

Utah Division of Oil, Gas and Mining Guidance Document

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Onsite Pit Guidance Document (re: Utah Oil & Gas Conservation General Rules R649-3-16 Reserve Pits and Other On-site Pits)

This document is intended for use in determining the applicability and use of reserve pits, cuttings trenches and on-site pits used in the exploration and production of oil and gas. Utah Administrative Code R649-6-13 pertaining to requirements for reserve pit operations should be used in conjunction with this guidance.

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Our Mission

The Utah Oil and Gas Program within the Division of Oil, Gas and Mining:

- Promote the exploration, development and conservation of oil and gas resources*
- Foster a fair economic return to the general public for those resources*
- Maintain sound, regulatory oversight to ensure environmentally acceptable activities*

Introduction

This document should be used as guidance by oil and gas operators and Division Staff in evaluating appropriate containment requirements for fluids and drill cuttings used and produced as a byproduct of oil and gas drilling and production operations.

The approach utilized is a ranking system to evaluate potential impacts of a proposed pit location. This ranking is used to determine level of containment needed to protect surface and near surface environment.

Ranking Criteria for Drilling Fluids and Materials

1) Distance from Surface to Groundwater

The depth to groundwater, in feet below land surface, must consider the highest seasonal average. Recharge areas are considered to be as environmentally sensitive as the distance to groundwater. Sites located in recharge areas may therefore be scored 20 points.

2) Distance to Surface Water

Surface water bodies include perennial rivers, streams, creeks, irrigation canals and ditches, lakes, and ponds. Large drainages which lead to surface waters should be considered as if they contained surface waters.

3) Distance to Nearest Municipal Water Well

A municipal water well is assumed to be a well designed to supply groundwater for community consumption.

4) Distance to Other Water Wells

Other wells will be defined as domestic, irrigation, and stockwatering wells that generally have less capacity, and thus smaller radius of influence, than municipal wells.

5) Native Soil Type

The predominant site lithology and native soil type will be determined by soils classified according to the Unified Soil Classification. Permeability of native soils shall be determined according to the following:

- a) Low permeability (clay, shale, fat clay, high plasticity clay, elastic silt low plasticity silt, lean clay, silty clay, sandy clay, silty or clayey fine sand, very fine gravelly clay, non-fractured igneous and metamorphic rocks, and consolidated, cemented sedimentary rocks; USC=Pt, OH, CH, MH,OL,CL,ML).
- b) Moderate permeability (clayey sand, poorly graded sand-clay mixtures, silty sand, poorly graded sand-silt mixtures, moderately fractured igneous and metamorphic rocks, moderately permeable limestone; USC=SC, SM).
- c) High permeability (fine sand, silty sand, sand, gravel, gravelly sand, clayey gravel, gravel-sand-clay-silt mixtures, silty, gravel, highly fractured igneous and metamorphic rocks, vesicular igneous rocks, cavernous or vuggy limestone; USC=SM, SP, SW, GC, GM, GP, GW).

6) Fluid Type

The type of liner to be used should be compatible with the fluids it will contain.

7) Drill Cuttings

Most cuttings are not considered as detrimental to the environment. Large volumes of salt cuttings or other soluble materials which could degrade soils or water should be given special consideration.

8) Annual Precipitation

The average annual precipitation in a specific area must be identified in order to evaluate the effects of recharge and potential for mobilization of contaminants. Precipitation information shall be obtained from the nearest national meteorological weather station. Onsite ground cover (e.g. concrete or asphalt) that might prevent infiltration of precipitation is not considered due to the potential for irregularities and fractures in the ground cover that could allow infiltration.

9) Potentially Affected Populations

The score for affected populations is based on the number of potential receptors within a one-mile radius of a site. The potentially affected populations include residents, employees, recreational users, and others who regularly enter the area.

10) Presence of Onsite or Adjacent Utility Conduits

Utility conduits include water distribution lines, sewer lines, septic tanks, buried electrical lines, and any other conduit that may facilitate contaminant migration.

Summation of Ranking Criteria to Determine Containment Level

The summation of all of the above ranking scores will yield one value which shall be used to determine the appropriate type of containment, on a case-by-case basis. The sensitivity levels are as follows:

- Level I Containment ≥60
- Level II Containment 41-59
- Level III Containment 16-40
- Level IV Containment ≤15

Containment Requirements According to Sensitivity Level

- Level I: Requires total containment by closed-loop drilling system, concrete structure or other type of total containment structure or material.
- Level II: Synthetic liner required. Consideration of additional containment practices, depending on the fluid to be contained and environmental sensitivity, such as closed-loop system, synthetic liner, felt subliner material, etc.
- Level III: Synthetic liner recommended. Clay or other compatible lining is discretionary depending on the fluid to be contained and environmental sensitivity.
- Level IV: No specific lining requirement

Sensitivity Evaluation Ranking Criteria and Ranking Scores for Containment Levels

Site-Specific Factors	Ranking
Distance to Groundwater (feet)	
>200	0
100 to 200	5
75 to 100	10
25 to 75	15
<25 or recharge area	20
Distance to Surf. Water (feet)	
>1000	0
300 to 1000	5
200 to 300	10
100 to 200	15
< 100	20
Distance to Nearest Municipal Well (feet)	
>5280	0
1320 to 5280	5
500 to 1320	10
<500	20
Distance to Other Water Wells (feet)	
>1320	0
300 to 1320	10
<300	20
Native Soil Type	
Low permeability	0
Mod. permeability	10
High permeability	20
Fluid Type	
Air/mist	0
Fresh Water	5
TDS >5000 and <10000	10
TDS >10000 or Oil Base Mud	15
Fluid containing significant levels of hazardous constituents	20
Drill Cuttings	
Normal Rock	0
Salt or detrimental	10
Annual Precipitation (inches)	
<10	0
10 to 20	5
>20	10
Affected Populations	
<10	0
10 to 30	6
30 to 50	8
>50	10
Presence of Nearby Utility Conduits	
Not Present	0
Unknown	10
Present	15

Other Guidelines for Pits

- If the maximum value of any of the ranking criteria is met, a closed loop system should be considered.
- Pits/trenches shall **not** be constructed on areas of fill materials.
- A pit/trench shall **not** be constructed in a drainage or floodplain of flowing or intermittent streams.
- Synthetic liners used for reserve pits/trenches, shall be of no less than 20 mil thickness and shall be compatible with the fluid to be contained. Synthetic liners used for onsite pits/trenches which are intended for extended use, such as multi well drilling, emergency pits, etc., should be a minimum of 40 mil thickness or as approved by the Division.
- Synthetic liners shall be installed over smooth fill material which is free of pockets, loose rocks or other materials which could damage the liner.
- Monitoring systems for pits/trenches or closed mud systems may be required for drilling in sensitive areas.

