

Overview of OCWD's
Investigation into Source of
Newly Occurring High TDS
Surface Water
Behind Prado Dam



8/2021

1985 2021

Location of
Surface
Water

Image © 2021 Maxar Technologies

Google Earth



Dirt road appears to be
Wet (8/1/2021 imagery)

Google Earth

Imagery Date: 8/1/2021 33°54'01.97" N 117°38'55.27" W elev 682 ft eye alt 3661 ft

Overview of Timeline

- Surface water was first noticed (Nov 2021)
 - Review of historical aerial photos indicates first occurrence of Dry Season Standing Water in August 2021
- Field Recon (Dec 21)
 - Drones used to map extent of surface water. Field readings revealed high TDS
- Samples of surface water near SARI 4A-0030 (Dec 21) and SARI Brine at SARI 4A-0160 (Jan 22) collected
 - Piper Diagrams Created (inconclusive that surface water originated from brine line)
- Post Water Conservation Pool Surface Water Sampling (Feb 22)
 - High TDS water persists
- Additional Samples Collected to Test for Oil Indicators (Mar and May 22)

Field Recon

Dec 10, 2021

- Surface Water had high levels of electrical conductivity (EC) on the west side of road. Surface water was black and had distinct asphalt odor.
- EC from locations east of surface water in the road water generally had lower EC
- Visual salt build up in dry areas of the road south of SARI line. Some was reddish in color.

