California Low-Threat Closure Policy

Catalina Espino Devine
Lead Engineer
Chevron Energy Technology Company

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Outline

- Overview of California Low-Threat Underground Storage Tank Policy (LTCP)
- LTCP's Technical Criteria
  - General criteria
  - Media-specific criteria
- Example 1
- Example 2
- Conclusions
- Q&A

Overview of California Low-Threat Underground Storage Tank Policy (LTCP)

California passed LTCP in August 2012; as a result of

1. A growing need to **prioritize resources** for open UST environmental cases
2. A need to provide a **consistent approach** to site closure in the state.

The Policy results from a collaboration between regulators, industry, environmental (non-profit) organizations and consultants.

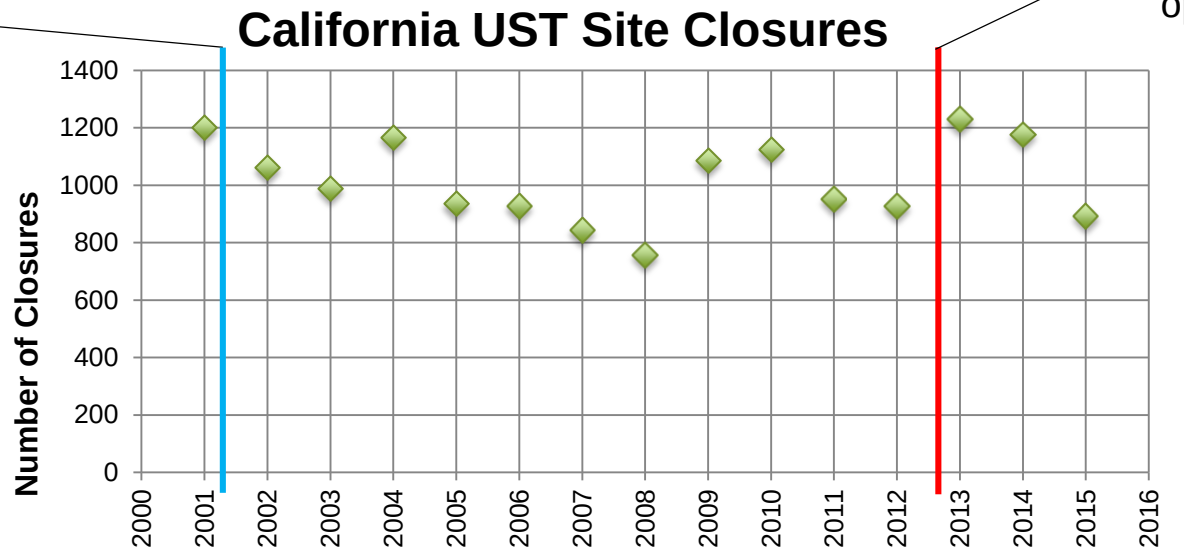
SWRCB – State Water Resources Control Board
UST – Underground Storage Tank

Overview of California LTCP

- **August 17, 2012 –** The Policy came into effect in California
- **2016 -** ~4000 remain open cases

~18,000 open UST cases

The Policy is in effect in Aug. 2012 (~7300 open UST cases)



Source of data: State public database (GeoTracker), Oct. 2016

Overview of California LTCP

- The State of California recognizes in the policy:

1. Resources available for environmental restoration are limited, and that the highest priority of these resources must be the protection of human health and the environmental receptors.
2. Experience and knowledge have demonstrated the ability of remedial technologies to mitigate a substantial fraction of the petroleum contaminant mass with the investment of a reasonable level of effort.
   a. Experience has also shown that residual contaminant mass usually remains after the investment of reasonable effort, and that this residual mass is difficult to completely remove regardless of the level of additional effort and resources invested.
3. Petroleum fuels releases naturally attenuate in the environment.
4. Individual UST release studies show that many petroleum release cases pose a low threat to human health and the environment.

UST – Underground Storage Tank

Overview of California LTCP

- Applies to UST cases in California, and can also be used for non-UST sites with “similar releases” (e.g., aboveground tank/pipeline petroleum releases):
- Applies to residential, commercial and industrial sites.
  - Different criteria applies to residential vs. commercial/industrial for VI, direct contact and outdoor air exposure pathways.
  - Each exposure pathway is evaluated separately.
- Can be used for active gas stations (Example 1)
- LTCP includes site review, stakeholder notification and monitoring well destruction requirements.

❑All of LTCP’s general and media specific criteria needs to be met in order to be deemed low threat.

❑Closure of sites are allowed under “low threat” or “low risk”.

LTCP General Criteria

a. The unauthorized release must be in a service area of a public water system.

b. The unauthorized release must consist of “petroleum”. This is defined as crude oil, or any fraction thereof, including motor fuels, jet fuels, distillate fuel oils, residual fuel oils, lubricants, petroleum solvents and used oils.

c. The unauthorized release must be stopped - Sites with ongoing leaks do not qualify.

d. Free product has been removed to the maximum extent practicable.

e. A conceptual site model has been developed.

f. Secondary source removal has been removed to the extent practicable.

