



Department of Energy

Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208-3621

FREEDOM OF INFORMATION ACT/PRIVACY PROGRAM

July 19, 2018

In reply refer to: BPA-FOIA-2016-01591-F

Patrick Ross Moberg
Jerry Moberg & Associates
2245 32nd Avenue, West
Seattle, WA 98199
prmoberg@jmlawps.com

Dear Mr. Moberg:

This communication is the Bonneville Power Administration's (BPA) final response to your records request made under the Freedom of Information Act, 5 U.S.C. § 552 (FOIA). Your records request was received on September 30, 2016. Your FOIA request was formally acknowledged on October 13, 2016.

Request

“...the Master Agreements and releases between BPA and Terraqua, Inc. including but not limited to: Nos. 14880, 27480, 53532 2[; and] ... all email communications between BPA and Mike Ward and/or Holiday Sloan.”

Response

In response to your FOIA request, BPA conducted electronic searches of records in the Grants and Agreements Team office. BPA located 234 pages of agency records responsive to your request and is herein releasing 191 pages in full and 43 pages with redactions applied under 5 U.S.C. § 552(b)(4) (Exemption 4). Those agency records accompany this communication.

The FOIA generally requires the release of all responsive government records upon request. However, the FOIA permits withholding certain limited information that falls under one or more of nine statutory exemptions (5 U.S.C. §§ 552(b)(1-9)). An explanation of the applied exemptions follows.

Exemption 4

Exemption 4 protects “trade secrets and commercial or financial information obtained from a person and privileged and confidential” (5 U.S.C. § 552(b)(4)). The existence of Exemption 4 encourages businesses and other entities to voluntarily furnish useful commercial or financial information, and provides protection from competitive harm to submitters who are required to furnish information to the government.

Information is considered commercial or financial in nature if it relates to business or trade. Information is “obtained from a person” when it has been provided to the government by an

individual or a wide range of entities including corporations and state and foreign governments. Here, Terraqua Inc. is a third party submitter of the information sought in your FOIA request.

Terraqua Inc. was required to provide this information to BPA by Bonneville Purchasing Instructions section 11.7.1.2(b). When BPA exercises its authority to require information submissions, the information can be withheld under Exemption 4 when disclosure of the information would (1) impair the government's ability to obtain necessary information in the future, or (2) cause substantial harm to the competitive position of the submitter.

The work completed under the Master Agreements includes, among other things, producing environmental compliance documentation, collecting and analyzing field data, and producing reports for use by BPA. This is specialized work that requires expertise, but it is not unique to Terraqua; there are a variety of companies operating in the same geographic area that offer the same types of services, including environmental data analysis. Competition for contracts of this nature is significant; a state or federal agency opening a bid process for this type of work could reasonably anticipate receiving multiple bids. These market conditions suggest that Terraqua would likely suffer competitive harm if specific costs and rates were released under FOIA.

The passage of time can erode the likelihood of competitive harm. BPA examined the unit costs and rates presented in the responsive records and compared them to similar releases completed in 2017, and found that there has been little change in prices in the time that has passed. The contracting officer confirmed that the compensation rates and cost of doing this type of work has held steady, with little fluctuation. Taken together with the marketplace factors above, and based further upon BPA's longstanding experience in this area, BPA finds that the likelihood of substantial competitive harm threshold has been met for each of the following items:

1. Quantity of items
2. Unit cost and price per item
3. Total line-item cost
4. Billing rates
5. Changes and amendments to costs
6. Overhead cost percentage

BPA has determined that Terraqua Inc. has shown a likelihood of competitive harm. Therefore, BPA finds that the information is confidential and declines to evaluate whether disclosure would impair the future collection of information, and BPA withholds this information under Exemption 4.

Fee

There are no FOIA fees applicable to your request for BPA records.

Certification

Your FOIA request BPA-2016-01591-F is now closed with all available agency records provided. Pursuant to 10 C.F.R. § 1004.7(b)(2), I am the individual responsible for the records release and exemption determinations described above.

Appeal

This decision, as well as the adequacy of the search, may be appealed within 90 calendar days from your receipt of this letter pursuant to 10 C.F.R. § 1004.8. Appeals should be addressed to:

Director, Office of Hearings and Appeals,
HG-1, L'Enfant Plaza
U.S. Department of Energy
1000 Independence Avenue, S.W.
Washington, D.C. 20585-1615

The written appeal, including the envelope, must clearly indicate that a FOIA appeal is being made. You may also submit your appeal to OHA.filings@hq.doe.gov, including the phrase "Freedom of Information Appeal" in the subject line. The appeal must contain all of the elements required by 10 C.F.R. § 1004.8, including a copy of the determination letter. Thereafter, judicial review will be available to you in the Federal District Court either: 1) in the district where you reside; 2) where you have your principal place of business; 3) where DOE's records are situated; or 4) in the District of Columbia.

You may contact BPA's FOIA Public Liaison, Jason Taylor, at the address at the letter header for any further assistance and to discuss any aspect of your request. Additionally, you may contact the Office of Government Information Services (OGIS) at the National Archives and Records Administration to inquire about the FOIA mediation services they offer. The contact information for OGIS is as follows:

Office of Government Information Services
National Archives and Records Administration
8601 Adelphi Road-OGIS
College Park, Maryland 20740-6001
E-mail: ogis@nara.gov
Phone: 202-741-5770; Toll-free: 1-877-684-6448; Fax: 202-741-5769

Questions about this communication may be directed to James King, CorSource Technology Group, LLC, at jjking@bpa.gov or at 503-230-7621.

Sincerely,



Rachel L. Hull
Freedom of Information/Privacy Act Officer

Enclosed: Responsive Records

UNITED STATES
GOVERNMENT

CONTRACT

BONNEVILLE
POWER ADMINISTRATION

Mail Invoice To:

fwinvoices@bpa.gov
F & W Invoices - KEWB-4
P. O. Box 3621
Portland OR 97208-3621

Contract : 00053532
Release :
Page : 1

Vendor:

TERRAQUA INC
PO BOX 85
WAUCONDA WA 98859

Please Direct Inquiries to:

KRISTI J. VAN LEUVEN
Title: CONTRACT SPECIALIST
Phone: 503-230-3605
Fax : 503-230-4508

Attn: MICHAEL B WARD

Contract Title: 2011-006-00 EXP CHAMP - TERRAQUA COORDINATION & IMPLEMENTATION

Total Value : \$1,097,769.00
Pricing Method: TIME & MATERIALS
Performance Period: 05/09/11 - 05/08/12

**** NOT TO EXCEED ****
Payment Terms: % Days Net 15

Michael B. Ward

Contractor Signature
Michael B. Ward/President

Printed Name/Title
June 6, 2011

Date Signed

Kristi VanLeuven

BPA Contracting Officer

6/3/2011

Date Signed

This award contains the following - TEXT ATTACHED

CONTRACT TERMS AND CONDITIONS



Contract 53532

**Columbia River Habitat Monitoring (CHaMP)
Project Number 2011-006-00
Contract 53532**

**BPA TECHNICAL POINT OF CONTACT (COTR): DAVID BYRNES (503) 230-3171
BPA CONTRACTING OFFICER: KRISTI VAN LEUVEN (503) 230-3605**

This contract includes the following documents:

1. Face page
2. This page 2 and page 3
3. Terms and Conditions
4. Statement of Work
5. Budget
6. Property Inventory

This contract is subject to the Cost Principles in Part 13 of the Bonneville Purchasing Instructions.

The Bonneville Purchasing Instructions, Appendix 19-A, Property Management Procedures for Contractors, is hereby incorporated by reference and made a part of this contract. Appendix 19-A may be accessed at: <http://www.bpa.gov/corporate/business/bpi/APP19-A.pdf>

The BPA COTR is authorized to perform the following:

- Inspect and review work performed;
- Inspect or witness test presentations or other activities;
- Interpret Technical Specifications;
- Approve submitted deliverables/reports (including property inventory reports);
- Approve invoices;
- Reject nonconforming services, materials, or equipment; and
- Maintain a file of all Contractor property acquisition and disposition documents.

The COTR is not authorized to perform the following:

- Contract Modifications that change the contract price, technical requirements or time for performance;
- Suspension or termination of the Contractor's right to proceed, either for default or for convenience of BPA;
- Final decisions on any matters subject to appeal, as provided in a disputes clause



Contract 53532

Please mail invoices with contract # to:

Bonneville Power Administration
Attn: **Fish & Wildlife Invoices / KEWB-4**
PO Box 3621
Portland, OR 97208-3621
fwinvoices@bpa.gov

We now have a central mailbox to use for invoices. It is located at fwinvoices@bpa.gov. All invoices should be submitted in PDF format. Please put the following information in the email subject line: entity/contract number/invoice performance period/invoice #/invoice amt. when mailing future invoices. A separate email is required for each invoice.

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TERMS AND CONDITIONS

UNIT 1 — SCHEDULE

CONTRACT TYPE (7-1) (SEP 98)(BPI 7.10)

This is a time and materials type contract.

PERFORMANCE PERIOD (7-7) (SEP 98)(BPI 7.2.7.1)

This is a one year contract with a performance period of 5/9/2011 through 5/8/2012.

LIMITATION ON TRAVEL COSTS (22-50) (SEP 10)

Costs incurred for lodging, meals, and incidental expenses shall be reimbursed on an actual cost basis to the extent that they do not exceed, on a daily basis, the per diem rates in effect at the time of travel as set forth in the Federal Travel Regulation, prescribed by the General Services Administration, for travel in the conterminous 48 United States. Per Diem shall be authorized for travel in excess of 12 hours and shall not exceed 75% of the daily rate for the first and last day of official travel. Lodging and other expenses exceeding \$75.00 must be supported with receipts, which shall be submitted with the request for payment.

Airline costs will be reimbursed on an actual cost basis to the extent determined reasonable and allocable under Part 13 of the Bonneville Purchasing Instructions. Generally, airline costs will be limited to coach or economy class. Any variation from these requirements must be approved by the Contracting Officer. Contractors may request a letter from the Contracting Officer, authorizing access to an airline, lodging, or other rates negotiated for government travel to the extent such authorization is honored by the service providers.

Per Diem rates are available at: <http://www.gsa.gov/portal/category/21287>

The Federal Travel Regulations are available at: <http://www.gsa.gov/portal/content/102886>

SCHEDULE OF PRICES (22-51) (MAY 08)

The contractor shall provide services in accordance with the Statement of Work and the budget as attached.

SCIENTIFIC AND TECHNICAL INFORMATION REPORTING REQUIREMENTS (14-15) (SEP 09)(BPI 14.14.1)

(a) The contractor shall prepare scientific and technical information developed as a result of this contract in accordance with the required report format for publications. A 50 to 300 word abstract (summary) of the report must also be provided. The contractor shall coordinate with the Contracting Officer's Technical Representative (COTR) for preparation and transmittal of the electronic copy of the required deliverables and scientific and technical information data requests. Recognized electronic document interchange formats include HTML, Postscript, and PDF.

UNIT 2 — CONTRACT CLAUSES

PAYMENT AND TAXES

ELECTRONIC FUNDS TRANSFER PAYMENT (22-20) (OCT 07)(BPI 22.6.2)

- (a) Payment Method. Payments under this contract, including invoice and contract financing payments, will be made by electronic funds transfer (EFT). Contractors are required to provide its taxpayer identification number (TIN) and other necessary banking information as per paragraph (c) of this clause to receive EFT payment.
- (b) Contractor EFT arrangement with a financial institution or authorized payment agent. The Contractor shall designate to BPA, as per paragraph (c) of this clause, and maintain at its own expense, a single financial institution or authorized payment agent capable of receiving and processing EFT using the Automated Clearing House (ACH) transfer method. The most current designation and EFT information will be used for all payments under all BPA contracts, unless the BPA Vendor File Maintenance Team is notified of a change as per paragraph (d) of this clause. An initial designation should be submitted after award, but no later than three weeks before an invoice or contract financing request is submitted for payment.
- (c) Submission of EFT banking information to BPA. The Contractor shall submit EFT enrollment banking information directly to BPA Vendor File Maintenance Team, using Substitute IRS Form w9e, Request for Taxpayer Identification Number and Certification. This form is available either from the Contracting Officer(CO) or from the Vendor File Maintenance Team. Submit completed enrollment form to the Vendor Team. Contact and mailing information:
- Bonneville Power Administration
PO Box 491
ATTN: NSTS - MODW Vendor Maint.
Vancouver, WA 98666-0491
- E-mail Address: VendorMaintenance@BPA.gov
Phone: (360) 418-2800
Fax: (360) 418-8904
- (d) Change in EFT information. In the event that EFT information changes or the Contractor elects to designate a different financial institution for the receipt of any payment made using EFT procedures, the Contractor shall be responsible for providing the changed information to the BPA Vendor File Maintenance Team office. The Vendor Maintenance Team must be notified 30 days prior to the date such change is to become effective.
- (e) Suspension of Payment. BPA is not required to make any payment under this contract until receipt of the correct EFT payment information from the Contractor.
- (f) EFT and prompt payment. BPA shall pay no penalty on delay of payment resulting from defective EFT information. BPA will notify the Contractor within 7 days of its receipt of EFT information which it determines to be defective.
- (g) EFT and assignment of claims. If the Contractor assigns the proceeds of this contract as provided for in the Assignment of Claims clause of this contract, the assignee shall provide the assignee's EFT information required by paragraph (c) of this clause.

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BASIS OF PAYMENT -- TIME-AND-MATERIALS CONTRACTS (22-4) (SEP 98)(BPI 22.1.3)

BPA shall pay the Contractor as follows after submission of invoices approved by the CO. The Contractor shall be reimbursed for items and services purchased directly for the contract only when cash, checks, or other forms of actual payment have been made for such purchased items or services.

(a) Hourly Rate.

(1) The amounts shall be computed by multiplying the appropriate hourly rates prescribed in the Schedule by the number of direct labor hours performed. The rates shall include wages, indirect costs, general and administrative expense, and profit. Fractional parts of an hour shall be payable on a prorated basis. The Contractor shall substantiate invoices by evidence of actual payment and by individual daily job timecards, or other substantiation approved by the CO.

(2) Overtime. The hourly rates shall not be varied by virtue of the Contractor having performed work on an overtime basis unless the CO has specifically authorized overtime and the contract includes overtime rates.

(b) Materials. Allowable costs of direct materials shall be determined by the CO in accordance with Part 13 of the BPI in effect on the date of this contract. Reasonable and allocable material handling costs may be included in the charge for material to the extent they are clearly excluded from the hourly rate. Material handling costs are comprised of indirect costs, including, when appropriate, general and administrative expense allocated to direct materials in accordance with the Contractor's usual accounting practices, consistent with Part 13 of the BPI. Direct materials are those materials which enter directly into the end product, or which are used or consumed directly in connection with the furnishing of the end product.

(c) Travel Costs. Costs incurred for lodging, meals, and incidental expenses shall be reimbursed on an actual cost basis to the extent that they do not exceed on a daily basis the per diem rates in effect at the time of travel as set forth in the Federal Travel Regulations, prescribed by the General Services Administration, for travel in the conterminous 48 United States. Airline costs will be reimbursed on an actual cost basis to the extent determined reasonable and allocable under Part 13 of the BPI. The CO must approve any variation from these requirements. Contractors may request a letter from the Contracting Officer authorizing access to lodging, or other rates negotiated for government travel to the extent such authorization is honored by the service providers.

(d) Subcontracts. The cost of subcontracts that are authorized under the subcontracts clause of this contract shall be reimbursable costs under this clause, if such costs are consistent with Part 13 of the BPI. Reimbursable costs in connection with subcontracts shall be limited to the amounts paid to the subcontractor. Reimbursable costs shall not include any costs arising from the letting, administration or supervision of performance of the subcontract, if the costs are included in the hourly rates in the Schedule.

(e) Responsibility to obtain best overall price. To the extent able, the Contractor shall--

(1) Obtain materials, subcontracts, and travel at the most advantageous prices available with due regard to securing prompt delivery of satisfactory products and services; and

(2) Take all cash and trade discounts, rebates, allowances, credits, salvage, commissions, and other benefits and additionally, give credit to BPA for any amounts that have accrued to the benefit of the Contractor or would have accrued except for the fault or neglect of the contractor. When unable to take advantage of the benefits, the Contractor shall promptly notify the CO and give the reasons.

(f) Material the Contractor regularly sells to the public. If the nature of the work to be performed requires the Contractor to furnish material which is regularly sold to the general public in the normal course of business by the Contractor, the price to be paid for such material, notwithstanding (e)(1) above, shall be on the basis of an

TERMS AND CONDITIONS

established catalog or list price, in effect when the material is furnished, less all applicable discounts to BPA; provided, that in no event shall such price be in excess of the Contractor's sales price to its most favored customer for the same item in like quantity, or the current market price, whichever is lower.

- (g) Audit. At any time before final payment under this contract the CO may audit the invoices and substantiating material. Each payment previously made shall be subject to reduction to the extent of amounts, on preceding invoices, that are found by the CO not to have been properly payable and shall also be subject to reduction for overpayments or to increase for underpayments. Upon receipt and approval of the invoice designated by the Contractor as the "final invoice" and substantiating material, and upon compliance by the Contractor with all terms of this contract, BPA shall promptly pay any balance due the Contractor.
- (h) Refunds. The Contractor agrees that any refunds, rebates, or credits (including any related interest) accruing to or received by the Contractor or any assignee, that arise under the materials portion of this contract and for which the Contractor has received reimbursement, shall be paid by the Contractor to BPA. The Contractor and each assignee shall assign to BPA all such refunds, rebates, or credits (including any interest) in form and substance satisfactory to the CO.

PAYMENT (22-12) (MAY 11)(BPI 22.2.5)

- (a) Payment Due Date. Payment (including partial payments or progress payments, if authorized, shall be due not later than thirty (30) calendar days after the later of the date on which BPA actually receives a proper invoice in the designated billing office or the date when the items delivered or completed services are accepted by BPA. According to the Prompt Payment Act, a proper invoice to a Federal Agency is to include bank account information requisite to enable Electronic Funds Transfer (EFT) as method of payment. For purposes of payment only, items will be deemed accepted not later than seven (7) calendar days after proper delivery. If delivered items or completed services are found defective, the provisions of this paragraph will be reapplied upon receipt of a corrected item or service.
- (b) Billing Instructions.
 - (1) Invoices must include the contractor's name and address, invoice date, contract number, task order number (if applicable), contract line item number, description of products delivered or work performed, price and quantity of item(s) actually delivered or rendered (amounts billed for work performed under a task order must be separately identified by task order number), and the name and address of the person to whom payment will be made, and name (where practicable), title, phone number, mailing address of person to be notified in event of a defective invoice and bank account information required to enable Electronic Funds Transfer (EFT) as method of payment (Invoices will not require banking information if the contractor has that information on file at BPA). Failure to submit a proper invoice may result in a delay in payment including a rejection of invoice pending receipt of a properly amended invoice.
 - (2) Contractors may bill monthly, or at more frequent intervals as may be agreed to by the CO. The contractor may submit invoices electronically (e-mail, fax, etc.).
- (c) Payment Method. Payments under this contract will be made by electronic funds transfer whenever possible, or by check in very limited circumstances, at the option of BPA.
- (d) Prompt Payment Act. This contract is subject to the provisions of the Prompt Payment Act (31 U.S.C. 3901 et seq.), and regulations at 5 CFR Part 1315.
- (e) Interest Penalty Payments. If interest penalty payments are determined due under the provisions of the Prompt Payment Act, payment shall be made at the rates determined by the U.S. Treasury Section 12 of the Contract Disputes Act of 1978 (41 U.S.C. 611).

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CONTRACT CEILING LIMITATION (22-7) (SEP 98)(BPI 22.1.3)

- (a) The Contractor agrees to use its best efforts to perform the work specified in the Schedule and all obligations under this contract within the contract ceiling. The contract ceiling includes all estimated costs (both direct and indirect) and any fee allowance. If this is a cost-sharing contract, the contract ceiling includes both BPA's and the Contractor's share of the cost.
- (b) Notification of CO. The Contractor shall notify the CO in writing at the first indication that the total cost for the performance of this contract, exclusive of any fee, will be either greater or substantially less than had been previously estimated.
- (c) Revised Estimate. As part of the notification, the Contractor shall provide the CO a revised estimate of the total cost of performing this contract.
- (d) Contract Ceiling.
 - (1) BPA is not obligated to reimburse the Contractor for costs incurred in excess of the contract ceiling specified in the Schedule or, if this is a cost-sharing contract, the estimated cost to BPA specified in the Schedule; and
 - (2) The Contractor is not obligated to continue performance under this contract (including actions under the Termination clause of this contract) or otherwise incur costs in excess of the contract ceiling specified in the Schedule, until the CO notifies the Contractor in writing that the contract ceiling has been increased.
- (e) No notice, communication, or representation, or from any person other than the CO, shall affect this contract's contract ceiling.
- (f) If this contract is terminated or the contract ceiling is not increased, BPA and the Contractor shall negotiate an equitable distribution of all property produced or purchased under the contract, based upon the share of costs incurred by each.

FEDERAL, STATE, AND LOCAL TAXES (22-15) (SEP 98)(BPI 22.5.3.4)

- (a) The contract price shall include all applicable Federal, State, and local taxes and duties.
- (b) The contract price shall be increased by the amount of any after-imposed Federal excise tax or duty, provided the Contractor warrants in writing that no amount for such newly imposed Federal excise tax or duty or rate increase was included in the contract price.
- (c) The contract price shall be decreased by the amount of any after-relieved Federal excise tax or duty.
- (d) The contract price shall be decreased by the amount of any Federal excise tax or duty, except social security or other employment taxes, that the Contractor is required to pay or bear, or does not obtain a refund of, through the Contractor's fault, negligence, or failure to follow instructions of the CO.
- (e) No adjustment shall be made in the contract price under this clause unless the amount of the adjustment exceeds \$250.
- (f) Notwithstanding any of the above provisions for adjustment of the contract price in the event of a change in a Federal excise tax or duty after the contract date, no increase in the contract price shall be made for any duty imposed under the Tariff Act of 1930, as amended, (19 U.S.C. 1303) or the Anti-dumping Act of 1921, as amended (19 U.S.C. 160-171).

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INTEREST ON AMOUNTS DUE BPA (22-13) (SEP 98)(BPI 22.3.1)

- (a) Notwithstanding any other clause of this contract, all amounts that become payable by the Contractor to BPA under this contract (net of any applicable tax credit under the Internal Revenue Code (26°U.S.C.°1481)) shall bear simple interest from the date due until paid unless paid within 30 days of becoming due. The interest rate shall be the interest rate established by the Secretary of the Treasury as provided in Section 12 of the Contract Disputes Act of 1978 (Public Law 95-563), which is applicable to the period in which the amount becomes due, as provided in paragraph (b) of this clause, and then at the rate applicable for each six month period as fixed by the Secretary until the amount is paid.
- (b) Amounts shall be due at the earliest of the following dates:
- (1) The date fixed under this contract;
 - (2) The date of the first written demand for payment consistent with this contract, including any demand resulting from a default termination;
 - (3) The date BPA transmits to the Contractor a proposed supplemental agreement to confirm completed negotiations establishing the amount of debt; and
 - (4) If this contract provides for revision of prices, the date of written notice to the Contractor stating the amount of refund payable in connection with a pricing proposal or a negotiated pricing agreement not confirmed by contract modification;
- (c) Payment will be due within 30 days of the date of the invoice. The collection actions available under the Debt Collection Act of 1982 (Public Law 97-365), as amended, and the revised Federal Claims Collections Standards (4 CFR 102), will be utilized. Administrative charges and penalties will be charged in accordance with 31 USC 3717, except where prohibited or explicitly provided for by statute or regulation required by statute.

GENERAL CONTRACT ADMINISTRATION

APPLICABLE REGULATIONS (1-1) (NOV 08)(BPI 1.3.1)

Purchases made by the Bonneville Power Administration are subject to the policies and procedures outlined in the Bonneville Purchasing Instructions. The BPI is available without charge on the Internet at <http://www.bpa.gov>. Copies are available for purchase from the Head of the Contracting Activity. The public may purchase unbound copies of the BPI from the Head of the Contracting Activity – DGP-7, Bonneville Power Administration, P.O. Box 3621, Portland, Oregon 97208. The cost is \$30.00. Subscriptions are not available.

TERMS AND CONDITIONS

SUBCONTRACTS (14-7) (SEP 98)(BPI 14.9.1)

The Contractor shall not subcontract any work without prior approval of the Contracting Officer, except work specifically agreed upon at the time of award. BPA reserves the right to approve specific subcontractors for work considered to be particularly sensitive. Consent to subcontract any portion of the contract shall not relieve the contractor of any responsibility under the contract.

CONTRACT ADMINISTRATION REPRESENTATIVES (14-2) (SEP 98)(BPI 14.3.2)

- (a) In the administration of this contract, the Contracting Officer may be represented by one or more of the following: Contracting Officer's Representative for administrative matters, and Contracting Officer's Technical Representative, Receiving Inspector, and/or Field Inspector for technical matters.
- (b) These representatives are authorized to act on behalf of the Contracting Officer in all matters pertaining to the contract, except: (1) contract modifications that change the contract price, technical requirements or time for performance, unless delegated field modification authority (see clause 24-25); (2) suspension or termination of the Contractor's right to proceed, either for default or for convenience of BPA; and (3) final decisions on any matters subject to appeal, as provided in a disputes clause. In addition, Field Inspectors may not make final acceptance under the contract.

STOP WORK ORDER (14-14) (SEP 98)(BPI 14.12.1)

- (a) The Contracting Officer may order the Contractor to suspend all or any part of the work of this contract for the period of time that the Contracting Officer determines appropriate for the convenience of BPA.
- (b) The contractor shall immediately comply with the Contracting Officer's order and take all reasonable steps to minimize the incurrence of costs allocable to the work covered by the order.
- (c) If a stop work order is issued for the convenience of BPA, the Contracting Officer shall make an equitable adjustment in the delivery schedule or contract price, or both, if the order results in a change in the time required for, or the costs properly allocable to, the performance of any part of this contract.
- (d) A claim under this clause shall not be allowed (1) for any cost incurred more than 20 days before the Contractor notified the Contracting Officer of the basis of the claim in writing, and (2) unless the claim stating the amount of time or money requested, is asserted in writing as soon as practicable after the termination of the delay or interruption, but not later than the day of final payment under the contract.

CHANGES - TIME-AND-MATERIALS (14-10) (SEP 98)(BPI 14.10.5.1.1)

- (a) The Contracting Officer may at any time, by written order, and without notice to the sureties, if any, make changes within the general scope of this contract to any one or more of the following:
 - (1) Drawings, designs, or specifications when the supplies to be furnished are to be specially manufactured for BPA in accordance with the drawings, designs, or specifications.
 - (2) Method of shipment or packing.
 - (3) Place of delivery or performance.
 - (4) Description of services to be performed.

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- (5) Time of performance (i.e., hours of the day, days of the week, etc.).
- (6) BPA-furnished property.
- (7) Place of inspection or acceptance.
- (b) If any change causes an increase or decrease in any hourly rate, the ceiling price, or the time required for performance of any part of the work under this contract, whether or not changed by the order, the Contracting Officer shall make an equitable adjustment in the (1) ceiling price, (2) hourly rates, (3) delivery schedule, and (4) other affected terms, and shall modify the contract accordingly.
- (c) The Contractor must assert its right to an adjustment under this clause within 30 days from the date of receipt of the written order, but not later than final payment.
- (d) Failure to agree to any adjustment shall be a dispute under a disputes clause, if one is included in this contract. However, nothing in this clause shall excuse the Contractor from proceeding with the contract as changed.
- (e) Notwithstanding the terms and conditions of paragraphs (a) and (b) above, the estimated cost of this contract and, if this contract is incrementally funded, the funds allotted for the performance of this contract, shall not be increased or considered to be increased except by specific written modification of the contract indicating the revised contract estimated cost and, if this contract is incrementally funded, the additional amount allotted to the contract. Until this modification is made, the Contractor shall not be obligated to continue performance or incur costs beyond the point established in the Contract Ceiling Limitation clause of this contract.
- (f) Notwithstanding other provisions herein, only the Contracting Officer, or persons specifically delegated authority to do so by the Contracting Officer, are authorized to orally modify or affect the terms of this contract. Contractor response to oral direction from any other source is at its own risk of liability.

PRICING OF ADJUSTMENTS (14-12) (SEP 98)(BPI 14.10.5.1.1)

When costs are a factor in any determination of a contract price adjustment pursuant to the Changes clause or any other modification in connection with this contract, such costs shall be in accordance with the contract cost principles and procedures in Part 13 of the Bonneville Purchasing Instructions which are in effect on the date of this contract.

EXAMINATION OF RECORDS (12-3) (SEP 98)(BPI 12.8.8.1)

- (a) The contractor shall keep accurate and complete accounting records in support of all cost-based billings to BPA in accordance with generally accepted accounting principles and practices. The Comptroller General of the United States, the Contracting Officer, or their representatives, shall have the right to examine, audit, and reproduce any of the Contractor's pertinent records involving transactions related to this contract or any subcontract hereunder. Records includes, but is not limited to, books, documents, and other information regardless of form (e.g., machine readable data) or type (e.g. data bases, applications software, data base management software, utilities, etc.) including computations and projections related to proposing, negotiating, pricing, subcontracting, modifying or performing the contract. The purpose of such examination shall be to determine the accuracy, completeness, and currency of costs charged under the contract and/or to verify cost or pricing information submitted to BPA.
- (b) Such documents shall be available for three (3) years after final payment or, in the case of termination, three (3) years from the date of any final termination settlement. Records relating to appeals under the Disputes

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clause or to litigation or the settlement of claims arising under or relating to this contract shall be made available until such appeals, litigation, or claims have been disposed of.

- (c) The contractor shall insert a clause containing all the terms of this clause, including this paragraph (c), in other than fixed price subcontracts over \$100,000, altering the clause as necessary to identify the contracting parties and the Contracting Officer under the prime contract.

ORDER OF PRECEDENCE (14-3) (SEP 98)(BPI 14.4.1.1)

Any inconsistency in this solicitation or contract shall be resolved by giving precedence in the following order: (a) the Schedule (excluding the specifications or statement of work); (b) contract clauses; (c) the specifications or statement of work; and (d) other documents, exhibits, and attachments.

BANKRUPTCY (14-18) (OCT 05)(BPI 14.19.1)

In the event the Contractor enters into proceedings relating to bankruptcy, whether voluntary or involuntary, the Contractor agrees to furnish written notification of the bankruptcy to the Contracting Officer responsible for administering the contract. This notification shall be furnished within five days of the initiation of the proceedings relating to bankruptcy filing. This notification shall include the date on which the bankruptcy petition was filed, the identify of the court in which the bankruptcy petition was filed, and a listing of Government contract numbers and contracting officers for all Government contracts against final payment has not been made. This obligation remains in effect until final payment under this contract.

PUBLICATION/PRESENTATIONS (25-8) (SEP 04)(BPI 25.2.1)

All news releases, presentations, publications, or signage and related materials shall acknowledge BPA support for project activities. BPA strongly endorses the publication of project results in scientific journals to facilitate public access and to preserve project data. Copies of news articles, publications, etc. shall be provided to the COTR. When appropriate, Project Managers shall prepare manuscripts for submission to journal editors, giving due credit for BPA's financial support. BPA reserves the right to publish all or part of the reports submitted pursuant to the terms of this contract.

ENDANGERED SPECIES ACT REQUIREMENTS (25-9) (SEP 98)(BPI 25.2.1)

- (a) To the extent requested by BPA, the contractor-agency shall:
- (1) Participate in consultations and conferences conducted under Section 7 of the Endangered Species Act (ESA);
 - (2) Obtain, or assist BPA in obtaining permits under Section 10 of the ESA, and
 - (3) Provide to BPA all information, materials, documents, records and other assistance requested by BPA for such consultations, conferences, or the acquisition of permits.
- (b) The contractor-agency shall not proceed with action/activities in this agreement until completion of requisite consultations and conferences and the acquisition of necessary permits. To the extent requested by BPA, the contractor-agency shall comply with conditions identified during consultations and conferences and with the provisions of any requisite permit.

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STANDARDS OF CONDUCT AND BUSINESS PRACTICES

ORGANIZATIONAL CONFLICTS OF INTEREST (3-2) (SEP 98)(BPI 3.4.6)

- (a) The offeror or contractor warrants that, to the best of its knowledge and belief, and except as otherwise disclosed, there are no relevant facts which could give rise to organizational conflicts of interest, as defined in BPI 3.4.1, and that the offeror or contractor has disclosed all relevant information to the Contracting Officer.
- (b) The offeror or contractor agrees that, if after award, an organizational conflict of interest with respect to this contract is discovered, an immediate and full disclosure in writing shall be made to the Contracting Officer which shall include a description of the action which the contractor has taken, or proposes to take, to avoid or mitigate such conflicts.
- (c) In the event that the contractor was aware of an organizational conflict of interest prior to the award of this contract and did not disclose the conflict to the Contracting Officer, BPA may terminate the contract for default.
- (d) The provisions of this clause shall be included in all subcontracts for work to be performed in aid of the services provided by the prime contractor, and the terms "contract," "contractor," "Contracting Officer" modified appropriately.

CERTIFICATION, DISCLOSURE, AND LIMITATION REGARDING PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (3-3) (SEP 98)(BPI 3.5.6)

- (a) As used in this clause:

"Covered Federal action" means:

- (1) The awarding of any Federal contract.
- (2) The extension, continuation, renewal, amendment, or modification of any Federal contract.

"Indian tribe" and "tribal organization" have the meaning provided in section 4 of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450B) and includes Alaskan Natives.

"Influencing or attempting to influence" means making, with the intent to influence, any communication to or appearance before an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with any covered Federal action.

"Local government" means a unit of government in a State and, if chartered, established, or otherwise recognized by a State for the performance of a governmental duty, includes a local public authority, a special district, an intrastate district, a council of governments, a sponsor group representative organization, and any other instrumentality of a local government.

"Person" means an individual, corporation, company, association, authority, firm, partnership, society, State, and local government, regardless of whether such entity is operated for profit or not for profit. This term excludes an Indian tribe, tribal organization, or any other Indian organization with respect to expenditures specifically permitted by other Federal law.

"Reasonable compensation" means, with respect to a regularly employed officer or employee of any person, compensation that is consistent with the normal compensation for such officer or employee for work that is not furnished to, not funded by, or not furnished in cooperation with the Federal Government.

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"Reasonable payment" means, with respect to professional and other technical services, a payment in an amount that is consistent with the amount normally paid for such services in the private sector.

"Recipient" includes all contractors and subcontractors. The term excludes an Indian tribe, tribal organization, or any other Indian organization with respect to expenditures specifically permitted by other Federal law.

"Regularly employed" means, with respect to an officer or employee of a person requesting or receiving a Federal contract, an officer or employee who is employed by such person for at least 130 working days within one year immediately preceding the date of the submission that initiates agency consideration of such person for receipt of such contract. An officer or employee who is employed by such person for less than 130 working days within one year immediately preceding the date of the submission that initiates agency consideration of such person shall be considered to be regularly employed as soon as he or she is employed by such person for 130 working days.

"State" means a State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, a territory or possession of the United States, an agency or instrumentality of a State, and a multi-State, regional, or interstate entity having governmental duties and powers.

(b) The offeror, by signing its offer, hereby certifies to the best of his or her knowledge and belief that:

- (1) No Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress on his or her behalf in connection with the awarding of any Federal contract or the extension, continuation, renewal, amendment, or modification of any Federal contract.
- (2) If any funds other than Federal appropriated funds (including profit or fee received under a covered Federal transaction) have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress on his or her behalf in connection with this solicitation, the offeror shall complete and submit, with its offer, Standard Form-LLL, Disclosure of Lobbying Activities, to the Contracting Officer.
- (3) He or she will include the language of this certification in all subcontract awards at any tier and that all sub-recipients of subcontract awards in excess of \$100,000 shall certify and disclose accordingly.

(c) Submission of this certification and disclosure is a prerequisite for making or entering into this contract imposed by section 1352, title 31, U.S. Code. Any person who makes an expenditure prohibited under this provision or who fails to file or amend the disclosure form to be filed or amended by this provision, shall be subject to a civil penalty of not less than \$10, 000 and not more than \$100,000 for each such failure.

(d) A contractor who requests or receives from an agency a Federal contract shall file with that agency a disclosure form, OMB standard form LLL, Disclosure of Lobbying Activities, if such person has made or has agreed to make any payment using non appropriated funds (to include profits from any covered Federal action), which would be prohibited under this clause if paid for with appropriated funds.

(e) The contractor shall file a disclosure form at the end of each calendar quarter in which there occurs any event that materially affects the accuracy of the information contained in any disclosure form previously filed by such person under paragraph (b) of this clause. An event that materially affects the accuracy of the information reported includes--

- (1) A cumulative increase of \$25,000 or more in the amount paid or expected to be paid for influencing or attempting to influence a covered Federal action; or
- (2) A change in the person(s) or individual(s) influencing or attempting to influence a covered Federal action;
or

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- (3) A change in the officer(s), employee(s), or Member(s) contacted to influence or attempt to influence a covered Federal action.
- (f) The contractor shall require the submittal of a certification, and if required, a disclosure form, by any person who requests or receives any subcontract exceeding \$100,000 under the Federal contract.
- (g) All subcontractor disclosure forms (but not certifications), shall be forwarded from tier to tier until received by the prime contractor. The prime contractor shall submit all disclosure forms to the Contracting Officer at the end of the calendar quarter in which the disclosure form is submitted by the subcontractor. Each subcontractor certification shall be retained in the subcontract file of the awarding contractor.
- (h) Any person who makes an expenditure prohibited under this clause or who fails to file or amend the disclosure form to be filed or amended by this clause shall be subject to a civil penalty as provided by 31 U. S. Code 1352. An imposition of a civil penalty does not prevent the Government from seeking any other remedy that may be applicable.

CONTRACTOR POLICY TO BAN TEXT MESSAGING WHILE DRIVING (3-4) (MAY 11) (BPI 3.7.1)

- (a) Definitions. As used in this clause--

“Driving”—(1) Means operating a motor vehicle on an active roadway with the motor running, including while temporarily stationary because of traffic, a traffic light, stop sign, or otherwise. (2) Does not include operating a motor vehicle with or without the motor running when one has pulled over to the side of, or off, an active roadway and has halted in a location where one can safely remain stationary.

“Text messaging” means reading from or entering data into any handheld or other electronic device, including for the purpose of short message service texting, e-mailing, instant messaging, obtaining navigational information, or engaging in any other form of electronic data retrieval or electronic data communication. The term does not include glancing at or listening to a navigational device that is secured in a commercially designed holder affixed to the vehicle, provided that the destination and route are programmed into the device either before driving or while stopped in a location off the roadway where it is safe and legal to park.

- (b) This clause implements Executive Order 13513, Federal Leadership on Reducing Text Messaging while driving, dated October 1, 2009.
- (c) The Contractor should adopt and enforce policies that ban text messaging while driving —(1) Company-owned or -rented vehicles or Government-owned vehicles; or (2) Privately-owned vehicles when on official Government business or when performing any work for or on behalf of the Government.
- (d) Subcontracts. The Contractor shall insert the substance of this clause, including this paragraph (d), in all subcontracts that exceed \$10,000.

DRUG-FREE WORKPLACE (3-6) (SEP 98)(BPI 3.6.4)

- (a) The contractor agrees that with respect to all employees to be employed under this contract it will provide a drug-free workplace as described in this clause.
- (b) Definitions. As used in this clause "Controlled substance" means a controlled substance in schedules I through V of section 202 of the Controlled Substances Act (21 U.S.C. 812), as from time to time amended, and as further defined in regulation at 21 CFR 1308.11-1308.15, as amended.

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"Conviction" means a finding of guilt (including a plea of nolo contendere) or imposition of sentence, or both, by any judicial body charged with the responsibility to determine violations of the Federal or State criminal drug statutes.

"Criminal drug statute" means a Federal or non-Federal criminal statute involving the manufacture, distribution, dispensing, possession or use of any controlled substance.

"Drug-free workplace" means the site(s) for the performance of work done by the contractor in connection with a specific contract at which employees of the contractor are prohibited from engaging in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance.

"Employee" means an employee of a contractor directly engaged in the performance of work under a Government contract. "Directly engaged" is defined to include all direct cost employees and any other contractor employees who have other than a minimal impact or involvement in contract performance.

"Individual" means an offeror/contractor that has no more than one employee including the offeror/contractor.

- (c) The Contractor, if other than an individual, shall -- within 30 calendar days after award (unless a longer period is agreed to in writing for contracts of 30 calendar days or more performance duration); or as soon as possible for contracts of less than 30 calendar days performance duration--
- (1) Publish a statement notifying its employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the contractor's workplace and specifying the actions that will be taken against employees for violations of such prohibition;
 - (2) Establish an on-going drug-free awareness program to inform such employees about--
 - (A) The dangers of drug abuse in the workplace;
 - (B) The contractor's policy of maintaining a drug-free workplace;
 - (C) Any available drug counseling, rehabilitation, and employee assistance programs; and
 - (D) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace.
 - (3) Provide all employees engaged in performance of the contract with a copy of the statement required by subparagraph (c)(1) of this clause;
 - (4) Notify such employees in writing in the statement required by subparagraph (c)(1) of this clause that, as a condition of continued employment on this contract, the employee will--
 - (A) Abide by the terms of the statement; and
 - (B) Notify the employer in writing of the employee's conviction under a criminal drug statute for a violation occurring in the workplace no later than five (5) days after such conviction.
 - (5) Notify the Contracting Officer in writing within ten (10) days after receiving notice under subdivision (c)(4)(B) of this clause, from an employee, or otherwise receiving actual notice of such conviction. The notice shall include the position title of the employee;
 - (6) Within 30 days after receiving notice under subparagraph (c)(4)(B) of this clause of a conviction, take one of the following actions with respect to any employee who is convicted of a drug abuse violation occurring in the workplace:

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- (A) Taking appropriate personnel action against such employee, up to and including termination; and/or
 - (B) Require such employee to satisfactorily participate in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency.
- (7) Make a good faith effort to maintain a drug-free workplace through implementation of subparagraphs (c)(1) through (c)(6) of this clause.
- (d) In addition to other remedies available to the Government, the Contractor's failure to comply with the requirements of paragraph (c) of this clause may, pursuant to BPI 3.6.3 render the contractor subject to suspension of contract payments, termination of the contract for default, and suspension or debarment.

RESTRICTION ON COMMERCIAL ADVERTISING (3-9) (OCT 05) (BPI 3.8.1)

The Contractor agrees that without the Bonneville Power Administration's (BPA) prior written consent, the Contractor shall not use the names, visual representations, service marks and/or trademarks of the BPA or any of its affiliated entities, or reveal the terms and conditions, specifications, or statement of work, in any manner, including, but not limited to, in any advertising, publicity release or sales presentation. The Contractor will not state or imply that the BPA endorses a product, project or commercial line of endeavor.

SOCIO-ECONOMIC ISSUES

BUY AMERICAN ACT - SUPPLIES (9-3) (SEP 98)(BPI 9.1.6)

- (a) The Buy American Act (41 U.S. Code 10a-d) provides that the Government give preference to domestic source end products.

"Components" means those articles, materials, and supplies, which are incorporated directly into the end products.

"End products" means those articles, materials, and supplies to be acquired for public use under this contract.

"Domestic end product" means (1) an unmanufactured end product mined or produced in the United States or (2) an end product manufactured in the United States, if the cost of its components mined, produced, or manufactured in the United States exceeds 50 percent of the cost of all its components. Components of foreign origin of the same class or kind as the products referred to in (b) (2) or (3) of this clause shall be treated as domestic. Scrap generated, collected, and prepared for processing in the United States is considered domestic.

- (b) The Contractor shall deliver only domestic end products, except those
- (1) That BPA determines are not mined, produced or manufactured in the United States in sufficient and reasonably available commercial quantities of a satisfactory quality;
 - (2) For which BPA determines that domestic preference would be inconsistent with the public interest; or
 - (3) For which BPA determines the cost to be unreasonable.

(The foregoing requirements are administered in accordance with Executive Order No. 10582, as amended, and Part 9 of the BPI.)

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RESTRICTION ON CERTAIN FOREIGN PURCHASES (9-8) (MAY 11) (BPI 9.3.2)

- (a) Except as authorized by the Office of Foreign Assets Control (OFAC) in the Department of the Treasury, the Contractor shall not acquire, for use in the performance of this contract, any supplies or services if any proclamation, Executive order, or statute administered by OFAC, or if OFAC's implementing regulations at 31 CFR Chapter V, would prohibit such a transaction by a person subject to the jurisdiction of the United States.
- (b) Except as authorized by OFAC, most transactions involving Cuba, Iran, and Sudan are prohibited, as are most imports from Burma or North Korea, into the United States or its outlying areas. Lists of entities and individuals subject to economic sanctions are included in OFAC's List of Specially Designated Nationals and Blocked Persons at <http://www.treas.gov/offices/enforcement/ofac/sdn>. More information about these restrictions, as well as updates, is available in the OFAC's regulations at 31 CFR Chapter V and/or on OFAC's website at <http://www.treas.gov/offices/enforcement/ofac>.
- (c) The Contractor shall insert this clause, including this paragraph (c), in all subcontracts.

NONDISCRIMINATION AND AFFIRMATIVE ACTION (10-1) (APR 09)(BPI 10.2.1)

- (a) The Contractor shall not discriminate against its employees or applicants because of their race, color, religion, sex, national origin, age, status as Disabled or Vietnam Veterans, or physical or mental handicaps. The Contractor certifies that it does not, and will not, maintain segregated facilities or accommodations on the basis of race, color, religion or national origin. Regarding any position for which an employee or an applicant is qualified, the Contractor agrees to take affirmative action to employ, train, advance in employment and retain individuals in accordance with applicable laws and regulations including:
 - (1) For nondiscrimination based on race, color, religion, sex or national origin this includes, but is not limited to, the U. S. Constitution, and Parts II and IV of Executive Order 11246, September 24, 1965 (30 Fed. Reg. 12319). Contractor disputes related to compliance with its obligations shall be handled according to the rules, regulations and relevant orders of the Secretary of Labor (See 41 CFR 60).
 - (2) For nondiscrimination based on Disabled or Vietnam Veterans this includes, but is not limited to, the Vietnam Era Veterans Readjustment Assistance Act of 1974, as amended (38 U.S.C. 4012); Executive Order 11701, January 24, 1973 (38 CFR 2675); and the regulations of the Secretary of Labor (41 CFR Part 60-250).
 - (3) For nondiscrimination based on the Handicapped this includes, but is not limited to, Section 503 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 793); Executive Order 11758, January 15, 1974; and the regulations of the Secretary of Labor (41 CFR Part 60-741).
 - (4) For nondiscrimination based on Age this includes, but is not limited to, Executive Order 11141, February 12, 1964 (29 CFR 2477).
- (b) The Contractor shall include the terms of this clause in every subcontract or purchase order exceeding \$50,000 and shall act as specified by the Department of Labor to enforce the terms and implement remedies.

NOTIFICATION OF EMPLOYEE RIGHTS UNDER THE NATIONAL LABOR RELATIONS ACT (10-6) (DEC 10) (BPI 10.3.1)

- (a) During the term of this contract, the Contractor shall post a notice, of such size and in such form, and containing such content as prescribed by the Secretary of Labor, in conspicuous places, in and about its plants and offices where employees covered by the National Labor Relations Act engage in activities relating to the performance of the contract, including all places where notices to employees are customarily posted

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both physically and electronically, in the languages employees speak, in accordance with 29 CFR 471.2 (d) and (f).

- (1) Physical posting of the employee notice shall be in conspicuous' places in and about the Contractor's plants and offices so that the notice is prominent and readily seen by employees who are covered by the National Labor Relations Act and engage in activities related to the performance of the contract.
- (2) If the Contractor customarily posts notices to employees electronically, then the Contractor shall also post the required notice electronically by displaying prominently, on any website that is maintained by the Contractor and is customarily used for notices to employees about terms and conditions of employment, a link to the Department of labor's website that contains the full text of the poster. The link to the Department's website, as referenced 'in (b)(3) of this section, must read, "Important Notice about Employee Rights to Organize and Bargain Collectively with Their Employers."

(b) This required notice, printed by the Department of Labor, can be:

- (1) Obtained from the Division of Interpretations and Standards, Office of Labor-Management Standards, U.S. Department of Labor, 200 Constitution Avenue, NW, Room N-5609, Washington, DC 20210, (202) 693-0123, or from any field office or the Office of Labor-Management Standards or Office of Federal Contract Compliance Programs; or
- (2) Provided by the Federal contracting agency, if requested; or
- (3) Downloaded from the Office of Labor-Management Standards web site at:

www.dol.gov/olms/regs/compliance/EO13496.htm; or

- (4) Reproduced and used as exact duplicate copies of the Department of Labor's official poster.

- (c) The required text of the Employee Notification referred to in this clause is located at Appendix A, Subpart A, 29 CFR Part 471.
- (d) The Contractor shall comply with all provisions of the Employee Notice and related rules, regulations, and orders of the Secretary of Labor.
- (e) In the event that the Contractor does not comply with the requirements set forth in paragraphs (a)-(d) of this clause, this contract may be terminated or suspended in whole or in part, and the Contractor may be suspended or debarred in accordance with 29 CFR 471.14. Such other sanctions or remedies may be imposed as are provided by 29 CFR Part 471, which implements E.O. 13496 or as otherwise provided by law.

(f) Subcontracts

- (1) The Contractor shall include the substance of the provisions of paragraphs (a)-(f) of this clause in every subcontract that exceeds \$10,000 unless exempted by the rules, regulations, or orders of the Secretary of Labor issued pursuant to section 3 of Executive Order 13496 of January 30, 2009, so that such provisions will be binding upon each subcontractor.
- (2) The Contractor and subcontractor are not permitted to procure supplies or services in a way designed to avoid the applicability of Executive Order 13496 or this subpart.
- (3) The Contractor shall take such action with respect to any such subcontract as may be directed by the Secretary of Labor as a means of enforcing such provisions, including the imposition of sanctions for non compliance.

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- (4) However, if the Contractor becomes involved in litigation with a subcontractor, or is threatened with such involvement, as a result of such direction, the Contractor may request the United States, through the Secretary of Labor, to enter into such litigation to protect the interests of the United States.

EMPLOYMENT ELIGIBILITY VERIFICATION (10-18) (MAR 09) (BPI 10.6.2)

(a) E-Verify enrollment and verification requirements.

- (1) If the Contractor is not enrolled as a Federal Contractor in E-Verify at the time of the contract award, the Contractor shall:

- (A) *Enroll.* Enroll as a Federal Contractor in the E-Verify program within 30 calendar days of contract award;
- (B) *Verify all new employees.* Within 90 calendar days of enrollment in the E-Verify program, begin to use E-Verify to initiate verification of employment eligibility of all new hires of the Contractor, who are working in the United States, whether or not assigned to the contract, within 3 business days after the date of hire (but see paragraph (a) (3) of this section); and
- (C) *Verify employees assigned to the contract.* For each employee assigned to the contract, initiate verification within 90 calendar days after date of enrollment or within 30 calendar days of the employee's assignment to the contract, whichever date is later (but see paragraph (a)(4) of this section).

- (2) If the Contractor is enrolled as a Federal Contractor in E-Verify at time of contract award, the Contractor shall use E-Verify to initiate verification of employment eligibility of—

(A) All new employees.

- (i) *Enrolled 90 calendar days or more.* The Contractor shall initiate verification of all new hires of the Contractor, who are working in the United States, whether or not assigned to the contract within 3 business days after the date of hire (but see paragraph (a)(3) of this section); or
- (ii) *Enrolled less than 90 calendar days.* Within 90 calendar days after enrollment as a Federal Contractor in E-Verify, the Contractor shall initiate verification of all new hires of the Contractor, who are working in the United States, whether or not assigned to the contract, within 3 business days after the date of hire (but see paragraph(3) of this section); or

- (B) Employees assigned to the contract. For each employee assigned to the contract, the Contractor shall initiate verification within 90 calendar days after date of contract award or within 30 days after assignment to the contract, whichever date is later (but see paragraph (4) of this section).

- (3) If the Contractor is an institution of higher education; a state or local government, or the government of a federally recognized Indian tribe; or a surety performing under a takeover agreement entered into with a federal agency pursuant to a performance bond, the Contractor may choose to verify only employees assigned to the contract. The Contractor shall follow the applicable verification requirements at (a)(1) or (a)(2), respectively, except that any requirement for verification of new employees applies only to new employees assigned to the contract.

- (4) Option to verify employment eligibility of all employees. The Contractor may elect to verify all existing employees hired after November 6, 1986, rather than just those employees assigned to the contract. The Contractor shall initiate verification for each existing employee working in the United States who was hired after November 6, 1986, within 180 calendar days of—

TERMS AND CONDITIONS

- (A) Enrollment in the E-Verify program; or
 - (B) Notification to E-Verify Operations of the Contractor's decision to exercise this option, using the contact information provided in the E-Verify program Memorandum of Understanding (MOU).
- (5) The Contractor shall comply, for the period of performance of this contract, with the requirement of the E-Verify program MOU.
- (A) The Department of Homeland Security (DHS) or the Social Security Administration (SSA) may terminate the Contractor's MOU and deny access to the E-Verify system in accordance with the terms of the MOU. In such case, the Contractor will be referred to a suspension or debarment official.
 - (B) During the period between termination of the MOU and a decision by the suspension or debarment official whether to suspend or debar, the Contractor is excused from its obligations under paragraph (b) of this clause. If the suspension or debarment official determines not to suspend or debar the Contractor, then the Contractor must reenroll in E-Verify.
- (b) Web site. Information on registration for and use of the E-Verify program can be obtained via the Internet at the Department of Homeland Security Web site: <http://www.dhs.gov/E-Verify>.
- (c) Individuals previously verified. The Contractor is not required by this clause to perform additional employment verification using E-Verify for any employee—
- (1) Whose employment eligibility was previously verified by the Contractor through the E-Verify program;
 - (2) Who has been granted and holds an active U.S. Government security clearance for access to confidential, secret, or top secret information in accordance with the National Industrial Security Program Operating Manual; or
 - (3) Who has undergone a completed background investigation and been issued credentials pursuant to Homeland Security Presidential Directive (HSPD) -12, Policy for a Common Identification Standard for Federal Employees and Contractors.
- (d) *Subcontracts*. The contractor shall include the requirements of this clause, including this paragraph (d) (appropriately modified for identification of the parties), in each subcontract that—
- (1) Is for:
 - (A) Services other than commercial services that are part of the purchase of a commercial-of-the-shelf (COTS) item, performed by the COTS provider and are normally provided for that COTS item;
 - (B) Construction.
 - (2) Has a value of more than \$3,000; and
 - (3) Includes work performed in the United States.

TERMS AND CONDITIONS

ENVIRONMENT AND SAFETY

SAFETY AND HEALTH – NON-ELECTRICAL CONTRACTOR(S) (15-55) (MAR 11)(BPI 15.2.1)

(a) General

- (1) The Contractor shall assure that no person employed on this contract works in surroundings or under conditions that are unsanitary, hazardous, or dangerous to their health or safety. In fulfilling these requirements, the Contractor shall comply with:
 - (A) Department of Labor Safety and Health Standards for Construction under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3701 et seq.).
 - (B) Occupational Safety and Health Act of 1970, (Public Law 91-598) and applicable rules and regulations as may have been delegated to the States.
 - (C) All Federal and state safety and health rules and regulations applicable to the contract work, as supplemented by BPA safety and health requirements stated below or elsewhere in the contract.
- (2) If there are conflicts between any of the requirements referenced in this contract, the more stringent requirement will prevail.
- (3) If the Contractor fails or refuses to promptly comply with any safety or health requirement, the Contracting Officer's Technical Representative (COTR) may notify the Contractor of any noncompliance and the Contractor shall take immediate corrective action. Such notice, whether oral or written, when served on the Contractor or any of its employees at the site of the work shall be deemed sufficient. If the Contractor fails or refuses to promptly correct the condition, the COTR may stop all or any portion of the work. When satisfactory corrective action has been taken, the Contractor shall request permission to resume work from the COTR. When all work on a contract has been suspended for a Safety and Health violation, accident, or incident by the Contracting Officer (CO), the Contractor shall meet with representatives of BPA's Contracting Office, and the BPA Safety Office to present a written statement outlining specific changes in work procedures that the contractor will make in order for work to safely resume. BPA must be satisfied that the Contractor is capable of completing the contract in a safe manner before allowing work to resume. No time extension or additional costs, resulting from the directive to stop work shall be allowed. Failure of the COTR to provide notice of noncompliance or to stop work shall not relieve the Contractor of its responsibility for the safe performance of the work.
- (4) The Contractor shall maintain an accurate record of, and shall immediately report to the COTR in the manner prescribed by the latter, all cases of death, occupational diseases, and injury arising from, or incident to, performance of work under this contract. The record and report shall include a description of the preventative measures to be taken to avoid recurrence, any restitution or settlement made, or the status thereof. The Contractor shall complete and file with the COTR, BPA form 6410.15e (Contractor's Report of Personal Injury, Illness, or Property Damage Accident) within five (5) working days of such an occurrence. In the case of a Near Miss Incident that does not involve injury, illness, or property damage, the Contractor shall complete and file with the COTR, BPA Form 6410.18e (Contractors Report of Incident/Near Miss) within five (5) working days of such an occurrence.
- (5) In case of an injury, the Contractor shall have 30 days to make full restitution or settlement. If the Contractor fails to make full restitution or settlement within 30 days, BPA may:
 - (A) Make, or cause to be made, the required remedial action or cash settlement to the person or persons who have been injured, and

TERMS AND CONDITIONS

(B) Charge to the Contractor's account an equitable amount, not to exceed \$2,500, for any injury claim. More than one such payment, and charge, can be assessed if more than one injury has occurred.

- (6) The Contractor bears sole responsibility for ensuring that all personnel engaged in work related to the contract possess the necessary knowledge and skills to perform their work safely and to otherwise function in compliance with the foregoing criteria. (See also the Material and Workmanship clause)
- (7) The Contractor shall hold BPA harmless from any and all suits, actions, and claims for injuries to or death of persons arising from any act or omission of the Contractor, its subcontractors, or any employee of the Contractor or subcontractors, in any way related to the work or operations under this contract.
- (8) The Contractor shall indemnify and hold harmless the property owners or parties lawfully in possession against all claims or liabilities asserted by third parties, including all governmental agencies, resulting directly or indirectly from the Contractor's wrongful or negligent acts or omissions.
- (9) Nothing stated herein shall be construed to be a limitation on the Contractor's liability. The rights and remedies of BPA provided in this clause are in addition to any other rights and remedies provided by law or under this contract.

(b) Personal Protective Equipment

- (1) The Contractor shall furnish non-conductive hard hats and all other required safety and personal protective equipment, except that which has been specified to be furnished by BPA. All persons on all construction projects shall wear non- conductive hard hats meeting the requirements of OSHA/ANSI. Contract employees shall not wear yellow non- conductive hard hats. (A yellow hat signifies a qualified BPA electrical worker.) Only a BPA approved safety watcher may wear orange non-conductive hard hats.
- (2) Appropriate footwear that provides adequate support and protection to the foot, toes and ankles for the work being performed shall be worn. Lace-up, over the ankle boots with rigid sole and heel meeting ASTM F 2413-05, Class 75 with EH rating shall be worn in all work areas where hard hats are required and other areas as determined by a supervisor. Supervisors have the responsibility for assuring that appropriate footwear is worn. Employees have the responsibility to wear appropriate footwear for the job.
- (3) While BPA's minimum qualifications for protective footwear are identified above, specialized footwear, in accordance with standard industry practice and appropriate for the work being performed, shall be worn at all times while executing the work tasks requiring specialized Personal Protective Equipment (PPE). Supervisors and employees have the responsibility of ensuring appropriate footwear is worn.

