TECHNICAL MEMORANDUM

To: City of Idaho Falls
Attn: Chris Canfield, PE
Assistant Public Works Director

From: Thane Kindred, GIT,
Patrick Naylor, PE, PG
Rocky Mtn. Environmental Assoc.

Subject: Infiltration test to determine infiltration capacity associated with stormwater galleries

Date: December 5, 2025
RMEA Project No.: 25-0202

INTRODUCTION

On behalf of the city of Idaho Falls (City), Rocky Mountain Environmental Associates, Inc. (RMEA) performed three infiltration tests on soils associated with proposed stormwater infiltration galleries. The tests were performed as part of the Scope of Work presented in RMEA's October 10, 2025 proposal, to determine the infiltration rate capacity.

TEST DESCRIPTION AND ESTIMATE OF INFILTRATION RATE

In preparation for the infiltration test, test pits were dug to approximately a depth of 10 ft on October 28. The locations of said test pits are shown in Figure 1. Test pits were filled with water on the same day and surrounding soils were allowed to become saturated. The wetting period allowed water to infiltrate into the soil under the test pits, resulting in near-saturation of soil to be more consistent with conditions that would exist during a major storm event. Photographs of the test pits are provided in Attachment A.

Two soil samples were collected from each test pit, one collected from a depth of five feet or less, and one collected from a depth greater than five feet. Three of the samples were sent to Allied Consulting Services, a geotechnical laboratory located in Rexburg, Idaho. Samples were analyzed through a sieve analysis, a hydrometer analysis, or both.

On the day of the test (October 29), a 12 ft length, 2-in inner diameter PVC pipe with drilled holes allowing water to penetrate into the pipe, was placed in each test. The test pits were filled with water at approximately 9:00 AM and the tests continued until approximately 1:00 PM on the same day. Depth to water was measure periodically throughout the test and is recorded on field sheets. Conditions during the test were sunny with low ambient air temperatures. Thus, precipitation and evaporation were assumed to have a negligible influence on the infiltration tests. After tests were completed, drawdown over time was calculated using collected depth to water level measurements.

RESULTS

As described above, excavators were used to dig four test pits, however, one test pit (ETP-3) was dug to a total depth of four feet due to shallow basalt bedrock. No attempt was made to dig through bedrock. The shallow test pit precluded the possibility of performing an infiltration test. Photographs of ETP-3 can be found in Appendix A. All other test pits were excavated to a depth of approximately ten ft. Test pit logs for all test pits can be found in Appendix B.

Results from the infiltration tests are shown as tabular data in Appendix C and as semi-logarithmic graphs in Figures 2-4. These data suggest two infiltration rates at each test pit: an initial, faster infiltration rate, and a later, slower infiltration rate. The initial rate likely represents re-saturation of surrounding soils due to the fact that infiltration tests occurred the day after wetting occurred. Conversely, the later, slower infiltration rates likely represent infiltration under saturated conditions. As saturated soils more accurately represent conditions during a major storm event, the later, slower infiltration rates are presented in Table 1 below. In Table 1, the elapsed time and drawdown represent the interval of the slower infiltration rate. Said interval was determined visually based on the semi-logarithmic graphs of drawdown over time. The start and end of these intervals are shown with enlarged-green points in Figures 2-4.

Table 1: Infiltration Rates Calculated From Infiltration Tests

	Elapsed Time (hr)	Drawdown (in)	Infiltration Rate (in/hr)
ETP-1	0.82	7.20	8.8
ETP-2	1.33	6.48	4.9
ETP-4	1.52	7.92	5.2

Infiltration rates were also estimated using a method presented by Bouwer (*Bouwer, H. 1978. Groundwater Hydrology. McGraw-Hill, New York, NY, 480 pp.*); however, assumptions included in the calculations introduced errors that resulted in estimates that were not realistic. Therefore, the results of those estimates are not included.

CONCLUSIONS AND RECOMMENDATIONS

The infiltration tests performed on behalf of the City of Idaho Falls resulted in estimated infiltration rates ranging from 4.9 in/hr to 8.8 in/hr under saturated conditions. The variability of infiltration rate estimates may be the result of small differences in soil characteristics from test pit to test pit.

LIMITATIONS

This seepage analysis has been completed with only a limited subsurface investigation of soils. Without extensive, expensive, intrusive characterization of hydrogeologic conditions, which was beyond the scope of this assessment, no statement of greater scientific certainty can be made regarding latent subsurface hydrologic conditions. The findings and conclusions of this report

are not scientific certainties; rather, they are probabilities based on professional judgment concerning the significance of the data gathered during the course of this Seepage Analysis.

