

# Montana Petroleum Mixing Zone

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Petroleum Tank Cleanup Section

# Petroleum Mixing Zone - What It Is:

- **Petroleum Mixing Zone (PMZ): Alternative to Resolve a Release With Petroleum-Contaminated Groundwater**
  - **Applicable Under Specific Conditions**
  - **Voluntary - Responsible Party Agrees to Conditions**

# Petroleum Mixing Zone - What It Is:

- **Categorizes Petroleum Release as “Resolved”**
  - **All Appropriate Corrective Action Completed**
  - **Free Product Removed to Maximum Extent Practicable**
  - **Plume is Stable or Shrinking (Natural Attenuation)**
  - **No Unacceptable Risks (Present or Future)**

# Petroleum Mixing Zone - What It Is:

- **Categorizes Petroleum Release as “Resolved”**
  - **Institutional Control at All Properties Within PMZ Boundary (Including Deed Notice)**
  - **Release Complies With All Applicable Environmental Laws, with Exception of Water Quality Standards within PMZ (i.e., Not Applicable to Soil)**

# Petroleum Mixing Zone - What It Is Not:

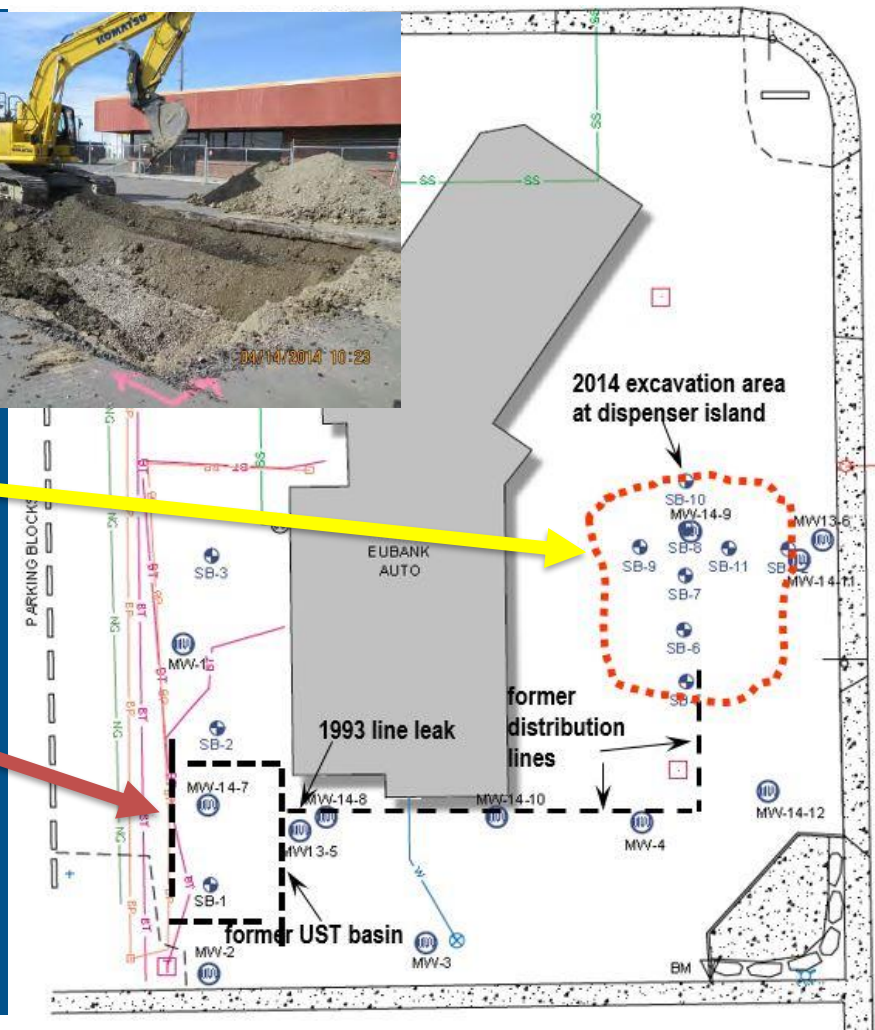
- **Substitute for Rigorous Investigation**
- **Substitute for Remediation –**
  - **All Appropriate Corrective Actions Must Be Completed**
- **Temporary Status with Additional Monitoring**
- **Not a Verb – We Can't "Just PMZ It"**

# Test Case

- Gas Station from 1984 to 2008
- Release Confirmed in 1993
- USTs Replaced in 1998, Removed 2008
- Soil Borings and Monitoring Wells Installed to Assess Extent and Magnitude