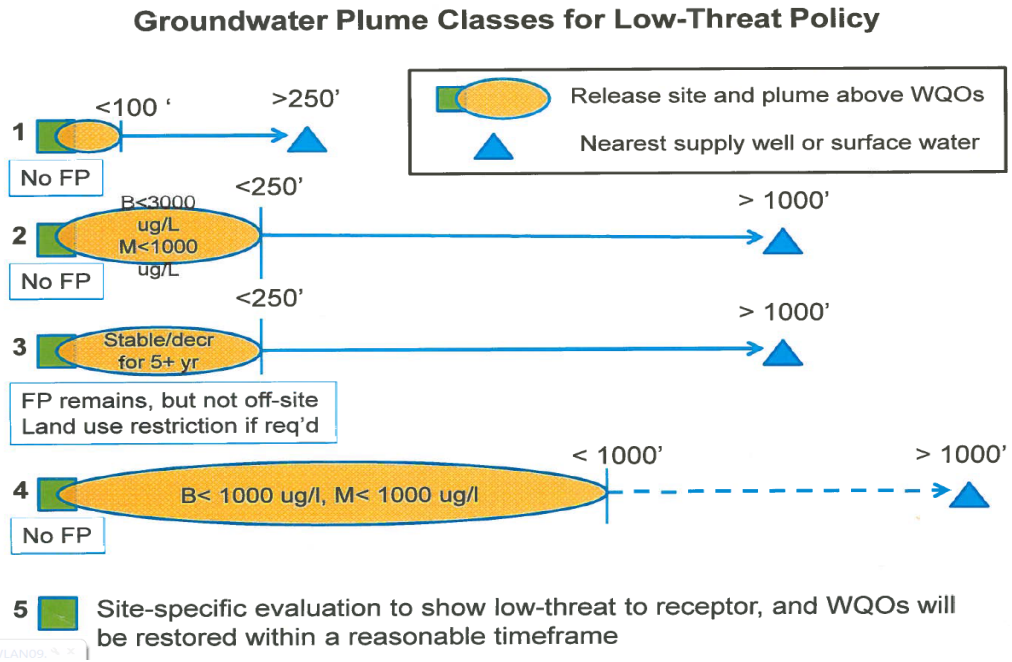
g. MTBE testing requirement: Soil, groundwater, or both, must be tested.

h. Nuisance* does not exist. Sites cannot be closed if they result in a nuisance as defined by Water Code section 13050.

*** -- Nuisance** - Under the California Water Code, section 13050(m), nuisance means anything which meets **all** of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property, (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal, (3) Occurs during, or as a result of, the treatment or disposal of wastes.

Source: California State Water Resources Control Board
www.swrcb.ca.gov/ust/lt_cls_plcy.shtml

Media-Specific Criteria
Groundwater: 5 Classes

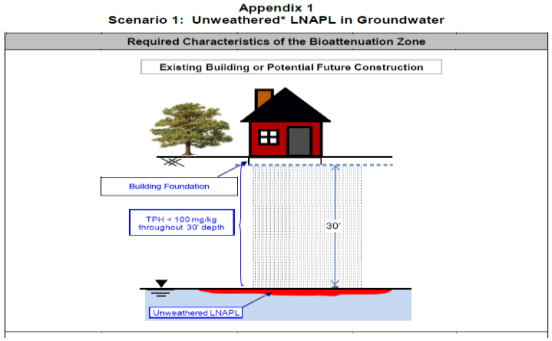


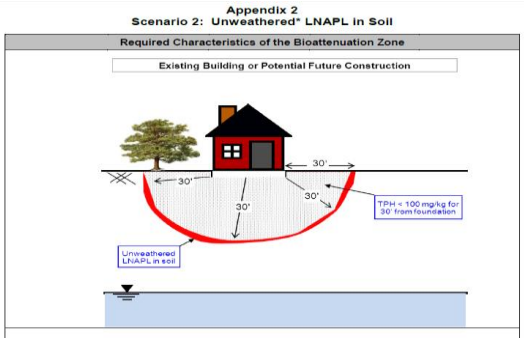
The Policy allows for closure if the GW plume that exceeds the WQOs is decreasing or stable in areal extent, and meets one of the 5 Classes below.

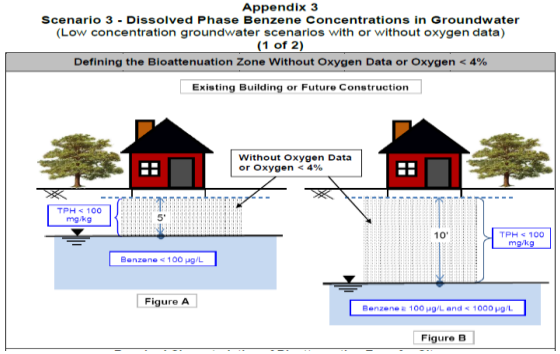
GW – Groundwater
B – Benzene
M – Methyl tertiary butyl ether (MTBE)
FP – Free product
WQO – Water Quality Objective (regulatory cleanup levels)

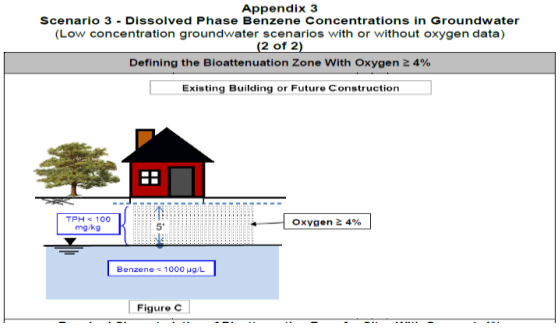
Source: California State Water Resources Control Board
www.swrcb.ca.gov/ust/lt_cls_plcy.shtml

Media Specific Criteria
Vapor Intrusion (VI) to Indoor Air







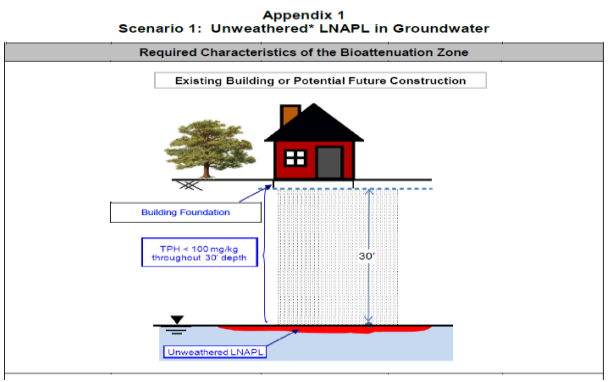


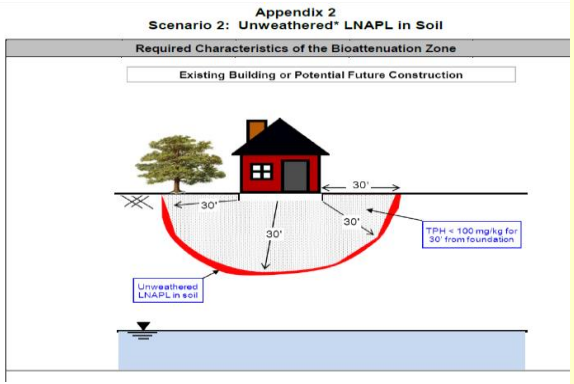
- The Policy describes conditions for bioattenuation zones, which if they are met they will "*assure that exposure to petroleum vapors in indoor air will not pose unacceptable risks" (SWRCB LTCP, 2012).*
- The Policy allows the use of different type of historical data (oxygen, TPH, etc.) to evaluate bioattenuation zones