BONDS AND INSURANCE

INSURANCE (16-2) (MAY 11)(BPI 16.3.3)

- (a) Before commencing work under this contract, the Contractor shall provide to the Contracting Officer certificates of insurance from the insurance company, or an authorized insurance agent, stating the required insurance has been obtained and is in force. The certificate(s) shall identify the Contractor and name BPA as the certificate holder as follows:

Bonneville Power Administration

Attention: Contracting Officer – **Kristi Van Leuven, Mail Stop NSSP-4, Portland, OR 97208**

The certificate shall also identify the contract number(s) for which coverage is provided, and shall contain a statement that the insurer will endeavor to give notice of cancellation or any material change to the certificate holder at least 30 days before the effective date.

TERMS AND CONDITIONS

- (b) Throughout the period of the contract the Contractor shall deliver a new certificate of insurance to the Contracting Officer within 10 business days of existing policy expiration, changes, and/or changes in insurance providers. If the Contractor's insurance does not cover the subcontractors involved in the work, the Contractor shall provide the Contracting Officer with certificates of insurance stating that the required insurance has been obtained by the subcontractors.
- (c) The Contractor may, with the approval of the Contracting Officer, maintain a self-insurance program; provided that, with respect to workers' compensation, the Contractor is qualified pursuant to statutory authority.
- (d) The following minimum kinds and amounts of insurance are applicable in the performance of the work under this contract. All insurance required by this paragraph shall be in a form and amount and for those periods as the Contracting Officer may require or approve and with insurers approved by the Contracting Officer.
 - (1) **Workers' compensation and employer's liability.** Contractors are required to comply with applicable Federal and State workers' compensation and occupational disease statutes. Employer's liability coverage of at least \$1,000,000 shall be required. BPA may require Contractors who are individuals (whether incorporated or not) to carry workers' compensation to protect agency interests. The Contracting Officer shall advise the Contractor regarding specific requirements.
 - (2) **Commercial General liability.** The contractor shall provide commercial general liability insurance (CGL) of at least \$1,000,000 per occurrence. Any policy aggregate limits which apply shall be modified to apply to each location and project. The policy shall name BPA, its officials, officers, employees and agents, as additional insureds with respect to the contractor's performance of services under the contract. The contractor's policy shall be primary and shall not seek any contribution from any insurance or self-insurance programs of BPA. The Contractor's CGL policy shall be issued on an occurrence basis.

PATENTS, DATA, AND COPYRIGHTS

RIGHTS IN DATA-- COPYRIGHT ON SPECIAL WORKS (17-5) (OCT 05)(BPI 17.4.4.1)

- (a) Allocation of Rights.
 - (1) BPA shall have--
 - (A) Unlimited rights, meaning the right of the Government to use, disclose, reproduce, prepare derivative works, distribute copies to the public, and perform publicly and display publicly, in any manner and for any purpose whatsoever, and to have or permit others to do so, in all data delivered under this contract, and in all data first produced in the performance of this contract, except as provided in paragraph (b) of this clause for copyright.
 - (B) The right to limit exercise of claim to copyright in data first produced in the performance of this contract, and to obtain assignment of copyright in such data, in accordance with subparagraph (b)(1) of this clause.
 - (C) The right to limit the release and use of certain data in accordance with paragraph (c) of this clause.
 - (2) The Contractor shall have, to the extent permission is granted in accordance with subparagraph (b)(1) of this clause, the right to establish claim to copyright subsisting in data first produced in the performance of this contract.
- (b) Copyright.
 - (1) Data, computer software and documentation, and source code material first produced in the performance of this contract.

TERMS AND CONDITIONS

- (A) The Contractor agrees not to assert, establish, or authorize others to assert or establish, any claim to copyright subsisting in any data first produced in the performance of this contract without the prior written permission of the Contracting Officer. If a claim to copyright is made, the Contractor grants to the Government, and others acting on its behalf, a paid-up non-exclusive, irrevocable, worldwide license for all such data to reproduce, prepare derivative works, distribute copies to the public, and perform publicly and display publicly, by or on behalf of the Government.
- (B) If BPA desires to obtain copyright in data first produced in the performance of this contract and permission has not been granted as set forth in subdivision (b)(1)(A) of this clause, the Contracting Officer may direct the Contractor to establish, or authorize the establishment of, claim to copyright in such data and to assign, or obtain the assignment of, such copyright to the Government or its designated assignee.
- (2) Data not first produced in the performance of this contract. The Contractor shall not, without prior written permission of the Contracting Officer, incorporate in data delivered under this contract any data not first produced in the performance of this contract and which contain a copyright notice, unless the Contractor identifies such data and grants to the Government or acquires on its behalf, a license of the same scope as set forth in subparagraph (b)(1) of this clause.
- (c) Release and use restrictions. Except as otherwise specifically provided for in this contract, the Contractor shall not use for purposes other than the performance of this contract, nor shall the Contractor release, reproduce, distribute, or publish any data first produced in the performance of this contract, nor authorize others to do so, without written permission of the Contracting Officer.
- (d) Indemnity. The Contractor shall indemnify BPA and its officers, agents, and employees acting for the Government against any liability, including costs and expenses, incurred as the result of the violation of trade secrets, copyrights, or right of privacy or publicity, arising out of the creation, delivery, publication or use of any data furnished under this contract; or any libelous or other unlawful matter contained in such data. The provisions of this paragraph do not apply unless BPA provides notice to the Contractor as soon as practicable of any claim or suit, affords the Contractor an opportunity under applicable laws, rules or regulations to participate in the defense thereof, and obtains the contractor's consent to the settlement of any suit or claim other than as required by final decree of a court of competent jurisdiction; nor do these provisions apply to material furnished to the Contractor by BPA and incorporated in data to which this clause applies.

UNAUTHORIZED REPRODUCTION OR USE OF COMPUTER SOFTWARE (23-3) (SEP 98)(BPI 23.3.1)

The contractor shall hold BPA harmless for unauthorized reproduction or use of copyrighted or proprietary computer software and/or manuals or other documentation by the contractor's employees or subcontractors in the performance of the contract.

INSPECTION AND WARRANTY

INSPECTION - SERVICES AND CONSTRUCTION (18-4) (SEP 98)(BPI 18.3.1)

- (a) BPA may inspect the work called for by the contract at any time and place. BPA will perform inspections in a manner that will not unduly delay the work.
- (b) If any of the services do not conform with contract requirements (including services performed on a cost-reimbursement or time-and-materials basis), BPA may require the Contractor to perform the services again in conformity with the contract at no cost to BPA. When the defects in services cannot be corrected by re-performance, BPA may deduct from the contract payments an amount which reflects the reduced value of the services performed.

TERMS AND CONDITIONS

- (c) Neither inspection, lack of inspection, acceptance, nor payment shall relieve the Contractor of any of its obligations under this contract.

PROPERTY

BPA-FURNISHED/CONTRACTOR-ACQUIRED PROPERTY (19-1) (SEP 02)(BPI 19.4)

- (a) The Contractor shall manage BPA-furnished, contractor-acquired property in accordance with BPI Appendix 19-A if that appendix is made a part of this contract. If Appendix 19-A is not made a part of this contract, property should be managed in accordance with ASTM Property Management Standards and/or sound industry practices.
- (b) BPA shall deliver to the Contractor, at the time and locations stated in this contract, BPA-furnished property described in the Schedule, statement of work, or specifications. If that property, suitable for its intended use, is not delivered to the Contractor, the Contracting Officer shall equitably adjust affected provisions of this contract in accordance with the Changes clause of the contract when--
- (1) The Contractor submits a timely written request for an equitable adjustment; and
 - (2) The facts warrant an equitable adjustment.
- (c) Title to BPA-furnished property shall remain with BPA, unless specifically identified elsewhere in this contract. The Contractor shall use BPA-furnished property, except as provided for in BPI subpart 19.3, only in connection with this contract. The Contractor shall maintain adequate property control records in accordance with sound industry practices and will make such records available for BPA inspection at all reasonable times.
- (d) Upon delivery of BPA-furnished property to the Contractor, the Contractor assumes the risk and responsibility for its loss or damage, except--
- (1) For reasonable wear and tear;
 - (2) To the extent property is consumed in the performance of this contract; or
 - (3) As otherwise provided for by the provisions of this contract.
- (e) Unless specified elsewhere in this contract, title to all property purchased by the Contractor for which the Contractor is entitled to be reimbursed as a direct item of cost under this contract shall pass to and vest in BPA upon the supplier's delivery of such property to the contractor.
- (f) Title to BPA property shall not be affected by its incorporation into or attachment to any property not owned by BPA, nor shall BPA property become a fixture or lose its identity as personal property by being attached to any real property.
- (g) Upon completion of this contract, the Contractor shall follow the instructions of the Contracting Officer regarding the disposition of all property, title to which is held by BPA, which was not consumed in the performance of this contract or previously delivered to BPA. The Contractor shall prepare for shipment, deliver f.o.b. origin, or dispose of BPA property, as may be directed or authorized by the Contracting Officer. The net proceeds of any such disposal shall be credited to the contract price or shall be paid to BPA as directed by the Contracting Officer.

TERMS AND CONDITIONS

TERMINATION

TERMINATION FOR THE CONVENIENCE OF BPA (20-2) (MAY 07)(BPI 20.4.1)

- (a) BPA may terminate all or any part of this contract, at any time, upon written notice to the contractor. Upon receipt of the termination notice, the contractor shall stop work on the terminated portion of the contract.
- (b) The contract amount shall be revised as a result of termination under this clause. On fixed-price contracts the revised amount shall not exceed the pre-termination contract price, excluding payments already received, plus reasonable termination expenses. On cost-reimbursement contracts it will not exceed the total of allowable and allocable costs of performance prior to termination, excluding payments already received, plus reasonable termination expenses, plus an adjustment of the fee on the terminated portion of the contract. No payment will be made for anticipated profits on the terminated portion, or consequential damages, of the contract. The contractor shall submit a settlement proposal within 30 days of the notice of termination.
- (c) The Contracting Officer may direct the disposition of material produced or acquired for the work terminated, or any completed or partially completed items.

TERMINATION FOR DEFAULT (20-3) (MAY 11)(BPI 20.5.1)

- (a) BPA reserves the right to terminate any or all of any undelivered or unexecuted portion of this contract for cause if the contractor fails to make any delivery, fails to prosecute the work, or to perform as scheduled, or if any of the contract terms are breached. However, the contractor shall not be terminated for default if the failure to perform arises from unforeseeable causes beyond the control and without the fault or negligence of the Contractor, provided that the Contractor provides notice to the Contracting Officer that a force majeure event has occurred within a reasonable period of time after occurrence. Examples of those events are: (1) acts of God or of the public enemy, (2) acts of the Government in its sovereign or BPA in its contractual capacity, (3) fires, (4) floods, (5) epidemics, (6) quarantine restrictions, (7) strikes, (8) freight embargoes and (9) unusually severe weather.
- (b) The Contracting Officer may direct the disposition of material produced or acquired for the work terminated, and the disposition of any completed or partially completed items.

DISPUTES

APPLICABLE LAW (21-5) (MAY 11)(BPI 21.1.2.1)

This agreement shall be construed in accordance with and governed by federal procurement laws of the United States. Where there is no applicable federal procurement law, the laws of the State of Oregon shall prevail.

DISPUTES (21-2) (MAY 11)(BPI 21.3.15.1)

- (a) This contract is subject to the Contract Disputes Act of 1978, as amended (41 USC 601-613).
- (b) Except as provided in the Act, all disputes arising under or relating to this contract shall be resolved under this clause.
- (c) "Claim," as used in this clause, means a written demand or written assertion by one of the contracting parties seeking, as a matter of right, the payment of money in a sum certain, the adjustment or interpretation of

TERMS AND CONDITIONS

contract terms, or other relief arising under or relating to this contract. However, a written demand or written assertion by the Contractor seeking the payment of money exceeding \$100,000 is not a claim under the Act until certified. A voucher, invoice, or other routine request for payment that is not in dispute when submitted is not a claim under the Act. The submission may be converted to a claim under the Act, by complying with the submission and certification requirements of this clause, if it is disputed either as to liability or amount or is not acted upon in a reasonable time.

- (d) (1) A claim by the Contractor shall be made in writing and, unless otherwise stated in this contract, submitted within six years after accrual of the claim to the Contracting Officer for a written decision. A claim by BPA against the Contractor shall be subject to a written decision by the Contracting Officer.
- (2) (i) The Contractor shall provide the certification specified in paragraph (d)(2)(iii) of this clause when submitting any claim exceeding \$100,000.
- (ii) The certification requirement does not apply to issues in controversy that have not been submitted as all or part of a claim.
- (iii) The certification shall state as follows:
- “I certify that the claim is made in good faith; that the supporting data are accurate and complete to the best of my knowledge and belief; that the amount requested accurately reflects the contract adjustment for which the Contractor believes BPA is liable; and that I am duly authorized to certify the claim on behalf of the Contractor.”**
- (3) The certification may be executed by any person duly authorized to bind the Contractor with respect to the claim.
- (e) For Contractor claims of \$100,000 or less, the Contracting Officer must, if requested in writing by the Contractor, render a decision within 60 days of the request. For contractor-certified claims over \$100,000, the Contracting Officer must, within 60 days, decide the claim or notify the Contractor of the date by which the decision will be made.
- (f) The Contracting Officer’s decision shall be final unless the Contractor appeals or files suit as provided in the Act.
- (g) If the claim by the Contractor is submitted to the Contracting Officer or a claim by BPA is presented to the Contractor, the parties, by mutual consent, may agree to use alternative dispute resolution (ADR). If the Contractor refuses an offer for ADR, the Contractor shall inform the Contracting Officer, in writing, of the Contractor’s specific reasons for rejecting the offer.
- (h) BPA shall pay interest on the amount found due and unpaid from (1) the date that the Contracting Officer receives the claim (certified, if required); or (2) the date that payment otherwise would be due, if the date is later, until the date of payment. With regard to claims having defective certifications, as defined in BPI 21.3.1, interest shall be paid from the date that the Contracting Officer initially receives the claim. Simple interest on claims shall be paid at the rate, fixed by the Secretary of the Treasury as provided in the Act, which is applicable to the period during which the Contracting Officer receives the claim and then at the rate applicable for each 6-month period as fixed by the Secretary of the Treasury during the pendency of the claim.
- (i) The Contractor shall proceed diligently with performance of this contract, pending final resolution of any request for relief, claim, appeal, or action arising under or relating to the contract, and comply with any decision of the Contracting Officer.

UNIT 3 — STATEMENT OF WORK



Statement of Work Report

Project Title: Columbia Habitat and Monitoring Program (CHaMP)
Project #: 2011-006-00
Contract Title: 2011-006-00 EXP CHAMP - TERRAQUA COORDINATION & IMPLEMENTATION

Contract #: 53532
Province: Non-Provincial **Subbasin:** Basinwide
Workorder ID: 270998 **Task ID:** 1
Perf. Period Budget: \$1,097,769 **Perf. Period:** 5/9/2011 - 5/8/2012
Contract Type: Contract **Pricing Type:** Time and Materials
Contractor(s): Terraqua, Inc. (Prime - TERRAQUA00)
BPA Internal Ref: 53532
SOW Validation: Last validated 06/02/2011 with 0 problems, and 0 reviewable items

Contract Documents: [Property Inventory \(05/09/2011\)](#) Property Inventory Terraqua CHaMP
[Budget - Contract \(06/01/2011\)](#) TQ LIB



Contacts:

Name	Role	Organization	Phone/Fax	Email	Address
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Kristi Van Leuven	Contracting Officer	Bonneville Power Administration	(503) 230-3605 / NA	kjleuven@bpa.gov	P.O Box 3621 Mailstop - NSSP-4 Portland, OR 97208-3621
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Pamela Nelle	Administrative Contact	Terraqua, Inc.	(509) 885-9046 / NA	pamela.nelle@nwi.net	PO Box 404 Peshastin WA 98847
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Work Element Table of Contents:

<u>Work Element - Work Element Title</u>	<u>EC Needed*</u>	<u>Estimate</u>	<u>(%)</u>
A : 165. Produce Environmental Compliance Documentation - 10.5b Environmental Compliance documents		\$0	(0%)
B : 157. Collect/Generate/Validate Field and Lab Data - 10.1a Conduct CHaMP fish habitat surveys in the Wenatchee River watershed	*	\$83,109	(8 %)
C : 157. Collect/Generate/Validate Field and Lab Data - 10.1b Conduct CHaMP fish habitat surveys in the Entiat River watershed	*	\$78,306	(7 %)



<u>Work Element - Work Element Title</u>	<u>EC Needed*</u>	<u>Estimate</u>	<u>(%)</u>
D : 157. Collect/Generate/Validate Field and Lab Data - 10.1c Conduct CHaMP fish habitat surveys in the Methow River watershed	*	\$67,297	(6 %)
E : 159. Transfer/Consolidate Regionally Standardized Data - 10.1d Deliver habitat data to CHaMP data management system using ISEMPtools		\$0	(0%)
F : 185. Produce Pisces Status Report - 10.0 Periodic Status Reports for BPA		\$0	(0%)
G : 119. Manage and Administer Projects - 10.5 Manage and Administer CHaMP in three (3) watersheds		\$68,134	(6 %)
H : 132. Produce (Annual) Progress Report - 10.2a Submit Progress Report for the period (5/2011) to (1/2012)		\$1,632	(0 %)
I : 132. Produce (Annual) Progress Report - 10.2b Coordinate contributions to and review of CHaMP Annual Synthesis Report		\$6,280	(1 %)
J : 189. Coordination-Columbia Basinwide - 10.2c CHaMP Program Coordination		\$83,001	(8 %)
K : 189. Coordination-Columbia Basinwide - 10.3 Develop and Implement Training for Field Methods		\$161,978	(15 %)
L : 157. Collect/Generate/Validate Field and Lab Data - 10.4 Dev and Imp Rep Sampling, Field Assistance, and Protocol Testing	*	\$445,182	(41 %)
M : 157. Collect/Generate/Validate Field and Lab Data - 10.6 Drift Macroinvertebrate Analysis	*	\$102,850	(9 %)
Total:		\$1,097,769	

* Environmental Compliance (EC) needed before work begins.

Contract Description:

This contract is in support of a BiOp Fast track II project.

In support of habitat restoration, rehabilitation and conservation action performance assessments and adaptive management requirements of the 2008 Federal Columbia River Power System Biological Opinion (FCRPS BiOp), the Bonneville Power Administration is working with NOAA and other regional fish management agencies to monitor status and trends of fish habitat for each major population group (MPG) in the Pacific Northwest identified through the Endangered Species Act (ESA). Status monitoring provides information on the quantity and quality of current habitat and thus maximizes spatial coverage with a given number of sample sites. Trend monitoring is used to detect changes in habitat through time and thus requires repeat samples at given sites. Minimizing sampling and measurement error is crucial in order to differentiate this variability from natural variability through time and space. In order to compare information across multiple MPGs, BPA is adopting a standardized fish habitat monitoring protocol, the Columbia Habitat Monitoring Program (CHaMP) for the Columbia River Basin monitoring programs.

CHaMP is a Columbia River basin-wide habitat status and trends monitoring program built around a single habitat monitoring protocol with a program-wide approach to data collection and management which meets FCRPS Action Agency (2010) programmatic prescriptions for habitat monitoring. CHaMP was developed by the Integrated Status and Effectiveness Monitoring Program (ISEMP) to capture habitat features that drive fish population biology and will result in systematic habitat status and trends information that will be used to assess basin-wide habitat condition and correlated with biological response indicators to evaluate habitat management strategies. CHaMP is integrated with ongoing Pacific Northwest Aquatic Monitoring Program (PNAMP) and Recovery Planning efforts, as well as the collaborative process across Columbia Basin fish management agencies and tribes and other state and federal agencies that are monitoring anadromous salmonids and/or their habitat.



The CHaMP is being proposed by the ISEMP and collaborating agencies to help BPA meet the requirements of the 2008 FCRPS BiOp and RPA 56.3. This program will provide information on the status/trends in habitat conditions, and will support habitat restoration, rehabilitation and conservation actions, performance assessments, and the adaptive management requirements of the 2008 FCRPS BiOp. In addition, the CHaMP meets RPA 56.3, RPA 57, and RPA 3 by characterizing stream and fish responses to watershed restoration and/or management actions in at least one population within each steelhead and Chinook MPG which have, or will have, fish in-fish out monitoring (identified in RPA 50.6). The watersheds originally identified for CHaMP include: Hood River, Wind River, Toppenish, Klickitat, Fifteen Mile, Lower Mainstem JD, North Fork JD, Upper Mainstem JD, Middle Fork JD, South Fork JD, Umatilla, Upper Grande Ronde, Catherine Ck, Imnaha, Lolo Ck, Tucannon, Asotin, SF Salmon, Big Ck, Lemhi, Pahsimeroi, Wenatchee, Entiat, Methow, and Okanogan. These watersheds were chosen to maximize the contrast in current habitat conditions and also represent a temporal gradient of expected change in condition through planned habitat actions. Following recommendations of the ISRP review, CHaMP will be implemented in the first year of implementation FY11, in a subset of these subbasins, which are Lower Mainstem JD, North Fork JD, Upper Mainstem JD, Middle Fork JD, South Fork JD, Upper Grande Ronde, Catherine Ck, Tucannon, SF Salmon, Lemhi, Wenatchee, Entiat, and Methow. CHaMP collaborators will be supported by cross-project data management, stewardship and analysis staff, annual pre- and post-season meetings, annual field protocol and data management tool implementation training sessions.

Program Elements

(1) Sampling Design

A Generalized Random-Tessellation Sampling (GRTS) survey design was recommended by Crawford and Rumsey (2009) for monitoring habitat status and trend in the Columbia River Basin. The GRTS design was initially developed under the EPA's Environmental Monitoring and Assessment Program and is a probabilistic sampling design that has been shown to be advantageous for generating habitat condition parameters with known statistical characteristics. The CHaMP monitoring design follows a GRTS design with a 3 year rotating 1-to-1 split panel structure to distribute sampling effort in space and time, and has management tools for sampling design. Implementing a GRTS survey design correctly is critical to producing a final dataset with known statistical characteristics requiring the implementation of strict procedures during the site evaluation and selection process. A GRTS Site Selection Protocol and Tool will be provided to each collaborator to support field crews with efficiently completing the process while strictly enforcing design requirements.

(2) Field Sampling

Habitat field sampling will follow the Bouwes et al. (2011) protocol that was developed after a review of fish habitat requirements, interactions of processes that influence fish habitat, the spatial scales for the context of these interactions, and current monitoring programs. The protocol has the greatest probability of being comparable to other protocols and most relevant to salmonids and has been designed to be applied across varying spatial contexts depending on the logistical constraints of the sites. In areas where GPS signals can be obtained, along with aerial photos, habitat units within reaches can be superimposed onto aerial photos with a map grade GPS. In situations, where a GPS signal is not obtainable, units can be referenced to aerial photos and supplemented with on the ground measurements. All approaches use a GPS map-grade data logger and thus do not require new gear for differing spatial contexts across related approaches.

(i) Standardized Crew Training: Sampling and Data Capture Tool

Standardized field crew training in the recommended methods will be provided/required of all CHaMP field crews. This standardized approach will promote crew efficiency and improved standardization across the region. In addition to agency-specific safety and other training, ISEMP will provide training to support cooperating agencies that implement the recommended habitat protocol.

(ii) QA/QC crews to do repeat sampling across all participating watersheds

Repeated sampling of habitat monitoring sites within the same sampling season has proven to be an important component of GRTS-based, watershed-scale habitat monitoring. Repeat sampling assists with 1) quality assurance/quality control, 2) the assessment of crew variability as a component of variation, and 3) providing improvements to temporal variability recognition (i.e., trend detection). Furthermore, repeat sampling will be important to ISEMP's research goals of testing the performance of the recommended protocols across the Columbia Basin. To achieve these objectives, ISEMP will conduct repeat sampling visits for all watersheds in this program at 10 percent of all sampling sites during the low-flow index period.



(3) Data Management

For a monitoring program at the scale of the Columbia River Basin to be successful a robust data management system must be in place before initiating data collection. Monitoring habitat in the CHaMP watersheds will generate a massive volume of data. A system of data processing, storage, analysis, reporting, and distribution is available to meet the needs of a large-scale monitoring program, such as (a) documenting monitoring objectives, study design and intended analysis; (b) summarizing how, when, and where the monitoring data were collected, (c) supporting a range of analytical methods, such as hypothesis testing, time series analysis, structural equation modeling, and GIS support; and (d) adapting to changing requirements in the future. The data system includes a centralized data warehouse and web-based data discovery tool (CHaMP Website); data exchange and loading procedures; a database schema that defines data storage format (Aquatic Resources Schema, ARS); metadata tools; data capture, validation, and summary tools; quality control and assurance procedures; and data stewards who support the system.

(i) Field Data Capture Tools: Hand Held Loggers

Field crews will need applications to support data capture, review, summarization, and reporting and a suite of handheld and desktop tools to support both habitat and fish monitoring is available. These tools have XML-based mechanisms to synchronize data. This workflow includes documenting metadata about project and statistical design, entering survey event information and observations, performing quality assurance procedures, deriving metrics, and submitting data for archiving.

(ii) GIS Data Management and Geoprocessing

The large spatial scales that the CHaMP will cover means that assimilating and managing spatial datasets in GIS, accounting for the geomorphic context of sampling, and performing watershed or subbasin-scale analyses are important data features within these programs. GIS data management support, coordination, and basic processing for monitoring programs that require data management guidance or processing assistance is available and development of geospatial models, the use of remote sensing technologies to collect continuous GIS datasets, such as LIDAR and aerial photos, and integrating field-based tabular data within a geospatial context is ongoing.

(iii) Data Storage and Retrieval

The CHaMP will have multiple groups collecting data and it will be critical to have data accessible and available for use by all groups within the program. The CHaMP data management system serves as a long-term storage facility for monitoring datasets including metadata and features online interfaces for searching, viewing, and downloading datasets and documents associated with the coordinated monitoring program.

(4) Reporting

In such a large and geographically dispersed program such as CHaMP it is important to have an annual review of the data collection events so that any issues experienced or lessons learned over the field season can be addressed in a timely manner and with each collaborators' input. To that end, collaborators will submit a summary of their field season to the CHaMP Lead Coordinator who will collate and summarize the data collected, logistics of implementation and lessons learned from each field season into an Annual Synthesis Report. This report will be used to inform full implementation in 2012, including any adjustments that may be appropriate on the design or scope of the project.

Statement of Work Report

Work Element Details

A: 165. Produce Environmental Compliance Documentation

Title:	10.5b Environmental Compliance documents
Description:	Review and evaluate existing NEPA compliance/permits to ensure coverage is adequate for any work to be performed during the next field season (if applicable). Ensure necessary documents are provided to BPA's Environmental Compliance group in sufficient time to allow for a compliance letter to be written prior to any work. Coordinate with appropriate agencies regarding any permits that may be required.
Deliverable Specification:	Provide necessary supporting documentation and assistance to BPA's Environmental Compliance Group (such as maps, survey reports, permit applications, ESA documents, etc.) to assure a timely receipt of EC compliance letter.



Planned Metrics:

* Are herbicides used as part of work performed under this contract?: No

* Will water craft, heavy equipment, waders, boots, or other equipment be used from outside the local watershed as part of work performed under this contract?: No

Milestone Title	Start Date	End Date	Status	Milestone Description
Deliverable: A. Environmental Compliance supporting documentation		6/1/2011	Inactive	See the Deliverable Specification above

B: 157. Collect/Generate/Validate Field and Lab Data

Title:

10.1a Conduct CHaMP fish habitat surveys in the Wenatchee River watershed

Description:

In support of habitat restoration, rehabilitation and conservation action performance assessments and adaptive management requirements of the 2008 FCRPS Biological Opinion (BiOp), the Bonneville Power Administration is working with NOAA and other regional fish management agencies to monitor status and trends of fish habitat for each major population group (MPG) in the Pacific Northwest identified through the Endangered Species Act (ESA). BPA is adopting a standardized fish habitat monitoring protocol, the Columbia Habitat Monitoring Program (CHaMP) for the Columbia River Basin monitoring programs.

CHaMP is a Columbia River basin-wide habitat status and trends monitoring program built around a single habitat monitoring protocol with a program-wide approach to data collection and management. CHaMP will capture habitat features that drive fish population biology and will result in systematic habitat status and trends information that will be used to assess basin-wide habitat condition and correlated with biological response indicators to evaluate habitat management strategies.

BPA is implementing CHaMP in at least one population within each steelhead and Chinook MPG which has, or will have, fish in-fish out monitoring. The goal of this work element is to implement CHaMP in the Wenatchee watershed. The data from this project will be used to evaluate the quantity and quality of tributary fish habitat available to salmonids across the Columbia River basin. When combined with parallel fish monitoring metrics from related projects, these data will also be used assess the impact of habitat management actions on fish population processes.

Deliverable Specification:

A generalized random tessellation stratified (GRTS) survey design is recommended by Crawford and Rumsey (2009) for monitoring habitat status and trend in the Columbia River Basin. The GRTS-based sampling approach is dependent upon compiling and processing GIS layers consistent with sampling decisions. The CHaMP Lead Coordinator will work with ISEMP personnel in assimilating, managing, and processing GIS data to support sampling design needs in advance of the field season. In addition, implementing a GRTS survey design correctly is critical to producing a final dataset with known statistical characteristics; however, doing so requires the implementation of strict procedures during the site evaluation and selection process. Terraqua personnel will work with the CHaMP Lead Coordinator and ISEMP personnel to implement the GRTS Site Selection Protocol and Tool to ensure the correct implementation of the survey design.

In addition to agency-specific safety and other training, Terraqua personnel will complete a two week training course for the CHaMP protocol and be competent in the use of the necessary field equipment and familiar with the concepts and terms of the CHaMP habitat monitoring protocol (Bouwes et al 2010). This training workshop will be run by ISEMP and offered from approximately early to mid-June 2011 and will be comprised of:

1. Three days of GIS training for contractor's GIS and sampling design coordinators to explain how to perform GRTS sample draws and allocate sample sites using a priori filters. By the end of this training, contractors could expect to have sample draws completed, mapped, and listed in field-ready forms.
2. Three days of in-office training on data loggers.
3. Five days of in-field training for contractor's field crew leaders and technicians using the ISEMP protocol. Crews will be trained to measure habitat and record data with data loggers.

At each site, the Terraqua crew will implement and complete a habitat survey using the CHaMP protocol. Data collected under the CHaMP protocol will include at a minimum:

- Water quality
- Water temperature
- Water Chemistry
- Stream discharge
- Drift Invertebrates
- Canopy cover
- Riparian structure
- Human influence
- Bank morphology
- Substrate composition
- Large woody debris
- Channel morphology
- Fish cover
- Particle size distribution and embeddedness
- Subsurface fines
- Solar input



Planned Metrics: * Primary R, M, and E Focal Area : Tributary Habitat
 * Primary R, M, and E Type : Status and Trend Monitoring
 * Secondary R, M, and E Type : Action Effectiveness Research

Primary Focal Species: Chinook - Upper Columbia River Spring ESU | Steelhead - Upper Columbia River DPS

Country: US **NPCC Subbasin:** WENATCHEE

State: WA **HUC5 Watershed:** ICICLE/CHUMSTICK

County: CHELAN **HUC6 Name:** DERBY CANYON

Salmonid ESUs Present: Upper Columbia River Spring-run Chinook Salmon ESU (accessible) | Upper Columbia River Steelhead DPS (accessible)

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	5/12/2011	5/30/2011	Inactive	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. GIS work and site selection preparation	5/12/2011	6/30/2011	Inactive	Collaborating agencies work in-house with the advice of ISEMP staff to identify a list of variables (each with a GIS layer) that may be used in the stratification of sampling effort. ISEMP will provide a "starter-kit" of GIS layers for the most commonly used variables. Collaborators may need to develop or modify these layers depending on local needs. These layers will be used in sampling design and site selection processes.
C. Pre-season program meeting including ISEMP staff and collaborators.	5/14/2011	5/22/2011	Inactive	Meeting will cover pre-season issues and, in 2011, will include a sampling design training session to learn about GRTS sampling design, to generate a draft a sampling site allocation scheme scenario, and to learn ISEMP site selection tools. Sample design will require GIS layers to be developed in advance of the meeting. This meeting will be 3 days in 2011. In out years, this meeting may be 1 day and may be held in May or June.
D. Field Season Preparation	5/12/2011	6/30/2011	Inactive	Field crew leader to order and prepare field gear. Field crew leader or designate to conduct landowner contacts. Field crew leader and technician to conduct map-based and on-the-ground site reconnaissance.
E. Field training	6/1/2011	6/15/2011	Inactive	Two weeks of training, including data capture techniques and monitoring methods, will be taught by ISEMP staff for all collaborators. Training will be held at sites to be determined, the location of which may be rotated on an annual basis.
F. Field Sampling	7/1/2011	10/15/2011	Inactive	Sampling should occur during the "low flow season" in the Wenatchee watershed and within as short a window as possible to minimize seasonal variation.
Deliverable: G. CHaMP habitat data from 25 sites in the Wenatchee watershed		10/15/2011	Inactive	<i>See the Deliverable Specification above</i>

C: 157. Collect/Generate/Validate Field and Lab Data

Title: 10.1b Conduct CHaMP fish habitat surveys in the Entiat River watershed

Description: In support of habitat restoration, rehabilitation and conservation action performance assessments and adaptive management requirements of the 2008 FCRPS Biological Opinion (BiOp), the Bonneville Power Administration is working with NOAA and other regional fish management agencies to monitor status and trends of fish habitat for each major population group (MPG) in the Pacific Northwest identified through the Endangered Species Act (ESA). BPA is adopting a standardized fish habitat monitoring protocol, the Columbia Habitat Monitoring Program (CHaMP) for the Columbia River Basin monitoring programs.

CHaMP is a Columbia River basin-wide habitat status and trends monitoring program built around a single habitat monitoring protocol with a program-wide approach to data collection and management. CHaMP will capture habitat features that drive fish population biology and will result in systematic habitat status and trends information that will be used to assess basin-wide habitat condition and correlated with biological response indicators to evaluate habitat management strategies.

BPA is implementing CHaMP in at least one population within each steelhead and Chinook MPG which has, or will have, fish in-fish out monitoring. The goal of this work element is to implement CHaMP in the Entiat River watershed. The data from this project will be used to evaluate the quantity and quality of tributary fish habitat available to salmonids across the Columbia River basin. When combined with parallel fish monitoring metrics from related projects, these data will also be used assess the impact of habitat management actions on fish population processes.



Deliverable Specification: A generalized random tessellation stratified (GRTS) survey design is recommended by Crawford and Rumsey (2009) for monitoring habitat status and trend in the Columbia River Basin. The GRTS-based sampling approach is dependent upon compiling and processing GIS layers consistent with sampling decisions. The CHaMP Lead Coordinator will work with ISEMP personnel in assimilating, managing, and processing GIS data to support sampling design needs in advance of the field season. In addition, implementing a GRTS survey design correctly is critical to producing a final dataset with known statistical characteristics; however, doing so requires the implementation of strict procedures during the site evaluation and selection process. Terraqua personnel will work with the CHaMP Lead Coordinator and ISEMP personnel to implement the GRTS Site Selection Protocol and Tool to ensure the correct implementation of the survey design.

In addition to agency-specific safety and other training, contractor personnel will complete a two week training course for the CHaMP protocol and be competent in the use of the necessary field equipment and familiar with the concepts and terms of the CHaMP habitat monitoring protocol (Bouwes et al 2010). This training workshop will be run by ISEMP and offered from approximately early to mid-June 2011 and will be comprised of:

1. Three days of GIS training for contractor's GIS and sampling design coordinators to explain how to perform GRTS sample draws and allocate sample sites using a priori filters. By the end of this training, contractors could expect to have sample draws completed, mapped, and listed in field-ready forms.
2. Three days of in-office training on data loggers.
3. Five days of in-field training for contractor's field crew leaders and technicians using the ISEMP protocol. Crews will be trained to measure habitat and record data with data loggers.

At each site, the Terraqua crew will implement and complete a habitat survey using the CHaMP protocol. Data collected under the CHaMP protocol will include at a minimum:

- Water quality
- Water temperature
- Water Chemistry
- Stream discharge
- Drift Invertebrates
- Canopy cover
- Riparian structure
- Human influence
- Bank morphology
- Substrate composition
- Large woody debris
- Channel morphology
- Fish cover
- Particle size distribution and embeddedness
- Subsurface fines
- Solar input

Planned Metrics:

- * Primary R, M, and E Focal Area : Tributary Habitat
- * Primary R, M, and E Type : Status and Trend Monitoring
- * Secondary R, M, and E Type : Action Effectiveness Research

Primary Focal Species: Chinook - Upper Columbia River Spring ESU | Steelhead - Upper Columbia River DPS

Country: US **NPCC Subbasin:** ENTIAT

State: WA **HUC5 Watershed:** ENTIAT RIVER

County: CHELAN **HUC6 Name:** LOWER ENTIAT RIVER

Salmonid ESUs Present: Upper Columbia River Spring-run Chinook Salmon ESU (accessible) | Upper Columbia River Steelhead DPS (accessible)



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	5/12/2011	5/30/2011	Inactive	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. GIS work and site selection preparation	5/12/2011	6/30/2011	Inactive	Collaborating agencies work in-house with the advice of ISEMP staff to identify a list of variables (each with a GIS layer) that may be used in the stratification of sampling effort. ISEMP will provide a "starter-kit" of GIS layers for the most commonly used variables. Collaborators may need to develop or modify these layers depending on local needs. These layers will be used in sampling design and site selection processes.
C. Pre-season program meeting including ISEMP staff and collaborators.	5/14/2011	5/30/2011	Inactive	Meeting will cover pre-season issues and, in 2011, will include a sampling design training session to learn about GRTS sampling design, to generate a draft a sampling site allocation scheme scenario, and to learn ISEMP site selection tools. Sample design will require GIS layers to be developed in advance of the meeting. This meeting will be 3 days in 2011. In out years, this meeting may be 1 day and may be held in May or June.
D. Field Season Preparation	5/12/2011	6/30/2011	Inactive	Field crew leader to order and prepare field gear. Field crew leader or designate to conduct landowner contacts. Field crew leader and technician to conduct map-based and on-the-ground site reconnaissance.
E. Field training	6/1/2011	6/15/2011	Inactive	Two weeks of training, including data capture techniques and monitoring methods, will be taught by ISEMP staff for all collaborators. Training will be held at sites to be determined, the location of which may be rotated on an annual basis.
F. Field Sampling	7/1/2011	10/15/2011	Inactive	Sampling should occur during the "low flow season" in the Entiat River watershed and within as short a window as possible to minimize seasonal variation.
Deliverable: G. CHaMP habitat data from 25 sites in the Entiat River watershed		10/15/2011	Inactive	<i>See the Deliverable Specification above</i>

D: 157. Collect/Generate/Validate Field and Lab Data

Title: 10.1c Conduct CHaMP fish habitat surveys in the Methow River watershed

Description: In support of habitat restoration, rehabilitation and conservation action performance assessments and adaptive management requirements of the 2008 FCRPS Biological Opinion (BiOp), the Bonneville Power Administration is working with NOAA and other regional fish management agencies to monitor status and trends of fish habitat for each major population group (MPG) in the Pacific Northwest identified through the Endangered Species Act (ESA). BPA is adopting a standardized fish habitat monitoring protocol, the Columbia Habitat Monitoring Program (CHaMP) for the Columbia River Basin monitoring programs.

CHaMP is a Columbia River basin-wide habitat status and trends monitoring program built around a single habitat monitoring protocol with a program-wide approach to data collection and management. CHaMP will capture habitat features that drive fish population biology and will result in systematic habitat status and trends information that will be used to assess basin-wide habitat condition and correlated with biological response indicators to evaluate habitat management strategies.

BPA is implementing CHaMP in at least one population within each steelhead and Chinook MPG which has, or will have, fish in-fish out monitoring. The goal of this work element is to implement CHaMP in the Methow River watershed. The data from this project will be used to evaluate the quantity and quality of tributary fish habitat available to salmonids across the Columbia River basin. When combined with parallel fish monitoring metrics from related projects, these data will also be used assess the impact of habitat management actions on fish population processes.



Deliverable Specification: A generalized random tessellation stratified (GRTS) survey design is recommended by Crawford and Rumsey (2009) for monitoring habitat status and trend in the Columbia River Basin. The GRTS-based sampling approach is dependent upon compiling and processing GIS layers consistent with sampling decisions. The CHaMP Lead Coordinator will work with ISEMP personnel in assimilating, managing, and processing GIS data to support sampling design needs in advance of the field season. In addition, implementing a GRTS survey design correctly is critical to producing a final dataset with known statistical characteristics; however, doing so requires the implementation of strict procedures during the site evaluation and selection process. Terraqua personnel will work with the CHaMP Lead Coordinator and ISEMP personnel to implement the GRTS Site Selection Protocol and Tool to ensure the correct implementation of the survey design.

In addition to agency-specific safety and other training, contractor personnel will complete a two week training course for the CHaMP protocol and be competent in the use of the necessary field equipment and familiar with the concepts and terms of the CHaMP habitat monitoring protocol (Bouwes et al 2010). This training workshop will be run by ISEMP and offered from approximately early to mid-June 2011 and will be comprised of:

1. Three days of GIS training for contractor's GIS and sampling design coordinators to explain how to perform GRTS sample draws and allocate sample sites using a priori filters. By the end of this training, contractors could expect to have sample draws completed, mapped, and listed in field-ready forms.
2. Three days of in-office training on data loggers.
3. Five days of in-field training for contractor's field crew leaders and technicians using the ISEMP protocol. Crews will be trained to measure habitat and record data with data loggers.

At each site, the Terraqua crew will implement and complete a habitat survey using the CHaMP protocol. Data collected under the CHaMP protocol will include at a minimum:

- Water quality
- Water temperature
- Water Chemistry
- Stream discharge
- Drift Invertebrates
- Canopy cover
- Riparian structure
- Human influence
- Bank morphology
- Substrate composition
- Large woody debris
- Channel morphology
- Fish cover
- Particle size distribution and embeddedness
- Subsurface fines
- Solar input

Planned Metrics:

- * Primary R, M, and E Focal Area : Tributary Habitat
- * Primary R, M, and E Type : Status and Trend Monitoring
- * Secondary R, M, and E Type : Action Effectiveness Research

Primary Focal Species: Chinook - Upper Columbia River Spring ESU | Steelhead - Upper Columbia River DPS

Country:	US	NPCC Subbasin:	METHOW
State:	WA	HUC5 Watershed:	MIDDLE METHOW RIVER
County:	OKANOGAN	HUC6 Name:	DAVIS CREEK
Salmonid ESUs Present:	Upper Columbia River Spring-run Chinook Salmon ESU (accessible) Upper Columbia River Steelhead DPS (accessible)		



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	5/12/2011	5/30/2011	Inactive	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. GIS work and site selection preparation	5/12/2011	6/30/2011	Inactive	Collaborating agencies work in-house with the advice of ISEMP staff to identify a list of variables (each with a GIS layer) that may be used in the stratification of sampling effort. ISEMP will provide a "starter-kit" of GIS layers for the most commonly used variables. Collaborators may need to develop or modify these layers depending on local needs. These layers will be used in sampling design and site selection processes.
C. Pre-season program meeting including ISEMP staff and collaborators.	5/12/2011	5/30/2011	Inactive	Meeting will cover pre-season issues and, in 2011, will include a sampling design training session to learn about GRTS sampling design, to generate a draft a sampling site allocation scheme scenario, and to learn ISEMP site selection tools. Sample design will require GIS layers to be developed in advance of the meeting. This meeting will be 3 days in 2011. In out years, this meeting may be 1 day and may be held in May or June.
D. Field Season Preparation	5/12/2011	6/30/2011	Inactive	Field crew leader to order and prepare field gear. Field crew leader or designate to conduct landowner contacts. Field crew leader and technician to conduct map-based and on-the-ground site reconnaissance.
E. Field training	6/1/2011	6/15/2011	Inactive	Two weeks of training, including data capture techniques and monitoring methods, will be taught by ISEMP staff for all collaborators. Training will be held at sites to be determined, the location of which may be rotated on an annual basis.
F. Field Sampling	7/1/2011	10/15/2011	Inactive	Sampling should occur during the "low flow season" in the Methow River watershed and within as short a window as possible to minimize seasonal variation.
Deliverable: G. CHaMP habitat data from 25 sites in the Methow River watershed		10/15/2011	Inactive	<i>See the Deliverable Specification above</i>

E: 159. Transfer/Consolidate Regionally Standardized Data

Title: 10.1d Deliver habitat data to CHaMP data management system using ISEMPtools

Description: In a regionally coordinated monitoring strategy that has multiple groups collecting data, such as the CHaMP, it is critical to have data accessible and available for use by all groups within and outside the program. ISEMP has built the CHaMP Databank, which serves as a long-term storage facility for monitoring datasets including metadata, and the CHaMP website which features online interfaces for searching, viewing, and downloading datasets and documents associated with the coordinated monitoring program.

Deliverable Specification: Raw data will initially be captured on handheld field computers and then quality controlled data and quality controlled geo-referenced summarized stream habitat survey data, including GPS locations, will be uploaded to an online database on the CHaMP website. A standard set of field data capture devices will be provided which will include data entry applications for the topographic and auxiliary habitat surveys. Daily data capture and quality assurance review of topographic and auxiliary data is necessary. Weekly quality assurance procedures and generated TIN file for each site should be completed by the field crew lead and data should be uploaded weekly to the CHaMP website.

Contractor will ensure datasets are complete and perform quality assurance on completed datasets and derived site-level metrics.

Data will be uploaded by October 15 2011 CHaMP DataBank and notice will be provided to BPA and the CHaMP Lead Coordinator when the data has been uploaded. The contractor will be responsible for all quality assurance/quality control steps necessary to ensure that data is properly collected and uploaded.

Primary Focal Species: Chinook - Upper Columbia River Spring ESU | Steelhead - Upper Columbia River DPS



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Pre-season documentation	5/12/2011	6/30/2011	Inactive	<p>Documentation must capture the statistical design for sampling, measurement procedures, data quality, and data reduction steps.</p> <p>The project and statistical design information will be entered directly to the CHaMP website using the Project and Study Design utilities by each CHaMP project supervisor. Project information will include agency, staff, roles, BPA project number, watersheds to be monitored, and other pertinent information. Study design information will include the extent of sampling frame, defined stratum, list of GRTS sites within each stratum, sampling allocation across stratum, and temporal sampling frequency. All projects will participate in a three day workshop that will walk participants through the process of defining the study design for their given watershed. Decisions made during the workshop about study design will be recorded through the CHaMP website using the Study Design utility. This information will be stored and tracked directly with raw measurements and derived metrics.</p> <p>Following the study design workshop, the project supervisor will begin evaluating sites for inclusion in the summer sampling effort. The evaluation process will be completed through the CHaMP website using the GRTS Site Evaluation utility. Each site is evaluated for its conformance to the statistical design, its ability to be safely access by field crew, and to arrange for access permission on private land. Evaluations rely on assessments using Google satellite images, USGS quad maps, landownership maps, other GIS layers, local knowledge, and in limited situations, field reconnaissance. Evaluations will be recorded in the Site Evaluation form. The evaluation process will produce a list of sites to be visited for the given year, along with latitude and longitude coordinates. The list will be saved as a text file and loaded to a hand-held field computer.</p>
B. Field data capture and field quality assurance	7/1/2011	9/30/2011	Inactive	<p>Topographic survey data and auxiliary data will be captured using separate data logger applications. Auxiliary data (wood loading, substrate composition, etc.) will be captured using a handheld field computer. A detailed user guide will be provided for the auxiliary data entry application.</p> <p>Data quality assurance review will be conducted on a daily basis by crew members and on a weekly basis by the crew supervisor. The quality assurance review will test for completeness, outliers in numeric data, and outliers in basic summary metrics. At the end of each day, number of channel units, total wood pieces, and number of drift samples, any values recorded as a missing value, and any numeric outliers will be verified. A short series of graphs will allow the crew to verify graphical data against their mental image of the site. The crew supervisor will perform a similar audit of the data weekly.</p> <p>The topography survey will create a raw topographic point file (x, y, z data) from which several geo-rectified products will be developed using survey and Arc GIS 10 software. A triangular irregular network (TIN) and digital elevation model (DEM) will be created as the base topographic products from the survey.</p> <p>Data quality assurance for the topographic survey data will take place at four checkpoints within the flow of data from origination on the total station to data storage and web availability. 1.Data origination (Total station);2. End of day data review (Total station/Data logger); 3. End of week data processing and review (Laptop), 4. Centralized database checks (CHaMP data system).The crew lead is responsible for creation and submission of the original point file, a lines file (breaklines), a clean TIN, and a quality assurance report (table in geodatabase). These should be produced within one week of initial data collection.</p>
C. Data Back-up and submittal	7/1/2011	9/30/2011	Inactive	<p>At the end of each day of sample field crew should back up data files to an external hard drive. It is critical that a daily back up is made in case the data logger is damaged or lost during field activities. The hard drive must be stored in a safe location and not taken in the field during sampling. The external hard drive should be stored in a waterproof and impact resistant case (e.g., a Pelican case). On a weekly basis, the crew supervisor must upload all data files for the week to the CHaMP website. This upload process will require an internet connection.</p>
D. Metric Generation and End of Season Quality Assurance Review	7/1/2011	10/15/2011	Inactive	<p>Site-level metrics will be generated from data submitted to the CHaMP website. These metrics will be presented in graphical and map format for all sites. At the end of each field season, crew supervisors will review raw measurements and derived metrics for data completeness, numeric outliers, and ecologic sensibility. Crew supervisors will be presented a series for graphs through the CHaMP website and asked to verify data quality.</p>
Deliverable: E. Upload QAQC data to CHaMP website		10/15/2011	Inactive	<p><i>See the Deliverable Specification above</i></p>



F: 185. Produce Pisces Status Report

Title: 10.0 Periodic Status Reports for BPA
Description: The Contractor shall report on the status of milestones and deliverables in Pisces. Reports shall be completed either monthly or quarterly as determined by the BPA COTR. Additionally, when indicating a deliverable milestone as COMPLETE, the contractor shall provide metrics and the final location (latitude and longitude) prior to submitting the report to the BPA COTR.

Deliverable Specification:

Milestone Title	Start Date	End Date	Status	Milestone Description
A. May 2011 (5/9/2011 - 5/31/2011)	6/1/2011	6/7/2011	Inactive	
B. Jun 2011 (6/1/2011 - 6/30/2011)	7/1/2011	7/7/2011	Inactive	
C. Jul 2011 (7/1/2011 - 7/31/2011)	8/1/2011	8/7/2011	Inactive	
D. Aug 2011 (8/1/2011 - 8/31/2011)	9/1/2011	9/7/2011	Inactive	
E. Sep 2011 (9/1/2011 - 9/30/2011)	10/1/2011	10/7/2011	Inactive	
F. Oct 2011 (10/1/2011 - 10/31/2011)	11/1/2011	11/7/2011	Inactive	
G. Nov 2011 (11/1/2011 - 11/30/2011)	12/1/2011	12/7/2011	Inactive	
H. Dec 2011 (12/1/2011 - 12/31/2011)	1/1/2012	1/7/2012	Inactive	
I. Jan 2012 (1/1/2012 - 1/31/2012)	2/1/2012	2/7/2012	Inactive	
J. Feb 2012 (2/1/2012 - 2/29/2012)	3/1/2012	3/7/2012	Inactive	
K. Mar 2012 (3/1/2012 - 3/31/2012)	4/1/2012	4/7/2012	Inactive	
L. Final Apr-May 2012 (4/1/2012 - 5/8/2012)	5/2/2012	5/8/2012	Inactive	

G: 119. Manage and Administer Projects

Title: 10.5 Manage and Administer CHaMP in three (3) watersheds
Description: This work element covers the management of on the ground efforts in the Wenatchee, Entiat, and Methow watersheds, including all staff associated with implementing the Columbia Habitat Monitoring Program (CHaMP) and any administrative work in support of on the ground efforts and in support of BPA's programmatic requirements such as metric reporting, financial reporting (e.g., accruals), and development of an SOW package (includes draft SOW, budget, spending plan, and property inventory) for annual contract renewal.

Deliverable Specification: The Contractor will develop a contract package using material provided by the CHaMP Lead Coordinator in a timely manner each year, i.e., products should be ready for submittal to BPA 120 days before the current contract expires, for contract renewal purposes. The package will contain a SOW, budget, and property inventory. The contractor will coordinate the contract preparation process with the CHaMP Lead Coordinator, Mike Ward, Terraqua, Inc.

Submit next year's SOW, Budget, and Property Inventory to the BPA COTR. The SOW should include location, planned metrics, and focal species information for those work elements that require it. If contractor or contractor's organization takes longer than 30 days to sign the contract, the contractor will need to send this funding package to BPA more than 90 days before the end of the current contract.



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Funding Package - Conduct internal review (e.g., Supervisor or Interagency)	10/1/2011	2/15/2012	Inactive	If necessary, submit next year's SOW and Budget for internal contractor review before submitting to BPA. Assuming this review takes 30 days, start this milestone 120 days before the end of the current contract.
B. Accrual - Submit September estimate to BPA	9/1/2011	9/10/2011	Inactive	Provide BPA with an estimate of contract work that will occur prior to September 30 but will not be billed until October 1 or later. Generally, this should be done by September 10.
C. Submit invoices on a monthly basis	5/12/2011	5/7/2012	Inactive	Contract Manager should review all expense charges included in contract invoices to ensure they are allowable, allocatable, and consistent with the approved line-item budget.
Deliverable: D. Funding Package - Submit draft to COTR		3/1/2012	Inactive	<i>See the Deliverable Specification above</i>

H: 132. Produce (Annual) Progress Report

Title: 10.2a Submit Progress Report for the period (5/2011) to (1/2012)

Description: The progress report for the Wenatchee, Entiat, and Methow subbasins summarizes the project goal, objectives, hypotheses, completed and uncompleted deliverables, problems encountered, lessons learned, and long-term planning. Examples of long-term planning include future improvements, new directions, or level of effort for contract implementation, including any ramping up or ramping down of contract components or of the project as a whole.

Progress reports must conform to BPA guidelines. See the "formatting guidelines" link at the Technical Reports and Publications page: <http://www.efw.bpa.gov/IntegratedFWP/technicalreports.aspx>.

If producing a technical report for this contract, a discrete experiment, or a peer-reviewed publication, use work element 183: Produce Journal Article.

Deliverable Specification: Use the attachment tab in Pisces to attach your progress report. Progress reports attached in Pisces will be posted on the web.

Planned Metrics: <None>

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Review progress report format requirements	9/1/2011	9/1/2011	Inactive	Contractor must review formatting requirements before starting the first draft of their report. Please follow the BPA-required format. http://www.efw.bpa.gov/IntegratedFWP/technicalreports.aspx
B. Internal review draft progress report for CHaMP in the Upper Columbia	11/15/2011	3/1/2012	Inactive	Progress report goes out for internal review.
C. Confirm BPA has posted the progress report	1/1/2012	5/1/2012	Inactive	It usually takes BPA 30-45 days to post the final version of a report. This milestone's end date should therefore be 45 days after the Deliverable milestone. You will receive an email from BPA confirming that your report has been finalized and posted to the web.
Deliverable: D. Attach Progress Report in Pisces		4/1/2012	Inactive	<i>See the Deliverable Specification above</i>

I: 132. Produce (Annual) Progress Report

Title: 10.2b Coordinate contributions to and review of CHaMP Annual Synthesis Report

Description: The CHaMP Lead Coordinator will work with collaborators to produce a logistics/lessons learned annual synthesis report for the CHaMP 2011 field season. This "lessons learned" annual report will be used to inform full implementation in 2012, including any adjustments that may be appropriate on the design or scope of the project.

The CHaMP Annual Synthesis report will:

- provide regular synthesis and reporting of habitat status results
- compare these results to available fish status and trend information
- inform adaptive management improvements for CHaMP, including comparison with other similar efforts such as PIBO and Washington State monitoring protocols with the goal of achieving use of fewer key parameters, greater efficiencies and lower costs;
- support Action Agencies requirements for the 2013/2016 Comprehensive Evaluations; and
- be written to inform agency and tribal decision-makers and specifically address key management questions and decisions.



Deliverable Specification: The CHaMP Lead Coordinator will coordinate contributions from collaborators for a logistics/lessons learned CHaMP annual synthesis report. The Lead Coordinator will assemble a draft annual synthesis report and solicit feedback from collaborators at a post-season meeting and from managers/ISRP at a workshop. This lesson learned/logistics annual report will summarize the project goal, objectives, hypotheses, completed and uncompleted deliverables, problems encountered, lessons learned, and long-term planning. Examples of long-term planning include future improvements, new directions, or level of effort for contract implementation, including any ramping up or ramping down of contract components or of the project as a whole.

Planned Metrics: <None>

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Review progress report format requirements	9/1/2011	9/15/2011	Inactive	Contractor must review formatting requirements before starting the first draft of their report. Please follow the BPA-required format. http://www.efw.bpa.gov/IntegratedFWP/technicalreports.aspx
B. Post-season program meeting including ISEMP staff and collaborators.	11/1/2011	11/15/2011	Inactive	This meeting will be a "post season" meeting to go over the field season, look at the data, discuss the protocol, review the draft logistics/lessons learned CHaMP Annual Synthesis report, and plan the next season. Meeting will be held at a location to be determined.
C. Compile field data	10/1/2011	12/1/2011	Inactive	All relevant data from the field season will be compiled ready for any applicable analysis to be included in the logistics/lessons learned annual synthesis report.
D. Submit draft logistics and lessons learned report for internal review	12/15/2011	12/15/2011	Inactive	Use this milestone if the annual report requires an internal review before being reviewed externally. Make sure to allow for both technical and policy reviews if necessary.
E. Attend workshop with managers and ISRP about logistics and lessons learned	12/15/2011	12/31/2011	Inactive	CHaMP collaborators will attend a workshop with BPA managers/ISRP to review the 2011 field season with respect to the logistics of implementing CHaMP and the lessons learned from the first pilot field season and to review the draft logistics/lessons learned CHaMP Annual Synthesis Report.
F. Submit draft logistics/lessons learned report for managers/IRSP review	1/31/2012	1/31/2012	Inactive	Use this milestone if the progress report requires external review.
Deliverable: G. CHaMP Annual Lessons Learned/Synthesis Report		1/31/2012	Inactive	<i>See the Deliverable Specification above</i>

J: 189. Coordination-Columbia Basinwide

Title: 10.2c CHaMP Program Coordination

Description: Implementation of CHaMP among the three pilot subbasins in the Upper Columbia, in the Salmon, the John Day, the Grande Ronde and Catherine Creek will require extensive coordination with the numerous entities who are participating in CHaMP, particularly in the area of data management, analysis, reporting, and dissemination of information. The CHaMP Lead Coordinator (Mike Ward, Terraqua) will represent the interests of CHaMP at meetings of the pilot subbasin coordinators and will coordinate electronically and in-person with these coordinators and other entities that are developing data management systems, analysis, reporting, and document/conference preparation materials related to CHaMP.

