



**To:** Steve Teel, Department of Ecology

**From:** Tasya Gray, Taylor Way and Alexander Avenue Fill Area (TWAFA) Agreed Order Potentially Liable Parties Group Project Coordinator

**Date:** September 16, 2021

**Subject: TWAFA Existing Groundwater Monitoring Network Evaluation and Recommendations Addendum**

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This addendum provides additional information regarding current conditions of wells identified for use in the Taylor Way and Alexander Avenue Fill Area (TWAFA) Site Groundwater Monitoring Plan, as required under section 5.1 of the Final Data Gaps Work Plan (DGWP) (DOF, 2020). Well conditions outside of the former CleanCare property were previously discussed in the March 5, 2021 memorandum, "TWAFA Existing Groundwater Monitoring Network Evaluation and Recommendation Memorandum" prepared by Dalton, Olmsted, and Fuglevand, Inc. (DOF). However, groundwater monitoring wells on the former CleanCare property could not be assessed as part of the initial evaluation completed in January and February 2021 pending clearance of brush and completion of an access agreement with the current property owner, Pierce County, that would allow for the required work to be conducted. Washington State Department of Ecology (Ecology) requested that once the task was completed an addendum be prepared (Ecology, 2021).

DOF personnel visited the TWAFA site on August 19 and 25, 2021 to locate wells not previously located on the former CleanCare property and assess borehole integrity of all CleanCare wells. Table 1 presents a summary of information collected about each well. Attachment A presents photographs of each well not previously located. Methods and findings are described in more detail below.

The well inspection followed methods outlined in the DGWP. The inspection involved a thorough visual inspection of each well to determine if it has been damaged or tampered with, and to verify the physical condition of the well at the ground surface as well as the internal well casing. Borehole integrity was assessed by measuring the total well depth to estimate sediment build up in the bottom of the well if that procedure had not been confirmed to have been completed in the last five years.

In addition, DOF identified well replacement locations for former wells CTMW-11 and CTMW-23 on the Burlington Environmental property. These wells are also slated for sampling under the DGWP.

### **Inspection Summary**

The following wells on the former CleanCare property were located, monument condition was assessed, and borehole integrity was confirmed.

- CCW-1A, CCW-1B, CCW-1C, CCW-2A, CCW-2B, CCW-2C, CCW-3A, CCW-3B, CCW-3C, CCW-4C, CCW-5B, CCW-5C, CCW-6B, CCW-6C, CCW-7B, CCW-7C, CCW-8B, and MW-4.

All wells on the former CleanCare property identified for monitoring as part of the TWAAFA Groundwater Monitoring Plan were found and inspected as part of this task. The following well maintenance issues were identified during the inspection:

- The concrete surrounding the flush mount monument of well CCW-1A was dislodged and the monument itself was loose, but still had its lid (Picture 4). The well casing inside was capped and appeared in good condition.
- The flush mount monument of well CCW-1B was buried below 6 inches of soil. The well casing inside was capped and appeared in good condition.
- The flush mount monument of well MW-4 was located in an area where DOF previously observed ponded water in February 2021.

## **Recommendations**

This section describes recommendations for maintenance prior to commencing groundwater sampling at the TWAAFA site. Recommendations include:

- Routine maintenance - replace gaskets and bolts (or re-tap if bolts are stripped) on well monuments CCW-4C, CCW-6B, CCW-6C, CCW-7B, CCW-7C, and internal j-plug caps.
- Replace the monuments at wells CCW-1A, CCW-1B, and MW-4 and raise well casing to facilitate seasonal monitoring.

No wells were found in poor condition or are recommended for abandonment based on the recent assessment.

Locations identified for installing replacement monitoring wells, CTMW-11R and CTMW-23R, on Burlington Environmental property are shown in Figure 1. The proposed locations are in the vicinity of the tank farm and limit the potential for damage due to facility operations.

## **Proposed Schedule**

General maintenance tasks outlined in this memorandum will be conducted concurrent with completing the remaining well installation tasks.

A survey of new monitoring wells, any wells adjusted due to maintenance recommendation provided above, and any existing wells that do not have adequate data will be performed after installation of new monitoring wells and prior to reporting of the first groundwater elevation measurement event.

## **References**

Dalton, Olmsted, & Fuglevand, Inc. (DOF), 2020. *Final Data Gaps Work Plan*. July.

