



# Montana Groundwater Monitoring and Report Guidance for Petroleum Releases

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February 2021

# Introduction

## Purpose of Revision:

MR-01 WP and Report

AC-01 WP and AR-01 Report

AC-02 WP and AR-02 Report (MNA)

MNA Guidance - Report

Groundwater  
Monitoring Work Plan  
and Report Guidance  
for Petroleum  
Releases



LOCATION OF  
FORMER 10,000  
GAL. GAS UST

MW #4

3  
M

**DEQ**  
Montana Department  
of Environmental Quality

FORMER 5,000 GAL. DIESEL UST  
(CONVERTED FROM GAS UST)



# Introduction

## Purpose of Revision:

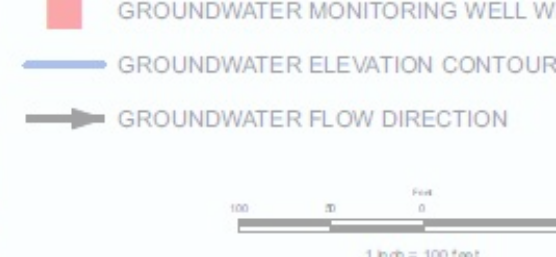
Reduce WPR, WP submittal, Report Cycle

WP approved and extended as needed to meet objectives of WP

Provide Guidance for Data, Discussion, Analysis not previously detailed  
e.g., IBI data

lathead Lake

# Introduction



## What this Guidance Is Not:

Does not Discuss Methods, Pumps, Etc.

Is not Intended to be Burdensome



# Overview

## Expectations:

Be qualified to do the work

Communicate with DEQ

Understand the purpose of monitoring;

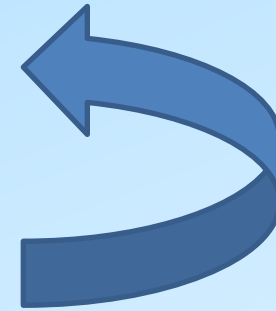
RP, DEQ, Consultant on the same page

Submit Interim Data Submittals and Reports as required

# Overview

## Process:

- Work Plan Request Issued
- Communication with DEQ
- Work Plan Prepared and Submitted
- Work Plan Approved
- Groundwater Monitored – Communication with DEQ
- Interim Data Submittals – Communication with DEQ
- DEQ issues Extensions as Needed – Communication
- Issue Groundwater Monitoring Report



Gw ele



LNAPL thickness

# Groundwater Monitoring – Work Plan

Title Page

Facility History/ Release Background

Objectives of Groundwater Monitoring

Work Plan Tasks

Schedule and Reporting

Appendices



The background is a satellite map with a semi-transparent blue overlay. The map shows several monitoring wells marked with blue circular icons and labels: MW-36, MW-32, GP-MW-3, SVE-2, MW-18, SVE-1, MW-2, and MW-6. A red-outlined polygon encloses a central area of the map. The text 'Guidoni Property' is visible on the right side of the map. The title 'Groundwater Monitoring – Interim Data Submittal' is centered at the top in a large, bold, dark blue font.

# Groundwater Monitoring – Interim Data Submittal

Cover Letter

Updated Cumulative Data Tables

Updated Maps and Figures

Well Purging Logs

Laboratory Analytical Data Package(s)

Completed Data Validation Summary Forms



# Groundwater Monitoring – Report



Title Page

Executive Summary

Purpose and Objectives

Facility History and Release Background

Site Maps – Facility, Potentiometric Surface, Iso-concentration

Receptor Survey

# Groundwater Monitoring – Report (cont.)

MW-24  
3189.54

MW-23

MW-22

Groundwater Monitoring

Intrinsic Biodegradation Indicators (IBI)