Deliverable Specification: Attend up to two (2) two-day meetings with pilot subbasin coordinators, and participate in one (1) two-day conference/meeting to disseminate results of CHaMP work to broad monitoring/research/management communities, from July 2011 through June 2012 at locations in Washington, Oregon, and Idaho.

Submit an electronic version of minutes from each of up to 3 meetings attended regarding program coordination.

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Attend program coordination meetings	7/1/2011	5/8/2012	Inactive	Attend up to two (2) two-day meetings with pilot subbasin coordinators, and participate in one (1) two-day conferences/meetings to disseminate results of CHaMP work to broad monitoring/research/management communities, from July 2011 through Dec 2011 at locations in Washington, Oregon, and Idaho. Submit an electronic version of minutes from each of up to 3 meetings attended regarding program coordination.
Deliverable: B. Meeting minutes		5/8/2012	Inactive	<i>See the Deliverable Specification above</i>

K: 189. Coordination-Columbia Basinwide

Title: 10.3 Develop and Implement Training for Field Methods

Description: The CHaMP protocol introduces many new methodologies and technologies into the field of habitat monitoring and as such training crews to implement CHaMP effectively and efficiently in their watersheds is critical.



Milestone Title	Start Date	End Date	Status	Milestone Description
B. Finalize protocol, study design, and methods in monitoringmethods.org	7/1/2011	10/31/2011	Inactive	The protocol (including temporal and spatial design) and methods for this work element are stored at monitoringmethods.org and need to be finalized (i.e., "Published" through monitoringmethods.org) at least 90 days before the close of this contract.
C. Collect and process macroinvertebrate drift samples according to CHaMP protocol	7/1/2011	9/30/2011	Inactive	<p>Macroinvertebrate drift samples will be collected from participating CHaMP watersheds on a regular basis throughout the field season, either weekly, monthly or bi-monthly, to ensure that all samples are analyzed and the data submitted to the CHaMP website by November 1, 2011.</p> <p>Processing of CHaMP stream macroinvertebrate drift samples will require the following procedures.</p> <p>Sample sorting – Separation of organisms from accompanying organic and inorganic materials retained by drift nets during sample collection. These drift samples will generally have a total volume of material that is under 500 ml, and contain between 50 and 500 organisms.</p> <p>Identification and size-class determination – Macroinvertebrates in drift samples will be categorized according to environment (terrestrial or aquatic), life-stage (pupa, larva, adult) and identified to a coarse taxonomic level (usually family). In addition, macroinvertebrates will be binned into size-classes based on their total body length.</p> <p>Biomass determination – The biomass (mg dry weight) of sample partitions will be measured after being placed in a drying oven until samples have reached a constant weight. (by Terrestrial, Aquatic Adults, Other Aquatics)</p>
E. Data Entry	7/1/2011	10/31/2011	Inactive	The contractor will be responsible for data entry and quality assurance. This work should be complete using aquatic invertebrate database applications built and maintained by the macro-invertebrate processing contractor. These applications must maintain taxonomic look-up tables, project and sample metadata, invertebrate count data recorded by taxon and size class, and biomass measurements. The database applications should support quality control procedures that ensure accurate data entry and quality assurance procedures to support review of completed data sets.
E. Protocol documentation	7/1/2011	10/31/2011	Inactive	Assist CHaMP collaborators in development of a macroinvertebrate drift sample processing protocol that documents each aspect of laboratory processing procedures.
F. Data delivery	7/1/2011	11/1/2011	Inactive	<p>Data will be delivered to the CHaMP project in an agreed upon data exchange format. The exchange format will include four files of comma separated values (csv). The four files are:</p> <ul style="list-style-type: none"> • Taxonomic.csv – metadata table that defines taxonomic codes including ITIS serial number, taxonomic hierarchy (phylum to species), lifestage, and any available information on functional feeding groups, habitat niche, or environmental tolerances. • Sample.csv – metadata table that describes the processed sample including site id, sample date and time, replicate number, sample jar, sorting technician, sorting time, and portion of sample sorted. • TaxonBySizeClassCount.csv – count data resulting from sample sorting. Data must include sample identifier, taxonomic identifier, size class, and observed count. • SampleBiomass.csv. – dry weight biomass of drift sample. Data must include sample identifier, taxonomic identifier, tare weight, and measured dry weight. <p>Contractor will coordinate with CHaMP data manager to refine formats of the four csv files after sorting and biomass procedures are finalized. Data will be delivered on a monthly basis for all samples processed during the previous month. Data files will be uploaded to a folder on a cloud file server maintained by CHaMP. Appropriate permissions to the file server will be setup and maintained by the CHaMP data manager.</p>
Deliverable: G. Processed drift macroinvertebrate samples		11/1/2011	Inactive	<i>See the Deliverable Specification above</i>



Inadvertent Discovery Instructions

BPA is required by section 106 of the National Historic Preservation Act (NHPA) to consider the effects of its undertakings on historic properties (16 USC 470). Prior to approving the expenditure of funds or conducting a federal undertaking, BPA must follow the section 106 process as described at 36 CFR 800. Even though BPA has completed this process by the time an undertaking is implemented, if cultural materials are discovered during the implementation of a project, work within the immediate area must stop and the significance of the materials must be evaluated and adverse effects resolved before the project can continue (36 CFR 800.13(b)(3)). The Inadvertent Discovery of Cultural Resources Procedure form outlines the steps to be taken and notifications to be made. If the undertaking takes place on tribal lands (16 USC 470w), BPA must also "comply with applicable tribal regulations and procedures and obtain the concurrence of the Indian tribe on the proposed action" (36 CFR 800.13(d)).

Inadvertent Discovery of Cultural Resources Procedure form:

<http://www.efw.bpa.gov/IntegratedFWP/InadvertentDiscoveryProcedure.pdf>

Terraqua, Inc.

Contract 53532

BPA Project 2011-006-00: Columbia Habitat Monitoring Program (CHaMP)

May 9, 2011 through May 8, 2012

		Qty	Unit		Unit Cost	COST
1	PERSONNEL SERVICES					\$563,476
	Administrative Scientist II, Michael Ward					
Task 10.2a	Reporting	(b)(4)	hours	@	(b)(4)	(b)(4)
Task 10.2b	Annual Synthesis Report	(b)(4)	hours	@	(b)(4)	(b)(4)
Task 10.2c	Program Coordination	(b)(4)	hours	@	(b)(4)	(b)(4)
Task 10.4	Repeat Sampling, Testing, and Assistance	(b)(4)	hours	@	(b)(4)	(b)(4)
	Administrative Scientist I, Nelle and Walker					
Task 10.1a	Wenatchee Status/Trend Habitat	(b)(4)	hours	@	(b)(4)	(b)(4)
Task 10.1b	Entiat Status/Trend Habitat	(b)(4)	hours	@	(b)(4)	(b)(4)
Task 10.1c	Methow Status/Trend Habitat	(b)(4)	hours	@	(b)(4)	(b)(4)
Task 10.2a	Reporting	(b)(4)	hours	@	(b)(4)	(b)(4)
Task 10.2b	Annual Synthesis Report	(b)(4)	hours	@	(b)(4)	(b)(4)
Task 10.2c	Program Coordination	(b)(4)	hours	@	(b)(4)	(b)(4)
Task 10.4	Repeat Sampling, Testing, and Assistance	(b)(4)	hours	@	(b)(4)	(b)(4)
	Senior Scientist I, Ward field, Tussing					
Task 10.3	Develop and Implement Training Program	(b)(4)	hours	@	(b)(4)	(b)(4)
	Scientist I, Moberg et al.					
Task 10.1a	Wenatchee Status/Trend Habitat	(b)(4)	hours	@	(b)(4)	(b)(4)
Task 10.1b	Entiat Status/Trend Habitat	(b)(4)	hours	@	(b)(4)	(b)(4)
Task 10.1c	Methow Status/Trend Habitat	(b)(4)	hours	@	(b)(4)	(b)(4)
Task 10.3	Develop and Implement Training Program	(b)(4)	hours	@	(b)(4)	(b)(4)
Task 10.4	Repeat Sampling, Testing, and Assistance	(b)(4)	hours	@	(b)(4)	(b)(4)
	Technican III Wittenbach, Adams, Dimodica, et al.					
Task 10.1a	Wenatchee Status/Trend Habitat	(b)(4)	hours	@	(b)(4)	(b)(4)
Task 10.1b	Entiat Status/Trend Habitat	(b)(4)	hours	@	(b)(4)	(b)(4)
Task 10.1c	Methow Status/Trend Habitat	(b)(4)	hours	@	(b)(4)	(b)(4)
Task 10.3	Develop and Implement Training Program	(b)(4)	hours	@	(b)(4)	(b)(4)
Task 10.4	Repeat Sampling, Testing, and Assistance	(b)(4)	hours	@	(b)(4)	(b)(4)
	Technician II, Ezell, Creager, et al.					
Task 10.1a	Wenatchee Status/Trend Habitat	(b)(4)	hours	@	(b)(4)	(b)(4)
Task 10.1b	Entiat Status/Trend Habitat	(b)(4)	hours	@	(b)(4)	(b)(4)
Task 10.1c	Methow Status/Trend Habitat	(b)(4)	hours	@	(b)(4)	(b)(4)
Task 10.3	Develop and Implement Training Program	(b)(4)	hours	@	(b)(4)	(b)(4)
Task 10.4	Repeat Sampling, Testing, and Assistance	(b)(4)	hours	@	(b)(4)	(b)(4)
	Technican I, et al.					
Task 10.1a	Wenatchee Status/Trend Habitat	(b)(4)	hours	@	(b)(4)	(b)(4)
Task 10.1b	Entiat Status/Trend Habitat	(b)(4)	hours	@	(b)(4)	(b)(4)
Task 10.1c	Methow Status/Trend Habitat	(b)(4)	hours	@	(b)(4)	(b)(4)
Task 10.3	Develop and Implement Training Program	(b)(4)	hours	@	(b)(4)	(b)(4)
Task 10.4	Repeat Sampling, Testing, and Assistance	(b)(4)	hours	@	(b)(4)	(b)(4)
2	Travel					\$70,682

Task 10.2c	Airfare Wenatchee to Portland, OR or other loc. in OR/WA/ID	(b)(4)	RT	@	(b)(4)	/RT	(b)(4)
Task 10.2c	Rental car and parking SEA or PDX (NOAA/BPA)	(b)(4)	RT	@	(b)(4)	/RT	(b)(4)
Task 10.3	Avis Car Rental Comprehensive Liability Insurance (\$1M coverage per incident) on 6 Avis vans for rental period (2-wk field training))	(b)(4)	vans	@	(b)(4)	/training event	(b)(4)
	Gas for 6 rental vans	(b)(4)	gallons	@	(b)(4)	/gallon	(b)(4) (b)(4)
Task 10.1a	Per Diem (Lodging plus M&IE) Washington Cities	(b)(4)	day/night	@	(b)(4)	/day	(b)(4)
Task 10.1a	Washington Cities (M&IE only)	(b)(4)	day/night	@	(b)(4)	/day	(b)(4)
Task 10.1b	Washington Cities	(b)(4)	day/night	@	(b)(4)	/day	(b)(4)
Task 10.1b	Washington Cities (M&IE only)	(b)(4)	day/night	@	(b)(4)	/day	(b)(4)
Task 10.1c	Washington Cities	(b)(4)	day/night	@	(b)(4)	/day	(b)(4)
Task 10.1c	Washington Cities (M&IE only)	(b)(4)	day/night	@	(b)(4)	/day	(b)(4)
Task 10.2c	Portland, OR	(b)(4)	day/night	@	(b)(4)	/day	(b)(4)
Task 10.2c	Washington Cities	(b)(4)	day/night	@	(b)(4)	/day	(b)(4)
Task 10.3	Washington Cities (M&IE only)	(b)(4)	day/night	@	(b)(4)	/day	(b)(4)
Task 10.3	Washington Cities	(b)(4)	day/night	@	(b)(4)	/day	(b)(4)
Task 10.4	Washington Cities	(b)(4)	day/night	@	(b)(4)	/day	(b)(4)
Task 10.1a	Field Trailer Rental Rental trailer (Entiat)	(b)(4)	months	@	(b)(4)	/month	(b)(4)
Task 10.1b	Rental trailer (Methow)	(b)(4)	months	@	(b)(4)	/month	(b)(4)
Task 10.1c	Rental trailer (Methow)	(b)(4)	months	@	(b)(4)	/month	(b)(4)
Task 10.1a	POV Mileage to/from(Rates from gsa.gov on 5/11/11 effective 1/1/11) RT to/among sites in Wenat.Subbasin from Riverside	(b)(4)	miles	@	(b)(4)	/mile	(b)(4)
Task 10.1b	RT to/among sites in Entiat Subbasin from Riverside	(b)(4)	miles	@	(b)(4)	/mile	(b)(4)
Task 10.1c	RT to/among sites in Methow Subbasin from Riverside	(b)(4)	miles	@	(b)(4)	/mile	(b)(4)
Task 10.2c	Wenatchee from Peshastin, WA	(b)(4)	trip	@	(b)(4)	mi/trip	(b)(4)
Task 10.2c	Wenachee, WA from Wauconda, WA	(b)(4)	trip	@	(b)(4)	mi/trip	(b)(4)
Task 10.2c	Misc. Mileage among sites	(b)(4)	miles	@	(b)(4)	/mile	(b)(4)
Task 10.2c	Wauconda to John Day, OR	(b)(4)	trip	@	(b)(4)	mi/trip	(b)(4)
Task 10.3	Wauconda to Training Sites	(b)(4)	trip	@	(b)(4)	mi/trip	(b)(4)
Task 10.3	Between site mileage	(b)(4)	miles	@	(b)(4)	/mile	(b)(4)
Task 10.4	Moving between Subbasins	(b)(4)	trips	@	(b)(4)	mi/trip	(b)(4)
Task 10.4	Between site mileage	(b)(4)	miles	@	(b)(4)	/mile	(b)(4)
3	Standard Daily Field Equipment Rate						\$11,880
Task 10.1a	Field Days	(b)(4)	days	@	(b)(4)	/day	(b)(4)
Task 10.1b	Field Days	(b)(4)	days	@	(b)(4)	/day	(b)(4)
Task 10.1c	Field Days	(b)(4)	days	@	(b)(4)	/day	(b)(4)
Task 10.3	Field Days	(b)(4)	days	@	(b)(4)	/day	(b)(4)
4	SUPPLIES						\$72,320
Task 10.2c	Printing Costs	(b)(4)			(b)(4)		(b)(4)
split 5-ways	Depth Rod - Home made	(b)(4)	each		(b)(4)	/each	(b)(4)
split 5-ways	Sample Jars	(b)(4)	case		(b)(4)	/case	(b)(4)
split 5-ways	Clip Boards	(b)(4)	each		(b)(4)	/each	(b)(4)
split 5-ways	Flagging bio orange transect layout	(b)(4)	case		(b)(4)	/case	(b)(4)

split 5-ways	Flagging wood fiber blue	(b)(4)	case		(b)(4)	/case	(b)(4)
split 5-ways	Sharpies (marking pens)		box			/box	
split 5-ways	Rebar (28" rebar 5/8")		feet			/foot	
split 5-ways	Hammer		each			/each	
split 5-ways	Maps		each			/each	
split 5-ways	Radios for communication within crew		set of 3			/set	
split 5-ways	Shade Umbrella		each			/each	
split 5-ways	Ruler		each			/each	
split 5-ways	Packing Tape		rolls			/roll	
split 5-ways	Write-in-Rain notebooks		each			/each	
split 5-ways	Rubber Gloves		box			/box	
split 5-ways	Ethanol		gallons			/gallon	
split 5-ways	Labels		box			/box	
split 5-ways	Watches		each			/each	
split 5-ways	Metal Wire (for metal tags and stream temp monitors)		box			/box	
split 5-ways	Zip ties		box			/box	
Task 10.5	Bulk Equipment Purchase for 10 Crews (see tab for details)		crews			/crew	
	RENT/UTILITIES						
Task 10.3	City of Brewster, Columbia Cove Facilities						\$8,305
Task 10.3	Camp sites for 70 people	(b)(4)	days	@	(b)(4)	/person/day	(b)(4)
Task 10.3	Rec Center/kitchen/gym		days	@		/day	
Task 10.3	Pool Passes (70)		days	@		/person/day	
5	SUBCONTRACTS (see tabs for budgets and justifications)						\$329,381
Task 10.3	Okanogan Highlands Productions, LLC : Training Facilities						(b)(4)
Task 10.4	Tetra Tech EC						
Task 10.6	Rhithron Associates Lab fees	(b)(4)	samples	@	(b)(4)	/sample	
6	Administrative Expense (10% of dir. exp. excl. travel)						\$41,724
Task 10.2c	Supplies	10%					(b)(4)
split 5-ways	Supplies	10%					
Task 10.3	Okanogan Highlands Productions, LLC : Training Facilities and Meals	10%	of subcontract total				
Task 10.3	Avis Car Rental	10%	of subcontract total				
Task 10.3	City of Brewster, Columbia Cove Facilities	10%	of subcontract total				
Task 10.4	Tetra Tech EC	10%	of subcontract total				
Task 10.5	Bulk Equipment Purchase for 10 Crews (see equipment tab for details)	10%					
Task 10.6	Rhithron Associates Lab Fees	10%	of subcontract total				
7	BUDGET TOTAL						\$1,097,769

Terraqua, Inc.

Contract 53532

BPA Project 2011-006-00: Columbia Habitat Monitoring Program (CHaMP)

May 9, 2011 through May 8, 2012

This worksheet describes costs for all of the equipment that will be used by each field crew to complete CHaMP field work.

These are Per Crew costs.

Some equipment will best be purchased in bulk by the CHaMP Program while other equipment will be purchased by collaborating crews.

This assumes 10 annual sites for temp loggers

Andy should purchase all the temp accessories and bring kits to training for each crew.

lines highlighted in yellow need additional information or review

			Purchase By ELR	Purchase by Crews	Purchase by Terraqua	Purchase by BPA				
Total Cost	quantity per watershed	price per item	\$13,531.58	\$0.00	\$6,193.95	\$0.00	Date ordered	Date expected	Back ordered date	Vendor
Cuffs	(b)(4)	(b)(4)			(b)(4)					Terraqua, inc.
site tubes										terraqua
Fines Grid										terraqua
Epoxy										Fox Industries
Wire Brush										Home Depot
Screw top PVC cylinder (Tidbit housing)										Home Depot
Attachment Wires										Home Depot
Neoprene										Jo-Ann Fabric
Air Temp Monitors										Thermoworks
USB Docking Station and Software										microdaq
On-set Tidbits										Onset Computer Corporation
Underwater Shuttle										Onset Computer Corporation
Housing Material (corrugated plastic sheeting, aluminum tape, box cutters, zip ties)										Home Depot
Chaining Pins (for discharge)										Forestry Suppliers
Compass Sunnto										Forestry Suppliers

	(b)(4)									http://www.pollardwater.com/pages_product/LamotteLLI4491DR.asp
Alkalinity kit (50 tests)	(b)(4)									Forestry Suppliers
Global waterflow Velocity Meter	(b)(4)									Forestry Suppliers
Custom Metal Forestry Tags (50/box) 7/8"x3"	(b)(4)									Forestry Suppliers
Monument Caps fits 5/8" rebar (200/pack)	(b)(4)									Forestry Suppliers
Extech Conductivity meter	(b)(4)									Forestry Suppliers
Extech Conductivity meter replacement cell module	(b)(4)									Forestry Suppliers
Calibration solution	(b)(4)									
Keson graduated Tape metric tape	(b)(4)									Forestry Suppliers
Foresight Version 2.2.5	(b)(4)									
Foresight DXM Software USB Key	(b)(4)	\$0.00								Rocky Mountain Transit Instruments
Nikon Nivo 5C Total Station	(b)(4)	\$7,412.35								Rocky Mountain Transit Instruments
Extra Battery Nikon Nivo C Series	(b)(4)	\$164.00								Rocky Mountain Transit Instruments
18X Eyepeice Nivo C Series	(b)(4)	\$205.00								Rocky Mountain Transit Instruments
Sokkia Heavy Duty Wood Tripod	(b)(4)	\$195.00								Rocky Mountain Transit Instruments
Seco 2.62M Ultralite Prism Pole	(b)(4)	\$115.00								Rocky Mountain Transit Instruments
Seco Mini Bi-Pod w Thumb Release	(b)(4)	\$118.00								Rocky Mountain Transit Instruments
Crain Round Level Rod (5 extentions, 7.6m)	(b)(4)	\$175.00								Rocky Mountain Transit Instruments
Bubble Level	(b)(4)	\$12.00								Rocky Mountain Transit Instruments
Double Male Prism Adapter	(b)(4)	\$12.25								Rocky Mountain Transit Instruments
Seco Standard Prism	(b)(4)	\$136.50								Rocky Mountain Transit Instruments
Seco Tilting Mini Prism Assembly	(b)(4)	\$75.00								Rocky Mountain Transit Instruments

Lufkin Metric Pocket Tape	(b)(4)	(b)(4)	\$9.00								Rocky Mountain Transit Instruments
Data logger (allegro MX color 128mb/2gb/bt)			\$2,587.00								Juniper Systems
NIMH battery			\$100.00								Juniper Systems
Field Case for Data Logger			\$57.00								Juniper Systems
12v car charger for Logger			\$15.00								Juniper Systems
Computer			\$1,163.25								HP Home Office Store
GPS Garmin Etrex Vista H			\$149.00								Garmin Store, Chicago
Camera Panasonic lumix ts3 and accessories (extra battery and car charger)			\$366.00								www.macconnection.com
Solar Path Finder			\$224.25								Solar Pathfinder
Solar Path Finder Software			\$148.98								Solar Pathfinder
HOBOWare Pro Mac/Win Software			\$92.00								Onset Computer Corporation
Drift Nets			\$0.00								ELR; is ELR purchasing and producing;
Depth Rod - Home made				x							
Sample Jars				x							
Clip Boards				x							
Flagging bio orange transect layout				x							
flaggingwood fiber blue				x							
Sharpies (marking pens)				x							
Rebar (28" rebar 5/8")				x							
Hammer				x							
Maps				x							
Radios for communication within crew				x							
Shade Umbrella				x							
Ruler				x							
Packing Tape				x							
Write-in-Rain notebooks				x							
Rubber Gloves				x							

Ethanol			x					
Labels			x					
Watches			x					
Metal Wire (for metal tags and stream temp monitors)	(b)(4)		x	\$0.00				Home Depot
zip ties			x					
GIS Software: ArcView, 3D Analyst, Spatial Analyst	(b)(4)				x			

Terraqua, Inc.

Contract 53532

Subcontract with Okanogan Highlands Events, Inc.

BPA Project 2011-006-00: Columbia Habitat Monitoring Program (CHaMP)

May 31, 2011 through June 12, 2011

		Qty	Unit		Unit Cost	COST
PERSONNEL (benefits & indirect included)						\$29,534
	Site Manager (available 16 hours per day)	(b)(4)	days	@	(b)(4) /hour	(b)(4)
	Camp Host (16 hrs/day)	(b)(4)	days	@	(b)(4) /hour	(b)(4)
	Building Host (17 hrs/day)	(b)(4)	days	@	(b)(4) /hour	(b)(4)
	Coordination and event planning services (OHE)	(b)(4)	days			(b)(4)
VEHICLES						\$4,610
	Drivers for pick up and return only (7) for two (2) trips	(b)(4)	hours	@	(b)(4) /hour	(b)(4)
	Drivers' per diem, 2 trips	(b)(4)	drivers	@	(b)(4) /day/driver	(b)(4)
	Rental 1 car to pick up van drivers	(b)(4)	trips	@	(b)(4) /trip	(b)(4)
	Accommodation for car driver	(b)(4)	nights	@	(b)(4) /night	(b)(4)
SUPPLIES/EQUIPMENT						\$30,150
	Sanitation	(b)(4)				
	Portapotties	(b)(4)	ea	@	(b)(4) /event	(b)(4)
	Handwashing station	(b)(4)	ea	@	(b)(4) /event	(b)(4)
	Meals (from OHE. Inc) for 70 people	(b)(4)	days	@	(b)(4) /day/person	(b)(4)
	Rental of tents	(b)(4)	ea	@	(b)(4) /event	(b)(4)
	One-time set up and take down of tents	(b)(4)				(b)(4)
	Rental of chairs (Dynamic Tents, Wenatchee, WA)	(b)(4)	ea	@	(b)(4) /chair	(b)(4)
	Rental of tables (Dynamic Tents, Wenatchee, WA)	(b)(4)	ea	@	(b)(4) /table	(b)(4)
	One time set up and take down of tables and chairs	(b)(4)				(b)(4)
Miscellaneous						\$4,150
	Internet wireless service (Community Net, Omak, WA)	(b)(4)				(b)(4)
	Routers (1 gig)	(b)(4)	ea	@	(b)(4) ea	(b)(4)

	Coffee Pots (Nels Café)	(b)(4)				(b)(4)
	Power distribution: Power strips	(b)(4)	ea	@	(b)(4)	ea
	Rental gang boxes	(b)(4)	ea	@	(b)(4)	ea
	Extension cords (100 ft)	(b)(4)	ea	@	(b)(4)	/ft/wk
	Extension cords (50 ft)	(b)(4)	ea	@	(b)(4)	/ft/wk
	Projection Screen	(b)(4)	ea	@	(b)(4)	/event
	Tableware 2 meals/day (plates, cups, spoons, knives, napkins)	(b)(4)	days	@	(b)(4)	/person/meal/day
	Drinking water	(b)(4)	carboys	@	(b)(4)	/carboy
	Ice coolers (Camp)	(b)(4)	ea	@	(b)(4)	ea
	Ice coolers (vans)	(b)(4)	es	@	(b)(4)	es
Subtotal						\$68,444
Taxes					7.70%	\$5,270
BUDGET TOTAL						\$73,714

Terraqua, Inc.

Contract 53532

BPA Project 2011-006-00: Columbia Habitat Monitoring Program (CHaMP)

May 9, 2011 through May 8, 2012

SUBCONTRACT: Tetra Tech - CHaMP Monitoring			Training	Coordination and Administration	Field Surveys	Deliver Data to CHaMp Website - QA/QC							TOTAL	
													Hours	Extended Total
Personnel	Work Title	Contract Category	2011 Rate	Task 1 Hrs/\$\$	Task 2 Hrs/\$\$	Task 3 Hrs/\$\$	Task 4 Hrs/\$\$	Task 6 Hrs/\$\$	Task 7 Hrs/\$\$	Task 8 Hrs/\$\$	Task 9 Hrs/\$\$	Task 10 Hrs/\$\$	Hours	Extended Total
TTECI STAFF														
(b)(6)	Lead Sci. W/PM	Eng/Sci/Pla	(b)(4)	(4)										(b)(4)
	Biologist	Eng/Sci/Pla												
	Project Admin.	Senior Pro												
	Budget Tracking	Project Ad												
	Procurement	Asst. Project												
	WP / Secr./ Inv.'g	Senior Sec												
LABOR HOURS SUBTOTAL				8	24	480	40	-	-	-	-	-	552	
LABOR COST SUBTOTAL				\$992	\$2,262	\$61,120	\$5,120	\$0	\$0	\$0	\$0	\$0		\$69,494
EXPENSES			<u>Unit Rate</u>											<u>Exp.Costs</u>
Subcontractor														
INCA -	Project Manager		(b)(4)	(4)										(b)(4)
	Field Tech IV													
Western W	Field Technician													
Travel														
	- Rental Car													
	- Mileage													
	- Lodging													
	- Per Diem													
	- Misc. Travel Expenses													
ODCS														
	- Computers													
EXPENSES SUBTOTAL				\$12,031	\$553	\$70,164	\$1,500	\$0	\$0	\$0	\$0	\$0		\$84,249
TOTAL ESTIMATED COST				\$13,023	\$2,815	\$131,284	\$6,620	\$0	\$0	\$0	\$0	\$0		\$153,743

FEE ON EXPENSES		10%	\$1,203	\$55	\$7,016	\$150	\$0	\$0	\$0	\$0	\$0			\$8,424
TOTAL LABOR COSTS, EXPENSES, &			\$14,226	\$2,870	\$138,300	\$6,770	\$0	\$0	\$0	\$0	\$0			\$162,167

Terraqua, Inc.

Contract 53532

Subcontract with Rhithron Associates

BPA Project 2011-006-00: Columbia Habitat Monitoring Program (CHaMP)

May 31, 2011 through November 1, 2011

	<u>Qty</u>	<u>Unit</u>	<u>Unit Cost</u>	<u>COST</u>
PERSONNEL (benefits & indirect included)				\$93,500
Rhithron Associates	(b)(4)	samples @	(b)(4) /sample	\$93,500

MASTER AGREEMENT

Mail Invoice To:

Program Analyst - KEWB-4
Bonneville Power Admin. - PBL
P. O. Box 3621
Portland OR 97208-3621

Contract : 00027480
Release : 00000
Page : 1

Vendor:

TERRAQUA INC
PO BOX 85
WAUCONDA WA 98859

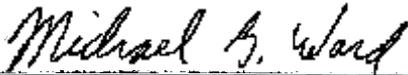
Please Direct Inquiries to:

MARK H. NADEAU
Title: CONTRACT SPECIALIST
Phone: 503-230-5889
Fax : 503-230-4508

Attn: MICHAEL B WARD

Contract Title: 2003-017-00 EXP ISEMP WENATCHEE/ENTIAT COORDINATION

Performance Period: 07/01/06 - 09/30/09



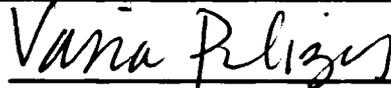
Contractor Signature

Michael B. Ward, Vice President, Terraqua, Inc.

Printed Name/Title

May 17, 2006

Date Signed



BPA Contracting Officer

05MAY06

Date Signed

This award contains the following - TEXT ATTACHED

CONTRACT TERMS AND CONDITIONS

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UNIT 1 — SCHEDULE

CONTRACT TYPE (7-1) (SEP 98)(BPI 7.1.9)

This is a Master Agreement with Releases issued on a Time and Materials Basis.

INDEFINITE-QUANTITY CONTRACT: ORDERING (7-5)(M) (MAY 06)(BPI 7.2.5.1.1)

- (a) This is an indefinite-quantity contract. The Contractor shall furnish to BPA, when and if ordered, the supplies or services specified in the Schedule of Items. The quantities of supplies and services specified in the Schedule of Items are estimates only and are not purchased by this contract. Delivery or performance shall be at locations designated in orders.
- (b) Only orders placed by individuals, or by BPA offices, that are specifically designated in writing by the Contracting Officer, are valid orders. If mailed, a delivery order is considered "issued" when BPA deposits the order in the mail. Orders may also be issued orally or by facsimile. Orders may also be issued electronically as an unalterable, electronic read-only formatted document transmitted via the Internet. A binding order will be formed when the Contracting Officer or his/her authorized representative transmits to the Contractor a complete and legible order that includes an order (release) number and the contract number, and receives from the Contractor a written or facsimile or electronic Internet confirmation. An order or confirmation transmitted via facsimile or the Internet will be deemed "writings."
- (c) Except for any limitations on quantities shown below, there is no limit on the number of orders that may be issued.
 - (1) Maximum, Total Orders: \$600,000
- (d) Any order issued during the effective period of this contract and not completed within that time shall be completed by the Contractor within the time specified in the order. The contract shall govern the Contractor's and BPA's rights and obligations with respect to that order to the same extent as if the order were completed during the contract's effective period; provided that the Contractor is not obligated to make deliveries within 30 days of the end of the performance period.
- (e) All orders are subject to the Terms and Conditions of this contract. In the event of conflict between an order and this contract, the contract shall control.

MASTER AGREEMENT: BASIC TERMS (7-6)(M) (MAY 06)(BPI 7.2.5.2.1)

- (a) Effective Period. This agreement is effective upon receipt and acceptance of this Agreement and continues until canceled by BPA or the Contractor in writing, or the date in Block 5, Page 1 of this master agreement, whichever occurs first.
- (b) BPA's Obligation. This agreement places no obligation on BPA to purchase a minimum amount of supplies or services. BPA is obligated only to the extent of authorized orders actually placed against this agreement.
- (c) Order Placement, Confirmation and Contract Formation. Only orders placed by the Contracting Officer will be considered valid orders. Orders may be issued electronically as an unalterable, electronic read-only formatted document transmitted via the Internet. A binding order will be formed when the Contracting Officer or his/her authorized representative transmits to the Contractor a complete and legible order that includes an order (release) number and the contract number, and receives from the Contractor a written or facsimile or electronic Internet confirmation. An order or confirmation transmitted via facsimile or the Internet will be

deemed "writings." There is no limit on the number of orders that may be issued, unless otherwise limited in the Schedule of Items.

- (d) Order Numbers. An "order number" will be the identifying number for each order placed against this agreement. Both this order number and the Master Agreement Number must be included on all correspondence, packing lists, invoices, etc.
- (e) Delivery Tickets. All deliveries made under this agreement shall be accompanied by a delivery ticket or sales slip which shall contain the following minimum information: (1) Name of Contractor; (2) Master Agreement Number; (3) Date of order; (4) Name of BPA employee placing order; (5) Order number; (6) Itemized list of supplies or services furnished (quantity, unit price, and extended price, less discounts; and (7) Date of delivery or shipment.
- (f) Variation In Quantity. No variation in the quantity of any item ordered will be accepted unless such variation has been caused by conditions of loading, shipping, or packing, or allowances in manufacturing processes, and then only to the extent, if any, specified elsewhere in this agreement or in any specific order.
- (g) Transportation Charges. No allowance will be made for packing, cartage, carting, or transportation charges unless specifically provided elsewhere in this agreement or unless provided at the time a specific order is placed.
- (h) Inspection and Acceptance. Inspection and acceptance will be at the place specified in each order for delivery or performance.
- (i) Taxes and Duties. The price includes all applicable Federal, State, and local taxes and duties in effect on the date an order is placed, but does not include any taxes from which BPA, the Supplier, or any specific order is exempt. Upon request of the Supplier, BPA shall furnish a Tax Exemption Certificate or similar evidence of exemption, if appropriate, with respect to any such tax not included in the price pursuant to this clause.
- (j) Payment.
- (1) Payment Due Date. Payment shall be due not later than thirty (30) calendar days after the later of the date on which BPA actually receives a proper invoice in the designated billing office or the date when the items delivered or completed services are accepted by BPA. For purposes of payment only, items will be deemed accepted not later than seven (7) working days after proper delivery. If delivered items or completed services are found defective, the provisions of this paragraph will be reapplied upon receipt of a corrected item or service.
- (2) Invoices. Suppliers may invoice monthly or at more frequent intervals as may be agreed to by the CO. Invoices shall include:
- supplier's name and address;
 - invoice date;
 - master agreement number;
 - order number;
 - description of products delivered or work performed;
 - price and quantity of item(s) actually delivered or rendered identified separately by order number,
 - the name and address of the person to whom payment will be made, and
 - name (where practicable), title, phone number, and mailing address of person to be notified in event of a defective invoice.

If the order is for supplies, each invoice shall also contain a reference to each delivery ticket and shall be supported by a copy of the delivery ticket. Failure to submit a proper invoice may result in a delay in payment.

(3) Prompt Payment Act. This agreement is subject to the provisions of the Prompt Payment Act (31 U.S.C. 3901 et seq.), and the regulations at 5 CFR Part 1315.

(4) Interest Penalty Payments. If interest penalty payments are determined due under the provisions of the Prompt Payment Act, payment shall be made at the rates determined by the U.S. Treasury, Section 12 of the Contract Disputes Act of 1978 (41 U.S.C. 611).

**SCHEDULE OF PRICES (22-51)
(SEP 98)**

The contractor shall provide all supplies/services according to the following schedule:

Category	Expense	Billing Rate (FY07)	Billing Rate (FY08)	Billing Rate (FY09)
Labor	Michael Ward, Senior Fish Ecologist (managerial, analytic, and other office tasks)			
	Michael Ward, Senior Fish Ecologist (field labor)			
	Jeremy Moberg, Fish/Watershed Technician			
	Keith Watson, Fisheries Technician			

SCIENTIFIC AND TECHNICAL INFORMATION REPORTING REQUIREMENTS (14-15)*
(SEP 98)(BPI 14.14.1) ***INCORPORATED BY REFERENCE**

CONTINUITY OF SERVICES (23-1)*
(SEP 98)(BPI 23.1.6) ***INCORPORATED BY REFERENCE**

**KEY PERSONNEL (23-2)
(SEP 98)(BPI 23.1.6)**

The personnel listed below are considered to be essential to the work being performed hereunder. No diversion shall be made by the Contractor without the written consent of the Contracting Officer. (List key personnel below)

Michael Ward

UNIT 2 — CONTRACT CLAUSES

PAYMENT AND TAXES

ELECTRONIC FUNDS TRANSFER PAYMENT (22-20)*
(JUN 01)(BPI 22.6.2) ***INCORPORATED BY REFERENCE**

BASIS OF PAYMENT -- TIME-AND-MATERIALS CONTRACTS (22-4)*
(SEP 98)(BPI 22.1.3) ***INCORPORATED BY REFERENCE**

PAYMENT (22-12)*
(OCT 05)(BPI 22.2.5) ***INCORPORATED BY REFERENCE**

CONTRACT CEILING LIMITATION (22-7)*
(SEP 98)(BPI 22.1.3) ***INCORPORATED BY REFERENCE**

FEDERAL, STATE, AND LOCAL TAXES (22-15)*
(SEP 98)(BPI 22.5.3.4) ***INCORPORATED BY REFERENCE**

INTEREST ON AMOUNTS DUE BPA (22-13)*
(SEP 98)(BPI 22.3.1) ***INCORPORATED BY REFERENCE**

LIMITATION ON TRAVEL COSTS (22-50) *
(JUL 04) ***INCORPORATED BY REFERENCE**

GENERAL CONTRACT ADMINISTRATION

**CLAUSES INCORPORATED BY REFERENCE (4-2)
(OCT 05) (BPI 4.10)**

This solicitation or contract incorporates one or more clauses by reference, with the same force and effect as if given in full text. These clauses are identified by their Title only with no text following. Information that is specific to this solicitation or contract is inserted immediately after the clause Title. Offerors are hereby notified that some clauses in solicitations may include blocks that must be completed by the offeror and submitted with its offer. In lieu of submitting the full text of those clauses, the offeror may identify the clause by paragraph identifier and provide the appropriate information with its offer. Upon request, the Contracting Officer will make the full text available. Also, the full text of a clause may be accessed electronically at this Internet address:

www.bpa.gov
DOING BUSINESS
Bonneville Purchasing Instructions

Or

URL: <http://www.bpa.gov/corporate/business/bpi/>.

APPLICABLE REGULATIONS (1-1)*
(SEP 98)(BPI 1.3.1) ***INCORPORATED BY REFERENCE**

SUBCONTRACTS (14-7)*
(SEP 98)(BPI 14.9.1) ***INCORPORATED BY REFERENCE**

CONTRACT ADMINISTRATION REPRESENTATIVES (14-2)*
(SEP 98)(BPI 14.3.2) ***INCORPORATED BY REFERENCE**

STOP WORK ORDER (14-14)*
(SEP 98)(BPI 14.12.1) ***INCORPORATED BY REFERENCE**

CHANGES - TIME-AND-MATERIALS (14-10)*
(SEP 98)(BPI 14.10.5.1.1) ***INCORPORATED BY REFERENCE**

MODIFICATION COST PROPOSAL - PRICE BREAKDOWN (14-13)***

(SEP 98)(BPI 14.10.5.1.1) *INCORPORATED BY REFERENCE**

PRICING OF ADJUSTMENTS (14-12)***

(SEP 98)(BPI 14.10.5.1.1) *INCORPORATED BY REFERENCE**

PRICE REDUCTION FOR INACCURATE COST OR PRICING INFORMATION (12-2)***

(SEP 98)(BPI 12.5.4.1) *INCORPORATED BY REFERENCE**

EXAMINATION OF RECORDS (12-3)***

(SEP 98)(BPI 12.8.8.1) *INCORPORATED BY REFERENCE**

ORDER OF PRECEDENCE (14-3)***

(SEP 98)(BPI 14.4.1.1) *INCORPORATED BY REFERENCE**

BANKRUPTCY (14-18)

(OCT 05)(BPI 14.19.1)

In the event the Contractor enters into proceedings relating to bankruptcy, whether voluntary or involuntary, the Contractor agrees to furnish written notification of the bankruptcy to the Contracting Officer responsible for administering the contract. This notification shall be furnished within five days of the initiation of the proceedings relating to bankruptcy filing. This notification shall include the date on which the bankruptcy petition was filed, the identify of the court in which the bankruptcy petition was filed, and a listing of Government contract numbers and contracting officers for all Government contracts against final payment has not been made. This obligation remains in effect until final payment under this contract.

STANDARDS OF CONDUCT AND BUSINESS PRACTICES

ORGANIZATIONAL CONFLICTS OF INTEREST (3-2)***

(SEP 98)(BPI 3.4.6) *INCORPORATED BY REFERENCE**

CERTIFICATION, DISCLOSURE, AND LIMITATION REGARDING PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (3-3)***

(SEP 98)(BPI 3.5.6) *INCORPORATED BY REFERENCE**

DRUG-FREE WORKPLACE (3-6)***

(SEP 98)(BPI 3.6.4) *INCORPORATED BY REFERENCE**

ENVIRONMENT AND SAFETY

SAFETY AND HEALTH – NON-ELECTRICAL CONTRACTOR(S) (15-2)

(OCT 05)(BPI 15.2.1)

(a) General

(1) The Contractor shall assure that no person employed on this contract works in surroundings or under conditions that are unsanitary, hazardous, or dangerous to their health or safety. In fulfilling these requirements, the Contractor shall comply with:

(A) Department of Labor Safety and Health Standards for Construction under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 327 et seq.).

(B) Occupational Safety and Health Act of 1970, (Public Law 91-598) and applicable rules and regulations as may have been delegated to the States.

(C) All Federal and state safety and health rules and regulations applicable to the contract work, as supplemented by BPA safety and health requirements stated below or elsewhere in the contract.

(2) If there are conflicts between any of the requirements referenced in this contract, the more stringent requirement will prevail.

(3) If the Contractor fails or refuses to promptly comply with any safety or health requirement, the Contracting Officer's Technical Representative (COTR) may notify the Contractor of any noncompliance and the Contractor shall take immediate corrective action. Such notice, whether oral or written, when served on the Contractor or any of its employees at the site of the work shall be deemed sufficient. If the Contractor fails or refuses to promptly correct the condition, the COTR may stop all or any portion of the work. When satisfactory corrective action has been taken, the contractor shall request permission to resume work from the COTR. When all work on a contract has been suspended for a Safety and Health violation, accident, or incident by the Contracting Officer (CO), the contractor shall meet with representatives of BPA's Contracting Office, and the BPA Safety Office to present a written statement outlining specific changes in work procedures that the contractor will make in order for work to safely resume. BPA must be satisfied that the contractor is capable of completing the contract in a safe manner before allowing work to resume. No time extension or additional costs, resulting from the directive to stop work shall be allowed. Failure of the COTR to provide notice of noncompliance or to stop work shall not relieve the Contractor of its responsibility for the safe performance of the work.

(4) The Contractor shall maintain an accurate record of, and shall immediately report to the COTR in the manner prescribed by the latter, all cases of death, occupational diseases, and injury arising from, or incident to, performance of work under this contract. The record and report shall include a description of the preventative measures to be taken to avoid recurrence, any restitution or settlement made, or the status thereof. The contractor shall complete and file with the COTR, BPA form 6410.15e (Contractor's Report of Personal Injury, Illness, or Property Damage Accident) within five (5) working days of such an occurrence.

(5) In case of an injury, the Contractor shall have 30 days to make full restitution or settlement. If the Contractor fails to make full restitution or settlement within 30 days, BPA may:

(A) Make, or cause to be made, the required remedial action or cash settlement to the person or persons who have been injured, and

(B) Charge to the Contractor's account an equitable amount, not to exceed \$2,500, for any injury claim. More than one such payment, and charge, can be assessed if more than one injury has occurred.

(6) The Contractor bears sole responsibility for ensuring that all personnel engaged in work related to the contract possess the necessary knowledge and skills to perform their work safely and to otherwise function in compliance with the foregoing criteria. (See also the Material and Workmanship clause)

(7) The Contractor shall hold BPA harmless from any and all suits, actions, and claims for injuries to or death of persons arising from any act or omission of the Contractor, its subcontractors, or any employee of the Contractor or subcontractors, in any way related to the work or operations under this contract.

(8) The Contractor shall indemnify and hold harmless the property owners or parties lawfully in possession against all claims or liabilities asserted by third parties, including all governmental agencies, resulting directly or indirectly from the Contractor's wrongful or negligent acts or omissions.

(9) Nothing stated herein shall be construed to be a limitation on the Contractor's liability. The rights and remedies of BPA provided in this clause are in addition to any other rights and remedies provided by law or under this contract.

(b) Personal Protective Equipment. The Contractor shall furnish non-conductive hard hats and all other required safety and personal protective equipment, except that which has been specified to be furnished by BPA. All

persons on all construction projects shall wear non- conductive hard hats meeting the requirements of OSHA/ANSI.

BONDS AND INSURANCE

INSURANCE (16-2) (SEP 03)(BPI 16.3.3)

- (a) The following minimum kinds and amounts of insurance are applicable in the performance of the work under this contract. All insurance required by this paragraph shall be in a form and amount and for those periods as the Contracting Officer may require or approve and with insurers approved by the Contracting Officer.
- (1) **Workers' compensation and employer's liability.** Contractors are required to comply with applicable Federal and State workers' compensation and occupational disease statutes. Employer's liability coverage of at least \$100,000 shall be required. BPA may require Contractors who are individuals (whether incorporated or not) to carry workers' compensation to protect agency interests. The Contracting Officer shall advise the Contractor regarding specific requirements.
 - (2) **General liability.** The contractor shall provide general liability insurance of at least \$1,000,000 per occurrence. Any policy aggregate limits which apply, shall be modified to apply to each location and project. The policy shall name BPA, its officials, officers, employees and agents, as insureds with respect to the contractor's performance of services. The contractor's policy shall be primary to any insurance or self-insurance programs of BPA.
 - (3) **Automobile liability.** The contractor shall provide automobile liability insurance covering the operation of all automobiles used in performing the contract. Policies shall provide limits of at least \$1,000,000 per accident and include coverage for all owned, non-owned and hired automobiles.

INSPECTION AND WARRANTY

INSPECTION - SERVICES AND CONSTRUCTION (18-4)* (SEP 98)(BPI 18.3.1) ***INCORPORATED BY REFERENCE**

WARRANTY - SERVICES (18-11)* (SEP 98)(BPI 18.5.1) ***INCORPORATED BY REFERENCE**

TERMINATION

TERMINATION FOR CONVENIENCE BY EITHER PARTY (20-1)* (SEP 98)(BPI 20.3.1) ***INCORPORATED BY REFERENCE**

TERMINATION FOR DEFAULT (20-3)* (SEP 98)(BPI 20.5.1) ***INCORPORATED BY REFERENCE**

DISPUTES

APPLICABLE LAW (21-5)* (SEP 98)(BPI 21.3.12) ***INCORPORATED BY REFERENCE**

DISPUTES (21-2)* (SEP 98)(BPI 21.3.12) ***INCORPORATED BY REFERENCE**

UNIT 3 — STATEMENT OF WORK

INTEGRATED STATUS & EFFECTIVENESS MONITORING PROGRAM PROJECT # 2003-017-00

Purpose/Justification

Project #2003-017-00 seeks to develop two novel monitoring and evaluation programs: (i) subbasin-scale pilot status and trend monitoring efforts for anadromous salmonids and their habitat in the Wenatchee, John Day and South Fork Salmon River basins, and (ii) effectiveness monitoring for suites of habitat restoration projects in selected watersheds within the three target subbasins. This work – critical for implementing the 2000 NMFS FCRPS Biological Opinion (RPA Actions 180, 181, and 183) (BiOp) and UPA’s from the 2004 BiOp – builds on current status and trend monitoring programs within each of these basins. Several regional and local organizations are funding and implementing these programs. In short, this project will integrate existing and new monitoring and evaluation activities in three pilot subbasins to help ensure that provisions of the BiOp are satisfied.

This Master Agreement will enable the Bonneville Power Administration (Bonneville) to continue to implement Project #2003-017-00 in the Wenatchee and Entiat subbasins. Specifically, this work will define cooperative agreements under which the salmonid and habitat status, trend and effectiveness monitoring program design, development and implementation will occur. Meetings with coordinators in the Oregon and Idaho pilot subbasins will help ensure that standard methods are developed and implemented. Detailed cooperative agreements are needed to partition particular tasks of the monitoring program among several project collaborators. The development of cooperative agreements will occur in parallel with the initial phases of monitoring program design and implementation.

SCHEDULE : 7/1/06 TO 6/30/13

OBJECTIVES:

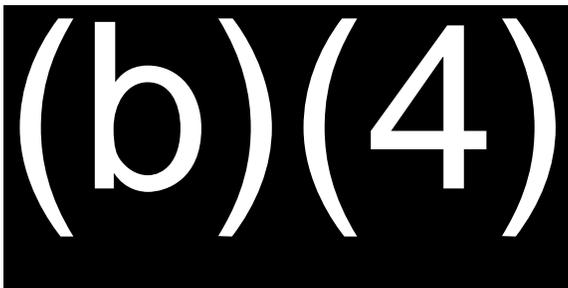
- Objective 1. Coordinate contract development between Bonneville and entities participating in implementation of the ISEMP program in the Wenatchee/Entiat and other pilot subbasins.
- Objective 2. Coordinate contract implementation between Bonneville and entities participating of the ISEMP program in the Wenatchee/Entiat and other pilot subbasins to insure that implementation activities meet the purpose and needs of the ISEMP program.
- Objective 3. Implement monitoring activities.
- Objective 4. Coordinate the design and testing of a data management system to support the program.
- Objective 5. Analyze and report results related to the implementation of monitoring activities.

COMPENSATION SCHEDULE

This section details anticipated costs that might be incurred in work undertaken for the ISEMP program in the Wenatchee and Entiat subbasins. Final costs for any work would be dependent on the development of specific scopes of work. Furthermore, the ISEMP Program could realize savings over the following rates depending on final work schedules and other project specifics.

Terraqua Inc. bills for services and related direct costs on a time and expense basis unless otherwise arranged. Charges for personnel include overhead, FICA, other taxes, and routine phone, fax, and in-house photocopying costs, with the exception of hosted conference calls, document publication, or large photocopying jobs which are billed as direct project expenses. All direct expenses incurred by Terraqua Inc. required for the proper performance of services, including but not limited to expenses incurred in report preparation, data analysis, project coordination, and travel costs other than mileage or per diem, are billed at 1.1 times the amount invoiced. All services performed by sub-consultants are billed at 1.1 times the amount of charges invoiced to Terraqua Inc.

Out-year costs are estimates that are subject to change depending on unpredictable market factors. Estimated labor rates for out-years are trend-based internal projections that reflect anticipated availability. Estimated rates for years later than FY09 can be better estimated in subsequent years.

Category	Expense	Billing Rate (FY07)	Billing Rate (FY08)	Billing Rate (FY09)
Labor	Michael Ward, Senior Fish Ecologist (managerial, analytic, and other office tasks)			
	Michael Ward, Senior Fish Ecologist (field labor)			
	Jeremy Moberg, Fish/Watershed Technician			
	Keith Watson, Fisheries Technician			
Travel/Lodging	Field equipment (rental rates depending on project need)	Need based	Need based	Need based
	Vehicle Mileage	Per federal regulations of the current year.		
	Air Fare (Spokane to Portland/Seattle)	Actual cost.	Actual cost.	Actual cost.
	Car Rental (Portland/Seattle)	Actual cost.	Actual cost.	Actual cost.
	Per Diem	Per federal regulations of the current year.		

BONNEVILLE
POWER ADMINISTRATION

RELEASE

Mail Invoice To:

F & W Invoices - KEWB-4
Bonneville Power Admin. - PBL
P. O. Box 3621
Portland OR 97208-3621

Contract : 00027480
Release : 00001
Page : 1

Vendor:

TERRAQUA INC
PO BOX 85
WAUCONDA WA 98859

Please Direct Inquiries to:

MARK H. NADEAU
Title: CONTRACT SPECIALIST
Phone: 503-230-5889
Fax : 503-230-4508

Attn: MICHAEL B WARD

Contract Title: 200301700 EXP ISEMP COORDINATION FOR WENATCHEE/ENTIAT - TERRAQUA

Performance Period: 07/01/06 - 06/30/07

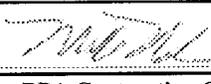

Contractor Signature

Michael B. Ward, Vice-President, Terraqua, Inc

Printed Name/Title

5/4/07

Date Signed


BPA Contracting Officer

May 4, 2007

Date Signed

This award contains the following - TEXT ATTACHED

CONTRACT TERMS AND CONDITIONS

Contract Amendments

Title : AMEND BUDGET & SOW FOR NEW SUBCONTRACT

Amendment: 001

Amended Performance Period: -

B O N N E V I L L E
P O W E R A D M I N I S T R A T I O N

RELEASE

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Bonneville Power Admin. - PBL
P. O. Box 3621
Portland OR 97208-3621

Contract : 00027480
Release : 00001
Page : 1

Vendor:
TERRAQUA INC
PO BOX 85
WAUCONDA WA 98859

Please Direct Inquiries to:

MARK H. NADEAU
Title: CONTRACT SPECIALIST
Phone: 503-230-5889
Fax : 503-230-4508

Attn: MICHAEL B WARD

Contract Title: 200301700 EXP ISEMP COORDINATION FOR WENATCHEE/ENTIAT - TERRAQUA

Performance Period: 07/01/06 - 06/30/07

Contractor Signature

Printed Name/Title

Date Signed



BPA Contracting Officer
May 4, 2007

Date Signed

This award contains the following - TEXT ATTACHED

CONTRACT TERMS AND CONDITIONS

Contract Amendments

Title : AMEND BUDGET & SOW FOR NEW SUBCONTRACT
Amendment: 001
Amended Performance Period: -

Contract No. 00027480
PI 2003-01-700
EXP ISEMP Wenatchee/Entiat Coordination
Release No. 01, Amendment 01

This Release authorizes the following:

1. Incorporate the attached Statement of Work and Budget.
2. Add \$22,000 to the Release amount for this work.

ALL OTHER TERMS AND CONDITIONS REMAIN THE SAME.

Two attachments: Statement of Work
Budget



Statement of Work Report

Project Title: Integrated Status/Effect Progr
Project #: 2003-017-00
Contract Title: 200301700 EXP ISEMP COORDINATION FOR WENATCHEE/ENTIAT - TERRAQUA
Contract #: 27480 REL 1 **Amendment #:** 1
Province: Systemwide **Subbasin:** Systemwide Projects
Workorder ID: 129074 **Task ID:** 1
Contract Type: Release **Pricing Type:** Time and Materials
Contractor(s): Terraqua, Inc. (Prime - TERRAQUA00)
BPA Internal Ref: Amd1
SOW Validation: Last validated 04/25/2007 with 0 problems, and 0 reviewable items

Contacts:

Name	Role	Organization	Phone	Email	Address
Mike Ward	Contract Manager	Terraqua, Inc.	(509) 486-2426	wardski@televar.com	100 Summer Road Wauconda WA 98859-
Nancy Weintraub	Env. Compliance Lead	Bonneville Power Administration	(503) 230-5373	nhweintraub@bpa.gov	P.O. Box 3621, Mailstop - KEC-4 Portland, OR 97208-3621
Mark Nadeau	Contracting Officer	Bonneville Power Administration	(503) 230-5889	mhnadeau@bpa.gov	905 NE 11th Ave. Mailstop NSSP-4 Portland OR 97232
Chris Jordan	Interested Party	National Oceanic and Atmospheric Administration (NOAA)	(541) 754-4629	chris.jordan@noaa.gov	2725 Montlake Blvd. East Seattle WA 98112-2097
Pamela Nelle	Supervisor	Terraqua, Inc.	(509) 548-0899	nelle@genext.net	PO Box 404 Peshastin WA 98847
David Byrnes	COTR	Bonneville Power Administration	(503) 230-3171	dmbyrnes@bpa.gov	Bonneville Power Administration Fish and Wildlife Program 905 NE 11th Ave. (97232) PO Box 3621 Portland OR 97208-3621

Work Element Table of Contents:

<u>Work Element - Work Element Title</u>	<u>EC Needed*</u>	<u>Estimate</u>	<u>(%)</u>
A : 118. Coordination - EXPIRED: 5.1 ISEMP Coordination		\$42,211	(15 %)
B : 174. Produce Plan - 5.2 Implementation Strategy and Tracking Tool		\$17,941	(7 %)
C : 160. Create/Manage/Maintain Database - 5.3 Data Management System Development		\$7,148	(3 %)



<u>Work Element - Work Element Title</u>	<u>EC Needed*</u>	<u>Estimate</u>	<u>(%)</u>
D : 118. Coordination - EXPIRED: 5.4 Pilot Subbasin Coordination		\$19,995	(7 %)
E : 174. Produce Plan - 5.5 Field Manual Development		\$2,933	(1 %)
F : 157. Collect/Generate/Validate Field and Lab Data - 5.6 Macroinvertebrate Analysis	*	\$28,115	(10 %)
G : 157. Collect/Generate/Validate Field and Lab Data - 5.7 Entiat Effectiveness Monitoring	*	\$98,242	(36 %)
H : 141. Produce Status Report - 5.8 ISEMP Year-three Program Review		\$20,415	(7 %)
I : 157. Collect/Generate/Validate Field and Lab Data - 5.9 Repeat Sampling in Wenatchee	*	\$7,341	(3 %)
J : 119. Manage and Administer Projects - 5.10a Project Management		\$4,210	(2 %)
K : 165. Produce Environmental Compliance Documentation - 5.10b Environmental compliance		\$500	(0 %)
L : 174. Produce Plan - 5.11 Develop an implementation strategy for Entiat IMW		\$22,000	(8 %)
M : 185. Produce Pisces Status Report - Periodic Status Reports for BPA		\$1,000	(0 %)
N : 132. Produce Annual Report - Submit Annual Report for the period July 2006 to June 2007		\$500	(0 %)
Total:		<u>\$272,551</u>	

* Environmental Compliance (EC) needed before work begins.

Contract Description:

AMENDMENT DESCRIPTION: In April 2007, this contract was amended by adding a two new work elements and a budget modification to fund these new work elements. The two new work element are Work Element L. 174: 5.11 Develop an implementation strategy for the Entiat IMW and Work Element N. 132: Produce Annual Report. All the milestones and other information within these new work elements are new. Associated work element budget modifications have been provided in an amended contract budget. This amendment does not require additional environmental compliance coordination as it only specifies the production of a report and does not involve any field work that could jeopardize endangered species, etc. No other changes to the contract were made during this amendment. See detailed justification for/description of proposed work for this amendment below at end of CONTRACT DESCRIPTION.

CONTRACT DESCRIPTION: Since its inception in FY2003, Project #2003-017-00 (the Integrated Status and Effectiveness Monitoring Program; ISEMP) has been developing two novel monitoring and evaluation programs: (i) subbasin-scale pilot status and trend monitoring efforts for anadromous salmonids and their habitat in the Wenatchee, John Day and South Fork Salmon River basins, and (ii) effectiveness monitoring for suites of habitat restoration projects in selected watersheds within the three target subbasins. This work - critical for implementing the 2000 NMFS FCRPS Biological Opinion (RPA Actions 180, 181, and 183) (BiOp) and UPAs from the 2004 BiOp - builds on current status and trend monitoring programs within each of these basins. Several regional and local organizations are funding and implementing these programs. In short, this project has integrated existing and new monitoring and evaluation activities in three pilot subbasins to help ensure that provisions of the BiOp are satisfied.