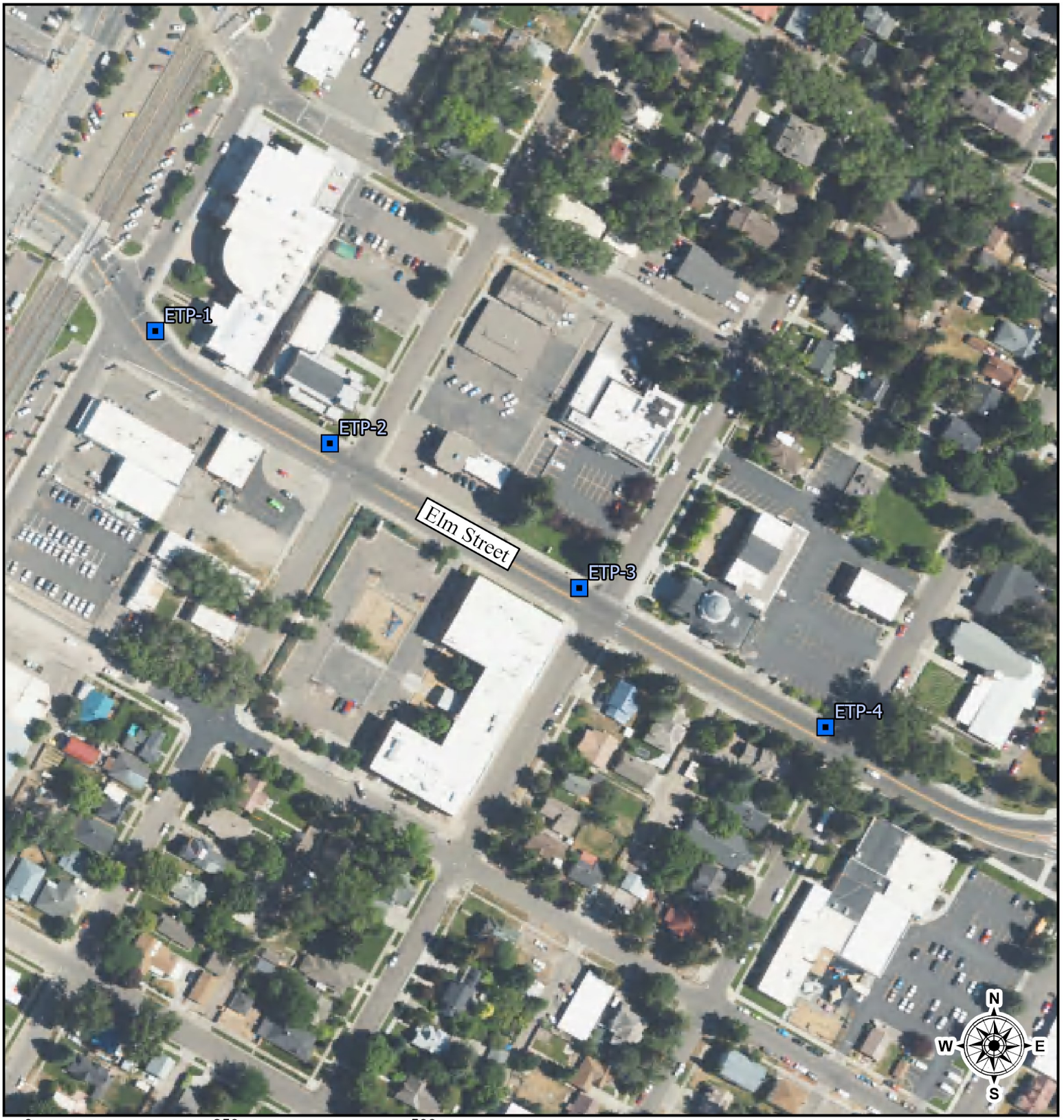


Figure 1: Location of Infiltration Test Pits

Legend

- TestPits

Elm Street
City of Idaho Falls
Infiltration Tests

Date: 12/4/2025

RMEA #: 25-0202

Drafted by: TK

Rocky Mountain ENVIRONMENTAL ASSOCIATES, INC.