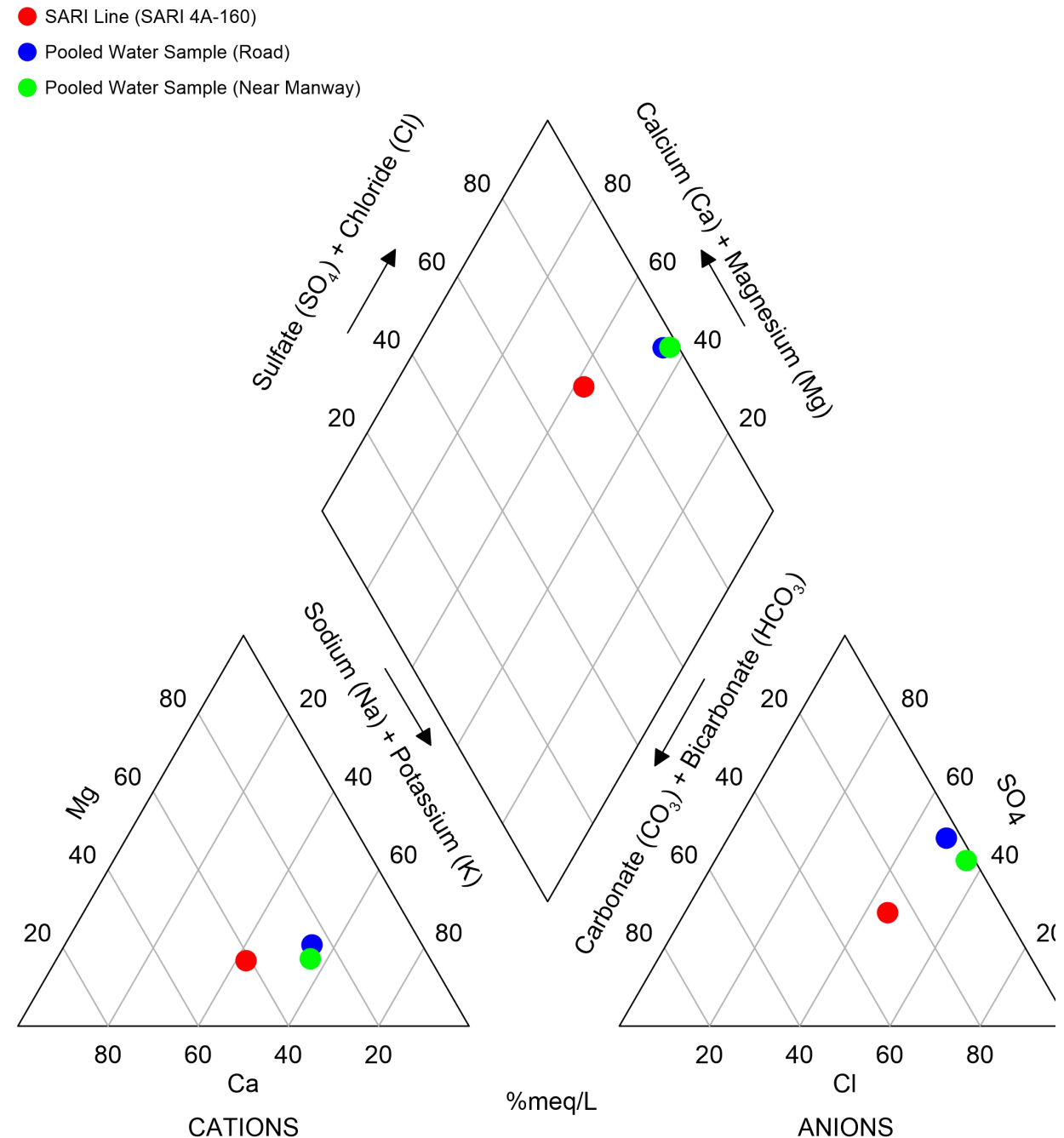


Jan 2022 - Coordinate SARI Line Sampling with SAWPA

- Purpose was to compare results of surface water with contents of the SARI line
- Samples collected at SARI 4A-0160 which is located a few miles upgradient of surface water due to Water Conservation Pool/access issues
- No additional inputs between SARI 4A-0160 and 4A-0030

Piper Diagrams

- Compare inorganic ion concentration to create water fingerprint (SO₄, Cl, Ca, Mg, Na, K, CO₃, HCO₃)
- Surface water samples are nearly identical
- SARI Line sample similar but not identical. Do not conclusively indicate SARI Line is the source of high TDS surface water
- Content of SARI line can change through time depending on inputs
- Compared other possible indicators (ClO₄, TOC, TDS & NO₃-N)