In FY2005, an effectiveness monitoring program-element was initiated in the Entiat Subbasin because restoration activities in this subbasin were more suited to scientific study. The ability of an effectiveness monitoring program to successfully detect subbasin-scale changes in fish populations brought about by



restoration actions requires the ability of the monitoring scientists to control, or at least strongly influence, the timing/location/magnitude of restoration activities. This influence directly affects the ability of the scientists to properly design the experiment and sample the necessary indicators.

The Entiat subbasin is particularly well suited to meet these needs because of its strong history of rigorous restoration and recovery planning, the opportune timing of its recovery efforts (just now beginning to get underway in earnest) that allow for concurrent monitoring design, and the supportive local planning group (the Entiat Watershed Planning Unit; EWPU) who place a high value on scientific assessment, planning, and evaluation through monitoring, and who have welcomed ISEMP's participation. Other unique qualities of the Entiat subbasin also benefit the ISEMP effectiveness monitoring program, including:

- The Entiat is adjacent to the Wenatchee where ISEMP status and trend program-elements are being executed and is comprised of the same ecotypes and has populations of the same target fish species (steelhead and spring chinook salmon) as the Wenatchee allowing for references and comparisons to be made between the two subbasins and their watersheds;
- In addition to the supportive EWPU, the agencies operating in the two subbasins are very similar and include some of the same contractors and field crews that are already working for ISEMP,
- Land management in the Entiat is a relatively stable mix of agriculture and national forest management compared to the rapidly urbanizing watershed of the Wenatchee,
- Factors limiting fish populations have been identified and narrowly defined; therefore, the actions necessary to reverse these factors will be straightforward and relatively easy to implement greatly improving the chance that the restoration program will to effect subbasin-scale changes that the monitoring program will be able to identify.

The initiation of a pilot effectiveness project (known as the Bridge-to-Bridge monitoring project) at a limited reach scale in FY2005 was successful. Therefore, the ISEMP program has proposed to expand this effort into a subbasin-scale effort in FY2006. The coordination needs of this effort are considerable and are reflected in this contract with Terraqua, Inc., who has been coordinating ISEMP monitoring efforts in the Wenatchee and Entiat subbasins since ISEMP's inception.

Terraqua's role has been, and continues to be, to enable the Bonneville Power Administration to continue to implement Project #2003-017-00 in the Wenatchee and Entiat subbasins. Objectives of this work have been, and continue to be:

- Coordinate contract development between Bonneville and entities participating in implementation of the ISEMP program in the Wenatchee/Entiat and other pilot subbasins.
- Coordinate contract implementation between Bonneville and entities participating of the ISEMP program in the Wenatchee/Entiat and other pilot subbasins to insure that implementation activities meet the purpose and needs of the ISEMP program.
- Implement selected monitoring activities.
- Coordinate the design and testing of a data management system to support the program with local ISEMP contractors.
- Analyze and report results related to the implementation of monitoring activities.

This contract represents a significant increase in scope and budget over the previous Terraqua Release #4 primarily due to the expansion of ISEMP activities into the Entiat subbasin. To offset the expanded costs associated with this expanded scope of work, Terraqua has: maintained the same rates for key personnel as were charged in previous years; has brought on new staff to assume some of the responsibilities previously executed by more senior staff; and has reduced the scope of some coordination elements that were more prominent in earlier releases as those elements have been completed or institutionalized to the point they are relatively maintenance-free. The following list describes details associated with some of the significant scope/budget differences compared to Release #4:

- An 80% increase in budget for "Coordination" (i.e. task 5.1 compared to 4.1) reflects the expanded effort to develop and manage a doubling of contracts and program-elements in the Entiat while maintaining work in the Wenatchee. This increase is also modeled on the actual number of hours spent on Coordination in FY2005 compared to the amount under-projected in 4.1.
- The decrease in budget for "Implementation Strategy" design (i.e. 5.2 vs. 4.2) is also a decrease compared to FY2004 Task 2.2. Task 2.2 was for the development of the implementation strategy for the Wenatchee. Task 5.2 is for comparable implementation strategy development in the Entiat plus maintenance of the



project tracking tool developed in 4.2. The better cost efficiency this year will result from using a lower-cost technical writer as well as experience learned from the last effort.

- The budget for Task 5.3 is about 60% lower than Task 4.3 because the data management system is largely built. Coordination efforts on this front are shifting to user interface development between ISEMP contractors and NOAA developers that requires less Terraqua time.
- The budget for Task 5.4 is 62% higher to accommodate a request that came out of a meeting between BPA and ISEMP staff in April 2006. This represents a 50% increase in hours (and a larger increase in expenses) to represent the program at more general meetings (Gerald, this is a scope/budget that could be whittled down pending a discussion with you).
- The budget for Task 5.5 is 50% lower than 4.5 because the work in task 5.5 will be largely confined to modifying a "working" document created in Task 4.5.
- Task 5.6 is 40% more expensive than Task 4.6 because of a 5% increase in macroinvertebrate analysis costs and 36% increase in the number of samples expected to be processed resulting from additional sampling in the Entiat.
- An expansion of scope under Task 5.7 explains the bulk of the increase in cost between Releases 4 and 5. However, the magnitude of this increase was reduced by a better (and lower) estimate of time required for each site based on experience in FY2005. The scope of this task includes sampling at 25 (compared with 10; 150% increase) status/trend sample sites and 20 (compared to 9, 122% increase) control/treatment sites. In light of this more-than-doubling of work, the 70% increase in cost is relatively modest.
- The cost of Task 5.9 has dropped about 5% for the same field sampling scope as in 4.9 due to the cost-efficiencies noted in Task 5.7. Furthermore, our per site cost of \$1,538 (which includes field labor and expenses, mobilization/demobilization, data entry, and training) is favorable compared to other ISEMP field work.
- Project management costs (Task 5.10) have risen to accommodate additional in-person program updates to BPA staff like the effort in April 2006.

(April 2007) AMENDMENT DESCRIPTION:

The ultimate goal of the Entiat IMW is to evaluate the biological response of ESA-listed species to projects intended to enhance aquatic habitat. The general hypothesis is that restoration efforts promoting a more natural, self-sustaining condition lead to significant population increases of target species. Since it is unlikely that population response to individual projects will be detectable, a comprehensive, watershed level restoration effort is required for a more reliable statistical evaluation of species response. The scope and scale of such an effort will require strategic direction, careful planning and long-term monitoring. To date, habitat restoration efforts in the Entiat IMW have not been of sufficient scale to enable empirical evaluation of restoration through ISEMP. The Project Partners estimate that up to 75 instream structures and off-channel restoration projects, completed within a three to five year timeframe, will be necessary to test hypotheses. Such an ambitious restoration project will require a project proponent and team of professionals to handle the myriad tasks required for successful and timely completion. Under this amendment GeoEngineer, Inc., will develop Phase 1 of a three phase plan that includes:

Phase 1: Scoping

- Develop Planning Strategy (Task 1)
- Develop Contact List and Schedule (Task 2)
- Develop Time and Cost Estimates (Task 3)

Phase 2: Wenatchee-Entiat ISTE Development

- Develop Conceptual Restoration Plan
- Permit Plan Framework
- Schedule and Cost Estimates

Phase 3: Construction

- Construct Preferred Design Alternative
- (Includes Monitoring and Maintenance).

The purpose of this amendment is to fund GeoEngineers, Inc. to complete Phase 1, developing an



Implementation Strategy for the treatment element of the ISEMP in the Entiat IMW. GeoEngineers is ideally suited to assist the Project Partners with the development of an Implementation Strategy for the treatment element of the ISEMP in the Entiat IMW. GeoEngineers has developed habitat restoration plans, secured project funding, completed permitting and design work, developed design specifications and bid packages, assisted with bid processes, and provided construction oversight and post-construction monitoring for dozens of projects in the Columbia River Basin and Pacific Northwest. Its staff is expert with this type of project work and includes: fisheries biologists, habitat biologists, fluvial geomorphologists, hydrologists, hydraulic modelers, licensed engineers, expert project managers, and experienced permit and regulatory assistance staff. GeoEngineers also offers other capabilities often needed but overlooked (e.g., expert facilitation, and geospatial capabilities such as GIS and LIDAR). Further, the project manager, John Monahan, has over 10 years experience in the Wenatchee-Entiat pilot basin supporting salmon recovery, habitat and watershed restoration, permitting and associated efforts. His experience working with the Project Partners, Wenatchee and Entiat River landowners, watershed Planning Unit members, permitting and regulatory agencies will be useful to the Project Partners' development of a suitable Implementation Strategy.



Statement of Work Report

Work Element Details

A: 118. Coordination

Title: EXPIRED: 5.1 ISEMP Coordination

Description: Terraqua will represent the interests of the ISEMP at meetings of the RTT, the Entiat Watershed Planning Unit Technical Team, and the mid-Columbia PUD's HCP Hatchery Committee, and will coordinate electronically and in-person with the following entities that may be involved in this Program: RTT, EWPU, U.S. Forest Service (USFS), Washington Department of Ecology (WDOE), Chelan PUD, Yakama Nation, NOAA-Fisheries, BPA, U.S. Bureau of Reclamation, Chelan County, Chelan County Conservation District, and other parties as necessary. Attend up to twelve (12) monthly Oversight Committee meetings to be held as part of regularly scheduled RTT meetings, attend up to four (4) quarterly meetings of the EWPU and/or up to six EWPU Technical Team meetings from July 2006 through June 2007. Attend up to two (2) meetings with BPA or NOAA at locations in Washington or Oregon from July 2006 through June 2007.

Terraqua will coordinate ISEMP contractors to help insure that contractors SOWs and deliverables meet ISEMP needs and that contractor budgets stay within the overall ISEMP budget and other available funds. Terraqua will also coordinate the analysis and reporting of ISEMP products with BioAnalysts, NOAA, and other program analysts.

Planned Metrics: <None>

Deliverable Specification: Provide a copy of written minutes from all RTT and EWPU meetings attended. Provide a monthly report of significant coordination issues

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Submit RTT Meeting minutes	7/1/2006	6/30/2007	Active	For any RTT meetings attended, submit minutes to BPA COTR via email.
B. Monthly, telephonically update COTR of significant coordination issues	7/1/2006	6/30/2007	Active	Monthly, conduct a telephone update with the BPA COTR regarding significant coordination issues, or anything that could jeopardize the overall project.
Deliverable: C. Meeting minutes / Coordination reports		6/30/2007	Active	<i>See the Deliverable Specification above</i>



B: 174. Produce Plan

Title: 5.2 Implementation Strategy and Tracking Tool

Description: Terraqua will continue to maintain the Project Tracking Tool developed in 2005-2006 that serves to document changes to scientific study design that have occurred since the inception of ISEMP to assist project contractors in conducting field work and to assist ISEMP analysts in the interpretation of project data. This tool will be expanded to include ISEMP activities in the Entiat Subbasin. This database will continue to be a "living" tool that will be periodically updated as necessary and will be electronically accessible to all ISEMP contractors and cooperators. This document will be maintained in working draft format through June 30, 2007 (and presumably thereafter by Terraqua or subsequently contracted project coordinators).

Terraqua will develop an "Implementation Strategy" for the Entiat Subbasin activities of ISEMP that will serve as "Appendix B" of the Upper Columbia Monitoring Strategy. This document will provide a comprehensive description of all ongoing and anticipated data collection efforts within this Program and will describe how that data will be compiled, analyzed, stored, and disseminated to meet the needs of Project # 2003-017-00. This document will assist BPA, NOAA, RTT, EWPU, and other Project participants in understanding the complex components of the Project, will assist with contract reviewing and management of future Project contracts, and will establish guidelines for the collection, compilation, and use of Project data in the long-term. A draft of the Implementation Strategy will be developed by October 31, 2006 to assist in the development of Project BiOp reporting. The final Implementation Strategy will be completed by January 31, 2007 to assist BPA in the review of contract for 2007 field work.

Planned Metrics: <None>

Deliverable Specification: Maintain the ISEMP Wenatchee/Entiat project tracking tool in a format that is accessible to all ISEMP contractors and cooperators (preferably via a central location, e.g., web site)

Develop an implementation strategy for the Entiat Subbasin in a format that is accessible to all ISEMP contractors and cooperators (preferably via a central location, e.g., web site)

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Draft Entiat Implementation Strategy document	7/1/2006	10/31/2006	Completed	Develop a draft Entiat Implementation strategy.
B. Final Entiat Implementation Strategy document	11/1/2006	4/30/2007	Active	Publish a final electronic, accessible Implementation Strategy for all contractors / cooperators of the ISEMP project.
C. Maintain working draft of project tracking tool with periodic updates	7/1/2006	6/30/2007	Active	Continue to update the project tracking tool such that maintenance can be done by future ISEMP coordinators (whether that continues to be Terraqua or not).
Deliverable: D. Implementation Strategy and Tracking Tool		6/30/2007	Active	<i>See the Deliverable Specification above</i>



C: 160. Create/Manage/Maintain Database

Title: 5.3 Data Management System Development

Description: The U.S. Bureau of Reclamation (USBR) and NOAA-Fisheries are continuing to develop a data management system to guide and capture data collected by ISEMP contractors. Terraqua will continue to serve as technical liaison between ISEMP contractors and this system's developers to ensure that the final data management system serves the ISEMP as implemented in the Upper Columbia basin. Terraqua will represent the interests of the Project at development meetings held by NOAA-Fisheries and USBR and will coordinate electronically and in-person with these and other entities that are developing the data management systems related to Project #2003-017-00. Attend up to three (3) one-day meetings from July 2006 through June 2007 at locations in Washington, Oregon, and Idaho.

Planned Metrics: <None>

Deliverable Specification: Submit, as developed, summaries of developments to the data management system and summaries of participation by ISEMP contractors.

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Submit summary of data management system development at project mid-point	7/1/2006	12/31/2006	Completed	No later than December 31, 2006, submit a report on developments to the data management system and ISEMP contractors participation.
Deliverable: B. Summary of data management system		6/30/2007	Active	<i>See the Deliverable Specification above</i>

D: 118. Coordination

Title: EXPIRED: 5.4 Pilot Subbasin Coordination

Description: Implementation of the Project among the three pilot subbasins, particularly in the area of data management, analysis, reporting, and dissemination of information to other users in the Columbia Basin and states of OR, ID, and WA, requires close coordination of numerous entities who are participating in the Project. Terraqua will represent the interests of the Project at meetings of the pilot subbasin coordinators and will Coordinate electronically and in-person with these coordinators and other entities that are developing data management systems, analysis, reporting, and document/conference preparation materials related to Project #2003-017-00. Attend up to three (3) one-day meetings with pilot subbasin coordinators, and participate in up to three (3) two-day conferences/meetings to disseminate results of ISEMP work to broad monitoring/research/management communities, from July 2006 through June 2007 at locations in Washington, Oregon, and Idaho.

Planned Metrics: <None>

Deliverable Specification: Submit an electronic version of minutes from each of up to 6 meetings attended regarding the database coordination.

Milestone Title	Start Date	End Date	Status	Milestone Description
Deliverable: A. Meeting Minutes		6/30/2007	Active	<i>See the Deliverable Specification above</i>



E: 174. Produce Plan

Title: 5.5 Field Manual Development

Description: Terraqua will revise, as needed, the ISEMP field manual suitable for use in training field personnel in the channel, riparian, and macroinvertebrate sampling protocols described in the Upper Columbia Monitoring Strategy (UCMS) as implemented by the ISEMP program in the Wenatchee and Entiat subbasins. Revisions will be based on field testing in ISEMP projects during the 2006 field season. This document will use existing documents (including original references used in the UCMS) as much as possible to preserve consistency and minimize costs. A draft of the revised Field Manual will be developed by January 31, 2007. The draft will be submitted to project cooperators (e.g. WDOE, USFS, et al.) and the RTT for review. The final Field Manual will be completed by April 30, 2007.

Planned Metrics: <None>

Deliverable Specification: Revise and update a field personnel training manual incorporating as much information as possible that is currently available. The document should be produce in Portable Document Format (PDF) or other generally accepted format. Any deviation requires prior approval from the BPA COTR.

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Prepare draft revised Field Manual	7/1/2006	1/31/2007	Completed	Submit draft Field Manual to reviewers by January 31, 2007
B. Receive draft field manual comments	2/1/2007	3/1/2007	Completed	Allow a one month review period of the draft field manual. Comments are to be submitted during this time to assure completion of the manual no later than April 30, 2007.
C. Final revised Field Manual	3/1/2007	4/30/2007	Active	Incorporate comments from reviewers no later than April 30, 2007.
Deliverable: D. Final Field Manual		5/15/2007	Active	<i>See the Deliverable Specification above</i>

F: 157. Collect/Generate/Validate Field and Lab Data

Title: 5.6 Macroinvertebrate Analysis

Description: Terraqua will subcontract with Rhithron Associates, Inc. in Missoula, Mt. for identification of fifty-one (51) macroinvertebrate samples collected by WDOE staff in the Wenatchee Subbasin in 2006. Terraqua, Inc. will also collect macroinvertebrate samples at up to forty-five (45) sites in the Entiat and five (5) sites in the Wenatchee subbasins (see Tasks 5.7 and 5.9 for details regarding these sites). At the end of field sampling in fall 2006, Terraqua, Inc. will transport macroinvertebrate samples to Rhithron. Terraqua/Rhithron will provide identification of macroinvertebrates to the lowest practical levels consistent with RIVPACS protocol, including midges and worms to genus or species using a 500-organism random subsample. Terraqua/Rhithron will deliver standardized metric calculations and will archive the identified fraction of the sample for one year.

Planned Metrics:
 * R, M, and E Focal Area : Tributaries
 * Primary R, M, and E Type : Action Effectiveness Research
 * Secondary R, M, and E Type : Action Effectiveness Research

Deliverable Specification: Per RIVPACS protocol, provide standardized metric calculations of Macroinvertebrates from up to 101 sites (51 in the Wenatchee collected by WDFW, 45 in the Entiat collected by Terraqua, and 5 in the Wenatchee collected by Terraqua).



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	7/1/2006	7/15/2006	Completed	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. Samples collected	7/15/2006	9/30/2006	Completed	Terraqua will collect macroinvertebrate samples at up to forty-five (45) sites in the Entiat and five (5) sites in the Wenatchee subbasins (see Tasks 5.7 and 5.9 for details regarding these sites). Also during this time, Washington Department of Ecology will be collecting samples in the Wenatchee subbasins at 51 sites.
C. Samples delivered to Rhithron Associates	9/30/2006	11/3/2006	Completed	At the end of field sampling in fall 2006, Terraqua, Inc. will transport macroinvertebrate samples collected by Terraqua and WDOE to Rhithron.
D. Data generated by Rhithron Associates and delivered to Terraqua/BPA	10/31/2006	4/30/2007	Active	Rhithron will provide identification of macroinvertebrates to the lowest practical levels consistent with RIVPACS protocol, including midges and worms to genus or species using a 500-organism random subsample. Rhithron will deliver standardized metric calculations and will archive the identified fraction of the sample for one year.
Deliverable: E. Macroinvertebrate Analysis		4/30/2007	Active	<i>See the Deliverable Specification above</i>

G: 157. Collect/Generate/Validate Field and Lab Data

Title: 5.7 Entiat Effectiveness Monitoring

Description: Terraqua will assist in the implementation of project effectiveness monitoring in the Entiat River under the ISEMP program. This work will include: monitoring of channel/riparian/macroinvertebrate conditions using protocols from the Upper Columbia Monitoring Strategy at twenty (20) restoration project control and treatment sites and at twenty-five (25) randomly located reference sites used for comparison of watershed status and trends with sites in the restoration project area; habitat quantification to support snorkeling work during three (3) snorkel surveys to be conducted by the USFWS at the thirteen (13) restoration project control and treatment sites which will be snorkeled in 2006-2007; coordination of the monitoring work conducted by USFWS, CCCD, and Terraqua; and data synthesis, analysis, and storage and preparation of a technical synthesis report that will include results from habitat, channel, riparian, fish abundance (redds, smolt production, and snorkel) observations by USFWS, CCCD, Terraqua and non-ISEMP agencies into a single project report.

Planned Metrics: * R, M, and E Focal Area : Tributaries
 * Primary R, M, and E Type : Action Effectiveness Research
 * Secondary R, M, and E Type : Action Effectiveness Research

Deliverable Specification: Submit in Microsoft Word format electronically

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	7/1/2006	7/15/2006	Completed	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).



Milestone Title	Start Date	End Date	Status	Milestone Description
B. Conduct habitat monitoring	7/18/2006	9/30/2006	Completed	Monitor channel/riparian/macroinvertebrate conditions using protocols from the Upper Columbia Monitoring Strategy at twenty (20) restoration project control and treatment sites and at twenty-five (25) randomly located reference sites used for comparison of watershed status and trends with sites in the restoration project area.
C. Support snorkel surveys with habitat measurements: 1	7/18/2006	8/31/2006	Completed	Quantify habitat to support snorkeling work during snorkel surveys to be conducted by the USFWS at the thirteen (13) restoration project control and treatment sites in late July to early August.
D. Data analysis	10/1/2006	5/31/2007	Active	Synthesize data, perform analyses, and store data in data management system.
E. First draft report	10/1/2006	3/31/2007	Completed	Produce a draft field data synthesis report that will include results from habitat, channel, riparian, fish abundance (redds, smolt production, and snorkel) observations by USFWS, CCCD, Terraqua and non-ISEMP agencies into a single project report. This report will focus on whether different field efforts have achieved the needs of the ISEMP Entiat Effectiveness program element and will briefly summarize these data in the context of the ISEMP Entiat Implementation Strategy goals and objectives. This report will not include in-depth analysis of data as that will be accomplished by other ISEMP contractors at different scheduling under related contracts.
F. Support snorkel surveys with habitat measurements: 2	10/17/2006	11/30/2006	Completed	Quantify habitat to support snorkeling work during snorkel surveys to be conducted by the USFWS at the thirteen (13) restoration project control and treatment sites in late October to November.
G. Support snorkel surveys with habitat measurements: 3	2/1/2007	3/31/2007	Completed	Quantify habitat to support snorkeling work during snorkel surveys to be conducted by the USFWS at the thirteen (13) restoration project control and treatment sites in February through March.
H. Final draft report	4/1/2007	6/30/2007	Active	Produce a final field data synthesis report that will include results from habitat, channel, riparian, fish abundance (redds, smolt production, and snorkel) observations by USFWS, CCCD, Terraqua and non-ISEMP agencies into a single project report. This report will focus on whether different field efforts have achieved the needs of the ISEMP Entiat Effectiveness program element and will briefly summarize these data in the context of the ISEMP Entiat Implementation Strategy goals and objectives. This report will not include in-depth analysis of data as that will be accomplished by other ISEMP contractors at different scheduling under related contracts. The relatively late date (in relation to when the field work is conducted) for this deliverable is required because of the need to synthesize reports from other agencies and due to the late field data collection season in March 2007.
Deliverable: I. Field Data Synthesis Report		6/30/2007	Active	<i>See the Deliverable Specification above</i>



H: 141. Produce Status Report

Title: 5.8 ISEMP Year-three Program Review

Description: Reporting for Project #2003-017 has been completed in the past by reports prepared by individual contractors or has been accomplished through BiOp reporting. BPA managers and ISEMP coordinators and other entities have expressed the desire to have the complete program summarized in a periodically updated program review document. In this work element, Terraqua will produce a document that compiles and coordinates the reports of all ISEMP contractors (from each of the three pilot subbasins and the umbrella group), describes all ISEMP progress in the first three years (including data from only the first two field seasons) of the program in relation to ISEMP's proposed goals and objectives, and documents changes in protocols/indicators being monitored that have resulted from data collected during the first three years of the program. This document will be stored on the ISEMP web site.

Planned Metrics: <None>

Deliverable Specification: Produce a document that can be shared with all participants as well as external parties via the ISEMP web site.

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Produce draft ISEMP Program Review	7/1/2006	8/31/2006	Completed	Develop a single document that compiles and coordinates the reports of all ISEMP contractors, describes all ISEMP progress in first three years (first two field seasons) of the program in relation to ISEMP proposed goals and objectives, and documents changes in protocols/indicators being monitored that have resulted from data collected during the first three years of the program. Circulate this draft document for review among ISEMP and BPA collaborators.
B. Produce final ISEMP Program Review	8/31/2006	9/30/2006	Completed	Publish an electronic, accessible, final document that compiles and coordinates the reports of all ISEMP contractors, describes all ISEMP progress in first three years (first two field seasons) of the program in relation to ISEMP proposed goals and objectives, and documents changes in protocols/indicators being monitored that have resulted from data collected during the first three years of the program. Store this document on the ISEMP web site.
Deliverable: C. ISEMP Year-Three Program Review		12/10/2006	Completed	<i>See the Deliverable Specification above</i>



I: 157. Collect/Generate/Validate Field and Lab Data

Title: 5.9 Repeat Sampling in Wenatchee

Description: Five of the 50 sites (10 percent) sampled by Washington Department of Ecology (WDOE) for habitat/channel/riparian/macroinvertebrate conditions will be resampled, per the Upper Columbia Monitoring Strategy, by an independent Terraqua field crew in order to estimate between crew measurement variability. The Terraqua crew will characterize channel and riparian habitat quality by collecting the same data for each specific indicator listed in Table 1 that is collected by WDOE. Participate in 5 days of annual training with WDOE in advance of the 2007 field season.

Planned Metrics: * R, M, and E Focal Area : Tributaries
 * Primary R, M, and E Type : Action Effectiveness Research
 * Secondary R, M, and E Type : Action Effectiveness Research

Deliverable Specification: Transmit channel characterization data along with Entiat habitat data and the bug data (although it is typically ready to go well in advance) after finishing the report writing process during which errors can sometimes become apparent. Collate, tabulate, and transmit data to WDOE in Access format.

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	7/1/2006	7/15/2006	Completed	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. Conduct field work	7/18/2006	9/30/2006	Completed	Five of the 50 sites (10 percent) sampled by Washington Department of Ecology (WDOE) for habitat/channel/riparian/macroinvertebrate conditions will be resampled, per the Upper Columbia Monitoring Strategy, by an independent Terraqua field crew in order to estimate between crew measurement variability. The Terraqua crew will characterize channel and riparian habitat quality by collecting the same data for each specific indicator listed in Table 1 that is collected by WDOE.
C. Participate in annual training with WDOE	6/1/2007	6/30/2007	Active	Participate in up to 5 days of field training with WDOE habitat crews in advance of the 2007 field season. Included within this training will be any revisions to the field manual and may include training in any database advancements that may have occurred since spring of 2006.
Deliverable: D. Final Channel Characterization Data		4/30/2007	Active	<i>See the Deliverable Specification above</i>



J: 119. Manage and Administer Projects

Title: 5.10a Project Management

Description: Manage the project. Also covers administrative work in support of on-the-ground efforts and in support of BPA's programmatic requirements such as metric reporting, financial reporting (e.g., accruals), and development of an SOW package (includes draft SOW, budget, spending plan, and property inventory).

Planned Metrics: <None>

Deliverable Specification: Submit next year's SOW, Budget, and Property Inventory to the BPA COTR. The SOW should include location information (latitude and longitude) for those work elements that require it. If contractor or contractor's organization takes longer than 30 days to sign the contract, the contractor will need to send this funding package to BPA more than 90 days before the end of the current contract.

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Prepare FY06 year-end accrual estimate	8/15/2006	9/15/2006	Completed	Provide estimate of expenses not yet invoiced, and not to be invoiced before the end of September 2006. Additional or superceding instructions may be provided by BPA as the end of fiscal year 2006 approaches.
B. Prepare FY07 SOW, budget, etc	3/1/2007	4/30/2007	Active	Provided funding is made available for additional work as defined under this current SOW, and additional protocol testing is required, submit a new SOW (via Pisces), budget, etc., no later than 90 days prior to the expiration of the current contract (i.e., June 30, 2007).
C. Prepare FY06 June accrual estimate	5/15/2007	6/15/2007	Active	Provide estimate of expenses not yet invoiced, and not to be invoiced before the end of June 2007. Additional or superceding instructions may be provided by BPA as the end of third quarter fiscal year 2007 approaches.
Deliverable: D. Funding Package - Submit draft to COTR		6/30/2007	Active	<i>See the Deliverable Specification above</i>

K: 165. Produce Environmental Compliance Documentation

Title: 5.10b Environmental compliance

Description: Ensure necessary documents are provided to BPA's Environmental Compliance group in sufficient time to allow for a compliance letter to be written prior to any ground-disturbing work. Coordinate with appropriate agencies regarding any permits that may be required.

Planned Metrics: Are herbicides used as part of work performed under this contract?:

Deliverable Specification: Provide necessary supporting documentation and assistance to BPA's Environmental Compliance Group (such as maps, design drawings, survey reports, permit applications, ESA documents, etc.) to assure a timely receipt of EC compliance letter.

Milestone Title	Start Date	End Date	Status	Milestone Description
Deliverable: A. Environmental Compliance supporting documentation		7/31/2006	Completed	<i>See the Deliverable Specification above</i>

L: 174. Produce Plan

Title: 5.11 Develop an implementation strategy for Entiat IMW

Description:



The ultimate goal of the Entiat IMW is to evaluate the biological response of ESA-listed species to projects intended to enhance aquatic habitat. The general hypothesis is that restoration efforts promoting a more natural, self-sustaining condition lead to significant population increases of target species. Since it is unlikely that population response to individual projects will be detectable, a comprehensive, watershed level restoration effort is required for a more reliable statistical evaluation of species response. The scope and scale of such an effort will require strategic direction, careful planning and long-term monitoring. To date, habitat restoration efforts in the Entiat IMW have not been of sufficient scale to enable empirical evaluation of restoration through ISEMP. The Project Partners estimate that up to 75 instream structures and off-channel restoration projects, completed within a three to five year timeframe, will be necessary to test hypotheses. Such an ambitious restoration project will require a project proponent and team of professionals to handle the myriad tasks required for successful and timely completion. Under this amendment GeoEngineer, Inc., will develop Phase 1 of a three phase plan that includes:

Phase 1: Scoping

- Develop Planning Strategy (Task 1)
- Develop Contact List and Schedule (Task 2)
- Develop Time and Cost Estimates (Task 3)

Phase 2: Wenatchee-Entiat ISTE Development

- Develop Conceptual Restoration Plan
- Permit Plan Framework
- Schedule and Cost Estimates

Phase 3: Construction

- Construct Preferred Design Alternative
- (Includes Monitoring and Maintenance).

The purpose of this amendment is to fund GeoEngineers, Inc. to complete Phase 1, developing an Implementation Strategy for the treatment element of the ISEMP in the Entiat IMW. GeoEngineers is ideally suited to assist the Project Partners with the development of an Implementation Strategy for the treatment element of the ISEMP in the Entiat IMW. GeoEngineers has developed habitat restoration plans, secured project funding, completed permitting and design work, developed design specifications and bid packages, assisted with bid processes, and provided construction oversight and post-construction monitoring for dozens of projects in the Columbia River Basin and Pacific Northwest. Its staff is expert with this type of project work and includes: fisheries biologists, habitat biologists, fluvial geomorphologists, hydrologists, hydraulic modelers, licensed engineers, expert project managers, and experienced permit and regulatory assistance staff. GeoEngineers also offers other capabilities often needed but overlooked (e.g., expert facilitation, and geospatial capabilities such as GIS and LIDAR). Further, the project manager, John Monahan, has over 10 years experience in the Wenatchee-Entiat pilot basin supporting salmon recovery, habitat and watershed restoration, permitting and associated efforts. His experience working with the Project Partners, Wenatchee and Entiat River landowners, watershed Planning Unit members, permitting and regulatory agencies will be useful to the Project Partners' development of a suitable Implementation Strategy.

Planned Metrics: <None>

Deliverable Specification: Terraqua/GeoEngineers will prepare a final work plan and budget that describes, depicts, and supports a recommended approach to accomplishing the work in Phase 2. This report will be brief and concise; reference supporting information and communication in appendices and will include a list of key contacts with contact information. This work plan will include elements necessary to draft a contract for completing Phase 2 including: a description of the project background, a description of the proposed approach, a task list identifying subtasks and deliverables and milestones, a description of the project personnel and their qualifications, and a budget broken down in two ways, by task/subtask and by category (personnel, expenses, indirect costs, etc.).

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Develop a report of the feasibility of creating a habitat action implementation strategy.	5/1/2007	6/30/2007	Inactive	Develop the report described in detail within the deliverable specifications. The final report for this work element will 1) be submitted to NOAA FISHERIES (also a contractor under this project) for use in a project level integrated Annual Report and 2) will be included in the final contract final report to BPA according to the terms of this contract.
Deliverable: B. ENTIAT RIVER RESTORATION ACTION PLANNING: PHASE I Report		6/30/2007	Inactive	<i>See the Deliverable Specification above</i>



M: 185. Produce Pisces Status Report

Title: Periodic Status Reports for BPA

Description: The Contractor shall report on the status of milestones and deliverables in Pisces. Reports shall be completed monthly. Additionally, when indicating a deliverable milestone as COMPLETE, the contractor shall provide metrics, the final location (latitude and longitude), focal species and an updated Work Element Budget prior to submitting the report to the BPA COTR.

Planned Metrics: <None>

Deliverable Specification:

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Jul 2006 (7/1/2006 - 7/31/2006)	8/1/2006	8/7/2006	Completed	
B. Aug 2006 (8/1/2006 - 8/31/2006)	9/1/2006	9/7/2006	Completed	
C. Sep 2006 (9/1/2006 - 9/30/2006)	10/1/2006	10/15/2006	Completed	
D. Oct 2006 (10/1/2006 - 10/31/2006)	11/1/2006	11/7/2006	Completed	
E. Nov 2006 (11/1/2006 - 11/30/2006)	12/1/2006	12/7/2006	Completed	
F. Dec 2006 (12/1/2006 - 12/31/2006)	1/1/2007	1/15/2007	Completed	
G. Jan 2007 (1/1/2007 - 1/31/2007)	2/1/2007	2/7/2007	Completed	
H. Feb-Mar 2007 (2/1/2007 - 3/31/2007)	4/1/2007	4/15/2007	Completed	
I. Final Apr-Jun 2007 (4/1/2007 - 6/30/2007)	6/16/2007	6/30/2007	Active	



N: 132. Produce Annual Report

Title: Submit Annual Report for the period July 2006 to June 2007

Description: This report will cover all work elements within this contract. Individual Annual reports are to be consolidated by the PI into a Project Level Annual Report, and only the consolidated report will be posted on the BPA website.

Planned Metrics: <None>

Deliverable Specification: Upload annual report for the period 7/1/2006 to 6/30/07. Currently, this is done via the BPA website; down the road, this may be done via attachments supported directly within Pisces. For guidance on how/where to upload: http://www.efw.bpa.gov/Integrated_Fish_and_Wildlife_Program/technicalreports.aspx

Prepared as outlined in 1-6 below:

1. Brief abstract (limit 600 words).
2. Standard introduction provided by ISEMP plus a brief description of project(s) covered by annual report purpose and rationale.
3. Concise description of project area/map.
4. Description of methods and materials used to perform tasks.
5. Summary of results (effectiveness of task completion; presentation of summarized field data in tabular or GIS format) and brief discussion of results by task.
6. If necessary, supplemental electronic copies of summarized field data in spreadsheet or GIS format."

The report shall be submitted to Terraqua, Inc., ISEMP Coordinator for the Wenatchee/ Entiat, on behalf of the Principal Investigator, Chris Jordan, at the Northwest Fisheries Science Center, as well as to the BPA Project Manager / COTR.

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Review annual report format requirements	4/25/2007	5/21/2007	Inactive	Contractor must review formatting requirements before starting the first draft of their report. Please follow the BPA-required format. http://www.efw.bpa.gov/Integrated_Fish_and_Wildlife_Program/technicalreports.aspx
B. Submit report for external review	5/21/2007	5/25/2007	Inactive	Submit a draft annual report for internal and external review including Terraqua, Inc. and NOAA Fisheries.
C. Email draft of report to COTR for review	5/25/2007	6/25/2007	Inactive	Email draft annual report to COTR.
D. Receive COTR review comments	5/25/2007	5/29/2007	Inactive	No later than this date, receive comments from NOAA Fisheries / BPA. If comments are not received by this time, report is considered final.
E. Finalize Annual Report	5/30/2007	5/31/2007	Inactive	Integrate review feedback and comments, and obtain internal signatures if necessary. Convert the annual report to Adobe Acrobat PDF format.
Deliverable: F. Final FY07 Contract Annual Report submitted to NOAA Fisheries		6/30/2007	Inactive	<i>See the Deliverable Specification above</i>

Terraqua, Inc.
 Release #1, Master Agreement #27480, CCR # 9992
 BPA Project 2003-017-00: Integrated Monitoring Pilot
 July 1, 2006 through June 30, 2007

	Qty	Unit	Unit Cost	COST
1	PERSONNEL SERVICES			\$187,932
	<i>Michael Ward</i>			
Task 5.1	(b)(4)	hours	@ (b)(4)/hour	(b)(4)
Task 5.2	(b)(4)	hours	@ (b)(4)/hour	(b)(4)
Task 5.3	(b)(4)	hours	@ (b)(4)/hour	(b)(4)
Task 5.4	(b)(4)	hours	@ (b)(4)/hour	(b)(4)
Task 5.5	(b)(4)	hours	@ (b)(4)/hour	(b)(4)
Task 5.6	(b)(4)	hours	@ (b)(4)/hour	(b)(4)
Task 5.7	(b)(4)	hours	@ (b)(4)/hour	(b)(4)
Task 5.8	(b)(4)	hours	@ (b)(4)/hour	(b)(4)
Task 5.10	(b)(4)	hours	@ (b)(4)/hour	(b)(4)
	<i>Jeremy Moberg</i>			
Task 5.5	(b)(4)	hours	@ (b)(4)/hour	(b)(4)
Task 5.6	(b)(4)	hours	@ (b)(4)/hour	(b)(4)
Task 5.7	(b)(4)	hours	@ (b)(4)/hour	(b)(4)
Task 5.9	(b)(4)	hours	@ (b)(4)/hour	(b)(4)
	<i>Keith Watson</i>			
Task 5.7	(b)(4)	hours	@ (b)(4)/hour	(b)(4)
Task 5.7	(b)(4)	hours	@ (b)(4)/hour	(b)(4)
Task 5.9	(b)(4)	hours	@ (b)(4)/hour	(b)(4)
Task 5.9	(b)(4)	hours	@ (b)(4)/hour	(b)(4)
	<i>Pamela Nelle</i>			
Task 5.1	(b)(4)	hours	@ (b)(4)/hour	(b)(4)
Task 5.2	(b)(4)	hours	@ (b)(4)/hour	(b)(4)
Task 5.5	(b)(4)	hours	@ (b)(4)/hour	(b)(4)
Task 5.7	(b)(4)	hours	@ (b)(4)/hour	(b)(4)
Task 5.8	(b)(4)	hours	@ (b)(4)/hour	(b)(4)
Task 5.10	(b)(4)	hours	@ (b)(4)/hour	(b)(4)
2	Travel			\$27,881
	<i>Airfare</i>			

Task 5.1	GEG or EAT to SEA or PDX (NOAA/BPA)	(b)(4)	RT	@	(b)(4)	/RT	(b)(4)
Task 5.3	GEG or EAT to Boise, ID or other loc.in OR/WA/		RT	@		/RT	
Task 5.4	GEG or EAT to Portland, OR or other loc.in OR/		RT	@		/RT	
	Rental car and parking						
Task 5.1	SEA or PDX (NOAA/BPA)		RT	@		/RT	
Task 5.3	Boise, ID or other loc.in OR/WA/ID		RT	@		/RT	
Task 5.4	Portland, OR or other loc.in OR/WA/ID		RT	@		/RT	
	Per Diem (Lodging plus M&IE)						
Task 5.1	Portland (BPA)		day/night	@		/day	
Task 5.1	Seattle (SEA)		day/night	@		/day	
Task 5.3	Boise, ID or other loc.in OR/WA/ID		day/night	@		/day	
Task 5.4	Portland, OR or other loc.in OR/WA/ID		day/night	@		/day	
Task 5.5	Leavenworth, WA		day/night	@		/day	
Task 5.6	Missoula, MT		day/night	@		/day	
Task 5.7	Washington Cities		day/night	@		/day	
Task 5.9	Washington Cities		day/night	@		/day	
	POV Mileage to/from						
Task 5.1	Wenatchee		trip	@		mi/trip	
Task 5.1	Entiat, Wa.		trip	@		mi/trip	
Task 5.1	Spokane or Wen. (to airport for SEA/PDX trips)		trip	@		mi/trip	
Task 5.3	Spokane or Wen. (to airport for Boise trips)		trip	@		mi/trip	
Task 5.4	Spokane or Wen. (to airport for Portland trips)		trip	@		mi/trip	
Task 5.5	Leavenworth, WA		trip	@		mi/trip	
Task 5.6	Missoula, MT		trip	@		mi/trip	
Task 5.6	Wenatchee		trip	@		mi/trip	
Task 5.7	RT to/among sites in Entiat Subbasin					miles	
Task 5.8	RT Leavenworth to Wenatchee		trip	@		mi/trip	
Task 5.9	RT to/among sites in Wenatchee Subbasin					miles	

3 FIELD EQUIPMENT RENTAL \$4,340

Task 5.7	FY06 (person days)	(b)(4)	da	(b)(4)	/day	(b)(4)
Task 5.9	FY05 (person days)		da		/day	

4 SUPPLIES \$3,448

	Qty	Unit	Unit Cost	COST
split 95% 5 Field Paper for data sheets	(b)(4)	ream	(b)(4)	(b)(4)
split 95% 5 Measuring Tape (50m)		each		
split 95% 5 Measuring Tape refill (100m)		each		
split 95% 5 Hand Level		each		
split 95% 5 Binders		each		

split 95% 5 Note paper refills	(b)(4)	each	(b)(4)/each	(b)(4)
split 95% 5 Notebooks		each	/each	
split 95% 5 Densimeter (concave)		each	/each	
split 95% 5 Densimeter (convex)		each	/each	
split 95% 5 Macroinvertebrate containers		case	/case	
split 95% 5 Surveyor Rod		each	/each	
split 95% 5 Denatured alcohol		gal.	/gal	
split 95% 5 Kicknet		each	/each	
split 95% 5 Miscellaneous				
split 95% 5 Taxes and Shipping at 15%				
Task 5.4 Conference fees		conferenc @	/confer	

5 SUBCONTRACTS \$43,735

Task 5.6 Rhithron Associate, Inc. lab fees	(b)(4)	samples @	(b)(4) /sample	(b)(4)
Task 5.11 GeoEngineers, Inc.				(b)(4)

6 Administrative Expense (10% of dir. exp. excl. mileage/per diem) \$5,216

Task 5.4 Conference fees		conferenc @	(b)(4) /confer	(b)(4)
Task 5.6 Rhithron Associate, Inc. lab fees	(b)(4)	samples @	(b)(4) /sample	
Task 5.11 GeoEngineers, Inc.				
split 1/3a Airfare, parking, rental cars				
split 1/3b Supplies				

7 BUDGET SUBTOTAL \$272,551

Less 2005 unspent balance 0

8 BUDGET TOTAL \$272,551

Detail Budget Estimate for GeoEngineers	Hrs.	Rate (dollars)	Total (dollars)
1. Project Scientist Level 2	(b)(4)		
2. Scientist Level			
3. Proj. Assistant			
4. Principal			
Total	(b)		(b)(4)
Total - Rounded			(b)(4)

BONNEVILLE
POWER ADMINISTRATION

RELEASE

Mail Invoice To:

Program Analyst - KEWB-4
Bonneville Power Admin. - PBL
P. O. Box 3621
Portland OR 97208-3621

Contract : 00027480
Release : 00001
Page : 1

Vendor:
TERRAQUA INC
PO BOX 85
WAUCONDA WA 98859

Please Direct Inquiries to.

MARK H. NADEAU
Title: CONTRACT SPECIALIST
Phone: 503-230-5889
Fax : 503-230-4508

Attn: MICHAEL B WARD

Contract Title: 200301700 EXP ISEMP COORDINATION FOR WENATCHEE/ENTIAT - TERRAQUA

Performance Period: 07/01/06 06/30/07

Contractor Signature

Printed Name/Title

Date Signed


BPA Contracting Officer

Date Signed

This award contains the following - TEXT ATTACHED

CONTRACT TERMS AND CONDITIONS

Contract No. 00027480
PI 2003-01-700
EXP ISEMP Wenatchee/Entiat Coordination
Release No. 01

This Release is issued for the following:

1. Incorporate the attached Statement of Work and Budget.
2. Authorize \$250,551.00 for this work.

ALL OTHER TERMS AND CONDITIONS REMAIN THE SAME.

Two attachments: Statement of Work
Budget



Statement of Work Report

Project Title: Integrated Status/Effect Progr
Project #: 2003-017-00
Contract Title: 200301700 EXP ISEMP COORDINATION FOR WENATCHEE/ENTIAT - TERRAQUA
Contract #: 27480 REL 1
Province: Systemwide **Subbasin:** Systemwide Projects
Workorder ID: 129074 **Task ID:** 1
Perf. Period Budget: \$250,551 **Perf. Period:** 7/1/2006 - 6/30/2007
Contract Type: Release **Pricing Type:** Time and Materials
Contractor(s): Terraqua, Inc. (Prime - TERRAQUA00)
BPA Internal Ref: 27480 REL 1

Contacts:

Name	Role	Organization	Phone	Email	Address
Mike Ward	Contract Manager	Terraqua, Inc.	(509) 486-2426	wardski@televar.com	P.O. Box 85 Wauconda WA 98859-
Nancy Weintraub	Env. Compliance Lead	Bonneville Power Administration	(503) 230-5373	nhweintraub@bpa.gov	P.O. Box 3621, Mailstop - KEC-4 Portland, OR 97208-3621
Gerald McClintock	COTR	Bonneville Power Administration	(503) 230-5375	gmcclintock@bpa.gov	905 NE 11th Street KEWU-4 Portland OR 97232
Mark Nadeau	Contracting Officer	Bonneville Power Administration	(503) 230-5889	mhnadeau@bpa.gov	
Chris Jordan	Interested Party	National Oceanic and Atmospheric Administration (NOAA)	(541) 754-4629	chris.jordan@noaa.gov	2725 Montlake Blvd. East Seattle WA 98112-2097

Work Element Table of Contents:

<u>Work Element - Work Element Title</u>	<u>EC Needed*</u>	<u>Estimate</u>	<u>(%)</u>
A : 118. Coordination - 5.1 ISEMP Coordination		\$42,211	(17 %)
B : 174. Produce Plan - 5.2 Implementation Strategy and Tracking Tool		\$17,941	(7 %)
C : 160. Create/Manage/Maintain Database - 5.3 Data Management System Development		\$7,148	(3 %)
D : 118. Coordination - 5.4 Pilot Subbasin Coordination		\$19,995	(8 %)
E : 174. Produce Plan - 5.5 Field Manual Development		\$2,933	(1 %)
F : 157. Collect/Generate/Validate Field and Lab Data - 5.6 Macroinvertebrate Analysis	*	\$28,115	(11 %)



<u>Work Element - Work Element Title</u>	<u>EC Needed*</u>	<u>Estimate</u>	<u>(%)</u>
G : 157. Collect/Generate/Validate Field and Lab Data - 5.7 Entiat Effectiveness Monitoring	*	\$98,242	(39 %)
H : 141. Produce Status Report - 5.8 ISEMP Year-three Program Review		\$20,415	(8 %)
I : 157. Collect/Generate/Validate Field and Lab Data - 5.9 Repeat Sampling in Wenatchee	*	\$7,341	(3 %)
J : 119. Manage and Administer Projects - 5.10a Project Management		\$4,710	(2 %)
K : 165. Produce Environmental Compliance Documentation - 5.10b Environmental compliance		\$500	(0 %)
L : 185. Produce Pisces Status Report - 5.10 c Monthly Status Reports for BPA		\$1,000	(0 %)
Total:		<hr/>	
		\$250,551	

* Environmental Compliance (EC) needed before work begins.

Contract Description:

Since its inception in FY2003, Project #2003-017-00 (the Integrated Status and Effectiveness Monitoring Program; ISEMP) has been developing two novel monitoring and evaluation programs: (i) subbasin-scale pilot status and trend monitoring efforts for anadromous salmonids and their habitat in the Wenatchee, John Day and South Fork Salmon River basins, and (ii) effectiveness monitoring for suites of habitat restoration projects in selected watersheds within the three target subbasins. This work - critical for implementing the 2000 NMFS FCRPS Biological Opinion (RPA Actions 180, 181, and 183) (BiOp) and UPAs from the 2004 BiOp - builds on current status and trend monitoring programs within each of these basins. Several regional and local organizations are funding and implementing these programs. In short, this project has integrated existing and new monitoring and evaluation activities in three pilot subbasins to help ensure that provisions of the BiOp are satisfied.

In FY2005, an effectiveness monitoring program-element was initiated in the Entiat Subbasin because restoration activities in this subbasin were more suited to scientific study. The ability of an effectiveness monitoring program to successfully detect subbasin-scale changes in fish populations brought about by restoration actions requires the ability of the monitoring scientists to control, or at least strongly influence, the timing/location/magnitude of restoration activities. This influence directly affects the ability of the scientists to properly design the experiment and sample the necessary indicators.

The Entiat subbasin is particularly well suited to meet these needs because of its strong history of rigorous restoration and recovery planning, the opportune timing of its recovery efforts (just now beginning to get underway in earnest) that allow for concurrent monitoring design, and the supportive local planning group (the Entiat Watershed Planning Unit; EWPU) who place a high value on scientific assessment, planning, and evaluation through monitoring, and who have welcomed ISEMP's participation. Other unique qualities of the Entiat subbasin also benefit the ISEMP effectiveness monitoring program, including:

- The Entiat is adjacent to the Wenatchee where ISEMP status and trend program-elements are being executed and is comprised of the same ecotypes and has populations of the same target fish species (steelhead and spring chinook salmon) as the Wenatchee allowing for references and comparisons to be made between the two subbasins and their watersheds;
- In addition to the supportive EWPU, the agencies operating in the two subbasins are very similar and include some of the same contractors and field crews that are already working for ISEMP,
- Land management in the Entiat is a relatively stable mix of agriculture and national forest management compared to the rapidly urbanizing watershed of the Wenatchee,
- Factors limiting fish populations have been identified and narrowly defined; therefore, the actions necessary to reverse these factors will be straightforward and relatively easy to implement greatly improving the chance



that the restoration program will to effect subbasin-scale changes that the monitoring program will be able to identify.

The initiation of a pilot effectiveness project (known as the Bridge-to-Bridge monitoring project) at a limited reach scale in FY2005 was successful. Therefore, the ISEMP program has proposed to expand this effort into a subbasin-scale effort in FY2006. The coordination needs of this effort are considerable and are reflected in this contract with Terraqua, Inc., who has been coordinating ISEMP monitoring efforts in the Wenatchee and Entiat subbasins since ISEMP's inception.

Terraqua's role has been, and continues to be, to enable the Bonneville Power Administration to continue to implement Project #2003-017-00 in the Wenatchee and Entiat subbasins. Objectives of this work have been, and continue to be:

- Coordinate contract development between Bonneville and entities participating in implementation of the ISEMP program in the Wenatchee/Entiat and other pilot subbasins.
- Coordinate contract implementation between Bonneville and entities participating of the ISEMP program in the Wenatchee/Entiat and other pilot subbasins to insure that implementation activities meet the purpose and needs of the ISEMP program.
- Implement selected monitoring activities.
- Coordinate the design and testing of a data management system to support the program with local ISEMP contractors.
- Analyze and report results related to the implementation of monitoring activities.

This contract represents a significant increase in scope and budget over the previous Terraqua Release #4 primarily due to the expansion of ISEMP activities into the Entiat subbasin. To offset the expanded costs associated with this expanded scope of work, Terraqua has: maintained the same rates for key personnel as were charged in previous years; has brought on new staff to assume some of the responsibilities previously executed by more senior staff; and has reduced the scope of some coordination elements that were more prominent in earlier releases as those elements have been completed or institutionalized to the point they are relatively maintenance-free. The following list describes details associated with some of the significant scope/budget differences compared to Release #4:

- An 80% increase in budget for "Coordination" (i.e. task 5.1 compared to 4.1) reflects the expanded effort to develop and manage a doubling of contracts and program-elements in the Entiat while maintaining work in the Wenatchee. This increase is also modeled on the actual number of hours spent on Coordination in FY2005 compared to the amount under-projected in 4.1.
- The decrease in budget for "Implementation Strategy" design (i.e. 5.2 vs. 4.2) is also a decrease compared to FY2004 Task 2.2. Task 2.2 was for the development of the implementation strategy for the Wenatchee. Task 5.2 is for comparable implementation strategy development in the Entiat plus maintenance of the project tracking tool developed in 4.2. The better cost efficiency this year will result from using a lower-cost technical writer as well as experience learned from the last effort.
- The budget for Task 5.3 is about 60% lower than Task 4.3 because the data management system is largely built. Coordination efforts on this front are shifting to user interface development between ISEMP contractors and NOAA developers that requires less Terraqua time.
- The budget for Task 5.4 is 62% higher to accommodate a request that came out of a meeting between BPA and ISEMP staff in April 2006. This represents a 50% increase in hours (and a larger increase in expenses) to represent the program at more general meetings (Gerald, this is a scope/budget that could be whittled down pending a discussion with you).
- The budget for Task 5.5 is 50% lower than 4.5 because the work in task 5.5 will be largely confined to modifying a "working" document created in Task 4.5.
- Task 5.6 is 40% more expensive than Task 4.6 because of a 5% increase in macroinvertebrate analysis costs and 36% increase in the number of samples expected to be processed resulting from additional sampling in the Entiat.
- An expansion of scope under Task 5.7 explains the bulk of the increase in cost between Releases 4 and 5. However, the magnitude of this increase was reduced by a better (and lower) estimate of time required for each site based on experience in FY2005. The scope of this task includes sampling at 25 (compared with 10; 150% increase) status/trend sample sites and 20 (compared to 9, 122% increase) control/treatment sites. In light of this more-than-doubling of work, the 70% increase in cost is relatively modest.
- The cost of Task 5.9 has dropped about 5% for the same field sampling scope as in 4.9 due to the cost-



efficiencies noted in Task 5.7. Furthermore, our per site cost of \$1,538 (which includes field labor and expenses, mobilization/demobilization, data entry, and training) is favorable compared to other ISEMP field work.

- Project management costs (Task 5.10) have risen to accommodate additional in-person program updates to BPA staff like the effort in April 2006.



Statement of Work Report

Work Element Details

A: 118. Coordination

Title: 5.1 ISEMP Coordination

Description: Terraqua will represent the interests of the ISEMP at meetings of the RTT, the Entiat Watershed Planning Unit Technical Team, and the mid-Columbia PUD's HCP Hatchery Committee, and will coordinate electronically and in-person with the following entities that may be involved in this Program: RTT, EWPU, U.S. Forest Service (USFS), Washington Department of Ecology (WDOE), Chelan PUD, Yakama Nation, NOAA-Fisheries, BPA, U.S. Bureau of Reclamation, Chelan County, Chelan County Conservation District, and other parties as necessary. Attend up to twelve (12) monthly Oversight Committee meetings to be held as part of regularly scheduled RTT meetings, attend up to four (4) quarterly meetings of the EWPU and/or up to six EWPU Technical Team meetings from July 2006 through June 2007. Attend up to two (2) meetings with BPA or NOAA at locations in Washington or Oregon from July 2006 through June 2007.

Terraqua will coordinate ISEMP contractors to help insure that contractors SOWs and deliverables meet ISEMP needs and that contractor budgets stay within the overall ISEMP budget and other available funds. Terraqua will also coordinate the analysis and reporting of ISEMP products with BioAnalysts, NOAA, and other program analysts.

Metrics: <None>

Deliverable Specification: Provide a copy of written minutes from all RTT and EWPU meetings attended. Provide a monthly report of significant coordination issues

Milestone Title	Start Date	End Date	Status	Milestone Description
Submit RTT Meeting minutes	7/1/2006	6/30/2007	Inactive	For any RTT meetings attended, submit minutes to BPA COTR via email.
Monthly, telephonically update COTR of significant coordination issues	7/1/2006	6/30/2007	Inactive	Monthly, conduct a telephone update with the BPA COTR regarding significant coordination issues, or anything that could jeopardize the overall project.
Deliverable: Meeting minutes / Coordination reports		6/30/2007	Inactive	<i>See the Deliverable Specification above</i>

B: 174. Produce Plan

Title: 5.2 Implementation Strategy and Tracking Tool



Description: Terraqua will continue to maintain the Project Tracking Tool developed in 2005-2006 that serves to document changes to scientific study design that have occurred since the inception of ISEMP to assist project contractors in conducting field work and to assist ISEMP analysts in the interpretation of project data. This tool will be expanded to include ISEMP activities in the Entiat Subbasin. This database will continue to be a "living" tool that will be periodically updated as necessary and will be electronically accessible to all ISEMP contractors and cooperators. This document will be maintained in working draft format through June 30, 2007 (and presumably thereafter by Terraqua or subsequently contracted project coordinators).

Terraqua will develop an "Implementation Strategy" for the Entiat Subbasin activities of ISEMP that will serve as "Appendix B" of the Upper Columbia Monitoring Strategy. This document will provide a comprehensive description of all ongoing and anticipated data collection efforts within this Program and will describe how that data will be compiled, analyzed, stored, and disseminated to meet the needs of Project # 2003-017-00. This document will assist BPA, NOAA, RTT, EWPU, and other Project participants in understanding the complex components of the Project, will assist with contract reviewing and management of future Project contracts, and will establish guidelines for the collection, compilation, and use of Project data in the long-term. A draft of the Implementation Strategy will be developed by October 31, 2006 to assist in the development of Project BiOp reporting. The final Implementation Strategy will be completed by January 31, 2007 to assist BPA in the review of contract for 2007 field work.

Metrics: <None>

Deliverable Specification: Maintain the ISEMP Wenatchee/Entiat project tracking tool in a format that is accessible to all ISEMP contractors and cooperators (preferably via a central location, e.g., web site)

Develop an implementation strategy for the Entiat Subbasin in a format that is accessible to all ISEMP contractors and cooperators (preferably via a central location, e.g., web site)

Milestone Title	Start Date	End Date	Status	Milestone Description
Draft Entiat Implementation Strategy document	7/1/2006	10/31/2006	Inactive	Develop a draft Entiat Implementation strategy.
Final Entiat Implementation Strategy document	11/1/2006	1/31/2007	Inactive	Publish a final electronic, accessible Implementation Strategy for all contractors / cooperators of the ISEMP project.
Maintain working draft of project tracking tool with periodic updates	7/1/2006	6/30/2007	Inactive	Continue to update the project tracking tool such that maintenance can be done by future ISEMP coordinators (whether that continues to be Terraqua or not).
Deliverable: Implementation Strategy and Tracking Tool		6/30/2007	Inactive	<i>See the Deliverable Specification above</i>

C: 160. Create/Manage/Maintain Database

Title: 5.3 Data Management System Development

Description: The U.S. Bureau of Reclamation (USBR) and NOAA-Fisheries are continuing to develop a data management system to guide and capture data collected by ISEMP contractors. Terraqua will continue to serve as technical liaison between ISEMP contractors and this system's developers to ensure that the final data management system serves the ISEMP as implemented in the Upper Columbia basin. Terraqua will represent the interests of the Project at development meetings held by NOAA-Fisheries and USBR and will coordinate electronically and in-person with these and other entities that are developing the data management systems related to Project #2003-017-00. Attend up to three (3) one-day meetings from July 2006 through June 2007 at locations in Washington, Oregon, and Idaho.