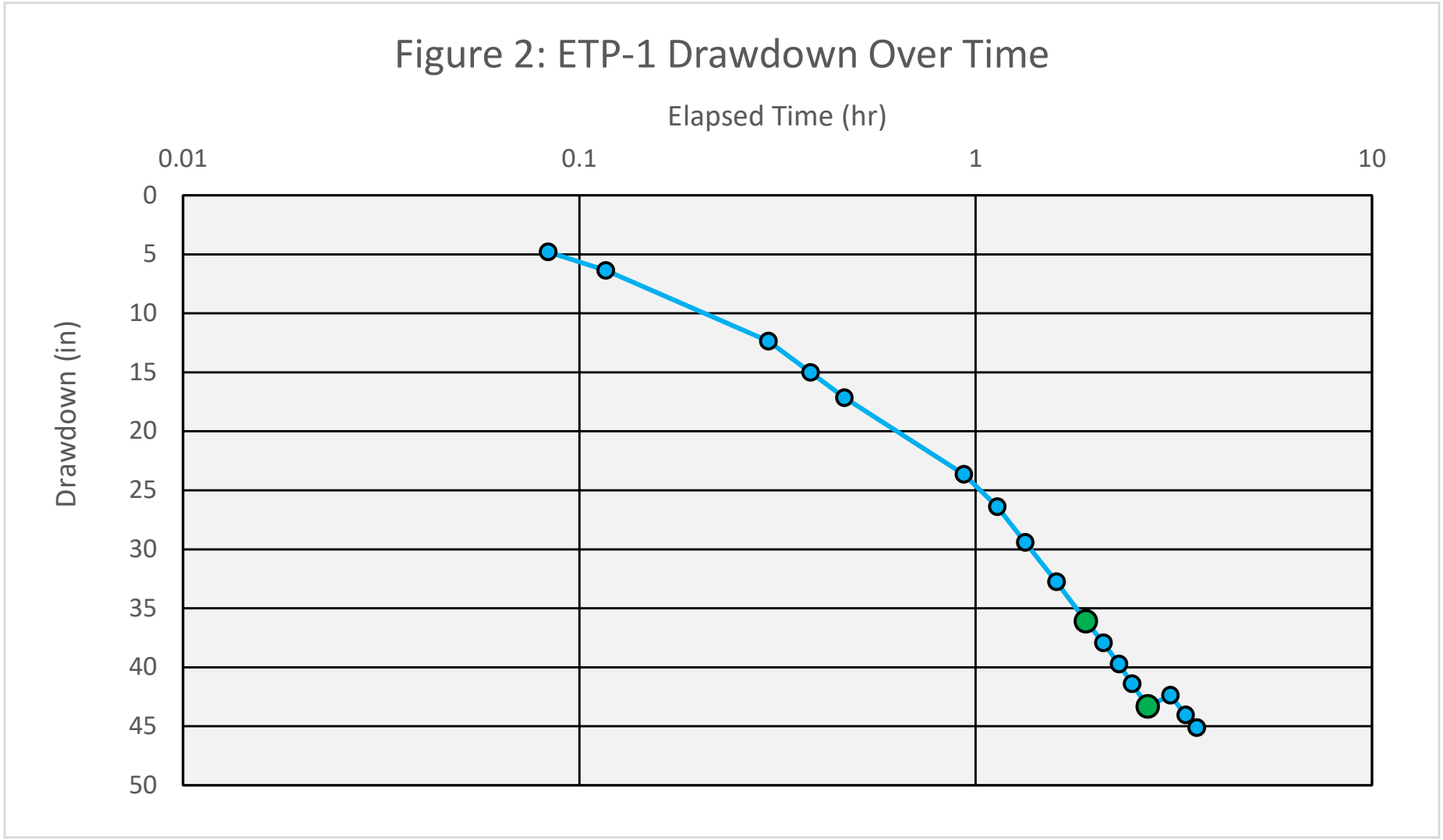

Figure 2: ETP-1 Drawdown Over Time
Elapsed Time (hr)
0.01
0.1
1
10
Drawdown (in)
0
5
10
15
20
25
30
35
40
45
50