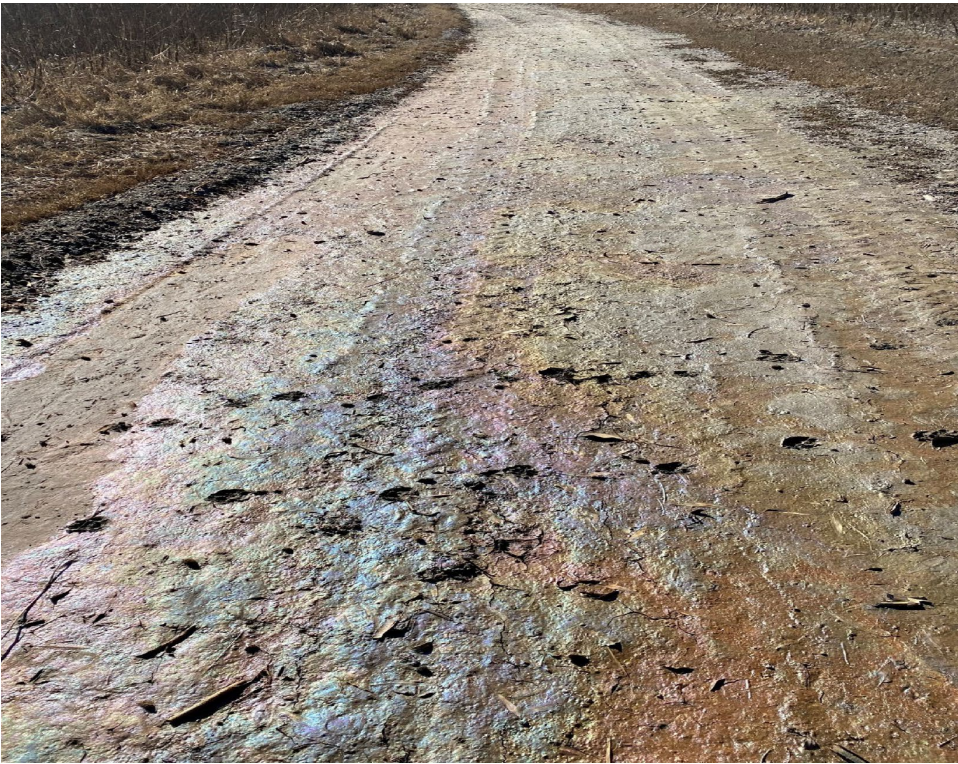


Comparison of Sampling Results

	SARI Line (SARI 4A-160)	Surface Water Sample (Road)	Surface Water Sample (Near Manway)	
Analyte	1/11/2022	12/7/2021	12/7/2021	Units
Bromide (Br)	ND	<10	<10	mg/L
Boron	0.23	0.9	0.64	mg/L
Calcium	590	645	740	mg/L
Magnesium	120	278	237	mg/L
Potassium	30	34.4	34.8	mg/L
Sodium	680	1600	1740	mg/L
Nitrate as N (NO3-N)	120	<10	<10	mg/L
Nitrite as N (NO2-N)	2.1	<0.002	0.053	mg/L
Chloride (Cl)	840	2050	2520	mg/L
Sulfate (SO4)	650	2540	2380	mg/L
Orthophosphate as P	1.7	0.1	0.14	mg/L
Alkalinity as CaCO3	850	330	236	mg/L
Bicarbonate Alkalinity as CaCO3	850	330	236	mg/L
Carbonate Alkalinity as CaCO3	ND	<1	<1	mg/L
Hydroxide Alkalinity as CaCO3	ND	<1	<1	mg/L
Total hardness as CaCO3	2000	2760	2830	mg/L
Specific Conductance	6200	10400	11200	umhos/cm
Total Dissolved Solids	4300	7650	8470	mg/L
pH	7.8	7.9	8.2	SU
Total Organic Carbon (TOC)	19	43.6	38.1	mg/L
Perchlorate ¹	9.8	ND	ND	µg/L

February 2022 - Sampling (Post Water Conservation Pool)

Site	EC (us/cm)
South 2	6010
South 1	6887
Middle 2	6929
Middle 1 (Sampled)	6852
North	8423