Metrics: <None>



Deliverable Specification: Submit, as developed, summaries of developments to the data management system and summaries of participation by ISEMP contractors.

Milestone Title	Start Date	End Date	Status	Milestone Description
Submit summary of data management system development at project mid-point	7/1/2006	12/31/2006	Inactive	No later than December 31, 2006, submit a report on developments to the data management system and ISEMP contractors participation.
Deliverable: Summary of data management system		6/30/2007	Inactive	<i>See the Deliverable Specification above</i>

D: 118. Coordination

Title: 5.4 Pilot Subbasin Coordination

Description: Implementation of the Project among the three pilot subbasins, particularly in the area of data management, analysis, reporting, and dissemination of information to other users in the Columbia Basin and states of OR, ID, and WA, requires close coordination of numerous entities who are participating in the Project. Terraqua will represent the interests of the Project at meetings of the pilot subbasin coordinators and will Coordinate electronically and in-person with these coordinators and other entities that are developing data management systems, analysis, reporting, and document/conference preparation materials related to Project #2003-017-00. Attend up to three (3) one-day meetings with pilot subbasin coordinators, and participate in up to three (3) two-day conferences/meetings to disseminate results of ISEMP work to broad monitoring/research/management communities, from July 2006 through June 2007 at locations in Washington, Oregon, and Idaho.

Metrics: <None>

Deliverable Specification: Submit an electronic version of minutes from each of up to 6 meetings attended regarding the database coordination.

Milestone Title	Start Date	End Date	Status	Milestone Description
Deliverable: Meeting Minutes		6/30/2007	Inactive	<i>See the Deliverable Specification above</i>

E: 174. Produce Plan

Title: 5.5 Field Manual Development

Description: Terraqua will revise, as needed, the ISEMP field manual suitable for use in training field personnel in the channel, riparian, and macroinvertebrate sampling protocols described in the Upper Columbia Monitoring Strategy (UCMS) as implemented by the ISEMP program in the Wenatchee and Entiat subbasins. Revisions will be based on field testing in ISEMP projects during the 2006 field season. This document will use existing documents (including original references used in the UCMS) as much as possible to preserve consistency and minimize costs. A draft of the revised Field Manual will be developed by January 31, 2007. The draft will be submitted to project cooperators (e.g. WDOE, USFS, et al.) and the RTT for review. The final Field Manual will be completed by April 30, 2007.

Metrics: <None>

Deliverable Specification: Revise and update a field personnel training manual incorporating as much information as possible that is currently available. The document should be produce in Portable Document Format (PDF) or other generally accepted format. Any deviation requires prior approval from the BPA COTR.



Milestone Title	Start Date	End Date	Status	Milestone Description
Prepare draft revised Field Manual	7/1/2006	1/31/2007	Inactive	Submit draft Field Manual to reviewers by January 31, 2007
Receive draft field manual comments	2/1/2007	3/1/2007	Inactive	Allow a one month review period of the draft field manual. Comments are to be submitted during this time to assure completion of the manual no later than April 30, 2007.
Final revised Field Manual	3/1/2007	4/30/2007	Inactive	Incorporate comments from reviewers no later than April 30, 2007.
Deliverable: Final Field Manual		5/15/2007	Inactive	<i>See the Deliverable Specification above</i>

F: 157. Collect/Generate/Validate Field and Lab Data

Title: 5.6 Macroinvertebrate Analysis

Description: Terraqua will subcontract with Rhithron Associates, Inc. in Missoula, Mt. for identification of fifty-one (51) macroinvertebrate samples collected by WDOE staff in the Wenatchee Subbasin in 2006. Terraqua, Inc. will also collect macroinvertebrate samples at up to forty-five (45) sites in the Entiat and five (5) sites in the Wenatchee subbasins (see Tasks 5.7 and 5.9 for details regarding these sites). At the end of field sampling in fall 2006, Terraqua, Inc. will transport macroinvertebrate samples to Rhithron. Terraqua/Rhithron will provide identification of macroinvertebrates to the lowest practical levels consistent with RIVPACS protocol, including midges and worms to genus or species using a 500-organism random subsample. Terraqua/Rhithron will deliver standardized metric calculations and will archive the identified fraction of the sample for one year.

Metrics:

- * R, M, and E Focal Area [Tributaries, Hydrosystem, Estuary, Ocean, Harvest, Hatchery, Systemwide, Emerging Issues]
- * Primary R, M, and E Type [Status and Trend Monitoring, Action Effectiveness Research, Uncertainties Research, Project Implementation/ Compliance Monitoring]
- * Secondary R, M, and E Type [Status and Trend Monitoring, Action Effectiveness Research, Uncertainties Research, Project Implementation/ Compliance Monitoring]

Deliverable Specification: Per RIVPACS protocol, provide standardized metric calculations of Macroinvertebrates from up to 101 sites (51 in the Wenatchee collected by WDFW, 45 in the Entiat collected by Terraqua, and 5 in the Wenatchee collected by Terraqua).



Milestone Title	Start Date	End Date	Status	Milestone Description
Environmental compliance requirements complete	7/1/2006	7/15/2006	Inactive	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
Samples collected	7/15/2006	9/30/2006	Inactive	Terraqua will collect macroinvertebrate samples at up to forty-five (45) sites in the Entiat and five (5) sites in the Wenatchee subbasins (see Tasks 5.7 and 5.9 for details regarding these sites). Also during this time, Washington Department of Ecology will be collecting samples in the Wenatchee subbasins at 51 sites.
Samples delivered to Rhithron Associates	9/30/2006	10/31/2006	Inactive	At the end of field sampling in fall 2006, Terraqua, Inc. will transport macroinvertebrate samples collected by Terraqua and WDOE to Rhithron.
Data generated by Rhithron Associates and delivered to Terraqua/BPA	10/31/2006	4/30/2007	Inactive	Rhithron will provide identification of macroinvertebrates to the lowest practical levels consistent with RIVPACS protocol, including midges and worms to genus or species using a 500-organism random subsample. Rhithron will deliver standardized metric calculations and will archive the identified fraction of the sample for one year.
Deliverable: Macroinvertebrate Analysis		4/30/2007	Inactive	<i>See the Deliverable Specification above</i>

G: 157. Collect/Generate/Validate Field and Lab Data

Title: 5.7 Entiat Effectiveness Monitoring

Description: Terraqua will assist in the implementation of project effectiveness monitoring in the Entiat River under the ISEMP program. This work will include: monitoring of channel/riparian/macroinvertebrate conditions using protocols from the Upper Columbia Monitoring Strategy at twenty (20) restoration project control and treatment sites and at twenty-five (25) randomly located reference sites used for comparison of watershed status and trends with sites in the restoration project area; habitat quantification to support snorkeling work during three (3) snorkel surveys to be conducted by the USFWS at the thirteen (13) restoration project control and treatment sites which will be snorkeled in 2006-2007; coordination of the monitoring work conducted by USFWS, CCCD, and Terraqua; and data synthesis, analysis, and storage and preparation of a technical synthesis report that will include results from habitat, channel, riparian, fish abundance (redds, smolt production, and snorkel) observations by USFWS, CCCD, Terraqua and non-ISEMP agencies into a single project report.

Metrics:

- * R, M, and E Focal Area [Tributaries, Hydrosystem, Estuary, Ocean, Harvest, Hatchery, Systemwide, Emerging Issues]
- * Primary R, M, and E Type [Status and Trend Monitoring, Action Effectiveness Research, Uncertainties Research, Project Implementation/ Compliance Monitoring]
- * Secondary R, M, and E Type [Status and Trend Monitoring, Action Effectiveness Research, Uncertainties Research, Project Implementation/ Compliance Monitoring]

Deliverable Specification: Submit in Microsoft Word format electronically



Milestone Title	Start Date	End Date	Status	Milestone Description
Environmental compliance requirements complete	7/1/2006	7/15/2006	Inactive	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
Conduct habitat monitoring	7/18/2006	9/30/2006	Inactive	Monitor channel/riparian/macroinvertebrate conditions using protocols from the Upper Columbia Monitoring Strategy at twenty (20) restoration project control and treatment sites and at twenty-five (25) randomly located reference sites used for comparison of watershed status and trends with sites in the restoration project area.
Support snorkel surveys with habitat measurements: 1	7/18/2006	8/31/2006	Inactive	Quantify habitat to support snorkeling work during snorkel surveys to be conducted by the USFWS at the thirteen (13) restoration project control and treatment sites in late July to early August.
Data analysis	10/1/2006	5/31/2007	Inactive	Synthesize data, perform analyses, and store data in data management system.
First draft report	10/1/2006	3/31/2007	Inactive	Produce a draft field data synthesis report that will include results from habitat, channel, riparian, fish abundance (redds, smolt production, and snorkel) observations by USFWS, CCCD, Terraqua and non-ISEMP agencies into a single project report. This report will focus on whether different field efforts have achieved the needs of the ISEMP Entiat Effectiveness program element and will briefly summarize these data in the context of the ISEMP Entiat Implementation Strategy goals and objectives. This report will not include in-depth analysis of data as that will be accomplished by other ISEMP contractors at different scheduling under related contracts.
Support snorkel surveys with habitat measurements: 2	10/17/2006	11/30/2006	Inactive	Quantify habitat to support snorkeling work during snorkel surveys to be conducted by the USFWS at the thirteen (13) restoration project control and treatment sites in late October to November.
Support snorkel surveys with habitat measurements: 3	2/1/2007	3/31/2007	Inactive	Quantify habitat to support snorkeling work during snorkel surveys to be conducted by the USFWS at the thirteen (13) restoration project control and treatment sites in February through March.



Milestone Title	Start Date	End Date	Status	Milestone Description
Final draft report	4/1/2007	6/30/2007	Inactive	Produce a final field data synthesis report that will include results from habitat, channel, riparian, fish abundance (redds, smolt production, and snorkel) observations by USFWS, CCCD, Terraqua and non-ISEMP agencies into a single project report. This report will focus on whether different field efforts have achieved the needs of the ISEMP Entiat Effectiveness program element and will briefly summarize these data in the context of the ISEMP Entiat Implementation Strategy goals and objectives. This report will not include in-depth analysis of data as that will be accomplished by other ISEMP contractors at different scheduling under related contracts. The relatively late date (in relation to when the field work is conducted) for this deliverable is required because of the need to synthesize reports from other agencies and due to the late field data collection season in March 2007.
Deliverable: Field Data Synthesis Report		6/30/2007	Inactive	<i>See the Deliverable Specification above</i>

H: 141. Produce Status Report

Title: 5.8 ISEMP Year-three Program Review

Description: Reporting for Project #2003-017 has been completed in the past by reports prepared by individual contractors or has been accomplished through BiOp reporting. BPA managers and ISEMP coordinators and other entities have expressed the desire to have the complete program summarized in a periodically updated program review document. In this work element, Terraqua will produce a document that compiles and coordinates the reports of all ISEMP contractors (from each of the three pilot subbasins and the umbrella group), describes all ISEMP progress in the first three years (including data from only the first two field seasons) of the program in relation to ISEMP's proposed goals and objectives, and documents changes in protocols/indicators being monitored that have resulted from data collected during the first three years of the program. This document will be stored on the ISEMP web site.

Metrics: <None>

Deliverable Specification: Produce a document that can be shared with all participants as well as external parties via the ISEMP web site.



Milestone Title	Start Date	End Date	Status	Milestone Description
Produce draft ISEMP Program Review	7/1/2006	8/31/2006	Inactive	Develop a single document that compiles and coordinates the reports of all ISEMP contractors, describes all ISEMP progress in first three years (first two field seasons) of the program in relation to ISEMP proposed goals and objectives, and documents changes in protocols/indicators being monitored that have resulted from data collected during the first three years of the program. Circulate this draft document for review among ISEMP and BPA collaborators.
Produce final ISEMP Program Review	8/31/2006	9/30/2006	Inactive	Publish an electronic, accessible, final document that compiles and coordinates the reports of all ISEMP contractors, describes all ISEMP progress in first three years (first two field seasons) of the program in relation to ISEMP proposed goals and objectives, and documents changes in protocols/indicators being monitored that have resulted from data collected during the first three years of the program. Store this document on the ISEMP web site.
Deliverable: ISEMP Year-Three Program Review		10/31/2006	Inactive	<i>See the Deliverable Specification above</i>

I: 157. Collect/Generate/Validate Field and Lab Data

Title: 5.9 Repeat Sampling in Wenatchee

Description: Five of the 50 sites (10 percent) sampled by Washington Department of Ecology (WDOE) for habitat/channel/riparian/macroinvertebrate conditions will be resampled, per the Upper Columbia Monitoring Strategy, by an independent Terraqua field crew in order to estimate between crew measurement variability. The Terraqua crew will characterize channel and riparian habitat quality by collecting the same data for each specific indicator listed in Table 1 that is collected by WDOE. Participate in 5 days of annual training with WDOE in advance of the 2007 field season.

Metrics:

- * R, M, and E Focal Area [Tributaries, Hydrosystem, Estuary, Ocean, Harvest, Hatchery, Systemwide, Emerging Issues]
- * Primary R, M, and E Type [Status and Trend Monitoring, Action Effectiveness Research, Uncertainties Research, Project Implementation/ Compliance Monitoring]
- * Secondary R, M, and E Type [Status and Trend Monitoring, Action Effectiveness Research, Uncertainties Research, Project Implementation/ Compliance Monitoring]

Deliverable Specification: Transmit channel characterization data along with Entiat habitat data and the bug data (although it is typically ready to go well in advance) after finishing the report writing process during which errors can sometimes become apparent. Collate, tabulate, and transmit data to WDOE in Access format.



Milestone Title	Start Date	End Date	Status	Milestone Description
Environmental compliance requirements complete	7/1/2006	7/15/2006	Inactive	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
Conduct field work	7/18/2006	9/30/2006	Inactive	Five of the 50 sites (10 percent) sampled by Washington Department of Ecology (WDOE) for habitat/channel/riparian/macrobenthic conditions will be resampled, per the Upper Columbia Monitoring Strategy, by an independent Terraqua field crew in order to estimate between crew measurement variability. The Terraqua crew will characterize channel and riparian habitat quality by collecting the same data for each specific indicator listed in Table 1 that is collected by WDOE.
Participate in annual training with WDOE	6/1/2007	6/30/2007	Inactive	Participate in up to 5 days of field training with WDOE habitat crews in advance of the 2007 field season. Included within this training will be any revisions to the field manual and may include training in any database advancements that may have occurred since spring of 2006.
Deliverable: Final Channel Characterization Data		4/30/2007	Inactive	<i>See the Deliverable Specification above</i>

J: 119. Manage and Administer Projects

Title: 5.10a Project Management

Description: Manage the project. Also covers administrative work in support of on-the-ground efforts and in support of BPA's programmatic requirements such as metric reporting, financial reporting (e.g., accruals), and development of an SOW package (includes draft SOW, budget, spending plan, and property inventory).

Metrics: <None>

Deliverable Specification: Submit next year's SOW, Budget, and Property Inventory to the BPA COTR. The SOW should include location information (latitude and longitude) for those work elements that require it. If contractor or contractor's organization takes longer than 30 days to sign the contract, the contractor will need to send this funding package to BPA more than 90 days before the end of the current contract.



Milestone Title	Start Date	End Date	Status	Milestone Description
Prepare FY06 year-end accrual estimate	8/15/2006	9/15/2006	Inactive	Provide estimate of expenses not yet invoiced, and not to be invoiced before the end of September 2006. Additional or superceding instructions may be provided by BPA as the end of fiscal year 2006 approaches.
Prepare FY07 SOW, budget, etc	3/1/2007	3/31/2007	Inactive	Provided funding is made available for additional work as defined under this current SOW, and additional protocol testing is required, submit a new SOW (via Pisces), budget, etc., no later than 90 days prior to the expiration of the current contract (i.e., June 30, 2007).
Prepare FY06 June accrual estimate	5/15/2007	6/15/2007	Inactive	Provide estimate of expenses not yet invoiced, and not to be invoiced before the end of June 2007. Additional or superceding instructions may be provided by BPA as the end of third quarter fiscal year 2007 approaches.
Deliverable: Funding Package - Submit draft to COTR		6/30/2007	Inactive	<i>See the Deliverable Specification above</i>

K: 165. Produce Environmental Compliance Documentation

Title: 5.10b Environmental compliance

Description: Ensure necessary documents are provided to BPA's Environmental Compliance group in sufficient time to allow for a compliance letter to be written prior to any ground-disturbing work. Coordinate with appropriate agencies regarding any permits that may be required.

Metrics: <None>

Deliverable Specification: Provide necessary supporting documentation and assistance to BPA's Environmental Compliance Group (such as maps, design drawings, survey reports, permit applications, ESA documents, etc.) to assure a timely receipt of EC compliance letter.

Milestone Title	Start Date	End Date	Status	Milestone Description
Deliverable: Environmental Compliance supporting documentation		7/31/2006	Inactive	<i>See the Deliverable Specification above</i>

L: 185. Produce Pisces Status Report

Title: 5.10 c Monthly Status Reports for BPA

Description: The Contractor shall report on the status of milestones and deliverables in Pisces. Reports shall be completed monthly. Additionally, when indicating a deliverable milestone as COMPLETE, the contractor shall provide metrics, the final location (latitude and longitude), focal species and an updated Work Element Budget prior to submitting the report to the BPA COTR.

Metrics: <None>

Deliverable Specification:



Milestone Title	Start Date	End Date	Status	Milestone Description
Jul 2006 (7/1/2006 - 7/31/2006)	8/1/2006	8/7/2006	Inactive	
Aug 2006 (8/1/2006 - 8/31/2006)	9/1/2006	9/7/2006	Inactive	
Sep 2006 (9/1/2006 - 9/30/2006)	10/1/2006	10/7/2006	Inactive	
Oct 2006 (10/1/2006 - 10/31/2006)	11/1/2006	11/7/2006	Inactive	
Nov 2006 (11/1/2006 - 11/30/2006)	12/1/2006	12/7/2006	Inactive	
Dec 2006 (12/1/2006 - 12/31/2006)	1/1/2007	1/7/2007	Inactive	
Jan 2007 (1/1/2007 - 1/31/2007)	2/1/2007	2/7/2007	Inactive	
Feb 2007 (2/1/2007 - 2/28/2007)	3/1/2007	3/7/2007	Inactive	
Mar 2007 (3/1/2007 - 3/31/2007)	4/1/2007	4/7/2007	Inactive	
Apr 2007 (4/1/2007 - 4/30/2007)	5/1/2007	5/7/2007	Inactive	
May 2007 (5/1/2007 - 5/31/2007)	6/1/2007	6/7/2007	Inactive	
Final Jun 2007 (6/1/2007 - 6/30/2007)	6/24/2007	6/30/2007	Inactive	

Release #1, Master Agreement #27480
BPA Project 2003-017-00: Integrated Monitoring Pilot
July 1, 2006 through June 30, 2007

		Qty	Unit	Unit Cost	COST
1	PERSONNEL SERVICES				\$187,932
	<i>Michael Ward</i>				
Task 5.1	Coordination/QC -- FY06-FY07	(b)(4)	hours	@ (b)(4)	/hour (b)(4)
Task 5.2	Implementation Strategy and Tracking -- FY06-F		hours	@	/hour
Task 5.3	Data Management System -- FY06-FY07		hours	@	/hour
Task 5.4	Pilot Subbasin Coord. -- FY06-FY07		hours	@	/hour
Task 5.5	Field Manual Development -- FY06-FY07		hours	@	/hour
Task 5.6	Macroinvertebrate Analysis -- FY06-FY07		hours	@	/hour
Task 5.7	Entiat Effectiveness (field rate) -- FY06-FY07		hours	@	/hour
Task 5.8	ISEMP 3 yr program review -- FY06-FY07		hours	@	/hour
Task 5.10	Proj. Mgt. and Reporting -- FY06-FY07		hours	@	/hour
	<i>Jeremy Moberg</i>				
Task 5.5	Field Manual Development -- FY06-FY07		hours	@	/hour
Task 5.6	Macroinvertebrate Analysis -- FY06-FY07		hours	@	/hour
Task 5.7	Entiat Effectiveness -- FY06-FY07		hours	@	/hour
Task 5.9	Repeat Sampling -- FY06-FY07		hours	@	/hour
	<i>Keith Watson</i>				
Task 5.7	Entiat Effectiveness -- FY06		hours	@	/hour
Task 5.7	Entiat Effectiveness -- FY07		hours	@	/hour
Task 5.9	Wenatchee Repeat Sampling -- FY06		hours	@	/hour
Task 5.9	Wenatchee Repeat Sampling -- FY07		hours	@	/hour
	<i>Pamela Nelle</i>				
Task 5.1	Coordination/QC -- FY06-FY07		hours	@	/hour
Task 5.2	Implementation Tracking -- FY06-FY07		hours	@	/hour
Task 5.5	Field Manual Development -- FY06-FY07		hours	@	/hour
Task 5.7	Entiat Effectiveness -- FY06-FY07		hours	@	/hour
Task 5.8	ISEMP 3 yr program review -- FY06-FY07		hours	@	/hour
Task 5.10	Proj. Mgt. and Reporting -- FY06-FY07		hours	@	/hour
2	Travel				\$27,881
	<i>Airfare</i>				
Task 5.1	GEG or EAT to SEA or PDX (NOAA/BPA)		RT	@	/RT (b)(4)
Task 5.3	GEG or EAT to Boise, ID or other loc.in OR/WA/ID		RT	@	/RT
Task 5.4	GEG or EAT to Portland, OR or other loc.in OR/WA/ID		RT	@	/RT
	<i>Rental car and parking</i>				
Task 5.1	SEA or PDX (NOAA/BPA)		RT	@	/RT
Task 5.3	Boise, ID or other loc.in OR/WA/ID		RT	@	/RT
Task 5.4	Portland, OR or other loc.in OR/WA/ID		RT	@	/RT
	<i>Per Diem (Lodging plus M&IE)</i>				
Task 5.1	Portland (BPA)		day/night	@	/day
Task 5.1	Seattle (SEA)		day/night	@	/day
Task 5.3	Boise, ID or other loc.in OR/WA/ID		day/night	@	/day
Task 5.4	Portland, OR or other loc.in OR/WA/ID		day/night	@	/day

		Qty	Unit	Unit Cost	COST	
Task 5.5	Leavenworth, WA	(b)(4)	day/night @	(b)(4)/day	(b)(4)	
Task 5.6	Missoula, MT		day/night @	/day		
Task 5.7	Washington Cities		day/night @	/day		
Task 5.9	Washington Cities		day/night @	/day		
POV Mileage to/from						
Task 5.1	Wenatchee		trip @	mi/trip	(b)(4)	
Task 5.1	Entiat, Wa.		trip @	mi/trip		
Task 5.1	Spokane or Wen. (to airport for SEA/PDX trips)		trip @	mi/trip		
Task 5.3	Spokane or Wen. (to airport for Boise trips)		trip @	mi/trip		
Task 5.4	Spokane or Wen. (to airport for Portland trips)		trip @	mi/trip		
Task 5.5	Leavenworth, WA		trip @	mi/trip		
Task 5.6	Missoula, MT		trip @	mi/trip		
Task 5.6	Wenatchee		trip @	mi/trip		
Task 5.7	RT to/among sites in Entiat Subbasin			miles		
Task 5.8	RT Leavenworth to Wenatchee		trip @	mi/trip		
Task 5.9	RT to/among sites in Wenatchee Subbasin			miles		
3	FIELD EQUIPMENT RENTAL					\$4,340
Task 5.7	FY06 (person days)	(b)(4)	da	(b)(4) /day		(b)(4)
Task 5.9	FY05 (person days)	(b)(4)	da	(b)(4) /day		(b)(4)
4	SUPPLIES			(b)(4)		\$3,448
split 95% 5.7	Field Paper for data sheets	(b)(4)	ream	(b)(4) /ream	(b)(4)	
split 95% 5.7	Measuring Tape (50m)		each	/each		
split 95% 5.7	Measuring Tape refill (100m)		each	/each		
split 95% 5.7	Hand Level		each	/each		
split 95% 5.7	Binders		each	/each		
split 95% 5.7	Note paper refills		each	/each		
split 95% 5.7	Notebooks		each	/each		
split 95% 5.7	Densimeter (concave)		each	/each		
split 95% 5.7	Densimeter (convex)		each	/each		
split 95% 5.7	Macroinvertebrate containers		case	/case		
split 95% 5.7	Surveyor Rod		each	/each		
split 95% 5.7	Denatured alcohol		gal.	/gal		
split 95% 5.7	Kicknet		each	/each		
split 95% 5.7	Miscellaneous					
split 95% 5.7	Taxes and Shipping at 15%					
Task 5.4	Conference fees		conferenc @	/confer		
5	SUBCONTRACTS				\$23,735	
Task 5.6	Rhithron Associate, Inc. lab fees	(b)(4)	samples @	(b)(4) /sample	\$23,735	
6	Administrative Expense (10% of dir. exp. excl. mileage/per diem)				\$3,216	
Task 5.4	Conference fees	(b)(4)	conferenc @	(b)(4) /confer	(b)(4)	
Task 5.6	Rhithron Associate, Inc. lab fees	(b)(4)	samples @	(b)(4) /sample		
split 1/3a	Airfare, parking, rental cars					
split 1/3b	Supplies					
7	BUDGET SUBTOTAL				\$250,551	
	Less 2005 unspent balance				0	
8	BUDGET TOTAL				\$250,551	

BONNEVILLE
POWER ADMINISTRATION

RELEASE

Mail Invoice To:

F & W Invoices - KEWB-4
Bonneville Power Admin. - PBL
P. O. Box 3621
Portland OR 97208-3621

Contract : 00027480
Release : 00002
Page : 1

Vendor:

TERRAQUA INC
PO BOX 85
WAUCONDA WA 98859

Please Direct Inquiries to:

MARK H. NADEAU
Title: CONTRACT SPECIALIST
Phone: 503-230-5889
Fax : 503-230-4508

Attn: MICHAEL B WARD

Contract Title: 200301700 EXP ISEMP TERRAQUA - COORDINATION FOR WENATCHEE/ENTIAT

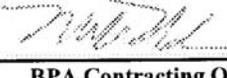
Total Value : \$298,275.00
Pricing Method: COST, NO FEE
Performance Period: 07/01/07 - 06/30/08

**** NOT TO EXCEED ****
Payment Terms: % Days Net 30


Contractor Signature

Michael B. Ward, Vice-President
Printed Name/Title

6/29/07
Date Signed


BPA Contracting Officer

June 28, 2007

Date Signed

This award contains the following - TEXT ATTACHED

CONTRACT TERMS AND CONDITIONS

B O N N E V I L L E
P O W E R A D M I N I S T R A T I O N

RELEASE

Mail Invoice To:

F & W Invoices - KEWB-4
Bonneville Power Admin. - PBL
P. O. Box 3621
Portland OR 97208-3621

Contract : 00027480
Release : 00002
Page : 1

Vendor:
TERRAQUA INC
PO BOX 85
WAUCONDA WA 98859

Please Direct Inquiries to:

MARK H. NADEAU
Title: CONTRACT SPECIALIST
Phone: 503-230-5889
Fax : 503-230-4508

Attn: MICHAEL B WARD

Contract Title: 200301700 EXP ISEMP TERRAQUA - COORDINATION FOR WENATCHEE/ENTIAT

Total Value : \$298,275.00
Pricing Method: COST, NO FEE
Performance Period: 07/01/07 - 06/30/08

**** NOT TO EXCEED ****
Payment Terms: % Days Net 30

Contractor Signature

Printed Name/Title

Date Signed



BPA Contracting Officer
June 28, 2007

Date Signed

This award contains the following - TEXT ATTACHED

CONTRACT TERMS AND CONDITIONS

Contract No. 00027480
PI 2003-01-700
EXP ISEMP Wenatchee/Entiat Coordination
Release No. 02

This Release authorizes \$298,275 for the attached statement of work and budget.

Two attachments: Statement of Work
Budget



Statement of Work Report

Project Title: Integrated Status/Effect Progr
Project #: 2003-017-00
Contract Title: 200301700 EXP ISEMP TERRAQUA - COORDINATION FOR WENATCHEE/ENTIAT
Contract #: 27480 REL 2
Province: Systemwide **Subbasin:** Systemwide Projects
Workorder ID: 129074 **Task ID:** 1
Perf. Period Budget: \$298,275 **Perf. Period:** 7/1/2007 - 6/30/2008
Contract Type: Release **Pricing Type:** Cost Reimbursement (CNF)
Contractor(s): Terraqua, Inc. (Prime - TERRAQUA00)
BPA Internal Ref: 27480 REL 2
SOW Validation: Last validated 06/18/2007 with 0 problems, and 0 reviewable items
Contract Documents: There are no contract document attachments

Contacts:

Name	Role	Organization	Phone	Email	Address
Mark Nadeau	Contracting Officer	Bonneville Power Administration	(503) 230-5889	mhnadeau@bpa.gov	905 NE 11th Ave. Mailstop NSSP-4 Portland OR 97232
David Byrnes	COTR	Bonneville Power Administration	(503) 230-3171	dmbyrnes@bpa.gov	Bonneville Power Administration Fish and Wildlife Program 905 NE 11th Ave. (97232) PO Box 3621 Portland OR 97208-3621
Mike Ward	Supervisor	Terraqua, Inc.	(509) 486-2426	wardski@televar.com	100 Summer Road Wauconda WA 98859-
Nancy Weintraub	Env. Compliance Lead	Bonneville Power Administration	(503) 230-5373	nhweintraub@bpa.gov	P.O. Box 3621, Mailstop - KEC-4 Portland, OR 97208-3621
Chris Jordan	Interested Party	National Oceanic and Atmospheric Administration (NOAA)	(541) 754-4629	chris.jordan@noaa.gov	2725 Montlake Blvd. East Seattle WA 98112-2097
Pamela Nelle	Technical Contact	Terraqua, Inc.	(509) 548-0899	nelle@genext.net	PO Box 404 Peshastin WA 98847
Holiday Sloan	Contract Manager	Terraqua, Inc.	(509) 486-2426	holidaze@televar.com	

Work Element Table of Contents:

<u>Work Element - Work Element Title</u>	<u>EC Needed*</u>	<u>Estimate</u>	<u>(%)</u>
A : 165. Produce Environmental Compliance Documentation - 6.10b Environmental Compliance		\$250	(0 %)



<u>Work Element - Work Element Title</u>	<u>EC Needed*</u>	<u>Estimate</u>	<u>(%)</u>
B : 189. Regional Coordination - 6.1 ISEMP Wenatchee/Entiat Coordination		\$47,978	(16 %)
C : 174. Produce Plan - 6.2 Implementation Tracking Tool		\$6,302	(2 %)
D : 160. Create/Manage/Maintain Database - 6.3 Data Management System Development		\$6,726	(2 %)
E : 189. Regional Coordination - 6.4 ISEMP Program Coordination		\$18,748	(6 %)
F : 174. Produce Plan - 6.5 Protocol Development		\$39,977	(13 %)
G : 157. Collect/Generate/Validate Field and Lab Data - 6.6 Macroinvertebrate Analysis	*	\$33,347	(11 %)
H : 157. Collect/Generate/Validate Field and Lab Data - 6.7 Entiat Effectiveness Monitoring	*	\$94,663	(32 %)
I : 157. Collect/Generate/Validate Field and Lab Data - 6.8 Snorkel Assistance	*	\$21,767	(7 %)
J : 157. Collect/Generate/Validate Field and Lab Data - 6.9 Repeat Habitat/Channel/Riparian/Macroinvertebrate Sampling in Wenatchee	*	\$10,564	(4 %)
K : 141. Produce Status Report - 6.11 ISEMP's Project Annual Review Report		\$12,000	(4 %)
L : 119. Manage and Administer Projects - 6.10a Project Management		\$4,203	(1 %)
M : 132. Produce (Annual) Progress Report - 6.10 d Produce Annual Progress Report for the period July 2007 to June 2008		\$750	(0 %)
N : 185. Produce Pisces Status Report - 6.10c Periodic Status Reports for BPA		\$1,000	(0 %)
Total:		<u>\$298,275</u>	

* Environmental Compliance (EC) needed before work begins.

Contract Description:

Since its inception in FY2003, Project #2003-017-00 (the Integrated Status and Effectiveness Monitoring Program; ISEMP) has been developing two novel monitoring and evaluation programs: (i) subbasin-scale pilot status and trend monitoring efforts for anadromous salmonids and their habitat in the Wenatchee/Entiat, John Day and South Fork Salmon River basins, and (ii) effectiveness monitoring for suites of habitat restoration projects in selected watersheds within the three target subbasins. This work - critical for implementing the 2000 NMFS FCRPS Biological Opinion (RPA Actions 180, 181, and 183) (BiOp) and UPAs from the 2004 BiOp - builds on current status and trend monitoring programs within each of these basins. Several regional and local organizations are funding and implementing these programs. In short, this project has integrated existing and new monitoring and evaluation activities in three pilot subbasins to help ensure that provisions of the BiOp are satisfied.

This contract is one of several contracts that will implement this project. The final report for this contract will contain data that will 1) be submitted to NOAA Fisheries (also a contractor under this project) for use in a project level integrated Annual Report and 2) be submitted to BPA as a contract final report according to the terms of this contract.

Terraqua's role has been, and continues to be, to enable the Bonneville Power Administration to continue to implement Project #2003-017-00 in the Wenatchee and Entiat subbasins. Objectives of this work have been, and continue to be:



- Coordinate contract development between Bonneville and entities participating in implementation of the ISEMP program in the Wenatchee/Entiat and other pilot subbasins.
- Coordinate contract implementation between Bonneville and entities participating of the ISEMP program in the Wenatchee/Entiat and other pilot subbasins to insure that implementation activities meet the purpose and needs of the ISEMP program.
- Implement selected monitoring activities.
- Coordinate the design and testing of a data management system to support the program with local ISEMP contractors including the development of field protocols coupled with metadata necessary for proper data management .
- Analyze and report results related to the implementation of monitoring activities.

This contract represents an increase in scope and budget of about 9.4 percent over the previous Terraqua Release #1 primarily due to the expansion of ISEMP activities in the Entiat subbasin, additional data analysis tasks, and additional protocol development.

To offset the expanded costs associated with this expanded scope of work, Terraqua has: maintained the same rates for key positions as were charged in previous years; has elevated lower-cost staff to assume some of the responsibilities previously executed by more senior staff; and has reduced the scope of some coordination elements that were more prominent in earlier releases as those elements have been completed or institutionalized to the point they are relatively maintenance-free. The following list describes details associated with some of the significant scope/budget differences compared to Release #1:

- A 13% increase in budget for "Coordination" (i.e. task 6.1 compared to Release #1 task 5.1) is modeled on the actual number of hours spent on Coordination in FY2006 compared to the amount under-projected in 5.1.
- The budget for "Implementation Strategy" design (i.e. 6.2 vs. Release #1 task 5.2) has been dropped 35% due to insufficient funds at the program scale. Existing strategies for the work in the Entiat and Wenatchee will continue to be used but will not be updated. The decision tracking tool will continue to be maintained.
- The budget for Task 6.3 is slightly lower than Release #1 Task 5.3 due to the projected use of lower-cost staff.
- The budget for Task 6.4 is slightly lower due to the projected use of lower-cost staff despite a projected increase in the frequency of ISEMP staff meetings.
- The budget for Task 6.5 is about 13 times higher than Release #1 task 5.5 because the work in task 6.5 includes the development of 10 times as many protocols (10 total vs. a single "habitat field manual") and 8 of those 10 will be developed for the first time (compared to relatively minor modifications of a pre-existing field manual as was covered by Release #1 task 5.5). The budget for Task 6.5 is much less than 10 times the initial cost of developing the field manual due to our reliance on contributions from other ISEMP contractors.
- Task 6.6 is 19% more expensive than Release #1 Task 5.6 because of a 12% increase in macroinvertebrate analysis costs and a 13% increase in the number of samples expected to be processed resulting from additional sampling in the Entiat.
- Task 6.7 represents an 69% expansion of work with the budget remaining at the same level as Release #1 Task 5.6. We expect to be able to achieve this efficiency due to the use of lower-cost staff (Mike Ward will not be used while (b)(6) crew leader for the past several years, will assume responsibility for more of the technical coordination and site selection once performed by Mike Ward) and because of efficiencies achieved at sites that have been previously monumented ("old" sites can be done at the rate of 2 per day where we used to budget sites at one per day; now, "new" sites are estimated to be surveyed at the rate of 1.5 per day).



- Task 6.8 is a new work element. It is based on a similar work element in Terraqua's contracts in the first two years where we provided contingency support for habitat field crews. This work element is necessary because the sheer number of sites requiring snorkeling, and the short time frame that the sampling must occur, has swamped the staffing capabilities of our usual list of ISEMP contractors.
- The budget for Task 6.9 has increased 44% for 50% more work and benefits from afore mentioned staff efficiencies.
- The budget for Task 6.11 has decreased about ½ to meet the lower amount of work expected to produce an annual review versus the three-year program review.



Statement of Work Report

Work Element Details

A: 165. Produce Environmental Compliance Documentation

Title: 6.10b Environmental Compliance

Description: Ensure necessary documents are provided to BPA's Environmental Compliance group in sufficient time to allow for a compliance letter to be written prior to any ground-disturbing work. Coordinate with appropriate agencies regarding any permits that may be required.

Planned Metrics: Are herbicides used as part of work performed under this contract?: No

Deliverable Specification: Provide necessary supporting documentation and assistance to BPA's Environmental Compliance Group (such as maps, design drawings, survey reports, permit applications, ESA documents, etc.) to assure a timely receipt of EC compliance letter.

Milestone Title	Start Date	End Date	Status	Milestone Description
Deliverable: A. Environmental Compliance supporting documentation		7/1/2007	Inactive	<i>See the Deliverable Specification above</i>

B: 189. Regional Coordination

Title: 6.1 ISEMP Wenatchee/Entiat Coordination

Description: Terraqua will represent the interests of the ISEMP at meetings of the RTT, the Entiat Watershed Planning Unit, and the mid-Columbia PUD's HCP Hatchery Committee, and will coordinate electronically and in-person with the following entities that may be involved in this Program: RTT, EWPU, U.S. Forest Service (USFS), Washington Department of Ecology (WDOE), Chelan PUD, Yakama Nation, NOAA-Fisheries, BPA, U.S. Bureau of Reclamation, Chelan County, Chelan County Conservation District, and other parties as necessary.

Terraqua will coordinate ISEMP contractors to help insure that contractors SOWs and deliverables meet ISEMP needs and that contractor budgets stay within the overall ISEMP budget and other available funds. Terraqua will also coordinate the analysis and reporting of ISEMP products with Quantitative Consultants, NOAA, and other program analysts.

Planned Metrics: <None>

Deliverable Specification: Attend up to twelve (12) monthly Oversight Committee meetings to be held as part of regularly scheduled RTT meetings, attend up to four (4) quarterly meetings of the EWPU and/or up to four EWPU Habitat Subcommittee meetings from July 2007 through June 2008. Attend up to two (2) meetings with BPA or NOAA at locations in Washington or Oregon from July 2007 through June 2008.

Provide a copy of written minutes from all RTT and EWPU meetings attended.

Provide a monthly report of significant coordination issues.

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Submit RTT Meeting minutes	7/1/2007	6/30/2008	Inactive	For any RTT meetings attended, submit minutes to BPA COTR via email.
B. Monthly, telephonically update COTR of significant coordination issues	7/1/2007	6/30/2008	Inactive	Monthly, conduct a telephone update with the BPA COTR regarding significant coordination issues, or anything that could jeopardize the overall project.
Deliverable: C. Meeting minutes / Coordination reports		6/30/2008	Inactive	<i>See the Deliverable Specification above</i>



C: 174. Produce Plan

Title: 6.2 Implementation Tracking Tool

Description: Terraqua will continue to maintain and update the Project Tracking Tool developed in 2005-2006 that serves to document changes to scientific study design that have occurred since the inception of ISEMP to assist project contractors in conducting field work and to assist ISEMP analysts in the interpretation of project data. This database will continue to be a "living" tool that will be periodically updated as necessary and will be electronically accessible to all ISEMP contractors and cooperators. This document will be updated and maintained in working draft format through June 30, 2008 (and presumably thereafter by Terraqua or subsequently contracted project coordinators).

Planned Metrics: <None>

Deliverable Specification: Maintain and update the ISEMP Wenatchee/Entiat project tracking tool in a format that is accessible to all ISEMP contractors and cooperators (preferably via a central location, e.g., web site)

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Maintain working draft of project tracking tool with periodic updates	7/1/2007	6/30/2008	Inactive	Continue to update and maintain the project tracking tool such that maintenance can be done by future ISEMP coordinators (whether that continues to be Terraqua or not).
Deliverable: B. Implementation of Tracking Tool		6/30/2008	Inactive	<i>See the Deliverable Specification above</i>
C. Provide accessibility to the tracking tool	7/1/2007	9/30/2007	Inactive	An accessible version of the tracking tool will be made available on-line. Because the ISEMP program relies on NOAA Fisheries web site hosting, Terraqua must work with ISEMP and NOAA staff to determine the best location and the best timing for posting this tool. Efforts to post the tool will begin immediately upon contract initiation. We anticipate that web accessibility of the document will be completed before 9/30/07 or sooner.

D: 160. Create/Manage/Maintain Database

Title: 6.3 Data Management System Development

Description: The U.S. Bureau of Reclamation (USBR) and NOAA-Fisheries are continuing to develop a data management system to guide and capture data collected by ISEMP contractors. Terraqua will continue to serve as technical liaison between ISEMP contractors and this system's developers to ensure that the final data management system serves the ISEMP as implemented in the Upper Columbia basin. Terraqua will represent the interests of the Project at development meetings held by NOAA-Fisheries and USBR and will coordinate electronically and in-person with these and other entities that are developing the data management systems related to Project #2003-017-00.

Planned Metrics: <None>

Deliverable Specification: Submit, as developed, summaries of developments to the data management system and summaries of participation by ISEMP contractors.
Attend up to three (3) one-day meetings from July 2007 through June 2008 at locations in Washington, Oregon, and Idaho.

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Submit summary of data management system development at project mid-point	7/1/2007	12/31/2007	Inactive	No later than December 31, 2007, submit a report on developments to the data management system and ISEMP contractors participation.
Deliverable: B. Summary of data management system		6/30/2008	Inactive	<i>See the Deliverable Specification above</i>



E: 189. Regional Coordination

Title: 6.4 ISEMP Program Coordination

Description: Implementation of the Project among the three pilot subbasins, particularly in the area of data management, analysis, reporting, and dissemination of information to other users in the Columbia Basin and states of OR, ID, and WA, requires close coordination of numerous entities who are participating in the Project. Terraqua will represent the interests of the Project at meetings of the pilot subbasin coordinators and will coordinate electronically and in-person with these coordinators and other entities that are developing data management systems, analysis, reporting, and document/conference preparation materials related to Project #2003-017-00.

Planned Metrics: <None>

Deliverable Specification: Attend up to six (6) one-day meetings with pilot subbasin coordinators, and participate in up to two (2) two-day conferences/meetings to disseminate results of ISEMP work to broad monitoring/research/management communities, from July 2007 through June 2008 at locations in Washington, Oregon, and Idaho.

Submit an electronic version of minutes from each of up to 8 meetings attended regarding program coordination.

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Attend program coordination meetings	7/1/2007	6/30/2008	Inactive	Attend up to six (6) one-day meetings with pilot subbasin coordinators, and participate in up to two (2) two-day conferences/meetings to disseminate results of ISEMP work to broad monitoring/research/management communities, from July 2007 through June 2008 at locations in Washington, Oregon, and Idaho. Submit an electronic version of minutes from each of up to 8 meetings attended regarding program coordination.
Deliverable: B. Meeting minutes		6/30/2008	Inactive	<i>See the Deliverable Specification above</i>

F: 174. Produce Plan

Title: 6.5 Protocol Development

Description: Terraqua will coordinate the development of working draft scientific protocols suitable to describe field and data management methodologies for several methodologies implemented by ISEMP in the Wenatchee/Entiat. These include updating existing protocols for habitat surveys and fish capture and tagging, and also includes new protocols for: fine sediment, water quality, snorkel, redd surveys, smolt trapping, macroinvertebrates sampling, site selection, efficiency trials, and fish capture/pit tagging. Terraqua will collate methodologies provided by ISEMP contractors, will provide descriptions of proper data management for each protocol that matches the needs of each protocol's ATM data management tool, and will produce a working draft document for each protocol.

Completion of this work element will require substantial input from ISEMP contractors and ISEMP data managers.

Planned Metrics: <None>

Deliverable Specification: Revise and update protocols for habitat surveys and fish capture/tagging. Create working-draft protocols for fine sediment, water quality, snorkel, redd surveys, smolt trapping, macroinvertebrates sampling, site selection, efficiency trials, fish capture/pit tagging. Each document should be produced in Portable Document Format (PDF) or other generally accepted format. Any deviation requires prior approval from the BPA COTR.

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Revise and update fish capture/PIT tagging protocol	9/1/2007	4/30/2008	Inactive	Update working-draft protocol for fish capture/PIT tagging to incorporate lessons learned from 2007 field season. Each document should be produced in Portable Document Format (PDF) or other generally accepted format. Any deviation requires prior approval from the BPA COTR.



Milestone Title	Start Date	End Date	Status	Milestone Description
B. Revise and update habitat survey protocol	12/1/2007	4/30/2008	Inactive	Update working-draft protocol for habitat surveys to incorporate lessons learned from 2007 field season. Each document should be produced in Portable Document Format (PDF) or other generally accepted format. Any deviation requires prior approval from the BPA COTR.
C. First draft of efficiency trial protocol	7/1/2007	10/31/2007	Inactive	Create and send out for review a draft protocol for efficiency trials as a Portable Document Format (PDF) or other generally accepted format. Any deviation requires prior approval from the BPA COTR.
D. Final working draft of efficiency trial protocol	11/1/2007	1/31/2008	Inactive	Finalize after review a working-draft protocol for efficiency trials as a Portable Document Format (PDF) or other generally accepted format. Any deviation requires prior approval from the BPA COTR.
E. First draft of redd survey protocol	7/1/2007	10/30/2007	Inactive	Create and send out for review a draft protocol for redd surveys as a Portable Document Format (PDF) or other generally accepted format. Any deviation requires prior approval from the BPA COTR.
F. Final working draft of redd survey protocol	11/1/2007	1/31/2008	Inactive	Finalize after review a working-draft protocol for redd surveys as a Portable Document Format (PDF) or other generally accepted format. Any deviation requires prior approval from the BPA COTR.
G. First draft of water quality protocol	7/1/2007	9/30/2007	Inactive	Create and send out for review a draft protocol for water quality as a Portable Document Format (PDF) or other generally accepted format. Any deviation requires prior approval from the BPA COTR.
H. Final working draft of water quality protocol	10/1/2007	12/31/2007	Inactive	Finalize after review a working-draft protocol for water quality as a Portable Document Format (PDF) or other generally accepted format. Any deviation requires prior approval from the BPA COTR.
I. First draft of snorkel survey protocol	9/7/2007	11/1/2007	Inactive	Create and send out for review a draft protocol for snorkel surveying as a Portable Document Format (PDF) or other generally accepted format. Any deviation requires prior approval from the BPA COTR.
J. Final working draft of snorkel survey protocol	11/1/2007	2/29/2008	Inactive	Finalize after review a working-draft protocol for snorkel surveys as a Portable Document Format (PDF) or other generally accepted format. Any deviation requires prior approval from the BPA COTR.
K. First draft of smolt trapping protocol	7/1/2007	10/31/2007	Inactive	Create and send out for review a draft protocol for smolt trapping as a Portable Document Format (PDF) or other generally accepted format. Any deviation requires prior approval from the BPA COTR.
L. Final working draft of smolt trapping protocol	11/1/2007	1/31/2008	Inactive	Finalize after review a working-draft protocol for smolt trapping as a Portable Document Format (PDF) or other generally accepted format. Any deviation requires prior approval from the BPA COTR.
M. First draft of macroinvertebrate collection protocol	9/1/2007	1/31/2008	Inactive	Create and send out for review a draft protocol for macroinvertebrate collection as a Portable Document Format (PDF) or other generally accepted format. Any deviation requires prior approval from the BPA COTR.



Milestone Title	Start Date	End Date	Status	Milestone Description
N. Final working draft of macroinvertebrate collection protocol	2/1/2008	5/30/2008	Inactive	Finalize after review a working-draft protocol for macroinvertebrate collection as a Portable Document Format (PDF) or other generally accepted format. Any deviation requires prior approval from the BPA COTR.
O. First draft of site selection protocol	9/1/2007	11/1/2007	Inactive	Create and send out for review a draft protocol for site selection as a Portable Document Format (PDF) or other generally accepted format. Any deviation requires prior approval from the BPA COTR.
P. Final working draft of site selection protocol	11/2/2007	12/15/2007	Inactive	Finalize after review working-draft protocol for site selection as a Portable Document Format (PDF) or other generally accepted format. Any deviation requires prior approval from the BPA COTR.
Q. First draft of fine sediment protocol	10/1/2007	1/31/2008	Inactive	Create and send out for review a draft protocol for fine sediment as a Portable Document Format (PDF) or other generally accepted format. Any deviation requires prior approval from the BPA COTR.
R. Final working draft of fine sediment protocol	2/1/2008	4/30/2008	Inactive	Finalize after review working-draft protocol for fine sediment as a Portable Document Format (PDF) or other generally accepted format. Any deviation requires prior approval from the BPA COTR.
Deliverable: S. Final working draft protocols		5/30/2008	Inactive	<i>See the Deliverable Specification above</i>

G: 157. Collect/Generate/Validate Field and Lab Data

Title: 6.6 Macroinvertebrate Analysis

Description: Terraqua will subcontract with Rhithron Associates, Inc. in Missoula, Mt. for identification of fifty (50) macroinvertebrate samples collected by WDOE staff in the Wenatchee Subbasin in 2007. Terraqua, Inc. will also collect macroinvertebrate samples at up to forty-seven (47) sites in the Entiat and ten (10) sites in the Wenatchee subbasins (see Work Element H:157 "Task 6.7" and Work Element J:157 "Task 6.9" for details regarding these sites). At the end of field sampling in fall 2007, Terraqua, Inc. will transport macroinvertebrate samples to Rhithron. Terraqua/Rhithron will provide identification of macroinvertebrates to the lowest practical levels consistent with the River Invertebrate Prediction and Classification System (RIVPACS; Hawkins et al. 2001) protocol, including midges and worms to genus or species using a 500-organism random subsample. Terraqua/Rhithron will deliver standardized metric calculations and will archive the identified fraction of the sample for one year.

Planned Metrics:
 * R, M, and E Focal Area : Tributaries
 * Primary R, M, and E Type : Status and Trend Monitoring
 * Secondary R, M, and E Type : Uncertainties Research

Deliverable Specification: Per RIVPACS protocol (Hawkins et al. 2001), provide standardized metric calculations of Macroinvertebrates from up to 107 sites (50 in the Wenatchee collected by WDOE, 47 in the Entiat collected by Terraqua, and 10 in the Wenatchee collected by Terraqua).

Quality controlled raw data and quality controlled summarized macroinvertebrate data with GPS locations, will be entered and stored in Microsoft Access databases known as Automated Template Modules (ATMs) that will be provided by NOAA Fisheries by May 30, 2008. Data will be uploaded by June 30, 2008 to NOAA Fisheries using the ATM and notice will be provided to BPA and Terraqua, Inc. when the data has been uploaded. The contractor will be responsible for all quality assurance/quality control steps necessary to ensure that data is properly collected and entered into the ATM.

Reference: Hawkins, C., J. Ostermiller, M. Vinson, and J. Stevenson. 2001. Stream algae, invertebrate, and environmental sampling associated with biological water quality assessments: field protocols. Utah State University, Logan, UT. web link: <http://www.usu.edu/buglab/monitor/USUproto.pdf>



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	7/15/2007	7/15/2007	Completed	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. Samples collected	7/15/2007	9/30/2007	Inactive	Terraqua will collect macroinvertebrate samples at up to forty-seven (47) sites in the Entiat and ten (10) sites in the Wenatchee subbasins (see Tasks 6.7 and 6.9 for details regarding these sites). Also during this time, Washington Department of Ecology will be collecting samples in the Wenatchee subbasins at 50 sites.
C. Samples delivered to Rhithron Associates	9/30/2007	11/3/2007	Inactive	At the end of field sampling in fall 2007, Terraqua, Inc. will transport macroinvertebrate samples collected by Terraqua and WDOE to Rhithron.
D. Data generated by Rhithron Associates and delivered to Terraqua/BPA	10/31/2007	4/30/2008	Inactive	Rhithron will provide identification of macroinvertebrates to the lowest practical levels consistent with RIVPACS protocol, including midges and worms to genus or species using a 500-organism random subsample. Rhithron will deliver standardized metric calculations and will archive the identified fraction of the sample for one year.
Deliverable: E. Macroinvertebrate Analysis		4/30/2008	Inactive	<i>See the Deliverable Specification above</i>

H: 157. Collect/Generate/Validate Field and Lab Data

Title: 6.7 Entiat Effectiveness Monitoring

Description: Terraqua will assist in the implementation of project effectiveness monitoring in the Entiat River under the ISEMP program. This work will include: monitoring of habitat/channel/riparian/macroinvertebrate conditions using protocols from the Upper Columbia Monitoring Strategy at twenty-two (22) restoration project control and treatment sites and at twenty-five (25) randomly located reference sites used for comparison of watershed status and trends with sites in the restoration project area; habitat quantification to support snorkeling work during three (3) snorkel surveys to be conducted by the USFWS at the twenty-three (22) restoration project control and treatment sites which will be snorkeled in 2007-2008; coordination of the monitoring work conducted by USFWS, CCCD, and Terraqua; and data synthesis, analysis, and storage and preparation of a brief technical synthesis report that will include results from habitat and snorkeling work by USFWS and Terraqua.

Planned Metrics:

- * R, M, and E Focal Area : Tributaries
- * Primary R, M, and E Type : Action Effectiveness Research
- * Secondary R, M, and E Type : Action Effectiveness Research

Deliverable Specification: Submit in Microsoft Word format electronically

Quality controlled raw data and quality controlled summarized habitat/channel/riparian/macroinvertebrate conditions data with GPS locations, will be entered and stored in Microsoft Access databases known as Automated Template Modules (ATMs) previously provided by NOAA Fisheries. Data will be uploaded by June 30, 2008 to NOAA Fisheries using the ATM and notice will be provided to BPA and Terraqua, Inc. when the data has been uploaded. The contractor will be responsible for all quality assurance/quality control steps necessary to ensure that data is properly collected and entered into the ATM.



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	7/15/2007	7/15/2007	Completed	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. Conduct habitat monitoring	7/1/2007	9/30/2007	Inactive	Monitor channel/riparian/macroinvertebrate conditions using protocols from the Upper Columbia Monitoring Strategy at twenty-two (22) restoration project control and treatment sites and at twenty-five (25) randomly located reference sites used for comparison of watershed status and trends with sites in the restoration project area.
C. Support snorkel surveys with habitat measurements: 1	7/1/2007	8/28/2007	Inactive	Quantify habitat to support snorkeling work during snorkel surveys to be conducted by the USFWS at twenty-two (22) restoration project control and treatment sites in late July to early August.
D. Data entry and analysis	10/1/2007	5/31/2008	Inactive	Synthesize data, perform analyses, and store data in data management system.
E. First draft report	10/1/2007	3/31/2008	Inactive	Produce a draft field data synthesis report that will include results from habitat and snorkeling work by USFWS and Terraqua. This report will focus on whether different field efforts have achieved the needs of the ISEMP Entiat Effectiveness program element and will briefly summarize these data in the context of the ISEMP Entiat Implementation Strategy goals and objectives. This report will not include in-depth analysis of data as that will be accomplished by other ISEMP contractors at different scheduling under related contracts.
F. Support snorkel surveys with habitat measurements: 2	10/17/2007	11/30/2007	Inactive	Quantify habitat to support snorkeling work during snorkel surveys to be conducted by the USFWS at the twenty-two (22) restoration project control and treatment sites in late October to November.
G. Support snorkel surveys with habitat measurements: 3	2/1/2008	3/31/2008	Inactive	Quantify habitat to support snorkeling work during snorkel surveys to be conducted by the USFWS at the twenty-two (22) restoration project control and treatment sites in February through March.
H. Final draft report	4/1/2008	6/30/2008	Inactive	Produce a final field data synthesis report that will include results from habitat and snorkeling work by USFWS and Terraqua. This report will focus on whether different field efforts have achieved the needs of the ISEMP Entiat Effectiveness program element and will briefly summarize these data in the context of the ISEMP Entiat Implementation Strategy goals and objectives. This report will not include in-depth analysis of data as that will be accomplished by other ISEMP contractors at different scheduling under related contracts. The relatively late date (in relation to when the field work is conducted) for this deliverable is required because of the need to synthesize reports from other agencies and due to the late field data collection season in March 2007.
Deliverable: I. Field Data Synthesis Report and final data		6/30/2008	Inactive	<i>See the Deliverable Specification above</i>



I: 157. Collect/Generate/Validate Field and Lab Data

Title: 6.8 Snorkel Assistance

Description: The USFWS, YN and USFS are all performing related field work under Project # 2003-017-00 but, due to restricted budgets and lack of available agency personnel, will be unable to assign redundant staff who would receive adequate field training and who would complete their field work in the case of illness, injury, or other staffing changes among the dedicated personnel. Two (2) Terraqua, Inc. field technicians will undergo the field protocol training for snorkel surveys alongside one of, or all of, the agencies involved (USFWS, YN, and USFS), and will assist the Yakama Nation for at five (5) sites with snorkel surveys that are already included in the ISEMP snorkel schedule. In addition, two (2) Terraqua Inc., field technicians will be available on an as-needed, as-available basis for redundant, on-call field support for snorkel surveys for up to 10 field-person-days. Additional field support could be made available through an amendment to this Release if the agency's staffing disruptions were anticipated to be long-term. Terraqua staff will work under the direction of field crew leaders of the appropriate agency and therefore will be covered by that agency's environmental compliance permits.

- Planned Metrics:**
- * R, M, and E Focal Area : Tributaries
 - * Primary R, M, and E Type : Status and Trend Monitoring
 - * Secondary R, M, and E Type : Status and Trend Monitoring

Deliverable Specification: Two (2) Terraqua, Inc., technicians will undergo the field protocol training for snorkel surveys alongside one of, or all of, the agencies involved (USFWS, YN, and USFS), and will assist ISEMP cooperators with previously scheduled snorkel surveys at five sites and will be available on an as-needed, as-available basis for redundant, on-call field support for snorkel surveys for up to 10 field-person-days. Other agencies, leading the snorkel effort, will be responsible for recording, storing, and managing field data.