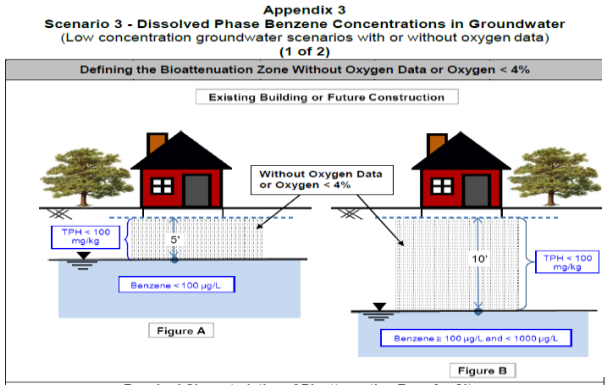
LNAPL – Light Non-Aqueous Phase Liquid or free product

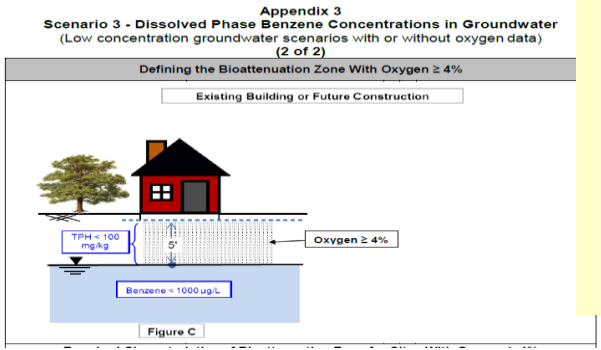
Source: California State Water Resources Control Board *www.swrcb.ca.gov/ust/lt_cls_plcy.shtml*

Media Specific Criteria
VI to Indoor Air









- LTCP Service Station exemption: *"Exposures from petroleum vapors from historical releases are comparatively insignificant relative to exposures from surface spills and fugitive vapor releases that typically occur at active fueling facilities…criteria for petroleum VI to indoor air is not required at active commercial fueling facilities, except in cases where release characteristics can be reasonably believed to pose an unacceptable health risk" (LTCP, 2012)*

LNAPL – Light Non-Aqueous Phase Liquid or free product

Source: California State Water Resources Control Board *www.swrcb.ca.gov/ust/lt_cls_plcy.shtml*

Media Specific Criteria
Direct Contact and Outdoor Air Exposure

Table 1
Concentrations of Petroleum Constituents in Soil That Will Have No Significant Risk of Adversely Affecting Human Health

Chemical	Residential		Commercial/ Industrial		Utility Worker
	0 to 5 feet bgs mg/kg	Volatilization to outdoor air (5 to 10 feet bgs) mg/kg	0 to 5 feet bgs mg/kg	Volatilization to outdoor air (5 to 10 feet bgs) mg/kg	0 to 10 feet bgs mg/kg
Benzene	1.9	2.8	8.2	12	14
Ethylbenzene	21	32	89	134	314
Naphthalene	9.7	9.7	45	45	219
PAH[1]	0.063	NA	0.68	NA	4.5

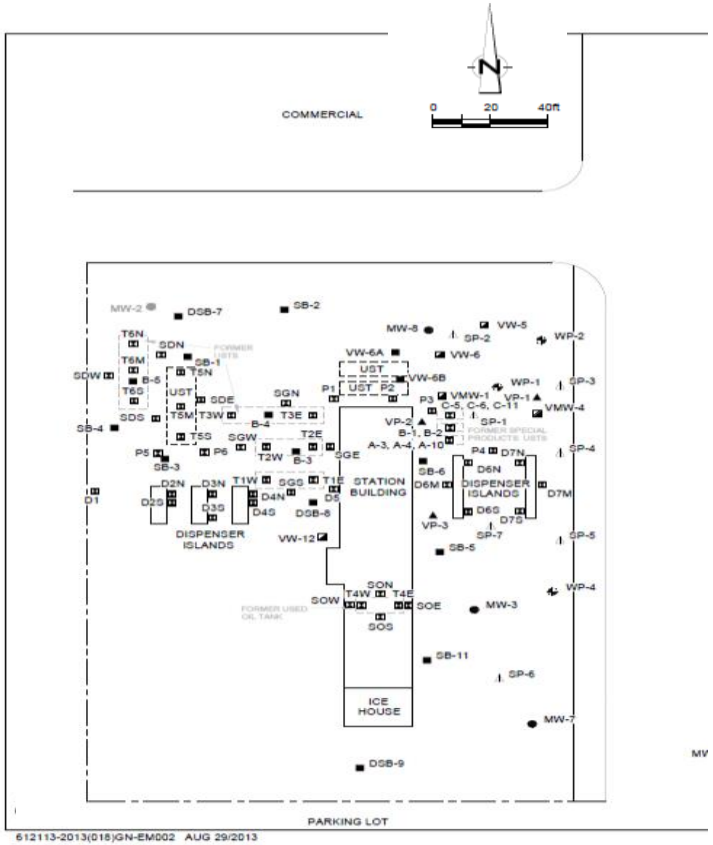
Notes:
1. Based on the seven carcinogenic poly-aromatic hydrocarbons (PAHs) as benzo(a)pyrene toxicity equivalent [BaPe]. Sampling and analysis for PAH is only necessary where soil as affected by either waste oil or Bunker C fuel.
2. The area of impacted soil where a particular exposure occurs is 25 by 25 meters (approximately 82 by 82 feet) or less.
3. NA = not applicable
4. mg/kg = milligrams per kilogram

