

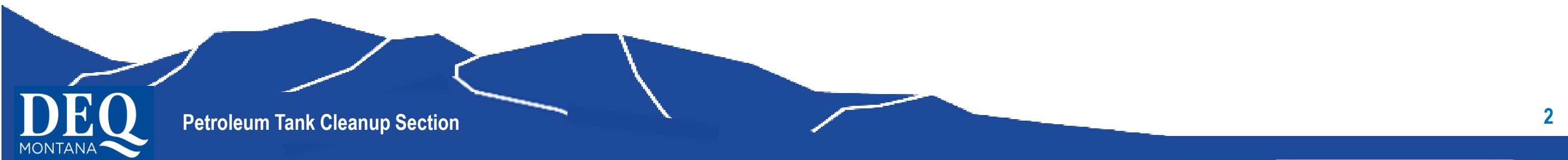
Montana Petroleum Tank Releases, Data Tables & Deferred Cleanups

Consultant's Day February 9, 2024

Jay Shearer | Billings Office | jshearer@mt.gov
Petroleum Tank Cleanup Section (PTCS)
Tanks, Brownfields, and Federal Facilities Bureau

Discussion Items

1. Cumulative Data Tables
2. Petroleum Releases & Resolution
3. Inaccessible Contaminated Media =
Deferred Cleanup



Cumulative Data Tables

- Soil, Water, & Vapor
- Lab Data, Field Data & site-specific info
- Confirmation date to present
- Organize by date; oldest to newest
- Use the Lab Detection Limit, not 'ND'

Cumulative Data Tables

Owner / RP & Consultant:

- Compile & Review Cumulative Tables
 - RBSLs vs Analyte concentrations
 - 3-D distribution of Analyte concentrations
 - Identify Data Gaps in RCP
- Propose / Develop new WPs

Cumulative Data Tables

Owner / RP & Consultant develop WPs

- Investigation
- Cleanup
- Compliance Monitoring
- move Release towards resolution

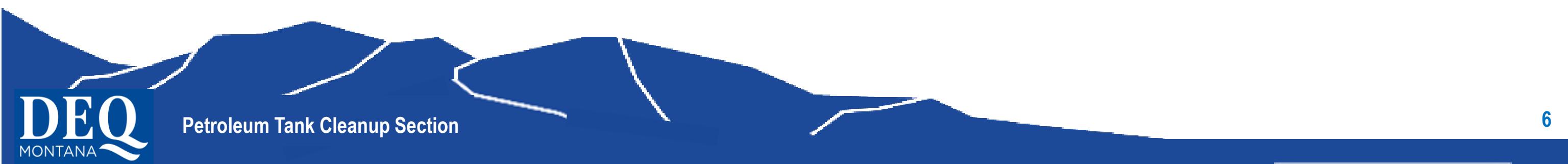
Cumulative Soil Data (extract)

Table 1. Soil Sample Laboratory Analytical Results for VPH & EPH Compounds

Location and Field Data			Volatile Petroleum Hydrocarbons, mg/kg										Extractable Petroleum Hydrocarbons, mg/kg					
Sample ID	Location	Sample Date	Sample Depth (ft)	MTBE	Benzene	Toluene	Ethyl-benzene	Xylenes	Naphthalene	C9-C10 Aromatics	C5-C8 Aliphatics	C9-C12 Aliphatics	TPH	EPH Screen	TEH	C9-C18 Aliphatics	C19-C36 Aliphatics	C11-C22 Aromatics
June 1991 UST Removals at Tank Basin																		
Tank 1 N	Diesel	1991	8-10	<0.1 ²	5	18	15	112	6	250	125	--	2,000	--	5,560	2,224	--	3,336
Tank 1 S		1991	8-10	<0.1 ²	8	12	6	180	3	125	500	--	2,130	--	2,800	1,120	--	1,680
Tank 2 N	Diesel	1991	8-10	<0.1 ²	3	6	7	175	2	95	320	--	1,875	--	1,360	544	--	816
Tank 2 S		1991	8-10	<0.1 ²	0.2	9	8	160	2	100	67	--	525	--	1,730	692	--	1,038
Tank 3 N	Gasoline	1991	8-10	<0.1 ²	18	6.3	<0.2	150	1	165	520	--	2,500	--	--	--	--	--
Tank 3 S		1991	8-10	<0.1 ²	170	64	<0.2	590	15	250	500	632	3,500	--	--	--	--	--
July 2003 Tank Basin Soil Excavation: 90 cubic yards																		
SS#1	West Floor	2003	10	<0.1 ²	1.35	2.23	4.98	9.36	10	110	330	435	1,000	--	668	--	--	--
SS#2	East Floor	2003	10	<0.1 ²	2.03	6.77	8.27	57.7	9	145	370	625	2,240	--	14,300	5,720	--	8,580
SS#3	East Wall	2003	10	<0.1 ²	<1.43 ²	3.72	<1.07	3.61	13	22	34	5	138	--	254	--	--	--
SS#4	North Wall	2003	8-10	<0.1 ²	<10 ²	<10	<7.5	25.1	8	650	325	435	2,050	--	4,020	1,608	--	2,412
SS#5	South Wall	2003	8-10	<0.1 ²	<0.02	<0.02	<0.015	0.036	<0.1	21	56	8	3.2	--	6	--	--	--

Required: Tier 1 RBSLs from RBCA Master Table based on site data

Fuel Station; Groundwater ~12 – 14 ft bgs



Tier 1 RBSLs

MASTER TABLE

Interim July 2020

ALL POTENTIAL TIER 1 RBSLs FOR SOIL (mg/kg)

Leaching RBSLs are based on the distance from the bottom of the contamination to the groundwater.

Chemical	Distance from Sample to Groundwater			0 – 2 ft bgs	0 – 2 ft bgs	0 – 10 ft bgs
	Leaching 0-10 feet	Leaching 10-20 feet	Leaching >20 feet	Direct Contact Residential	Direct Contact Commercial*	Direct Contact Construction
For Gasoline and Light Hydrocarbons measured using the Montana Method for Volatile Petroleum Hydrocarbons (VPH)						
C5-C8 Aliphatics	220	770	1,200	52	290	410
C9-C12 Aliphatics	11,000	40,000	60,000	77	360	640
C9-C10 Aromatics	130	470	720	130	1,000	1,000
MTBE	0.078	0.16	0.25	52	230	8,900
Benzene	0.07	0.21	0.33	1.3	5.7	240
Toluene	21	65	100	610	5,500	5,500
Ethylbenzene	26	84	130	6.4	28	1,300
Xylenes	320	1,000	1,600	72	310	610
Naphthalene	12	40	62	2.2 ^c	9.5 ^c	140 ⁿ
Lead Scavengers						
1,2-Dibromoethane (EDB)	0.000086	0.00022	0.00033	0.04	0.18	7.8
1,2-Dichloroethane (DCA)	0.019	0.052	0.079	0.52	2.3	110
For Diesel and Heavy Hydrocarbons measured using the Montana Method for Extractable Petroleum Hydrocarbons (EPH)						
C9-C18 Aliphatics	53,000	170,000	270,000	110	540	900
C19-C36 Aliphatics	Considered Immobile			24,000	200,000	200,000
C11-C22 Aromatics	370	1,300	2,000	490	3,900	3,900
Acenaphthene	27	91	140	450	3,800	3,800