Figure 3: ETP-2 Drawdown Over Time

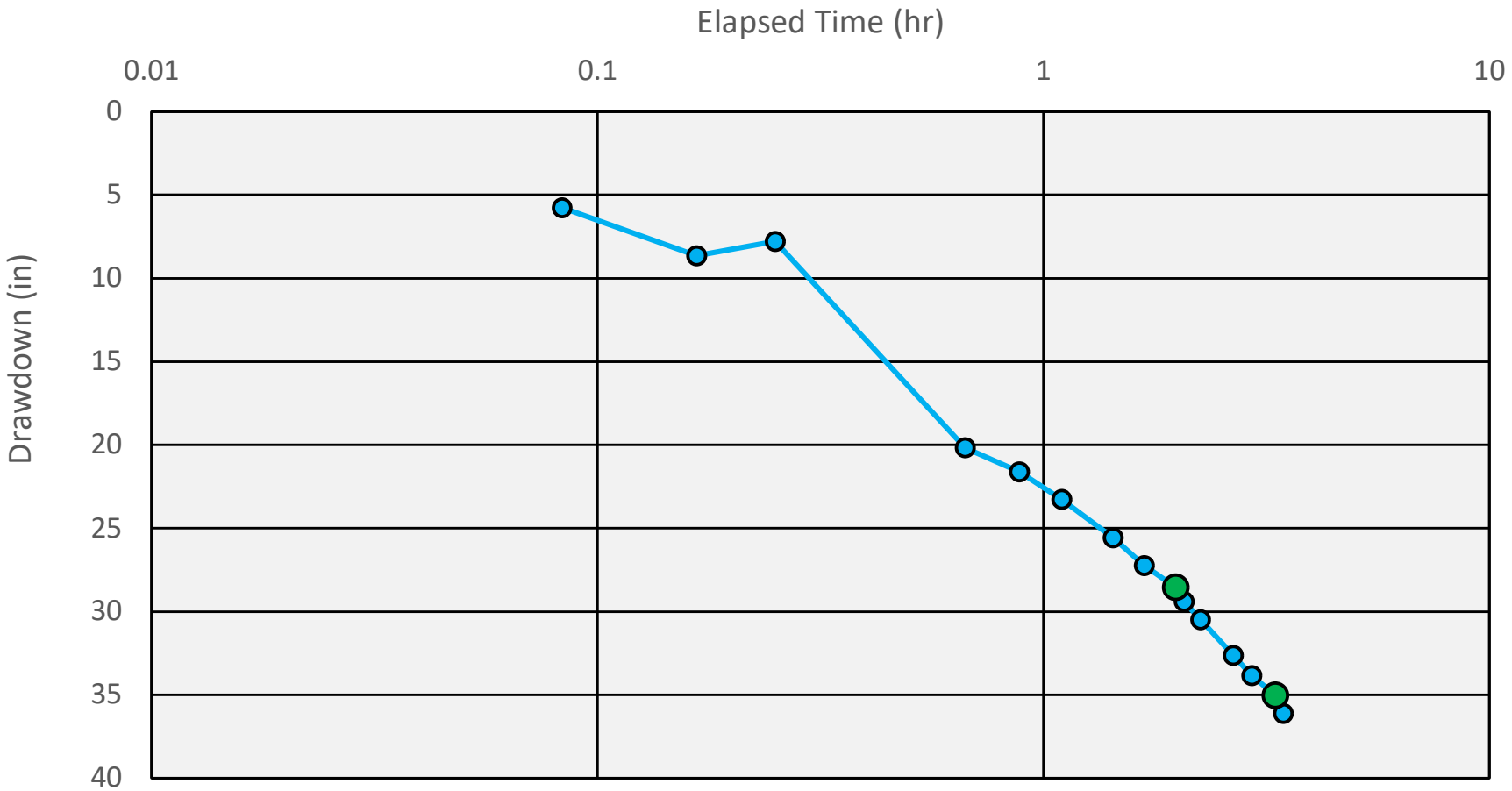
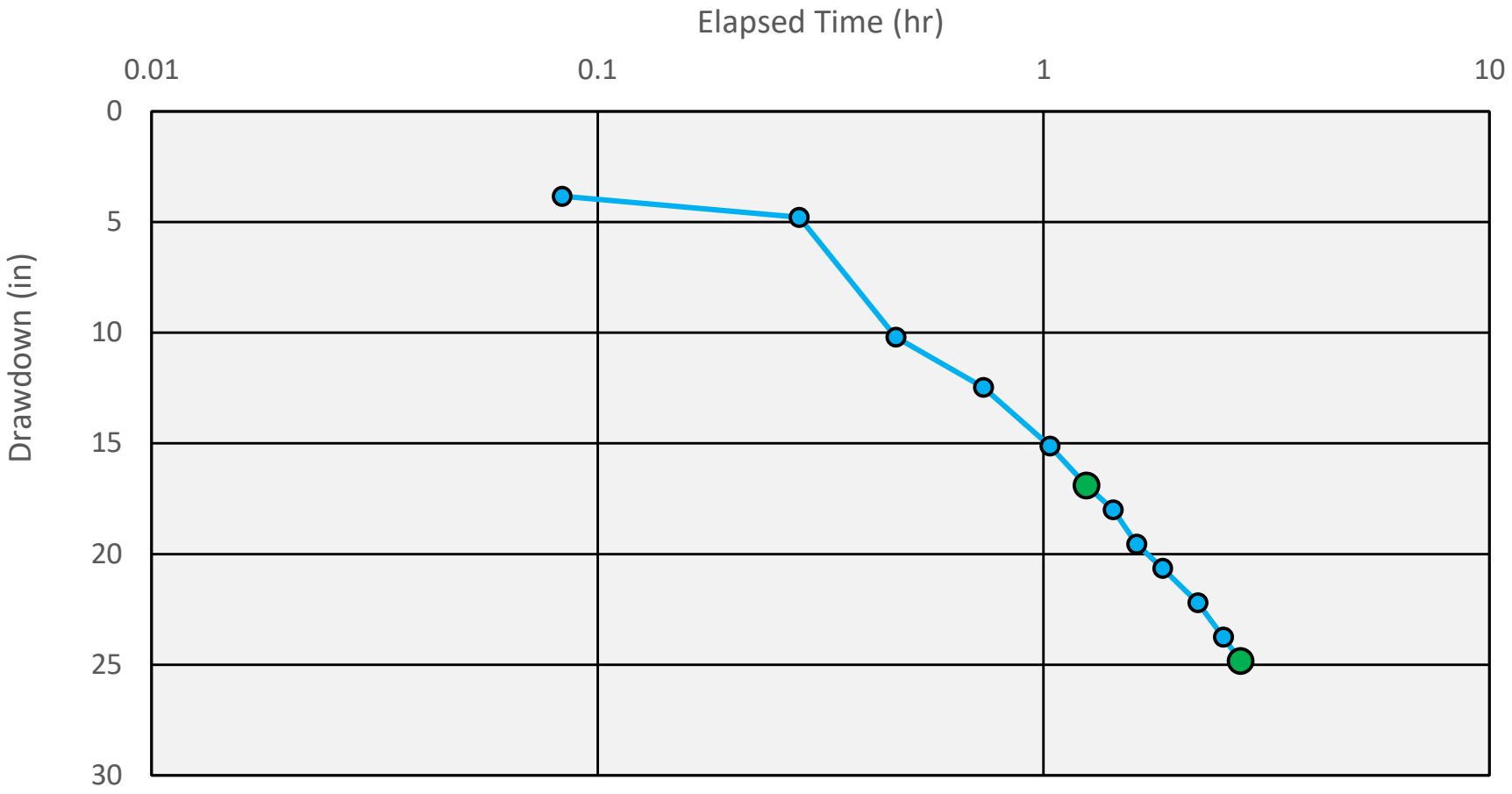


