USTMP Staff GRBCA Training Manual: Step 3

I. Area of Contamination (AOC) SSTL Report Worksheet Overview:

This worksheet evaluates the AOC petroleum release site to determine the applicable GW Site-Specific Threshold Levels (SSTLs), which is based upon the groundwater to indoor air vapor intrusion (VI) pathway for the onsite structure. This evaluation is the first of six (6) exposure pathways evaluated that will determine the applicable GW Alternate Concentration Limits (ACLs) for the release. If the remaining five (5) receptor pathways are not present or not at risk of exposure, then the AOC GW SSTL's determined in this worksheet will be the default GW ACLs the workbook publishes.

The vadose and capillary fringe soil class determinations completed by the user are critical for this worksheet. Users should focus on boring logs near the release source area. The table below provides the tasks completed by the user and the workbook, as well as what the workbook evaluates:

AOC Task	Task Description	What is Evaluated?	AOC Line Item	User Action Green Button*
1	User selects soil classes from boring logs. Soil properties significantly impact on SSTL calculations	Boring logs, which ideally represent the source area	1	N/A
2	User enters most recent GW elevation & enters the max/min GW elevation range	AOC GW source area and establish the GW max fluctuation elevations	2	N/A
3	A. Workbook calculates GW SSTLs B. Workbook compares max COC values to Calculated SSTLs	Max GW COC values are compared to calculated SSTLs	3	3. Calculate AOC SSTLs and Compare COC Concentrations

*Green command buttons may require double clicking

II. AOC GW SSTL Determination:

1. Vadose and capillary fringe soil classes- Table 1 AOC Soil Parameters.

Review the boring logs focusing on the petroleum release area. Evaluate changes in moisture and lithology description recorded in the log. Identify correlation between borings for lithology and moisture content.

A. Moisture Content: Moisture content is recorded during sample evaluation as a boring is advanced and split spoons are collected. Samples screened are ideally continuous or may be at set intervals. Petroleum vapor observations are usually recorded at the same time moisture content is described. Moisture content descriptions may include, but not be limited to "dry", "low", "moderate, "damp", "water", "wet", "saturated", etc.

B. Lithology Description: Consultants typically use the Unified Soil Classification System for soil type descriptions. The **predominant** soil type from each sample evaluated will be fully capitalized, whereas **modifier(s)** will not (i.e., **sandy CLAY**, or **CLAY, silty with gray sand**). For both examples, the correct soil class selection to enter in Table 1, Vadose or Capillary Fringe selection categories is **CLAY**. Identify the vadose zone and capillary fringe zones from the

provided lithology description, where water is documented to be initially encountered and/or, moisture content descriptions listed as “water”, “wet”, “saturated”, etc.

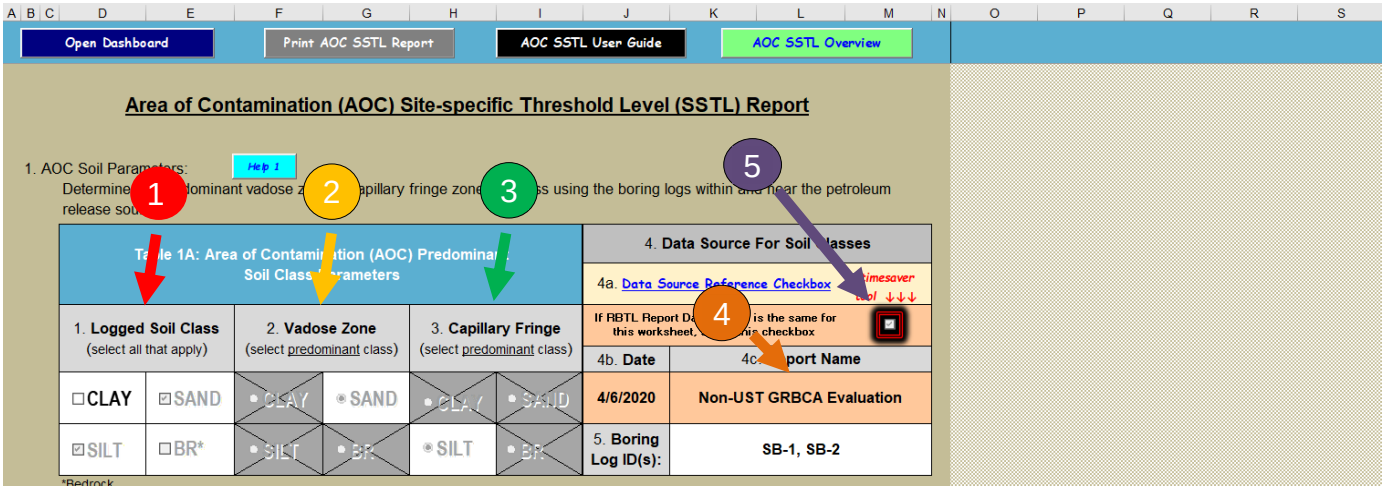
1. In Table 1, “Soil Classes Logged” category, select **all** soil types recorded in the reviewed boring logs.