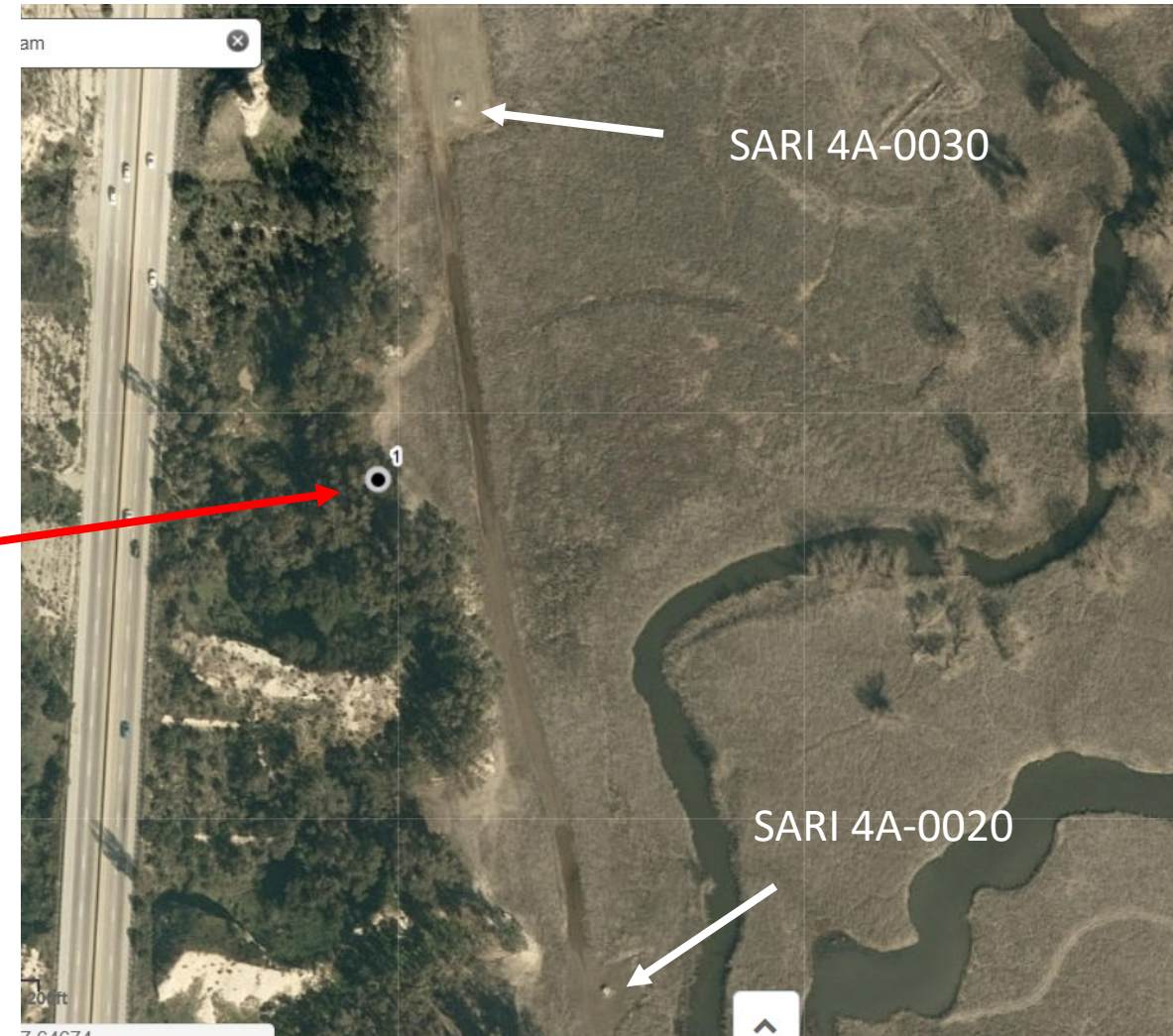
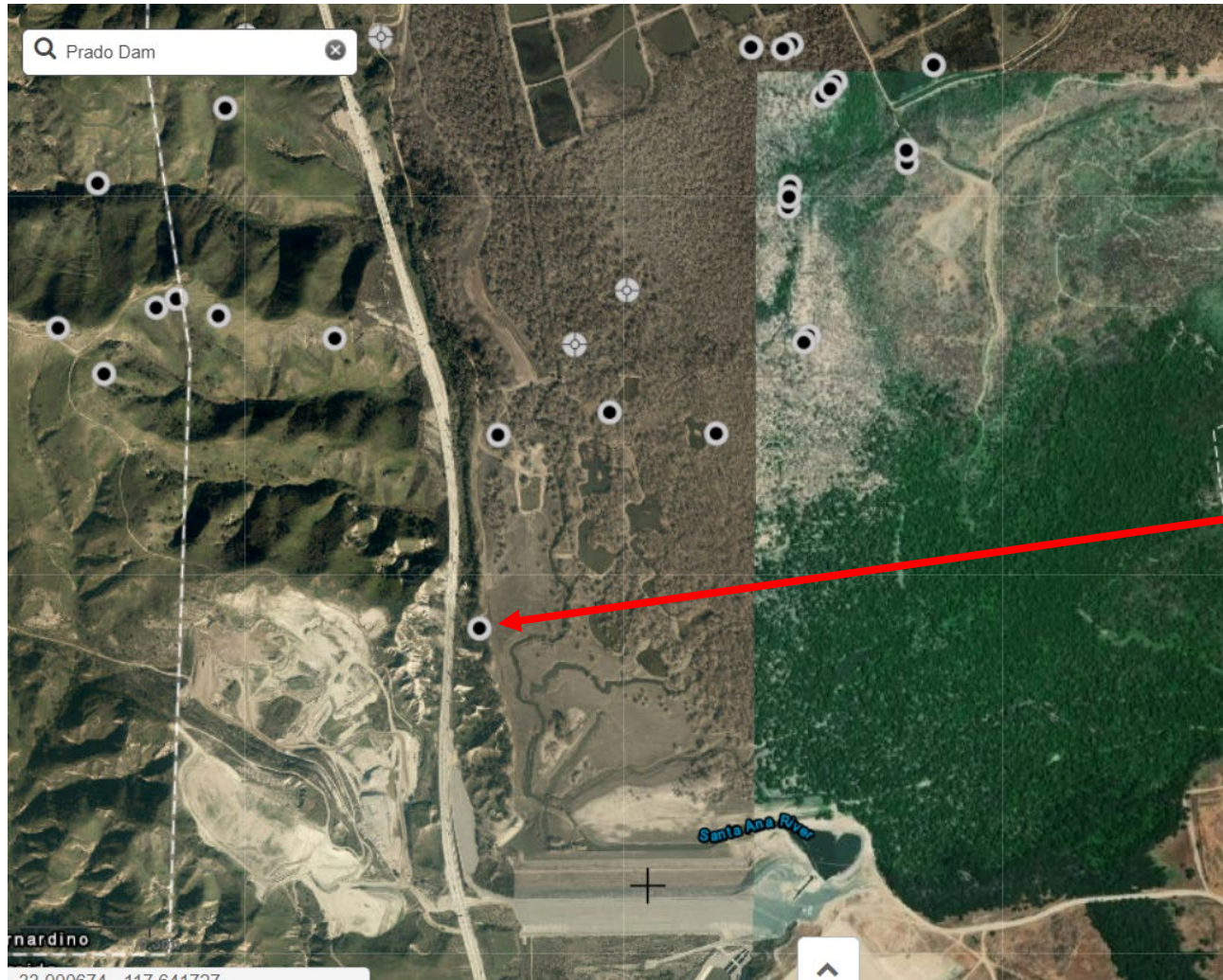