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	7/1/2007	7/15/2007	Completed	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. Snorkel assistance labor	7/1/2007	3/30/2008	Inactive	Undergo field protocol training for snorkel surveys, assist other ISEMP cooperators with previously scheduled snorkel surveys at five sites, and perform snorkel surveys in conjunction with other ISEMP cooperators on an as-needed, as-available basis for redundant, on-call field support for snorkel surveys for up to 10 field-person-days. YN or other lead agency will be responsible for recording, storing, and managing field data.
Deliverable: C. Snorkel assistance for scheduled and un-scheduled sites		6/30/2008	Inactive	<i>See the Deliverable Specification above</i>



J: 157. Collect/Generate/Validate Field and Lab Data

Title: 6.9 Repeat Habitat/Channel/Riparian/Macroinvertebrate Sampling in Wenatchee

Description: Per the Upper Columbia Monitoring Strategy (Hillman 2006), five of the 50 sites (10 percent) sampled by Washington Department of Ecology (WDOE) for habitat/channel/riparian/macroinvertebrate conditions will be resampled by independent field crews. Each of these 5 sites will be resampled twice for a total of three visits at five sites, which is necessary to calculate between crew variability.

Of the three visits at these five sites, WDOE will provide 1.5 crews and Terraqua will provide 1.5 crews. This amounts to a level of effort by Terraqua of 15 person days. Also, in this work element, Terraqua crew members will participate in 5 days of annual training with WDOE in advance of the 2007 field season.

- Planned Metrics:**
- * R, M, and E Focal Area : Tributaries
 - * Primary R, M, and E Type : Status and Trend Monitoring
 - * Secondary R, M, and E Type : Status and Trend Monitoring

Deliverable Specification: Transmit habitat/channel/riparian/macroinvertebrate conditions data after finishing the report writing process during which errors can sometimes become apparent. Collate, tabulate, and transmit data to WDOE in Access format.

Quality controlled raw data and quality controlled summarized habitat data with GPS locations, will be entered and stored in Microsoft Access databases known as Automated Template Modules (ATMs) previously provided by NOAA Fisheries. Data will be uploaded by June 30, 2008 to NOAA Fisheries using the ATM and notice will be provided to BPA and Terraqua, Inc. when the data has been uploaded. The contractor will be responsible for all quality assurance/quality control steps necessary to ensure that data is properly collected and entered into the ATM.

Reference: Hillman, T.W. 2006. Monitoring strategy for the Upper Columbia basin: Second draft report. BioAnalysts, Inc., Boise, ID.

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	7/1/2007	7/1/2007	Completed	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. Conduct field work	7/18/2007	9/30/2007	Inactive	Five of the 50 sites (10 percent) sampled by Washington Department of Ecology (WDOE) for habitat/channel/riparian/macroinvertebrate conditions will be resampled, per the Upper Columbia Monitoring Strategy, by an independent Terraqua field crew in order to estimate between crew measurement variability. The Terraqua crew will characterize channel and riparian habitat quality by collecting the same data for each specific indicator identified in the ISEMP habitat survey protocol.
C. Participate in annual training with WDOE	6/1/2008	6/30/2008	Inactive	Participate in up to 5 days of field training with WDOE habitat crews in advance of the 2007 field season. Included within this training will be any revisions to the field manual and may include training in any database advancements that may have occurred since spring of 2006.
Deliverable: D. Final survey data		6/30/2008	Inactive	<i>See the Deliverable Specification above</i>



K: 141. Produce Status Report

Title: 6.11 ISEMP's Project Annual Review Report

Description: The ISEMP Project Annual Review Report is the capstone report for all activities that are separately contracted under this Project #2003-017. Prior to 2006, this reporting has been completed by reports prepared by individual contractors or has been accomplished through BiOp reporting. BPA managers and ISEMP coordinators and other entities have expressed the desire to have the complete program summarized in a periodically updated program review document. In 2006, a three-year review was created with the intention of updating that document annually beginning in 2007.

In this work element, Terraqua will produce the 2007 ISEMP Project Annual Review, a document that compiles and coordinates the reports of all ISEMP contractors from each of the three pilot subbasins and the umbrella group (Note: ISEMP contractors will continue to provide BPA with annual reports regarding contract-specific progress and work performed), describes all ISEMP progress in the past year of the program in relation to ISEMP proposed goals and objectives, and documents changes in protocols/indicators being monitored that have resulted from data collected. This document will be stored on the ISEMP web site and uploaded to Pisces.

Planned Metrics: <None>

Deliverable Specification: Produce the ISEMP Project Annual Review Report that captures accomplishments to date all activities that are separately contracted under this Project #2003-017 for external review that can be shared with all participants as well as external parties via the ISEMP web site and Pisces. This document will be a "special progress report" that will be developed in addition to the progress report prepared in Work Element N, 6.10d Submit Annual Report. The ISEMP Project Annual Review Report will not change the need of other contractors to submit their annual reports.

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Produce draft ISEMP Annual Review	7/1/2007	10/31/2007	Inactive	Develop a single document that compiles and coordinates the reports of all ISEMP contractors, describes all ISEMP progress in the past year of the program in relation to ISEMP proposed goals and objectives, and documents changes in protocols/indicators being monitored that have resulted from data collected. Circulate this draft document for review among ISEMP and BPA collaborators.
B. Produce final ISEMP Annual Review	10/31/2007	12/30/2007	Inactive	Publish an electronic, accessible, final document that compiles and coordinates the reports of all ISEMP contractors, describes all ISEMP progress in the past year of the program in relation to ISEMP proposed goals and objectives, and documents changes in protocols/indicators being monitored that have resulted from data collected over the past year of the program. Store this document on the ISEMP web site.
Deliverable: C. ISEMP Annual Review		12/10/2007	Inactive	<i>See the Deliverable Specification above</i>



L: 119. Manage and Administer Projects

Title: 6.10a Project Management

Description: Manage the project. Also covers administrative work in support of on-the-ground efforts and in support of BPA's programmatic requirements such as metric reporting, financial reporting (e.g., accruals), and development of an SOW package (includes draft SOW, budget, spending plan, and property inventory).

Planned Metrics: <None>

Deliverable Specification: Submit next year's SOW, Budget, and Property Inventory to the BPA COTR. The SOW should include location information (latitude and longitude) for those work elements that require it. If contractor or contractor's organization takes longer than 30 days to sign the contract, the contractor will need to send this funding package to BPA more than 90 days before the end of the current contract.

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Accrual - Submit September estimate to BPA	8/15/2007	9/10/2007	Inactive	Provide BPA with an estimate of contract work that will occur prior to September 30 but will not be billed until October 1 or later. Generally, this should be done by September 10.
B. Prepare FY08 SOW, budget, etc	3/1/2008	4/30/2008	Inactive	Provided funding is made available for additional work as defined under this current SOW, and additional protocol testing is required, submit a new SOW (via Pisces), budget, etc., no later than 90 days prior to the expiration of the current contract (i.e., June 30, 2007).
C. Funding Package - Conduct internal review (e.g., Supervisor or Interagency)	3/1/2008	4/30/2008	Inactive	If necessary, submit next year's SOW and Budget for internal contractor review before submitting to BPA. Assuming this review takes 30 days, start this milestone 120 days before the end of the current contract.
Deliverable: D. Funding Package - Submit draft to COTR		6/30/2008	Inactive	<i>See the Deliverable Specification above</i>



M: 132. Produce (Annual) Progress Report

Title: 6.10 d Produce Annual Progress Report for the period July 2007 to June 2008

Description: The annual report summarizes the project goal, objectives, hypotheses, completed and uncompleted deliverables, problems encountered, lessons learned, and long-term planning. Examples of long-term planning include future improvements, new directions, or level of effort for contract implementation, including any ramping up or ramping down of contract components or of the project as a whole. Date range July 1, 2007 to June 30, 2008 has been agreed upon by the COTR and the contractor. This may or may not coincide with the contract period. For an ongoing project, an annual report covering a contract period may be submitted under the subsequent contract, if approved by the COTR.

Planned Metrics: <None>

Deliverable Specification: Upload annual report for the period July 2007 to June 2008. Currently, this is done via the BPA website; down the road, this may be done via attachments supported directly within Pisces. For guidance on how/where to upload: http://www.efw.bpa.gov/Integrated_Fish_and_Wildlife_Program/technicalreports.aspx

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Review annual report format requirements	10/1/2007	10/1/2007	Inactive	Contractor must review formatting requirements before starting the first draft of their report. Please follow the BPA-required format. http://www.efw.bpa.gov/Integrated_Fish_and_Wildlife_Program/technicalreports.aspx
B. Email draft of report to COTR for review	5/30/2008	5/30/2008	Inactive	The draft annual report must be submitted to the BPA COTR in Microsoft Word format (any version of Word is fine).
C. Receive COTR review comments	6/15/2008	6/15/2008	Inactive	The BPA COTR should provide review feedback and comments within 30 days of receiving the draft annual report. This milestone should therefore have a duration of 30 days.
D. Finalize Draft Annual Report	6/1/2008	6/30/2008	Inactive	Integrate review feedback and comments, and obtain internal signatures if necessary. Convert the annual report to Adobe Acrobat PDF format. It is anticipated that this report will be uploaded to public by BPA within 30 days of its receipt on June 30, 2008.
Deliverable: E. Final report uploaded to the BPA website		6/30/2008	Inactive	<i>See the Deliverable Specification above</i>



N: 185. Produce Pisces Status Report

Title: 6.10c Periodic Status Reports for BPA

Description: The Contractor shall report on the status of milestones and deliverables in Pisces. Reports shall be completed either monthly or quarterly as determined by the BPA COTR. Additionally, when indicating a deliverable milestone as COMPLETE, the contractor shall provide metrics and the final location (latitude and longitude) prior to submitting the report to the BPA COTR.

Planned Metrics: <None>

Deliverable Specification:

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Jul 2007 (7/1/2007 - 7/31/2007)	8/1/2007	8/7/2007	Inactive	
B. Aug 2007 (8/1/2007 - 8/31/2007)	9/1/2007	9/7/2007	Inactive	
C. Sep 2007 (9/1/2007 - 9/30/2007)	10/1/2007	10/7/2007	Inactive	
D. Oct 2007 (10/1/2007 - 10/31/2007)	11/1/2007	11/7/2007	Inactive	
E. Nov 2007 (11/1/2007 - 11/30/2007)	12/1/2007	12/7/2007	Inactive	
F. Dec 2007 (12/1/2007 - 12/31/2007)	1/1/2008	1/7/2008	Inactive	
G. Jan 2008 (1/1/2008 - 1/31/2008)	2/1/2008	2/7/2008	Inactive	
H. Feb 2008 (2/1/2008 - 2/29/2008)	3/1/2008	3/7/2008	Inactive	
I. Mar 2008 (3/1/2008 - 3/31/2008)	4/1/2008	4/7/2008	Inactive	
J. Apr 2008 (4/1/2008 - 4/30/2008)	5/1/2008	5/7/2008	Inactive	
K. May 2008 (5/1/2008 - 5/31/2008)	6/1/2008	6/7/2008	Inactive	
L. Final Jun 2008 (6/1/2008 - 6/30/2008)	6/24/2008	6/30/2008	Inactive	

Budget

(CR # 82251) Release #2, Master Agreement #27480
 BPA Project 2003-017-00: Integrated Monitoring Pilot
 July 1, 2007 through June 30, 2008

Task	Description	Qty	Unit	Unit Cost	COST
1	PERSONNEL SERVICES				\$220,157
	Michael Ward	(b)(4)		(b)(4)	
Task 6.2	Implementation Tracking		hours @	/hour	(b)(4)
Task 6.5	Protocol Development		hours @	/hour	
Task 6.10	Proj. Mgt. and Reporting		hours @	/hour	
	Holiday Sloan				
Task 6.10	Proj. Mgt. and Reporting		hours @	/hour	
	Pamela Nelle				
Task 6.1	Coordination/QC		hours @	/hour	
Task 6.2	Implementation Tracking		hours @	/hour	
Task 6.3	Data Management System		hours @	/hour	
Task 6.4	Pilot Subbasin Coord.		hours @	/hour	
Task 6.5	Protocol Development		hours @	/hour	
Task 6.6	Macroinvertebrate Analysis		hours @	/hour	
Task 6.7	Entiat Effectiveness		hours @	/hour	
Task 6.10	Proj. Mgt. and Reporting		hours @	/hour	
Task 6.11	ISEMP Annual Program Review		hours @	/hour	
	Jeremy Moberg				
Task 6.5	Protocol Development		hours @	/hour	
Task 6.6	Macroinvertebrate Analysis		hours @	/hour	
Task 6.7	Entiat Effectiveness		hours @	/hour	
Task 6.8	Wenatchee/Entiat Snorkel Assistance		hours @	/hour	
Task 6.9	Repeat Sampling		hours @	/hour	
	Jon Raymond				
Task 6.7	Entiat Effectiveness		hours @	/hour	
Task 6.8	Wenatchee/Entiat Snorkel Assistance		hours @	/hour	
Task 6.9	Wenatchee Repeat Sampling		hours @	/hour	
	Drew Wheelan				
Task 6.7	Entiat Effectiveness		hours @	/hour	
Task 6.8	Wenatchee/Entiat Snorkel		hours @	/hour	

		(b)(4)		(b)(4)	(b)(4)
Task 6.9	Assistance Wenatchee Repeat Sampling		hours	@	/hour
Task 6.5	Steve Tussing Protocol Development		hours	@	/hour
2	Travel				\$32,381
	Airfare				
Task 6.1	EAT to Portland, OR or other loc. in OR/WA/ID	(b)(4)	RT	@	(b)(4) /RT
Task 6.3	EAT to Boise, ID or other loc.in OR/WA/ID		RT	@	/RT
Task 6.4	EAT to Portland, OR or other loc.in OR/WA/ID		RT	@	/RT
Task 6.5	Redding, CA to Portland, OR or other loc. In OR/WA/ID		RT	@	/RT
	Rental car and parking				
Task 6.1	SEA or PDX (NOAA/BPA)		RT	@	/RT
Task 6.3	Boise, ID or other loc.in OR/WA/ID		RT	@	/RT
Task 6.4	Portland, OR or other loc.in OR/WA/ID		RT	@	/RT
Task 6.5	Portland, OR or other loc.in OR/WA/ID		RT	@	/RT
	Per Diem (Lodging plus M&IE)				
Task 6.1	Portland (BPA)		day/night	@	/day
Task 6.1	Seattle (SEA)		day/night	@	/day
Task 6.3	Seattle, WA or other loc.in OR/WA/ID		day/night	@	/day
Task 6.4	Portland, OR or other loc.in OR/WA/ID		day/night	@	/day
Task 6.5	Leavenworth, WA		day/night	@	/day
Task 6.5	Portland, OR or other loc.in OR/WA/ID		day/night	@	/day
Task 6.6	Missoula, MT		day/night	@	/day
Task 6.7	Washington Cities		day/night	@	/day
Task 6.7	Washington Cities (M&IE only)		day/night	@	/day
Task 6.8	Washington Cities		day/night	@	/day
Task 6.8	Washington Cities (M&IE only)		day/night	@	/day
Task 6.9	Washington Cities		day/night	@	/day
	Field Trailer Rental				
Task 6.7	Rental of trailer (in lieu of approx. 98 nights of lodging)		months	@	/month
	POV Mileage to/from				
Task 6.1	Wenatchee from Peshastin, WA		trip	@	mi/trip
Task 6.1	Entiat, Wa. from Peshastin, WA		trip	@	mi/trip
Task 6.3	EAT from Peshastin, WA		trip	@	mi/trip
Task 6.4	EAT from Peshastin, WA		trip	@	mi/trip
Task 6.5	Leavenworth, WA from Riverside, WA		trip	@	mi/trip

Task 6.5	Red Bluff, CA to Redding, CA	(b)(4)	trip	@	(b)(4)	mi/trip	(b)(4)
Task 6.6	Missoula, MT from Riverside, WA	(b)(4)	trip	@	(b)(4)	mi/trip	(b)(4)
Task 6.6	Wenatchee from Riverside, WA	(b)(4)	trip	@	(b)(4)	mi/trip	(b)(4)
Task 6.7	RT to/among sites in Entiat Subbasin from Riverside	(b)(4)			(b)(4)	miles	(b)(4)
Task 6.8	RT to/among sites in Wen/Entiat Subbasin from Riverside	(b)(4)			(b)(4)	mi/trip	(b)(4)
Task 6.9	RT to/among sites in Wenatchee Subbasin from Riverside	(b)(4)			(b)(4)	miles	(b)(4)

3	FIELD EQUIPMENT RENTAL						\$6,680
Task 6.7	Field gear rental days	(b)(4)	days	@	(b)(4)	/day	(b)(4)
Task 6.8	Field gear rental days	(b)(4)	days	@	(b)(4)	/day	
Task 6.9	Field gear rental days	(b)(4)	days	@	(b)(4)	/day	

4	SUPPLIES						\$6,652
split 95% 6.7	Field Paper for data sheets	(b)(4)	ream	@	(b)(4)	/ream	(b)(4)
split 95% 6.7	Measuring Tape (50m)	(b)(4)	each	@	(b)(4)	/each	
split 95% 6.7	Measuring Tape refill (100m)	(b)(4)	each	@	(b)(4)	/each	
split 95% 6.7	Hand Level	(b)(4)	each	@	(b)(4)	/each	
split 95% 6.7	Binders	(b)(4)	each	@	(b)(4)	/each	
split 95% 6.7	Note paper refills	(b)(4)	each	@	(b)(4)	/each	
split 95% 6.7	Notebooks	(b)(4)	each	@	(b)(4)	/each	
split 95% 6.7	Densimeter (convex)	(b)(4)	each	@	(b)(4)	/each	
split 95% 6.7	Macroinvertebrate containers	(b)(4)	case	@	(b)(4)	/case	
split 95% 6.7	Surveyor Rod	(b)(4)	each	@	(b)(4)	/each	
split 95% 6.7	Denatured alcohol	(b)(4)	gal.	@	(b)(4)	/gal	
split 95% 6.7	Kicknet	(b)(4)	each	@	(b)(4)	/each	
split 95% 6.7	Miscellaneous	(b)(4)			(b)(4)		
split 95% 6.7	Taxes and Shipping at 15%	(b)(4)			(b)(4)		
Task 6.4	Conference fees	(b)(4)	conf.	@	(b)(4)	/conf.	
Task 6.8	Drysuits	(b)(4)	each	@	(b)(4)	/each	

Task 6.8	Misc snorkel equipment (fleece suits, replace masks, gloves, hoods, snorkel etc.)				(b)(4)
5	SUBCONTRACTS				\$28,355
Task 6.6	Rhithron Associate, Inc. lab fees	(b)(4)	samples	@	(b)(4) /sample \$28,355
6	Administrative Expense (10% of dir. exp. excl. mileage/per diem)				\$4,051
Task 6.4	Conference fees	(b)(4)	conf.	@	(b)(4) /conf.
Task 6.6	Rhithron Associate, Inc. lab fees	(b)(4)	samples	@	(b)(4) /sample
split 1/3a	Airfare, parking, rental cars				(b)(4)
split 1/3b	Supplies				
7	BUDGET SUBTOTAL				\$298,275
	Less 2005 unspent balance				0
8	BUDGET TOTAL				\$298,275

RONNEVILLE
POWER ADMINISTRATION

RELEASE

Mail Invoice To:

F & W Invoices - KEWB-4
Bonneville Power Admin. - PBL
P. O. Box 3621
Portland OR 97208-3621

Contract : 00027480
Release : 00004
Page : 1

Vendor:

TERRAQUA INC
PO BOX 85
WAUCONDA WA 98859

Please Direct Inquiries to:

LISA R. GANG
Title: CONTRACTOR CIBER
Phone: 503-230-3893
Fax :

Attn: MICHAEL B WARD

Contract Title: 2003-017-00 EXP ISEMP-TERRAQUA COORDINATION WENATCHEE/ENTIAT

Total Value : \$475,768.00
Pricing Method: COST, NO FEE
Performance Period: 07/01/09 - 06/30/10

**** NOT TO EXCEED ****
Payment Terms: % Days Net 30


Contractor Signature
Holiday A Sloan/president
Printed Name/Title
6/24/09
Date Signed


BPA Contracting Officer
6/24/09
Date Signed



COVER SHEET CONTINUATION

Master Agreement No. 00027480, Release 004
Project : 2003-017-00 Exp Isemp/Terraqua Coordination Wenatchee/Entiat

COTR – David Byrnes (503) 230-3171 / dmbyrnes@bpa.gov
COR – Lisa Gang (503) 230-3893 / lrgang@bpa.gov

This release includes the following documents:

Face Page
This Page 2
Statement of Work
Budget

This release is hereby issued as follows:

1. Incorporate the Statement of Work (SOW) and Budget.
2. Authorize funding of not-to-exceed \$475,768.00.
3. There is no capital equipment that is being transferred as part of this Release.
4. Please mail invoices to: Bonneville Power Administration
ATTN: F & W Invoices, KEWB-4
P.O. Box 3621
Portland, OR 97208
fwinvoices@bpa.gov

This release is subject to the terms and conditions of the Master Agreement 00027480.

The funds are obligated by individual releases.

ALL OTHER TERMS & CONDITIONS REMAIN THE SAME.



Statement of Work Report

Project Title: Integrated Status and Effectiveness Monitoring Program (ISEMP)
Project #: 2003-017-00
Contract Title: 2003-017-00 EXP ISEMP-TERRAQUA COORDINATION WENATCHEE/ENTIAT
Contract #:
Province: Non-Provincial **Subbasin:** Basinwide
Workorder ID: 129074 **Task ID:** 1
Perf. Period Budget: \$475,768 **Perf. Period:** 7/1/2009 - 6/30/2010
Contract Type: Release **Pricing Type:** Cost Reimbursement (CNF)
Contractor(s): Terraqua, Inc. (Prime - TERRAQUA00)
BPA Internal Ref: CR-101705
SOW Validation: Last validated 06/08/2009 with 0 problems, and 1 reviewable items
Contract Documents: [Budget - Contract \(06/18/2009\)](#) Rev. Line Item Budget

Contacts:

Name	Role	Organization	Phone/Fax	Email	Address
Nancy Weintraub	Interested Party	Bonneville Power Administration	(503) 230-5373 / NA	nhweintraub@bpa.gov	P.O. Box 3621, Mailstop - KEC-4 Portland, OR 97208-3621
Chris Jordan	Interested Party	National Oceanic and Atmospheric Administration (NOAA)	(541) 754-4629 / NA	chris.jordan@noaa.gov	2725 Montlake Blvd. East Seattle WA 98112-2097
Mike Ward	Supervisor	Terraqua, Inc.	(509) 486-2426 / (509) 486-2423	wardski@wildblue.net	100 Summer Road Wauconda WA 98859-
Pamela Nelle	Technical Contact	Terraqua, Inc.	(509) 885-9046 / NA	pamela_nelle@genext.net	PO Box 404 Peshastin WA 98847
Holiday Sloan	Contract Manager	Terraqua, Inc.	(509) 486-2426 / NA	holidaze@wildblue.net	P.O. Box 85 Wauconda WA 98859
Jody White	Interested Party	Quantitative Consultants Inc	(208) 860-5269 / NA	jody.white@clearwire.net	
Carol Volk	Interested Party	Volk Consulting	(206) 240-0301 / NA	volkconsulting@gmail.com	
Barbara Shields	COTR	Bonneville Power Administration	(503) 230-4748 / NA	bashields@bpa.gov	
Israel Duran	Env. Compliance Lead	Bonneville Power Administration	(503) 230-3967 / NA	induran@bpa.gov	P.O. Box 3621, Mailstop - KEC-4 Portland OR 97208-3967
Lisa Gang	Contracting Officer	Bonneville Power Administration	(503) 230-3893 / NA	lgang@bpa.gov	

Work Element Table of Contents:

<u>Work Element - Work Element Title</u>	<u>EC Needed*</u>	<u>Estimate</u>	<u>(%)</u>
A : 165. Produce Environmental Compliance Documentation - 8.10b Environmental Compliance		\$0	(0%)



<u>Work Element - Work Element Title</u>	<u>EC Needed*</u>	<u>Estimate</u>	<u>(%)</u>
B : 132. Produce (Annual) Progress Report - 8.10 d Produce Annual Progress Report for the period July 2009 to June 2010		\$0	(0%)
C : 189. Regional Coordination - 8.1 ISEMP Wenatchee/Entiat Coordination		\$72,330	(15 %)
D : 174. Produce Plan - 8.2 Implementation Tracking Tool		\$3,744	(1 %)
E : 174. Produce Plan - 8.3 Wenatchee/Entiat Strategy Updates		\$10,004	(2 %)
F : 189. Regional Coordination - 8.4 ISEMP Pilot Subbasin Coordination		\$11,229	(2 %)
G : 174. Produce Plan - 8.5 Protocol Development		\$29,206	(6 %)
H : 157. Collect/Generate/Validate Field and Lab Data - 8.6 Macroinvertebrate Analysis	*	\$46,901	(10 %)
I : 157. Collect/Generate/Validate Field and Lab Data - 8.7 Entiat Effectiveness Monitoring	*	\$131,066	(28 %)
J : 157. Collect/Generate/Validate Field and Lab Data - 8.8 Field Survey Assistance	*	\$75,069	(16 %)
K : 157. Collect/Generate/Validate Field and Lab Data - 8.9 Repeat Habitat/Channel/Riparian/Macroinvertebrate Sampling in Wenatche	*	\$42,169	(9 %)
L : 119. Manage and Administer Projects - 8.10a Project Management		\$8,126	(2 %)
M : 141. Produce Other Report - 8.11 ISEMP's Project Annual Review Report		\$2,496	(1 %)
N : 162. Analyze/Interpret Data - 8.12 Downstream Migrant Trapping Analysis		\$43,428	(9 %)
O : 185. Produce Pisces Status Report - Periodic Status Reports for BPA		\$0	(0%)
Total:		\$475,768	

* Environmental Compliance (EC) needed before work begins.

Contract Description:

Contract Description: Since its inception in FY2003, Project #2003-017-00 (the Integrated Status and Effectiveness Monitoring Program; ISEMP) has been developing two novel monitoring and evaluation programs: (i) subbasin-scale pilot status and trend monitoring efforts for anadromous salmonids and their habitat in the Wenatchee/Entiat, John Day and South Fork Salmon River basins, and (ii) effectiveness monitoring for suites of habitat restoration projects in selected watersheds within the three target subbasins. This work is critical for the development of a federal research, monitoring, and evaluation (FRME) program for the Columbia River Basin, which is now a requirement under the U.S. National Oceanic and Atmospheric Administration Fisheries (NOAA-Fisheries) 2000, 2004 and 2008 Federal Columbia River Power System Biological Opinions (BiOps, NMFS 2000, NOAA 2004, NMFS-NWR 2008). In 2008, the ISEMP became a component of BPA's BiOp Program to help ensure that provisions of the BiOp are satisfied. ISEMP builds on current status and trend monitoring programs within each of the pilot basins. Several regional and local organizations are funding and implementing these programs. In short, this project has integrated existing and new monitoring and evaluation activities in three pilot subbasins to help ensure that provisions of the BiOp are satisfied. This contract is one of several contracts that will implement this project. The final report for this contract will contain data that will 1) be submitted to NOAA Fisheries (also a contractor under this project) for use in a project level integrated Annual Report and 2) be submitted to BPA as a



contract final report according to the terms of this contract. Terraqua's role has been, and continues to be, to enable the Bonneville Power Administration to continue to implement Project #2003-017-00 in the Wenatchee and Entiat and other pilot subbasins. Objectives of this work have been, and continue to be:

- Coordinate contract development between Bonneville and entities participating in implementation of the ISEMP program in the Wenatchee/Entiat and other pilot subbasins.
- Coordinate contract implementation between Bonneville and entities participating in the ISEMP program in the Wenatchee/Entiat and other pilot subbasins to ensure that implementation activities meet the purpose and needs of the ISEMP program.
- Implement selected monitoring and analysis activities.
- Coordinate the design and testing of a data management system to support the program with local ISEMP contractors including the development of field protocols coupled with metadata necessary for proper data management .
- Analyze and report results related to the implementation of monitoring activities.

This contract represents an increase in scope and budget of about 25 percent over the previous Terraqua Release #3 of Contract 27480 primarily due to the expansion of ISEMP monitoring and coordination activities in the Entiat subbasin and expanded field work support of repeat habitat sampling and snorkel/redd survey field assistance.

To offset the expanded costs associated with this expanded scope of work, Terraqua has: maintained the same rates for key positions as were charged in previous years; has elevated lower-cost staff to assume some of the responsibilities previously executed by more senior staff; and has reduced the scope of some coordination elements that were more prominent in earlier releases as those elements have been completed or institutionalized to the point they are relatively maintenance-free. The following list describes details associated with some of the significant scope/budget differences compared to Release #3:

- The total effort and cost of coordination-related tasks (Tasks 8.1 through 8.4) has remained about the same (\$98K versus \$94K in Release #3) and reflects a balance of increased cost-of-business, increased efficiencies, and an expanded scope of work for the Entiat IMW project. Similarly, there is no significant change in the budget for project management (Task 8.10) or ISEMP program annual reporting (Task 8.11).
- The budget increase for task 8.6 over Release #3 Task 7.6 reflects a 5% increase in laboratory fees and a 18% increase in the number of samples that will be processed.
- Task 8.7 represents a 20% expansion of effectiveness monitoring work in the Entiat.
- The budget for task 8.8 includes capacity for a doubling of snorkeling effort and elimination of the steelhead redd support that was in Task 7.8 of Release #2.
- In Task 8.9, we will perform 2 and 1/2 times more work than in Task 7.9 of Release #3..
- The budget for Task 8.11 has decreased to one-quarter of last year's budget to reflect the amount of effort that actually went into producing this past year's annual review.
- Task 8.12 is a new analysis effort that will help BPA begin to re-evaluate its approach to smolt trapping. Bonneville Power Administration and the co-managers of salmonid populations in the Columbia Basin rely heavily on these estimates of population abundance making the accuracy of these estimates of paramount importance to the management of salmonids in the Columbia Basin.



Statement of Work Report

Work Element Details

A: 165. Produce Environmental Compliance Documentation

Title: 8.10b Environmental Compliance

Description: Ensure necessary documents are provided to BPA's Environmental Compliance group in sufficient time to allow for a compliance letter to be written prior to any ground-disturbing work. Coordinate with appropriate agencies regarding any permits that may be required.

Deliverable Specification: Provide necessary supporting documentation and assistance to BPA's Environmental Compliance Group (such as maps, design drawings, survey reports, permit applications, ESA documents, etc.) to assure a timely receipt of EC compliance letter.

Planned Metrics: Are herbicides used as part of work performed under this contract?: No

Milestone Title	Start Date	End Date	Status	Milestone Description
Deliverable: A. Environmental Compliance supporting documentation		6/30/2010	Inactive	<i>See the Deliverable Specification above</i>

B: 132. Produce (Annual) Progress Report

Title: 8.10 d Produce Annual Progress Report for the period July 2009 to June 2010

Description: The annual report summarizes the project goal, objectives, hypotheses, completed and uncompleted deliverables, problems encountered, lessons learned, and long-term planning. Examples of long-term planning include future improvements, new directions, or level of effort for contract implementation, including any ramping up or ramping down of contract components or of the project as a whole. Date range July 1, 2008 to June 30, 2009 has been agreed upon by the COTR and the contractor. This may or may not coincide with the contract period. For an ongoing project, an annual report covering a contract period may be submitted under the subsequent contract, if approved by the COTR.

Deliverable Specification: Upload annual report for the period July 2008 to June 2009. Currently, this is done via the BPA website; down the road, this may be done via attachments supported directly within Pisces. For guidance on how/where to upload: http://www.efw.bpa.gov/Integrated_Fish_and_Wildlife_Program/technicalreports.aspx

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Review annual report format requirements	10/1/2009	10/1/2009	Inactive	Contractor must review formatting requirements before starting the first draft of their report. Please follow the BPA-required format. http://www.efw.bpa.gov/Integrated_Fish_and_Wildlife_Program/technicalreports.aspx
B. Email draft of report to COTR for review	5/30/2010	5/30/2010	Inactive	The draft annual report must be submitted to the BPA COTR in Microsoft Word format (any version of Word is fine).
C. Receive COTR review comments	6/15/2010	6/15/2010	Inactive	The BPA COTR should provide review feedback and comments within 30 days of receiving the draft annual report. This milestone should therefore have a duration of 30 days.
D. Finalize Draft Annual Report	6/1/2010	6/30/2010	Inactive	Integrate review feedback and comments, and obtain internal signatures if necessary. Convert the annual report to Adobe Acrobat PDF format. It is anticipated that this report will be uploaded to public by BPA within 30 days of its receipt on June 30, 2009.
Deliverable: E. Final report uploaded to the BPA website		6/30/2010	Inactive	<i>See the Deliverable Specification above</i>

C: 189. Regional Coordination

Title: 8.1 ISEMP Wenatchee/Entiat Coordination



Description: Terraqua will represent the interests of the ISEMP at meetings of the RTT, the Entiat Watershed Planning Unit, and will coordinate electronically and in-person with the following entities that may be involved in this Program: RTT, EWPU, U.S. Forest Service (USFS), Washington Department of Ecology (WDOE), Chelan PUD, Yakama Nation, NOAA-Fisheries, BPA, U.S. Bureau of Reclamation, Chelan County, Cascadia Conservation District, the mid-Columbia PUD's HCP Hatchery Committee, and other parties as necessary.

Terraqua will coordinate ISEMP contractors to help insure that contractors SOWs and deliverables meet ISEMP needs and that contractor budgets stay within the overall ISEMP budget and other available funds. Terraqua will also coordinate the analysis and reporting of ISEMP products with Quantitative Consultants, NOAA, and other program analysts.

Deliverable Specification: Attend up to twelve (12) monthly Oversight Committee meetings to be held as part of regularly scheduled RTT meetings, attend up to eight (8) monthly meetings of the EWPU and/or up to four EWPU Habitat Subcommittee meetings from July 2008 through June 2009. Attend up to two (2) meetings with BPA or NOAA at locations in Washington, Oregon, or Idaho from July 2008 through June 2009.

Provide a copy of written minutes from all RTT and EWPU meetings attended.

Provide a monthly report of significant coordination issues.

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Submit RTT Meeting minutes	7/1/2009	6/30/2010	Inactive	For any RTT meetings attended, submit minutes to BPA COTR via email.
B. Monthly, telephonically update COTR of significant coordination issues	7/1/2009	6/30/2010	Inactive	Monthly, conduct a telephone update with the BPA COTR regarding significant coordination issues, or anything that could jeopardize the overall project.
Deliverable: C. Meeting minutes / Coordination reports		6/30/2010	Inactive	<i>See the Deliverable Specification above</i>

D: 174. Produce Plan

Title: 8.2 Implementation Tracking Tool

Description: Terraqua will continue to maintain and update the Project Tracking Tool developed since 2005 that serves to document changes to scientific study design that have occurred since the inception of ISEMP to assist project contractors in conducting field work and to assist ISEMP analysts in the interpretation of project data. This database will continue to be a "living" tool that will be periodically updated as necessary and will be electronically accessible to all ISEMP contractors and cooperators. This document will be updated and maintained in working draft format through June 30, 2009.

Deliverable Specification: Maintain and update the ISEMP Wenatchee/Entiat project tracking tool in a format that is accessible to all ISEMP contractors and cooperators (preferably via a central location, e.g., web site)

Primary Focal Species: Chinook - Upper Columbia River Spring ESU | Steelhead - Upper Columbia River DPS

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Maintain working draft of project tracking tool with periodic updates	7/1/2009	6/30/2010	Inactive	Continue to update and maintain the project tracking tool such that maintenance can be done by future ISEMP coordinators (whether that continues to be Terraqua or not).
Deliverable: B. Implementation of Tracking Tool		6/30/2010	Inactive	<i>See the Deliverable Specification above</i>

E: 174. Produce Plan

Title: 8.3 Wenatchee/Entiat Strategy Updates



Description: Terraqua developed strategies for the implementation of the ISEMP program in the Wenatchee and Entiat subbasins in FY05 and FY06, respectively. These strategies were developed as working documents and were intended to be updated as needed. Continuing changes in the institutional, scientific, and policy settings within which the ISEMP program operates within these two subbasins require that these strategy documents be updated. For example, planning and implementation of ESA recovery plans is on-going and is leading to large-scale implementation of restoration programs. ISEMP needs to ensure that its goals and objectives remain consistent within these new contexts and that ISEMP program elements will continue to meet the rigorous scientific needs of the larger ISEMP program within these two subbasins. Furthermore, local groups that cooperate with the ISEMP program, including the Upper Columbia Salmon Recovery Board and its Regional Technical Team, look to ISEMP as the template for monitoring in the Wenatchee and Entiat and would like to adopt ISEMP's monitoring strategies for their recovery implementation work. For these reasons, Terraqua will review and revise the existing ISEMP monitoring strategies for the Wenatchee and Entiat subbasins within this work element to accommodate the changing institutional needs of ISEMP partners and subbasin management authorities.

This work element is based on Work Element B in Contract 27480 Release 1 and Task 2.2 of Master Agreement 14880 Release 2.

Deliverable Specification: Revise the ISEMP implementation strategies for the Wenatchee and Entiat subbasins in a format that is accessible to all ISEMP contractors and cooperators.

Primary Focal Species: Chinook - Upper Columbia River Spring ESU | Steelhead - Upper Columbia River DPS

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Draft Revised Entiat Implementation Strategy document	7/1/2009	12/31/2009	Inactive	Revise the ISEMP Implementation Strategy for the Entiat Subbasin and develop a draft document for review.
B. Draft Revised Wenatchee Implementation Strategy document	7/1/2009	12/31/2009	Inactive	Revise the ISEMP Implementation Strategy for the Wenatchee Subbasin and develop a draft document for review.
C. Final Revised Entiat Implementation Strategy document	1/1/2010	6/30/2010	Inactive	Produce a final working Implementation Strategy for the ISEMP program in the Entiat Subbasin.
D. Final Revised Wenatchee Implementation Strategy document	1/1/2010	6/30/2010	Inactive	Produce a final working Implementation Strategy for the ISEMP program in the Wenatchee Subbasin.
Deliverable: E. Revised ISEMP strategies for the Wenatchee and Entiat subbasins		6/30/2010	Inactive	<i>See the Deliverable Specification above</i>

F: 189. Regional Coordination

Title: 8.4 ISEMP Pilot Subbasin Coordination

Description: Implementation of the Project among the three pilot subbasins, particularly in the area of data management, analysis, reporting, and dissemination of information to other users in the Columbia Basin and states of OR, ID, and WA, requires close coordination of numerous entities who are participating in the Project. Terraqua will represent the interests of the Project at meetings of the pilot subbasin coordinators and will coordinate electronically and in-person with these coordinators and other entities that are developing data management systems, analysis, reporting, and document/conference preparation materials related to Project #2003-017-00.

Deliverable Specification: Attend up to two (2) two-day meetings with pilot subbasin coordinators, and participate in one (1) two-day conference/meeting to disseminate results of ISEMP work to broad monitoring/research/management communities, from July 2008 through June 2009 at locations in Washington, Oregon, and Idaho.

Submit an electronic version of minutes from each of up to 3 meetings attended regarding program coordination.

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Attend program coordination meetings	7/1/2009	6/30/2010	Inactive	Attend up to two (2) two-day meetings with pilot subbasin coordinators, and participate in one (1) two-day conferences/meetings to disseminate results of ISEMP work to broad monitoring/research/management communities, from July 2009 through June 2010 at locations in Washington, Oregon, and Idaho. Submit an electronic version of minutes from each of up to 3 meetings attended regarding program coordination.
Deliverable: B. Meeting minutes		6/30/2010	Inactive	<i>See the Deliverable Specification above</i>

G: 174. Produce Plan



Title: 8.5 Protocol Development

Description: Terraqua has been developing working scientific protocols for the ISEMP program since FY05, for habitat, and in FY07 for several other ISEMP survey techniques. These protocols were developed as working documents and were intended to be updated as needed. In FY09, Terraqua will coordinate the revision of working draft scientific protocols suitable to describe field and data management methodologies for several methodologies implemented by ISEMP in the Wenatchee/Entiat. These include updating existing protocols for habitat surveys, fish capture and tagging, fine sediment, water quality, snorkel, redd surveys, smolt trapping/efficiency trials, macroinvertebrates sampling, site selection, and operation and maintenance of Passive Instream Antennas. Terraqua will work with field crews, who have used previous working drafts of these documents in the field, to revise these documents to ensure that current ISEMP methodologies are sufficiently documented, and that each protocol provides descriptions of proper data management that matches the needs of each protocol's ATM data management tool, and will produce a revised and updated working draft document for each protocol.

Other ISEMP pilot subbasins have been considering adopting some of the protocols developed in the Wenatchee/Entiat subbasins. In selected cases, where appropriate, the protocols that will be revised and updated within this work element will include expanded sections that allow for easier transfer of these protocols to other ISEMP subbasins.

Completion of this work element will require substantial input from ISEMP contractors and ISEMP data managers.

Deliverable Specification: Revise and update protocols for habitat surveys, fish capture/tagging, fine sediment, water quality, snorkel, redd surveys, smolt trapping/efficiency trials, macroinvertebrates sampling, site selection, and operation and maintenance of Passive Instream Antennas. Each document will be produced in Portable Document Format (PDF) or other generally accepted format. Any deviation requires prior approval from the BPA COTR.

Primary Focal Species: Chinook - Upper Columbia River Spring ESU | Steelhead - Upper Columbia River DPS

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Revise and update fish capture/PIT tagging protocol	11/1/2009	2/28/2010	Inactive	Update working-draft protocol for fish capture/PIT tagging to incorporate lessons learned from 2009 field season. Each document should be produced in Portable Document Format (PDF) or other generally accepted format. Any deviation requires prior approval from the BPA COTR.
B. Revise and update habitat survey protocol	3/1/2010	5/30/2010	Inactive	Update working-draft protocol for habitat surveys to incorporate lessons learned from 2009 field season. Each document should be produced in Portable Document Format (PDF) or other generally accepted format. Any deviation requires prior approval from the BPA COTR.
C. Revise and update steelhead redd survey protocol	11/1/2009	1/31/2010	Inactive	Update working-draft protocol for steelhead redd surveys to incorporate lessons learned from 2009 field season. Each document should be produced in Portable Document Format (PDF) or other generally accepted format. Any deviation requires prior approval from the BPA COTR.
D. Revise and update water quality protocol	1/1/2010	2/28/2010	Inactive	Update working-draft protocol for water quality sampling to incorporate lessons learned from 2009 field season. Each document should be produced in Portable Document Format (PDF) or other generally accepted format. Any deviation requires prior approval from the BPA COTR.
E. Revise and update snorkel survey protocol	10/1/2009	12/31/2009	Inactive	Update working-draft protocol for snorkel surveys to incorporate lessons learned from 2009 field season. Each document should be produced in Portable Document Format (PDF) or other generally accepted format. Any deviation requires prior approval from the BPA COTR.
F. Revise and update smolt trapping/efficiency trial protocol	11/1/2009	1/31/2010	Inactive	Update working-draft protocol for smolt trapping/efficiency trials to incorporate lessons learned from 2009 field season. Each document should be produced in Portable Document Format (PDF) or other generally accepted format. Any deviation requires prior approval from the BPA COTR.
G. Revise and update macroinvertebrate collection protocol	4/1/2010	5/30/2010	Inactive	Update working-draft protocol for smolt trapping/efficiency trials to incorporate lessons learned from 2009 field season. Each document should be produced in Portable Document Format (PDF) or other generally accepted format. Any deviation requires prior approval from the BPA COTR.
H. Revise and update site selection protocol	10/1/2009	12/31/2009	Inactive	Update working-draft protocol for site selection to incorporate lessons learned from 2009 field season. Each document should be produced in Portable Document Format (PDF) or other generally accepted format. Any deviation requires prior approval from the BPA COTR.
I. Revise and update fine sediment protocol	4/1/2010	5/30/2010	Inactive	Update working-draft protocol for fine sediment sampling to incorporate lessons learned from 2009 field season. Each document should be produced in Portable Document Format (PDF) or other generally accepted format. Any deviation requires prior approval from the BPA COTR.
Deliverable: J. Final working draft protocols		5/30/2010	Inactive	<i>See the Deliverable Specification above</i>



H: 157. Collect/Generate/Validate Field and Lab Data

Title: 8.6 Macroinvertebrate Analysis

Description: Terraqua will subcontract with Rhithron Associates, Inc. of Missoula, MT for processing and identification of up to a total of one hundred thirty six (136) macroinvertebrate samples collected by ISEMP in the Wenatchee and Entiat subbasins. Fifty (50) samples will be collected by WDOE in the Wenatchee subbasin in 2009 while Terraqua will collect sixty-one (61) samples in the Entiat and twenty five (25) in the Wenatchee (see Work Element J: 157 Task 8.7 and Work Element L: 157 Task 8.9 for details regarding these sites).” At the end of field sampling in fall 2009, Terraqua, Inc. will transport macroinvertebrate samples to Rhithron. Terraqua/Rhithron will provide identification of macroinvertebrates to the lowest practical levels consistent with the River Invertebrate Prediction and Classification System (RIVPACS; Hawkins et al. 2001) protocol, including midges and worms to genus or species using a 500-organism random subsample. Terraqua/Rhithron will deliver standardized metric calculations and will archive the identified fraction of the sample for one year.

Deliverable Specification: Per RIVPACS protocol (Hawkins et al. 2001), provide standardized metric calculations of Macroinvertebrates from up to 121 sites (50 in the Wenatchee collected by WDOE, 61 in the Entiat collected by Terraqua, and 25 in the Wenatchee collected by Terraqua).

Quality controlled raw data and quality controlled summarized macroinvertebrate data with GPS locations, will be entered and stored in Microsoft Access databases known as Automated Template Modules (ATMs) if available or in an Excel spreadsheet. Data will be uploaded by June 30, 2010 to NOAA Fisheries using the ATM and notice will be provided to BPA and Terraqua, Inc. when the data has been uploaded. The contractor will be responsible for all quality assurance/quality control steps necessary to ensure that data is properly collected and entered into the ATM.

Reference: Hawkins, C., J. Ostermiller, M. Vinson, and J. Stevenson. 2001. Stream algae, invertebrate, and environmental sampling associated with biological water quality assessments: field protocols. Utah State University, Logan, UT. web link: <http://www.usu.edu/buglab/monitor/USUproto.pdf>

Planned Metrics:

- * Primary R, M, and E Focal Area : Tributary Habitat
- * Primary R, M, and E Type : Status and Trend Monitoring
- * Secondary R, M, and E Type : Action Effectiveness Research
- * Secondary R, M, and E Focal Area : Population Status

Primary Focal Species: Chinook - Upper Columbia River Spring ESU | Steelhead - Upper Columbia River DPS

Country: US **NPCC Subbasin:** Multiple

State: WA **HUC5 Watershed:** Multiple

County: CHELAN **HUC6 Name:** Multiple

Salmonid ESUs Present: Upper Columbia River Spring-run Chinook Salmon ESU (accessible) | Upper Columbia River Steelhead DPS (accessible)

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	7/1/2009	7/14/2009	Inactive	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. Samples collected	7/15/2009	9/30/2009	Inactive	Terraqua will collect macroinvertebrate samples at up to 61 (61) sites in the Entiat and twenty-five (25) sites in the Wenatchee subbasins (see Tasks 8.7 and 8.9 for details regarding these sites). Also during this time, Washington Department of Ecology will be collecting samples in the Wenatchee subbasins at 50 sites.
C. Samples delivered to Rhithron Associates	9/29/2009	11/3/2009	Inactive	At the end of field sampling in fall 2009, Terraqua, Inc. will transport macroinvertebrate samples collected by Terraqua and WDOE to Rhithron.
D. Data generated by Rhithron Associates and delivered to Terraqua/BPA	10/31/2009	4/30/2010	Inactive	Rhithron will provide identification of macroinvertebrates to the lowest practical levels consistent with RIVPACS protocol, including midges and worms to genus or species using a 500-organism random subsample. Rhithron will deliver standardized metric calculations and will archive the identified fraction of the sample for one year.
Deliverable: E. Macroinvertebrate Analysis		4/30/2010	Inactive	<i>See the Deliverable Specification above</i>

I: 157. Collect/Generate/Validate Field and Lab Data

Title: 8.7 Entiat Effectiveness Monitoring



Description: Terraqua will assist in the implementation of project effectiveness monitoring in the Entiat River under the ISEMP program. This work will include: monitoring of habitat/channel/riparian/macroinvertebrate conditions using protocols from the Upper Columbia Monitoring Strategy at thirty six (36) restoration project control and treatment sites and at twenty-five (25) randomly located reference sites used for comparison of watershed status and trends with sites in the restoration project area; habitat quantification to support snorkeling work during two (2) snorkel surveys to be conducted by the USFWS at the thirty six (36) restoration project control and treatment sites which will be snorkeled in 2009-2010; coordination of the monitoring work conducted by USFWS, CCD, and Terraqua; and data synthesis, analysis, and storage and preparation of a brief technical synthesis report that will include results from habitat and snorkeling work by USFWS and Terraqua.

Deliverable Specification: Submit in Microsoft Word format electronically

Quality controlled raw data and quality controlled summarized habitat/channel/riparian/macroinvertebrate conditions data with GPS locations, will be entered and stored in Microsoft Access databases known as Automated Template Modules (ATMs) previously provided by NOAA Fisheries. Data will be uploaded by June 30, 2010 to NOAA Fisheries using the ATM and notice will be provided to BPA and Terraqua, Inc. when the data has been uploaded. The contractor will be responsible for all quality assurance/quality control steps necessary to ensure that data is properly collected and entered into the ATM.

Planned Metrics:

- * Primary R, M, and E Focal Area : Tributary Habitat
- * Primary R, M, and E Type : Action Effectiveness Research
- * Secondary R, M, and E Type : Uncertainties Research
- * Secondary R, M, and E Focal Area : Population Status

Primary Focal Species: Chinook - Upper Columbia River Spring ESU | Steelhead - Upper Columbia River DPS

Country: US **NPCC Subbasin:** ENTIAT

State: WA **HUC5 Watershed:** ENTIAT RIVER

County: CHELAN **HUC6 Name:** LOWER ENTIAT RIVER

Salmonid ESUs Present: Upper Columbia River Spring-run Chinook Salmon ESU (accessible) | Upper Columbia River Steelhead DPS (accessible)



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	7/1/2009	7/1/2009	Inactive	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. Conduct habitat monitoring	7/1/2009	9/30/2009	Inactive	Monitor channel/riparian/macrobenthic conditions using protocols from the Upper Columbia Monitoring Strategy at thirty six (36) restoration project control and treatment sites and at twenty-five (25) randomly located reference sites used for comparison of watershed status and trends with sites in the restoration project area.
C. Support snorkel surveys with habitat measurements	7/1/2009	8/28/2009	Inactive	Quantify habitat to support snorkeling work during snorkel surveys to be conducted by the USFWS at thirty six (36) restoration project control and treatment sites in late July to early August.
D. Data entry and analysis	10/1/2009	5/31/2010	Inactive	Synthesize data, perform analyses, and store data in data management system.
E. First draft report	10/1/2009	3/31/2010	Inactive	Produce a draft field data synthesis report that will include results from habitat and snorkeling work by USFWS and Terraqua. This report will focus on whether different field efforts have achieved the needs of the ISEMP Entiat Effectiveness program element and will briefly summarize these data in the context of the ISEMP Entiat Implementation Strategy goals and objectives. This report will not include in-depth analysis of data as that will be accomplished by other ISEMP contractors at different scheduling under related contracts.
F. Support snorkel surveys with habitat measurements	2/1/2010	3/31/2010	Inactive	Quantify habitat to support snorkeling work during snorkel surveys to be conducted by the USFWS at the thirty six (36) restoration project control and treatment sites in February through March.
G. Final draft report	4/1/2010	6/30/2010	Inactive	Produce a final field data synthesis report that will include results from habitat and snorkeling work by USFWS and Terraqua. This report will focus on whether different field efforts have achieved the needs of the ISEMP Entiat Effectiveness program element and will briefly summarize these data in the context of the ISEMP Entiat Implementation Strategy goals and objectives. This report will not include in-depth analysis of data as that will be accomplished by other ISEMP contractors at different scheduling under related contracts. The relatively late date (in relation to when the field work is conducted) for this deliverable is required because of the need to synthesize reports from other agencies and due to the late field data collection season in March 2010.
Deliverable: H. Field Data Synthesis Report and final data		6/30/2010	Inactive	<i>See the Deliverable Specification above</i>

J: 157. Collect/Generate/Validate Field and Lab Data

Title: 8.8 Field Survey Assistance

Description: The USFWS, YN, WDFW, and USFS are all performing related field work under Project # 2003-017-00 but, due to restricted budgets and lack of available agency personnel, are often unable to assign redundant staff who would receive adequate field training and who would complete their field work in the case of illness, injury, or other staffing changes among the dedicated personnel.

Four (4) Terraqua, Inc. field technicians will undergo the field protocol training for snorkel surveys alongside one of, or all of, the agencies involved (USFWS, YN, and USFS), and will assist the Yakama Nation for up to twenty (20) person-days of snorkel surveys that are already included in the ISEMP snorkel schedule. In addition, four (4) Terraqua Inc., field technicians will participate in an ISEMP study of snorkel variability for up to 51 person-days of labor.

Additional field support could be made available through an amendment to this Release if the agency's staffing disruptions were anticipated to be long-term. Terraqua staff will work under the direction of field crew leaders of the appropriate agency and therefore will be covered by that agency's environmental compliance permits.

Deliverable Specification: Four (4) Terraqua, Inc. field technicians will undergo the field protocol training for snorkel surveys alongside one of, or all of, the agencies involved (USFWS, YN, and USFS), and will assist the Yakama Nation for up to twenty (20) person-days of snorkel surveys that are already included in the ISEMP snorkel schedule and four (4) Terraqua Inc., field technicians will participate in an ISEMP study of snorkel variability for up to 51 person-days of labor.

Planned Metrics:

- * Primary R, M, and E Focal Area : Tributary Habitat
- * Primary R, M, and E Type : Status and Trend Monitoring
- * Secondary R, M, and E Type : Action Effectiveness Research
- * Secondary R, M, and E Focal Area : Population Status

Primary Focal Species: Chinook - Upper Columbia River Spring ESU | Steelhead - Upper Columbia River DPS

Country: US **NPCC Subbasin:** Multiple



State: WA **HUC5 Watershed:** Multiple
County: CHELAN **HUC6 Name:** Multiple
Salmonid ESUs Present: Upper Columbia River Spring-run Chinook Salmon ESU (accessible) | Upper Columbia River Steelhead DPS (accessible)

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	7/1/2009	7/1/2009	Completed	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. Snorkel assistance labor	7/1/2009	3/30/2010	Inactive	Four (4) Terraqua, Inc. field technicians will undergo the field protocol training for snorkel surveys alongside one of, or all of, the agencies involved (USFWS, YN, and USFS), and will assist the Yakama Nation for up to twenty (20) person-days of snorkel surveys that are already included in the ISEMP snorkel schedule. In addition, four (4) Terraqua Inc., field technicians will participate in an ISEMP study of snorkel variability for up to 51 person-days of labor.
Deliverable: C. Field survey assistance		6/30/2010	Inactive	<i>See the Deliverable Specification above</i>

K: 157. Collect/Generate/Validate Field and Lab Data

Title: 8.9 Repeat Habitat/Channel/Riparian/Macroinvertebrate Sampling in Wenatche
Description: Per the Upper Columbia Monitoring Strategy (Hillman 2006), five of the 50 sites (10 percent) sampled by Washington Department of Ecology (WDOE) for habitat/channel/riparian/macroinvertebrate conditions will be resampled by independent field crews. Analysis of repeat sampling data from previous ISEMP efforts suggests that a more focused analysis of the repeatability of habitat and snorkel surveys is necessary. ISEMP is planning to conduct such a study in the summer of 2009 but (as of May 2, 2009) has not yet completed a study design. This work element provides for Terraqua field crews to conduct one habitat survey at each of 25 sites that will be surveyed twice by WDOE. Some or all of this effort may be redirected to snorkel surveys at up to 40 sites depending on the final ISEMP study design.
Deliverable Specification: Quality controlled raw data and quality controlled summarized habitat data with GPS locations, will be entered and stored in Microsoft Access databases known as Automated Template Modules (ATMs) previously provided by NOAA Fisheries. Data will be uploaded by June 30, 2009 to NOAA Fisheries using the ATM and notice will be provided to BPA and Terraqua, Inc. when the data has been uploaded. The contractor will be responsible for all quality assurance/quality control steps necessary to ensure that data is properly collected and entered into the ATM.
 Reference: Hillman, T.W. 2006. Monitoring strategy for the Upper Columbia basin: Second draft report. BioAnalysts, Inc., Boise, ID.
Planned Metrics:

- * Primary R, M, and E Focal Area : Tributary Habitat
- * Primary R, M, and E Type : Status and Trend Monitoring
- * Secondary R, M, and E Type : Action Effectiveness Research
- * Secondary R, M, and E Focal Area : Population Status

Primary Focal Species: Chinook - Upper Columbia River Spring ESU | Steelhead - Upper Columbia River DPS
Country: US **NPCC Subbasin:** WENATCHEE
State: WA **HUC5 Watershed:** LOWER WENATCHEE RIVER
County: CHELAN **HUC6 Name:** BURCH MTN
Salmonid ESUs Present: Upper Columbia River Spring-run Chinook Salmon ESU (accessible) | Upper Columbia River Steelhead DPS (accessible)



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	7/1/2009	7/18/2009	Inactive	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. Conduct field work	7/18/2009	9/30/2009	Inactive	Five of the 50 sites (10 percent) sampled by Washington Department of Ecology (WDOE) for habitat/channel/riparian/macroinvertebrate conditions will be resampled, twice, per the Upper Columbia Monitoring Strategy, by independent Terraqua field crews in order to estimate between crew measurement variability. The Terraqua crews will characterize channel and riparian habitat quality by collecting the same data for each specific indicator identified in the ISEMP habitat survey protocol.
C. Participate in annual training with WDOE	6/1/2010	6/30/2010	Inactive	Participate in up to 5 days of field training with WDOE habitat crews in advance of the 2009 field season. Included within this training will be any revisions to the field manual and may include training in any database advancements that may have occurred since spring of 2008.
Deliverable: D. Final survey data		6/30/2010	Inactive	<i>See the Deliverable Specification above</i>

L: 119. Manage and Administer Projects

Title: 8.10a Project Management
Description: Manage the project. Also covers administrative work in support of on-the-ground efforts and in support of BPA's programmatic requirements such as metric reporting, financial reporting (e.g., accruals), and development of an SOW package (includes draft SOW, budget, spending plan, and property inventory).
Deliverable Specification: Submit next year's SOW, Budget, and Property Inventory to the BPA COTR. The SOW should include location information (latitude and longitude) for those work elements that require it. If contractor or contractor's organization takes longer than 30 days to sign the contract, the contractor will need to send this funding package to BPA more than 90 days before the end of the current contract.