2. In Table 1, “Vadose Zone” soil class category, select the recurring soil class observed between boring logs, where moisture content is dry to low (usually shallower conditions).

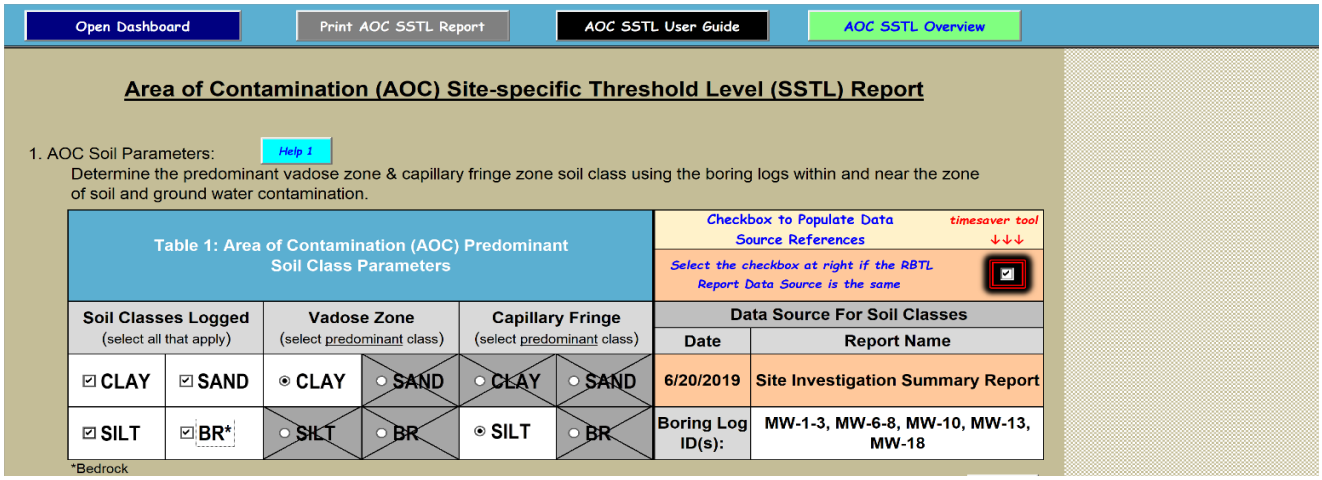
3. In Table 1, “Capillary Fringe” soil class category, select the recurring soil class observed between boring logs, where moisture content is wet or saturated (usually deeper conditions).

