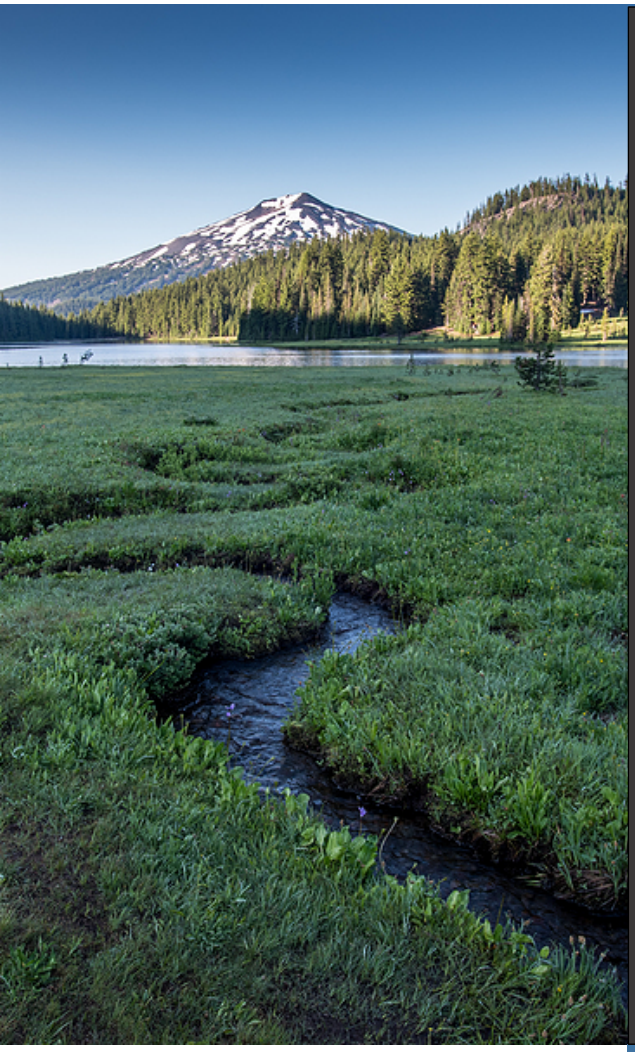

Quality Assurance Project Plan

Pesticide Stewardship Partnerships (PSP)

DEQ05-LAB-0022-QAPP
Version 7.0

November 2025

State of Oregon
DEQ Department of Environmental Quality

This document was prepared by
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1. Project management

1.1. Approvals sheet

Prepared by:

ALLEN HAMEL
ALLEN HAMEL (Nov 13, 2025 17:32:53 PST)

Allen Hamel, PSP Project Coordinator — Date: _____

Reviewed by:

David Gruen
David Gruen (Nov 14, 2025 10:52:58 PST)

David Gruen, Columbia River Coordinator — Date: _____

Reviewed by:

Wade Peerman
Wade Peerman (Nov 17, 2025 10:11:52 PST)

Wade Peerman, RATS Section Manager — Date: _____

Approved by:

Sara Krepps

Sara Krepps, Laboratory Quality Assurance Officer — Date: _____

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1.2. Distribution List

The following DEQ personnel will be emailed regarding all aspects of this QAPP/SAP. Final reports from the third-party laboratories will be emailed and/or mailed to the Project Manager (PM), Laboratory Project Manager (LPM). Final reports from the DEQ laboratory may also be faxed/emailed and mailed to the PM, and LPM and data coordinator.

This QAPP will be posted internally through MediaLab and publicly on ORMS (DEQ's internal website) at Content Manager WebDrawer - Record Search. This project is expected to continue through multiple seasons; thus, revisions should be anticipated. The PM may revise this plan, which must be approved by the signatories on the approval page. The DEQ is not responsible for the control of reprinted copies from web sites or photocopies of the original plan. It is the responsibility of the reader to ensure that they are using the most current QAPP. The QAO will replace posted network files as the plan is revised.

Table 1 – Distribution List

Name	Phone	Email
David Gruen	503-719-2282	David.gruen@deq.oregon.gov
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Jeremy Unrau	503-887-9346	Jeremy.unrau@deq.oregon.gov
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Wade Peerman	971-413-1922	Wade.peerman@deq.oregon.gov
Sarah Rockwell	503.693.5775	Sarah.rockwell@deq.oregon.gov

To track the time and expenses spent on this project DEQ personnel must use the Q-Time numbers designated in the Sampling and Analysis Plan (SAP).

1.3. Acronyms

CCV	Continuing Calibration Verification
CFR	Code of Federal Regulations
DEQ	Oregon Department of Environmental Quality (also ODEQ)
DQL	Data Quality Level
EPA	Environmental Protection Agency
HUC	Hydrologic Unit Code
LCS	Laboratory Control Sample
LIMS	Laboratory Information Management System (Also called ELEMENT™ developed by Promium)
LEAD	Laboratory and Environmental Assessment Division
LOD	Limit of Detection (aka MDL)
LOQ	Limit of Quantitation (aka MRL)
LPM	Laboratory Project Manager
MB	Method Blank
MDL	Method Detection Limit (aka LOD)

MRL	Method Reporting Limit (aka LOQ)
MOM	Mode of Operations Manual
NELAP	National Environmental Laboratory Accreditation Program
NIST	National Institute of Standards and Technology
ORELAP	Oregon Environmental Laboratory Accreditation Program
PM	Project Manager
QA	Quality Assurance
QAO	Quality Assurance Officer
QC	Quality Control
QAPP	Quality Assurance Project Plan
QC	Quality Control
QMP	Quality Management Plan
SAP	Sampling and Analysis Plan
SOP	Standard Operating Procedure
USGS	United States Geological Survey
WQM	Water Quality Monitoring

1.4. Definitions

Sampling Event: A group of samples collected and/or shipped under a single chain of custody; by an individual or individual sampling team (usually a single day's sampling activity). After the sampling event is logged into Element, it is referred to as a Work Order.

Survey: The grouping of all the samples collected for a project during specific time period. The specific grouping and time periods must be defined in the QAPP or SAP. (Example: spring sampling for all of the samples in a specific basin). The QAPP/SAP completeness goal is based on a review of the data within a survey.

Survey Batch: The survey batch is a subset of the survey and is used to reflect how the samples are grouped relative to project Field QC samples. The survey batch defines what samples are associated with specific QC samples. (Example: Samples taken for a one-week period by a specific sampling team may only have one duplicate or one blank. All of the samples associated with the duplicate and blank are in the sample survey batch. The Survey Batch for each project must be defined in the QAPP or SAP.

1.5. Project/Task Organization

The Laboratory and Environmental Assessment Division's (LEAD) role covers monitoring network design, sample collection, analysis, reporting, data storage, and data verification in DEQ's data repository database. The LEAD is also responsible for maintaining data records, analysis of data, transferring data to EPA databases, and for the development of Quality Assurance Project Plans (QAPPs) and Sampling and Analysis Plans (SAPs).

The project team organization provides the framework for conducting the sample collection tasks to meet study objectives. The organizational structure and function also facilitate project performance and adherence to Quality Control (QC) procedures and Quality Assurance (QA) requirements. Key roles are filled by those persons responsible for ensuring program planning, sample collection, data generation, data verification, as well as the persons responsible for validating data for usability with final products and deliverables.

The DEQ Laboratory and Environmental Assessment Division (LEAD) Section Managers establish operational monitoring framework, set program objectives and priorities; supervise staff, and manage program workloads/budgets. Managers contribute to project development, planning and documentation; Section Managers work cross-programmatically to facilitate availability of equipment, logistical support and qualified personnel to conduct statewide monitoring in Oregon's waters and aquatic organisms. Together, they ensure laboratory procedures and field-collections conform to established safety and data quality guidelines.

Quality Assurance Officers are responsible for reviewing and approving all Quality Assurance Project Plans (QAPPs) and assisting the Project Manager on decisions regarding data acceptability.

Project Data Coordinator is responsible for the transfer of data from the Agency data base to AWQMS.

Sample Custodian will ensure project and QC samples are logged into LIMS appropriately.

The **Project Manager** is responsible for overseeing development and implementation of the project and communication of programmatic accomplishments and findings with internal and external stakeholders. The project coordinator is also responsible for ensuring that project monitoring strategies are current and reflect program priorities.

The **Laboratory Project Manager** (LPM) contributes to the development of accurate project-level QA documents, reviews laboratory and field/laboratory data records for accuracy and completeness. The LPM communicates findings of reviews with participating field/analytical staff and managers.

The LPM facilitates communication among staff involved with the project (the sample custodian, analytical staff, field staff, and data coordinator). They will review all project data for accuracy and completeness. This project-level review will evaluate data quality after the laboratory has performed their section reviews and before the approval of work orders.

The **Field Operations Coordinator** will review all field records for accuracy and ensure that any problems encountered outside normal operating conditions are documented and addressed. The field operations coordinator will also verify that all other field QA/QC procedures, which are identified in this QAPP, are followed. The Field Operations Coordinator will verify samples were logged into LIMS accurately.

The **Sample Custodian or Sample Control Technician** will ensure project and QC samples are logged into LIMS appropriately.

Table 2 – Project/Task Responsibilities

Name	Project Title/Responsibility
David Gruen	Project Manager
Allen Hamel	Laboratory Project Manager & Field Operations Coordinator
Sarah Rockwell	Project Data Coordinator
Ben Hamilton	Field Quality Assurance Officer
Sara Krepps	Laboratory Quality Assurance Officer
Jeremy Unrau	Organic Section Lab Manager

Name	Project Title/Responsibility
Zach Mandera	Inorganic Section Lab Manager
Karen Williams	WQM Section Manager
Susan Treat	Sample Custodian
Community Based Organization (CBO)/Field Staff Volunteers	Sample Collectors
Sarah Rockwell	Third Party Data Coordinator

1.6. Problem Definition/Background

The purpose of this plan is to provide a Quality System for the development of Sampling and Analysis Plans (SAPs) for projects developed for the Pesticide Stewardship Partnerships (PSPs). The SAP shall describe the purpose of the project, procedures used to select sampling sites, schedule for collecting samples, and identify responsible parties who shall perform the necessary tasks.

The purpose for specific projects shall be to collect data for evaluating the occurrence and concentration of current use pesticides in local surface water during agricultural pesticide application periods. The data will be used to encourage voluntary improvements in pesticide application and management practices that are designed to reduce concentrations of pesticides in surface waters.

Data could be used in 303(d) list determination, TMDL development, or other regulated reporting purposes, which allow or require the use of secondary data sources. The data validation procedure in Section 4 describes the process making it possible for the secondary data users to put the PSP data to their use. SAPs shall be written for the intended use of the PSP program. It is expected to develop PSP SAPs, which do not precisely meet the secondary data source DQO's.

This system includes the process used to quantify the quality of water data collected by Community Based Organizations (CBOs) in the State of Oregon. Depending on the quality of the data, the DEQ will include available CBO data in these reports. In order for the DEQ or outside data users to apply CBO monitoring data appropriately it is essential that the quality of this data be defined. When it is necessary for the CBO to subcontract analytical work, the DEQ recommends the CBO use ORELAP accredited laboratories, which should provide assurances that such data will be of known quality.