Cumulative Soil Data Table

Table 1. Soil Sample Laboratory Analytical Results for VPH & EPH Compounds

Location and Field Data				Volatile Petroleum Hydrocarbons, mg/kg									Extractable Petroleum Hydrocarbons, mg/kg					
Sample ID	Location	Sample Date	Sample Depth (ft)	MTBE	Benzene	Toluene	Ethy-benzene	Xylenes	Naphthalene	C9-C10 Aromatics	C5-C8 Aliphatics	C9-C12 Aliphatics	TPH	EPH Screen	TEH	C9-C18 Aliphatics	C19-C36 Aliphatics	C11-C22 Aromatics
June 1991 UST Removals at Tank Basin																		
Tank 1 N	Diesel	1991	8-10	<0.1 ²	5	18	15	112	6	250	125	--	2,000	--	5,560	2,224	--	3,336
Tank 1 S		1991	8-10	<0.1 ²	8	12	6	180	3	125	500	--	2,130	--	2,800	1,120	--	1,680
Tank 2 N	Diesel	1991	8-10	<0.1 ²	3	6	7	175	2	95	320	--	1,875	--	1,360	544	--	816
Tank 2 S		1991	8-10	<0.1 ²	0.2	9	8	160	2	100	67	--	525	--	1,730	692	--	1,038
Tank 3 N	Gasoline	1991	8-10	<0.1 ²	18	6.3	<0.2	150	1	165	520	--	2,500	--	--	--	--	--
Tank 3 S		1991	8-10	<0.1 ²	170	64	<0.2	590	15	250	500	632	3,500	--	--	--	--	--
July 2003 Tank Basin Soil Excavation: 90 cubic yards																		
SS#1	West Floor	2003	10	<0.1 ²	1.35	2.23	4.98	9.36	10	110	330	435	1,000	--	668	---	---	---
SS#2	East Floor	2003	10	<0.1 ²	2.03	6.77	8.27	57.7	9	145	370	625	2,240	--	14,300	5,720	--	8,580
SS#3	East Wall	2003	10	<0.1 ²	<1.43 ²	3.72	<1.07	3.61	13	22	34	5	138	--	254	---	---	---
SS#4	North Wall	2003	8-10	<0.1 ²	<10 ²	<10	<7.5	25.1	8	650	325	435	2,050	--	4,020	1,608	--	2,412
SS#5	South Wall	2003	8-10	<0.1 ²	<0.02	<0.02	<0.015	0.036	<0.1	21	56	8	3.2	--	6	---	---	---
Tier 1 RBSLs Leaching (0-10 ft)				0.078	0.07	21	26	320	12	130	220	11,000	NSL	NSL	NSL	53,000	NSL	370
Tier 1 RBSLs Direct Contact Construction				8,900	240	5,500	1,300	610	140	1,000	410	640	NSL	NSL	NSL	900	200,000	3,900
1 - RBSL (M): Risk Based Screening Level Master Table (DEQ, July 2020)																		
2 - Reporting Limit >RBSL																		
NSL - No Screening Level				--- indicates not analyzed														

Cumulative Soil Data Table

Table 1. Soil Sample Laboratory Analytical Results for VPH & EPH Compounds

Location and Field Data				Volatile Petroleum Hydrocarbons, mg/kg								Extractable Petroleum Hydrocarbons, mg/kg						
Sample ID	Location	Sample Date	Sample Depth (ft)	MTBE	Benzene	Toluene	Ethy-benzene	Xylenes	Naphthalene	C9-C10 Aromatics	C5-C8 Aliphatics	C9-C12 Aliphatics	TPH	EPH Screen	TEH	C9-C18 Aliphatics	C19-C36 Aliphatics	C11-C22 Aromatics
June 1991 UST Removals at Tank Basin																		
Tank 1 N	Diesel	1991	8-10	<0.1 ²	5	18	15	112	6	250	125	--	2,000	--	5,560	2,224	--	3,336
Tank 1 S		1991	8-10	<0.1 ²	8	12	6	180	3	125	500	--	2,130	--	2,800	1,120	--	1,680
Tank 2 N	Diesel	1991	8-10	<0.1 ²	3	6	7	175	2	95	320	--	1,875	--	1,360	544	--	816
Tank 2 S		1991	8-10	<0.1 ²	0.2	9	8	160	2	100	67	--	525	--	1,730	692	--	1,038
Tank 3 N	Gasoline	1991	8-10	<0.1 ²	18	6.3	<0.2	150	1	165	520	--	2,500	--	--	--	--	--
Tank 3 S		1991	8-10	<0.1 ²	170	64	<0.2	590	15	250	500	632	3,500	--	--	--	--	--
July 2003 Tank Basin Soil Excavation: 90 cubic yards																		
SS#1	West Floor	2003	10	<0.1 ²	1.35	2.23	4.98	9.36	10	110	330	435	1,000	--	668	--	--	--
SS#2	East Floor	2003	10	<0.1 ²	2.03	6.77	8.27	57.7	9	145	370	625	2,240	--	14,300	5,720	--	8,580
SS#3	East Wall	2003	10	<0.1 ²	<1.43 ²	3.72	<1.07	3.61	13	22	34	5	138	--	254	--	--	--
SS#4	North Wall	2003	8-10	<0.1 ²	<10 ²	<10	<7.5	25.1	8	650	325	435	2,050	--	4,020	1,608	--	2,412
SS#5	South Wall	2003	8-10	<0.1 ²	<0.02	<0.02	<0.015	0.036	<0.1	21	56	8	3.2	--	6	--	--	--
Tier 1 RBSLs Leaching (0-10 ft)				0.078	0.07	21	26	320	12	130	220	11,000	NSL	NSL	NSL	53,000	NSL	370
Tier 1 RBSLs Direct Contact Construction				8,900	240	5,500	1,300	610	140	1,000	410	640	NSL	NSL	NSL	900	200,000	3,900
1 - RBSL (M): Risk Based Screening Level Master Table (DEQ, July 2022)				180	Bold Value > Leaching RBSL (0-10 ft)													
2 - Reporting Limit >RBSL																		
NSL - No Screening Level				--- indicates not analyzed														