4. Enter the boring logs reviewed to compete soil class determinations.

5. Select this checkbox if the report to source data reference is the same as the RBTL Report.



Example of completed Table 1 AOC Soil Parameters (below)



2. Groundwater (GW) and Free Product (FP) Elevation Parameters.

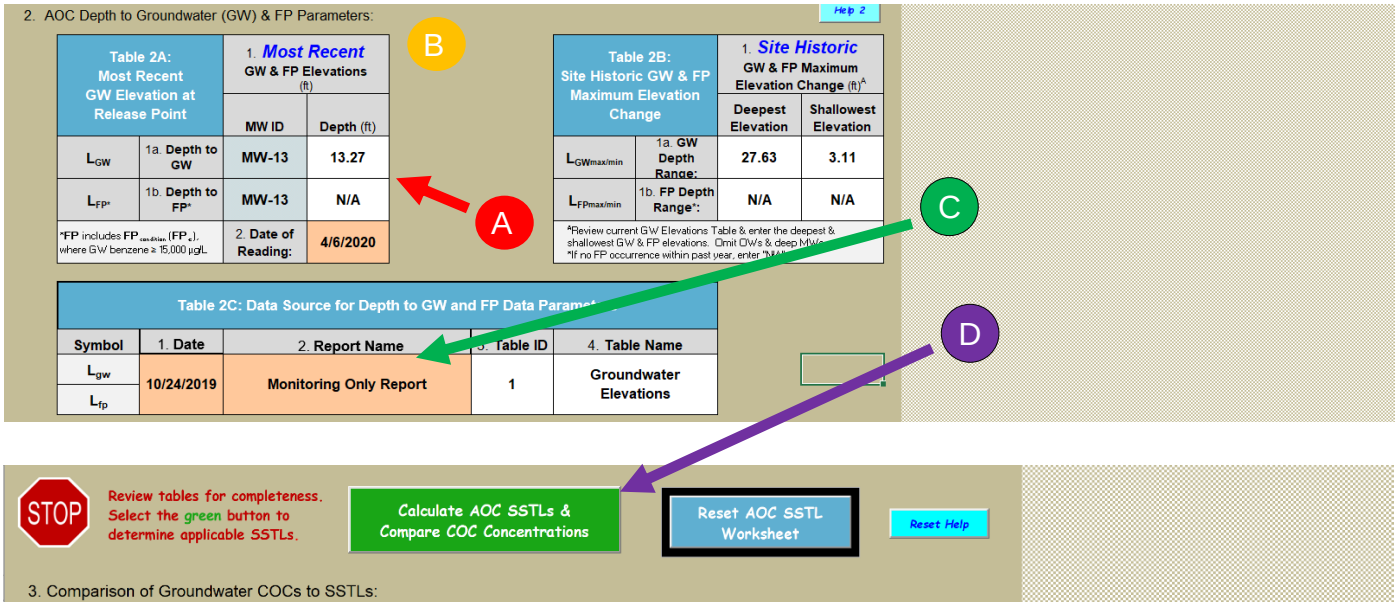
A **GW Elevation Table 2A - Most Recent GW & FP Elevations recorded at AOC (MW^{Cmax})**: Review and record in Table 2A the most recent GW and FP elevations for the listed MW(s). If FP data entry cells are deactivated (gray with a black "x" in the cell), then no FP entry is needed. If FP data entry cells are shaded white and FP has not been evident at the site for one (1) year or more years, then enter "N/A" in all Table 2A FP entries.

B **GW Elevation Table 2B – Site Historic GW& FP Maximum Elevation Change**: Review the current GW Elevations Table to identify the historical GW elevation maximum elevation change. This zone is defined as the maximum (deepest) and minimum (shallowest) recorded GW and FP Elevations. Exclude from consideration (1) tank pit observation wells and (2) offsite MWs when offsite structures are not evaluated in the risk evaluation. If FP has not been evident at the site for two (2) or more years, then enter "N/A" in all Table 2B FP entries.

> ***NOTE**: the deepest elevation and shallowest elevation is compared to the GW VI screening depth, which is determined by the workbook. The VI Screening depth will be identified to be above. within, or below the GW elevation fluctuation range. If GW occurrence is:*
>
> *(1) above the GW elevation fluctuation zone, ACLs will be actionable for cleanup*
> *(2) within the GW elevation fluctuation zone, ACLs may be actionable for cleanup and,*
> *(3) below the GW fluctuation elevation zone, ACLs will not be actionable for cleanup*

C In **Table 2C - Data Source for GW Elevation Parameters**: If the data source entry was not pre-populated from Table 1A, then complete all entries for the table. Otherwise, enter Table ID and Table Name.