Figure 4: ETP-4 Drawdown Over Time



Appendix A: Photographs of Test Pits and Infiltration Tests



Photo 1: Beginning of infiltration test at ETP-1.



Photo 2: End of infiltration test at ETP-2.



Photo 3: Excavation of ETP-3.



Photo 4: End of excavation of ETP-3.



Photo 5: Infiltration test at ETP-3.

Appendix B: Test Pit Logs

Test Pit ID:	**ETP-1**						
			Percent Composition				**Description (color, density, grading, sorting, roundness, moisture, comments)**
Depth (ft)	**Soil Classification**	**Sampled (ID) / Analyzed**	**Gravel & Cobbles**	**Sand**	**Fines**	**Organics**	
0-10.75	Sand	Yes (ETP-1_4') / No Yes (ETP-1_8') / Yes	0	100	0	0	Light brown, loose, very fine grained sand, poorly graded, well sorted, rounded, dry.
Total Depth:	10.75 ft						

Test Pit ID:	**ETP-2**						
			Percent Composition				**Description (color, density, grading, sorting, roundness, moisture, comments)**
Depth (ft)	**Soil Classification**	**Sampled (ID) / Analyzed**	**Gravel & Cobbles**	**Sand**	**Fines**	**Organics**	
0-10	Silt	Yes (ETP-1_5') / No Yes (ETP-1_9') / Yes	0	0	100	0	Light to dark brown, dense, non-plastic, slightly moist.
Total Depth:	10 ft						