Cumulative Soil Data Table

Table 1. Soil Sample Laboratory Analytical Results for VPH & EPH Compounds

Location and Field Data				Volatile Petroleum Hydrocarbons, mg/kg								Extractable Petroleum Hydrocarbons, mg/kg						
Sample ID	Location	Sample Date	Sample Depth (ft)	MTBE	Benzene	Toluene	Ethyl-benzene	Xylenes	Naphthalene	C9-C10 Aromatics	C5-C8 Aliphatics	C9-C12 Aliphatics	TPH	EPH Screen	TEH	C9-C18 Aliphatics	C19-C36 Aliphatics	C11-C22 Aromatics
June 1991 UST Removals at Tank Basin																		
Tank 1 N	Diesel	1991	8-10	<0.1 ²	5	18	15	112	6	250	125	--	2,000	--	5,560	2,224	--	3,336
Tank 1 S		1991	8-10	<0.1 ²	8	12	6	180	3	125	500	--	2,130	--	2,800	1,120	--	1,680
Tank 2 N	Diesel	1991	8-10	<0.1 ²	3	6	7	175	2	95	320	--	1,875	--	1,360	544	--	816
Tank 2 S		1991	8-10	<0.1 ²	0.2	9	8	160	2	100	67	--	525	--	1,730	692	--	1,038
Tank 3 N	Gasoline	1991	8-10	<0.1 ²	18	6.3	<0.2	150	1	165	520	--	2,500	--	--	--	--	--
Tank 3 S		1991	8-10	<0.1 ²	170	64	<0.2	590	15	250	500	632	3,500	--	--	--	--	--
July 2003 Tank Basin Soil Excavation: 90 cubic yards																		
SS#1	West Floor	2003	10	<0.1 ²	1.35	2.23	4.98	9.36	10	110	330	435	1,000	--	668	--	--	--
SS#2	East Floor	2003	10	<0.1 ²	2.03	6.77	8.27	57.7	9	145	370	625	2,240	--	14,300	5,720	--	8,580
SS#3	East Wall	2003	10	<0.1 ²	<1.43 ²	3.72	<1.07	3.61	13	22	34	5	138	--	254	--	--	--
SS#4	North Wall	2003	8-10	<0.1 ²	<10 ²	<10	<7.5	25.1	8	650	325	435	2,050	--	4,020	1,608	--	2,412
SS#5	South Wall	2003	8-10	<0.1 ²	<0.02	<0.02	<0.015	0.036	<0.1	21	56	8	3.2	--	6	--	--	--
Tier 1 RBSLs Leaching (0-10 ft)				0.078	0.07	21	26	320	12	130	220	11,000	NSL	NSL	NSL	53,000	NSL	370
Tier 1 RBSLs Direct Contact Construction				8,900	240	5,500	1,300	610	140	1,000	410	640	NSL	NSL	NSL	900	200,000	3,900
1 - RBSL (M): Risk Based Screening Level Master Table (DEQ, July 2022)																		
2 - Reporting Limit >RBSL																		
NSL - No Screening Level				--- indicates not analyzed														

1 - RBSL (M): Risk Based Screening Level Master Table (DEQ, July 2022)

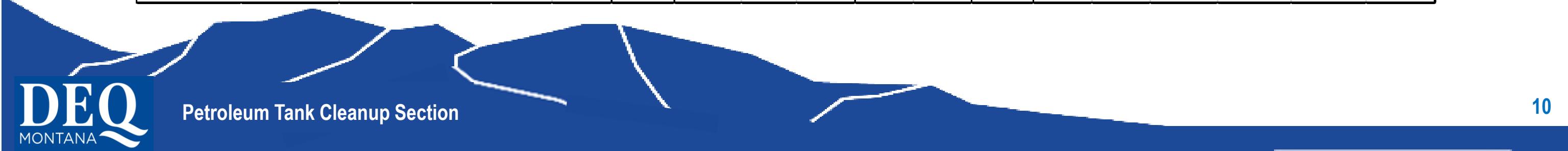
180 Bold Value > Leaching RBSL (0-10 ft)

2 - Reporting Limit >RBSL

1,450 Bold Value > Tier 1 Direct Contact Construction RBSL (>2-10 ft) & Leaching RBSLs (0-10 ft)

NSL - No Screening Level

--- indicates not analyzed



Tier-1 RBSLs for Soil

TABLE 4 - MASTER TABLE

ALL POTENTIAL TIER 1 RBSLs F

Leaching RBSLs are based on the distance from the bottom of the tank

Calculate Site-Specific
Tier 2 RBSLs

in July 2020

Chemical	Distance from Sample to Groundwater			Tier 2 RBSLs		
	Leaching 0-10 feet	Leaching 10-20 feet	Leaching >20 feet	0 – 2 ft bgs Direct Contact Residential	0 – 2 ft bgs Direct Contact Commercial	0 – 10 ft bgs Direct Contact Construction
For Gasoline and Light Hydrocarbons measured using the Montana Method for Volatile Petroleum Hydrocarbons (VPH)						
C5-C8 Aliphatics	220	770	1,200	52	290	410
C9-C12 Aliphatics	11,000	40,000	60,000	77	360	640
C9-C10 Aromatics	130	470	720	130	1,000	1,000
MTBE	0.078	0.16	0.25	52	230	8,900
Benzene	0.07	0.21	0.33	1.3	5.7	240
Toluene	21	65	100	610	5,500	5,500
Ethylbenzene	26	84	130	6.4	28	1,300
Xylenes	320	1,000	1,600	72	310	610
Naphthalene	12	40	62	2.2 ^c	9.5 ^c	140 ⁿ
Lead Scavengers						
1,2-Dibromoethane (EDB)	0.000086	0.00022	0.00033	0.04	0.18	7.8
1,2-Dichloroethane (DCA)	0.019	0.052	0.079	0.52	2.3	110
For Diesel and Heavy Hydrocarbons measured using the Montana Method for Extractable Petroleum Hydrocarbons (EPH)						
C9-C18 Aliphatics	53,000	170,000	270,000	110	540	900
C19-C36 Aliphatics	Considered Immobile			24,000	200,000	200,000
C11-C22 Aromatics	370	1,300	2,000	490	3,900	3,900
Acenaphthene	27	91	140	450	3,800	3,800



Extract of Cumulative Soil Data Table

Table 1. Soil VPH and EPH Analytical Results (mg/kg)

Sample ID	Location	Sample Date	Sample Depth (ft)	VPH Compounds										EPH Compounds							
				MTBE	Benzene	Toluene	Ethyl-benzene	Xylenes	Naphthalene	C9-C10 Aromatics	C5-C8 Aliphatics	C9-C12 Aliphatics	TPH	EPH Screen	TEH	C9-C18 Aliphatics*	C19-C36 Aliphatics	C11-C22 Aromatics*			
RBSLs (M)																					
Leaching (0-10 feet)				0.078	0.07	21	26	320	12	130	220	11,000	NSL	p	NSL	53,000	NSL	370			
Direct Contact Construction (2-10 ft)				8,900	240	5,500	1,300	610	140	1,000	410	640	NSL	NSL	NSL	900	200,000	3,900			
Tier 2 Direct Contact Construction (2-10 feet)**											1,093					2,400		10,400			
June 1991 UST Removals: "Bulk Tank Basin": Soil Excavated																					
Tank 1 N	Diesel		8-10	<0.1 ²	5	18	15	112	6	250	125	---	2,000	EPH	5,560	2,224	---	3,336			
Tank 1 S			8-10	<0.1 ²	8	12	6	180	3	125	500	---	2,130	---	2,800	1,120	---	1,680			
Tank 2 N	Diesel		8-10	<0.1 ²	3	6	7	175	2	95	320	---	1,875	---	1,360	544	---	816			
Tank 2 S			8-10	<0.1 ²	0.2	9	8	160	2	100	67	---	525	---	1,730	692	---	1,038			
Tank 3 N	Gasoline		8-10	<0.1 ²	18	6.3	<0.2	150	1	165	520	---	2,500	---	---	---	---	---			
Tank 3 S			8-10	<0.1 ²	170	64	<0.2	590	15	250	500	632	3,500	---	---	---	---	---			
Tank Basin III Soil Excavation: 90 cubic yards																					
SS#1	West Floor		10	<0.1 ²	1.35	2.23	4.98	9.36	10	330	435	1,000	---	668	---	---	---	---			
SS#2			10	<0.1 ²	2.03	6.77	8.27	57.7	9	370	625	2,240	---	14,300	5,720	---	---	8,580			
SS#3			10	<0.1 ²	<1.43 ²	3.72	<1.07	3.61	13	34	5	138	---	254	---	---	---	---			
SS#4			8-10	<0.1 ²	<10 ²	<10	<7.5	25.1	8	325	435	2,050	---	4,020	1,608	---	---	2,412			
SS#5			8-10	<0.1 ²	<0.02	<0.02	<0.015	0.036	<0.1	56	8	3.2	6	---	---	---	---	---			

