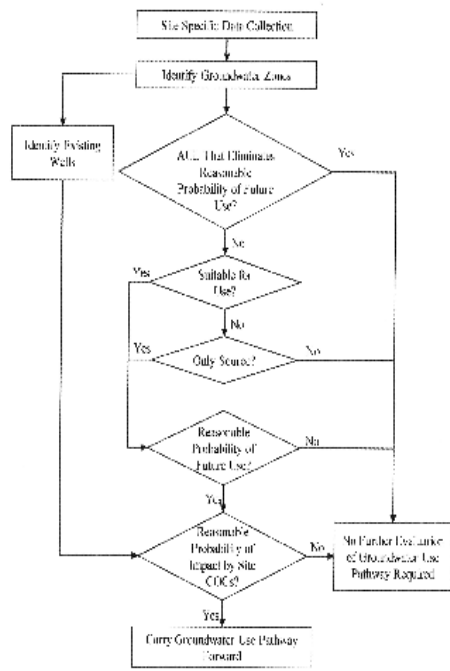
**MISSOURI**  
DEPARTMENT OF  
NATURAL RESOURCES

## MISSOURI RISK-BASED CORRECTIVE ACTION PROCESS FOR PETROLEUM STORAGE TANKS

October 17, 2013

# Figure 6-1

# Site Conceptual Model for Domestic Consumption of Groundwater Exposure Pathway Analysis



**NOTE:**

1. The term "use" refers to domestic consumption.
2. The analysis conducted in this step is performed for each groundwater zone or area. The analysis of the analysis file groundwater use pathway is not an all-or-none; for additional evaluation or to further evaluate a use pathway is required, depends on the individual groundwater zone or area. Different conclusions may apply to different groundwater zones at a given site.
3. The all-hazards for ALL may be utilized to eliminate potential future use, and, by law, allow a conclusion that no further evaluation of groundwater use pathway is required.

Figure 6-1. Site Conceptual Model for Domestic Consumption of Groundwater Exposure Pathway Analysis

# Identify Groundwater Zones

- This should be the most robust section of the evaluation!
- Essentially creating a “Groundwater Model” for the site.

# Identify Groundwater Zones

- Not enough to just discuss the geology!
- Must also interpret the data.



## **Identify Groundwater Zones**

- Other Information that may or may not be appropriate, depending upon the site.

# Identify Groundwater Zones

- Springs, spring elevations
- Sinkholes
- Faulting
- Losing or gaining streams (Use with caution)

# Identify Groundwater Zones

What information should **NOT** be included in this section?

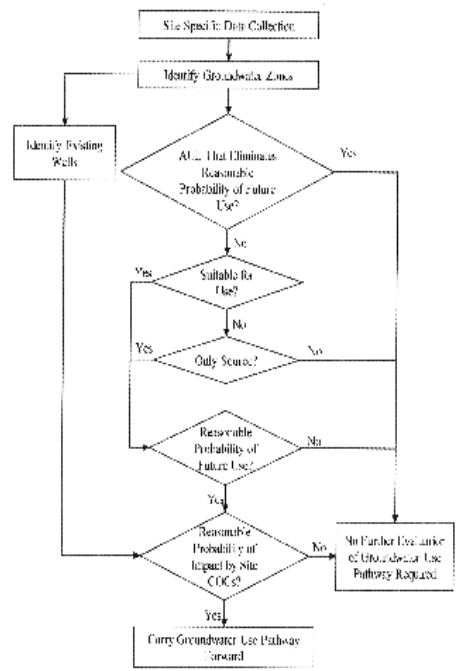
# Identify Groundwater Zones

What should NOT be discussed:

1. AULs
2. Wells and Well Construction
3. Groundwater Use Patterns
4. Suitability of Use

# Figure 6-1

# Site Conceptual Model for Domestic Consumption of Groundwater Exposure Pathway Analysis



**NOTE:**  
 1. The term "AUL" refers to domestic consumption.  
 2. The analysis conducted in this step is performed for each groundwater zone or aquifer. The analysis of the analysis file groundwater use pathway is not a field-based or field-based evaluation of the pathway is required; depends on the individual groundwater zone or aquifer. Different conclusions may apply to different groundwater zones at a given site.  
 3. The analysis of the AUL may be sufficient to eliminate the need for further evaluation, but, by law, allow a conclusion that the data and analysis of groundwater use pathway required.