Soil criteria limited to the first 10 ft below ground surface (bgs)

Source: California State Water Resources Control Board
www.swrcb.ca.gov/ust/lt_cls_plcy.shtml

Examples

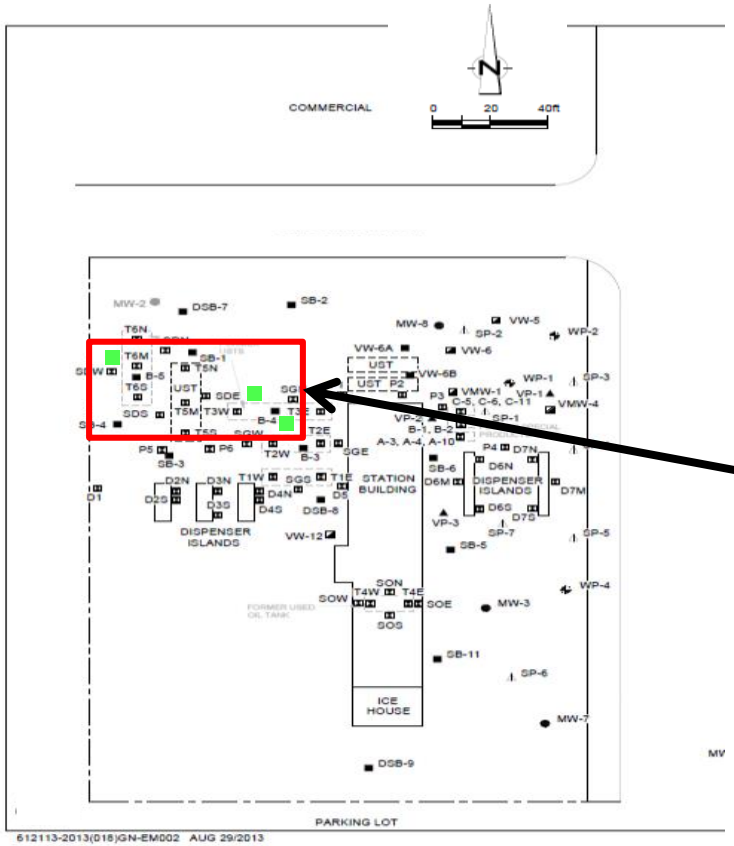
Example 1
Active Service Station



- ✓ Site meets LTCP general criteria
- ✓ Site meets groundwater LTCP criteria
- ✓ Site is exempt from the VI criteria (active service station)
- ✓ Site was remediated using AS/SVE technology for 1 year
- ✓ The release has been stopped
- ✓ There is no free product

Source: State public database (GeoTracker)
VI – Vapor intrusion
AS/SVE – Air sparging/Soil Vapor Extraction

Example 1
Active Service Station



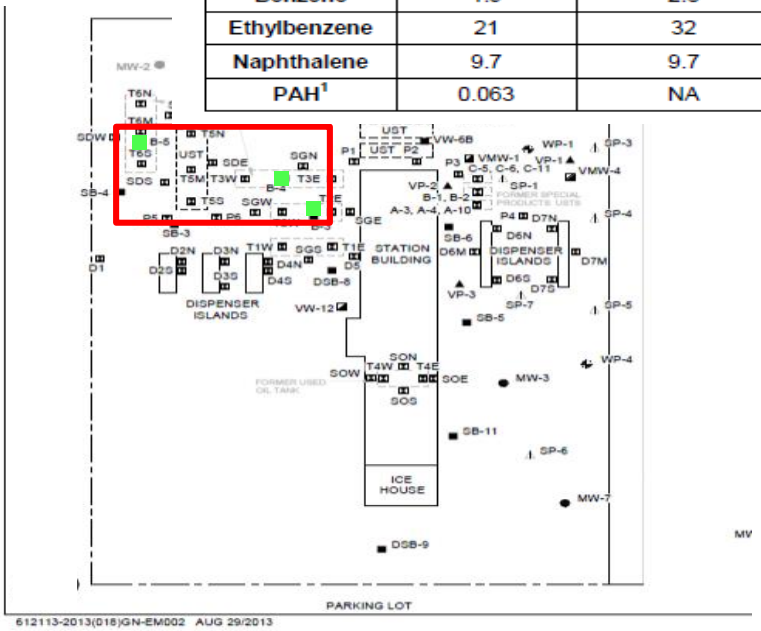
- ✓ Site meets groundwater LTCP criteria
- ✓ Site is exempt from the VI criteria (active service station)
- ✓ Site was remediated using AS/SVE technology for 1 year
- ✓ The release has been stopped
- ✓ There is no free product

- ❑ Regulator agreed the site largely meets LTCP but required additional soil assessment to evaluate **direct contact and outdoor air exposure criteria** near the former UST tank area.

Source: State public database (GeoTracker)