The CBO shall submit collected data to the DEQ for inclusion in the AQWMS database. CBO must submit the data in the proper format so that it may be transferred into AQWMS.

1.7. Project Task/Description

This QAPP meets the DEQ's Quality System standards described in the Agency's Quality Management Plan. This QAPP describes the Data Quality Objectives (DQOs) for projects intended to produce data for the agency within the Water Quality - Pesticide Stewardship Partnerships program. Agency personnel and or third parties participating in the partnership will write Sampling and Analysis Plans (SAPs). The SAP shall cite this QAPP and state the policy to comply with the policies and procedures described in the QAPP. The SAP shall describe

sampling locations, sampling schedules, list intended analytical parameters whether included or not in this QAPP and identify the responsible parties for accomplishing each task. The Project Manager identified in Table 2 above will review and approve each plan. SAPs will be controlled, as is this QAPP through the DEQ's laboratory document control system as noted below.

1.8. Quality Objectives and Criteria

The ODEQ Laboratory document control procedures ensure the most recently approved Quality Systems documents are available for implementation. These documents are available through MediaLab. Specific Quality Systems documents cited in this QAPP contain a hyperlink to the controlled document for easy reference.

Samples collected for laboratory analysis will be analyzed following standard DEQ protocol as described in the Laboratory Quality Manual (DEQ91-LAB-0006-LQM) and the Laboratory's analytical SOPs. Procedures for collecting Water Quality samples and conducting field analyses are described in the Watershed Assessment Section Mode of Operations Manual (MOMs: DEQ03-LAB-0036-SOP V3 and DEQ03-LAB-0036-SOP V4).

Environmental data is assumed to be acceptable for use when associated QC data is within established control limits. It is therefore important to define appropriate QC data and how to interpret the QC data as is applies to the reported environmental data.

To establish relationships between environmental data and QC data, EPA's Guidance for the Data Quality Objectives Process (QA/G-4, EPA 2006) was used. As the title implies this document is intended to provide guidance for establishing a plan for data collection efforts and for developing an appropriate data collection design to support decision making, i.e. develop acceptance or performance criteria for the quality of the data collected and for the quality of the decision.

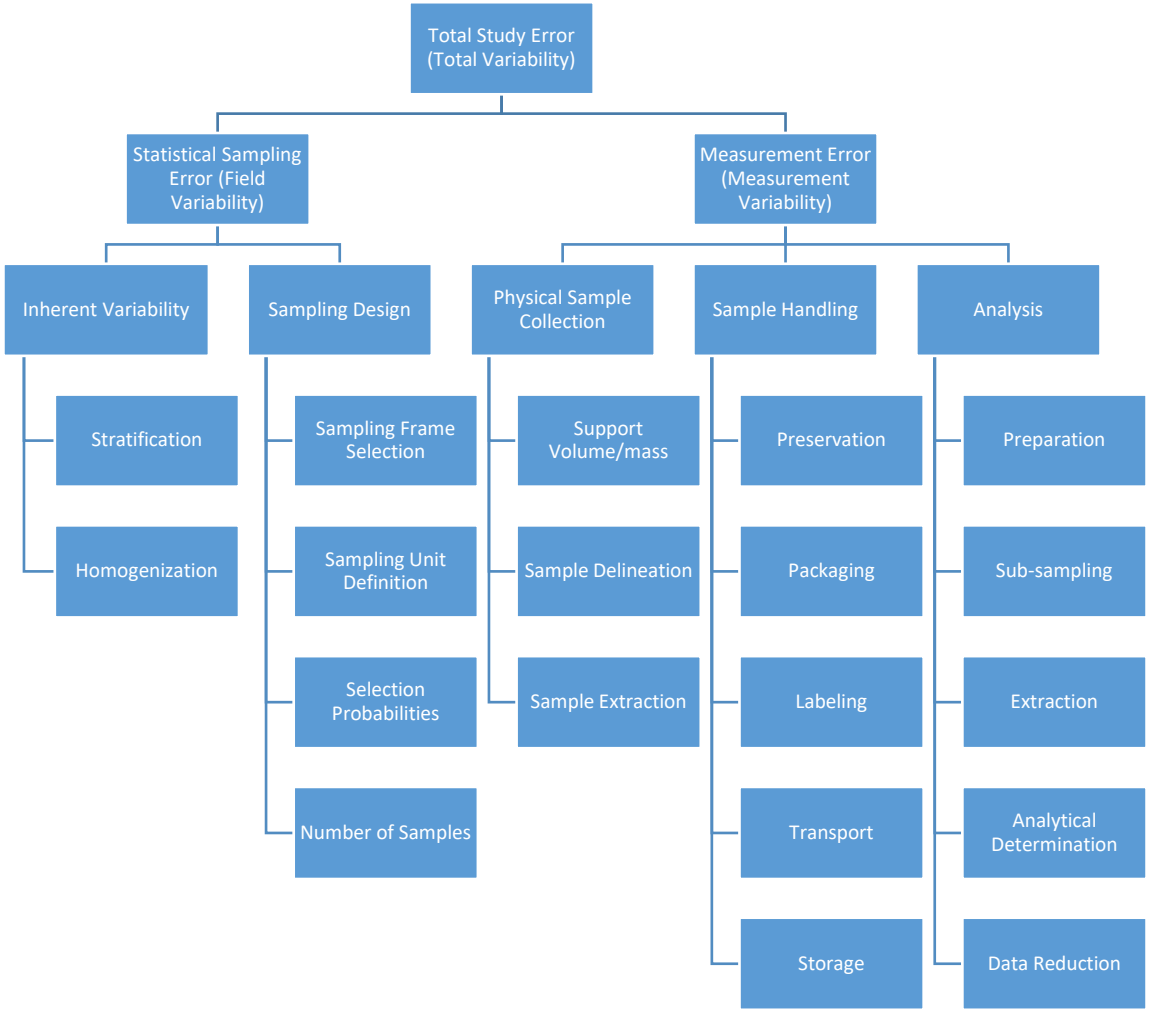
The QA/G-4 guidance document defines two sources of error Statistical Sampling Error (Field Variability) and Measurement Error (Measurement Variability), which contribute partially to the total error.

Sampling (field) error – This error is influenced by the inherent variability of the contaminant over space and time, the sample collection design, and the number of samples. It is usually impractical to measure the entire space, and limited sampling may miss some features of the natural variation of the measurement. Sampling design error occurs when the data collection design does not capture the complete variability within the environment, to the extent appropriate for making conclusions. Sampling design error can lead to random error (i.e., variability or imprecision) and systematic error (bias) in estimates of contaminant concentrations.

Measurement error – This error is influenced by imperfections in the measurement and analysis system. Random and systematic measurement errors are introduced in the measurement process during physical sample collection, sample handling, sample preparation, sample analysis, data reduction, transmission, and storage.

Turnaround Time: The expected turnaround time for the final laboratory reports for the SM 6640, EPA 8270 and EPA 8321 pesticides is 60 business days from the time of log-in. The expected turnaround time for glyphosate pesticide, and glyphosate degradate AMPA, is 90 business days from the time of log-in.

Figure 1 – Sources of Error



This figure illustrates where errors can occur in procedural steps used for generating environmental data. During many of these procedural steps, QC measurements can be taken or QC samples can be introduced into the process thereby making it possible to estimate the error attributable to a specific protocol. With each procedural step that a QC element can be implemented, environmental data will be batched with the QC result in which the samples or data were processed. Section 2.5 will further define the QC batches to be used for this project. With the knowledge of an unacceptable error in the QC measurement, environmental samples within the QC batch are either reprocessed after improvements are made to minimize the observed error, or the environmental data will be flagged as not meeting the quality control standard. Often it is physically impossible to reprocess samples or it is not cost effective, in which case data must be flagged in a manner that ensures the data user is aware of the data quality anomaly.

Specific QA Objectives for this project are:

Collect a sufficient number of samples, sample duplicates, and field blanks to evaluate the sampling and measurement error.

Analyze a sufficient number of QC Standards, blanks and duplicate samples in the Laboratory environment to effectively evaluate results against numerical QA goals established for precision and accuracy.

Implement sampling techniques in such a manner that the analytical results are representative of the media and conditions being sampled.

Data quality shall be evaluated through the use of the traditional Data Quality Indicators:

- Precision
- Accuracy/Bias
- Sensitivity
- Representativeness
- Comparability
- Completeness

The corresponding laboratory analytical review sheets (Appendix C) list precision, accuracy, and sensitivity control limits for each analytical method.

1.8.1 Precision

Precision shall be estimated by measuring the variability of duplicate measurements. The best estimate of precision for the overall monitoring program is the comparison of duplicate samples collected in the field. The variability in the results obtained from field duplicate samples is the sum of the sampling and analytical variability (measurement uncertainty). Generally, the control limit for duplicate samples collected in the field are +/-30% RPD for samples >5 times the Method Reporting Limit (MRL) or +/- 2x the MRL for the difference between replicates when the concentrations are <5 times the MRL. The control limit for duplicates collected in the field for

SM2540B and SM2540D is +/-20% >5 times the Method Reporting Limit (MRL) or ≤ MRL for the absolute difference between replicates when the concentrations are <5 times the MRL. A full list of control limits can be found in Appendix B.

The LPM will review data from grab duplicate and collocated samples to assess project precision. Grab precision shall be evaluated by measuring the difference in duplicate samples collected within 15 minutes of each other. The duplicate sample should be collected from the same location (within 15 ft) as the original or otherwise noted on the sampling form.

1.8.2 Accuracy/Bias

Accuracy is a measure of the error between reported test results and the true sample concentration. It shall be estimated by measuring the bias of Measurement Error, even though bias is due to both systematic error in sampling and measurement variability.

Systematic error attributable to sampling design shall be minimized and be considered acceptable by following the procedures in described in section 1.

All instruments shall be calibrated using appropriate reference materials. The accuracy of these materials is to be documented and maintained by the laboratory. The instrument's response to the reference material (initial calibration) shall also be documented and fall within method control limits. Immediately following the initial calibration, a second source standard will be used to verify the accuracy of the calibration reference material.

The Laboratory Control Samples (LCS) prepared with each batch of samples will be used to estimate accuracy and where applicable matrix spikes will be used in conjunction with the LCS. Refer to Appendix B for LCS limits for each method.

1.8.3 Sensitivity

Parameters of interest for this project and the target reporting level are listed in the SAP. Data Quality Indicators will follow standard laboratory protocols and most current methods.

Blanks must be less than the Method Reporting Limit for each analyte. Laboratory Method Blanks (MB) will be prepared along with each LCS. The MB will be used to assess the sensitivity of the method. If corrective action measures fail to resolve MB errors, results batched with the MB will be flagged with the appropriate data qualifier.

1.8.4 Significant Figures

The DEQ Laboratory & Environmental Assessment Division's (LEAD) policy on rounding, decimal places, and significant figures for reporting analytical data is:

1) The report results to 3 significant figures with the following caveats
    a) We will not report results to more decimal places than the MRL.

b) If the results are to be reported to the MDL and the results are between the MDL and the MRL, do not exceed the number of decimal places in the MDL (still report 3 significant figures where possible).
2) Results having trailing 5's are rounded to the even number (e.g. 2.555 = 2.56; 2.545 = 2.54).
3) All results will be rounded according to the rules and then compared to the MRL (or whatever the reporting level is).

