
Reviewing Residual Risk at Closed LUST Sites In Utah

Avery Holyoak
Petroleum Storage Tank Remedial Assistance & Cleanup
Section Manager



UTAH DEPARTMENT of
ENVIRONMENTAL QUALITY
**ENVIRONMENTAL RESPONSE
& REMEDIATION**

Utah's Risk-Based Closure Methods

The Tanks Database notes LUST releases closed using one, or a combination of, three risk-based LUST release closure methods



**Residual
Impacts Map**

**Blue Stakes
Notification**

**Institutional
Controls**

Utah's Risk-Based Closure Methods: Use Over Time

2002

Institutional Controls

Use Count: 14

Deed restrictions
(Environmental Covenants),
spelling out required
engineering controls and/or
acceptable land-uses.

2013

Blue Stakes Notifications

Use Count: 64

Flyers, showing restricted
areas and giving contact
information, when utility
markings are requested
within 200ft of a site.

2015


Residual Risk Map Enclosures

Use Count: 32

Enclosures, sent to the
responsible party with the
NFA letter, detailing the
depths and locations of
residual contamination at a
site.



Utah's Population is projected to rise 66% by 2060

- 
- Population boom has increased the chances of land being redeveloped.
 - Onus is on the purchaser of the property to complete environmental assessments and reach out to DERR.
 - DERR determines if the original closure is still protective of human health and the environment for the changed land use.

Residual Risk Review (R3)

From 2020-21, DERR developed the R3 protocol to proactively review risk-based release closures.

What is R3?

- A series of questions, separated into two sets
- The first set of questions can be answered while sitting in the office
 - The answer “Yes” to any question in the first set triggers a more in-depth review: the second set of questions
- The second set of questions may require outreach to current property owners or a site visit to answer the questions.



