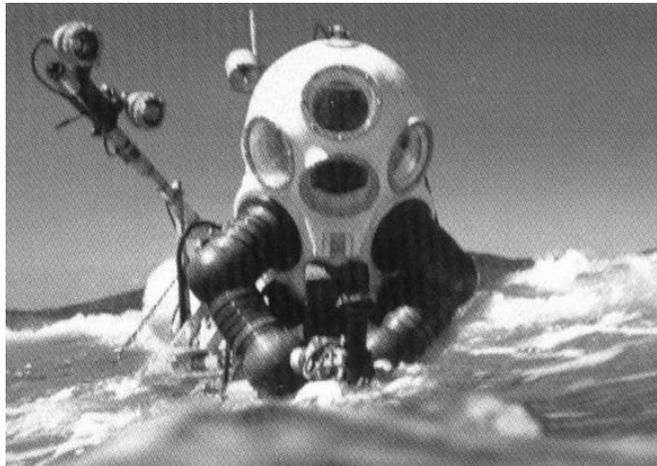


Water Sampling & Flow Measurement Protocol

Office of Surface Mining, Reclamation & Enforcement
Technical Information Processing System
AquaChem 3.7 Class

All Purpose Automatic Water Sampler



Components of Water Sampling

- Defining sampling objectives
- Design sampling plan
- Prepare for sampling
- Representative sampling
- Chain of custody/documentation

3

Define Sampling Objectives

- Assess baseline conditions & trends
- Self monitoring for compliance
- Provide evidence of non compliance
- Assess impacts

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Baseline monitoring

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Sampling Schemes

Short term

- Storm runoff
- Non compliance
- Spills

Long term

- Stream stations
- Springs
- UPDES
- Underground sites
- Wells

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Maintenance

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Determine Sampling Locations

- Point sources
- Non-point sources
- Safety constraints
- Environmental constraints
- Accessibility

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Point Source

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Non Point Sources

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Components of Water Sampling

- Defining sampling objectives
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Sample Containers, Preservatives, & Holding Times

Type	Amount/bottle	Preservative	Holding Time
Chemistry	2000 ml/Plastic	none	7 days
Oil & Grease	1000 ml/glass w/ teflon seal	H ₂ SO ₄ / HCL	28 Days
Metals	500 ml/ Plastic	HNO ₃	6 months
Bacterial	100 ml/Plastic	Na ₂ S ₂ O ₃	6 Hours
Nutrients	500 ml/Plastic	H ₂ SO ₄	28 Days

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Field Filtration

- Required for dissolved metals
- Removes suspended matter from sample
- Field filtration most desirable. (0.45 μm membrane filters)

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Components of Water Sampling

- Defining sampling objectives
- Design sampling schemes
- Sampling preparation
- Representative sampling
- Chain of custody/documentation

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A representative sample is one that closely resembles, or is a subset of the population being measured.

From: Principles of Environmental Sampling, Keith, Lawrence H., editor 1996

A representative sample is collected and handled in a manner that:

- Preserves its original physical form & chemical composition
- Prevents changes in the concentration of the materials to be analyzed
- Prevents the introduction of outside contamination.

From: Principles of Environmental Sampling, Keith, Lawrence H., editor 1996

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Grab sampling

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Sample in well mixed zone

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Measuring Flow

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Components of Water Sampling

- Defining sampling objectives
- Design sampling schemes
- Sampling preparation
- Representative sampling
- Chain of custody/documentation

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Documentation For Evidence & Testimony

- Chain of custody paperwork
- Field notes
- Photographs
- Sketches

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PROJECT CODE/STREET NO.	MONTH/DAY/YEAR	TIME	DESIGNATE:													
			COMP.	GRAS												
TAG NO. UT - DEQ No 000430	SAMPLERS (SIGNATURE)															
	LAB SAMPLE NO.	ANALYSIS	TOTAL CHEMISTRY	NUTRIENTS	TOTAL METALS	BOD	BACTERIOLOGICAL	CYANIDE	SULFIDE	PHENOL	RADIOLOGICALS	OIL & GREASE	ASBESTOS	ORGANICS	TCLP	OTHER

Sample bottle chain of custody label

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Field Notes



Bound notebook, permanent ink pen

Photographs



Above

Below

Chain of Custody

- Chain of Custody (COC) Forms (completed when samples taken)
- Seals on bottle caps
- COC tags
- Transfer samples to Lab w/ signatures

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Approved Analytical Methods

- Lab must use approved methods
 - EPA methods
 - Standard Methods

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Summary of Water Sampling Protocol

- Define sampling objectives
- Design sampling schemes
- Sampling preparation
- Representative sampling
- Chain of custody/documentation

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References

- **Standard Methods for the Examination of Water and Wastewater, 19th edition.,**
- **Principles of Environmental Sampling, Keith, Lawrence H., Editor, 1996**
- **Study and Interpretation of the Chemical Characteristics of Natural Water, Hem, USGS WSP 2254, 1986**
- **Monitoring Training Guide Utah Dept. of Environmental Quality, Div. of Water Quality**
- **Water Measurement Manual, 3rd edition, USDI, Bureau of Reclamation, 1997**

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