1.8.5 Representativeness

Representativeness is a qualitative term that should be evaluated to determine whether in situ and other measurements are made and physical samples collected in such a manner that the resulting data appropriately reflect the media and phenomenon measured or studied.[1] The intent of this project is to quantify chemical, biological, and physical parameters in the ambient environment.

Representativeness is controlled by using well defined sampling and sample handling SOPs. Sampling procedures are designed so that results are representative of the matrix being sampled. Sample handling protocols for storage, preservation and transportation have been developed to preserve the representativeness of the collected samples. Proper documentation will establish that protocols have been followed and sample identification and sample integrity assured. If it is determined that sample integrity has been compromised data will be flagged with the appropriate data qualifier.

Samples that are not representative of the population often occur in judgmental sampling because not all the units of the population have equal or known selection probabilities[2]. The rational for selecting sampling stations is described in section 2.1.

The location of the sample will be referenced to latitude and longitude using a GPS. Samples will be collected at or near the center of the stream channel where the water is well mixed and representative of the ambient conditions. The date and time range measurements are made and physical samples collected will be recorded with every sample. All efforts will be made to confirm the accuracy of this sample meta-data.

Since special or unusual sample conditions might affect the accuracy of an analysis, it is helpful to have information about the sample matrix. Results of such matrix tests may give additional insight into the representativeness of the analyses. Tests describing the sample matrix may be requested on a site-specific basis. When appropriate, other QA tools such as ion balance reports, solid balances, conductivity-dissolved solid comparisons, etc., will be used to establish the representativeness of the data.

[1] USEPA 1998. EPA Guidance for quality assurance project plans EPA QA/G-5, pp 76.
[2] ibid, pp 94.

Analytical measurements with poor field duplicate precision may point to sampling problems or heterogeneous samples and thus not representative of ambient conditions. To ensure the representative data quality indicator is correct, field duplicates must be collected within 15 minutes and 15 meters of each other, where the sample matrix is assumed to be homogeneous. Evaluation of field duplicate, lab duplicate, and accuracy data will provide information if there is error in the hypothesis that the sample is homogeneous. If field duplicate data exceeds precision limits but lab duplicate and accuracy data is acceptable, the sampling design may be in error and the data may not represent the environmental conditions for which it was collected. If field duplicate data indicates Representativeness is acceptable, data users may assume other project data meet Representativeness objectives.

The LPM will qualify or narrate environmental results for samples obtained outside the representative area of a station or create a new station. The DQL will remain unchanged if the Lat/Long of the actual sample location is documented.

If station data is not indicative of the normal ambient conditions and the variances are attributable to anomalous environmental conditions, the project station data will qualified and assigned a DQL of “F”.

1.8.6 Comparability

To ensure data will be comparable to similar environmental data, the DEQ will use documented procedures for sampling, sample handling, and sample analysis, which are written to comply with nationally accepted methods. Coordination with other agencies is emphasized to ensure that data are comparable. The DEQ laboratory will follow the analytical methods cited in Table 3, which are promulgated methods in 40 CFR Part 136 and the sampling procedures described in the ODEQ Laboratory MOMs Manual.

1.8.7 Completeness

It is expected that samples will be collected from all sites described in a Sampling and Analysis Plan (SAP) unless seasonal-related events or safety issues prevent sampling. The PM may authorize re-sampling to obtain more information of qualified data.

1.8.8 Modeling Approach

No modeling is expected for this project.

1.9. Special Training and Certification

No specialized trainings or certifications are required of DEQ sampling staff. CBO sampling staff are assumed to have received training on sample collection, processing, analysis and safety considerations.

Contractual agreements require third party laboratories to be NELAP/ORELAP accredited where available. Refer to the NELAC Institute LAMS data base (http://lams.nelac-institute.org/Search) to review a laboratory's accreditation status.

1.10. Documentation and Records

Non DEQ laboratories used for this project must be ORELAP accredited. Refer to the ORELAP web page (http://www.oregon.gov/oha/ph/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx) to review the laboratory's accreditation status.

1.10.1 Controlled documents

Completed versions of this document will be distributed to those listed in Table 1 by the QAO or their designee. DEQ LEAD staff can access current versions of this document and other controlled documents using the MediaLab system. Individuals outside of the DEQ LEAD can access controlled documents listed in this document through the hyperlinks or by contacting the DEQ QAO. As controlled documents are updated the QAO will be responsible for ensuring the most recent version is available on MediaLab.

1.10.2 Analytical Reports

If CBO utilized third party laboratories, they will send their Analytical Report along with their subcontracted data to the DEQ Third Party Data and Project Data Coordinator within 60 days of the completion of each sampling event. These data, including all QA/QC data results, will be delivered both electronically and in paper form.

The Third-Party Data Coordinator will enter third party data by hand or download it into the DEQ's LIMS database.

Electronic versions of the final LEAD laboratory analytical reports will be emailed to the PM and are available in a Portable Document Format (PDF). An original hard copy of the final analytical report with the supporting QC documentation and field forms will be kept on file at the DEQ Laboratory. After the final analytical report has been released, the analytical results will be transferred to a web accessible data repository which is available to the public.

Analytical reports will contain sufficient information to unambiguously link sample collection information to the group of analytical parameters.

1.10.3 Sample Receipt and Log-in Procedures

Separate field data sheets (Appendix A) will be maintained for each sampling event.

The DEQ laboratory will receive the Chain of Custody form with the following information: sampling location, Station ID number, date sampled, time sampled, sampler, weather condition, fund code, DEQ subproject code, data report recipient, sampling point description, number of

containers per site, equipment ID numbers, test(s) requested, and contact with whom samples were split. The following information will be required for Station ID creation: Site name, latitude, longitude, river mile, 3rd and 4th field HUC, county, and DEQ basin.

Please note that the third-party laboratories will in general follow similar procedures below. However, specific documentation and custody procedures will be as per their protocol.

The laboratory receiving the samples will verify the information contained on the custody form and check to make certain that samples meet appropriate handling and preservation requirements by:

- Matching actual sample container #'s with those listed on the custody form;
- Checking that appropriate containers were used for the analytes requested;
- Testing pH to determine whether samples requiring acid or base preservation were preserved correctly;
- Consulting technical personnel when field observations raise concern to ensure tests requested are appropriate;
- Consulting this QA Project Plan for to ensure that all tests requested are assigned.

Samples improperly documented, preserved, or exceeding holding time are either rejected by the sample coordinator for analysis, or analyzed and the result reported as an “estimate.” The sampler is notified and re-sampling is recommended.

The contractor will use laboratory approved chain of custody forms to be used for tracking the samples and relinquishing sample custody. The DEQ sample coordinator will receive a copy of the custody forms and enter the sampling event into the DEQ’s Laboratory Information Management System (LIMS).

The DEQ LIMS maintains the history to changes to data in LIMS from log-in through sample release and archival. All biographical information contained on the custody form is entered into LIMS at the time of log-in. Each set of containers collected at a station constitutes a “sample,” and each “sample” is linked to the sampling event batch. The DEQ LIMS sample ID numbers are unique. The ID number consists of the sampling event number concatenated with the container number. The sample coordinator assigns the appropriate tests during log-in. LIMS creates analysis records or each sample and test assigned.

The contract laboratories must maintain an unequivocal link between the custody form, their LIMS database, and analytical reports.

Raw analytical data records must be maintained, which will include the following information, in ink:

- Date of analysis
- Analyst
- Identification of blanks, standards, and controls

- LIMS ID numbers, sample number, treatment such as dilutions, analyte additions, or special calculations and associated information
- Unusual observations
- All instrument readings and final results (including units) may be maintained as electronic data.

1.10.4 Field Documentation

The sampling team uses the chain of custody (COC)/field data sheets to document the record of significant events, observations, and measurements during field investigations. This record may include water level data, field measurements, personnel, significant weather observations, and physical conditions should they exist such as plankton abundance and conditions of riparian zones. All entries in the chain of custody/field data sheets should be signed and dated. The COC/field data sheets will be kept as a permanent record.

2. Data Generation and Acquisition

2.1. Sampling Process Design

Probabilistic sampling models will not be used to determine specific sampling locations. The Sampling and Analysis Plan (SAP) will be written for each targeted watershed. The SAP will describe the logic behind selecting the sampling locations. Sites are targeted based on pesticide applications within the watershed.

Where site locations safely allow, samples should be collected from the center of the main channel, at a depth of one meter or half the total depth, whichever is greater. This ensures a sample representative of environmental conditions.

2.2. Sampling Methods

Sampling will be accomplished using the standard DEQ protocol described in the ODEQ Laboratory MOMs Manual (DEQ03-LAB-0036-SOP V3). Specific sample preservation methods and holding times are summarized in Table 3 below.

2.3. Sample Handling and Custody Procedures

Sample preservation and holding times are identified in Table 5. Routine ODEQ sample custody protocols will be followed. Refer to the ODEQ laboratory's *Sample Receiving and Control* SOP (DEQ06-LAB-0054-SOP). See Table 3 below for sample quantities, containers and Preservation requirements.

Table 3 – Sample container, holding times, and preservation

Parameter	Holding Time	Container	Volume (min)	Sample Preservation
Total Solids by SM2540B	7 days	Clear poly or glass, 500mL or 1000mL	100 mL	Refrigerate on ice at 4ºC.
Total Suspended Solids by SM 2540D	7 days	Clear poly or glass, 500mL or 1000mL	200 mL	Refrigerate on ice at 4ºC.
Pesticides-HV by GCMS in Water (EPA 8270D)	7 days extract / 40 days analyze	Amber glass, 1000mL	1000 mL	Refrigerate on ice at 4ºC.
Phenoxy herbicides by GCECD 6640 In Water**	7 days extract / 40 days analyze	Amber glass, 125mL	40 mL	Refrigerate on ice at 4ºC.
Pesticides by LCMSMS SOP 11-0031 in Water	7 days extract / 40 days analyze	Amber glass, 1000mL	1000 mL	Refrigerate on ice at 4ºC.
Glyphosate by LCMSMS in Water by (DEQ16-LAB-0001-SOP)	180 days	Amber poly, 250mL	250 mL	Refrigerate on ice at 4ºC.

** Phenoxy herbicides may not be measured throughout entire season. This analysis may be discontinued based on sampling results.

2.4. Analytical Methods

All of the contaminants of concern for this project are listed by method in this QAPP in Appendix B, including quantitation limits. Analyte lists and reporting limits may change based on changes in pesticide usage in basin as well as changes in instrumentation and analytical capabilities. In addition, not all analytical methods may be utilized for each sampling event. All laboratories involved with this project will make analytical SOPs available upon request. The laboratories' analytical SOPs must cite the methods identified in the QAPP. Field analytical methods can be found in the Watershed Assessment Mode of Operations Manual MOMs (DEQ03-LAB-0036-SOP) which is available in MediaLab and in the state archive ORMS. Any contracted analytical data must follow DEQ's current laboratory practices.