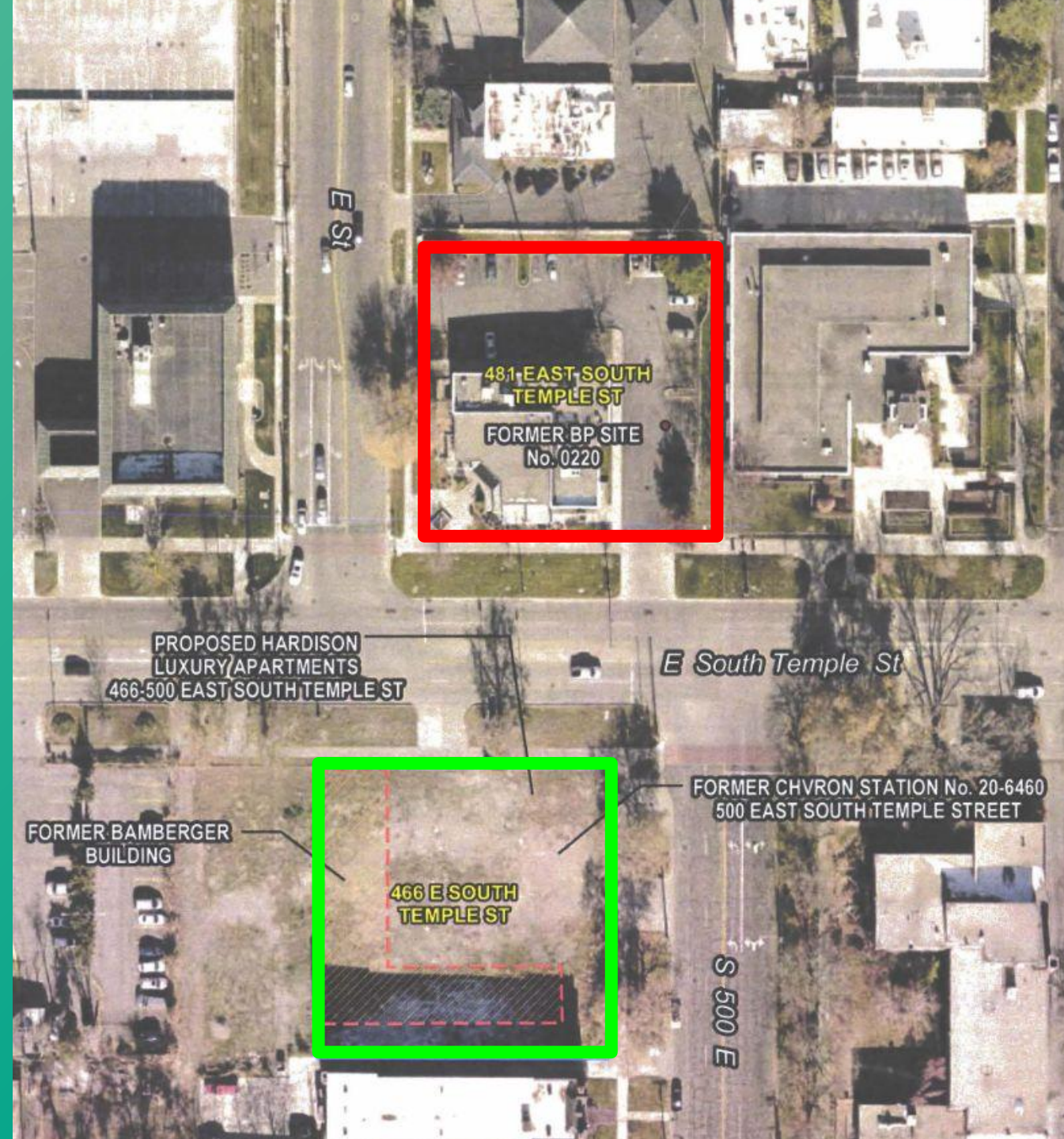


Tanks Database Module

- Developed simultaneously with R3 protocol
- Walks the project manager through the R3 process and records the details of each R3 review

R3 Demonstration: Brigham Street Service

located at 479 E South Temple
Salt Lake City, Utah
Institutional Controls
NFA issued July 2016



Residual Risk Review

Set 1

Questions answered while in
the comfort of the office

Are there differences between previous (at closure or prior review) and current aerial imagery?

Use ARCMAP, Google Earth, or other software.

Set 1
Question 1

Are there differences between closure
aerial imagery and current aerial
imagery?

Set 1
Question 1
Answer:
Yes!



Brigham Str. Service, 2016

Brigham Str. Service, 2022

Have buildings been demolished, replaced, modified, or added?

Evaluate current street level imagery or photos available in site files.

Set 1
Question 2

Have buildings been demolished, replaced, modified, or added?

Set 1
Question 2
**Answer:
Yes!**



Brigham Str. Service, 2016



Brigham Str. Service, 2022

Has the site been partially or fully redeveloped?

Answer: Yes!

Empty lot to apartment building.

Set 1
Question 3

Have the on-site and/or surrounding property uses changed with the addition of new receptors, or have the original receptors at closure become more sensitive?

Answer: Yes!

Empty lot to residential.

Set 1
Question 4

Has the property changed ownership since the last review?

Answer: No.

The owner listed on the environmental covenant still owns the property, per county assessor online search, August 2022.

Set 1
Question 5

Have Water Rights been added within the critical distance, or have pre-existing Water Rights been modified?

Compare Water Rights in the closure package and/or prior review to current information.

Set 1
Question 6

Have Water Rights been added within the critical distance, or have pre-existing Water Rights been modified?

Set 1
Question 6
Answer:
No.



Brigham Str. Service, 2016

Brigham Str. Service, 2022

Are there Blue Stakes notifications in the “Blue Stakes Information” module in the release ID page of the database?

If excavation work was conducted in the area of known residual impacts, mark “yes”.

Set 1
Question 7

Are there Blue Stakes notifications in the “Blue Stakes Information” module in the release ID page of the database?

Set 1
Question 7
Answer:
Yes!

