

# Guideline for Writing the Quality Assurance Summary Report

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Coal and Uranium Program

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Last Updated: September 18, 2012

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## Quality Assurance Summary Report

This guidance is intended for use by the DEQ Coal Program and active coal mine permit holders/mine operators. It presents a required template for reporting of quality assurance/quality control elements as prescribed in the approved Monitoring and Quality Assurance Plan (MQAP).

In this guideline, template language is italicized and bracketed with <>. These statements are examples and may be copied directly by mine operators when preparing the QASR. Portions of example tables are included in this document to illustrate how to fill in data tables. A more complete example can be found in the accompanying example Excel files.

## 1.0 Overview

<The Quality Assurance Summary Report (QASR) reports on the performance of Data Quality Indicators (DQIs) and quality control actions given in the Monitoring and Quality Assurance Plan (Sections 7 and 8).>

## 2.0 Data Quality Indicators and Assessment Criteria

### 2.1 Precision

Discuss/report on the collection and performance of all duplicate-pair samples. Include a table (see **Table 2-1**) of samples/duplicates, RPD values, and any data qualifiers (J-flags) applied in accordance with performance criteria given in the MQAP (i.e. any paired results > 5 times the RL that exceed 25% RPD are qualified with a J-flag).

### 2.2 Accuracy

Discuss/report on any sampling or data collection/management activities that may affect the accuracy of results. Activities that may affect accuracy of results can include: water quality laboratory analyses that fall outside laboratory recovery ranges, surface flows above or below the limits of calibrated flow-monitoring devices, deviations from sampling methods or analyses established in the MQAP, equipment failure, external causes, etc.

Report on any measures taken to ensure accuracy in data collection and results. This may include: manual flow measurements (calibration of flumes/flow monitoring cross-sections), performance of field blank samples (see Section 2.6 Sensitivity), calibration of and testing of equipment and instrumentation, etc.

### 2.3 Completeness

Discuss/report on data completeness and any factors that affected the completeness of data collection as prescribed in the MQAP. Describe the conditions that led to any incomplete data collection, note if and when DEQ was notified, and any corrective actions implemented by the mine operator. Present future plans to remedy or mitigate conditions that led to incomplete data collection.

Stream flow water quantity data completeness is calculated for the entire reporting year. Water quality (field and analytical laboratory samples) and groundwater levels are calculated per scheduled sampling event. Provide a table that shows data completeness (as defined in the MQAP) for all field and analytical parameters. **Table 2-3** shows an example of a completeness reporting table for water quality and quantity. The format of the completeness tables may need to be modified depending on the type and frequency of data collection prescribed in the MQAP.

## 2.4 Representativeness

Discuss/report on any conditions that affected representativeness of the data. Where sampling of water quality and water quantity is temporally and spatially incomplete, or fails to meet the intent of the sampling design for spatial and temporal representativeness, describe the conditions that affected representativeness of the data set.

## 2.5 Comparability

Discuss/report on any conditions that affected comparability of the data for its intended use. Where sampling of water quality and water quantity is deficient or fails to meet the intent of the sampling design, comparability may be compromised.

## 2.6 Sensitivity

Discuss/report on the collection and performance of all field-blank samples. Include a table of blanks, result values (see **Table 2-6**), and any data qualifiers (B-flags) applied in accordance with performance criteria given in the MQAP (i.e. for all Field Blank results >MDL, qualify all associated project data < 10x the detected value with B flags). Associated project data includes all results that may potentially be affected by the performance of blank detections: list all associated project data, and describe its relevance as 'associated data'.

Use the “**QASR.xlsx/BFlags**” worksheet as a template for listing flagged samples. One table can be used to list all flagged samples.