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Accrual - Submit September estimate to BPA	8/15/2009	9/10/2009	Inactive	Provide BPA with an estimate of contract work that will occur prior to September 30 but will not be billed until October 1 or later. Generally, this should be done by September 10.
B. Prepare FY08 SOW, budget, etc	3/1/2010	4/30/2010	Inactive	Provided funding is made available for additional work as defined under this current SOW, and additional protocol testing is required, submit a new SOW (via Pisces), budget, etc., no later than 90 days prior to the expiration of the current contract (i.e., June 30, 2010).
C. Funding Package - Conduct internal review (e.g., Supervisor or Interagency)	3/1/2010	4/30/2010	Inactive	If necessary, submit next year's SOW and Budget for internal contractor review before submitting to BPA. Assuming this review takes 30 days, start this milestone 120 days before the end of the current contract.
Deliverable: D. Funding Package - Submit draft to COTR		6/30/2010	Inactive	<i>See the Deliverable Specification above</i>

M: 141. Produce Other Report

Title: 8.11 ISEMP's Project Annual Review Report
Description: The ISEMP Project Annual Review Report is the capstone report for all activities that are separately contracted under this Project #2003-017. Prior to 2006, this reporting has been completed by reports prepared by individual contractors or has been accomplished through BiOp reporting. BPA managers and ISEMP coordinators and other entities have expressed the desire to have the complete program summarized in a periodically updated program review document. In 2006, a three-year review was created with the intention of updating that document annually beginning in 2007.

In this work element, Terraqua will produce the 2009 ISEMP Project Annual Review, a document that compiles and coordinates the reports of all ISEMP contractors from each of the three pilot subbasins and the umbrella group (Note: ISEMP contractors will continue to provide BPA with annual reports regarding contract-specific progress and work performed), describes all ISEMP progress in the past year of the program in relation to ISEMP proposed goals and objectives, and documents changes in protocols/indicators being monitored that have resulted from data collected. This document will be stored on the ISEMP web site and uploaded to Pisces.



Deliverable Specification: Produce the ISEMP Project Annual Review Report that captures accomplishments to date all activities that are separately contracted under this Project #2003-017 for external review that can be shared with all participants as well as external parties via the ISEMP web site and Pisces. This document will be a "special progress report" that will be developed in addition to the progress report prepared in Work Element N, 8.10d Submit Annual Report. The ISEMP Project Annual Review Report will not change the need of other contractors to submit their annual reports.

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Produce draft ISEMP Annual Review	10/1/2009	12/31/2009	Inactive	Develop a single document that compiles and coordinates the reports of all ISEMP contractors, describes all ISEMP progress in the past year of the program in relation to ISEMP proposed goals and objectives, and documents changes in protocols/indicators being monitored that have resulted from data collected. Circulate this draft document for review among ISEMP and BPA collaborators.
B. Produce final ISEMP Annual Review	1/1/2010	6/30/2010	Inactive	Publish an electronic, accessible, final document that compiles and coordinates the reports of all ISEMP contractors, describes all ISEMP progress in the past year of the program in relation to ISEMP proposed goals and objectives, and documents changes in protocols/indicators being monitored that have resulted from data collected over the past year of the program. Store this document on the ISEMP web site.
Deliverable: C. ISEMP Annual Review		6/30/2010	Inactive	<i>See the Deliverable Specification above</i>

N: 162. Analyze/Interpret Data

Title: 8.12 Downstream Migrant Trapping Analysis

Description: There are five areas of scientific uncertainty associated with downstream migrant trapping programs all of which call into question the validity of population estimates of outmigrating salmonids. Bonneville Power Administration and the co-managers of salmonid populations in the Columbia Basin rely heavily on these estimates of population abundance making the accuracy of these estimates of paramount importance to the management of salmonids in the Columbia Basin.

The five areas of scientific uncertainty include: 1) the relative performance of common statistical/ sampling designs; 2) the performance of common catch expansion methods; 3) the potential effect that daily variability in trap efficiencies has on abundance estimates; 4) the feasibility of using PIT tag-based abundance, survival and migrant timing estimates as an alternative to rotary screw trapping; and 5) exploring potential multivariate relationships for modeled trap efficiency methods.

This work element will investigate each of these areas of uncertainty and will produce recommendations on how to improve downstream migrant trapping programs to provide more defensible population abundance estimates. These five areas of uncertainty will be investigated in five steps. Our approach will be collaborative and will seek the participation of ISEMP partners involved in trapping programs in the Upper Columbia, Snake and John Day Rivers to have the broadest applicability. In addition, the results will be incorporated into the ISEMP Juvenile Trapping Protocol (2008) to provide recommendations to trapping programs on methods that may better meet assumptions with estimating abundance and improve precision of abundance estimates.

These five analysis steps were generated after the review of: Trapping programs throughout the Columbia River Basin (Tussing 2007); The Trinity River Trapping Program; The Implementation Strategy for the Wenatchee River Subbasin Monitoring (Nelle and Ward 2008); Recent trapping reports from the Wenatchee and Entiat River Basins; ISEMP Data Analysis Priorities for Fiscal Year 2008 (Beasley 2008); Recent research proposals for the use of PIT Tag Interrogation Systems (PTIS); The Field Manual of Scientific Protocols for Downstream, Migrant Trapping within the Upper Columbia River Monitoring Strategy (Tussing 2008); and discussions with ISEMP science staff and Upper Columbia River downstream migrant practitioners.

In Step 1, we will perform a series of comparisons on the relative performance of common statistical/ sampling designs to provide trapping programs with information that will help them maximize the precision of juvenile production estimates relative to river characteristics, migrant abundance, trap efficiencies, and effort (cost). In Step 2 we will build upon datasets and efforts from Step 1 and we will assess the performance of common catch expansion methods. In Step 3 we will explore the potential effect that daily variability in trap efficiencies has on abundance estimates. In Step 4 we will scope the feasibility of using PIT tag-based abundance, survival and migrant timing estimates as an alternative to rotary screw trapping; and in Step 5 we will address the Modeled Trap Efficiency approach by exploring potential multivariate relationships for modeled trap efficiency methods.



Deliverable Specification: A draft and final report will be prepared that describes the results of each analysis step. The document will be produced in Portable Document Format (PDF) or other generally accepted format. Any deviation requires prior approval from the BPA COTR.

The draft and final reports will include the following:

1) Comparisons of performance measures among common statistical/sampling designs to provide downstream migrant trapping programs with information to maximize the precision of juvenile production estimates relative to river characteristics, migrant abundance, trap efficiencies, and effort (cost). Known daily migrant universes will be established from two existing downstream migrant data sets, one with low migrant abundance characteristics and one with higher abundance. The relative performance or precision of juvenile production estimates of the four most commonly used statistical/sampling designs will be performed over a range of trap efficiencies, effort (cost) and migrant rate to flow relationships (for modeled trap efficiency approaches). Results will identify the weaknesses with each approach and provide guidance to practitioners on how to improve current methods through either a well-placed increase in effort (funding) or employing alternative statistical/sampling designs.

2) Determination of validity of various catch expansion methodologies based upon their use in estimating total migrant production. Based upon two known universes of daily catches and their variability, several catch expansion approaches will be compared including: 2-day before and after averaging; single day before/after averaging; linear regression; model-based relationships (e.g., flow); and explore the potential of using the proportion of PIT tagged fish detections. Two types of events, random downtimes and targeted downtimes that coincide with high flow events, will be studied. The range of catch expansion approaches, their frequency and circumstances of use, will be compared for their influence on total production estimates. Results will provide guidance to trapping programs on which approaches are best, the circumstances (e.g., downtime duration) in which they are valid, and degree to which downtimes influence production estimates if they are unaccounted for. Additionally, this project will estimate the degree to which total production estimates may be underestimated if downtimes during high flow events occur. This will provide an improvement to trapping programs which currently report production estimates as "minimum number estimates" when catches are not expanded.

3) Comparison of performance measures that use a single larger release of fish for trap efficiency trials vs. the daily marking and release of smaller numbers of fish which are then summed over several days to achieve an estimate of trap efficiency. The range of potential day to day variability in trap efficiencies to explore will be established from published literature and evidence from trapping programs. It is anticipated that a range of potential daily variability in trap efficiencies will be explored by imposing this variability on the two data set universes being used. The results will: 1) determine if daily variability in trap efficiencies has the potential to reduce the precision of abundance estimates for commonly used methods; 2) provide guidance on whether the assumption of trap efficiency consistency within weekly (or longer) stratum should be tested for validity; 3) determine if daily releases of smaller numbers of marked fish results in greater precision of abundance estimates where daily variability in trap efficiencies do occur; and 4) determine if modeled trap efficiency methods will benefit from more than one trap efficiency trial at a given flow interval.

4) Determination of the feasibility of replacing a network of rotary screw traps with PIT Tag interrogations systems (PTIS) in the Wenatchee and Entiat Rivers and alternative designs for status and trend monitoring of population abundance, survival and migrant timing and an informed project design for implementation to test its actual effectiveness. Comparisons will be made at the cost level of existing smolt trapping operations in terms of annually recurring labor and equipment costs. The abundance estimates using the PIT tag based design at a range of array detection efficiencies will be compared to the current trapping program results. PTIS related costs will be based upon recent in-river PIT tagging efforts and local expert opinion on the ability to effectively capture the desired numbers of fish in tributaries and mainstems.

5) Identification of methods to generate a more robust multivariate trap efficiency model from a single trapping season, e.g., where data exists for potential covariates from sources such as water quality/climate monitoring that is performed within watersheds, to increase the precision of abundance estimates and reduce the reliance on a number of untested assumptions.

Planned Metrics:

- * Primary R, M, and E Focal Area : Population Status
- * Primary R, M, and E Type : Status and Trend Monitoring
- * Secondary R, M, and E Type : Action Effectiveness Research
- * Secondary R, M, and E Focal Area : Tributary Habitat

Primary Focal Species:

Chinook - Upper Columbia River Spring ESU | Steelhead - Upper Columbia River DPS



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Project Coordination	7/1/2009	6/30/2010	Inactive	Coordinate with trapping program partners and biometrician on project design and establish performance measures.
B. Data Preparation	7/1/2009	10/31/2009	Inactive	Identify and secure two complete trapping season data sets that represent different environments and population sizes; clean data sets and fill any data gaps to attain full migrant universes and trap efficiencies. Establish the range of test to be conducted and structure data to assist this testing (e.g., weekly intervals of trap efficiency and variability). Review recent developments in sampling designs and population and variance estimators. Establish the breadth of sampling designs, population abundance estimators and variance equations to be tested. Review literature and existing trapping programs, to identify the range of potential daily variability in capture efficiencies that may be encountered and establish the levels of daily variability to be tested. Identify the effort (labor hours/cost) typical of the full suite of migrant trapping field tasks for each trapping site explored. Establish a field trapping schedule for each estimation method to equalize effort at the two effort levels to be explored for both migrant universes. From existing trapping programs, identify the types and durations of trapping downtimes encountered (e.g., low abundance early/late season, high flows) and catch expansion methods used. Establish the catch expansion methods to be tested.
C. Analyze performance sampling designs, catch-expansion methods, trap-efficiency variability influence	9/1/2009	2/28/2010	Inactive	Compare performance measures of sampling designs and related estimators, for two levels of effort using both migrant universes. Use previously established migrant universes to compare performance of multiple catch expansion methods and determine their overall effect on performance measures (e.g. population abundance estimates). Use previously established migrant universes and hypothesized daily variability in capture efficiencies to: 1) explore the performance of common abundance estimators; 2) determine if alternative release methods increase precision of performance measures.
D. Analyze PTIS alternatives and multivariate Modeled Trap Efficiency Methods	11/1/2009	4/30/2010	Inactive	Identify a combined remote tagging/PTIS array and smolt trap design that could meet downstream migrant program goals and life stage specific data needs. Establish the effort (labor hours/cost) for the full suite of field tasks needed for implementation of PTIS arrays. From existing programs, identify the variability in detection efficiency for PIT tag arrays throughout a trapping season and the recommended frequency of array efficiency trials. Determine the population abundance estimates of the PIT tag array alternatives using a range of array efficiencies and compare to current trapping program results. Identify where additional turbidity and climate data exists for trapping programs that rely on the modeled trap efficiency approach. Secure trapping, flow, turbidity, and climate data sets. Explore the potential for turbidity and climate data to explain additional variation in the flow to migrant relationship
E. Draft report	11/1/2009	3/31/2010	Inactive	Write project report draft for review and final report.
Deliverable: F. Downstream Migrant Trapping Analysis		6/30/2010	Inactive	<i>See the Deliverable Specification above</i>

O: 185. Produce Pisces Status Report

Title: Periodic Status Reports for BPA

Description: The Contractor shall report on the status of milestones and deliverables in Pisces. Reports shall be completed either monthly or quarterly as determined by the BPA COTR. Additionally, when indicating a deliverable milestone as COMPLETE, the contractor shall provide metrics and the final location (latitude and longitude) prior to submitting the report to the BPA COTR.

Deliverable Specification:



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Jul 2009 (7/1/2009 - 7/31/2009)	8/1/2009	8/7/2009	Inactive	
B. Aug 2009 (8/1/2009 - 8/31/2009)	9/1/2009	9/7/2009	Inactive	
C. Sep 2009 (9/1/2009 - 9/30/2009)	10/1/2009	10/7/2009	Inactive	
D. Oct 2009 (10/1/2009 - 10/31/2009)	11/1/2009	11/7/2009	Inactive	
E. Nov 2009 (11/1/2009 - 11/30/2009)	12/1/2009	12/7/2009	Inactive	
F. Dec 2009 (12/1/2009 - 12/31/2009)	1/1/2010	1/7/2010	Inactive	
G. Jan 2010 (1/1/2010 - 1/31/2010)	2/1/2010	2/7/2010	Inactive	
H. Feb 2010 (2/1/2010 - 2/28/2010)	3/1/2010	3/7/2010	Inactive	
I. Mar 2010 (3/1/2010 - 3/31/2010)	4/1/2010	4/7/2010	Inactive	
J. Apr 2010 (4/1/2010 - 4/30/2010)	5/1/2010	5/7/2010	Inactive	
K. May 2010 (5/1/2010 - 5/31/2010)	6/1/2010	6/7/2010	Inactive	
L. Final Jun 2010 (6/1/2010 - 6/30/2010)	6/24/2010	6/30/2010	Inactive	

Terraqua, Inc.
Release #4, Master Agreement #27480
BPA Project 2003-017-00: Integrated Monitoring Pilot
July 1, 2009 through June 30, 2010

6/18/2009

		Qnty	Unit	Unit Cost	COST
1 PERSONNEL SERVICES					\$351,273
	<i>Administrative Scientist II, Michael Ward</i>				
Task 8.1	Coordination/QC	(b)(4)	hours @	(b)(4)/hour	(b)(4)
Task 8.3	Wenatchee/Entiat Strategy Updates	(b)(4)	hours @	(b)(4)/hour	(b)(4)
Task 8.5	Protocol Development	(b)(4)	hours @	(b)(4)/hour	(b)(4)
Task 8.10	Proj. Mgt. and Reporting	(b)(4)	hours @	(b)(4)/hour	(b)(4)
	<i>Administrative Scientist I</i>				
Task 8.1	Coordination/QC	(b)(4)	hours @	(b)(4)/hour	(b)(4)
Task 8.2	Implementation Tracking	(b)(4)	hours @	(b)(4)/hour	(b)(4)
Task 8.3	Wenatchee/Entiat Strategy Updates	(b)(4)	hours @	(b)(4)/hour	(b)(4)
Task 8.4	Pilot Subbasin Coord.	(b)(4)	hours @	(b)(4)/hour	(b)(4)
Task 8.5	Protocol Development	(b)(4)	hours @	(b)(4)/hour	(b)(4)
Task 8.6	Macroinvertebrate Analysis	(b)(4)	hours @	(b)(4)/hour	(b)(4)
Task 8.7	Entiat Effectiveness	(b)(4)	hours @	(b)(4)/hour	(b)(4)
Task 8.10	Proj. Mgt. and Reporting	(b)(4)	hours @	(b)(4)/hour	(b)(4)
Task 8.11	ISEMP Annual Program Review	(b)(4)	hours @	(b)(4)/hour	(b)(4)
	<i>Senior Scientist I</i>				
Task 8.1	Coordination/QC	(b)(4)	hours @	(b)(4)/hour	(b)(4)
Task 8.5	Protocol Development	(b)(4)	hours @	(b)(4)/hour	(b)(4)
Task 8.12	Downstream Migrant Trapping Analysis	(b)(4)	hours @	(b)(4)/hour	(b)(4)
	<i>Scientist I</i>				
Task 8.1	Coordination/QC	(b)(4)	hours @	(b)(4)/hour	(b)(4)
Task 8.5	Protocol Development	(b)(4)	hours @	(b)(4)/hour	(b)(4)
Task 8.6	Macroinvertebrate Analysis	(b)(4)	hours @	(b)(4)/hour	(b)(4)
Task 8.7	Entiat Effectiveness	(b)(4)	hours @	(b)(4)/hour	(b)(4)
Task 8.8	Field Survey Assistance	(b)(4)	hours @	(b)(4)/hour	(b)(4)
Task 8.9	Repeat Sampling	(b)(4)	hours @	(b)(4)/hour	(b)(4)
	<i>Technican III</i>				
Task 8.7	Entiat Effectiveness	(b)(4)	hours @	(b)(4)/hour	(b)(4)
Task 8.8	Field Survey Assistance	(b)(4)	hours @	(b)(4)/hour	(b)(4)
Task 8.9	Repeat Sampling	(b)(4)	hours @	(b)(4)/hour	(b)(4)
	<i>Technician II</i>				
Task 8.7	Entiat Effectiveness	(b)(4)	hours @	(b)(4)/hour	(b)(4)
Task 8.8	Field Survey Assistance	(b)(4)	hours @	(b)(4)/hour	(b)(4)
Task 8.9	Repeat Sampling	(b)(4)	hours @	(b)(4)/hour	(b)(4)
	<i>Technician I</i>				
Task 8.7	Entiat Effectiveness	(b)(4)	hours @	(b)(4)/hour	(b)(4)
Task 8.8	Field Survey Assistance	(b)(4)	hours @	(b)(4)/hour	(b)(4)
Task 8.9	Repeat Sampling	(b)(4)	hours @	(b)(4)/hour	(b)(4)
2 Travel					\$44,145
	<i>Airfare</i>				
Task 8.1	EAT to Portland, OR or other loc. in OR/WA/	(b)(4)	@	(b)(4)/RT	(b)(4)
Task 8.4	EAT to Portland, OR or other loc.in OR/WA/	(b)(4)	@	(b)(4)/RT	(b)(4)
Task 8.5	Redding, CA to Portland, OR or other loc. In	(b)(4)	@	(b)(4)/RT	(b)(4)
Task 8.12	Redding, CA toSeattle, WA or other loc. In C	(b)(4)	@	(b)(4)/RT	(b)(4)
	<i>Rental car and parking</i>				
Task 8.1	SEA or PDX (NOAA/BPA)	(b)(4)	@	(b)(4)/RT	(b)(4)
Task 8.4	Portland, OR or other loc.in OR/WA/ID	(b)(4)	@	(b)(4)/RT	(b)(4)
Task 8.5	Portland, OR or other loc.in OR/WA/ID	(b)(4)	@	(b)(4)/RT	(b)(4)
Task 8.12	Redding, CA toSeattle, WA or other loc. In C	(b)(4)	@	(b)(4)/RT	(b)(4)

	<i>Per Diem (Lodging plus M&IE)</i>				
Task 8.1	Portland, OR	(b)(4)	day/night @	(b)(4) /day	(b)(4)
Task 8.1	Seattle, WA		day/night @	/day	
Task 8.4	Portland, OR or other loc.in OR/WA>ID		day/night @	/day	
Task 8.5	Leavenworth, WA		day/night @	/day	
Task 8.5	Portland, OR or other loc.in OR/WA>ID		day/night @	/day	
Task 8.6	Missoula, MT		day/night @	/day	
Task 8.7	Washington Cities		day/night @	/day	
Task 8.7	Washington Cities (M&IE only)		day/night @	/day	
Task 8.8	Washington Cities		day/night @	/day	
Task 8.8	Washington Cities (M&IE only)		day/night @	/day	
Task 8.9	Washington Cities		day/night @	/day	
Task 8.9	Washington Cities (M&IE only)		day/night @	/day	
Task 8.12	Seattle, WA		day/night @	/day	

	<i>Field Trailer Rental</i>				
Task 8.7	Rental of trailer (in lieu of approx. 199 nights)	(b)	months @	(b)(4) /month	(b)(4)

	<i>POV Mileage to/from</i>				
Task 8.1	Wenatchee from Peshastin, WA	(b)(4)	trip @	(b)(4) mi/trip	(b)(4)
Task 8.1	Entiat, Wa. from Peshastin, WA		trip @	mi/trip	
Task 8.1	Entiat, Wa. from Riverside, WA		trip @	mi/trip	
Task 8.4	EAT from Peshastin, WA		trip @	mi/trip	
Task 8.5	Leavenworth, WA from Riverside, WA		trip @	mi/trip	
Task 8.5	Red Bluff, CA to Redding, CA		trip @	mi/trip	
Task 8.6	Missoula, MT from Riverside, WA		trip @	mi/trip	
Task 8.6	Wenatchee from Riverside, WA		trip @	mi/trip	
Task 8.7	RT to/among sites in Entiat Subbasin from Riverside			miles	
Task 8.8	RT to/among sites in Wen/Entiat Subbasin from Riverside			mi/trip	
Task 8.9	RT to/among sites in Wenatchee Subbasin from Riverside			miles	
Task 8.12	Red Bluff, CA to Redding, CA	(b)	trip @	mi/trip	

3 Standard Daily Field Equipment Rate \$12,690

Task 8.7	Field Days	(b)(4)	days @	(b)(4) /day	(b)(4)
Task 8.8	Field Days	(b)(4)	days @	/day	
Task 8.9	Field Days	(b)(4)	days @	/day	

4 SUPPLIES \$9,425

		Qty	Unit	Unit Cost	COST
split 95% 8.7	Field Paper for data sheets	(b)	ream	(b)(4)	(b)(4)
split 95% 8.7	Measuring Tape (50m)	(b)	each	/each	
split 95% 8.7	Measuring Tape refill (100m)	(b)	each	/each	
split 95% 8.7	Hand Level	(b)	each	/each	
split 95% 8.7	Binders	(b)	each	/each	
split 95% 8.7	Note paper refills	(b)	each	/each	
split 95% 8.7	Notebooks	(b)	each	/each	
split 95% 8.7	Densimeter (convex)	(b)	each	/each	
split 95% 8.7	Macroinvertebrate containers	(b)	case	/case	
split 95% 8.7	Surveyor Rod	(b)	each	/each	
split 95% 8.7	Denatured alcohol	(b)(4)	gal.	/gal	
split 95% 8.7	Kicknet	(b)	each	/each	
split 95% 8.7	Miscellaneous				
split 95% 8.7	Taxes and Shipping at 15%				
Task 8.4	Conference fees	(b)	conference @	/conference	
Task 8.8	Drysuits	(b)	each	/each	
Task 8.8	Misc snorkel equipment (fleece suits, replace masks, gloves, hoods, snorkel etc.)				

5 SUBCONTRACTS \$52,084

Task 8.6	Rhithron Associate, Inc. lab fees	(b)(4)	samples @	(b)(4) /sample	(b)(4)
Task 8.12	ESSA, Inc.	(b)(4)	hours @	(b)(4) /hour	(b)(4)

6 Administrative Expense (10% of dir. exp. excl. mileage/per diem) \$6,151

Task 8.6	Rhithron Associate, Inc. lab fees	(b)(4)	samples @	(b)(4) /sample	(b)(4)
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Task 8.12
split 1/3b

ESSA, Inc.
Supplies

(b)(4) hours

@

(b)(4) /hour

(b)(4)
(b)(4)

7 BUDGET TOTAL \$475,768

UNITED STATES
GOVERNMENT

RELEASE

BONNEVILLE
POWER ADMINISTRATION

Mail Invoice To:

fwinvoices@bpa.gov
F & W Invoices - KEWB-4
P. O. Box 3621
Portland OR 97208-3621

Contract : 00027480
Release : 00005
Page : 1

Vendor:
TERRAQUA INC
PO BOX 85
WAUCONDA WA 98859

Please Direct Inquiries to:

KRISTI J. VAN LEUVEN
Title: CONTRACT SPECIALIST
Phone: 503-230-3605
Fax : 503-230-4508

Attn: MICHAEL B WARD

Contract Title: 2003-017-00 EXP ISEMP - TERRAQUA - COORDINATION WENATCHEE/ENTIAT

Performance Period: 07/01/10 - 06/30/11

Michael B. Ward

Contractor Signature

Michael B. Ward, President

Printed Name/Title

March 7, 2011

Date Signed

Kristi Vanleuwen

BPA Contracting Officer

3/7/2011

Date Signed

Contract Modifications

Title : RM&E REV - CHAMP - PRIORITY SCOPE & BUDGET AMEND

Modification: 001

Modified Performance Period: -



Contract 27480 Release 5
Page 2

ISEMP Coordination Wenatchee Entiat
Project Number 2003-017-00
Modification 1

This modification is issued to authorize a change to the project statement of work and budget in accordance with the attached. Funding in the amount of \$88,846 is added to this contract.

Original release amount:	\$741,848
Increase this modification 1:	<u>\$ 88,846</u>
Revised total release:	\$830,694

All other terms and conditions remain the same.



Statement of Work Report

Project Title: Integrated Status and Effectiveness Monitoring Program (ISEMP)
Project #: 2003-017-00
Contract Title: 2003-017-00 EXP ISEMP - TERRAQUA - COORDINATION WENATCHEE/ENTIAT
Contract #: 27480 REL 5 **Amendment #:** 1
Province: Non-Provincial **Subbasin:** Basinwide
Workorder ID: 129074 **Task ID:** 1
Contract Type: Release **Pricing Type:** Time and Materials
Contractor(s): Terraqua, Inc. (Prime - TERRAQUA00)
BPA Internal Ref: Amd1
SOW Validation: Last validated 02/18/2011 with 0 problems, and 0 reviewable items
Contract Documents: [Budget - Contract \(02/18/2011\)](#) corrected line item budget amendment

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Kristi Van Leuven	Contracting Officer	Bonneville Power Administration	(503) 230-3605 / NA	kjvleuven@bpa.gov	P.O Box 3621 Mailstop - NSSP-4 Portland, OR 97208-3621
Paul Krueger	Contract Approver	Bonneville Power Administration	(503) 230-5723 / NA	pgkrueger@bpa.gov	905 NE 11th Ave. Portland OR 97232

Work Element Table of Contents:



<u>Work Element - Work Element Title</u>	<u>EC Needed*</u>	<u>Estimate</u>	<u>(%)</u>
A : 165. Produce Environmental Compliance Documentation - 9.13b Environmental Compliance (Fast Track)		\$500	(0 %)
B : 185. Produce Pisces Status Report - Periodic Status Reports for BPA		\$500	(0 %)
C : 132. Produce (Annual) Progress Report - 9.13d Produce Annual Progress Report for the period July 2010 to June 2011(Fast Track)		\$500	(0 %)
D : 189. Regional Coordination - 9.1 ISEMP Wenatchee/Entiat/Methow Coordination		\$66,547	(8 %)
E : 141. Produce Other Report - 9.2 ISEMP Program Reporting		\$38,898	(5 %)
F : 174. Produce Plan - 9.3 Wenatchee/Entiat Strategy Updates and Implementation Tracking		\$9,994	(1 %)
G : 189. Regional Coordination - 9.4 ISEMP Pilot Subbasin Coordination		\$17,829	(2 %)
H : 174. Produce Plan - 9.5 Protocol Development		\$735	(0 %)
I : 157. Collect/Generate/Validate Field and Lab Data - 9.6a Macroinvertebrate Analysis	*	\$25,052	(3 %)
J : 157. Collect/Generate/Validate Field and Lab Data - 9.6b Macroinvertebrate Analysis (Fast Track)	*	\$29,967	(4 %)
K : 157. Collect/Generate/Validate Field and Lab Data - 9.7 Entiat IMW - Effectiveness - Habitat Monitoring	*	\$95,210	(11 %)
L : 157. Collect/Generate/Validate Field and Lab Data - 9.8a Entiat IMW - Effectiveness - Fish Monitoring	*	\$96,360	(12 %)
M : 157. Collect/Generate/Validate Field and Lab Data - 9.9 Entiat IMW - Status/Trend - Habitat Monitoring (Fast Track)	*	\$87,044	(10 %)
N : 157. Collect/Generate/Validate Field and Lab Data - 9.10 Entiat IMW - Status/Trend - Fish Monitoring (Fast Track)	*	\$75,309	(9 %)
O : 157. Collect/Generate/Validate Field and Lab Data - 9.11 Methow - Status/Trend - Habitat Monitoring (Fast Track)	*	\$155,996	(19 %)
P : 162. Analyze/Interpret Data - 9.12 Downstream Migrant Trapping Analysis		\$32,675	(4 %)
Q : 119. Manage and Administer Projects - 9.13a Project Management (Fast Track)		\$8,732	(1 %)
R : 189. Regional Coordination - 9.14a NEW: Develop and Implement the CHaMP		\$88,846	(11 %)
Total:		\$830,694	

* Environmental Compliance (EC) needed before work begins.

Contract Description:

AMENDMENT February 2011

This contract was amended February 8, 2011 to add one new work element and amend an existing work element:

Added WE 189: 9.14: Develop and Implement CHaMP

Added milestone to WE 157:9.8: Entiat IMW- Effectiveness- Fish Monitoring - to add Winter Sampling. Cost efficiencies in the summer 2010 Entiat IMW Effectiveness Fish Monitoring and other field work allows us to conduct



fish monitoring in the winter period without requiring a budget amendment.

In support of habitat restoration, rehabilitation and conservation action performance assessments and adaptive management requirements of the 2008 Federal Columbia River Power System Biological Opinion (FCRPS BiOp), the Bonneville Power Administration is working with NOAA and other regional fish management agencies to monitor status and trends of fish habitat for each major population group (MPG) in the Pacific Northwest identified through the Endangered Species Act (ESA). Status monitoring provides information on the quantity and quality of current habitat and thus maximizes spatial coverage with a given number of sample sites. Trend monitoring is used to detect changes in habitat through time and thus requires repeat samples at given sites. Minimizing sampling and measurement error is crucial in order to differentiate this variability from natural variability through time and space. In order to compare information across multiple MPGs, BPA is adopting a standardized fish habitat monitoring protocol, the Columbia Habitat Monitoring Program (CHaMP) for the Columbia River Basin monitoring programs.

CHaMP is a Columbia River basin-wide habitat status and trends monitoring program built around a single habitat monitoring protocol with a program-wide approach to data collection and management which meets FCRPS Action Agency (2010) programmatic prescriptions for habitat monitoring. CHaMP was developed by the Integrated Status and Effectiveness Monitoring Program (ISEMP) to capture habitat features that drive fish population biology and will result in systematic habitat status and trends information that will be used to assess basin-wide habitat condition and correlated with biological response indicators to evaluate habitat management strategies. CHaMP is integrated with ongoing Pacific Northwest Aquatic Monitoring Program (PNAMP) and Recovery Planning efforts, as well as the collaborative process across Columbia Basin fish management agencies and tribes and other state and federal agencies that are monitoring anadromous salmonids and/or their habitat.

The CHaMP is being proposed by the ISEMP and eight collaborating agencies to help BPA meet the requirements of the 2008 FCRPS BiOp and RPA 56.3. This program will provide information on the status/trends in habitat conditions, and will support habitat restoration, rehabilitation and conservation actions, performance assessments, and the adaptive management requirements of the 2008 FCRPS BiOp. In addition, the CHaMP meets RPA 56.3, RPA 57, and RPA 3 by characterizing stream and fish responses to watershed restoration and/or management actions in at least one population within each steelhead and Chinook MPG which have, or will have, fish in-fish out monitoring (identified in RPA 50.6). The watersheds identified for CHaMP include: Hood River, Wind River, Toppenish, Klickitat, Fifteen Mile, Lower Mainstem JD, North Fork JD, Upper Mainstem JD, Middle Fork JD, South Fork JD, Umatilla, Upper Grande Ronde, Catherine Ck, Imnaha, Lolo Ck, Tucannon, Asotin, SF Salmon, Big Ck, Lemhi, Pahsimeroi, Yankee Fork, Wenatchee, Entiat, Methow, and Okanogan. These watersheds were chosen to maximize the contrast in current habitat conditions and also represent a temporal gradient of expected change in condition through planned habitat actions. CHaMP collaborators will be supported by cross-project data management, stewardship and analysis staff, annual pre- and post-season meetings, annual field protocol and data management tool implementation training sessions.

Work elements 189: 9.14 was added to develop and implement the basin-wide Columbia Habitat Monitoring Program (CHaMP). Terraqua, Inc. staff, including Michael B. Ward as Lead Coordinator, will provide coordination and help organize and implement the work necessary to assist those collaborators implementing the CHaMP in 2011 to be ready for the 2011 field season.

WE 157:9.8b: Entiat IMW- Effectiveness-Fish Monitoring was added under this CCR to add planned for fish monitoring in February/March in the Entiat Intensively Monitored Watershed.

This contract contains work elements that are funded under the "Fast Track" budget, including: Tasks 9.6b, 9.9, 9.10, 9.11, and 9.13.

Contract Description: Since its inception in FY2003, Project #2003-017-00 (the Integrated Status and Effectiveness Monitoring Program; ISEMP) has been developing two novel monitoring and evaluation programs: (i) subbasin-scale pilot status and trend monitoring efforts for anadromous salmonids and their habitat in the Wenatchee/Entiat, John Day and South Fork Salmon River basins, and (ii) effectiveness monitoring for suites of habitat restoration projects in selected watersheds within the three target subbasins. This work is critical for the development of a federal research, monitoring, and evaluation (FRME) program for the Columbia River Basin, which is now a requirement under the U.S. National Oceanic and Atmospheric Administration Fisheries (NOAA-Fisheries) 2000, 2004 and 2008 Federal Columbia River Power System Biological Opinions (BiOps, NMFS 2000, NOAA 2004, NMFS-NWR 2008). In 2008, the ISEMP became a component of BPA's BiOp Program to help



ensure that provisions of the BiOp are satisfied. ISEMP builds on current status and trend monitoring programs within each of the pilot basins. Several regional and local organizations are funding and implementing these programs. In short, this project has integrated existing and new monitoring and evaluation activities in three pilot subbasins to help ensure that provisions of the BiOp are satisfied. This contract is one of several contracts that will implement this project. The final report for this contract will contain data that will 1) be submitted to NOAA Fisheries (also a contractor under this project) for use in a project level integrated Annual Report and 2) be submitted to BPA as a contract final report according to the terms of this contract. Terraqua's role has been, and continues to be, to enable the Bonneville Power Administration to continue to implement Project #2003-017-00 in the Wenatchee and Entiat and other pilot subbasins. Objectives of this work have been, and continue to be:

In 2010,

- Coordinate contract development between Bonneville and entities participating in implementation of the ISEMP program in the Wenatchee/Entiat and other pilot subbasins.
- Coordinate contract implementation between Bonneville and entities participating in the ISEMP program in the Wenatchee/Entiat and other pilot subbasins to ensure that implementation activities meet the purpose and needs of the ISEMP program.
- Implement selected monitoring and analysis activities.
- Analyze and report results related to the implementation of monitoring activities.

This contract represents an increase in scope and budget of about 56 percent over the previous Terraqua Release #4 of Contract 27480 primarily due to the expansion of ISEMP monitoring and coordination activities in the Entiat and Methow subbasins (particularly the Fast Track work elements listed above).

To offset the expanded costs associated with this expanded scope of work, Terraqua has: elevated lower-cost staff to assume some of the responsibilities previously executed by more senior staff and has reduced the scope of some coordination elements that were more prominent in earlier releases as those elements have been completed or institutionalized to the point they are relatively maintenance-free. The following list describes details associated with some of the significant scope/budget differences compared to Release #4:

- The total effort and cost of coordination-related and development tasks (Tasks 8.1 through 8.5) has remained about the same (\$135K versus \$129K in Release #4) and reflects a balance of increased cost-of-business, increased efficiencies, and an expanded scope of work for the Entiat IMW project. Similarly, there is no significant change in the budget for project management (Task 9.13).
- The slight budget increase for task 9.6 over Release #4 Task 8.6 reflects constant laboratory fees and a 17% increase in the number of samples that will be processed.
- Task 9.7 represents a 25% expansion of habitat effectiveness monitoring work in the Entiat.
- The budget for Task 9.8 represents a new task of fish effectiveness monitoring in the Entiat.
- The budget for Task 9.9 is higher than in Release #3 because the larger scope of work requires more crew. All crew training falls within this work element.
- Task 9.10 Entiat Status/Trend Fish is new for Terraqua this year and was previously performed by another ISEMP subcontractor whose contract was already in place when Fast Track money was budgeted to this work.
- Task 9.11 Methow Status/Trend habitat is new for Terraqua and is a result of Fast Track budgeting.

Statement of Work Report



Work Element Details

A: 165. Produce Environmental Compliance Documentation

Title: 9.13b Environmental Compliance (Fast Track)
Description: Ensure necessary documents are provided to BPA's Environmental Compliance group in sufficient time to allow for a compliance letter to be written prior to any ground-disturbing work. Coordinate with appropriate agencies regarding any permits that may be required.
Deliverable Specification: Provide necessary supporting documentation and assistance to BPA's Environmental Compliance Group (such as maps, design drawings, survey reports, permit applications, ESA documents, etc.) to assure a timely receipt of EC compliance letter.
Planned Metrics: Are herbicides used as part of work performed under this contract?: No

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Provide BPA EC Lead with calendar year XXXX proposed herbicide use	7/1/2010	6/30/2011	Active	Contractor submits any proposed herbicide use on an approved form to the BPA Environmental Compliance Lead
B. Provide BPA EC Lead with calendar year XXXX actual herbicide use	7/1/2010	6/30/2011	Active	Contractor submits any actual herbicide use on an approved form to the BPA Environmental Compliance Lead
Deliverable: C. Environmental Compliance supporting documentation		6/30/2011	Active	<i>See the Deliverable Specification above</i>

B: 185. Produce Pisces Status Report

Title: Periodic Status Reports for BPA
Description: The Contractor shall report on the status of milestones and deliverables in Pisces. Reports shall be completed either monthly or quarterly as determined by the BPA COTR. Additionally, when indicating a deliverable milestone as COMPLETE, the contractor shall provide metrics and the final location (latitude and longitude) prior to submitting the report to the BPA COTR.
Deliverable Specification:

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Jul-Sep 2010 (7/1/2010 - 9/30/2010)	10/1/2010	10/15/2010	Completed	
B. Oct-Dec 2010 (10/1/2010 - 12/31/2010)	1/1/2011	1/15/2011	Completed	
C. Jan-Mar 2011 (1/1/2011 - 3/31/2011)	4/1/2011	4/15/2011	Active	
D. Final Apr-Jun 2011 (4/1/2011 - 6/30/2011)	6/16/2011	6/30/2011	Active	

C: 132. Produce (Annual) Progress Report

Title: 9.13d Produce Annual Progress Report for the period July 2010 to June 2011(Fast Track)
Description: The annual report summarizes the project goal, objectives, hypotheses, completed and uncompleted deliverables, problems encountered, lessons learned, and long-term planning. Examples of long-term planning include future improvements, new directions, or level of effort for contract implementation, including any ramping up or ramping down of contract components or of the project as a whole. Date range July 1, 2010 to June 30, 2011 has been agreed upon by the COTR and the contractor. This may or may not coincide with the contract period. For an ongoing project, an annual report covering a contract period may be submitted under the subsequent contract, if approved by the COTR.
Deliverable Specification: Upload annual report for the period July 2010 to June 2011 via attachments within Pisces. For guidance on how/where to upload:
http://www.efw.bpa.gov/Integrated_Fish_and_Wildlife_Program/technicalreports.aspx



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Review annual report format requirements	9/1/2010	10/1/2010	Completed	Contractor must review formatting requirements before starting the first draft of their report. Please follow the BPA-required format. http://www.efw.bpa.gov/Integrated_Fish_and_Wildlife_Program/technicalreports.aspx
B. Email draft of report to COTR for review	5/16/2011	5/16/2011	Active	The draft annual report must be submitted to the BPA COTR in Microsoft Word format (any version of Word is fine).
C. Receive COTR review comments	5/16/2011	6/15/2011	Active	The BPA COTR should provide review feedback and comments within 30 days of receiving the draft annual report. This milestone should therefore have a duration of 30 days.
D. Finalize Draft Annual Report	6/15/2011	6/30/2011	Active	Integrate review feedback and comments, and obtain internal signatures if necessary. Convert the annual report to Adobe Acrobat PDF format. It is anticipated that this report will be uploaded to public by BPA within 30 days of its receipt on June 30, 2011.
Deliverable: E. Final report uploaded to the BPA website		6/30/2011	Active	<i>See the Deliverable Specification above</i>

D: 189. Regional Coordination

Title: 9.1 ISEMP Wenatchee/Entiat/Methow Coordination

Description: Terraqua will represent the interests of the ISEMP at meetings of the RTT, the Entiat Watershed Planning Unit, and will coordinate electronically and in-person with the following entities that may be involved in this Program: RTT, EWPU, U.S. Forest Service (USFS), Washington Department of Ecology (WDOE), Methow River Salmon Restoration Council, Chelan PUD, Yakama Nation, NOAA-Fisheries, BPA, U.S. Bureau of Reclamation, Chelan County, Cascadia Conservation District, the mid-Columbia PUD's HCP Hatchery Committee, and other parties as necessary.

Terraqua will coordinate ISEMP contractors to help insure that contractors SOWs and deliverables meet ISEMP needs and that contractor budgets stay within the overall ISEMP budget and other available funds. Terraqua will also coordinate the analysis and reporting of ISEMP products with Quantitative Consultants, NOAA, and other program analysts.

Deliverable Specification: Attend up to twelve (12) monthly Oversight Committee meetings to be held as part of regularly scheduled RTT meetings, attend up to four quarterly meetings of the EWPU and/or up to 12 monthly EWPU Habitat Subcommittee meetings from July 2010 through June 2011. Attend up to two (2) meetings with BPA or NOAA at locations in Washington, Oregon, or Idaho from July 2010 through June 2011.

Provide a copy of written minutes from all RTT and EWPU meetings attended.

Provide a monthly report of significant coordination issues.

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Submit RTT Meeting minutes	7/1/2010	6/30/2011	Active	For any RTT meetings attended, submit minutes to BPA COTR via email.
B. Monthly, telephonically update COTR of significant coordination issues	7/1/2010	6/28/2011	Active	Monthly, conduct a telephone update with the BPA COTR regarding significant coordination issues, or anything that could jeopardize the overall project.
Deliverable: C. Meeting minutes / Coordination reports		6/30/2011	Active	<i>See the Deliverable Specification above</i>

E: 141. Produce Other Report

Title: 9.2 ISEMP Program Reporting

**Description:**

Beginning in FY10, ISEMP will expand the yearly programmatic reporting beyond the Annual Review to also include the preparation of up to three scientific manuscripts based on data collected and analyzed by ISEMP since its inception.

The ISEMP Project Annual Review Report is the capstone report for all activities that are separately contracted under this Project #2003-017. Prior to 2006, this reporting has been completed by reports prepared by individual contractors or has been accomplished through BiOp reporting. BPA managers and ISEMP coordinators and other entities have expressed the desire to have the complete program summarized in a periodically updated program review document. In 2006, a three-year review was created; since then, it has been updated annually beginning in 2007.

In this work element, Terraqua will produce the 2010 ISEMP Project Annual Review, a document that compiles and coordinates the reports of all ISEMP contractors from each of the three pilot subbasins and the umbrella group (Note: ISEMP contractors will continue to provide BPA with annual reports regarding contract-specific progress and work performed), describes all ISEMP progress in the past year of the program in relation to ISEMP proposed goals and objectives, and documents changes in protocols/indicators being monitored that have resulted from data collected. This document will be stored on the ISEMP web site and uploaded to Pisces.

Also in this work element, Terraqua will produce up to three manuscripts that will be ready for submission to peer-reviewed journals based on data collected and analyzed by ISEMP since its inception. Terraqua will coordinate with ISEMP staff to determine which analyses/datasets to report, the extent of analyses necessary for manuscript preparation, and for editing/internal development and review of manuscripts. As of May 2010, ISEMP staff have identified several areas where data analysis will likely lead to publishable results in the next six months. Completion of this work element will depend on other ISEMP contractors and staff to provide study designs, descriptions of methodology as conducted, complete data analysis to the point that results will be publishable, interpretation of results and conclusions, and editorial review of draft and final manuscripts.

Deliverable Specification:

Produce the ISEMP Project Annual Review Report that captures accomplishments to date of all activities that are separately contracted under this Project #2003-017 for external review that can be shared with all participants as well as external parties via the ISEMP web site and Pisces. This document will be a "special progress report" that will be developed in addition to the progress report prepared in Work Element C, 9.14d Produce Annual Report. The ISEMP Project Annual Review Report will not change the need of other contractors to submit their annual reports.

Produce up to three manuscripts that will be ready for submission to peer-reviewed journals based on data collected and analyzed by ISEMP since its inception.



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Produce draft ISEMP Annual Review	10/1/2010	3/15/2011	Active	Develop a single document that compiles and coordinates the reports of all ISEMP contractors, describes all ISEMP progress in the past year of the program in relation to ISEMP proposed goals and objectives, and documents changes in protocols/indicators being monitored that have resulted from data collected. Circulate this draft document for review among ISEMP and BPA collaborators.
B. Produce final ISEMP Annual Review	1/1/2011	6/30/2011	Active	Publish an electronic, accessible, final document that compiles and coordinates the reports of all ISEMP contractors, describes all ISEMP progress in the past year of the program in relation to ISEMP proposed goals and objectives, and documents changes in protocols/indicators being monitored that have resulted from data collected over the past year of the program. Store this document on the ISEMP web site.
C. Coordinate ISEMP contributions to the preparation of three manuscripts	7/1/2010	6/30/2011	Active	Coordinate with ISEMP staff to determine which analyses/datasets to report, the extent of analyses necessary for manuscript preparation, and for editing/internal development and review of manuscripts. Completion of this work element will depend on other ISEMP contractors and staff to provide study designs, descriptions of methodology as conducted, complete data analysis to the point that results will be publishable, interpretation of results and conclusions, and editorial review of draft and final manuscripts. The coordination milestone and budget includes up to 6 meetings (up to 12 days) and associated travel expenses to meet in-person with ISEMP staff for development of draft and final manuscripts if necessary.
D. Produce draft of Manuscript 1	7/1/2010	5/15/2011	Active	Produce a draft of 1 of 3 manuscripts including all analysis work completed by December 1, 2010.
E. Produce draft of Manuscript 2	7/1/2010	5/15/2011	Active	Produce a draft of 2 of 3 manuscripts including all analysis work completed by December 1, 2010.
F. Produce draft of Manuscript 3	7/1/2010	5/15/2011	Active	Produce a draft of 3 of 3 manuscripts including all analysis work completed by December 1, 2010.
G. Produce final version of Manuscript 1	1/1/2011	6/30/2011	Active	Produce a final draft of 1 of 3 manuscripts that will be ready for submission to a peer-reviewed journal.
H. Produce final version of Manuscript 2	1/1/2011	6/30/2011	Active	Produce a final draft of 2 of 3 manuscripts that will be ready for submission to a peer-reviewed journal.
I. Produce final version of Manuscript 3	1/1/2011	6/30/2011	Active	Produce a final draft of 3 of 3 manuscripts that will be ready for submission to a peer-reviewed journal.
Deliverable: J. ISEMP Annual Review and Manuscript Preparation		6/30/2011	Active	<i>See the Deliverable Specification above</i>

F: 174. Produce Plan

Title:

9.3 Wenatchee/Entiat Strategy Updates and Implementation Tracking

Description:

Terraqua developed strategies for the implementation of the ISEMP program in the Wenatchee and Entiat subbasins in FY05 and FY06, respectively. These strategies were developed as working documents and were intended to be updated as needed. Continuing changes in the institutional, scientific, and policy settings within which the ISEMP program operates within these two subbasins require that these strategy documents be updated. For example, planning and implementation of ESA recovery plans is on-going and is leading to large-scale implementation of restoration programs. ISEMP needs to ensure that its goals and objectives remain consistent within these new contexts and that ISEMP program elements will continue to meet the rigorous scientific needs of the larger ISEMP program within these two subbasins. Furthermore, local groups that cooperate with the ISEMP program, including the Upper Columbia Salmon Recovery Board and its Regional Technical Team, look to ISEMP as the template for monitoring in the Wenatchee and Entiat and would like to adopt ISEMP's monitoring strategies for their recovery implementation work. For these reasons, Terraqua will review and revise the existing ISEMP monitoring strategies for the Wenatchee and Entiat subbasins within this work element to accommodate the changing institutional needs of ISEMP partners and subbasin management authorities.

Terraqua will continue to maintain and update the Project Tracking Tool developed since 2005 that serves to document changes to scientific study design that have occurred since the inception of ISEMP to assist project contractors in conducting field work and to assist ISEMP analysts in the interpretation of project data. This database will continue to be a "living" tool that will be periodically updated as necessary and will be electronically accessible to all ISEMP contractors and cooperators. This document will be updated and maintained in working draft format through June 30, 2011.

Deliverable Specification:

Revise the ISEMP implementation strategies for the Wenatchee and Entiat subbasins in a format that is accessible to all ISEMP contractors and cooperators. Maintain and update the ISEMP Wenatchee/Entiat project tracking tool in a format that is accessible to all ISEMP contractors and cooperators (preferably via a central location, e.g., web site)



Primary Focal Species: Chinook - Upper Columbia River Spring ESU | Steelhead - Upper Columbia River DPS

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Draft Revised Entiat Implementation Strategy document	7/1/2010	3/31/2011	Active	Revise the ISEMP Implementation Strategy for the Entiat Subbasin and develop a draft document for review.
B. Draft Revised Wenatchee Implementation Strategy document	7/1/2010	12/31/2010	Completed	Revise the ISEMP Implementation Strategy for the Wenatchee Subbasin and develop a draft document for review.
C. Final Revised Entiat Implementation Strategy document	1/1/2011	6/30/2011	Active	Produce a final working Implementation Strategy for the ISEMP program in the Entiat Subbasin.
D. Final Revised Wenatchee Implementation Strategy document	1/1/2011	6/30/2011	Active	Produce a final working Implementation Strategy for the ISEMP program in the Wenatchee Subbasin.
E. Maintain working draft of project tracking tool with periodic updates	7/1/2010	6/30/2011	Active	Continue to update and maintain the project tracking tool such that maintenance can be done by future ISEMP coordinators (whether that continues to be Terraqua or not).
Deliverable: F. Revised ISEMP strategies for the Wenatchee and Entiat subbasins		6/30/2011	Active	<i>See the Deliverable Specification above</i>

G: 189. Regional Coordination

Title: 9.4 ISEMP Pilot Subbasin Coordination

Description: Implementation of the Project among the three pilot subbasins, particularly in the area of data management, analysis, reporting, and dissemination of information to other users in the Columbia Basin and states of OR, ID, and WA, requires close coordination of numerous entities who are participating in the Project. Terraqua will represent the interests of the Project at meetings of the pilot subbasin coordinators and will coordinate electronically and in-person with these coordinators and other entities that are developing data management systems, analysis, reporting, and document/conference preparation materials related to Project #2003-017-00.

Deliverable Specification: Attend up to two (2) two-day meetings with pilot subbasin coordinators, and participate in one (1) two-day conference/meeting to disseminate results of ISEMP work to broad monitoring/research/management communities, from July 2010 through June 2011 at locations in Washington, Oregon, and Idaho.

Submit an electronic version of minutes from each of up to 3 meetings attended regarding program coordination.

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Attend program coordination meetings	7/1/2010	6/30/2011	Active	Attend up to two (2) two-day meetings with pilot subbasin coordinators, and participate in one (1) two-day conferences/meetings to disseminate results of ISEMP work to broad monitoring/research/management communities, from July 2010 through June 2011 at locations in Washington, Oregon, and Idaho. Submit an electronic version of minutes from each of up to 3 meetings attended regarding program coordination.
Deliverable: B. Meeting minutes		6/30/2011	Active	<i>See the Deliverable Specification above</i>

H: 174. Produce Plan

Title: 9.5 Protocol Development

Description: Terraqua has been developing working scientific protocols for the ISEMP program since FY05, for habitat, and in FY07 for several other ISEMP survey techniques. These protocols were developed as working documents and were intended to be updated as needed. In FY10, most of the protocols are in a stable form and little change is expected in most protocols, with the possible exception of the redd survey protocol, which may need to be substantially revised. Also in FY10, budget constraints require that this task be moth-balled for at least one year. A small amount of effort (about 10 hours) is included in this release to insure that any issues regarding the existing protocols can be noted in the project tracking tool for subsequent inclusion when protocol development is refunded.

Deliverable Specification: Capture notes regarding any protocol changes in the project implementation tracking tool.

Primary Focal Species: Chinook - Upper Columbia River Spring ESU | Steelhead - Upper Columbia River DPS

Milestone Title	Start Date	End Date	Status	Milestone Description
Deliverable: A. Notes in project tracking tool		6/30/2011	Active	<i>See the Deliverable Specification above</i>

I: 157. Collect/Generate/Validate Field and Lab Data



Title: 9.6a Macroinvertebrate Analysis

Description: Terraqua will subcontract with Rhithron Associates, Inc. of Missoula, MT for processing and identification of up to a total of seventy-six (76) macroinvertebrate samples collected by ISEMP in the Wenatchee and Entiat subbasins. Twenty (20) samples will be collected by WDOE in the Wenatchee subbasin in 2010 while Terraqua will collect fifty-six (56) samples in the Entiat Effectiveness sites (see Work Element K: 157 Task 9.7 for details regarding these sites). At the end of field sampling in fall 2010, Terraqua, Inc. will transport macroinvertebrate samples to Rhithron. Terraqua/Rhithron will provide identification of macroinvertebrates to the lowest practical levels consistent with the River Invertebrate Prediction and Classification System (RIVPACS; Hawkins et al. 2001) protocol, including midges and worms to genus or species using a 500-organism random subsample. Terraqua/Rhithron will deliver standardized metric calculations and will archive the identified fraction of the sample for one year.

Deliverable Specification: Per RIVPACS protocol (Hawkins et al. 2001), provide standardized metric calculations of Macroinvertebrates from up to 76 sites (20 in the Wenatchee collected by WDOE, 56 in the Entiat collected by Terraqua).

Quality controlled raw data and quality controlled summarized macroinvertebrate data with GPS locations, will be entered and stored in Microsoft Access databases known as Automated Template Modules (ATMs) if available or in an Excel spreadsheet. Data will be uploaded by June 30, 2011 to NOAA Fisheries using the ATM and notice will be provided to BPA and Terraqua, Inc. when the data has been uploaded. The contractor will be responsible for all quality assurance/quality control steps necessary to ensure that data is properly collected and entered into the ATM.

Reference: Hawkins, C., J. Ostermiller, M. Vinson, and J. Stevenson. 2001. Stream algae, invertebrate, and environmental sampling associated with biological water quality assessments: field protocols. Utah State University, Logan, UT. web link: <http://www.usu.edu/buglab/monitor/USUproto.pdf>

Planned Metrics:

- * Primary R, M, and E Focal Area : Tributary Habitat
- * Primary R, M, and E Type : Action Effectiveness Research
- * Secondary R, M, and E Type : Status and Trend Monitoring

Primary Focal Species:

Chinook - Upper Columbia River Spring ESU | Steelhead - Upper Columbia River DPS

Country:

US

NPCC Subbasin: ENTIAT

State:

WA

HUC5 Watershed: ENTIAT RIVER

County:

CHELAN

HUC6 Name: ENTIAT RIVER/MUD CREEK

Salmonid ESUs Present:

Upper Columbia River Spring-run Chinook Salmon ESU (accessible) | Upper Columbia River Steelhead DPS (accessible)

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	7/1/2010	6/30/2011	Completed	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. Samples collected	7/15/2010	9/30/2010	Completed	Terraqua will collect macroinvertebrate samples at up to fifty-six (56) sites in the Entiat (see Tasks 9.7 for details regarding these sites). Also during this time, Washington Department of Ecology will be collecting samples in the Wenatchee subbasins at 20 sites.
C. Samples delivered to Rhithron Associates	9/30/2010	11/3/2010	Completed	At the end of field sampling in fall 2010, Terraqua, Inc. will transport macroinvertebrate samples collected by Terraqua and WDOE to Rhithron.
D. Data generated by Rhithron Associates and delivered to Terraqua/BPA	11/3/2010	4/30/2011	Active	Rhithron will provide identification of macroinvertebrates to the lowest practical levels consistent with RIVPACS protocol, including midges and worms to genus or species using a 500-organism random subsample. Rhithron will deliver standardized metric calculations and will archive the identified fraction of the sample for one year.
Deliverable: E. Macroinvertebrate Analysis		4/30/2011	Active	<i>See the Deliverable Specification above</i>

J: 157. Collect/Generate/Validate Field and Lab Data

Title: 9.6b Macroinvertebrate Analysis (Fast Track)

Description: Terraqua will subcontract with Rhithron Associates, Inc. of Missoula, MT for processing and identification of up to a total of eighty-five (85) macroinvertebrate samples collected by ISEMP in the Entiat and Methow subbasins. Thirty (30) samples will be collected by Terraqua at Entiat Status/Trend sites, and fifty-five (55) in the Methow (see Work Elements M: 157 Task 9.9 and Work Element O: 157 Task 9.11 for details regarding these sites). At the end of field sampling in fall 2010, Terraqua, Inc. will transport macroinvertebrate samples to Rhithron. Terraqua/Rhithron will provide identification of macroinvertebrates to the lowest practical levels consistent with the River Invertebrate Prediction and Classification System (RIVPACS; Hawkins et al. 2001) protocol, including midges and worms to genus or species using a 500-organism random subsample. Terraqua/Rhithron will deliver standardized metric calculations and will archive the identified fraction of the sample for one year.



Deliverable Specification: Per RIVPACS protocol (Hawkins et al. 2001), provide standardized metric calculations of Macroinvertebrates from up to eighty-five (30 in the Entiat and 55 in the Methow collected by Terraqua).

Quality controlled raw data and quality controlled summarized macroinvertebrate data with GPS locations, will be entered and stored in Microsoft Access databases known as Automated Template Modules (ATMs) if available or in an Excel spreadsheet. Data will be uploaded by June 30, 2011 to NOAA Fisheries using the ATM and notice will be provided to BPA and Terraqua, Inc. when the data has been uploaded. The contractor will be responsible for all quality assurance/quality control steps necessary to ensure that data is properly collected and entered into the ATM.

Reference: Hawkins, C., J. Ostermiller, M. Vinson, and J. Stevenson. 2001. Stream algae, invertebrate, and environmental sampling associated with biological water quality assessments: field protocols. Utah State University, Logan, UT. web link: <http://www.usu.edu/buglab/monitor/USUproto.pdf>

Planned Metrics:

* Primary R, M, and E Focal Area : Tributary Habitat
 * Primary R, M, and E Type : Status and Trend Monitoring

Primary Focal Species:

Chinook - Upper Columbia River Spring ESU | Steelhead - Upper Columbia River DPS

Country:

US

NPCC Subbasin: Multiple

State:

WA

HUC5 Watershed: Multiple

County:

Multiple

HUC6 Name: Multiple

Salmonid ESUs Present:

Upper Columbia River Spring-run Chinook Salmon ESU (accessible) | Upper Columbia River Steelhead DPS (accessible)

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	7/1/2010	6/30/2011	Completed	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. Samples collected	7/15/2010	9/30/2010	Completed	Terraqua will collect macroinvertebrate samples at up to eighty-five (30+55=85) sites in the Entiat and Methowsubbasins (see Tasks 9.9 and 9.11 for details regarding these sites).
C. Samples delivered to Rhithron Associates	9/30/2010	11/3/2010	Completed	At the end of field sampling in fall 2010, Terraqua, Inc. will transport macroinvertebrate samples collected by Terraqua and WDOE to Rhithron.
D. Data generated by Rhithron Associates and delivered to Terraqua/BPA	11/3/2010	4/30/2011	Active	Rhithron will provide identification of macroinvertebrates to the lowest practical levels consistent with RIVPACS protocol, including midges and worms to genus or species using a 500-organism random subsample. Rhithron will deliver standardized metric calculations and will archive the identified fraction of the sample for one year.
Deliverable: E. Macroinvertebrate Analysis		4/30/2011	Active	<i>See the Deliverable Specification above</i>

K: 157. Collect/Generate/Validate Field and Lab Data

Title: 9.7 Entiat IMW - Effectiveness - Habitat Monitoring

Description:

Terraqua will assist in the implementation of project effectiveness monitoring in the Entiat River under the ISEMP program. This work will include: monitoring of habitat/channel/riparian/macroinvertebrate conditions using ISEMP habitat protocols at fifty-six (56) restoration project control and treatment sites; coordination of the monitoring work conducted by USFWS, CCD, and Terraqua; and data synthesis, analysis, and storage.