Dalton, Olmsted, & Fuglevand, Inc. (DOF), 2021. *TWAAFA Existing Groundwater Monitoring Network Evaluation and Recommendation Memorandum*. March 5.

Washington State Department of Ecology, 2021. *Re: Comments on the Aboveground Site Conditions Memorandum and Existing Groundwater Monitoring Network Evaluation and Recommendations Memorandum. May 5.*

# Tables

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**Table 1**  
**Well Inspection Summary**

Property	Well Name	Install Year	Most Recent TD Measure Date	Inspection Completed (Yes/No)	Notes
Former CleanCare	CCW-1A	1994	8/19/2021	Yes	Well was dry during inspection. Hard bottom. Replace monument.
	CCW-1B	1994	8/25/2021	Yes	Monument is in depression. Replace monument to bring up to surrounding grade.
	CCW-1C	2001	8/19/2021	Yes	Replace gasket/bolts.
	CCW-2A	1994	8/19/2021	Yes	Replace gasket/bolts. Asphalt buckling due to tree roots nearby.
	CCW-2B	1994	8/19/2021	Yes	Replace gasket/bolts. Asphalt buckling due to tree roots nearby.
	CCW-2C	2001	8/19/2021	Yes	Replace gasket/bolts. Asphalt buckling due to tree roots nearby.
	CCW-3A	1994	8/25/2021	Yes	Good condition.
	CCW-3B	1994	8/25/2021	Yes	Good condition.
	CCW-3C	2001	8/25/2021	Yes	Good condition.
	CCW-4C	2001	8/25/2021	Yes	Good condition. Replace gasket/j-plug.
	CCW-5B	2001	8/19/2021	Yes	Replace gasket/bolts.
	CCW-5C	2001	8/19/2021	Yes	Replace gasket/bolts.
	CCW-6B	2001	8/19/2021	No	Good condition. Replace gasket/j-plug.
	CCW-6C	2001	8/25/2021	No	Good condition. Replace gasket/j-plug.
	CCW-7B	2001	8/25/2021	No	Good condition. Replace gasket/j-plug.
	CCW-7C	2001	8/19/2021	No	Good condition. Replace gasket/j-plug.
	CCW-8B	2001	8/19/2021	Yes	Replace gasket/bolts. Loose j-plug cap
MW-4	1986	NM1	Yes	Monument is in low area and may pond during wet season. Replace monument with stick up.	
TWA-9			NA	to be installed	
Potter	CTMW-15	1989	12/4/2020	Yes	Little to no sediment accumulation measurable in well in 2020.
	CTMW-20	2000	12/4/2020	Yes	Little to no sediment accumulation measurable in well in 2020.
	MW-1	1986	6/25/2021	Yes	Good condition.
BE	CTMW-1	1987	NM1	Yes	Records indicate LNAPL-containing, internal casing observed to be in good condition.
	CTMW-5	1987	12/4/2020	Yes	Little to no sediment accumulation measurable in well in 2020.
	CTMW-6	1987	NM2	No	Records indicate well abandoned in 2019
	CTMW-7	1987	12/4/2020	Yes	Little to no sediment accumulation measurable in well in 2020.
	CTMW-8	1987	12/4/2020	Yes	Little to no sediment accumulation measurable in well in 2020.
	CTMW-9	1987	12/4/2020	Yes	Little to no sediment accumulation measurable in well in 2020.
	CTMW-10	1987	NM1	Yes	Records indicate LNAPL-containing, internal casing observed to be in good condition.
	CTMW-11R	2007	NM2	No	Well was abandoned in 2013; plan to re-install
	CTMW-12	1987	12/4/2020	Yes	Little to no sediment accumulation measurable in well in 2020.
	CTMW-14	1989	12/4/2020	Yes	Little to no sediment accumulation measurable in well in 2020.
	CTMW-17	1991	12/4/2020	Yes	Little to no sediment accumulation measurable in well in 2020.
	CTMW-17D	2001	12/4/2020	Yes	Little to no sediment accumulation measurable in well in 2020.
	CTMW-18	1991	12/4/2020	Yes	Little to no sediment accumulation measurable in well in 2020.
	CTMW-23R		NM2	No	Well was abandoned; plan to re-install
	CTMW-24	2005	12/4/2020	Yes	Little to no sediment accumulation measurable in well in 2020.
CTMW-24D	2005	12/4/2020	Yes	Little to no sediment accumulation measurable in well in 2020.	