Example 1
Active Service Station

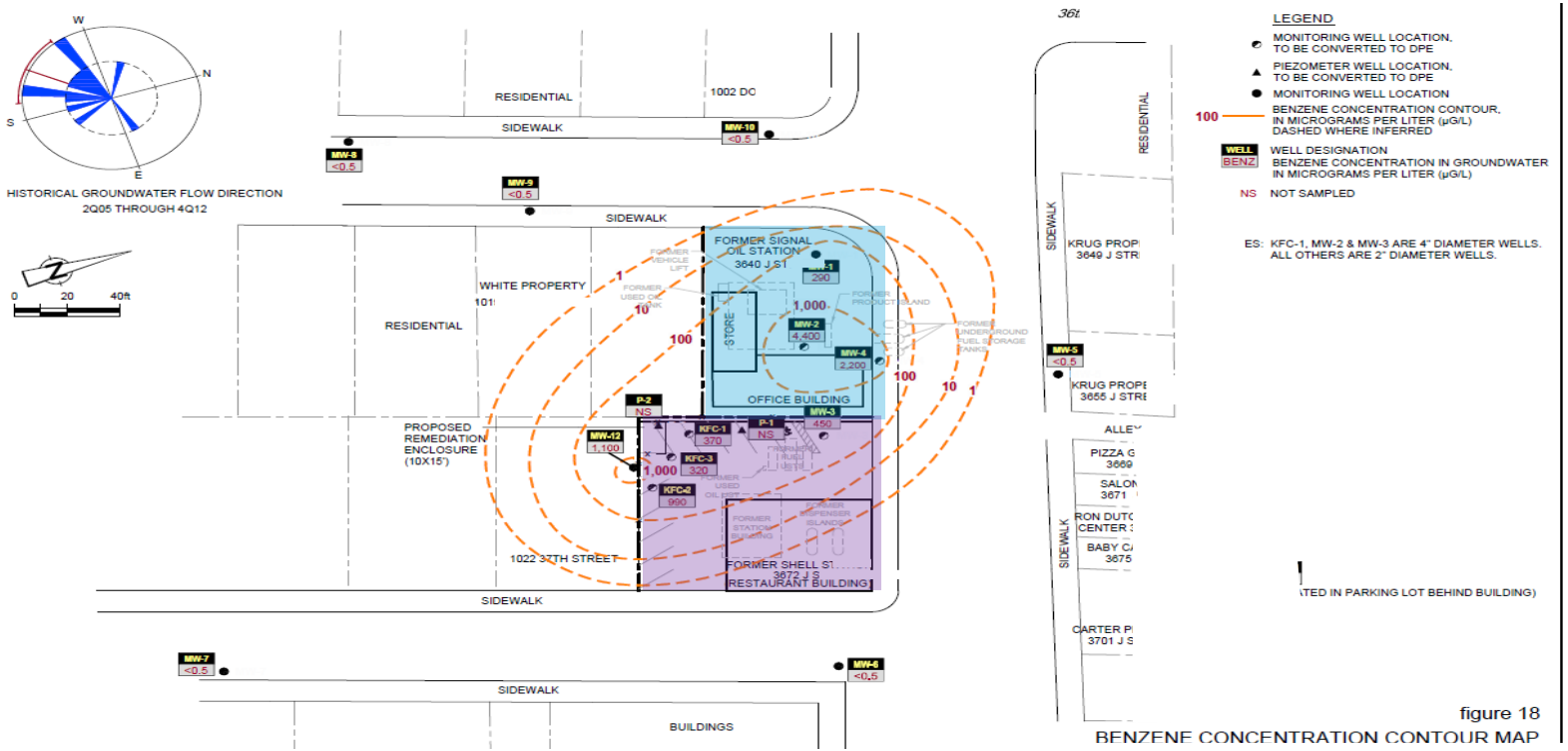
Chemical	Residential		Commercial/ Industrial		Utility Worker	Site-specific Max. Concentrations (mg/kg)
	0 to 5 feet bgs mg/kg	Volatilization to outdoor air (5 to 10 feet bgs) mg/kg	0 to 5 feet bgs mg/kg	Volatilization to outdoor air (5 to 10 feet bgs) mg/kg	0 to 10 feet bgs mg/kg	
Benzene	1.9	2.8	8.2	12	14	ND
Ethylbenzene	21	32	89	134	314	ND
Naphthalene	9.7	9.7	45	45	219	0.12
PAH[1]	0.063	NA	0.68	NA	4.5	NA



✓ After additional site assessment, regulator agreed the site meets all of LTCP criteria and closed site.

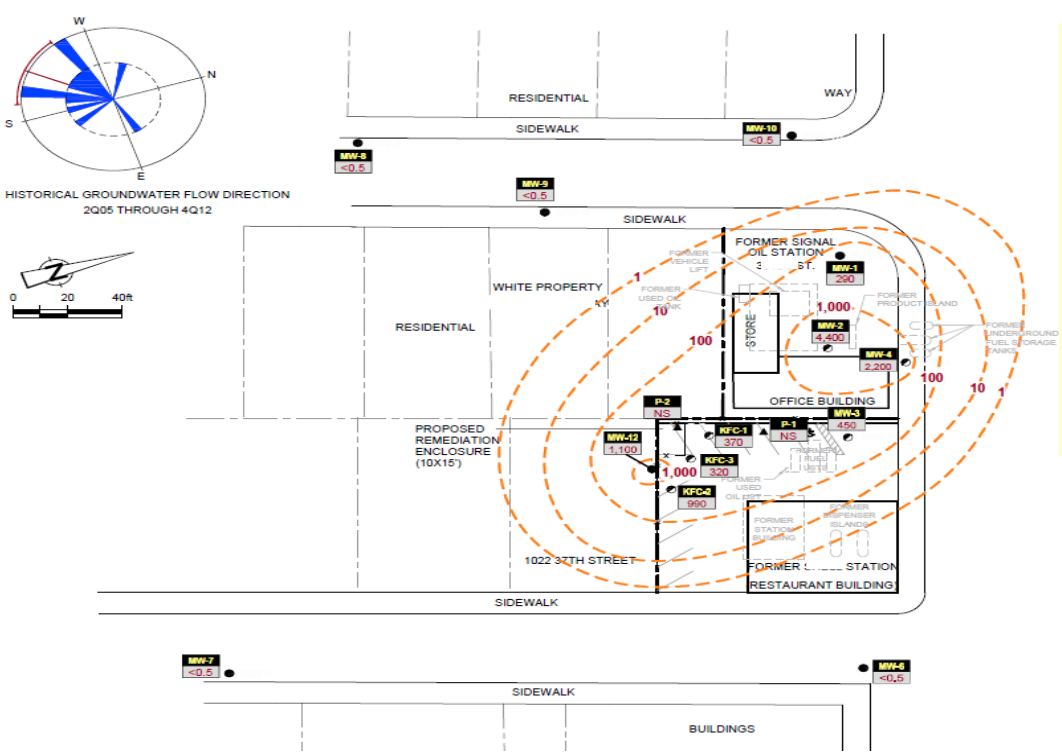
Source: State public database (GeoTracker)
ND – Non detect
NA – Not applicable