1 - RBSL (M): Risk Based Screening Level Master Table (DEQ, July 2020)

180 Bold Value > Leaching RBSL (0-10 feet)

2 - Reporting Limit >RBSL

1,450 Bold Value > Tier 1 Direct Contact Construction RBSL (2-10 feet)

NSL - No Screening Level

7,120 Bold Value > Tier 2 Direct Contact Construction RBSL (2-10 feet)

— indicates not analyzed

*C9-C18 Aliphatics & C11-C22 Estimated per RBCA

** Assumes 3 non-carcinogens

Cumulative Groundwater Data Extract

Table 2. Cumulative Groundwater Analytical Results for Company XYZ Inc.; FID 78-12345, Release 1xxx

Sample Information & Field Data				Lead		Volatile Petroleum Hydrocarbons (VPH), mg/kg									Extractable Petroleum Hydrocarbons (EPH),					
Sample ID	Screened Interval, ft bgs	Water Depth, ft bgs	Collection Date	DCA	EDB	MTBE	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Naphthalene	C9 to C10 Aromatics	C5 to C8 Aliphatics	C9 to C12 Aliphatics	TPH	EPH (Screen)	C9 to C18 Aliphatics	C19 to C36 Aliphatics	C11 to C22 Aromatics	TEH
MW-1	4 to 19	12.91	10/14/98	---	---	<10D	315	9	147	170	---	---	---	---	2,470	---	---	---	---	
		12.87	03/19/99	---	---	7.8	982	18	206	213	---	---	---	---	3,040	---	---	---	---	
		12.63	11/16/99	---	---	82	563	3.6	140	3.2	---	264	1,300	105	2,020	---	---	---	---	---
		13.3	07/18/00	---	---	<30	916	5.4	200	7	---	374	1,890	51	2,770	---	---	---	---	---
		12.53	01/23/01	---	---	<1.0	262	1.1	70	7.2	---	170	763	<20	978	---	---	---	---	---
		13.27	09/10/01	---	---	<5.0	1,110	10	133	12	---	330	2,230	158	3,210	---	---	---	---	---
		13.66	09/22/03	---	---	<1.0	44	0.54	11	2.1	---	102	260	110	447	---	---	---	---	---
		13.05	12/08/04	---	---	<1.0	187	0.91	11	1.8	---	112	470	91	776	---	---	---	---	---
		12.99	04/13/05	---	---	<2.0	248	1.9	22	1.4	<1.0	58	421	44	746	---	---	---	---	---
		12.66	03/16/10	---	---	<1.0	27	<0.50	<0.50	<0.50	<1.0	<20	62	25	97	---	---	---	---	---
		12.53	02/14/11	---	---	<1.0	26	<0.50	<0.50	<0.50	<1.0	<20	57	28	91	---	---	---	---	---
		12.72	04/25/19	<0.50	<0.010	<2.0	145	1.2	2.2	<0.50	<1.0	36	246	44	402	996	---	---	---	---
			11/14/19	MW-1 removed during 2019 Excavation																
MW20-03	5 to 20		04/20/20	MW20-03 installed to replace MW-1																
		12.22	05/06/20	<0.50	<0.010	<1.0	0.63	<0.50	<0.50	0.42 (J)	<1.0	22	69	21	99	538	---	---	---	---
		12.55	09/22/20	---	---	<1.0	<0.50	<0.50	<0.50	<0.50	<1.0	20J	113	21	127	726	---	---	---	---
		12.4	03/16/21	---	---	<1.0	<0.50	0.8	<0.50	<0.50	<0.50	18J	89	33	116	351	---	---	---	---
			08/09/21	Well MW20-03 abandoned for site redevelopment																
MW20-02	5 to 20	12.17	05/06/20	<0.50	<0.010	<15 (D)	100	<10 (D)	32	2.5	<1.0	413	984	311	1,620	1,490	<300	<300	<300	410
		12.45	09/22/20	---	---	<4.0 (D)	2.4	2.4	1.7	<0.50	<1.0	107	374	95	485	316	---	---	---	---
		12.35	03/16/21	---	---	<3.5D	2.3	6	0.5	0.5	1	133	629	240	840	496	---	---	---	---
		12.33	04/12/21	---	---	<7D	3.9	5	<2.0	0.97	<1.0	112	651	112	762	521	---	---	---	---
			08/09/21	Well MW20-02 abandoned for site redevelopment																
MW-2	6 to 21	12.03	10/14/98	---	---	<2.0	<0.50	<0.50	<0.50	<1.0	---	---	---	---	<20	---	---	---	---	
		12	03/19/99	---	---	<2.0	<0.50	<0.50	<0.50	<1.0	---	---	---	---	<20	---	---	---	---	
		13.12	11/16/99	---	---	<1.0	<0.50	<0.50	<0.50	<0.50	---	<20	<20	<20	<20	---	---	---	---	---

Example Cumulative Soil & Water Tables

Excel file on DEQ website

GUIDANCE

Risk Based Corrective Action Guidance (RBCA)

- Risk-Based Screening Level (RBSL) Changes
- Table 1: Tier 1 Surface Soil (0-2 ft) RBSLs
- Table 2: Tier Subsurface Soil (>2 ft) RBSLs
- Table 3: Tier 1 Groundwater RBSLs and Standards
- Table 4: Master Table - All Potential Tier 1 RBSLs for Soil
- Table 5: Conceptual Site Model - Evaluation of Exposure Pathways

Remedial Investigation Guidance

Remedial Alternatives Analysis Guidance

Cleanup Guidance and Cleanup Technologies Workbook

Groundwater Monitoring Work Plan and Report Guidance



Example Cumulative Tables for Soil & Groundwater Data with RBSLs

Release Closure Plan (PDF not fillable)