2.5. Quality Control

With each procedural step that a QC element can be implemented, environmental data will be batched with the QC result in which the samples or data were processed. With the knowledge of an unacceptable error in the QC measurement, environmental samples within the QC batch are either reprocessed after improvements are made to minimize the observed error, or the

environmental data will be flagged as not meeting the quality control standard. If more than one of the same QC is performed in the batch only the environmental data preceding the failed QC is qualified. Batch QC control limits are based on current laboratory practices.

2.5.1 Quality Management Plan:

As noted in section 1.8 above, quality documents are controlled. One such document is the Agency Quality Management Plan itself. With the approval of the QMP, EPA has granted the ODEQ laboratory QA section the authority to approve QAPPs, which EPA requires for all projects they fund.

This project will comply with the policy and procedures outlined in the QMP.

2.5.2 Quality Assurance Project Plan:

This QAPP complies with the agency's QMP. Changes to the QMP that affect the procedures for writing a QAPP may require revisions to this plan. This QAPP should be reviewed with the next revision of the QMP.

The LPM will flag environmental data collected without a QAPP or SAP as "B" data unless there is other supporting documentation as to how the samples were collected and analyzed. The LPM will review QC summary data at the end of the project and flag project data, if insufficient QC data is collected or there are apparent systematic errors.

2.5.3 Survey:

The grouping of all the samples collected for a project during specific time period (i.e. Spring, Fall, etc.) is called a Survey.

The survey periods for this project varies by watershed but is concentrated in the spring and fall seasons. The Survey often extends over the entire project; however, there may be circumstances where the Survey may be broken up over shorter periods (e.g. seasons) and may be defined in a Sampling and Analysis Plan. The survey title and Survey Batch are to be transcribed to the Chain of Custody (COC) and will be entered into ELEMENT™. The intent of the Survey field is to provide a convenient means to query the database for all data generated for the project during the survey period. The project managers may use this queried data to evaluate the completeness of the project as it progresses and/or prepare reports. Lab Project Managers may report on laboratory performance for completeness reports (e.g.: % of analyses completed within the analytical holding time, % of analyses completed within project turnaround time target, % of analyses with level "A" data quality).

2.5.4 Survey Batch:

For this project, a survey batch is defined as all samples collected within a specific watershed over a survey. PSP survey batches are divided Spring (February to June) and Summer / Fall

(July to November). For watersheds collected by DEQ, a survey batch may include multiple watersheds collected during the same sampling day. Each sampling team will collect transfer blanks and field duplicates at a minimum frequency of 5% for each survey batch. The samples associated with the QC samples will be determined by the Project Coordinator and identified on the sampling schedules. If laboratory corrective action cannot rectify apparent transfer blank or field duplicate error all affected environmental data within the survey batch may be qualified as “B” data. If the transfer blank or the field duplicate are not collected at the minimum frequency during the survey batch all related environmental data within the survey batch will be qualified as “B” data.

For each survey batch, the LPM will review the results from the field quality control samples (duplicates, blanks). The control limits for field duplicates are defined in Table 4. If the duplicate precision does not meet the criteria specified, the FP and FD source sample and will have the DQL set to “B” and estimated.

If an analyte is detected above the laboratory’s MRL in a transfer/field blank, only associated, detected sample results with less than 10x the level of contamination are affected. For those results, the DQL will be set to “B”.

The survey batch is a subset of the survey and is used to reflect how the samples are grouped relative to project field QC samples (Example: Samples taken for a one-week period by a specific sampling team may only have one duplicate or one blank). All of the samples associated with the duplicate and blank are in the sample survey batch. Control measures applied to the survey batch should have the expectation that they would be constant within the survey batch but possess more variability across survey batches.

Each sampling team will collect at least one transfer blank and one duplicate set of samples for each survey batch. If laboratory corrective action cannot rectify apparent transfer blank or duplicate error all related environmental data within the survey batch will be qualified.

The LPM will qualify and assign a DQL of “B” to environmental results if transfer blank or field duplicate data fail to meet control limits for the entire sampling survey batch

For duplicates: If sufficient evidence is available to establish that the error was isolated to the primary/duplicate sample pair, only the primary sample result will be assigned a DQL of “B” rather than the entire survey batch).

During the initial survey for the project each sampling team will collect a transfer with each work order.

If the transfer blank exceeds the control limits, the laboratory will analyze qualify impacted data. With the information available the laboratory will advise the PM and assist in the development of quality improvement strategies.

The control limits in Appendix B are based on lab duplicates and lab blanks. It is anticipated that field blanks and duplicate sample QC measurements will exceed set limits more frequently than

similar laboratory controls. Thus, survey control limits may be adjusted in future revisions of this QAPP. In the meantime the transfer blank control limits are equal to that of the method blank and the field duplicate sample control limits are equal to the laboratory replicate control limits.

The LPM will flag environmental results and assign a DQL of “B”, if transfer blank or field duplicate data fail to meet control limits for the entire sampling survey. Unless sufficient evidence is available to establish that the error was isolated to the primary/duplicate sample pair, in which case only the primary sample result will be flagged and assigned the DQL of “B”.

2.5.5 Work Order:

A “work order” is a group of samples shipped at the end of the day by each individual sampling team. The group of samples collected from the stations listed in a SAP will require multiple collection teams over multiple days, i.e. multiple work orders. During a work order multiple coolers may be filled with samples and transported to the laboratory. The sample coordinator will log the samples into LIMS under the same work order ID number.

The sample custodian will randomly select a sample from each survey batch from the day the field duplicate is collected, which will be used to repeat field parameters in the laboratory (field audit sample). If the difference between the field and laboratory measurements exceeds the precision control limits, the laboratory will repeat all of the field parameters within the work order. The laboratory analyst will email the LPM of the corrective action, who will assess the error and determine if the field/lab variance is attributable to factors other than the accuracy of the field parameter. If appropriate, the LPM will ensure the DQL is set to “B” for all results when work order is approved.

2.5.6 Location:

All environmental data generated from samples collected at a station may be flagged based on observations made by the sampling team and supporting data. The sampling station should appear to be indicative of normal homogeneous ambient conditions. Access to the sample location within the stream should not be impaired. The sampling team will note on their field sheet if an obstacle prevents collecting the sample at the specified location and time. The sampling should occur within 15 feet of the station ID. The field operations coordinator will flag environmental results not obtained from the scheduled stations and assign a DQL of “B”. Analytical data not collected as scheduled due to unforeseen circumstances will be cancelled and assigned a DQL of “D”.

2.5.7 Collection:

The sample team will collect samples using the techniques described in MOMs. If circumstances dictate other sampling techniques the sampling team will make the note on their field form. For techniques that are considered equivalent the data will not be flagged. If, however, the technique is not equivalent the LPM will flag environmental results and assign a DQL of “B”.

2.5.8 Transport Container:

The sampling team will pack the collected samples and the field forms into coolers along with a temperature blank sample. The temperature of the temperature blank will be checked at the time of sample receipt. If the temperature does not fall between 0° – 6° C or, for samples received the same day of collection, the samples were not received on ice, all measurements requiring thermal preservation will be commented by the sample custodian and flagged in the lab with a qualifier in the report. Additionally, the DQL of “B is assigned if the sample temperature is > 10°C.

If there is uncertainty (incorrect or illegible) of the sample ID or sampling location, the sample custodian will comment into Element™ and the lab staff will apply a “V” qualifier in Element™ which will “Void” the sample and apply a DQL of “D” if the information cannot be rectified by the field personnel.

If the Sample ID and Location are correct:

If the sampling date is in question, all data relating to that sample are qualified with an associated DQL of “C” if the information cannot be rectified by the field personnel.

If the sampling time is not recorded and there is no impact on holding time compliance, the DQL may remain as “A”, however if there is potential impact on the holding time, the DQL will be set to “B”.

2.5.9 Bottle/Filter/Probe:

During sample receipt the sample coordinator will examine each container.

If a container is damaged, or an inappropriate container was used for the requested analysis; the sample custodian will comment into Element™ and the lab staff will flag all analytical results and apply a DQL of “B” or using professional judgment, flag the sample with a “V” (Void).

If the container is mislabeled and cannot be rectified through discussion with field personnel, the sample custodian will comment into Element™ and the lab staff will flag all data affected by the sample container with a “V” (Void) with an associated DQL of “D”.

2.5.10 Receipt:

The sample coordinator must document their inspection of the sample integrity upon receipt. Sample Control will verify that sample receipt documentation is complete, data are qualified where appropriate, and the proper analyses are assigned. Personnel reviewing the Sample Coordinator’s work will sign for their review and will flag results and assign a DQL of “B”, for samples that had integrity issues if corrective action does not resolve the integrity of the sample.

2.5.11 Storage:

The Sample Coordinator will transfer samples requiring refrigeration into refrigerators. Operations staff will track the temperatures of refrigerators using the Smartvue program or another approved system. A DQL of “B” will be applied as needed to affected samples for all analytical data that is measured from samples stored in a faulty refrigerator.

2.5.12 Work List:

The Organic, Inorganic, and the field monitoring sections of the laboratory will assign staff to peer review data records. Peer review shall verify that calibrations, sample data reduction, and data reporting were accurate. Personnel reviewing the analyst’s work will sign for their review and will qualify results and assign a DQL of “B”, if corrective action does not resolve sample/data integrity errors. This process provides assurances that data is of known quality.

2.5.13 Sub-sample:

Occasionally heterogeneous samples must be split into new containers after receipt at the laboratory. For this project samples containing mixed media should not be split into different containers without first homogenizing the sample. If it is determined during the peer review that the sample was mishandled the analytical results will be flagged and assigned a DQL of “B”.

2.5.14 Preparation Batch:

The preparation batch is defined as the environmental samples that are prepared and/or analyzed together by the same personnel, using the same process and lot(s) of reagents. A preparation batch is composed of one to twenty matrix defined environmental samples with a maximum time of 24 hours between the start of processing of the first sample and the completion of the last sample. An analyst may prepare more than twenty samples during the day; however each group of twenty samples must be identified as a unique batch.

At least one method blank will be prepared with each preparation batch. A method blank is a “clean” water sample (e.g. containing no analyte of concern), which is processed through all the analytical protocols. If the concentration of a targeted analyte in the blank is above the MRL and is greater than 1/10 of the amount measured in the sample, the analyte will be qualified and assigned a DQL of “B”.

The laboratory will also prepare a Laboratory Control Sample (LCS) with each preparation batch. The LCS is defined as sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes. It is generally used to establish intra-laboratory or analyst specific precision and bias or to assess the performance of all or a portion of the measurement system. If the LCS fails to meet the laboratories control limit and samples cannot be re-analyzed, all associated environmental data within the preparation batch is qualified. Where possible, the LCS should be traceable to NIST, however standard reference materials may be used as well. The LCS’s are

typically mid-range in the calibration curve and used to assess the accuracy of the analysis. Control limits are based on historical data, or limits published in the method. If the LCS fails to meet control limits, the analyst will qualify all parameter results within the preparation batch and assign a DQL of “B”. **Note:** If sample results are ND and LCS has a high bias, the DQL is not changed, however a qualifier should still be added to the LCS only to reflect the bias.