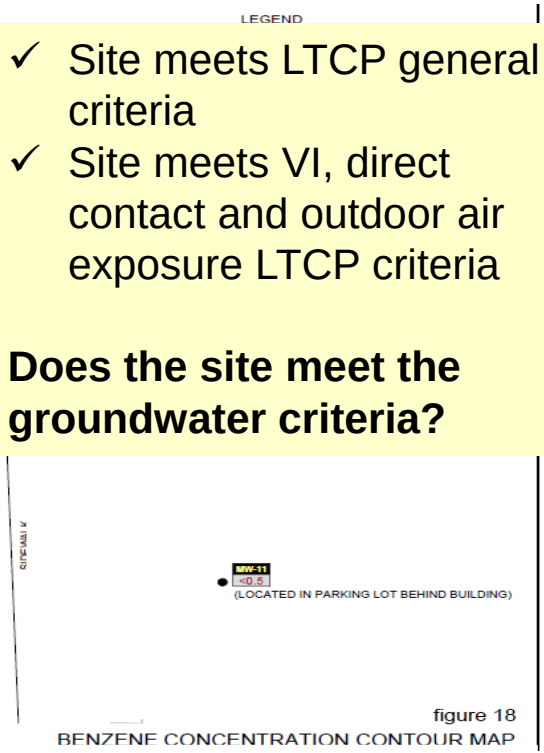
Example 2
Commercial Buildings



Source: State public database (GeoTracker)

Example 2



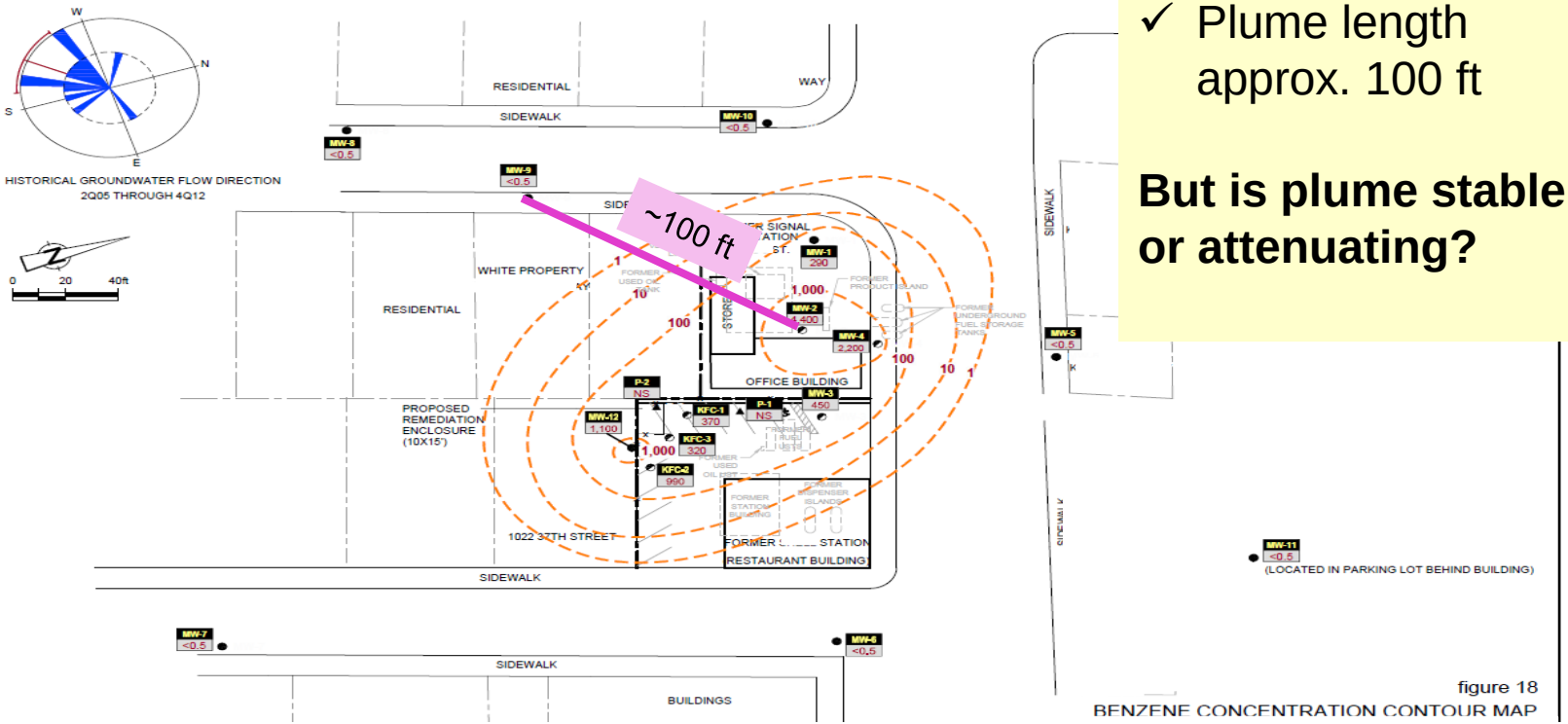


- ✓ Site meets LTCP general criteria
- ✓ Site meets VI, direct contact and outdoor air exposure LTCP criteria

Does the site meet the groundwater criteria?

Source: State public database (GeoTracker)