Utah State UST Database

Utah's UST Database

LUST Details

*Fields in blue are not editable

Release ID: FIA
Facility Details

Alt Facility ID: 4000093
Owner ID: 5917
Risk Assessment Info

Clerk: matkinson
Modified: 8/20/2019 2:44:21 PM

Save
Back

1 of 1

Owner Information

Facility Information

ReDev Docs Map

Redev Potential: Yes

Attention: _____
Name: DO 1 INC
Street: P O BOX 27837
City: SALT LAKE CITY
County: SALT LAKE
State: UT
Zip: 84127
Phone: (801) 463-6242
Cell: () - -
FAX: () - -
Email: did@dunnoll.com

Contact: NEIL ATKIN
Name: BRIGHAM ST SERVICE
Street: 479 E SOUTH TEMPLE
City: SALT LAKE CITY
County: SALT LAKE
State: UT
ZIP: 84111
Phone: () - -
Utm Easting X: 425976
Utm Nthing Y: 451374
Utm Desc: Orthoquad (DOQ) 1 meter image

RP Owner Information

Is any documentation available indicating a natural disaster may have impacted contaminant mobility (i.e. a flood, landslide, wind event, earthquake, etc.) in the past three years?

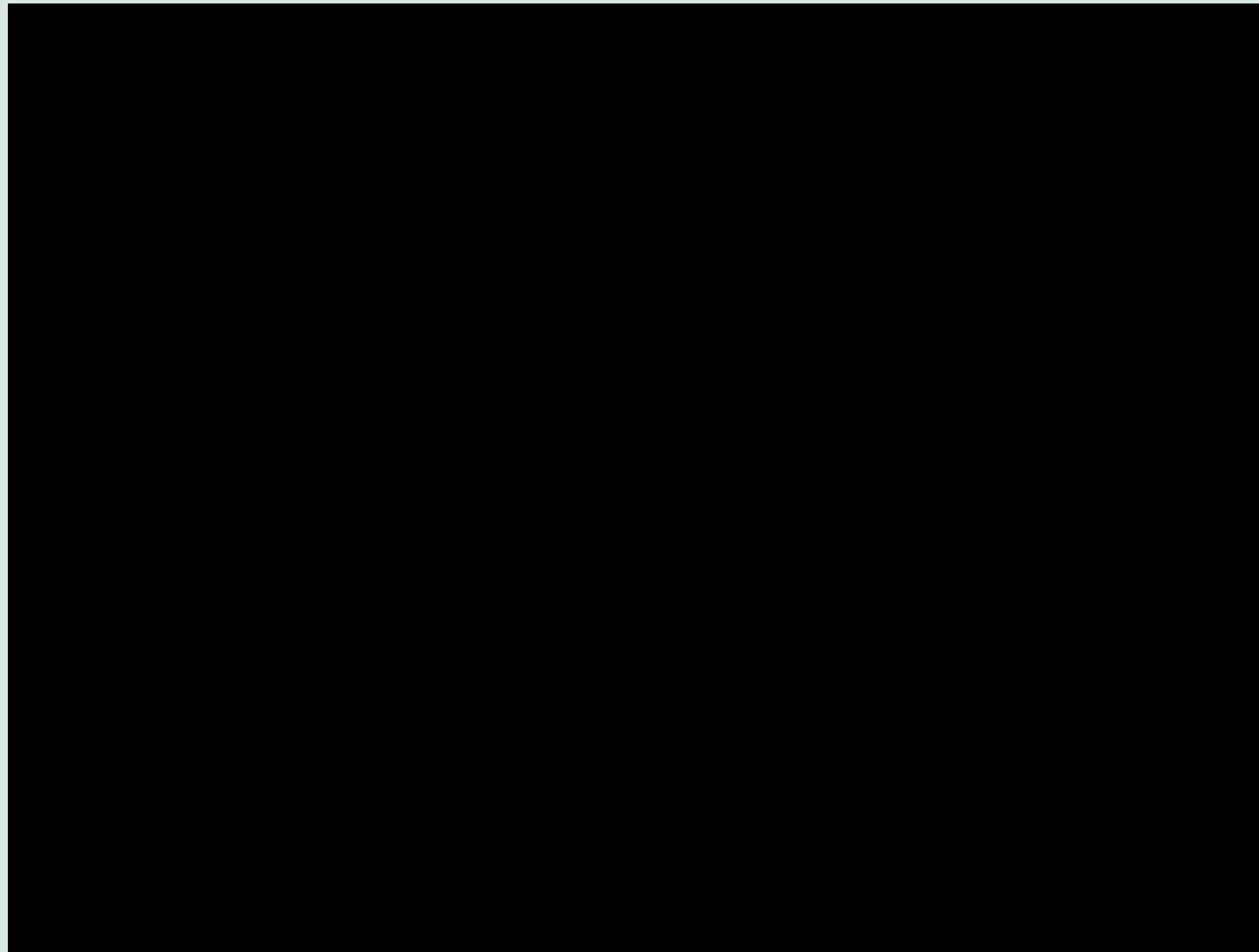
Check the Utah Department of Public Safety, Division of Emergency Management incident map.