2.5.15 Calibration:

All measurement systems must be calibrated meeting specific requirements. Calibration requirements are divided into three parts:

1) requirements for analytical **support equipment**,
2) requirements for **standardizing the** test method **titrant**, and
3) requirements for **instrument calibration**, which is further divided into
    a. initial instrument calibration and
    b. continuing instrument calibration verification

Support Equipment: Since support equipment is calibrated quarterly or annually as required by current standards, it is possible for analytical data to be reported using inaccurate support equipment for quite some time after data is reported. Should the calibration of support equipment fail to meet control limits, all analytical data generated with the piece equipment prior to the failed calibration up to the last acceptable calibration shall be qualified and assigned a DQL of “B”.

Instrument Calibration: Immediately following the initial “instrument calibration” an Initial Calibration Verification sample (ICV) must be analyzed to verify the accuracy of the calibration standards. If the ICV fails to meet control limits, the analyst must determine the significance of the error and qualify the results and assign all affected data within the calibration batch with a DQL of “B” or “C” depending on the severity of the failure.

The lowest calibration standard used will be equal or less than to the laboratory’s Method Reporting Limit (MRL).

2.5.16 Analytical Batch:

The analytical batch is defined as a group of environmental samples that is composed of prepared environmental samples (extracts, digestates or concentrates) which are analyzed together as a group. If there are no preparation steps the analytical batch definition is the same as the preparation batch definition.

A high to mid-range calibration standard is to be used for a continuing calibration verification (CCV) standard. A CCV is analyzed at the beginning of the analytical batch and at a frequency specified in the analytical methods or lab SOPs. The CCV is used to verify that the initial calibration is still valid and to assess calibration drift. A CCV sample are usually near a mid-range of the calibration curve. The CCV must fall within method specified control limits all data

reported with a trailing CCV that fails to meet the control limit are to be qualified if they and the associated samples cannot be reanalyzed.

For organics, a CCV is generally analyzed at the beginning of the analytical batch and throughout the batch at frequency specified in the analytical method.

If the CCV fails to meet control limits and if the samples cannot be reanalyzed, the analyst will qualify all affected results in the Analytical Batch and assign a DQL of "B". *Exception to CCV flagging*: If, after review of the data, it can be assessed that CCV has a high bias (and not a result of standard preparation error) and samples are ND, the DQL would not change, however a comment qualifier should still be added in ELEMENT™ to reflect the CCV bias.

2.5.17 Analyte QC:

Each laboratory will replicate the analysis of an environmental sample with every analytical batch of twenty samples. If the laboratory's control limit is exceeded the sample result must be flagged. When analytes are not detected in the environmental samples and it is feasible to perform a matrix spike, the laboratory will prepare matrix spike/matrix spike duplicate samples to estimate analytical precision.

Matrix spikes are to be analyzed at the frequency of one in every twenty environmental samples. The method-specific criteria for spike recovery are located in Appendix B. Spike recoveries are used to determine the analytical accuracy of the test method for the specific sample matrix. Sample dilution may be used to minimize interference. Some methods require the use of an interference check standard, which ensures that corrections for interferences are made.

2.5.18 Corrective Action

In the event of repeated problems with sampling or analysis, or issues that affect large amounts of data DEQ will utilize its Corrective action process DEQ07-LAB-0053-SOP to address the issue.

2.6. Instrument/Equipment Testing, Inspection, and Maintenance

All analytical equipment will be maintained and inspected in accordance with the procedure's test method SOPs. All DEQ test method SOPs are controlled documents and are available on MediaLab. Field parameter SOPs are outlined in DEQ MOMs manual.

The laboratories will keep maintenance logs on all analytical equipment. Laboratories are expected to conduct routine maintenance procedures and follow the manufacture's advice. Personnel conducting peer review will find it helpful to use maintenance logs during corrective action procedures.

2.7. Instrument Calibration and Frequency

All analytical equipment will be calibrated in accordance with the procedures test method SOPs. Field parameter SOPs are outlined in DEQ MOMs manual.

If instruments cannot be calibrated as required, the analyst will flag data as appropriate (refer to section 2.5.15).

2.8. Inspection/Acceptance of Supplies and Consumables

The analyst will be responsible for maintaining records of traceability for all reagents and standards. The procedure used to maintain traceability is described in the Laboratory Quality Manual (DEQ91-LAB-0006-LQM). The analyst must validate the usability of standards and reagents upon receipt and when expiration dates are exceeded.

2.9. Data Management

Data management will be provided through the ODEQ LIMS and the web accessible database.

Separate field data sheets will be maintained for each work order. Information recorded on data sheets is to include Project name, sample location identification, data and time of work orders, water body name, basin name, station ID numbers, general weather conditions, and names of field staff, time of each sample or measurement, results and equipment ID numbers. All data are to be entered into the DEQ the web accessible database.

The LPM will coordinate with the DEQ Laboratory Operations & RATS staff to input field data and third-party data into the DEQ LIMS and the web accessible database. LEAD staff will enter data as it is received and will not correct errors. The project coordinator will verify and correct data transcribed into LIMS, ensuring data meet LEAD reporting policies. Refer to the LEAD's *Quality Manual* (DEQ91-LAB-0006-LQM).

Analytical data generated by the laboratory will be sent to the project coordinator as an electronic PDF report. The DEQ Laboratory will maintain hard copies of the analytical reports, including all analytical QC measurements. Data generated by the DEQ laboratory will be moved to an external web accessible data repository database following release to the LPM.

3. Assessment and Oversight

3.1. Assessment and Response Actions

Table 4 – Required QC Elements

QC Element	Frequency	Acceptance Criteria
Transfer Blank	**5% of sample number, or one minimum per survey batch.**	< MRL
Field Duplicate	**5% of sample number, or one minimum per survey batch.**	**+/-30% RPD for samples >5**xMRL

Surveillance and data management will be performed once a month to ensure data being collected will meet the needs of the project. Information collected during this project is intended to meet the needs of section 1.6. All results of the individual assessments will be complied and managed by Sample Coordinator.

Response actions will be developed as data becomes available. Any stop work orders or change in project scope will come from the PM. Corrective actions will be documented as addendums to this QAPP/SAP.

3.2. Reports

Reports will be generated and electronically sent to the personnel listed in Table 1 for approval and/or review.

Table 5 – Laboratory Reports

Official Analytical Report (includes Batch QC results)
Project Summary Report – When applicable
Analytical Peer review checklists
Original Field Data Records
Sample Receipt Checklist
Sample Preservation Summary
Technical Corrective Action
Field QC report
Laboratory Audit of Field Measurements
Solids Balance/QC Form
Ion Balance Report
Third Party Data – When applicable

No additional reporting to management is planned at this time.

4. Data Validation and Usability

Data is reviewed, qualified and validated according to DEQ guidance document *Data Validation and Qualification* (DEQ09-LAB-0006-QAG). Throughout the sampling, analysis, reporting, and project review process, various staff members are reviewing and evaluating the information against various quality criteria as specified in QA Plans and/or LEAD SOPs. If any of the items are outside of the specified QA/QC criteria, a decision must be made as to the limitations on the usability of the information (if any). Affected samples are qualified in LIMS (Element™) to explain any limitations. A list of data flags with definitions, DQL and guidance on how to apply them is available at file://deqlead-lims/serverfolders/ElementGuidanceDocuments/ElementQualifierUsage.pdf. Data quality levels shown below Table 5 are those that are listed in the guidance document but are presented here for convenience.

The DQLs are used to simplify database queries of quality data and as a simplified indicator of data suitability for THIS project (the suitability of the data by others must be determined based on their own individual data needs). Data not meeting the data quality indicator control limits will receive a DQL other than “A”. If a QC measure fails to meet control limits, personnel evaluating the QC must flag all results associated with the particular QC failure. The DQL will be set to “B” or “C” depending on the severity of the failure or the analyst may void the result and set the DQL to “D”. Comments will be linked to the results explaining QC failures.

If the LPM determines the data does not meet the data quality objectives described in section 1.8 the DQL of all affected results will be adjusted to the appropriate code defined in Table 5.

Table 6 – Data Quality Levels (DQL)

DQL	Definition	Description
A	Data of known Quality	meets QC limits established in a DEQ approved QAPP
B	Data of known but lesser quality	Data may not meet established QC but is within marginal acceptance criteria; or data value may be accurate, however controls used to measure Data Quality Objective (DQO) elements failed (e.g., batch failed to meet blank QC limit); the data is generally usable for most situations or in supporting other, higher quality data. (Equivalent to the “J” (estimated) qualifier used by EPA)
C	Data of unacceptable quality	Generally due to QC failures but may be related to other known information about the sample. Data should not be used for quantitation purposes but may have qualitative use. (Equivalent to the “R” (rejected) validation qualifier used by EPA).
D	No data available	No sample collected or no reportable results. Samples are either voided or canceled.

DQL	Definition	Description
E	Data of unknown quality	Insufficient QA/QC or other information available to make determination. Data could be acceptable; however, no evidence is available to prove either way. Data is provided for Educational Use Only.
F	Exceptional Event.	Exceptional Event; "A" quality data (data is of known quality), but not representative of sampling conditions as required by project plan.(e.g., an air particulate sampler fails to sample the full time period because adverse conditions such as a forest fire overloaded the sampling equipment)

Data with a DQL of “B” may be used for this project.

Precision requirements for the field measurements (conductivity/salinity & turbidity meters, etc.) are consistent with the Data Quality Matrix DEQ04-LAB-0003-QAG.

4.1. Data Review, Verification and Validation

The LPM will determine if the data collected meets the QA Plan objectives. The LPM will review all data resulting from this project as data becomes available. Questionable data will be brought to the PM and QA officer, if necessary. Decisions to accept, qualify or reject data will be made by the PM and LPM.

The LPM will verify all parameters requested were reported and that data were reported to the requested target levels and with the appropriate units. If data are reported incorrectly, the LPM will be responsible for ensuring corrections to the database are made.

4.2. Verification and Validation Methods

The data review process will be monitored through the use LIMS sample status codes. The analyst will enter, review analytical data, and flag results not meeting test method SOP defined QC standards (2.5.13 through 2.5.17). A second qualified analyst will review 2.5.13 through 2.5.17 QC batch data and sign off on data in LIMS as having been reviewed. Documentation of the peer review will be maintained using an Analytical Data Review Checklist developed for each method.

The inorganic and organic laboratory sections will review data grouped together in the same sampling event (2.5.5) as it relates to the test results reported by their section. This level of review will include the review of the peer review checklist (2.5.12), inter-parameter comparisons, history comparisons, LIMS comments, laboratory QC checks on field measurements, correspondences with sampling teams, and compliance with QAPP requirements 2.5.12 through 2.5.17.

The Project Coordinator will review Sampling Event batch data (2.5.5) in LIMS and ensure that field data was transcribed and qualified correctly in LIMS. During this review the Project

Coordinator will ensure batch data described in 2.5.55-3 through 2.5.11 meets control limits and that samples were flagged with appropriate data qualifiers and corresponding results were flagged with the appropriate QC status code.

The data review process will be monitored through the use LIMS sample status codes. The analyst will enter, review analytical data, and flag results not meeting test method SOP defined QC standards. A second qualified analyst will review QC batch data and sign off on data in LIMS as having been reviewed. Documentation of the peer review will be maintained using an Analytical Data Review Checklist developed for each method.

