MODULE 5.
STANDARD OPERATING PROCEDURES

This module contains a compilation of Standard Operating Procedures (SOPs) pulled together by the various EPA regions and tribes represented on the workgroup developing this CD-ROM tool. In some cases, you will find more than one SOP for a given task or activity provided by a different organization (and developed specifically for that organization). Feel free to look through the SOPs (attached as "PDF" documents), choose those that best reflect your activities, and then customize them for your organization. While there is no requirement that the SOPs provided be used, they may assist in developing those most pertinent for your program or project. It is important to remember that your organization is responsible for following its SOPs as written, so give this consideration when adapting someone else's SOPs to operations for your organization.

The example SOPs provided below are divided into 10 categories:

- **Field Measurements** - An example for each of four water quality measurements that are part of most field monitoring activities (including: turbidity, conductivity, pH, and dissolved oxygen), as well as a multi-parameter measurement. Also a field measurement calibration procedure for both pH & dissolved oxygen and the multi-parameter measurement.
- **Global Positioning Systems** - Two methods for collection of latitudinal and longitudinal field data using different instruments.
- **Sample Handling and Preservation** - Four sets of tables (not SOPs) depicting sample containers & volumes, preservation, and maximum holding times for a variety of analyses.
- **Miscellaneous Field Procedures** - Eight procedures covering general sampling, (2 methods for) equipment decontamination, stream gage measurements, stream flow measurement, electrofishing, transport & operation of a boat for sample collection, and canopy cover and gradient/slope estimation procedures.
- **Surface Water Sampling** - Two subcategories. Five examples of general surface water sampling methods. Two example procedures associated with low level metals analysis.
- **Sediment Sampling** - Three procedures covering general sediment sampling.
- **Groundwater Sampling** - Three subcategories. Three procedures for equipment operation. Six procedures for monitoring well installation & activities including: two methods for installation with Geoprobe ™, one method for pressure transducers, two procedures for static water level measurements, and one method for well development. Five procedures for groundwater sampling, including one by low flow.
- **Soil Sampling** - Two subcategories. Two examples of general soil sampling procedures. One example of soil collection for analysis of volatile organic compounds (VOCs).
- **Miscellaneous/Documentation** - An example for each of three documentation procedures including: sample login/tracking/disposition, chain of custody, document control.
- **Website Links** - Links where additional SOPs can be found.

Field Measurements -

Turbidity: 29 Palms Band. *Portable Turbidimeter, Model 2100, US EPA Method 180.1*, SOP No. PP0011, Version 1.0. April, 16 2003.

Conductivity: 29 Palms Band. *Conductivity, EPA 120.1 (HACH CO150 Conductivity Meter)*, SOP No. PP002, Version 2.0. April 27, 2000.

pH: 29 Palms Band. *pH, EPA 150.1 (HACH EC10 pH Meter)*, SOP No. PP001, Version 2.0. November 6, 2001.

Dissolved Oxygen: 29 Palms Band. *Dissolved Oxygen, EPA Method 360.1 (VWR Scientific Dissolved Oxygen Meter, Model 4000)*, SOP No. PP006, Version 1.0. July, 10 2002.

pH and Dissolved Oxygen: US EPA Region 6. *SOP for pH and Dissolved Oxygen Instrument Calibration*, May 15, 2000.

Multi-Parameter Measurement: US EPA Region 1. *Standard Operating Procedure for Calibration and Field Measurement Procedures for the YSI Model 6-Series SONDES and Data Logger (Including: Temperature, pH, Specific Conductance, Turbidity, Dissolved Oxygen, Chlorophyll, Rhodamine WT, ORP, and Barometric Pressure)*, Revision 7, June 7, 2005.

Multi-Parameter Calibration: US EPA Region 1. *Draft Calibration of Field Instruments (Temperature, pH, Dissolved Oxygen, Conductivity/Specific Conductance, Oxidation Reduction Potential [ORP], and Turbidity)*, Draft, June 3, 1998.

Global Positioning Systems -

Trimble: 29 Palms Band. *GPS Data Collection using Trimble for Point Features (Trimble Pro XRS)*, SOP No. SP 0009, Version 1.0. September 25, 2002.

Garmin: 29 Palms Band. *GPS Data Collection using Garmin (Garmin GPS 12)*, SOP No. SP 0003, Version 1.2. September 25, 2002.

Sample Handling and Preservation (Tables) -

Sample Handling and Preservation (Table 1), 29 Palms Band

Sample Collection Parameters, US EPA Contract Laboratory Program (CLP)

Appendix B-1 – Sample Collection Parameters for Metals and Classical Chemistry Parameters

Appendix B-2 – Sample Collection Parameters for Volatile, Semivolatile, and Pesticide/PCB Analysis

Appendix B-3 – Field QC and Laboratory QC Sample Collection and Documentation Requirements

Sample Handling and Preservation (Tables 2 & 3), US EPA Region 6

Miscellaneous Field Procedures -

General Sampling: Environmental Response Team (ERT), US EPA. *General Field Sampling Guidelines*, SOP No. 2001, Revision 0.0. August 11, 1994.

Equipment Decontamination:

Environmental Response Team (ERT), US EPA. *Sampling Equipment Decontamination*, SOP No. 2006, Revision 0.0. August 11, 1994.