D Select [3. Calculate AOC SSTLs & Compare COC Concentrations] to finalize the worksheet.



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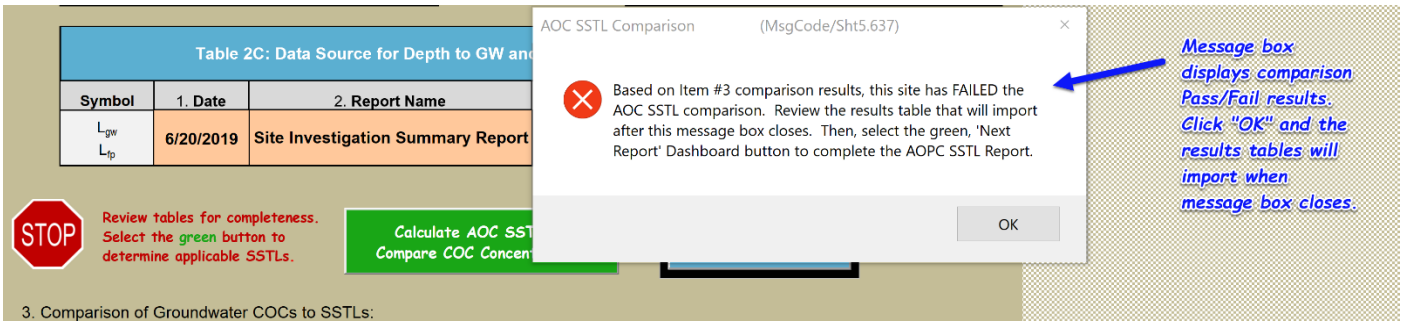
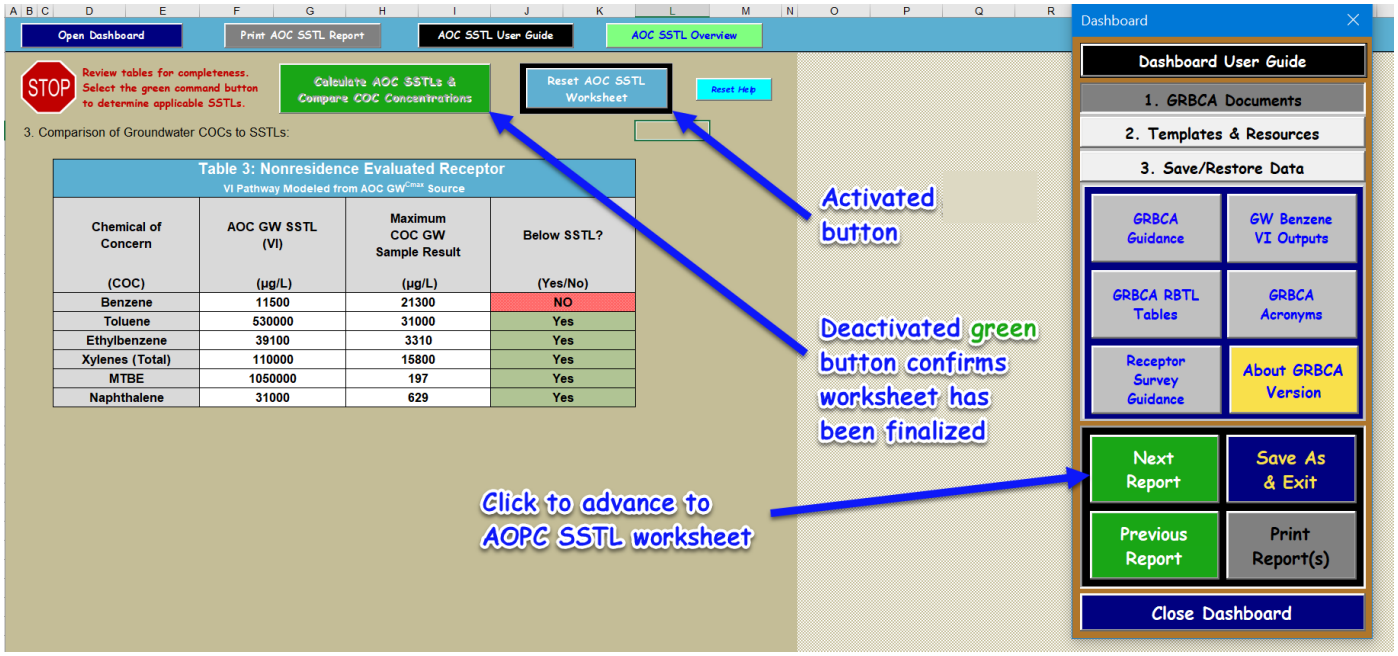