The inorganic and organic laboratory sections will review data grouped together in the same work order as it relates to the test results reported by their section. This level of review will include the review of the peer review checklist, inter-parameter comparisons, history comparisons, LIMS comments, laboratory QC checks on field measurements, correspondences with sampling teams, and compliance with QAPP requirements.

The LPM will review work order batch data in LIMS and ensure that field data was transcribed and qualified correctly in LIMS. During this review the LPM will ensure batch data meets control limits and that samples were flagged with appropriate data qualifiers and corresponding results were assigned the appropriate DQL. Data quality levels (DQLs) will be assigned in accordance with this Quality Assurance Project Plan and the revised *DEQ Guidance: Data Validation and Qualification* DEQ09-LAB-0006-QAG. Generally, only DQLs of A or B will be acceptable for this project unless the basis for the data acceptability is approved and documented by the LPM.

The data coordinator must coordinate the approval of LIMS data with the LPM to verify QC elements are met and reset DQLs if necessary. This validation process is tracked in ELEMENT™. Once all data is completed through the laboratory review process, the LPM will view a draft report and proofread it against the original field data sheets. Errors in data entry will be corrected at that time. Outliers and inconsistencies will be flagged for further review or be discarded. Data quality problems will be discussed as they occur and in the final report to data users.

Once all work order data has been reviewed and approved by the LEAD Project Manager the analytical report will be released. The LEAD Project Manager will digitally sign the report.

4.3. Reconciliation with User Requirements

As soon as possible after each work order, calculations and determinations for precision, completeness, and accuracy will be made and corrective action implemented if needed. If data quality indicators do not meet the project's specifications, re-sampling may occur. The cause of the failure will be evaluated. If the cause is found to be equipment failure, calibration and/or maintenance techniques will be reassessed and improved. If the problem is found to be sampling team error, team members will be retrained. Any limitations on data use will be detailed in both interim and final reports, and other documentation as needed. If failure to meet project specifications is found to be unrelated to equipment, methods, or sample error,

specifications may be revised for the next sampling season. Revisions will be submitted to the QA section of the DEQ laboratory for review and/or approval.

Corrective action is initiated whenever an “out of control” condition is identified (e.g. either control limits or holding time has been exceeded). The analyst is responsible for initiating corrective action, which generally consists of:

- Analytical system recalibrated or verified and analysis repeated, if holding time permits.
- Documentation of “out of control” condition in MediaLab which is reviewed by the section manager and QAO, who investigate the “out of control” condition, along with the analyst, and decide on a course of corrective action.
- If corrective action procedures do not rectify “out of control” conditions the analytical data may be reported with qualifiers and the DQL be set to “B” (or “C” if really bad). A comment (qualifier) explaining the DQL change must also be included.

If time for reanalysis exceeds the allowable holding time for the analyte, the following procedure is followed:

- Sampler is notified and resampling is requested, or
- If resampling is not feasible, and the particular analytical results are not critical, initial analytical results are reported with an explanatory qualifier indicating all QC criteria have not been met and the DLA is adjusted accordingly.

Data identified as violating the data quality objective criteria will be reviewed by the appropriate laboratory section manager (organic or inorganic), and/or the LPM and a recommendation will be made to the PM. The PM will make a decision on the suitability and use of the data. Situations requiring corrective action for sample collection will be dealt with immediately, such as equipment malfunction. Sample collection events requiring corrective action that cannot occur immediately will be considered a long-term corrective action. The corrective actions will be detailed in the field sampling notebook and reviewed by the LPM or field operation coordinator.

If corrective action procedures do not mitigate the error, associated environmental data must be qualified and a DQL assigned. Table 6 lists the DQL levels. For this project, data with a DQL of “B” may prove to be acceptable for use. The PM should review flagged data and use their professional judgment to either omit or include non- “A” level data from the final data analysis.

5. Revision History

Revision	Date	Changes	Editor
2.0	10/12/2006	Add Appendices and Revision History Need to add instruction on how to collect MS/MSD samples	Redman
3.0	03/24/2007	Revised section A7 DQO’s and B5. Changed the title	Redman Masterson

Revision	Date	Changes	Editor
3.1	10/09/2007	Revised Table 5 and section B9 referenced “Data Requirements” document no longer exists	Redman
4.0	02/26/2009	Revised Table 5 replacing 8141 B with methods 8270 D and 8321. Added Appendix B.	Hamel
5.0	03/29/2012	Updated document to most current QAPP language. Revised laboratory methods and sampling information. Updated Project Task Responsibilities section. Deleted Table 5 & revised Appendix B. Revised Table 4. Updated Section A7-1, Precision.	Pillsbury / Rockwell
6.0	02/22/2021	Migrated QAPP to new template, personnel and analytical info updated.	Hamel / Moore
7.0	03/17/2025 – 11/13/2025	Updated document. Replaced analytical information from Element with current limits.	Hamel / Krepps

Appendix A - Field Data Forms

Electronic Field Data Sheet associated with this Sampling and Analysis Plan is located at Electronic Field Sheet MediaLab external link.

Appendix B – Analytical Method Information

Analytical Method Information

Printed: 11/13/2025 8:49 am

Solids - Total by SM2540B in Water::LAB (SM 2540 B)
Preservation: Cool 4°C
Container: Poly 1000mL **Amount Required:** 1000 **Hold Time:** 7 days

Analyte	MDL	Reporting Limit	Surrogate %Rec	Duplicate RPD	----Matrix Spike---- %Rec	RPD	--Blank Spike / LCS-- %Rec	RPD
Total Solids	10.0	20.0 mg/L		10			80-120	20

Analytical Method Information

Printed: 11/13/2025 8:51 am

Solids - Suspended by SM2540D in Water::LAB (SM 2540 D)
Preservation: Cool 4°C
Container: Poly 1000mL **Amount Required:** 1000 **Hold Time:** 7 days

Analyte	MDL	Reporting Limit	Surrogate %Rec	Duplicate RPD	----Matrix Spike---- %Rec	RPD	--Blank Spike / LCS-- %Rec	RPD
Total Suspended Solids	0.500	1.00 mg/L		10			80-120	

Analytical Method Information

Printed: 11/13/2025 8:51 am

Pesticides-HV by GCMS 8270 in Water::LAB (EPA 8270E)

Preservation: Cool 4°C

Container: AG, 1000ml

Amount Required: 1000 **Hold Time:** 7 days

Analyte	MDL	Reporting Limit	Surrogate %Rec	Duplicate RPD	----Matrix Spike---- %Rec	RPD	--Blank Spike / LCS-- %Rec	RPD
Surr: ^{13}C-Alachlor			59-120		59-123		65-125	
Surr: ^{13}C-Endosulfan sulfate			35-113		34-122		55-115	
Dichlorvos	7.91	20.0 ng/L		30	60-123	30	44-150	30
Dichlobenil	4.14	20.0 ng/L		30	68-112	30	67-120	30
EPTC	7.69	20.0 ng/L		30	60-113	30	64-138	30
Mevinphos	7.51	20.0 ng/L		30	70-118	30	56-155	30
Butylate	4.74	20.0 ng/L		30	45-116	30	60-139	30
Acephate	25.4	100 ng/L		30	16-110	30	11-110	30
Vernolate	4.50	20.0 ng/L		30	51-113	30	60-141	30
Etridiazole	7.21	20.0 ng/L		30	44-134	30	64-148	30
Pebulate	3.87	20.0 ng/L		30	52-114	30	60-143	30
Chloroneb	11.3	50.0 ng/L		30	53-146	30	70-143	30
Tebuthiuron	14.4	50.0 ng/L		30	67-145	30	46-138	30
Molinate	4.71	20.0 ng/L		30	67-113	30	60-145	30
Propachlor	3.50	20.0 ng/L		30	64-117	30	60-146	30
Ethoprop	4.76	20.0 ng/L		30	67-126	30	65-149	30
Cycloate	4.41	20.0 ng/L		30	52-116	30	56-146	30
Chlorpropham	6.19	20.0 ng/L		30	55-131	30	54-152	30
Trifluralin	5.09	20.0 ng/L		30	44-133	30	68-146	30
2,6-Dichlorobenzamide	8.27	20.0 ng/L		30	50-136	30	45-149	30
alpha-BHC	6.26	20.0 ng/L		30	59-113	30	61-142	30
Dimethoate	13.9	50.0 ng/L		30	48-132	30	52-159	30
beta-BHC	7.53	20.0 ng/L		30	54-118	30	51-146	30
Tris (2-chloroethyl) phosphate (TCEP)	5.51	20.0 ng/L		30	55-135	30	55-152	30
gamma-BHC (Lindane)	5.70	20.0 ng/L		30	52-110	30	53-142	30
Terbufos	20.2	50.0 ng/L		30	28-120	30	10-143	30
Pronamide	4.15	20.0 ng/L		30	57-126	30	53-145	30
Diazinon	5.83	20.0 ng/L		30	16-110	30	34-110	30
Chlorothalonil	6.85	20.0 ng/L		30	10-110	30	10-111	30
Methyl paraoxon	12.5	50.0 ng/L		30	28-155	30	55-142	30
Terbacil	8.26	20.0 ng/L		30	50-144	30	52-148	30
delta-BHC	5.93	20.0 ng/L		30	60-112	30	60-125	30
Dimethenamid	3.53	20.0 ng/L		30	68-126	40	70-130	30
Parathion-methyl	8.51	20.0 ng/L		30	51-160	30	56-156	30
Heptachlor	6.02	20.0 ng/L		30	32-124	30	65-124	30
Bromacil	17.7	50.0 ng/L		30	67-140	30	60-141	30
Malathion	8.16	20.0 ng/L		30	43-158	30	56-158	30
Chlorpyrifos	4.49	20.0 ng/L		30	37-128	30	66-122	30
Aldrin	6.27	20.0 ng/L		30	27-123	30	63-120	30
Dacthal (DCPA)	4.83	20.0 ng/L		30	45-122	30	63-125	30
Cyanazine	6.97	20.0 ng/L		30	10-115	30	33-110	30
Parathion-ethyl	6.08	20.0 ng/L		30	36-173	30	47-168	30
Triadimefon	7.69	20.0 ng/L		30	67-127	30	67-128	30
Diphenamid	3.38	20.0 ng/L		30	64-124	30	62-131	30
MGK 264	4.94	20.0 ng/L		30	51-127	30	64-125	30
Pendimethalin	6.08	20.0 ng/L		30	49-144	30	71-134	30
Fipronil	5.97	20.0 ng/L		30	64-135	30	62-131	30
Heptachlor epoxide	6.60	20.0 ng/L		30	37-124	30	63-123	30
trans-Chlordane	5.83	20.0 ng/L		30	36-126	30	68-120	30
Tetrachlorvinphos (Stirophos)	9.76	20.0 ng/L		30	10-154	30	59-135	30
Butachlor	3.02	20.0 ng/L		30	41-135	30	66-132	30
Endosulfan I	6.19	20.0 ng/L		30	37-119	30	61-122	30
cis-Chlordane	5.15	20.0 ng/L		30	32-129	30	65-124	30
trans-Nonachlor	4.79	20.0 ng/L		30	34-125	30	64-126	30

Analytical Method Information

(Continued)

Printed: 11/13/2025 8:51 am

Pesticides-HV by GCMS 8270 in Water::LAB (EPA 8270E) (Continued)