**Set 1
Question 8**

Type

-  Large Crowd Event
-  Algal Bloom
-  Avalanche
-  Earthquake
-  Flood
-  Landslide
-  Winter Storm
-  Tornado
-  Wind Storm
-  HAZMAT
-  Wildfire
-  Water Supply Issues
-  Biohazard
-  Gas Leak
- Missing Person
- Other

Is any documentation available indicating a natural disaster may have impacted contaminant mobility in the past three years?



Set 1
Question 8
Answer:
No.

Have any environmental incidents occurred on the subject property or adjoining properties which may impact the residual risk?

Check the Environmental Incident layer in the DEQ Interactive Map. Mark “No” if nearby incidents don’t appear to be impacting the risk.

Set 1
Question 9

Have any environmental incidents occurred on the subject property or adjoining properties which may impact the residual risk?

Set 1
Question 9
Answer:
No.



surface diesel
spill < 30 gallons

transformer oil
spill at power
company

Residual Risk Review

Set 2

Questions requiring a more in depth review and possible site visits

Was the redevelopment or land use change completed without DERR involvement?

Check the release file for documentation of DERR involvement. If redevelopment or land use modifications have occurred without DERR involvement, make inquiries to the property owner. Evaluate if the changes have any impact on the risk.

Set 2
Question 1

Was the redevelopment or land use change completed without DERR involvement?

Set 2
Question 1
Answer:
No.

eZ Search Public	Preview	Doc #	Site ID	Name	Sub Pgm	Category	Doc Date	Title
View		DERR-2018-005993	FIA	BRIGHAM ST SERVICE	Closed Releases		06/14/2018	Site Management Plan 4000093 FIA.pdf
View		DERR-2018-005885	FIA	BRIGHAM ST SERVICE	Correspondence		05/16/2018	BP_Station_22_(SLC Letter_to_DEQ)_RiskMgtPla
View		DERR-2018-005884	FIA	BRIGHAM ST SERVICE	Correspondence		05/09/2018	BP 0220 Risk Management Plan 481 South Temple.pdf
View		DERR-2018-005883	FIA	BRIGHAM ST SERVICE	Correspondence		05/09/2018	Arcadis BP220 Well Aband Rpt.pdf
View		DERR-2018-005176	FIA	BRIGHAM ST SERVICE	Closed Releases		05/18/2018	Risk Management Plan 4000093 5-14-2018.p
View		DERR-2018-005175	FIA	BRIGHAM ST SERVICE	Closed Releases		05/07/2018	Risk Management Plan 4000093.pdf
View		DERR-2018-002431	FIA	BRIGHAM ST SERVICE	Redevelopment		03/14/2018	Hardison - 4000093 Brigham St FACT SHEET.p
View		DERR-2018-002430	FIA	BRIGHAM ST SERVICE	Redevelopment		03/14/2018	4000093 Hardison Final Approved Color Elevatio 2017.pdf
View		DERR-2018-002429	FIA	BRIGHAM ST SERVICE	Redevelopment		03/14/2018	4000093 Brigham Street Aerial.JPG

Have changes or additions to the Water Rights affected the residual risk at the site?

Answer: No.

Not applicable.

Set 2
Question 2

Is there evidence that engineering controls are not still in place and/or functioning as outlined in the EC?

Verify current conditions or operating status through inquiry to the tank inspector/District Engineer/owner/responsible party/former consultant/etc or conduct a site visit.

Set 2
Question 3

Is there evidence that engineering controls are not still in place and/or functioning as outlined in the EC?