**Table 1**  
**Well Inspection Summary**

Property	Well Name	Install Year	Most Recent TD Measure Date	Inspection Completed (Yes/No)	Notes
BE (cont.)	CTMW-25D	2005	12/4/2020	Yes	Little to no sediment accumulation measurable in well in 2020.
	PZ-1	1994	NM1	Yes	Records indicate LNAPL-containing, internal casing observed to be in good condition.
	PZ-5	1994	NM1	Yes	Records indicate LNAPL-containing, internal casing observed to be in good condition.
	PZ-6	1999	NM2	No	Records indicate well abandoned in 2019.
	PZ-7	2001	1/14/2021	Yes	Little to no sediment accumulation measurable in well in 2021.
	PZ-8	2001	1/14/2021	Yes	Little to no sediment accumulation measurable in well in 2021.
	PZ-9	2001	1/14/2021	Yes	Little to no sediment accumulation measurable in well in 2021.
PoT-Hyebos Marsh	PZ-10	2002	NM2	No	Records indicate well abandoned in 2019
	SB-1A	1991	12/11/2019	Yes	Little to no sediment accumulation measurable in well in 2019. Well capped but unsecured.
	SB-2A	1991	12/11/2019	Yes	Little to no sediment accumulation measurable in well in 2019. Well capped but unsecured.
	SB-2	1991	1/14/2021	Yes	Little to no sediment accumulation measurable in well in 2021. Well capped but unsecured.
	SB-3A	1991	12/11/2019	Yes	Little to no sediment accumulation measurable in well in 2019. Well capped but unsecured.
	TWA-5	2019	12/10/2019	Yes	Little to no sediment accumulation measurable in well in 2019. Well capped but unsecured.
PoT - 1514 Taylor	TWA-6	2019	12/10/2019	Yes	Little to no sediment accumulation measurable in well in 2019. Well capped but unsecured.
	TWA-1			NA	to be installed
	TWA-2			NA	to be installed
	TWA-3			NA	to be installed
	TWA-10			NA	to be installed
BE	TWA-4			NA	to be installed
BE	TWA-7			NA	to be installed
BE	TWA-8			NA	to be installed

Notes:

■ indicates a deep well

BE = Burlington Environmental

NA = not applicable

PoT = Port of Tacoma

NM1 = not measured because well reported to contain LNAPL or will only be used for water levels

