DEPARTMENT OF ECOLOGY
State of Washington

Addendum to Quality Assurance Project Plan

Kittitas Reclamation District's Targeted Managed Aquifer Recharge Project

June 2025

Publication 25-12-010

Publication Information

This Quality Assurance Project Plan Addendum is on the Department of Ecology's website at https://apps.ecology.wa.gov/publications/SummaryPages/2512010.html This is an addition to an original Quality Assurance Project Plan (QAPP). It is not a correction (errata) to the original plan.

This QAPP addendum was approved to begin work in June 2025.

Suggested citation for this addendum:
Kittitas Reclamation District. 2025. Addendum to Quality Assurance Project Plan: Kittitas Reclamation District's Targeted Managed Aquifer Recharge Project. Publication 24-12-014. Washington State Department of Ecology, Olympia. https://apps.ecology.wa.gov/publications/SummaryPages/2512010.html.

Data for this project will be available on Ecology's Environmental Information Management (EIM) website at EIM Database. Search Study ID: WRYBIP-2325-KittRD.

Original Quality Assurance Project Plan:
Kittitas Reclamation District. 2024. Quality Assurance Project Plan: Kittitas Reclamation District's Targeted Managed Aquifer Recharge Project. Publication 24-12-014. Washington State Department of Ecology, Olympia. https://apps.ecology.wa.gov/publications/SummaryPages/2412014.html.

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Kittitas Reclamation District's Targeted Managed Aquifer Recharge Project

by Kittitas Reclamation District

May 2025

Approved by:

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1.0 Table of Contents

Note: The numbered headings in this document correspond to the headings in the original QAPP. Only relevant sections are included here; therefore, some numbered headings may be missing.

3.0 Background

3.2 Study Area and Surroundings

Updated to include the following proposed stream monitoring location:

Manastash Creek originates in the foothills of the Cascade Mountains as the North Fork and South Fork Manastash Creek to the west of the Kittitas Valley and flows for approximately 25 miles before its confluence with the Yakima River at RM 154.5. Manastash Creek drains a 97 square mile watershed.

3.2.3 Parameters of Interest and Potential Sources

Updated to include the following parameters of interest:

- Stream stage – obtained at three locations (Manastash, Taneum, Wenas) via bridge-mounted ultrasonic sensors logging data at 15-minute intervals.
- Stream discharge – calculated with rating curves developed using flow measurements and stream stage (submerged pressure transducer and/or bridge-mounted ultrasonic sensor and staff gage readings).

4.0 Project Description

4.3 Information Needed and Sources

Updated to include additional field instrumentation:

- Surface water levels – derived from surface water elevation obtained from newly installed submerged pressure transducers or bridge-mounted ultrasonic sensors.

6.0 Quality Objectives

6.2 Measurement Quality Objectives

Updated to include additional field instrumentation in text and Table 4:

<u>Surface Water Stage Monitoring</u>
Surface water state elevation monitoring equipment includes In-Situ LevelTroll transducers and Tolthalk bridge-mounted ultrasonic level sensors.

Table 4. Parameters measured with measurement instruments and their respective range, accuracy, and resolution.

Parameter	Equipment	Accuracy	Resolution	Range	Field Replicates	Expected Range
Water Levels	ToltHawk WL100 Ultrasonic Sensor	+/- 0.2%	0.01 ft	2 to 32 ft Sensing cone: 15° from center	-	5 to 20 ft

6.2.1.3 Sensitivity

Updated to include additional field instrumentation:

7.0 Study Design

7.2 Field Data Collection

Updated to include an additional field site:

The approximate location of stream gauges at Taneum, Swauk, Big, Little, Cooke, Schnebly, Reecer, Park, Wenas, Upper Naneum, Lower Naneum and Manastash Creeks are shown in Figure 1.

7.2.1 Sampling Locations and Frequency

Updated to include additional field instrumentation:

Stream stage at sites equipped with ultrasonic sensors will be measured and logged in 15-minute intervals.

7.2.2 Field Parameters and Laboratory Analytes to be Measured

Updated to include additional field instrumentation in Table 5:

Table 5. Additional Field Parameters

Environmental Parameters	Frequency	Equipment	Model
Stream Stage	15 minutes	ToltHawk Ultrasonic Sensor	WL100

7.5.1 Logistical Problems

Updated to include additional field instrumentation:

The internal battery for the ultrasonic sensors is charged by a small attached solar panel. Should this panel become obscured (vegetation, dirt, snow, seasonal solar angle, etc.) the unit will not charge, and the battery will drain. Should this happen, the sensor will be retrieved, recharged via wired connection, and reinstalled.

8.0 Field Procedures

8.2 Measurement and Sampling Procedures

Updated to include procedures for bridge-mounted ultrasonic sensors:

The ToltHawk ultrasonic sensors used in this study are programmed to record a measurement every fifteen minutes. These measurements are sent via cellular network to the manufacturer, who provides the data in near-real-time on a web portal designated specifically for the instruments in this study.

Installation procedure for the sensors is as follows: After securing necessary permissions for access to and installation on the bridge, sensors must be securely mounted in a vertical orientation above the channel thalweg with the attached solar panel positioned such that it will receive the most direct sunlight possible. Following installation, the instrument is calibrated by manually measuring the vertical distance between the aperture at the base of the instrument and the streambed directly below. This measurement is provided to the manufacturer and used to correct raw data before publishing it to the web portal.

14.0 Data Quality (Usability) Assessment

14.3 Data Analysis and Presentation Methods

Updated to include ultrasonic sensors in the development of rating curves:

Water depths will be determined by data acquired from bridge-mounted ultrasonic sensors or submerged pressure transducers.