Set 2
Question 3
Answer:
No.

with law and in accordance with the approved Pre-Construction Plan described in Paragraph 8(d)(i), below. Owner shall maintain documentation demonstrating the proper handling and disposal of contaminated soil and groundwater, including waste manifests, and submit them to the DERR with the Post-Construction Report referenced in Paragraph 8(d)(ii), below. Owner shall retain a Utah DERR certified underground storage tank consultant to oversee the removal of contaminated soil and/or groundwater, and a Utah DERR certified soil and groundwater sampler to conduct sampling.

- iii. When constructing any structure, Owner shall install, maintain and operate vapor-related engineering controls to eliminate the potential for subsurface vapor phase petroleum to migrate into the structure, unless a vapor intrusion risk assessment is conducted and shows that there is no unacceptable vapor intrusion risk, as determined by DERR using the criteria and standards as required by Utah Admin. Code R311-211 Corrective Action Clean-Up Standards Policy – UST and CERCLA Sites, as may be amended from time to time.

Pre-Construction Plan. Owner will comply with the following prior to, during, and post construction:

- i. Prior to beginning any construction, Owner shall submit a Pre-Construction Plan to the DERR and obtain approval of said plan by the DERR. The Pre-Construction Plan shall include the following:
 - A) A description of how contaminated soils and groundwater will be handled and disposed of during construction:

in soil from approximately 10 to 20 feet bgs at concentrations exceeding the Utah Division of Environmental Response and Remediation (UDERR) underground storage tank (UST) facility cleanup standards (Tables 1 and 2). Based on available records, COPC concentrations in site groundwater have not been greater than UDERR cleanup standards since June 2006, when benzene was detected at concentrations greater than the UDERR initial screening level (ISL) in the groundwater sample collected from AMW-29.

Results of a risk assessment conducted on the former Bamberger Property indicate that exposure to impacted groundwater and soil are incomplete pathways. Exposure to soil vapor, while a potentially complete pathway, will be mitigated with the use of a vapor barrier installed beneath the elevator shafts and stairwells (Arcadis 2016a). Results of a risk assessment conducted on the former BP site and beneath East South Temple Street indicate ongoing degradation of residual petroleum below these areas, therefore, exposure to site media should not result in unacceptable risk to future receptors (Arcadis 2017).

2 SITE CONDITIONS

This section describes the site geology and hydrogeology, and the impacted soil, groundwater, and soil vapor near the site.

2.1 Site Geology

The site is located on quaternary-age unconsolidated deposits known as the Provo Formation and younger lake bottom sediment, typically consisting of clay, silt, and sand (Arcadis 2014b). Based on the previous investigations conducted at the BP site and nearby properties, the soil consists of interbedded gravel, sand, silt, and clay (Arcadis 2013, 2014b).

Environmental Covenant, 2016

Risk Management Plan, 2018

Is there evidence that activity and use limitations are not in place and/or functioning as outlined in the EC?

Answer: No.

Culinary water is supplied to the building by the municipality.

Set 2
Question 4

Did utility activities encounter known residual impacts or create a new preferential pathway for contamination?

Answer: No.

Residual impacts were encountered, but property owner worked with DERR and had materials management and risk management plans in place.

Set 2
Question 5

If residual impacts were near a property boundary, does that adjoining property have increased risk due to any documented land use change?

Answer: No.

Adjoining properties are unchanged.

Set 2
Question 6

Residual Risk Review Results

Set 1: six “Yes”
Set 2: zero “Yes”

The results of Set 1 indicate a land use change since closure; however, DERR has documentation of these changes, and risks were mitigated. **Site will not be reopened** at this time and will be reviewed again in three years.

What if the property owner hadn't worked with DERR?


... or what if there was no documentation of what occurred?

The project manager, section managers, branch manager, and toxicologist would meet to discuss

- current site conditions
- any concerns
- funding
- if there are grounds to **reopen** the release



Future Work

- 
- All risk-based closure sites reviewed every three years
 - Apply R3 to sites closed in the 1990's before risk-based closures were tracked in the Tanks Database

Thank you



Avery Holyoak

Petroleum Storage Tank
Remedial Assistance & Cleanup
Section Manager



PHONE

(385) 391-8126



EMAIL

aholyoak@utah.gov

Questions?