Analyte	MDL	Reporting Limit	Surrogate %Rec	Duplicate RPD	----Matrix Spike---- %Rec	RPD	--Blank Spike / LCS-- %Rec	RPD
Napropamide	5.31	20.0 ng/L		30	58-127	30	62-130	30
Tricyclazole	13.9	50.0 ng/L		30	44-126	30	29-129	30
Fenamiphos	35.2	100 ng/L		30	31-131	30	10-147	30
Fludioxonil	10.8	50.0 ng/L		30	50-144	30	55-128	30
4,4´-DDE	4.36	20.0 ng/L		30	21-125	30	60-122	30
Dieldrin	4.78	20.0 ng/L		30	40-120	30	61-121	30
Oxyfluorfen	8.84	20.0 ng/L		30	47-149	40	62-143	30
Endrin	11.7	50.0 ng/L		30	31-133	30	63-130	30
Chlorobenzilate	6.22	20.0 ng/L		30	45-128	30	64-127	30
Endosulfan II	7.18	20.0 ng/L		30	44-119	30	62-121	30
4,4´-DDD	4.46	20.0 ng/L		30	37-136	30	64-123	30
Endrin aldehyde	7.41	20.0 ng/L		30	10-118	30	39-130	30
Tris (1,3-dichloro-2-propyl) phosphate (TDCP)	49.2	100 ng/L		30	48-154	30	66-138	30
Norflurazon	7.14	20.0 ng/L		30	62-134	30	58-131	30
Endosulfan sulfate	8.55	50.0 ng/L		30	41-124	30	64-120	30
Trifloxystrobin	5.73	20.0 ng/L		30	33-137	30	62-129	30
4,4´-DDT	9.09	20.0 ng/L		30	10-128	30	59-126	30
Pyraflufen ethyl	7.05	20.0 ng/L		30	43-144	30	64-132	30
Hexazinone	8.06	20.0 ng/L		30	39-127	30	49-134	30
Bifenthrin	4.57	20.0 ng/L		30	10-148	30	54-137	30
Methoxychlor	9.61	20.0 ng/L		30	10-135	30	62-137	30
Pyriproxyfen	19.2	100 ng/L		30	32-123	30	56-127	30
Mirex	4.53	20.0 ng/L		30	10-129	30	57-122	30
Fenarimol	7.89	20.0 ng/L		30	51-132	30	62-126	30
Permethrin	11.4	40.0 ng/L		30	10-146	30	58-128	30
Fluridone	13.6	50.0 ng/L		30	62-128	30	61-128	30
Fenvalerate+Esfenvalerate	43.9	200 ng/L		30	10-139	30	52-128	30
Azoxystrobin	8.91	20.0 ng/L		30	28-136	30	53-145	30

Analytical Method Information

Printed: 11/13/2025 8:52 am

Pesticides by LCMSMS SOP 11-0031 in Water::LAB (DEQ11-LAB-0031-SOP)

Preservation: Cool 4°C

Container: AG, 1000ml **Amount Required:** 1000 **Hold Time:** 7 days

Analyte	MDL	Reporting Limit	Surrogate %Rec	Duplicate RPD	----Matrix Spike---- %Rec	RPD	--Blank Spike / LCS-- %Rec	RPD
Surr: ^{13}C-Carbaryl			55-167		55-167		60-153	
Surr: ^{13}C-Metolachlor			62-120		62-120		62-125	
Oxamyl	2.10	4.00 ng/L		30	64-129	30	61-110	30
Aminocarb	1.20	4.00 ng/L		30	25-110	30	20-110	30
Methomyl	1.90	4.00 ng/L		30	60-133	30	60-111	30
Imazapyr	1.50	40.0 ng/L		30	49-117	30	45-110	30
Imidacloprid	2.40	20.0 ng/L		30	61-152	30	60-115	30
Simazine	2.00	4.00 ng/L		30	47-110	30	57-110	30
Metribuzin	1.90	4.00 ng/L		30	37-110	30	53-110	30
Baygon (Propoxur)	2.30	4.00 ng/L		30	67-113	30	64-110	30
Carbofuran	1.80	4.00 ng/L		30	61-110	30	63-110	30
Carbaryl	1.90	5.00 ng/L		30	69-169	30	65-160	30
Fluometuron	2.00	4.00 ng/L		30	60-111	30	64-110	30
Simetryn	2.10	4.00 ng/L		30	64-110	30	56-110	30
Atrazine	1.80	4.00 ng/L		30	58-110	30	60-110	30
Diuron	1.60	4.00 ng/L		30	48-135	30	62-110	30
Prometon	2.30	4.00 ng/L		30	58-110	30	56-110	30
DEET	9.45	30.0 ng/L		30	67-137	30	66-110	30
Mexacarbate	2.50	4.00 ng/L		30	26-110	30	41-110	30
Ametryn	2.30	4.00 ng/L		30	64-118	30	60-110	30
Azinphos-methyl (Guthion)	2.30	20.0 ng/L		30	58-110	30	60-110	30
Siduron	2.20	4.00 ng/L		30	54-110	30	64-110	30
Methiocarb	1.70	4.00 ng/L		30	58-150	30	51-132	30
Propazine	2.10	4.00 ng/L		30	50-110	30	60-110	30
Linuron	2.50	4.00 ng/L		30	62-117	30	56-116	30
Terbutylazine	2.20	4.00 ng/L		30	43-110	30	60-110	30
Prometryn	2.10	4.00 ng/L		30	59-110	30	66-110	30
Terbutryn (Prebane)	2.20	4.00 ng/L		30	53-110	30	60-110	30
Acetochlor	2.10	10.0 ng/L		30	26-147	30	57-110	30
Alachlor	2.00	10.0 ng/L		30	42-110	30	56-110	30
Neburon	2.10	5.00 ng/L		30	46-110	30	57-110	30
Metolachlor	2.20	10.0 ng/L		30	48-110	30	58-110	30
Propiconazole	2.30	20.0 ng/L		30	46-110	30	54-110	30
Pyraclostrobin	1.82	4.00 ng/L		30	27-110	30	32-110	30
Acetamiprid	2.40	4.00 ng/L		30	47-110	30	62-110	30
Sulfometuron-methyl	1.40	4.00 ng/L		30	40-113	30	37-110	30
Deisopropylatrazine	2.60	4.00 ng/L		30	50-125	30	53-110	30
Desethylatrazine	2.70	4.00 ng/L		30	45-110	30	52-110	30
Metsulfuron Methyl	1.94	4.00 ng/L		30	40-140	30	44-110	30

Analytical Method Information

Printed: 11/13/2025 8:52 am

Phenoxy Herbicides by GCECD 6640 in Water::LAB (SM 6640)

Preservation: Cool 4°C

Container: AG, 125mL

Amount Required: 125 **Hold Time:** 14 days

Analyte	MDL	Reporting Limit	Surrogate %Rec	Duplicate RPD	----Matrix Spike---- %Rec	RPD	--Blank Spike / LCS-- %Rec	RPD
3,5-Dichlorobenzoic acid	0.101	0.300 µg/L		30	70-130	30	70-130	30
3,5-Dichlorobenzoic acid [2C]	0.100	0.300 µg/L		30	70-130	30	70-130	30
Dicamba	0.0460	0.300 µg/L		30	70-130	30	70-130	30
Dicamba [2C]	0.0400	0.300 µg/L		30	70-130	30	70-130	30
MCPP	6.35	60.0 µg/L		30	70-130	30	70-130	30
MCPP [2C]	8.39	60.0 µg/L		30	70-130	30	70-130	30
MCPA	5.00	20.0 µg/L		30	70-130	30	70-130	30
MCPA [2C]	4.58	20.0 µg/L		30	70-130	30	70-130	30
Dichloroprop	0.0544	0.600 µg/L		30	70-130	30	70-130	30
Dichloroprop [2C]	0.0502	0.600 µg/L		30	70-130	30	70-130	30
2,4-D	0.0256	0.200 µg/L		30	70-130	30	70-130	30
2,4-D [2C]	0.0300	0.200 µg/L		30	70-130	30	70-130	30
Pentachlorophenol	0.0300	0.100 µg/L		30	70-130	30	70-130	30
Pentachlorophenol [2C]	0.0300	0.100 µg/L		30	70-130	30	70-130	30
Triclopyr	0.0870	0.300 µg/L		30	70-130	30	70-130	30
Triclopyr [2C]	0.0450	0.300 µg/L		30	70-130	30	70-130	30
2,4,5-TP (Silvex)	0.0210	0.100 µg/L		30	70-130	30	70-130	30
2,4,5-TP (Silvex) [2C]	0.0300	0.100 µg/L		30	70-130	30	70-130	30
2,4,5-T	0.0310	0.300 µg/L		30	70-130	30	70-130	30
2,4,5-T [2C]	0.0265	0.300 µg/L		30	70-130	30	70-130	30
Dinoseb	0.0743	0.300 µg/L		30	70-130	30	70-130	30
Dinoseb [2C]	0.0518	0.300 µg/L		30	70-130	30	70-130	30
2,4-DB	0.0529	0.600 µg/L		30	70-130	30	70-130	30
2,4-DB [2C]	0.0484	0.600 µg/L		30	70-130	30	70-130	30
DCPA acid metabolites	0.200	0.600 µg/L		30	70-130	30	70-130	30
DCPA acid metabolites [2C]	0.200	0.600 µg/L		30	70-130	30	70-130	30
Picloram	0.100	0.600 µg/L		30	70-130	30	70-130	30
Picloram [2C]	0.100	0.600 µg/L		30	70-130	30	70-130	30
Acifluorfen	0.0692	0.300 µg/L		30	70-130	30	70-130	30
Acifluorfen [2C]	0.0500	0.300 µg/L		30	70-130	30	70-130	30
Surr: 2,4-Dichlorophenylacetic acid			70-130		70-130		70-130	
Surr: 2,4-Dichlorophenylacetic acid [2C]			70-130		70-130		70-130	

Analytical Method Information

Printed: 11/13/2025 8:52 am

Glyphosate by LCMSMS in Water::LAB (DEQ16-LAB-0011-SOP)

Preservation: Cool 4°C

Container: AmberPoly 250mL **Amount Required:** 250 **Hold Time:** 180 days

Analyte	MDL	Reporting Limit	Surrogate %Rec	Duplicate RPD	----Matrix Spike---- %Rec	RPD	--Blank Spike / LCS-- %Rec	RPD
Surr: ^{13}C2,15N-Glyphosate			70-130		70-130		70-130	
Surr: ^{13}C,15N,D2-Aminomethylphosphonic acid (AMPA)			70-130		70-130		70-130	
Glyphosate	26.9	50.0 ng/L		30	70-130	30	70-130	30
Aminomethylphosphonic acid (AMPA)	40.7	80.0 ng/L		30	70-130	30	70-130	30

Appendix C – Analytical Review Sheets (by method)

Pesticide/Herbicides by GC/MS CLLE, EPA 8270

OREGON DEPT OF ENVIRONMENTAL QUALITY
Laboratory Division
Analytical Data Review Checklist
Gas Chromatography/Mass Spectometry - SW-846