Example 2

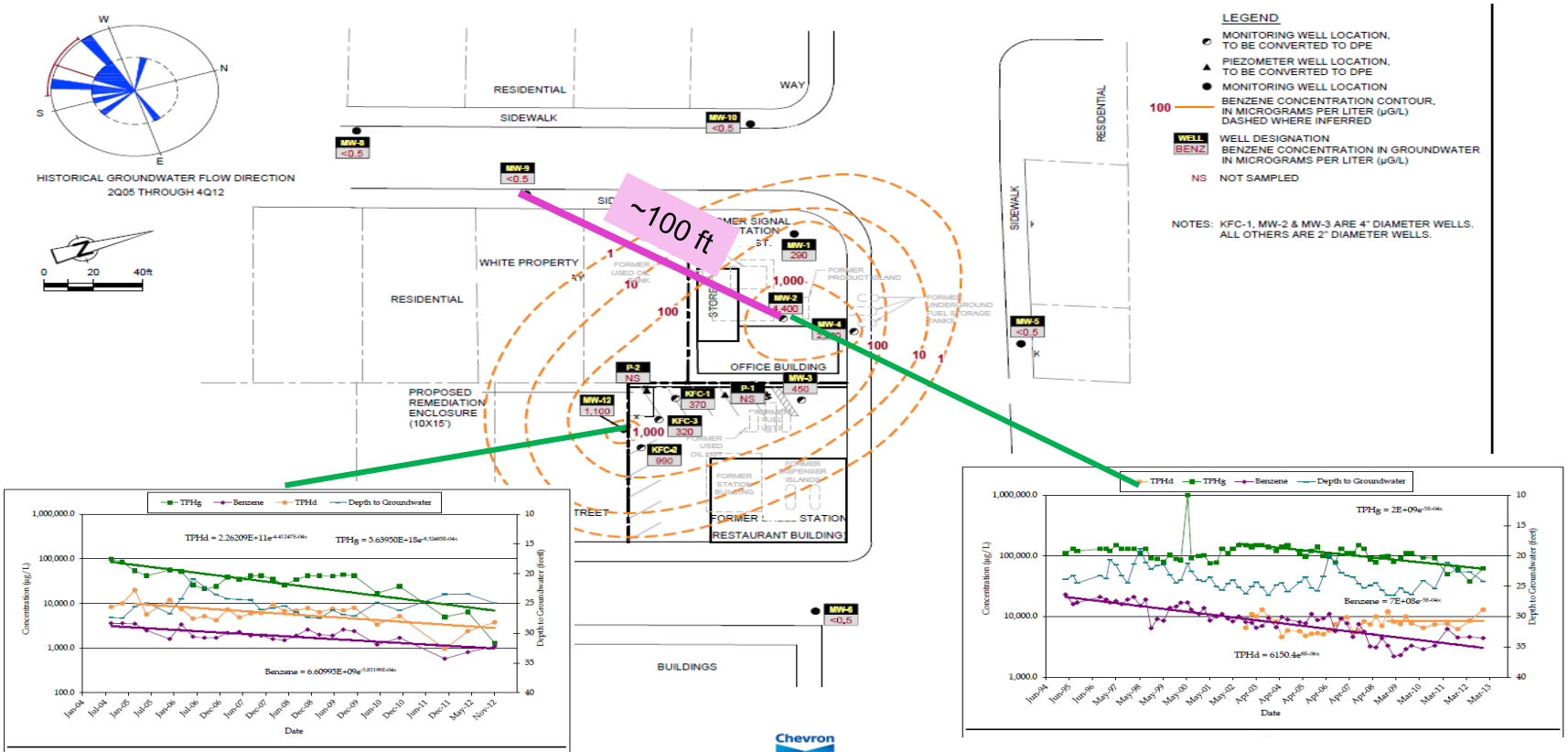


- ✓ Plume length approx. 100 ft

But is plume stable or attenuating?

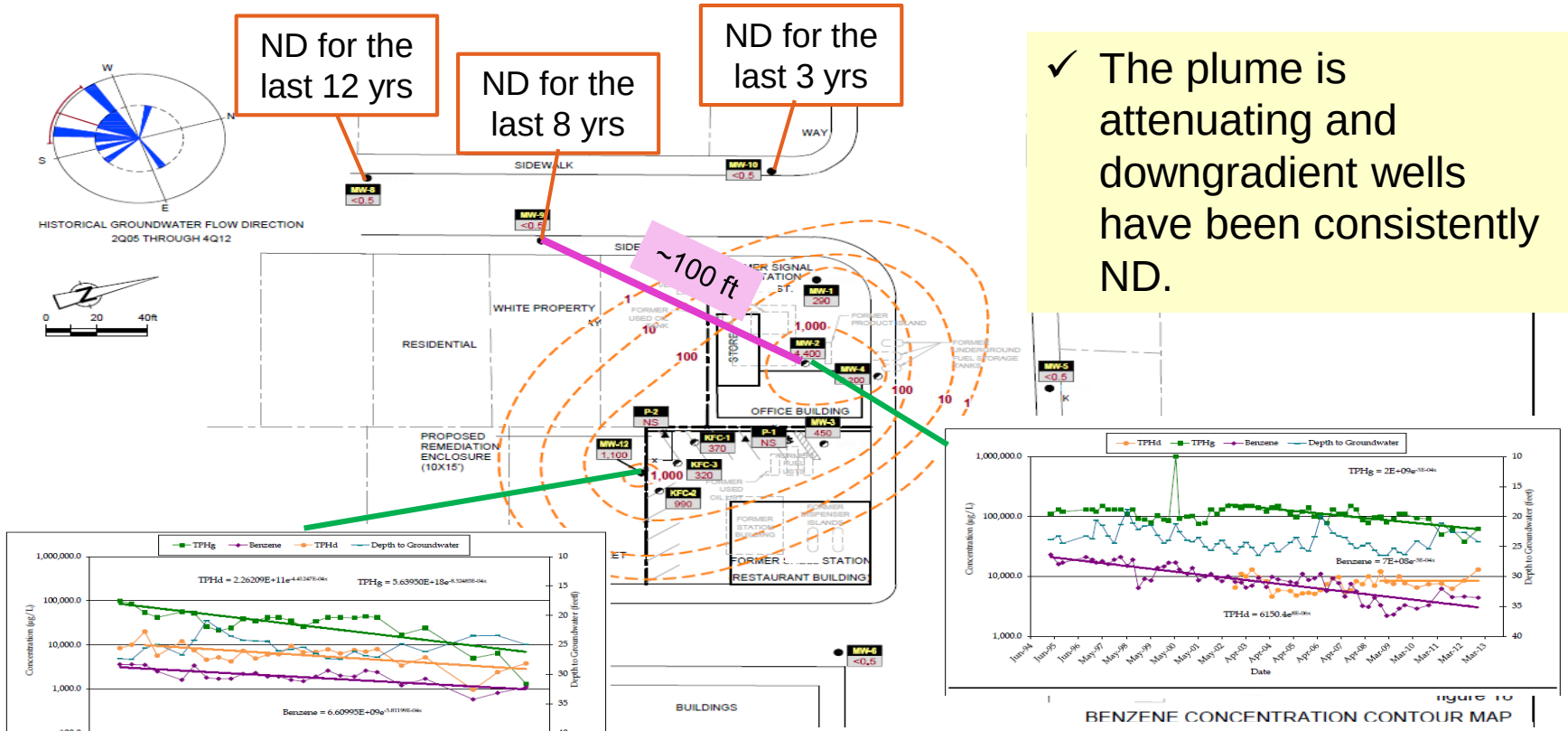
Source: State public database (GeoTracker)