US EPA Region 9. *Sampling Equipment Decontamination*, SOP No. 1230, Revision 1. September 1999.

Stream Gage Measurements: 29 Palms Band. *Stream Gaging*, SOP No. SP008, Version 1.0. July 12, 2001.

Stream Flow Measurements: US EPA Region 6. *SOP for Stream Flow Measurement*. Update Jan. 31, 2003.

Electrofishing: US EPA Region 1. *Sampling of Fish in Wadeable Streams Through the Use of Electrofishing*, Revision 3. August 14, 2003.

Boat Transport & Operation for Sampling: US EPA Region 1. *Transporting and Operating Boats*, Revision 1. June 26, 2002.

Canopy Cover and Gradient/Slope Estimation: US EPA Region 6. *Canopy Cover and Gradient/Slope Estimation Procedures*, February 6, 2004.

Surface Water Sampling -

General Methods:

29 Palms Band. *Surface Water Sampling,* Version 2.1. November 3, 2003.

Environmental Response Team (ERT), US EPA. *Surface Water Sampling*, SOP No. 2013, Revision 0.0. November 17, 1994.

US EPA Region 1. *Collection of Chemical and Biological Ambient Water Samples*, Revision 1. July 24, 2002.

US EPA Region 9. *Surface Water Sampling*, SOP No. 1225, Revision 1. September 1999.

Methods Associated with Low Level Metals Analysis:

US EPA Region 6. *Water-Quality Samples for Dissolved Metals-in-Water*, SOP No. , Revision 0. January 13, 2000.

US EPA Region 1. *Collection of Low Level Metals Ambient Water Samples,* Revision 1. September 4, 2003.

US EPA Region 9. *Trace Metal Clean Sampling of Natural Waters*, SOP No. 1229, Revision 0. July 26, 2004.

Sediment Sampling -

General Methods:

Environmental Response Team (ERT), US EPA. *Sediment Sampling*, SOP No. 2016, Revision 0.0. November 17, 1994.

US EPA Region 1. *Soil, Sediment, and Solid Waste Sampling*, Revision 2. February 13, 2004.

US EPA Region 9. *Sediment Sampling*, SOP No. 1215, Revision 1. September 1999.

Groundwater Sampling -

Equipment:

29 Palms Band. *Coleman Generator Operation*, Version 1.0. March 6, 2001.

29 Palms Band. *Generac EXL Generator System*, Version 1.1. February 3, 2003.

29 Palms Band. *Redi-Flo Performance Pumps*, Version 2.0. July 19, 2004.

Monitoring Well Installation & Activities:

Geoprobe ™ -

Environmental Response Team (ERT), US EPA. *Model 5400 Geoprobe ™ Operation*, SOP No. 2050, Revision 0.0. March 27, 1996.

US EPA Region 1. *Groundwater Monitoring Well Installation Using Geoprobe®,* Revision 1. June 20, 2002.

Pressure Transducer - 29 Palms Band. *Pressure Transducer Maintenance and Download*, Version 1.0. February 20, 2004.

Static Water Level Measurement -

29 Palms Band. *Static Water Level Determination*, Version 1.2. February 5, 2002.

Environmental Response Team (ERT), US EPA. *Water Level Measurement*, SOP No. 2043, Revision 0.0. October 3, 1994.

Well Development - Environmental Response Team (ERT), US EPA. *Well Development*, SOP No. 2044, Revision 0.0. October 3, 1994.

Sampling:

General -

29 Palms Band. *Ground Water Sampling*, Version 1.4. February 5, 2002.

Environmental Response Team (ERT), US EPA. *Groundwater Well Sampling*, SOP No. 2007, Revision 0.0. January 26, 1995.

US EPA Region 1. *Groundwater Sampling*, Revision 0. January 9, 2003.

US EPA Region 9. *Groundwater Well Sampling*, SOP No. 1220, Revision 1. September 1999.

Low Flow - US EPA Region 1. *Low Stress (Low Flow) Purging and Sampling Procedure for the Collection of Ground Water Samples from Monitoring Wells*, SOP No. GW 0001, Revision 2. July 30, 1996.

Soil Sampling -

General Methods:

Environmental Response Team (ERT), US EPA. *Soil Sampling*, SOP No. 2012, Revision 0.0. February 18, 2000.

US EPA Region 9. *Soil Sampling*, SOP No. 1205, Revision 2. September 1999.

Sampling for Volatile Compounds: US EPA Region 9. *Soil Sampling for Volatile Compounds*, SOP No. 1210, Revision 1. September 1999.

Miscellaneous/Documentation -

Sample Login/Tracking/Disposition: US EPA Region 1. *Sample Login, Tracking, and Sample Disposition*, EIA-ADMLOG10.SOP, Revision 1. July 26, 2002.

Chain of Custody: US EPA Region 1. *Chain of Custody of Samples*, Revision 1. March 25, 2002.

Document Control: US EPA Region 1, Office of Environmental Measurement and Evaluation. *Document Control*, EQASOP-DocContrlSOP0, Revision 0. February 18, 2004.

Website Links -

Environmental Response Team (ERT), US EPA:
http://www.ert.org/mainContent.asp?section=Products&subsection=List

Other Links: See additional information in Module 4 under subheading "Supplemental Technical Information". Reference #5 may be particularly helpful for surface water projects.