Data Validation and Usability Summary

Data and Results

Release Closure Plan

Conclusions

Recommendations

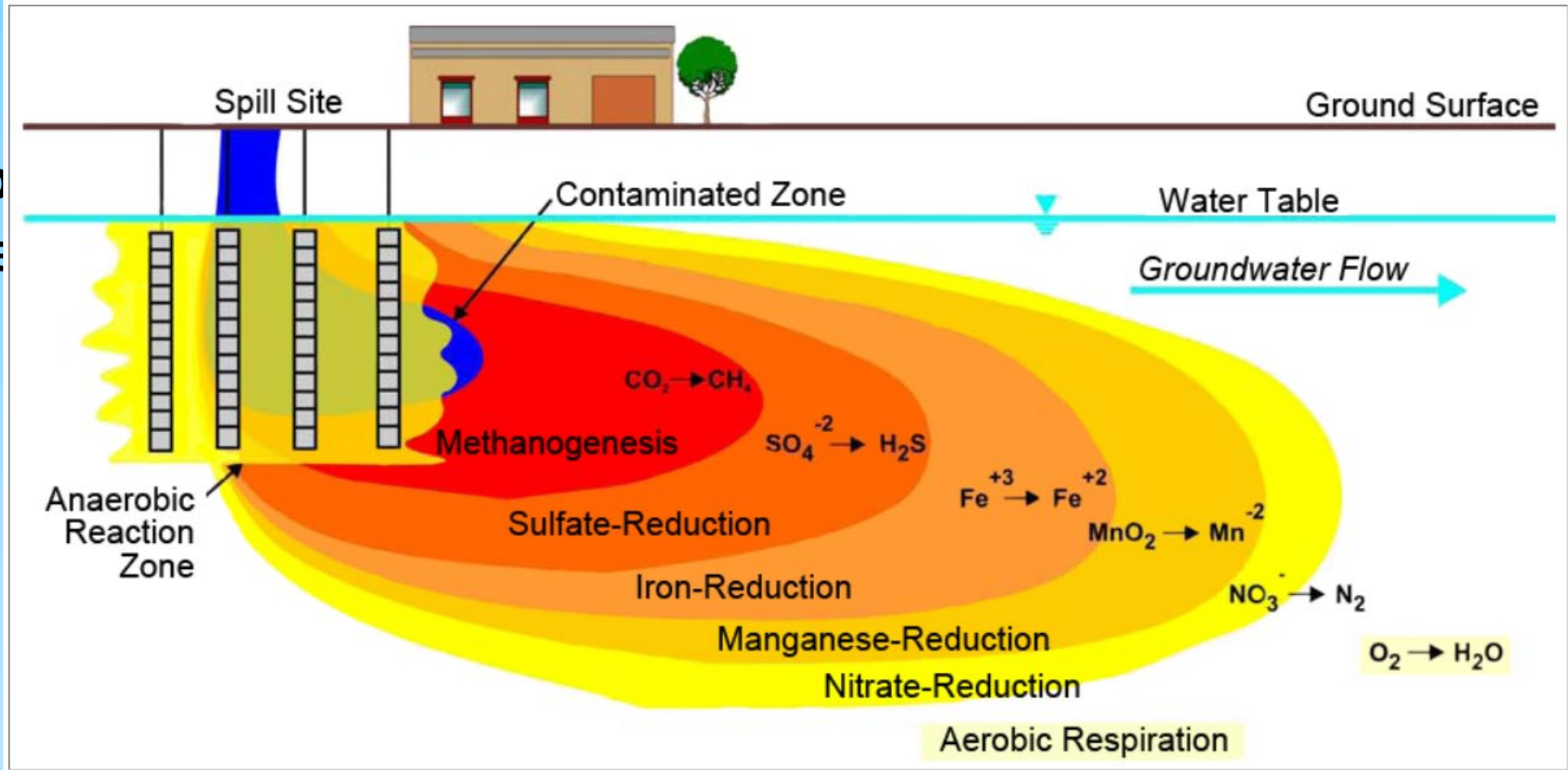
MW-27  
3196.32

Background

**DEQ**  
Montana Department  
of Environmental Quality

# Groundwater Monitoring – Report (cont.)

- Ob
- pre
- 1.
- 2.
- 3.
- 4.
- 5.



# Groundwater Monitoring – Report (cont.)

## Intrinsic Biodegradation Indicators (IBI)

### □ Results and Discussion-

- Describe the processes occurring in the background (non-impacted) aquifer, upgradient, source, and peripheral wells and data points.
- Describe what limits degradation spatially
- Provide site-specific recommendations for additional sample points, IBI analyses, groundwater monitoring schedules, and amendments as necessary to achieve closure.

# Example - Intrinsic Biodegradation Indicator/Monitored Natural Attenuation Data

Sample Intrinsic Biological Indicator/Monitored Natural Attenuation Data Table							
		Concentration/Measurement					
<u>Well ID</u>	Parameters Investigated	Sample Date	Sample Date	Sample Date	Sample Date	<u>Trend</u> Increasing/ Decreasing? (+ or -)	Position within the plume (upgradient, source, mid-point, peripheral, downgradient, etc.)
<b>MW1</b>	pH						
	DO (mg/L)						
	ORP (mV)						
	Nitrate + Nitrite						
	Manganese						
	Iron						
	Sulfate + Sulfite						
	Methane						
	Other						
	_TPH						
	_TEH						

Please Note: the sample data table provided above allows for easy presentation and interpretation of IBI results. The table provides space for commonly observed parameters observed in a basic IBI evaluation and can be expanded to include other analytes as necessary. Parameters provided are listed in order from top-to-bottom by order of greatest to least aerobic reactivity. It is the hope that data will be analyzed in order of highest aerobic reactivity to least aerobic reactivity to provide a more thorough evaluation of attenuation processes. Data should be compared to TPH and or TEH levels in each well to draw correlations between IBI parameters and concentration data as it relates to total respiration.

# Revised Groundwater Monitoring Work Plan and Reporting Guidance Overview

## Summary - Revisions and Concepts Introduced:

- Consolidate multiple work plan and report guidance documents into one concise format.
- One work plan and one report to cover multiple events to eliminate correspondence redundancy.
- Interim data submittal requirements
- New IBI data reporting requirements



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▪ Questions?