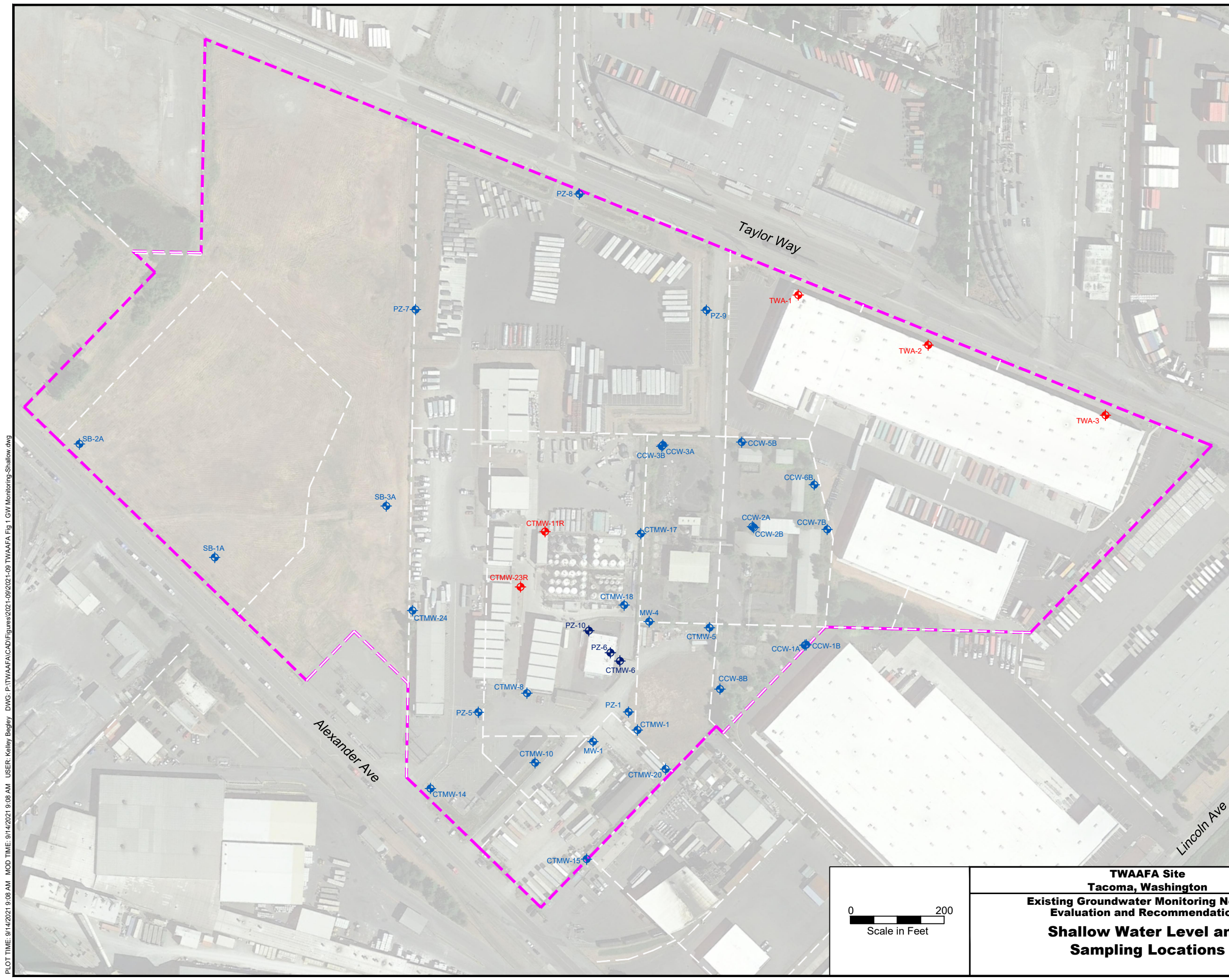
NM2 = not measured because well was not located

TD = total depth

# Figures

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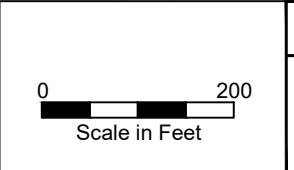




Legend

- ◆ TWA-1 Wells to be installed
- ◆ CTMW-17 Groundwater Well/Piezometer
- ◆ CTMW-11R Abandoned Groundwater Well/Piezometer
- - - TWAFA Site Boundary
- - - Parcel Boundary

PLOT TIME: 9/14/2021 9:08 AM MOD TIME: 9/14/2021 9:08 AM USER: Kelley Begley DWG: P:\TWAFA\CA\ID\Figures\2021-09\2021-09 TWAFA Fig 1 GW Monitoring-Shallow.dwg