Figure 6-1. Site Conceptual Model for Domestic Consumption of Groundwater Exposure Pathway Analysis

# Current Use Pathway

What is required to evaluate this pathway?

## Current Use Pathway

What is required:

1. Domestic wells within  $\frac{1}{4}$  mile
2. Public wells within 1 mile

## Current Use Pathway

If a domestic or public well is present..

Pathway is complete

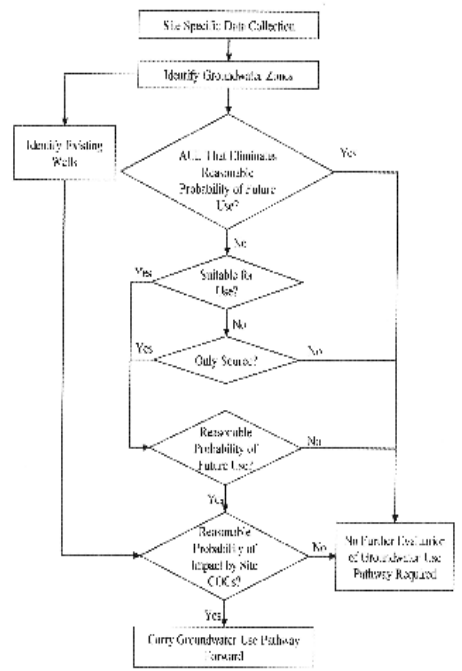


# Current Use Pathway

How do you assess probability of impact?

# Figure 6-1

# Site Conceptual Model for Domestic Consumption of Groundwater Exposure Pathway Analysis



**NOTE:**  
 1. The term "AUL" refers to domestic consumption.  
 2. The analysis conducted in this step is performed for each groundwater zone or aquifer. The analysis of the analysis file groundwater use pathway is not a field filter; for additional evaluation or to further evaluate a use pathway is required; depends on the individual groundwater zone analysis. Different conclusions may apply to different groundwater zones at a given site.  
 3. The analysis of the AUL may be utilized to estimate potential future use, and, by law, allow a conclusion that the future use of groundwater is not required.

Figure 6-1. Site Conceptual Model for Domestic Consumption of Groundwater Exposure Pathway Analysis

# Future Use Pathway

Each Groundwater Zone determined during the compilation of your groundwater model **MUST** be evaluated for each decision block for the future use pathway evaluation.

# Future Use Pathway

1. AUL for Probability of Future Use
2. Suitable for Use (Only Source)
3. Reasonable Probability of Future Use
4. Reasonable Probability of Impact

# Future Use Pathway

AUL that Eliminates Reasonable  
Probability of Future Use

Well Construction Rules  
Deed Restrictions

# Future Use Pathway

Suitable for Use and Only Source

Yield of  $\frac{1}{4}$  gallon per minute  
(or 360 gallons per day)

TDS of 10,000 mg/L or less

When does “Only Source” matter?

# Future Use Pathway

Reasonable Probability of Future Use

Will be evaluated on a “weight of evidence” basis and will be site specific.

**This is determined by the Tanks  
Section not by MGS.**

# Future Use Pathway

## Reasonable Probability of Impact by Site COCs

Potential impacts must be evaluated at the nearest downgradient location that could reasonably be considered for use.



When should a Groundwater Use  
Pathway Evaluation be completed?

Any Questions ??

**Thank You**

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