Test Pit ID:	**ETP-3**						
			Percent Composition				**Description (color, density, grading, sorting, roundness, moisture, comments)**
Depth (ft)	**Soil Classification**	**Sampled (ID) / Analyzed**	**Gravel & Cobbles**	**Sand**	**Fines**	**Organics**	
0-4	Silt	Yes (ETP-3_4') / No	0	0	100	0	Dark brown, dense, non-plastic, slightly moist.
4	Basalt Bedrock	No	NA	NA	NA	NA	NA
Total Dept:	11 ft						

Test Pit ID:	**ETP-4**						
			Percent Composition				**Description (color, density, grading, sorting, roundness, moisture, comments)**
Depth (ft)	**Soil Classification**	**Sampled (ID) / Analyzed**	**Gravel & Cobbles**	**Sand**	**Fines**	**Organics**	
0-9	Silt	Yes (ETP-4_4') / No Yes (ETP-4_8') / Yes	0	0	100	Tr	Light brown, dense, non-plastic, moisture increases with depth.
9-10.5	Silt with Cobbles	No	15	0	85	0	Silt matrix similar to above with rounded cobbles.
Total Depth:	10.5 ft						

Appendix C: Tabular Results of Infiltration Tests

Test Pit: ETP-1
Start Vol. 12949.2 gal
End Vol. 14135.4 gal

Date	Time	Elapsed Time (h)	DTW (ft)	Drawdown (in)	Remarks
10/29/2025	9:11:00 AM	0.00	5.18	0.0	Start
	9:16:00 AM	0.08	5.58	4.8	
	9:18:00 AM	0.12	5.71	6.4	
	9:29:00 AM	0.30	6.21	12.4	
	9:34:00 AM	0.38	6.43	15.0	
	9:39:00 AM	0.47	6.61	17.2	
	10:07:00 AM	0.93	7.15	23.6	
	10:19:00 AM	1.13	7.38	26.4	
	10:31:00 AM	1.33	7.63	29.4	
	10:47:00 AM	1.60	7.91	32.8	
	11:05:00 AM	1.90	8.19	36.1	
	11:17:00 AM	2.10	8.34	37.9	
	11:29:00 AM	2.30	8.49	39.7	
	11:40:00 AM	2.48	8.63	41.4	
	11:54:00 AM	2.72	8.79	43.3	
	12:17:00 PM	3.10	8.71	42.4	No visual change
	12:34:00 PM	3.38	8.85	44.0	
	12:48:00 PM	3.62	8.94	45.1	

Test Pit: ETP-2
Start Vol. 14135.4 gal
End Vol. 15058.0 gal

Date	Time	Elapsed Time (h)	DTW (ft)	Drawdown (in)	Remarks
10/29/2025	9:27:00 AM	0.00	4.99	0.00	Start
	9:32:00 AM	0.08	5.47	5.76	
	9:37:00 AM	0.17	5.71	8.64	
	9:42:00 AM	0.25	5.64	7.80	
	10:07:00 AM	0.67	6.67	20.16	
	10:20:00 AM	0.88	6.79	21.60	
	10:33:00 AM	1.10	6.93	23.28	
	10:53:00 AM	1.43	7.12	25.56	
	11:08:00 AM	1.68	7.26	27.24	
	11:26:00 AM	1.98	7.37	28.56	
	11:31:00 AM	2.07	7.44	29.40	
	11:42:00 AM	2.25	7.53	30.48	
	12:07:00 PM	2.67	7.71	32.64	
	12:23:00 PM	2.93	7.81	33.84	
	12:46:00 PM	3.32	7.91	35.04	
	12:54:00 PM	3.45	8.00	36.12	

Test Pit: ETP-4
Start Vol. 15056.3 gal
End Vol. 16511.6 gal

Date	Time	Elapsed Time (h)	DTW (ft)	Drawdown (in)	Remarks
10/29/2025	9:58:00 AM	0.00	5.83	0.00	Start
	10:03:00 AM	0.08	6.15	3.84	
	10:15:00 AM	0.28	6.23	4.80	Water bubbling
	10:26:00 AM	0.47	6.68	10.20	Came back to find pipe moved
	10:42:00 AM	0.73	6.87	12.48	Splashes in water from sloughing
	11:00:00 AM	1.03	7.09	15.12	
	11:13:00 AM	1.25	7.24	16.92	
	11:24:00 AM	1.43	7.33	18.00	
	11:35:00 AM	1.62	7.46	19.56	
	11:49:00 AM	1.85	7.55	20.64	
	12:11:00 PM	2.22	7.68	22.20	
	12:30:00 PM	2.53	7.81	23.76	
	12:44:00 PM	2.77	7.90	24.84	