Maximum GW COC and AOC GW SSTL comparison results are shown below in Table 3. Follow the prompts to advance to the next step.



The following pages contain the GW Benezene VI Output Tables 1 and 2. The AOC output table is groundwater vapor intrusion driven for the onsite structure. The tables show the full range of GW benzene values that the workbook will publish and provides information on what to expect from the results generated from this worksheet.

GRBCA Workbook : GW Benzene VI Outputs

Georgia Risk-based Corrective Action (GRBCA) - Applicable Threshold Level Determination at Petroleum Sites

Table 1 below lists the calculated ground water benzene VI outputs where both the vadose and the capillary fringe soil class selections are the same. For sites where the vadose and capillary fringe soil class selections are different, refer to Table 2.

Table 1: Workbook GW Benzene VI Outputs Using Identical Vadose and Capillary Fringe Soil Class Selections: The predominant soil class selected is ideally from the petroleum release source area and includes the applicable GW VI screening depth of 5, 15 and 25 feet determined within the 500-foot receptor survey distance from the release point. The workbook calculates the following GW benzene VI concentration SSTLs. Concentration variability will occur with different depth to GW values, but should be consistent with the output ranges in both tables. If a direct exposure receptor (i.e. drinking water well, surface water intake, perennial surface water body) is not a factor and therefore, not evaluated, then this table can be a very good guide for professionals to assess the scope of future site investigation and remediation potential for any petroleum release site.

Table 1: GRBCA Calculated GW Benzene VI Outputs
AOC GW SSTL (GW to Indoor Air) **from identical soil class selections**

VADOSE SOIL CLASS	CAP. FRINGE SOIL CLASS	GW VI SCREENING DEPTH (feet)	RESIDENCE (µg/L)	NONRESIDENCE (µg/L)
BEDROCK	BEDROCK	5	275	1,970
		15	300	2,150
		25	325	2,330
SAND	SAND	5	593	4,250
		15	610	4,380
		25	628	4,510
CLAY	CLAY	5	1,380	9,930
		15	1,400	10,000
		25	1,410	10,100
SILT	SILT	5	1,790	12,800
		15	1,800	12,900
		25	1,820	13,000

See Table 2 on next page for additional GW benzene VI outputs using soil class selection combinations

Table 2: Workbook GW VI Outputs Using Different Vadose and Capillary Fringe Soil Class Selections:

Table 2: GRBCA Calculated GW Benzene VI Outputs AOC GW SSTL (GW to Indoor Air) from soil class combination selections				
VADOSE SOIL CLASS	CAP. FRINGE SOIL CLASS	GW VI SCREENING DEPTH (feet)	RESIDENCE (µg/L)	NONRESIDENCE (µg/L)
SAND	BEDROCK	5	462	3,310
		15	482	3,460
		25	504	3,610
CLAY	BEDROCK	5	979	7,030
		15	998	7,160
		25	1,020	7,300
SAND	CLAY	5	1,030	7,370
		15	1,040	7,480
		25	1,060	7,600
SILT	BEDROCK	5	1,250	8,980
		15	1,270	9,120
		25	1,290	9,280
SAND	SILT	5	1,260	9,050
		15	1,280	9,160
		25	1,290	9,280
SILT	CLAY	5	1,590	11,400
		15	1,610	11,500
		25	1,620	11,600

The AOC SSTL Report Worksheet Training is now complete.