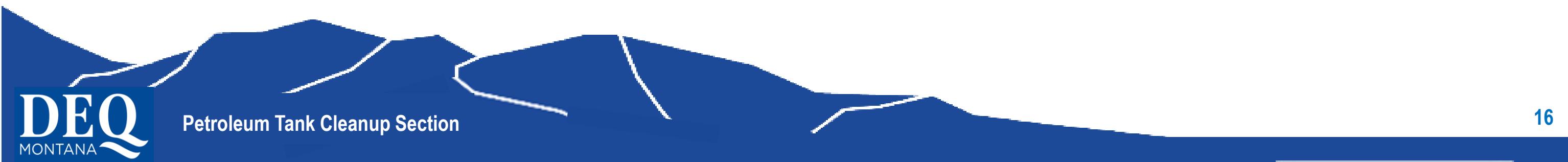
Release Closure Plan (Excel)

Cumulative Data Tables

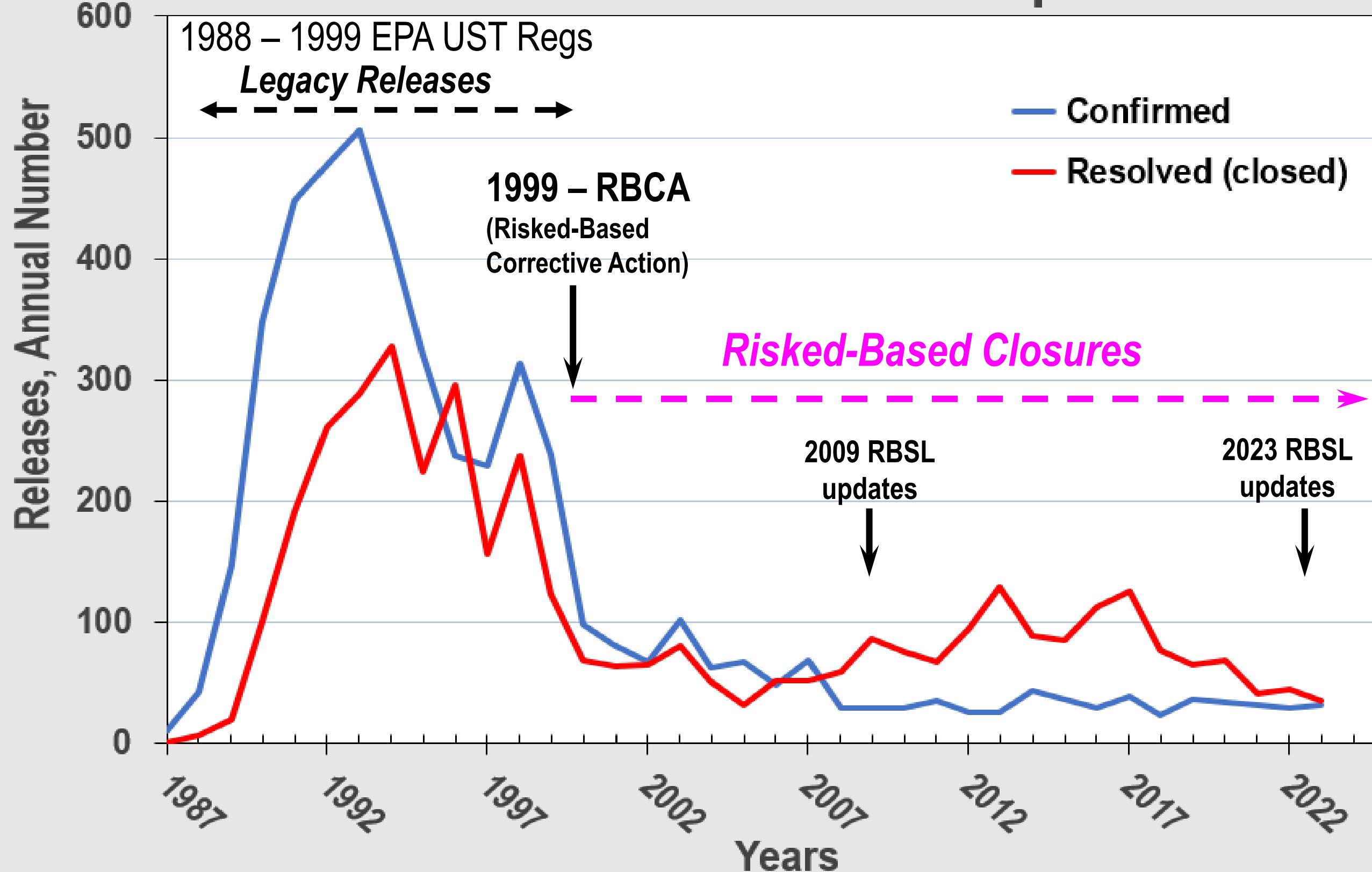
- Investigate – Extent & Magnitude
- Develop new Work Plans
- Evaluate Cleanup & Monitoring
- Screen potential PVI
- Data Gaps ?
-  Resolve the Release