Standing Water Observations: Clear Water, Yellow Tint, Foul Odor, Sample Depth 4", Color sheen throughout dirt road approximately 1 mile

February 2022 Data – Notable Results

- Method 624.1 Volatile Organic Compounds (All ND)
- 1,4-DIOX (ND), NDMA (ND), Perchlorate (ND), Nitrate (ND)
- Method 537 (PFAS)
 - PFHxS - 580 ng/L & PFBS – 300ng/L
- High levels of sulfate, chloride, calcium, magnesium, sodium, EC, TDS, and TOC consistent with prior sampling.

Doggr Wells



Maps from <https://maps.conservation.ca.gov/doggr/wellfinder/> - accessed 3.28.2022

Oil Disposal Pond Locations



Oil Disposal Pond Data from Regional Board

Analyte	OPT-POND-L	OPT-POND-S	SC-POND	Units	
TDS	11,200	54,600	24,900	mg/L	
8260b - Volatile Organic Compounds					
Benzene	3.28	17.3	77.7	ug/L	←
Ethylbenzene	ND	ND	5.37	ug/L	←
Naphthalene	ND	ND	9.68	ug/L	
Toluene	0.960 (J)	10.1	58.3	ug/L	
1,2,4-Trimethylbenzene	ND	2.25	9.03	ug/L	
1,3,5-Trimethylbenzene	ND	0.650 (J)	2.65	ug/L	
o-Xylene	ND	5.16	20.8	ug/L	←
m,p-Xylenes	1.36 (J)	9.01	39.3	ug/L	←
8270c - Semivolatile Organic Compounds					
2,4 Dimethylphenol	ND	77	ND	ug/L	
4-Mthylphenol	ND	31.3	ND	ug/L	
2-Mthylphenol	ND	60.2	ND	ug/L	

← ND in 624.1 Method Test Series Samples of Standing Water Collected in February 2022

March 2022 – Targeted Oil Indicator Samples

- Samples targeted at constituents consistent with oil pond water samples results from Regional Board

Methods 1664 [Oil & Grease]

8015B [Non-Halogenated Organics]

8270C [Semivolatile Organic Compounds]

8260B [VOCs]

LUFTGCMS [DRO & GRO]

Short (C13-22) and long (C23-C40) chain diesel range organic (DRO) detected at 280 ug/L and 1300 ug/L respectively

May 2022 – Oil Indicator Confirmation Samples

- Sampling mirrored March 2022 event and were collected to confirm results of March sampling event
- Results are pending (expected in the next few weeks)