# Test Case



- 2 Excavations
  - Dispenser Area in April 2014, 305 cy, max depth 17 ft.
  - Tank Basin in 1998, 375 cy, max depth 13 ft.
- Depth to Groundwater ~12 to 14 ft

# Test Case

- Petroleum Contamination in Groundwater:
  - Delineated
  - Attenuating
  - On-Site
- Benzene in Groundwater –
  - 1,730  $\mu\text{g/L}$  (RBSL = 5  $\mu\text{g/L}$ )





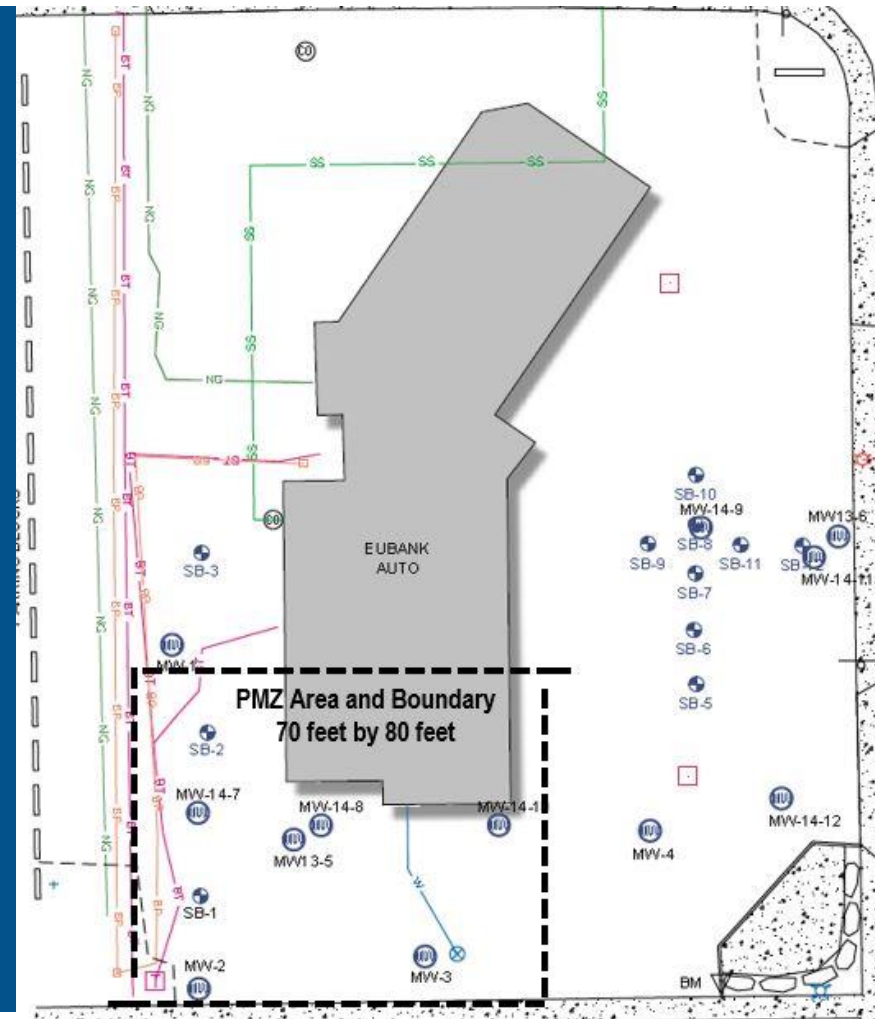
# Test Case

- **Additional Remediation Necessary?**
  - No Free Product
  - Source Mass Removed to Extent Possible
  - Residual Petroleum Contaminated Soil is Not a Direct-Contact Risk
- Plume w/in 500 ft of Source Area
- No Present Risk. Future Risk?