Petroleum Releases

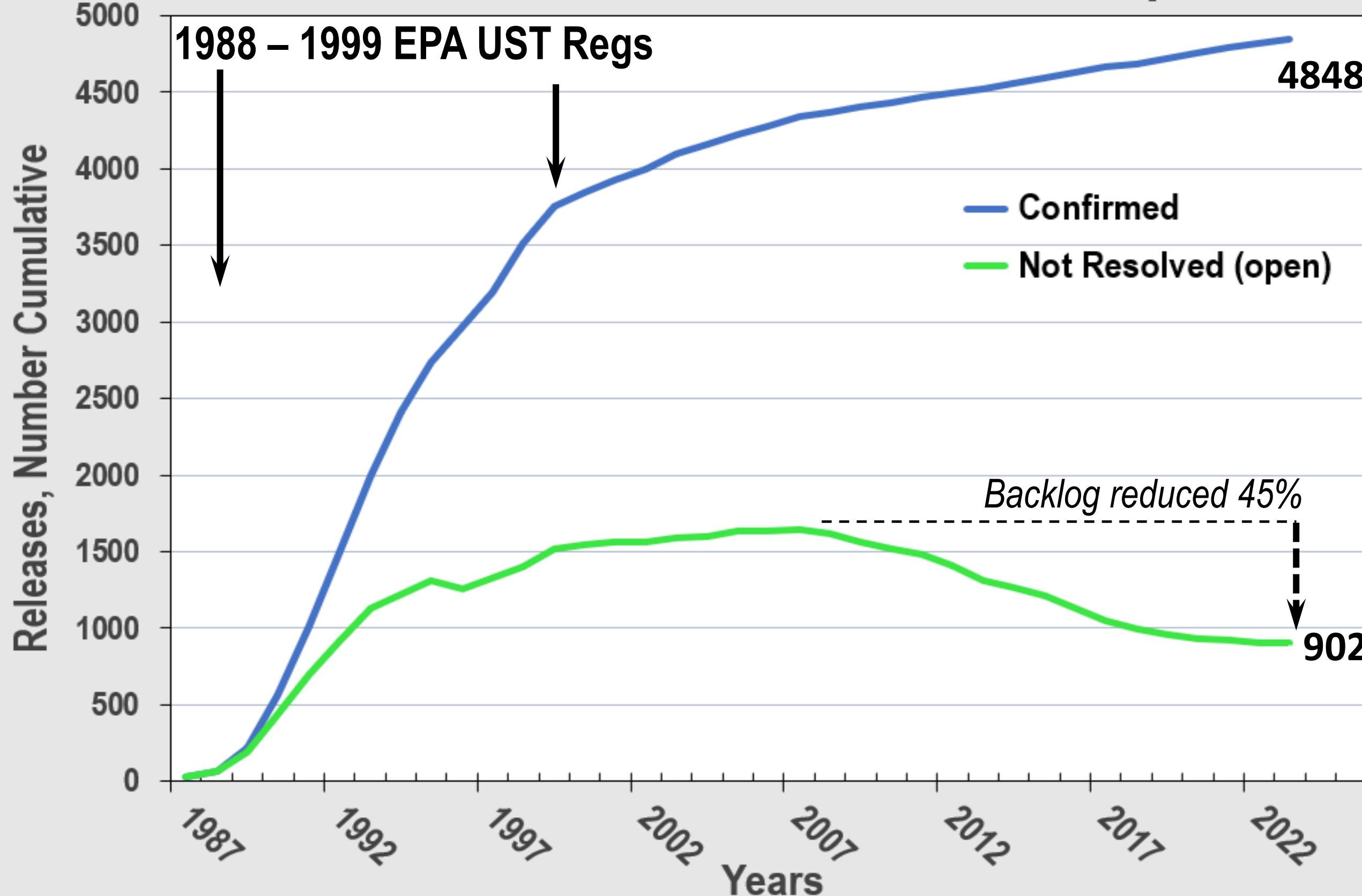
History – Confirmation & Resolution



Releases Confirmed & Closed per Year

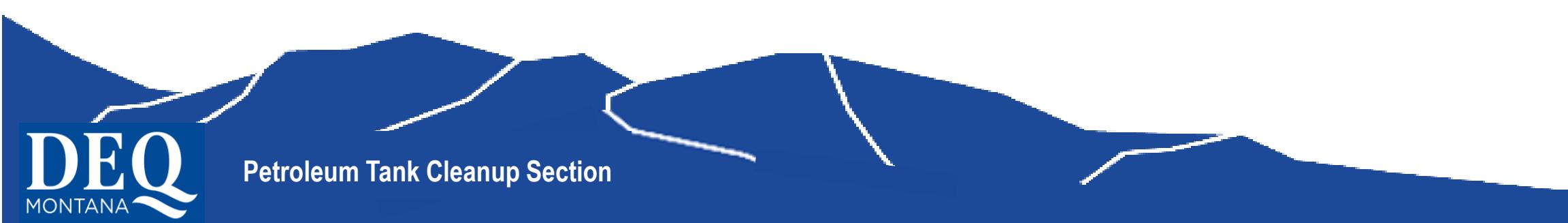


Cumulative Releases Confirmed vs Open

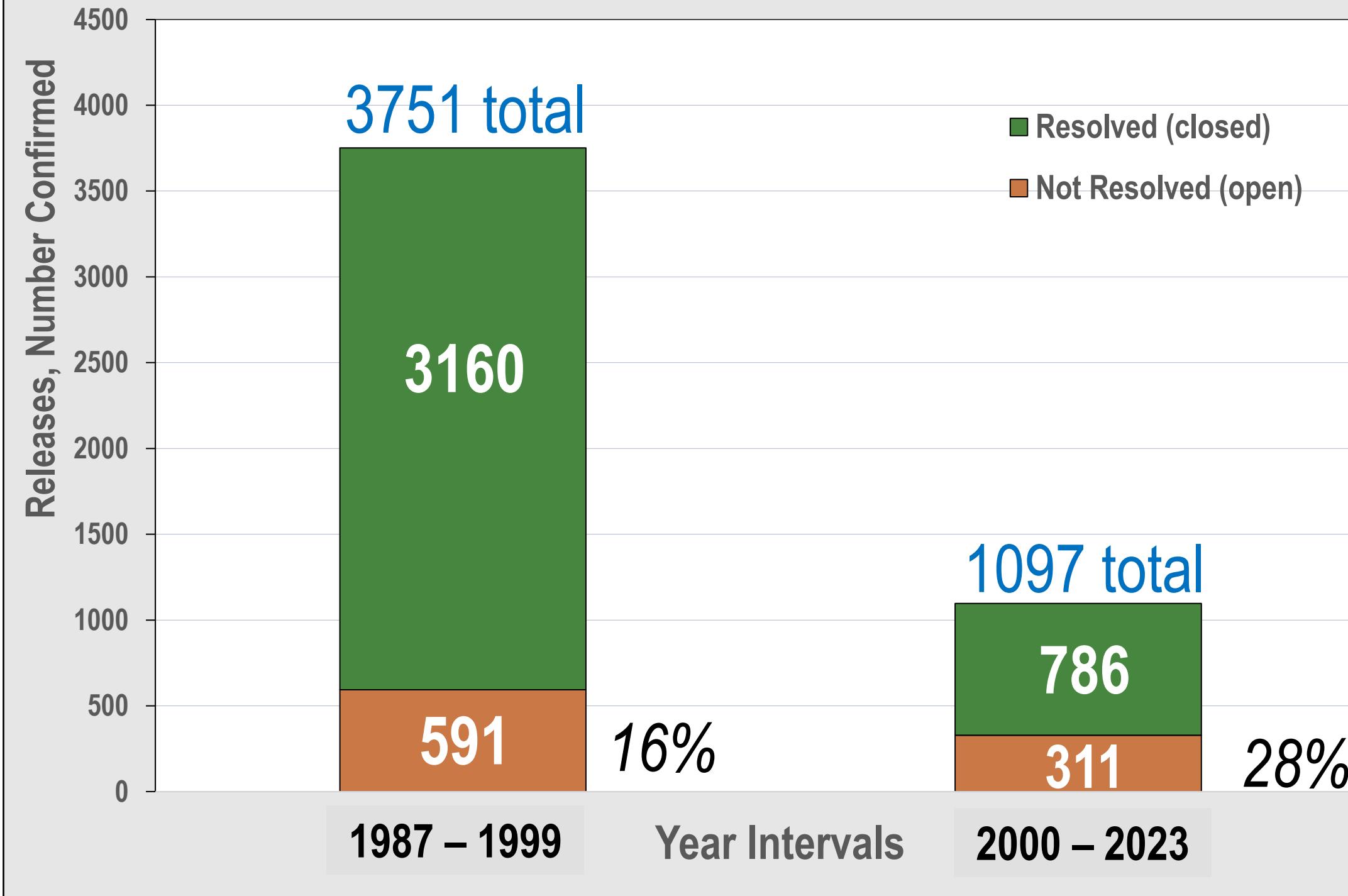


MT DEQ Petroleum Tank Releases

Calendar Intervals	Confirmed	Resolved (closed)	Unresolved (open)
1987-99	3751	2231	
2000-23	1097	1715	
Totals:	4848	3946	902