I. Analytical Batch Information

Analytical Sequence ID: _____ Instrument: 52692-GCMS-7890-5975 or 109437-GCMS-QQQ
SOP: DEQ03-LAB-0052-SOP Analysis Date: _____ Analyst: _____
Version: 4.0 Date: 25-Jun-2024 Ref. Method(s): EPA 8270E
Method File(s): _____
Work Order(s): _____
Analytical Due Date(s): _____

II. Preparation Batch Information

Preparation Batch ID(s): _____ ❒ N/A

III. Standards & Reagents

Traceability: Element LIMS Standards Database — See raw analytical data for standard numbers

		Analyst			Reviewer			Comments
IV. Calibrations		**Pass**	**Fail**	**N/A**	**Pass**	**Fail**	**N/A**	
ICAL Date:								
No. of Calibration Stds:	≥ 5 for ARF or Linear, ≥ 6 for Quad	❒	❒		❒	❒		
%RSD, r^2, or RSE satisfied:	RSD ≤ 20% for ARF r^2 ≥ 0.99 or RSE ≤ 20% for Linear or Quad	❒	❒		❒	❒		
Low Calibration Std:	≤ MRL, recalc within ± 50%	❒	❒		❒	❒		
Calibration Residuals:	Recalc within ± 30% of TV (Low Cal ± 50%)	❒	❒		❒	❒		
ICV (2nd Source):	Within 30% of true value	❒	❒		❒	❒		
CCVs every 12 hours:	Within 20% of true value	❒	❒	❒	❒	❒	❒	
V. Analytical Quality Control		**Pass**	**Fail**	**N/A**	**Pass**	**Fail**	**N/A**	
MS Tune Check:	Prior to ICAL	❒	❒	❒	❒	❒	❒	
GC Performance:	Prior to ICAL							
Breakdown:	DDT degradation to DDE & DDD ≤ 20%	❒	❒	❒	❒	❒	❒	
Tailing Factor:	Pentachlorophenol & benzidine TF ≤ 2.0	❒	❒	❒	❒	❒	❒	
Isomer Resolution:	Depth of valley between 2 peaks ≥ 50% of the avg. hgt. of the 2 pks.	❒	❒	❒	❒	❒	❒	
Method Blank(s):	Conc < ½ MRL	❒	❒	❒	❒	❒	❒	
LCS:	Control Chart Limits or ± 30% of TV	❒	❒	❒	❒	❒	❒	
LCS Duplicate:	CC Limits or ± 30% of TV and ≤ 30% RPD	❒	❒	❒	❒	❒	❒	
Laboratory Duplicate:	Control Chart Limits or RPD ≤ 30% if either conc. ≥ 5XMRL, or difference ≤ 2XMRL if both conc. < 5xMRL	❒	❒	❒	❒	❒	❒	
VI. Sample QC		**Pass**	**Fail**	**N/A**	**Pass**	**Fail**	**N/A**	
Data Q-edited:		❒	❒		❒	❒		
Internal Standards:	CCV: 50-200% from ICAL midpoint or average Samples: 50-200% from most recent CCV	❒	❒		❒	❒		
Isotope Dilution Standards:	CCV: ± 35% drift from ICAL Samples: Recovery within Control Chart Limits	❒	❒	❒	❒	❒	❒	
Surrogates:	Control Chart Limits or ± 30% of TV	❒	❒	❒	❒	❒	❒	
Matrix Spike / MSD:	CC Limits or ± 30% of TV and ≤ 30% RPD	❒	❒	❒	❒	❒	❒	
Manual Integrations:	Before & after included	❒	❒	❒	❒	❒	❒	
Preservation Check:	☑ See benchsheet	❒	❒	☑	❒	❒	☑	
Hold Times Met:	Water: 7d Ext./40d An.; Soil: 14d Ext./40d An.	❒	❒	❒	❒	❒	❒	
TICs Evaluated:	When requested by Project Manager	❒	❒	❒	❒	❒	❒	
VII. Field QC		**Pass**	**Fail**	**N/A**	**Pass**	**Fail**	**N/A**	
Field Blank:	Conc < ½ MRL	❒	❒	❒	❒	❒	❒	
Field Duplicate:	Control Chart Limits or RPD ≤ 30% if either conc. ≥ 5XMRL, or difference ≤ 2XMRL if both conc. < 5xMRL	❒	❒	❒	❒	❒	❒	
VIII. Data Management		**Yes**	**No**	**N/A**	**Yes**	**No**	**N/A**	
Data Entry/Upload Complete & Accurate		❒	❒		❒	❒		
Element Status Updated		❒	❒	❒	❒	❒	❒	

DEQ03-LAB-0052-FORM Checklist Version 1.2 25-Jun-2024

Organic compounds by LC/MS/MS, EPA 8321

OREGON DEPT OF ENVIRONMENTAL QUALITY
Laboratory Division
Analytical Data Review Checklist
Liquid Chromatography/MS/MS

I. Analytical Batch Information

Analytical Sequence ID: _____ **Instrument:** 52475-LCMSMS-Quattro
SOP: *DEQ11-LAB-0030-SOP/DEQ11-LAB-0031-SOP* **Analysis Date:** _____ **Analyst:** _____
Version: *1.3* **Date:** *3/30/2022*
Method File(s): _____ **Ref. Method(s):** EPA 8321A
Work Orders: _____
Analytical Due Date(s): _____

II. Preparation Batch Information

Preparation Batch ID(s): _____ ❑ N/

III. Standards & Reagents

Traceability: Element Standards Database — See raw analytical data for standard numbers
Reagent Prep Logbook: See Element

		Analyst			Reviewer			Comments
IV. Calibrations		**Pass**	**Fail**		**Pass**	**Fail**		
ICAL Date:								
% RSD or r2 satisfied:	*20% RSD or r=0.99*	❑	❑		❑	❑		
ICV (2nd Source):	*70-130%*	❑	❑		❑	❑		
CCV's:	*±20%*	❑	❑		❑	❑		
V. Analytical Quality Control		**Pass**	**Fail**	**N/A**	**Pass**	**Fail**	**N/A**	
Method Blank(s):	Conc < 1/2 LOQ	❑	❑		❑	❑		
LCS:	*control chart limits (RPD: 30%)*	❑	❑	❑	❑	❑	❑	
Laboratory Duplicate:	*≤ 30% RPD if conc. is > 5X LOQ*	❑	❑	❑	❑	❑	❑	
	OR Diff < 2X LOQ if conc. < 5X LOQ							
VI. Sample QC		**Pass**	**Fail**	**N/A**	**Pass**	**Fail**	**N/A**	
Internal Std	*50-200%*	❑	❑	❑	❑	❑	❑	
Surrogate Recovery	*control chart limits*	❑	❑	❑	❑	❑	❑	
Matrix Spike:	*control chart limits (RPD: 30%)*	❑	❑	❑	❑	❑	❑	
Manual Integrations:	*See Target lynx .QLD*	❑	❑	❑	❑	❑	❑	
Hold times met:	Ext. : H2O: 7days, Soil/Tissue: 14 days @ ≤6°C Analytical: 40 days @ < 6°C	❑	❑		❑	❑		
VII. Field QC		**Yes**	**No**	**N/A**	**Yes**	**No**	**N/A**	
Field Blank acceptable:	Conc < 1/2 LOQ	❑	❑	❑	❑	❑	❑	
Field Duplicate within limits:	*≤ 30% RPD if conc. is > 5X LOQ*	❑	❑	❑	❑	❑	❑	
	OR Diff < 2X LOQ if conc. < 5X LOQ							
VIII. Data Management		**Yes**	**No**		**Yes**	**No**		
Data Entry/Upload Complete & Accurate		❑	❑		❑	❑		

IX. Additional Comments

X. Signatures & Date

Analyst: _____ Reviewer: _____

DEQ11-LAB-0031-FORM Checklist Version 1.3 03/30/2022

Phenoxy Herbicides by GCECD, SM 6640B

OREGON DEPT OF ENVIRONMENTAL QUALITY
Laboratory Division
Analytical Data Review Checklist
Chlorinated Herbicides by Gas Chromatography/ECD

I. Analytical Batch Information

Analytical Sequence ID(s): _____ Instrument: 51968-GC-6890ECD
SOP: DEQ93-LAB-0016-SOP Analysis Date: _____ Analyst: _____
Version: 3.6 Date: 9/17/2024
Method File(s): _____ Ref. Method(s): EPA 515.4/SM 6640
Work Orders: _____
Analytical Due Date(s): _____

II. Preparation Batch Information

Preparation Batch ID(s): _____ ❑ N/A

III. Standards & Reagents

Traceability: Element Standard Database See raw analytical data for standard numbers

IV. Calibrations		Analyst Pass	Analyst Fail	Reviewer Pass	Reviewer Fail	
ICAL Date:						
% RSD or r^2 pass:	%RSD ≤20, or r^2 ≥ 0.990	❑	❑	❑	❑	
Each Calibration Level	Low point ±50% of TV; all others ±30% of TV	❑	❑	❑	❑	
ICV/LCS (2nd Source):	70-130% Rec	❑	❑	❑	❑	
CCV's:	70-130% Rec	❑	❑	❑	❑	
CCV Frequency:	After every 10 sample injects	❑	❑	❑	❑	

V. Analytical Quality Control		Pass	Fail	N/A	Pass	Fail	N/A	
Method Blank Freq:	1 per 20 samples or batch	❑	❑		❑	❑		
Method Blank(s):	Conc < 1/3 MRL	❑	❑		❑	❑		
Laboratory Duplicate:	≤ 30% RPD	❑	❑	❑	❑	❑	❑	

VI. Sample QC		Pass	Fail	N/A	Pass	Fail	N/A	
Data q-edited:		❑	❑	❑	❑	❑	❑	
Manual Integrations:	Before & after included	❑	❑	❑	❑	❑	❑	
Internal Standards:	250 µg/L, ±50% Cal Response	❑	❑		❑	❑		
Surrogate Rec:	70-130% Rec	❑	❑	❑	❑	❑	❑	
Matrix Spike Freq:	1 per 20 samples or batch	❑	❑	❑	❑	❑	❑	
Matrix Spike Rec:	70-130%, RPD≤30%	❑	❑	❑	❑	❑	❑	
Preservation Check:	NA	❑	❑	■	❑	❑	■	
Extraction times met:	Extraction: 14d	❑	❑		❑	❑		
	Analysis: 21d after extraction	❑	❑		❑	❑		

VII. Field QC		Yes	No	N/A	Yes	No	N/A	
Field Blank acceptable:	Conc < 1/3 MRL	❑	❑	❑	❑	❑	❑	
Field Duplicate within limits:	RPD≤30% (or according to QAPP)	❑	❑	❑	❑	❑	❑	

VIII. Data Management	Yes	No	Yes	No	
Primary reporting column, circle one: FRONT or REAR					
Data Entry/Upload Complete & Accurate	❑	❑	❑	❑	

IX. Additional Comments

X. Signatures & Date

Analyst: _____ Reviewer: _____

Checklist Version 3.6 09/18/2024

DEQ05-LAB-0022-QAPP_rev7.0

Final Audit Report 2025-11-17

Created:	2025-11-13
By:	Sara KREPPS (sara.krepps@deq.oregon.gov)
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