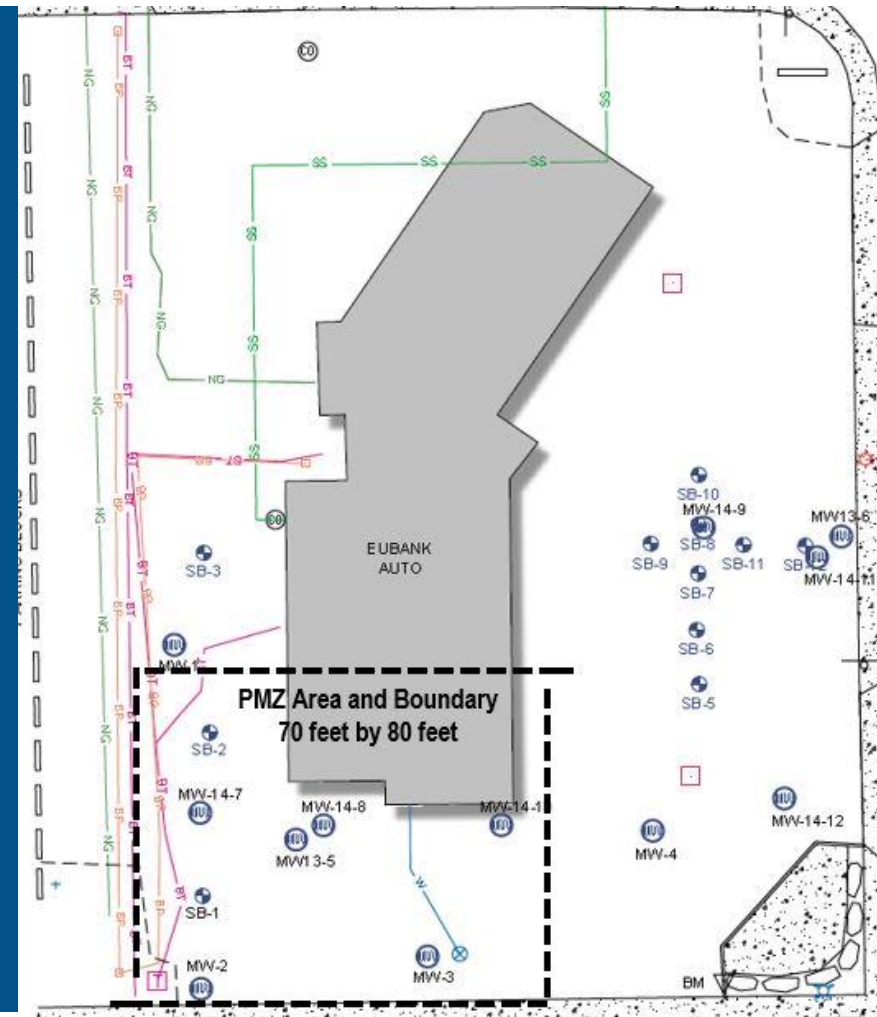
# Test Case

- PMZ – Institutional Control
- Commercial Use
- No Wells
- Future Structures Slab on Grade
  - Limit Excavation to 8 ft
  - Structure to Include Vapor Barrier
  - Limits on Water Service Lines
  - Dispose of any Contaminated Soil



# Test Case

- Release Resolved with PMZ
- Facilitated Property Transaction
- Site Has Been Redeveloped
  - Former Building Removed
  - Commercial Coffee Establishment



# PMZ Recap

- **Applicable for Petroleum Storage Tank Releases If:**
  - **Conditions Ensure Present and Long-Term Protection**
  - **Residual Contamination in Soil and Groundwater will Continue to Naturally Attenuate**

ARM 17.56.607(10)

# PMZ Recap

- **Applicable for Petroleum Storage Tank Releases If:**
  - **(a) PMZ Included in a Corrective Action Plan**
  - **(b) Documented Thorough Investigation of the Release**
  - **(c) Free Product Removed to the Maximum Extent Practicable**
  - **(d) Risk Evaluation – No Unacceptable Risk**

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# PMZ Recap

- **Applicable for Petroleum Storage Tank Releases If:**
  - **(e) All Appropriate Corrective Actions Completed**
  - **(f) Release Complies With All Environmental Laws –**
    - **Exception: Groundwater Quality Standards**
  - **(g) Contaminant Plume Stable or Shrinking**

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# PMZ Recap

- **Applicable for Petroleum Storage Tank Releases If:**
  - **(h) Source Area Contamination Removed to the Maximum Extent Practical – Residual Not a Risk**
  - **(i) Downgradient Boundary <Water Quality Standard,**
    - **Established by Investigation**
  - **(j) Institutional Control on All Properties w/in PMZ**
- **ARM 17.56.607(10)**

# PMZ Recap

- **Applicable for Petroleum Storage Tank Releases If:**
  - **(k) PMZ w/in 500 feet of Origin of Release and Not w/in 500 feet of Drinking Water Well or Surface Water Unless DEQ Determines Exception is Acceptable**
  - **(l) Institutional Control, Engineered Control Ensure Safety**
  - **(m) Deed Notice on All Properties w/in PMZ**
  - **ARM 17.56.607(10)**



# Current Status of PMZ Closures

- From 2011 through 2019: 4 PMZ Approved
- PMZ Considered Earlier in the Investigation/Remediation Process
  - Voluntary – Responsible Party Included Earlier in Discussion
- ~20 Releases Currently Progressing Toward PMZ

# QUESTIONS?