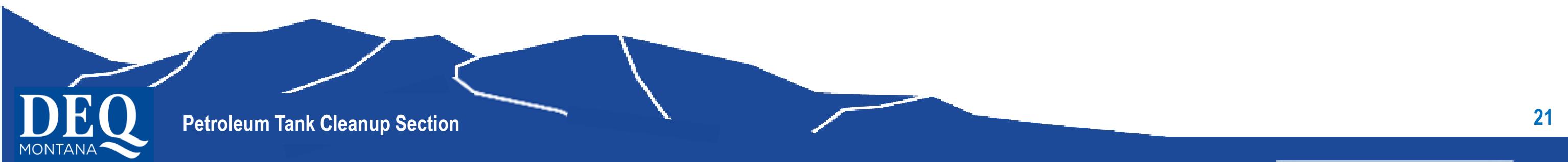
Releases – Resolved vs Not Resolved



Deferred Cleanups

Lack of access

- Petroleum-Contaminated Media
- Property, Funding, RP / Ownership



Deferred Cleanups

MT DEQ Petroleum Tank Releases

PTCS Evaluated Unresolved Releases = 812

Number of Cleanups Deferred, Nov 2022

for lack of access to:

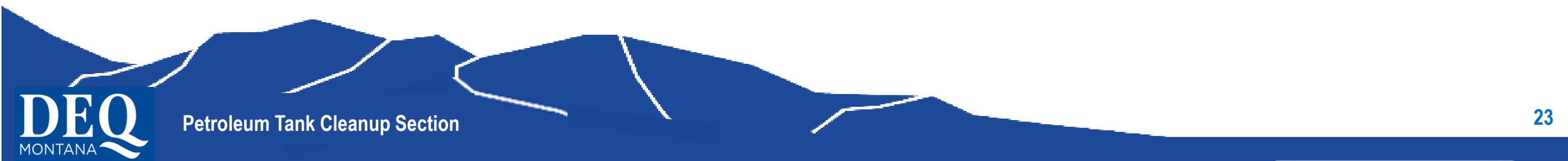
Petroleum- Contaminated Media	Funding / Property / RP	Total Deferred
106	53	159
		20%

Legacy Release – Deferred Cleanup

Example –

Small Excavation Cleanup

~1,000 cy



Legacy Release – Deferred Cleanup

~2017 Owner Informed DEQ about plans
to dismantle fuel station



Release confirmed 1997:

- Inaccessible petroleum-contaminated soil
- Persistent groundwater plume (1998-2019)