Example 2



Source: State public database (GeoTracker)

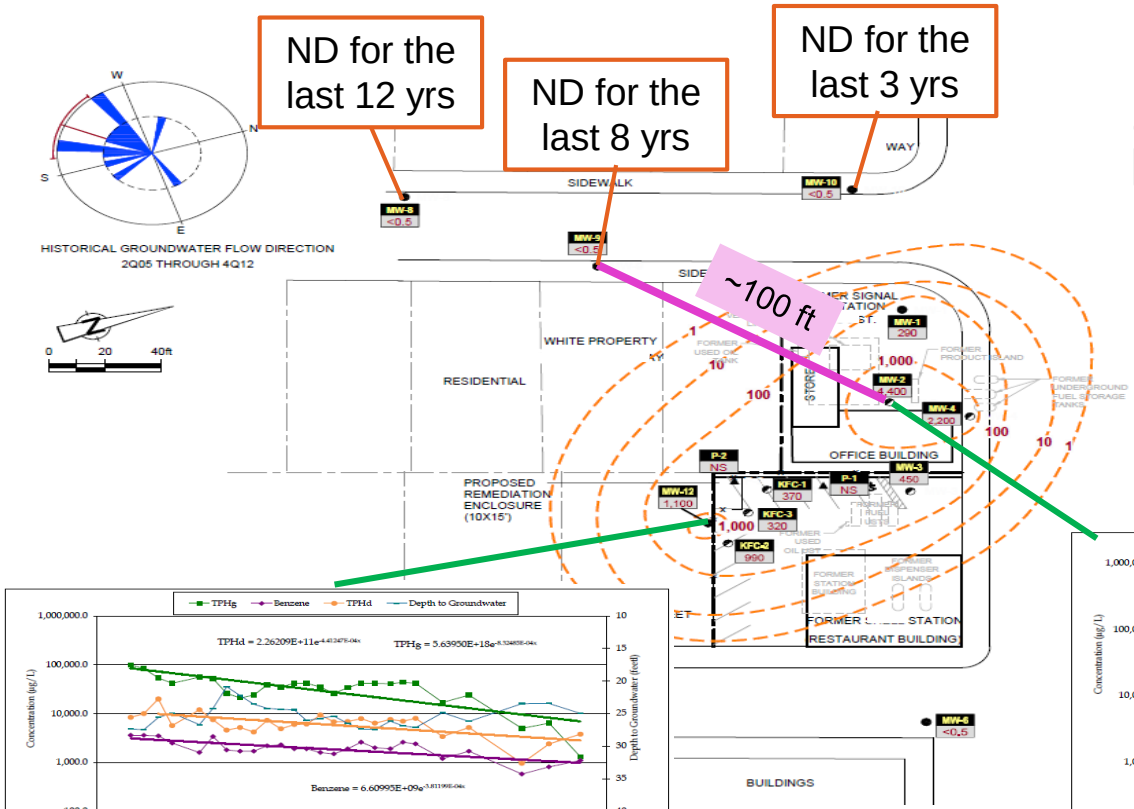
Example 2

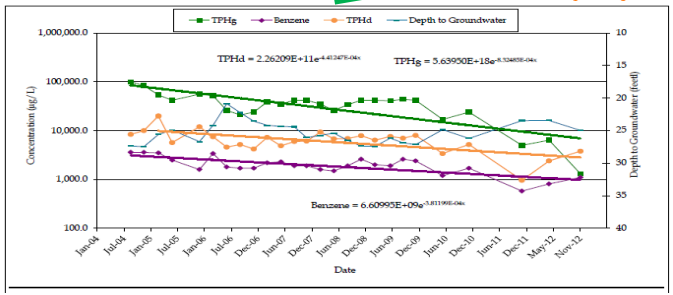


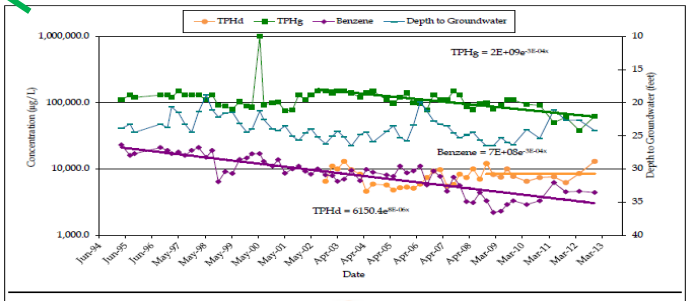
- ✓ The plume is attenuating and downgradient wells have been consistently ND.

ND –Not detected
Source: State public database (GeoTracker)

Example 2







Agency granted closure based on site-specific conditions that under current and reasonable anticipated near-term future scenarios, **the contaminant plume poses a low threat to human health and the environment.** The WQOs will be achieved within a reasonable time frame.

ND –Not detect
Source: State public database (GeoTracker)

Conclusions

- **California's LTCP is:**
  - A framework for identifying low-threat UST-release sites (or similar sites) for expedited closure or for identifying closure impediments and work towards addressing those closure impediments
  - A way of focusing resources on high priority cases
  - A way of applying a consistent approach to regulatory decisions, site assessment and remedial actions
- **California LTCP <u>is not:</u>**
  - A way to achieve regulatory closure for all sites irrespective of risk
  - The only way to evaluate UST cases for closure (site-specific risk assessments are also viable options)
- **Other LTCP-like efforts:**
  - The state of Washington is considering an LTCP-like approach for UST cases

Thank you

Q&A