**TWAFA Site  
Tacoma, Washington**

**Existing Groundwater Monitoring Network  
Evaluation and Recommendations**

**Shallow Water Level and  
Sampling Locations**

**DOF** DALTON OLMSTED FUGLEVAND

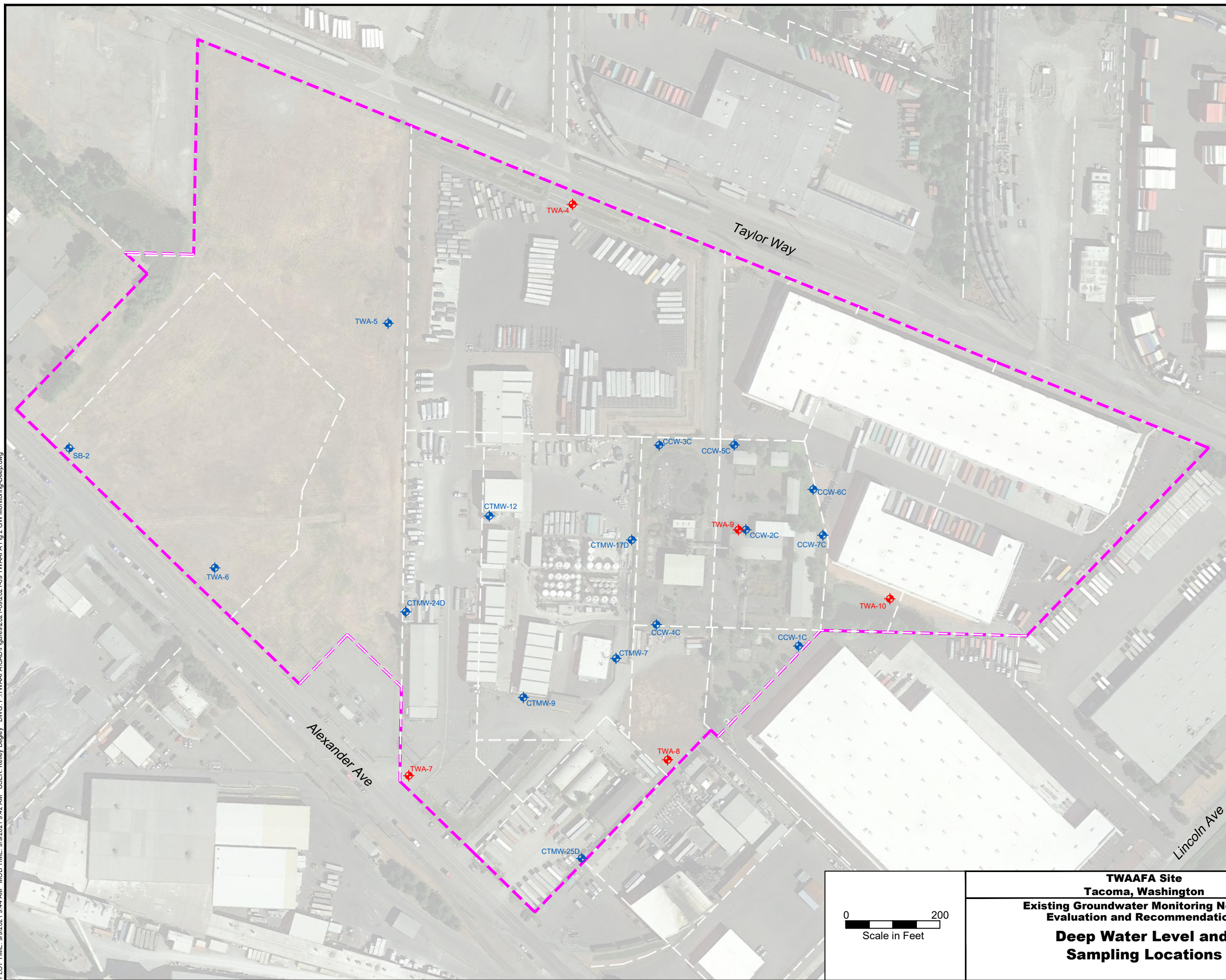
**FIGURE  
1**

09/14/2021



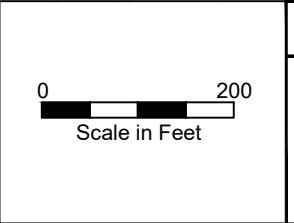


PLOT TIME: 9/9/2021 9:44 AM MOD TIME: 9/9/2021 9:42 AM USER: Kelley Begley DWG: P:\TWAFA\CAD\Figures\2021-09\2021-09 TWAFA Fig 2 GW Monitoring-Deep.dwg



**Legend**

- ◆ TWA-1 Wells to be installed
- ◆ CTMW-17 Groundwater Well/Piezometer
- TWAFA Site Boundary
- Parcel Boundary



**TWAFA Site  
Tacoma, Washington**

**Existing Groundwater Monitoring Network  
Evaluation and Recommendations**

**Deep Water Level and  
Sampling Locations**

**DOF** DALTON  
OLMSTED  
FUGLEVAND

**FIGURE  
2**

09/09/2021

# Appendix A

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## Photo Log





*Picture 1 Monitoring Well CCW-4C on CleanCare Property*



*Picture 2 Monitoring Wells CCW-6B and CCW-6C on CleanCare Property (located at stake near end of cleared brambles)*





*Picture 3 Monitoring Wells CCW-7B (foreground under brambles) and CCW-7C (background) on CleanCare Property*



*Picture 4 Monitoring wells CCW-1B (foreground), CCW-1A (left), CCW-1C (background)*





*Picture 5 Monitoring Well MW-4 located on CleanCare Property*