Legacy Release – Deferred Cleanup

Small-scale cleanup
2019

Owner removed UST
system

Excavated petroleum-
contaminated soil
~1,000 yd³



Legacy Release – Deferred Cleanup



Redevelopment 2021

Compliance Monitoring 2020-2023

Closure review complete 2023

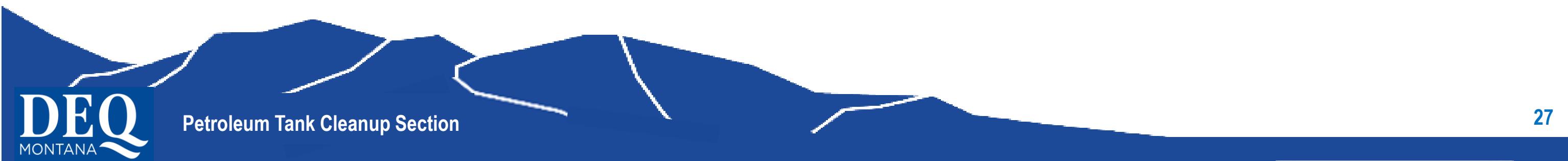
2024 – remove MWs & Resolve Release

Legacy Release – Deferred Cleanup

Example –

Large Excavation Cleanup

~15,000 cy



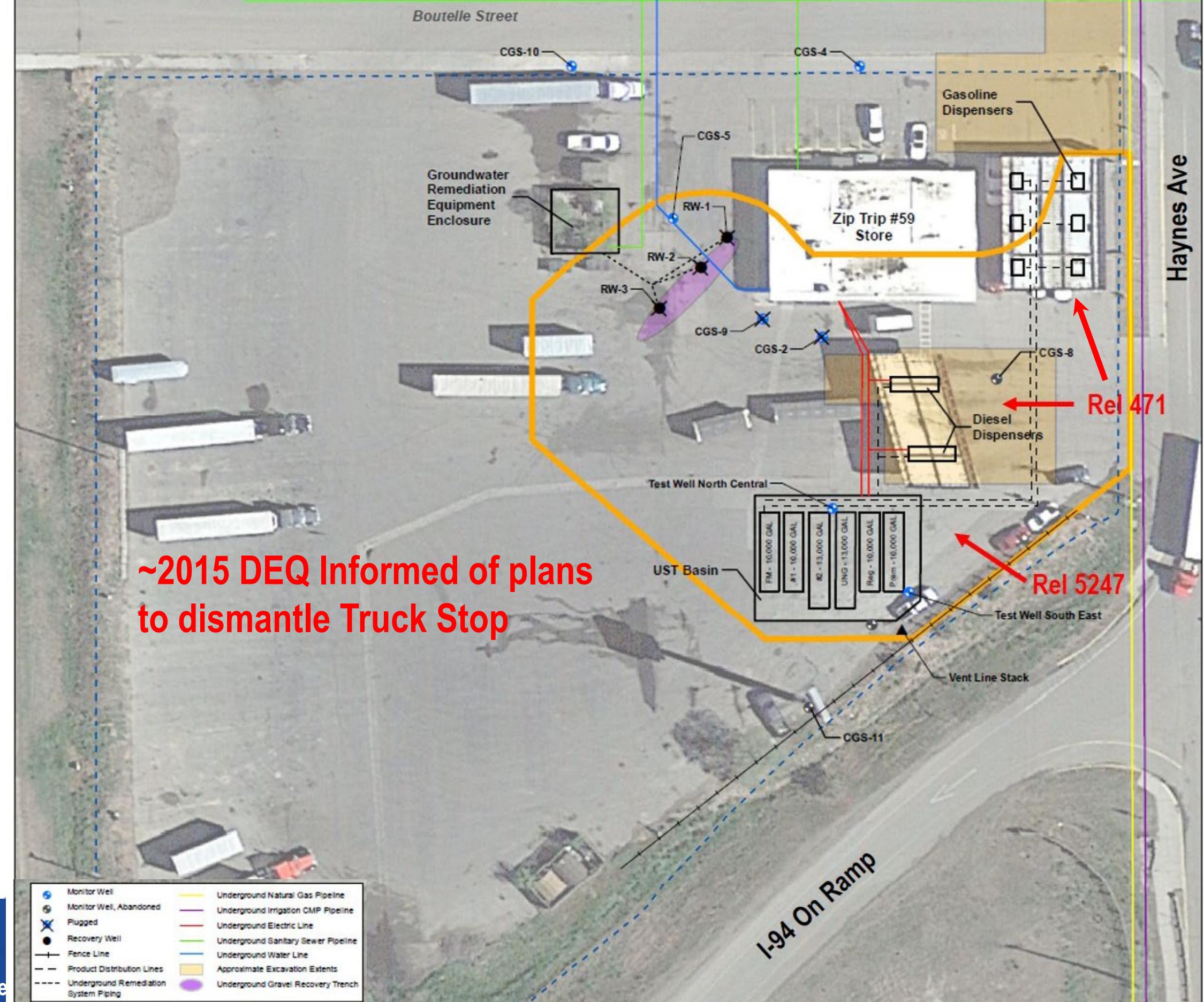
Legacy Release – Deferred Cleanup

1991 Confirmed

Plan Cleanup
2015-2019

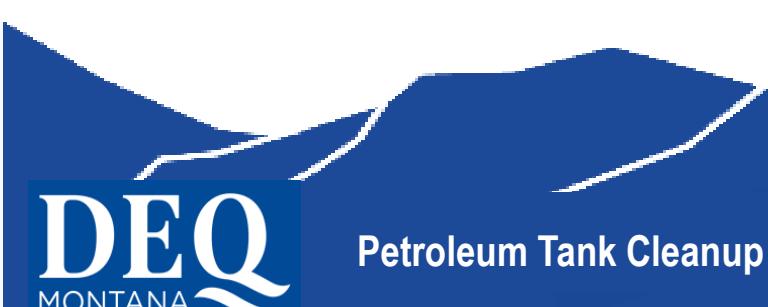
Cleanup 2020
Excavated
~15,000 cy

Compliance
Monitoring



Legacy Release – Deferred Cleanup

2020
Excavated
~15,000 cy



Boutelle St

Boutelle St Boutelle St

Cenex Zip Trip
Truck stop

Area
Excavated
~15,000 cy

South Haynes

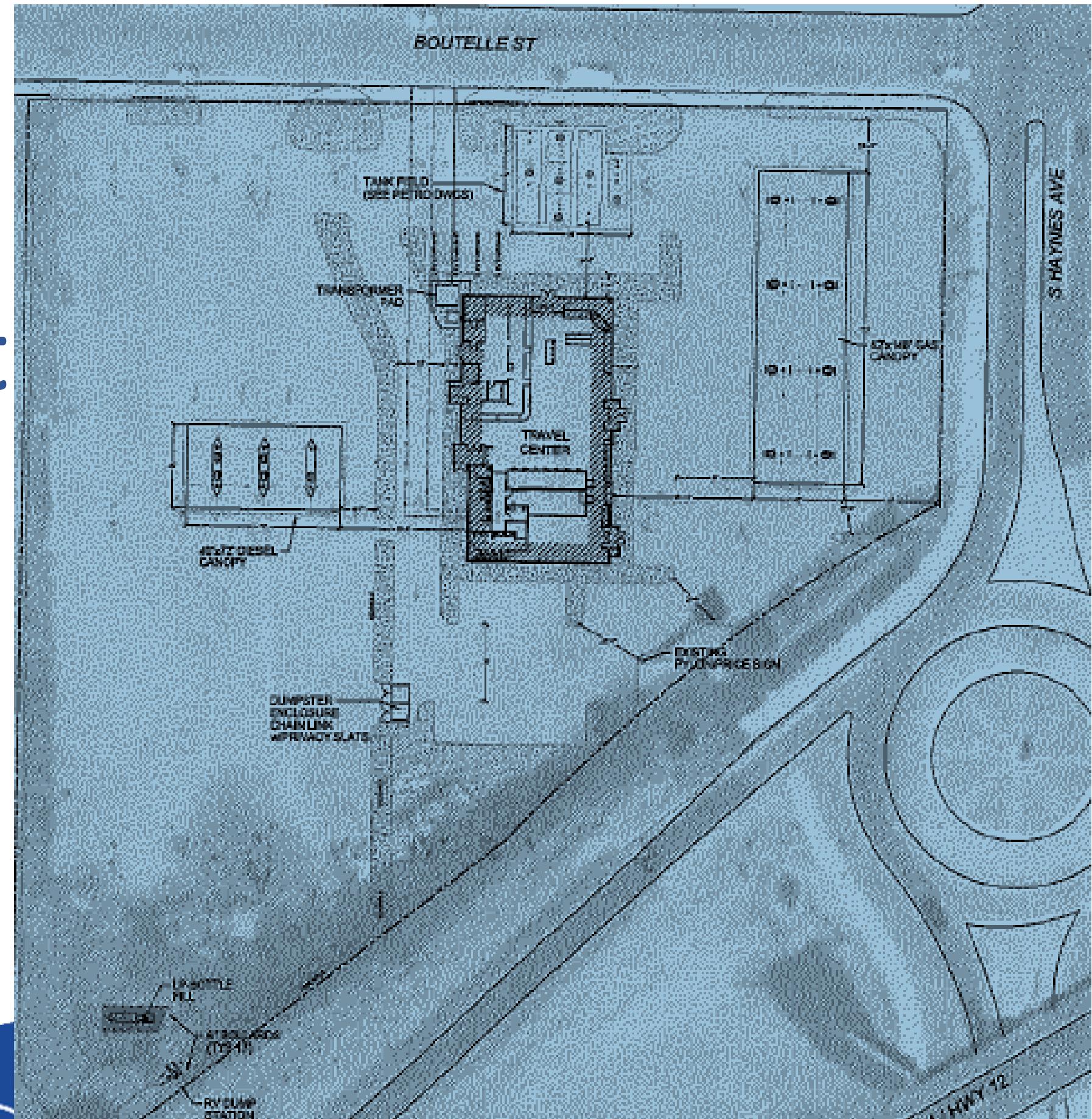
Four B's
American \$\$\$

Wild horse statue

94

94

Post Cleanup: Redevelopment at Legacy Release



Redevelopment at Legacy Release



MOUNTAIN MUDD ENTRANCE

ZIP TRIP ENTRANCE

EXTERIOR RENDERINGS

3609 | CHS, INC. (CENEX) ZIP TRIP - MILES CITY, MT



ZIP TRIP SIDE ENTRANCE

Petroleum Tank Cleanup Section



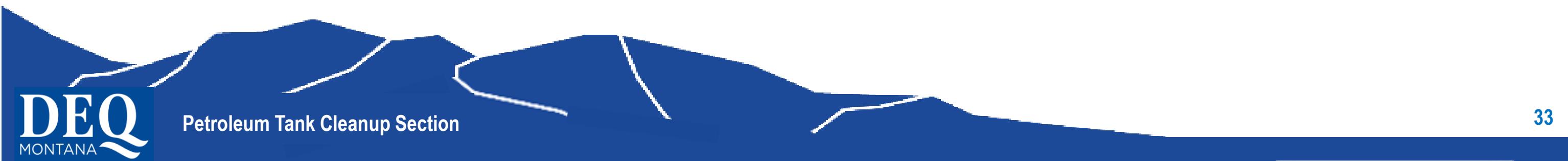
Legacy Release – Deferred Cleanup

Inform: Owner / RP Informs DEQ of future construction plans. *Essential*

Evaluate: Pre-cleanup – extent / magnitude

Cumulative Data is Essential

Time: WP generation & approval takes months



Questions

Discussion