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**Example: Table 2-1. PRECISION: Performance of Field Duplicate Samples and Corrective Action Taken**

Sample ID/Pair	Date Sampled	Analyte	Sample Result (ug/L)	Duplicate Result (ug/L)	RL (ug/L)	Sample >5x RL?	RPD	Action Taken
SD01/SD01d	8/15/2010	Al	123	148	30	No	18.5%	None
SD34/SD35d	8/15/2010	As (diss)	9.2	6.4	3	No	35.9%	None
SD61/SD61d	8/15/2010	Fe	330	450	50	Yes	30.8%	J-flag results

QASR.xlsx/JFlags

**Example: Table 2-3a. COMPLETENESS: Surface Water Quality Sampling Events**

Event 1: <Date Of Sampling Event>	Water Quality	Field Measurements	Comment/Explanation
Total # of surface water monitoring sites in MQAP	8	8	
Total # of surface water monitoring sites sampled	6	6	
Total # of surface water monitoring sites not sampled	2	2	
<b>Completeness</b>	75%	75%	
<b>Event 2: &lt;Date Of Sampling Event&gt;</b>			
Total # of surface water monitoring sites in MQAP	8	8	
Total # of surface water monitoring sites sampled	7	7	
Total # of surface water monitoring sites not sampled	2	2	
<b>Completeness</b>	88%	88%	
<b>Event 2: &lt;Date Of Sampling Event&gt;</b>			
Total # of surface water monitoring sites in MQAP	8	8	
Total # of surface water monitoring sites sampled	2	2	
Total # of surface water monitoring sites not sampled	6	6	
<b>Completeness</b>	25%	25%	

QASR.xlsx/SWCompleteness

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**Example: Table 2-3b. COMPLETENESS: Groundwater Sampling Events**

<b>Table 2-3b. COMPLETENESS: Groundwater Quality Sampling Events</b>				
<b>Quarterly Groundwater Sampling events</b>				
<b>Q1 Event (Oct-Dec):</b>	<b>Water Quality</b>	<b>Field Measurements</b>	<b>Well Level</b>	<b>Comment/Explanation</b>
Total # of groundwater monitoring sites in MQAP	0	0	50	
Total # of groundwater monitoring sites sampled	0	0	49	
Total # of groundwater monitoring sites not sampled	0	0	1	
<b>Completeness</b>	<b>NA</b>	<b>NA</b>	<b>98%</b>	
<b>Q2 Event (Jan-Mar):</b>				
Total # of groundwater monitoring sites in MQAP	10	10	60	
Total # of groundwater monitoring sites sampled	9	9	57	
Total # of groundwater monitoring sites not sampled	0	0	0	
<b>Completeness</b>	<b>90%</b>	<b>90%</b>	<b>95%</b>	
<b>Q3 Event (Apr-Jun):</b>				
Total # of groundwater monitoring sites in MQAP	0	0	50	
Total # of groundwater monitoring sites sampled	0	0	48	
Total # of groundwater monitoring sites not sampled	0	0	0	
<b>Completeness</b>	<b>NA</b>	<b>NA</b>	<b>96%</b>	
<b>Q4 Event (Jul-Sep):</b>				
Total # of groundwater monitoring sites in MQAP	10	10	60	
Total # of groundwater monitoring sites sampled	8	10	57	
Total # of groundwater monitoring sites not sampled	0	0	0	
<b>Completeness</b>	<b>80%</b>	<b>100%</b>	<b>95%</b>	

QASR.xlsx/GWCompleteness

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**Example: Table 2-3c. COMPLETENESS: Surface Water Flow Recording**

Surface Flow Station	Instrumentation	Days of operational data/yr	Completeness	Comment/Explanation
S1	weir/Stevens recorder	240	66%	
S2	open channel/pressure transducer	365	100%	
S3	weir/pressure transducer	330	90%	

QASR.xlsx/FlowCompleteness

**Example: Table 2-6. Sensitivity: Performance of Field Blank Samples and Corrective Action Taken**

Sample ID	Station	Collection Date	Parameter	MDL (ug/L)	Result (ug/L)	Associate Samples (Sample ID)	Action Taken
A1-102010B	A1	10/20/2010	Fluoride	100	122	A2-102011, A3-001200	B-flag all associated FI data < 10x the detected value
A1-102010B	A1	10/20/2010	Vanadium	10	67	A2-102011, A3-001200	B-flag all associated FI data < 10x the detected value
A1-102010B	A1	10/20/2010	Fe	50	<50	A2-102011, A3-001200	No Action

QASR.xlsx/BFlags