Deliverable Specification:

Quality controlled raw data and quality controlled summarized habitat/channel/riparian/macroinvertebrate conditions data with GPS locations, will be entered and stored in Microsoft Access databases known as Automated Template Modules (ATMs) previously provided by NOAA Fisheries. Data will be uploaded by June 30, 2011 to NOAA Fisheries using the ATM and notice will be provided to BPA and Terraqua, Inc. when the data has been uploaded. The contractor will be responsible for all quality assurance/quality control steps necessary to ensure that data is properly collected and entered into the ATM.

Planned Metrics:

* Primary R, M, and E Focal Area : Tributary Habitat
 * Primary R, M, and E Type : Action Effectiveness Research

Primary Focal Species:

Chinook - Upper Columbia River Spring ESU | Steelhead - Upper Columbia River DPS

Country:

US

NPCC Subbasin: ENTIAT

State:

WA

HUC5 Watershed: ENTIAT RIVER

County:

CHELAN

HUC6 Name: ENTIAT RIVER/MUD CREEK

Salmonid ESUs Present:

Upper Columbia River Spring-run Chinook Salmon ESU (accessible) | Upper Columbia River Steelhead DPS (accessible)



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	7/1/2010	6/30/2011	Completed	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. Conduct habitat monitoring in the Entiat IMW project area.	7/1/2010	9/30/2010	Completed	Monitor channel/riparian/macrobenthic conditions using ISEMP habitat protocols at fifty-six (56) restoration project control and treatment sites in the Entiat IMW project area.
C. Data entry and summary	10/1/2010	3/31/2011	Active	Synthesize data, summarize data, and store data in data management system. Data summaries of from this task will be reported in a single report described in WE N.157 Task 9.11.
Deliverable: D. Final field data		6/30/2011	Active	<i>See the Deliverable Specification above</i>

L: 157. Collect/Generate/Validate Field and Lab Data

Title: 9.8a Entiat IMW - Effectiveness - Fish Monitoring

Description: Terraqua will assist the USFWS in the implementation of project effectiveness monitoring in the Entiat River under ISEMP's Entiat IMW program. This work will include: monitoring fish abundance, survival, and growth by capturing/sampling/tagging fish using ISEMP fish capture protocols at 14 restoration project control and treatment sites during the summer of 2010. Environmental compliance, field coordination, data entry, and storage will be performed by USFWS.

Deliverable Specification: Terraqua will provide up to 9 field crew personnel including as many as 4 crew leaders to participate with the USFWS in fish sampling at 14 restoration project control and treatment sites during the summer of 2010.

Data on juvenile abundance, growth and survival at treated and untreated reaches will be collected using a mark-recapture study requiring PIT tagging of spring Chinook and steelhead at 14 stratified randomly located sites in the Entiat and Mad Rivers. By pairing habitat and juvenile monitoring at the same sampling site under the Entiat IMW, we expect to provide information on the mechanisms by which habitat restoration structures influence habitat quality and on the mechanistic relationships between habitat and macroinvertebrate conditions and how these influence observed fish performance. Mark-recapture methods give a more precise and less biased estimate compared with traditional depletion estimates (Rosenburger and Dunham 2005). A site will be visited for two consecutive days to allow for equal capture probabilities per sample event. A variety of capture techniques will be used based on site conditions e.g., electrofishing, e-herding (using low voltage electroshocking to herd fish into a seine or dip nets. This reduces stress and possible mortality from electrofishing and has been used successfully in the John Day Basin and appears to have a lower level of mortality than traditional electroshocking (i.e., <1% mortality) and may be more feasible than traditional electrofishing in the low conductivity waters found in the Entiat River subbasin) snerding (snorkelers herd fish into nets) or seining. Captured fish will be anesthetized, tagged with 12 mm or 8 mm passive integrated transponder (PIT) tags, weighed and measured, revived and released near the site of capture following the PIT tagging protocol (Terraqua 2009). Fish sampling will occur during two time periods (July/August and February/March) throughout the year to get seasonal estimates of the above response variables. This will likely require sampling during higher flows and winter conditions, which will pose challenges. This information will provide the responses and potential covariates at the highest resolution of comparisons (treatment/temporary control areas) but can be rolled up to address larger area comparisons as well. Data collected under this deliverable will be entered and controlled for accuracy and quality by the proposer within data management tools provided by ISEMP and will be stored/archived for analysis in the STEM data bank.

Planned Metrics: * Primary R, M, and E Focal Area : Population Status

Primary Focal Species: * Primary R, M, and E Type : Action Effectiveness Research

Country: Chinook - Upper Columbia River Spring ESU | Steelhead - Upper Columbia River DPS

State: US **NPCC Subbasin:** ENTIAT

County: WA **HUC5 Watershed:** ENTIAT RIVER

Salmonid ESUs Present: CHELAN **HUC6 Name:** ENTIAT RIVER/MUD CREEK

Upper Columbia River Spring-run Chinook Salmon ESU (accessible) | Upper Columbia River Steelhead DPS (accessible)



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	7/1/2010	6/30/2011	Completed	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. Fish monitoring assistance (summer 2010)	7/1/2010	9/30/2010	Completed	Terraqua will provide up to 9 field crew personnel including as many as 4 crew leaders to participate with the USFWS in fish sampling at 56 restoration project control and treatment sites during the summer of 2010.
C. Fish monitoring assistance (winter 2011)	2/28/2011	3/31/2011	Inactive	Terraqua will provide up to 8 field crew personnel to participate with the USFWS in fish sampling at 56 restoration project control and treatment sites during the winter of 2011.
Deliverable: D. Fish monitoring assistance		9/30/2010	Completed	<i>See the Deliverable Specification above</i>

M: 157. Collect/Generate/Validate Field and Lab Data

Title: 9.9 Entiat IMW - Status/Trend - Habitat Monitoring (Fast Track)

Description: Terraqua will assist in the implementation of project effectiveness monitoring in the Entiat River under the ISEMP program. This work will include: monitoring of habitat/channel/riparian/macroinvertebrate conditions using ISEMP protocols at an annual panel of twenty-five (25) randomly located reference sites used for comparison of watershed status and trends with sites in the restoration project area. This work also includes data entry and storage.

Deliverable Specification: Quality controlled raw data and quality controlled summarized habitat data with GPS locations, will be entered and stored in Microsoft Access databases known at Automated Template Modules (ATMs) previously provided by NOAA Fisheries. Data will be uploaded by June 30, 2011 to NOAA Fisheries using the ATM and notice will be provided to BPA and Terraqua, Inc. when the data has been uploaded. The contractor will be responsible for all quality assurance/quality control steps necessary to ensure that data is properly collected and entered into the ATM.

Planned Metrics:
 * Primary R, M, and E Focal Area : Tributary Habitat
 * Primary R, M, and E Type : Status and Trend Monitoring

Primary Focal Species: Chinook - Upper Columbia River Spring ESU | Steelhead - Upper Columbia River DPS

Country: US **NPCC Subbasin:** ENTIAT

State: WA **HUC5 Watershed:** ENTIAT RIVER

County: CHELAN **HUC6 Name:** ENTIAT RIVER/MUD CREEK

Salmonid ESUs Present: Upper Columbia River Spring-run Chinook Salmon ESU (accessible) | Upper Columbia River Steelhead DPS (accessible)

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	7/1/2010	6/30/2011	Completed	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. Conduct habitat monitoring	7/1/2010	9/30/2010	Completed	Monitor channel/riparian/macroinvertebrate conditions using ISEMP habitat protocols at an annual panel of twenty-five (25) randomly located sites in the Entiat IMW project area.
C. Participate in annual training with WDOE	6/1/2011	6/30/2011	Active	Participate in up to 5 days of field training with WDOE habitat crews in advance of the 2009 field season. Included within this training will be any revisions to the field manual and may include training in any database advancements that may have occurred since spring of 2008.
D. Data entry and summary	10/1/2010	3/31/2011	Active	Synthesize data, summarize data, and store data in data management system. Data summaries from this task will be reported in a single report described in WE N.157 Task 9.11.
Deliverable: E. Final survey data		6/30/2011	Active	<i>See the Deliverable Specification above</i>

N: 157. Collect/Generate/Validate Field and Lab Data

Title: 9.10 Entiat IMW - Status/Trend - Fish Monitoring (Fast Track)

Description: Terraqua will assist in the implementation of project effectiveness monitoring in the Entiat River under the ISEMP program. This work will include: monitoring of fish abundance using ISEMP protocols at an annual panel of twenty-five (25) randomly located reference sites used for comparison of watershed status and trends with sites in the restoration project area. This work also includes data entry and storage.

Deliverable Specification: Quality controlled raw data and quality controlled summarized habitat data with GPS locations, will be entered and stored in Microsoft Access databases known at Automated Template Modules (ATMs) previously provided by NOAA Fisheries. Data will be uploaded by June 30, 2011 to NOAA Fisheries using the ATM and notice will be provided to BPA and Terraqua, Inc. when the data has been uploaded. The contractor will be responsible for all quality assurance/quality control steps necessary to ensure that data is properly collected and entered into the ATM.



Planned Metrics: * Primary R, M, and E Focal Area : Population Status
 * Primary R, M, and E Type : Status and Trend Monitoring
 * Secondary R, M, and E Type : Action Effectiveness Research

Primary Focal Species: Chinook - Upper Columbia River Spring ESU | Steelhead - Upper Columbia River DPS

Country: US **NPCC Subbasin:** ENTIAT

State: WA **HUC5 Watershed:** ENTIAT RIVER

County: CHELAN **HUC6 Name:** ENTIAT RIVER/MUD CREEK

Salmonid ESUs Present: Upper Columbia River Spring-run Chinook Salmon ESU (accessible) | Upper Columbia River Steelhead DPS (accessible)

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	7/1/2010	6/30/2011	Completed	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. Conduct fish monitoring at annual panel sites	7/1/2010	9/30/2010	Completed	Monitor fish abundance using ISEMP snorkeling protocols at an annual panel of twenty-five (25) randomly located sites in the Entiat River subbasin.
C. Data entry and summary	10/1/2010	5/31/2011	Active	Synthesize data, summarize data, and store data in data management system. Data summaries of from this task will be reported in a single report described in WE N.157 Task 9.11.
Deliverable: D. Final survey data		6/30/2011	Active	<i>See the Deliverable Specification above</i>

O: 157. Collect/Generate/Validate Field and Lab Data

Title: 9.11 Methow - Status/Trend - Habitat Monitoring (Fast Track)

Description: Terraqua will assist in the implementation of status and trend monitoring in the Methow River. This work will include: monitoring of habitat/channel/riparian/macroinvertebrate conditions using ISEMP protocols at an annual panel of fifty (50) randomly located sites within the subbasin and conduct repeat sampling at five (5) of these sites. This work includes data entry and storage, and preparation of a brief technical summary report that will include results from status and trend habitat and snorkeling work by Terraqua under this release.

Deliverable Specification: Submit in Microsoft Word format electronically

Quality controlled raw data and quality controlled summarized habitat/channel/riparian/macroinvertebrate conditions data with GPS locations, will be entered and stored in Microsoft Access databases known as Automated Template Modules (ATMs) previously provided by NOAA Fisheries. Data will be uploaded by June 30, 2011 to NOAA Fisheries using the ATM and notice will be provided to BPA and Terraqua, Inc. when the data has been uploaded. The contractor will be responsible for all quality assurance/quality control steps necessary to ensure that data is properly collected and entered into the ATM.

Planned Metrics: * Primary R, M, and E Focal Area : Tributary Habitat
 * Primary R, M, and E Type : Status and Trend Monitoring

Primary Focal Species: Chinook - Upper Columbia River Spring ESU | Steelhead - Upper Columbia River DPS

Country: US **NPCC Subbasin:** METHOW

State: WA **HUC5 Watershed:** MIDDLE METHOW RIVER

County: OKANOGAN **HUC6 Name:** LOWER MIDDLE METHOW RIVER

Salmonid ESUs Present: Upper Columbia River Spring-run Chinook Salmon ESU (accessible) | Upper Columbia River Steelhead DPS (accessible)



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	7/1/2010	6/30/2011	Completed	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. Conduct habitat monitoring in the Entiat IMW project area.	7/1/2010	9/30/2010	Completed	Monitor channel/riparian/macroinvertebrate conditions using ISEMP protocols at fifty (50) randomly-located status and trend sites (plus 5 sites to be repeat sampled) in the Methow subbasin.
C. Data entry and summary	10/1/2010	3/31/2011	Active	Synthesize data, summarize data, and store data in data management system.
D. First draft report	10/1/2010	3/31/2011	Active	Produce a draft field data summary report that will include results from ISEMP status and trend habitat and fish monitoring in the Methow and Entiat subbasins. This report will present status and trend data (collected under this work element and WE L. 157 Task 9.9 and WE M. 157 Task 9.10) and will briefly summarize these data in the context of the Upper Columbia Implementation Strategy goals and objectives for these two subbasins. This report will not include in-depth analysis of data as that will be accomplished by other ISEMP contractors at different scheduling under related contracts.
E. Final draft report	4/1/2011	6/30/2011	Active	Produce a final field data synthesis report that will include results from ISEMP status and trend habitat and fish monitoring in the Methow and Entiat subbasins. This report will present status and trend data (collected under this work element and WE L. 157 Task 9.9 and WE M. 157 Task 9.10) and will briefly summarize these data in the context of the Upper Columbia Implementation Strategy goals and objectives for these two subbasins. This report will not include in-depth analysis of data as that will be accomplished by other ISEMP contractors at different scheduling under related contracts.
Deliverable: F. Final field data and summary report		6/30/2011	Active	<i>See the Deliverable Specification above</i>

P: 162. Analyze/Interpret Data

Title: 9.12 Downstream Migrant Trapping Analysis



Description:

In FY09, we investigated fully three of the following five areas of scientific uncertainty, and partially investigated the remaining two areas. In FY10, we will complete investigations of the two remaining areas by running simulations that were not afforded under the FY09 budget and we will follow up with additional work in the third area that has come to light during work performed under the first release. Results from FY09 and FY10 work will be incorporated into one of the manuscripts described in WE E. 141 Task 9.2 ISEMP Program Reporting.

There are five areas of scientific uncertainty associated with downstream migrant trapping programs all of which call into question the validity of population estimates of outmigrating salmonids. Bonneville Power Administration and the co-managers of salmonid populations in the Columbia Basin rely heavily on these estimates of population abundance making the accuracy of these estimates of paramount importance to the management of salmonids in the Columbia Basin.

The five areas of scientific uncertainty include: 1) the relative performance of common statistical/ sampling designs; 2) the performance of common catch expansion methods; 3) the potential effect that daily variability in trap efficiencies has on abundance estimates; 4) the feasibility of using PIT tag-based abundance, survival and migrant timing estimates as an alternative to rotary screw trapping; and 5) exploring potential multivariate relationships for modeled trap efficiency methods.

This work element will investigate each of these areas of uncertainty and will produce recommendations on how to improve downstream migrant trapping programs to provide more defensible population abundance estimates. These five areas of uncertainty will be investigated in five steps. Our approach will be collaborative and will seek the participation of ISEMP partners involved in trapping programs in the Upper Columbia, Snake and John Day Rivers to have the broadest applicability. In addition, the results will be incorporated into the ISEMP Juvenile Trapping Protocol (2008) to provide recommendations to trapping programs on methods that may better meet assumptions with estimating abundance and improve precision of abundance estimates.

These five analysis steps were generated after the review of: Trapping programs throughout the Columbia River Basin (Tussing 2007); The Trinity River Trapping Program; The Implementation Strategy for the Wenatchee River Subbasin Monitoring (Nelle and Ward 2008); Recent trapping reports from the Wenatchee and Entiat River Basins; ISEMP Data Analysis Priorities for Fiscal Year 2008 (Beasley 2008); Recent research proposals for the use of PIT Tag Interrogation Systems (PTIS); The Field Manual of Scientific Protocols for Downstream, Migrant Trapping within the Upper Columbia River Monitoring Strategy (Tussing 2008); and discussions with ISEMP science staff and Upper Columbia River downstream migrant practitioners.

In Step 1, we will perform a series of comparisons on the relative performance of common statistical/ sampling designs to provide trapping programs with information that will help them maximize the precision of juvenile production estimates relative to river characteristics, migrant abundance, trap efficiencies, and effort (cost). In Step 2 we will build upon datasets and efforts from Step 1 and we will assess the performance of common catch expansion methods. In Step 3 we will explore the potential effect that daily variability in trap efficiencies has on abundance estimates. In Step 4 we will scope the feasibility of using PIT tag-based abundance, survival and migrant timing estimates as an alternative to rotary screw trapping; and in Step 5 we will address the Modeled Trap Efficiency approach by exploring potential multivariate relationships for modeled trap efficiency methods.

Deliverable Specification:

Figures, tables and text will be generated from the remaining tasks of this analysis to support the development of at least one of the three manuscripts to be developed under WE E. 141 Task 9.2 ISEMP Program Reporting.

This manuscript(s) will include, in addition to results from FY09, results from the following FY10 tasks:

1) Determination of the feasibility of replacing a network of rotary screw traps with PIT Tag interrogations systems (PTIS) in the Wenatchee and Entiat Rivers and alternative designs for status and trend monitoring of population abundance, survival and migrant timing and an informed project design for implementation to test its actual effectiveness. Comparisons will be made at the cost level of existing smolt trapping operations in terms of annually recurring labor and equipment costs. The abundance estimates using the PIT tag based design at a range of array detection efficiencies will be compared to the current trapping program results. PTIS related costs will be based upon recent in-river PIT tagging efforts and local expert opinion on the ability to effectively capture the desired numbers of fish in tributaries and mainstems.

2) Identification of methods to generate a more robust multivariate trap efficiency model from a single trapping season, e.g., where data exists for potential covariates from sources such as water quality/climate monitoring that is performed within watersheds, to increase the precision of abundance estimates and reduce the reliance on a number of untested assumptions.

3) Continued investigation of the potential effect that daily variability in trap efficiencies has on abundance estimates.

Planned Metrics:

- * Primary R, M, and E Focal Area : Tributary Habitat
- * Primary R, M, and E Type : Status and Trend Monitoring
- * Secondary R, M, and E Type : Action Effectiveness Research
- * Secondary R, M, and E Focal Area : Systemwide

Primary Focal Species:

Chinook - All Populations | Steelhead - All Populations



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Project Coordination	7/1/2010	6/30/2011	Active	Coordinate with ISEMP staff, trapping program partners, and biometrician on project design and establish performance measures.
B. Analyze the performance of sampling designs, catch-expansion methods, trap-efficiency variability	7/1/2010	3/30/2011	Active	Compare performance measures of sampling designs and related estimators, for two levels of effort using both migrant universes. Use previously established migrant universes to compare performance of multiple catch expansion methods and determine their overall effect on performance measures (e.g. population abundance estimates). Use previously established migrant universes and hypothesized daily variability in capture efficiencies to: 1) explore the performance of common abundance estimators; 2) determine if alternative release methods increase precision of performance measures.
C. Final reporting materials	9/30/2010	6/30/2011	Active	Prepare final reporting materials (figures, tables, and text) to support the development of a manuscript summarizing FY09 and FY10 ISEMP downstream migrant trapping analyses.
Deliverable: D. Downstream Migrant Trapping Analysis		6/30/2011	Active	<i>See the Deliverable Specification above</i>

Q: 119. Manage and Administer Projects

Title: 9.13a Project Management (Fast Track)
Description: Manage the project. Also covers administrative work in support of on-the-ground efforts and in support of BPA's programmatic requirements such as metric reporting, financial reporting (e.g., accruals), and development of an SOW package (includes draft SOW, budget, spending plan, and property inventory).
Deliverable Specification: Submit next year's SOW, Budget, and Property Inventory to the BPA COTR. The SOW should include location information (latitude and longitude) for those work elements that require it. If contractor or contractor's organization takes longer than 30 days to sign the contract, the contractor will need to send this funding package to BPA more than 90 days before the end of the current contract.

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Manage the project.	7/1/2010	6/30/2011	Active	Manage personnel allocation and workflow, accounting, and file management to insure that this release is properly carried out.
B. Accrual - Submit September estimate to BPA	8/15/2010	9/10/2010	Completed	Provide BPA with an estimate of contract work that will occur prior to September 30 but will not be billed until October 1 or later. Generally, this should be done by September 10.
C. Prepare FY08 SOW, budget, etc	3/1/2011	4/30/2011	Active	Provided funding is made available for additional work as defined under this current SOW, and additional protocol testing is required, submit a new SOW (via Pisces), budget, etc., no later than 90 days prior to the expiration of the current contract (i.e., June 30, 2010).
D. Funding Package - Conduct internal review (e.g., Supervisor or Interagency)	3/1/2011	4/30/2011	Active	If necessary, submit next year's SOW and Budget for internal contractor review before submitting to BPA. Assuming this review takes 30 days, start this milestone 120 days before the end of the current contract.
Deliverable: E. Funding Package - Submit draft to COTR		6/30/2011	Active	<i>See the Deliverable Specification above</i>

R: 189. Regional Coordination

Title: 9.14a NEW: Develop and Implement the CHaMP
Description: NEW WE: Develop and Implement CHaMP

The goal of this work element is to develop and implement a program designed to monitor a standard set of fish habitat monitoring metrics and indicators in select watersheds of the Columbia River basin. The CHaMP includes monitoring the status and trends of fish habitat for at least one population per major population group (MPG) as identified in the AA/NOAA/NPCC BiOp RM&E Recommendations Report (FCRPS AA 2010) : Hood River, Wind River, Toppenish, Klickitat, Fifteen Mile, Lower Mainstem JD, North Fork JD, Upper Mainstem JD, Middle Fork JD, South Fork JD, Umatilla, Upper Grande Ronde, Catherine Ck, Imnaha, Lolo Ck, Tucannon, Asotin, SF Salmon, Big Ck, Lemhi, Pahsimeroi, Yankee Fork, Wenatchee, Entiat, Methow, Okanogan.



Deliverable Specification: The Columbia Habitat Monitoring Program (CHaMP) was initially conceived in June 2010 with initial field work to begin in July 2011 with supporting prerequisite activities required in early 2011. This represents a very short window in which to develop a large, complex program that will span dozens of watersheds and agencies within the Columbia Basin. Program development and implementation will require protocol development and writing, budgeting and coordination of dozens of contract actions, study design and sample site evaluation, field season planning, outreach to many agencies and collaborators, and the coordination of several ISEMP/CHaMP contractors responsible for specific CHaMP deliverables.

Program development and implementation of a large program that will span the Columbia Basin will require coordination with dozens of agencies and co-managers at several levels including, at least, policy, middle management, and field levels. In this deliverable, a single part-time Program Coordinator, with support staff, will coordinate all program activities: 1) among ISEMP/CHaMP staff, 2) between ISEMP/CHaMP staff and program funders and cost share partners (e.g. BPA, PNAMP, NOAA Fisheries, etc.), 3) between ISEMP/CHaMP staff and policy makers with interests in program operations, design, and results (e.g. BPA, NOAA Fisheries, PNAMP, co-managers, and other federal/tribal/state agencies, etc.), 4) between ISEMP/CHaMP staff and contracting officers, environmental compliance officers, and others responsible for the execution of this work and work related to CHaMP, 5) between ISEMP/CHaMP staff and technical staff from other related programs such as PNAMP, ISTM, USFS/BLM, and state/tribal habitat monitoring programs such as those run by WDOE, and ODEQ, and 6) between ISEMP/CHaMP staff and biologists and field crews of collaborating agencies. Under this deliverable, the Program Coordinator will manage budgets and scopes of work to ensure that all CHaMP objectives and deliverables will be met. Particularly notable coordination milestones: each year, CHaMP will hold program-wide meetings (including relevant ISEMP and collaborating-agency staff) for pre-field season issues, post-field season issues and data analysis. CHaMP coordination will be performed by staff of Terraqua, Inc. (with Michael Ward as the Program Coordinator).

Provide a copy of written minutes from all CHaMP meetings attended.

Provide a monthly report of significant coordination issues.

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Submit RTT Meeting minutes	1/1/2011	6/30/2011	Inactive	For any CHaMP meetings attended, submit minutes to BPA COTR via email.
B. Monthly, telephonically update COTR of significant coordination issues	1/1/2011	6/28/2011	Inactive	Monthly, conduct a telephone update with the BPA COTR regarding significant coordination issues, or anything that could jeopardize the overall project.
Deliverable: C. Meeting minutes/development and implementation reports		6/30/2011	Inactive	<i>See the Deliverable Specification above</i>

Inadvertent Discovery Instructions

BPA is required by section 106 of the National Historic Preservation Act (NHPA) to consider the effects of its undertakings on historic properties (16 USC 470). Prior to approving the expenditure of funds or conducting a federal undertaking, BPA must follow the section 106 process as described at 36 CFR 800. Even though BPA has completed this process by the time an undertaking is implemented, if cultural materials are discovered during the implementation of a project, work within the immediate area must stop and the significance of the materials must be evaluated and adverse effects resolved before the project can continue (36 CFR 800.13(b)(3)). The Inadvertent Discovery of Cultural Resources Procedure form outlines the steps to be taken and notifications to be made. If the undertaking takes place on tribal lands (16 USC 470w), BPA must also “comply with applicable tribal regulations and procedures and obtain the concurrence of the Indian tribe on the proposed action” (36 CFR 800.13(d)).

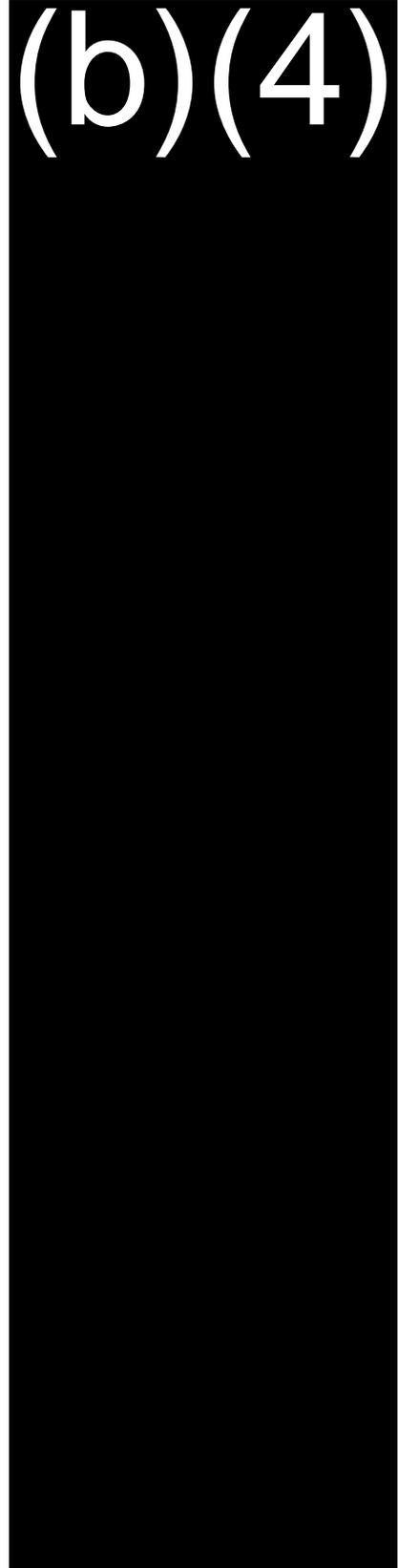
Inadvertent Discovery of Cultural Resources Procedure form:

<http://www.efw.bpa.gov/IntegratedFWP/InadvertentDiscoveryProcedure.pdf>

Terraqua, Inc.

Release #5, Master Agreement #27480
 BPA Project 2003-017-00: Integrated Monitoring Pilot
 July 1, 2010 through June 30, 2011
 Revision, CCR-22217

1	PERSONNEL SERVICES	Qty	Unit	Unit Cost	COST	Change	Amendment
					\$522,390	\$88,846	\$611,236
	<i>Administrative Scientist II, Michael Ward</i>						
Task 9.1	Coordination/QC	(b)(4)	hours @	(b)(4)			
Task 9.2	ISEMP Program Reporting		hours @				
Task 9.3	Wenatchee/Entiat Strategy Updates		hours @				
Task 9.5	Protocol Development		hours @				
Task 9.13	Proj. Mgt. and Reporting		hours @				
Task 9.14a	CHaMP coordination and development		hours @				
	<i>Administrative Scientist I, Nelle and Sloan</i>						
Task 9.1	Coordination/QC		hours @				
Task 9.2	ISEMP Program Reporting		hours @				
Task 9.3	Wenatchee/Entiat Strategy Updates		hours @				
Task 9.4	Pilot Subbasin Coord.		hours @				
Task 9.5	Protocol Development		hours @				
Task 9.6a	Macroinvertebrate Analysis		hours @				
Task 9.9	Entiat Status/Trend Habitat		hours @				
Task 9.11	Methow Status/Trend Habitat		hours @				
Task 9.13	Proj. Mgt. and Reporting		hours @				
	<i>Senior Scientist I, Tussing and Ward field</i>						
Task 9.1	Coordination/QC		hours @				
Task 9.5	Protocol Development		hours @				
Task 9.8	Entiat Effectiveness Fish		hours @				
Task 9.9	Entiat Status/Trend Habitat		hours @				
Task 9.10	Entiat Status/Trend Fish		hours @				
Task 9.11	Methow Status/Trend Habitat		hours @				
Task 9.12	Downstream Migrant Trapping Analysis		hours @				
	<i>Scientist I</i>						
Task 9.1	Coordination/QC		hours @				
Task 9.5	Protocol Development		hours @				
Task 9.6b	Macroinvertebrate Analysis		hours @				
Task 9.7	Entiat Effectiveness Habitat		hours @				
Task 9.8	Entiat Effectiveness Fish		hours @				
Task 9.9	Entiat Status/Trend Habitat		hours @				
Task 9.10	Entiat Status/Trend Fish		hours @				
Task 9.11	Methow Status/Trend Habitat		hours @				
	<i>Technican III</i>						
Task 9.7	Entiat Effectiveness Habitat		hours @				
Task 9.8	Entiat Effectiveness Fish		hours @				
Task 9.9	Entiat Status/Trend Habitat		hours @				
Task 9.10	Entiat Status/Trend Fish		hours @				
Task 9.11	Methow Status/Trend Habitat		hours @				
	<i>Technician II</i>						
Task 9.7	Entiat Effectiveness Habitat		hours @				
Task 9.8	Entiat Effectiveness Fish		hours @				
Task 9.9	Entiat Status/Trend Habitat		hours @				
Task 9.10	Entiat Status/Trend Fish		hours @				
Task 9.11	Methow Status/Trend Habitat		hours @				
	<i>Technican I</i>						
Task 9.7	Entiat Effectiveness Habitat		hours @				
Task 9.8	Entiat Effectiveness Fish		hours @				
Task 9.9	Entiat Status/Trend Habitat		hours @				
Task 9.10	Entiat Status/Trend Fish		hours @				



Task 9.11 Methow Status/Trend Habitat (b)(4) hours @ (b)(4) /hour (b)(4) (b)(4)

2 Travel \$61,093 \$0 \$61,093

Task 9.1 Airfare (b)(4) EAT to Portland, OR or other loc. in OR/W RT @ (b)(4) /RT
Task 9.2 Wenatchee to Portland, OR or other loc. ii RT @ (b)(4) /RT
Task 9.4 EAT to Portland, OR or other loc.in OR/W RT @ (b)(4) /RT
Task 9.5 Redding, CA to Portland, OR or other loc. In RT @ (b)(4) /RT
Task 9.8 Redding, CA to Wenatchee, WA RT @ (b)(4) /RT
Task 9.12 Redding, CA to Seattle, WA or other loc. I RT @ (b)(4) /RT

Task 9.1 Rental car and parking SEA or PDX (NOAA/BPA) RT @ (b)(4) /RT
Task 9.2 Portland, OR or other loc.in OR/WA/ID RT @ (b)(4) /RT
Task 9.4 Portland, OR or other loc.in OR/WA/ID RT @ (b)(4) /RT
Task 9.5 Portland, OR or other loc.in OR/WA/ID RT @ (b)(4) /RT
Task 9.12 Redding, CA toSeattle, WA or other loc. Ir RT @ (b)(4) /RT

Task 9.1 Per Diem (Lodging plus M&IE) Portland, OR (b)(4) day/night @ (b)(4) /day
Task 9.1 Seattle, WA (b)(4) day/night @ (b)(4) /day
Task 9.2 Portland, OR or other loc.in OR/WA/ID (b)(4) day/night @ (b)(4) /day
Task 9.2 Other loc.in OR/WA/ID (b)(4) day/night @ (b)(4) /day
Task 9.4 Portland, OR or other loc.in OR/WA/ID (b)(4) day/night @ (b)(4) /day
Task 9.4 Other loc.in OR/WA/ID (b)(4) day/night @ (b)(4) /day
Task 9.5 Leavenworth, WA (b)(4) day/night @ (b)(4) /day
Task 9.5 Portland, OR or other loc.in OR/WA/ID (b)(4) day/night @ (b)(4) /day
Task 9.6b Missoula, MT (b)(4) day/night @ (b)(4) /day
Task 9.7 Washington Cities (b)(4) day/night @ (b)(4) /day
Task 9.7 Washington Cities (M&IE only) (b)(4) day/night @ (b)(4) /day
Task 9.8 Washington Cities (b)(4) day/night @ (b)(4) /day
Task 9.8 Washington Cities (M&IE only) (b)(4) day/night @ (b)(4) /day
Task 9.9 Washington Cities (b)(4) day/night @ (b)(4) /day
Task 9.9 Washington Cities (M&IE only) (b)(4) day/night @ (b)(4) /day
Task 9.10 Washington Cities (b)(4) day/night @ (b)(4) /day
Task 9.10 Washington Cities (M&IE only) (b)(4) day/night @ (b)(4) /day
Task 9.11 Washington Cities (b)(4) day/night @ (b)(4) /day
Task 9.11 Washington Cities (M&IE only) (b)(4) day/night @ (b)(4) /day
Task 9.12 Seattle, WA (b)(4) day/night @ (b)(4) /day

Field Trailer Rental (in lieu of approx. 466 nights of lodging)
split 1/2 among Rental trailer (Entiat) (b)(4) months @ (b)(4) /month (b)(4) (b)(4)
Task 9.11 Rental trailer (Methow) (b)(4) months @ (b)(4) /month (b)(4) (b)(4)

Task 9.1 POV Mileage to/from Wenatchee from Peshastin, WA (b)(4) trip @ (b)(4) mi/trip
Task 9.1 Entiat, Wa. from Peshastin, WA (b)(4) trip @ (b)(4) mi/trip
Task 9.1 Entiat, Wa. from Riverside, WA (b)(4) trip @ (b)(4) mi/trip
Task 9.2 Wenachee, WA from Wauconda, WA (b)(4) trip @ (b)(4) mi/trip
Task 9.4 EAT from Peshastin, WA (b)(4) trip @ (b)(4) mi/trip
Task 9.5 Leavenworth, WA from Riverside, WA (b)(4) trip @ (b)(4) mi/trip
Task 9.5 Red Bluff, CA to Redding, CA (b)(4) trip @ (b)(4) mi/trip
Task 9.6b Missoula, MT from Riverside, WA (b)(4) trip @ (b)(4) mi/trip
Task 9.6a Wenatchee from Riverside, WA (b)(4) trip @ (b)(4) mi/trip
Task 9.7 RT to/among sites in Entiat Subbasin from Riverside (b)(4) @ (b)(4) miles
Task 9.8 RT to/among sites in Wen/Entiat Subbasin from Riverside (b)(4) @ (b)(4) miles
Task 9.9 RT to/among sites in Wenatchee Subbasin from Riverside (b)(4) @ (b)(4) miles
Task 9.10 RT to/among sites in Wenatchee Subbasin from Riverside (b)(4) @ (b)(4) miles
Task 9.11 RT to/among sites in Wenatchee Subbasin from Riverside (b)(4) @ (b)(4) miles
Task 9.12 Red Bluff, CA to Redding, CA (b)(4) trip @ (b)(4) mi/trip

3 Standard Daily Field Equipment Rate \$25,110 \$0 \$25,110

Task 9.7 Field Days (b)(4) days @ (b)(4) /day
Task 9.8 Field Days (b)(4) days @ (b)(4) /day
Task 9.9 Field Days (b)(4) days @ (b)(4) /day

(b)(4)

(b)(4)

(b)(4)

(b)(4)

Task 9.10	Field Days	(b)(4)	days @	(b)(4)	/day	(b)(4)	(b)(4)
Task 9.11	Field Days	(b)(4)	days @	(b)(4)	/day	(b)(4)	(b)(4)

4 SUPPLIES

	Qty	Unit	Unit Cost	\$21,808 COST	\$0	\$21,808
split 1/3 9.7, 9.9 Field Paper for data sheets	(b)(4)	ream @	(b)(4)/ream	(b)(4)		
split 1/3 9.7, 9.9 Measuring Tape (50m)	(b)(4)	each @	(b)(4)/each			
split 1/3 9.7, 9.9 Measuring Tape refill (100m)	(b)(4)	each @	(b)(4)/each			
split 1/3 9.7, 9.9 Hand Level	(b)(4)	each @	(b)(4)/each			
split 1/3 9.7, 9.9 Binders	(b)(4)	each @	(b)(4)/each			
split 1/3 9.7, 9.9 Note paper refills	(b)(4)	each @	(b)(4)/each			
split 1/3 9.7, 9.9 Notebooks	(b)(4)	each @	(b)(4)/each			
split 1/3 9.7, 9.9 Densimeter (convex)	(b)(4)	each @	(b)(4)/each			
split 1/3 9.7, 9.9 Macroinvertebrate containers	(b)(4)	case @	(b)(4)/case			
split 1/3 9.7, 9.9 Surveyor Rod	(b)(4)	each @	(b)(4)/each			
split 1/3 9.7, 9.9 Denatured alcohol	(b)(4)	gal. @	(b)(4)/gal			
split 1/3 9.7, 9.9 Kicknet	(b)(4)	each @	(b)(4)/each			
split 1/3 9.7, 9.9 Miscellaneous	(b)(4)					
Task 9.4 Conference fees	(b)(4)	conf @	(b)(4)/conf			
split 1/2 9.8, 9.9 Drysuits	(b)(4)	each @	(b)(4)/each			
Task 9.8 Misc snorkel equipment (fleece suits, replace masks, gloves, hoods, snorkel etc.)	(b)(4)					
split 1/3 9.7, 9.9 Temperature data loggers	(b)(4)	each @	(b)(4)/each			
split 1/3 9.7, 9.9 Data logger - repair old hand held	(b)(4)	each @	(b)(4)/each			
split 1/3 9.7, 9.9 Solar Pathfinder	(b)(4)	each @	(b)(4)/each			
split 1/3 9.7, 9.9 Flow meters	(b)(4)	each @	(b)(4)/each			
split 1/3 9.7, 9.9 Drift nets accessories	(b)(4)	each @	(b)(4)/each			
split 1/3 9.7, 9.9 Alkalinity test kits	(b)(4)	each @	(b)(4)/each			
split 1/3 9.7, 9.9 Conductivity Meters	(b)(4)	each @	(b)(4)/each			
split 1/2 9.8, 9.9 Electrofishing Unit	(b)(4)	each @	(b)(4)/each			
split 1/2 9.8, 9.9 Electrofishing gear - electrode	(b)(4)	each @	(b)(4)/each			
split 1/2 9.8, 9.9 Electrofishing gear - ring and pack	(b)(4)	each @	(b)(4)/each			
split 1/2 9.8, 9.9 Electrofishing gear - battery and wiring	(b)(4)	each @	(b)(4)/each			
split 1/2 9.8, 9.9 Seine net	(b)(4)	each @	(b)(4)/each			
Task 9.2 Printing Costs	(b)(4)					

5 SUBCONTRACTS

				\$99,334	\$0	\$99,334
Task 9.6a	Rhithron Associate, Inc. lab fees	(b)(4)	samples @	(b)(4)/sample	(b)(4)	(b)(4)
Task 9.6b	Rhithron Associate, Inc. lab fees	(b)(4)	samples @	(b)(4)/sample	(b)(4)	(b)(4)
Task 9.12	ESSA, Inc.	(b)(4)	hours @	(b)(4)/hour	(b)(4)	(b)(4)
Task 9.11	Landowner Outreach/WRS, Inc.	(b)(4)	season @	(b)(4)	(b)(4)	(b)(4)
Task 9.11	Coordination/Methow Monitoring Coord	(b)(4)	season @	(b)(4)	(b)(4)	(b)(4)
Task 9.11	Data Administration	(b)(4)	season @	(b)(4)	(b)(4)	(b)(4)

6 Administrative Expense (10% of dir. exp. excl. travel)

				\$12,114	\$0	\$12,114
Task 9.6a	Rhithron Associate, Inc. lab fees	(b)(4)	samples @	(b)(4)/sample	(b)(4)	
Task 9.6b	Rhithron Associate, Inc. lab fees	(b)(4)	samples @	(b)(4)/sample		
Task 9.12	ESSA, Inc.	(b)(4)	hours @	(b)(4)/hour		
Task 9.11	Landowner Outreach/WRS, Inc.	(b)(4)	season @	(b)(4)		
Task 9.11	Coordination/Methow Monitoring Coord	(b)(4)	season @	(b)(4)		
Task 9.11	Data Administration	(b)(4)	season @	(b)(4)		
split 1/5 all field Supplies						

7 BUDGET TOTAL

\$741,848 \$88,846 \$830,694

UNITED STATES
GOVERNMENT

RELEASE

BONNEVILLE
POWER ADMINISTRATION

Mail Invoice To:

fwinvoices@bpa.gov
F & W Invoices - KEWB-4
P. O. Box 3621
Portland OR 97208-3621

Contract : 00027480
Release : 00006
Page : 1

Vendor:
TERRAQUA INC
PO BOX 85
WAUCONDA WA 98859

Please Direct Inquiries to:

KRISTI J. VAN LEUVEN
Title: CONTRACT SPECIALIST
Phone: 503-230-3605
Fax : 503-230-4508

Attn: MICHAEL B WARD

Contract Title: 2003-017-00 EXP ISEMP-TERRAQUA-COORDINATION FOR WENATCHEE- ENT R

Performance Period: 09/01/11 - 06/30/12

Contractor Signature

Printed Name/Title

Date Signed

Kristi VanLeuven

BPA Contracting Officer

2/1/12
Date Signed

Contract Modifications

Title : \$0 CLOSE

Modification: 001

Modified Performance Period: -

UNITED STATES
GOVERNMENT

RELEASE

BONNEVILLE
POWER ADMINISTRATION

Mail Invoice To:

fwinvoices@bpa.gov
F & W Invoices - KEWB-4
P. O. Box 3621
Portland OR 97208-3621

Contract : 00027480
Release : 00006
Page : 1

Vendor:

TERRAQUA INC
PO BOX 85
WAUCONDA WA 98859

Please Direct Inquiries to:

KRISTI J. VAN LEUVEN
Title: CONTRACT SPECIALIST
Phone: 503-230-3605
Fax : 503-230-4508

Attn: MICHAEL B WARD

Contract Title: 2003-017-00 EXP ISEMP-TERRAQUA-COORDINATION FOR WENATCHEE- ENT R

Performance Period: 09/01/11 - 06/30/12

Michael B. Ward

Kristi VanLeuven

Contractor Signature
Michael B. Ward, President, Terraqua, Inc.

BPA Contracting Officer

9/21/2011

Printed Name/Title

Date Signed

9/22/11

Date Signed



**Contract 27480
Release 006**

**Terraqua, INC.
Project Number 2003-017-00
ISEMP- TERRAQUA-COORDINATION FOR WENATCHEE-ENT R**

**BPA TECHNICAL POINT OF CONTACT (COTR): DAVID BYRNES (503) 230-3171
BPA CONTRACTING OFFICER: KRISTI VAN LEUVEN (503) 230-3605**

This release includes the following documents:

1. Face page
2. This page 2
3. Statement of Work
4. Budget
5. Property Inventory

This release is being added to current contract 27480 and authorizes the following:

- 1.) Contractor shall provide all supplies/services necessary to perform the work as outlined in the attached Statement of Work.
- 2.) This Release allocates funds for time and materials in the amount of \$680,318.00 to Terraqua, Inc.
- 3.) **All Terms and Conditions for the Master Agreement shall apply.**

Please email invoices to fwinvoices@bpa.gov. All invoices should be submitted in PDF format. Please put the following information in the email subject line: entity/contract number/invoice performance period/invoice #invoice amt. when mailing future invoices. A separate email is required for each invoice.

While email is preferred, contractors may mail invoices with above contract # to:

Bonneville Power Administration
Attn: **Fish & Wildlife Invoices / KEWB-4**
PO Box 3621
Portland, OR 97208-3621
fwinvoices@bpa.gov



Statement of Work Report

Project Title: Integrated Status and Effectiveness Monitoring Program (ISEMP)
Project #: 2003-017-00
Contract Title: 2003-017-00 EXP ISEMP-TERRAQUA-COORDINATION FOR WENATCHEE- ENT R
Contract #:
Province: Non-Provincial **Subbasin:** Basinwide
Workorder ID: 129074 **Task ID:** 1
Perf. Period Budget: \$680,318 **Perf. Period:** 9/1/2011 - 6/30/2012
Contract Type: Request **Pricing Type:** Cost Reimbursement (CNF)
Contractor(s): Terraqua, Inc. (Prime - TERRAQUA00)
BPA Internal Ref: CR-184028
SOW Validation: Last validated 09/13/2011 with 0 problems, and 0 reviewable items
Contract Documents: [Property Inventory \(09/13/2011\)](#) FY11 Terraqua Property Inventory
 [Budget - Contract \(09/15/2011\)](#) LIB for TQ ISEMP FY11

Contacts:

Name	Role	Organization	Phone/Fax	Email	Address
David Byrnes	COTR	Bonneville Power Administration	(503) 230-3171 / (503) 230-3049	dmbyrnes@bpa.gov	Bonneville Power Administration Fish and Wildlife Program 905 NE 11th Ave. (97232) PO Box 3621 Portland OR 97208-3621
Kristi Van Leuven	Contracting Officer	Bonneville Power Administration	(503) 230-3605 / NA	kjyleuven@bpa.gov	P.O. Box 3621 Mailstop - NSSP-4 Portland, OR 97208-3621
Chris Jordan	Supervisor	National Oceanic and Atmospheric Administration (NOAA)	(541) 754-4629 / NA	chris.jordan@noaa.gov	2725 Montlake Blvd. East Seattle WA 98112-2097
Christopher A. Beasley	Interested Party	Quantitative Consultants Inc	(360) 620-2883 / NA	chris@qcinc.org	180 Bay Run Newport NC 28570
Mike Ward	Contract Manager	Terraqua, Inc.	(509) 486-2426 / (509) 486-2423	wardski@wildblue.net	P.O. Box 85 Wauconda WA 98859-
Pamela Nelle	Technical Contact	Terraqua, Inc.	(509) 885-9046 / NA	pamela.nelle@nwi.net	PO Box 404 Peshastin WA 98847
Jody White	Interested Party	Quantitative Consultants Inc	(208) 860-5269 / NA	jody@qcinc.org	P.O. Box 8263 Boise ID 83707
Carol Volk	Interested Party	Volk Consulting	(206) 240-0301 / NA	volkconsulting@gmail.com	
Israel Duran	Env. Compliance Lead	Bonneville Power Administration	(503) 230-3967 3308 / NA	induran@bpa.gov	P.O. Box 3621 Mailstop - KEC-4 Portland, OR 97208-3967
Paul Krueger	F&W Approver	Bonneville Power Administration	(503) 230-5723 / NA	pjkrueger@bpa.gov	905 NE 11th Ave. Portland OR 97232

**Work Element Table of Contents:**

<u>Work Element - Work Element Title</u>	<u>EC Needed*</u>	<u>Estimate</u>	<u>(%)</u>
A : 185. Produce Pisces Status Report - Periodic Status Reports for BPA		\$0	(0%)
B : 189. Coordination-Columbia Basinwide - 11.1 ISEMP Wenatchee/Entiat/Methow Coordination		\$59,842	(9 %)
C : 158. Mark/Tag Animals - 11.10 PIT tagging juvenile salmon and steelhead for UC status and trend monitoring	*	\$138,905	(20 %)
D : 162. Analyze/Interpret Data - 11.12 Downstream Migrant Trapping Analysis		\$35,394	(5 %)
E : 119. Manage and Administer Projects - 11.13a Project Management (Fast Track)		\$5,584	(1 %)
F : 165. Produce Environmental Compliance Documentation - 11.13b Environmental Compliance (Fast Track)		\$0	(0%)
G : 132. Produce (Annual) Progress Report - 11.13d Produce Annual Progress Report for the period Sept 2011 to June 2012(Fast Track)		\$0	(0%)
H : 141. Produce Other Report - 11.2 ISEMP Program Synthesis Report 2003-2010		\$21,812	(3 %)
I : 174. Produce Plan - 11.3 Wenatchee/Entiat Strategy Updates and Implementation Tracking		\$3,776	(1 %)
J : 189. Coordination-Columbia Basinwide - 11.4 ISEMP Pilot Subbasin Coordination		\$21,549	(3 %)
K : 174. Produce Plan - 11.5 Protocol Development		\$3,238	(0 %)
L : 157. Collect/Generate/Validate Field and Lab Data - 11.6 Macroinvertebrate Analysis	*	\$13,419	(2 %)
M : 157. Collect/Generate/Validate Field and Lab Data - 11.7 Entiat IMW - Effectiveness - Habitat Monitoring	*	\$109,151	(16 %)
N : 158. Mark/Tag Animals - 11.8 PIT tag juveniles as part of the Entiat IMW	*	\$101,944	(15 %)
O : 157. Collect/Generate/Validate Field and Lab Data - 11.9 Fish Habitat Status and Trend Monitoring in three subbasins	*	\$165,704	(24 %)
	Total:	\$680,318	

* Environmental Compliance (EC) needed before work begins.

Contract Description:

This contract is for a 10 month period, from September 1, 2011 through June 30, 2012. This will re-establish the timeline of contract renewal for Terraqua to the renewal data of July1 that has been in place since 2004, a renewal data that allows for a contract to be in place before the start of the field season. All contract periods hereafter will be 12 months.

This contract contains work elements that are funded under the "Fast Track" budget, including: Tasks 11.6b, 11.9, 11.10, 11.11, and 11.13.

Contract Description (NEW Eff 10-20-10 DB/CJ): The Integrated Status and Effectiveness Monitoring Program (ISEMP, 2003-017-00) is an ongoing collaborative effort to design, test, implement and evaluate Status and Trends



Monitoring for salmon and steelhead populations and their habitat, and watershed-scale Effectiveness Monitoring for management actions impacting salmon and steelhead populations and habitat in the Interior Columbia River Basin.

ISEMP explicitly addresses work requirements of many 2008 FCRPS Biological Opinion RPAs (56.1, 56.2, 56.3, 57.1, 57.2, 57.3, 57.4, 57.5) and is directly related to additional 2008 FCRPS Biological Opinion implementation strategy requirements and recommendations. ISEMP takes a pilot-project approach to the research and development of monitoring by implementing experimental programs in several major subbasins of the Interior Columbia: the Wenatchee, Entiat, Methow, John Day, South Fork Salmon and Lemhi River basins. The overall goal of the project is to provide regional salmon management agencies with the data, information and tools necessary to design efficient and effective monitoring programs.

Specifically, ISEMP generates quantitative guidance on and examples of: the robustness and limitations of population and habitat monitoring protocols, indicators and metrics; sampling design approaches for the distribution of monitoring effort in time and space; analytical approaches to the evaluation of monitoring data, information and programs; effective data management and communication designs that support the use, standardization and compilation of implementation, compliance, status, trends and effectiveness monitoring data by regional data generators and decision makers; and finally the design and implementation of watershed-scale restoration actions to maximize both the biological impact and associated learning opportunities resulting from the design and implementation strategy.

Through its work to date, ISEMP has developed expertise in the coordination and implementation of large-scale monitoring data collection programs. Applying this experience, ISEMP coordinates the installation, maintenance and calibration of in-stream PIT tag arrays across the Snake River basin and is designing and coordinating the implementation of a Columbia River basin-wide stream habitat status and trends monitoring. These programmatic implementation facets of ISEMP leverage previous experience with logistics and social factors to effectively implement comprehensive, standardized monitoring research and development at an unprecedented scale.

This contract is one of several contracts that will implement this project.

The final report for this contract will contain data that will 1) be submitted to NOAA Fisheries (also a contractor under this project) for use in a project level integrated Annual Report and 2) be submitted to BPA as a contract final report according to the terms of this contract. Terraqua's role has been, and continues to be, to enable the Bonneville Power Administration to continue to implement Project #2003-017-00 in the Wenatchee and Entiat and other pilot subbasins. Objectives of this work have been, and continue to be:

In 2011,

- Coordinate contract development between Bonneville and entities participating in implementation of the ISEMP program in the Wenatchee/Entiat and other pilot subbasins.
- Coordinate contract implementation between Bonneville and entities participating in the ISEMP program in the Wenatchee/Entiat and other pilot subbasins to ensure that implementation activities meet the purpose and needs of the ISEMP program.
- Implement selected monitoring and analysis activities.
- Analyze and report results related to the implementation of monitoring activities.

Statement of Work Report



Work Element Details

A: 185. Produce Pisces Status Report

Title: Periodic Status Reports for BPA
Description: The Contractor shall report on the status of milestones and deliverables in Pisces. Reports shall be completed either monthly or quarterly as determined by the BPA COTR. Additionally, when indicating a deliverable milestone as COMPLETE, the contractor shall provide metrics and the final location (latitude and longitude) prior to submitting the report to the BPA COTR.
Deliverable Specification:

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Sep 2011 (9/1/2011 - 9/30/2011)	10/1/2011	10/7/2011	Inactive	
B. Oct 2011 (10/1/2011 - 10/31/2011)	11/1/2011	11/7/2011	Inactive	
C. Nov 2011 (11/1/2011 - 11/30/2011)	12/1/2011	12/7/2011	Inactive	
D. Dec 2011 (12/1/2011 - 12/31/2011)	1/1/2012	1/7/2012	Inactive	
E. Jan 2012 (1/1/2012 - 1/31/2012)	2/1/2012	2/7/2012	Inactive	
F. Feb 2012 (2/1/2012 - 2/29/2012)	3/1/2012	3/7/2012	Inactive	
G. Mar 2012 (3/1/2012 - 3/31/2012)	4/1/2012	4/7/2012	Inactive	
H. Apr 2012 (4/1/2012 - 4/30/2012)	5/1/2012	5/7/2012	Inactive	
I. May 2012 (5/1/2012 - 5/31/2012)	6/1/2012	6/7/2012	Inactive	
J. Final Jun 2012 (6/1/2012 - 6/30/2012)	6/24/2012	6/30/2012	Inactive	

B: 189. Coordination-Columbia Basinwide

Title: 11.1 ISEMP Wenatchee/Entiat/Methow Coordination
Description: Terraqua will represent the interests of the ISEMP at meetings of the RTT, the Entiat Watershed Planning Unit, and will coordinate electronically and in-person with the following entities that may be involved in this Program: RTT, EWPU, U.S. Forest Service (USFS), Methow River Salmon Restoration Council, Chelan PUD, Yakama Nation, NOAA-Fisheries, BPA, U.S. Bureau of Reclamation, Chelan County, Cascadia Conservation District, the mid-Columbia PUD's HCP Hatchery Committee, and other parties as necessary.
Terraqua will coordinate ISEMP contractors to help ensure that contractors SOWs and deliverables meet ISEMP needs and that contractor budgets stay within the overall ISEMP budget and other available funds. Terraqua will also coordinate the analysis and reporting of ISEMP products with Quantitative Consultants, NOAA, and other program analysts.
Deliverable Specification: Attend up to ten(10) monthly Oversight Committee meetings to be held as part of regularly scheduled RTT meetings, attend up to four quarterly meetings of the EWPU and/or up to 10 monthly EWPU Habitat Subcommittee meetings from September 2011 through June 2012. Attend up to two (2) meetings with BPA or NOAA at locations in Washington, Oregon, or Idaho from September 2011 through June 2012.
Provide a copy of written minutes from all RTT and EWPU meetings attended.
Provide a monthly report of significant coordination issues.

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Submit RTT Meeting minutes	9/1/2011	6/30/2012	Inactive	For any RTT meetings attended, submit minutes to BPA COTR via email.
B. Monthly, telephonically update COTR of significant coordination issues	9/1/2011	6/28/2012	Inactive	Monthly, conduct a telephone update with the BPA COTR regarding significant coordination issues, or anything that could jeopardize the overall project.
Deliverable: C. Meeting minutes / Coordination reports		6/30/2012	Inactive	See the Deliverable Specification above



C: 158. Mark/Tag Animals

Title: 11.10 PIT tagging juvenile salmon and steelhead for UC status and trend monitoring

Description: From 2004 through 2010 ISEMP used snorkel surveys to generate abundance indices, which have proved useful but limited in the types of biological data that can be collected. Beginning in 2011 status and trend monitoring for fish populations in the Upper Columbia will use a new protocol based on a fish monitoring protocol designed by the U.S. Fish and Wildlife Service and ISEMP for monitoring fish abundance, survival, and growth by capturing/sampling/tagging fish in the Entiat Intensively Monitored Watershed. This will bring the Upper Columbia in line with the fish monitoring protocols in the John Day and Salmon subbasins and the effectiveness monitoring in the Entiat IMW, and allows for better exploration of fish/habitat relationships.

Deliverable Specification: This work element provides for Terraqua to provide two (2) crew members to lead a multi-agency crew to conduct fish monitoring under the ISEMP's status and trend monitoring study in the Wenatchee and Entiat River subbasins. This work also includes data entry and storage. Terraqua will be part of two, four-person crews tagging juvenile anadromous salmonids using Passive Integrated Transponder (PIT) tags at 50 sites in the Wenatchee and Entiat River subbasins as part of ISEMP status and trend monitoring.

Planned Metrics:

- * Primary R, M, and E Focal Area : Population Status
- * Primary R, M, and E Type : Status and Trend Monitoring
- * Secondary R, M, and E Type : Action Effectiveness Research

Primary Focal Species: Chinook - Upper Columbia River Spring ESU | Steelhead - Upper Columbia River DPS

Country: US **NPCC Subbasin:** Multiple

State: WA **HUC5 Watershed:** Multiple

County: CHELAN **HUC6 Name:**

Salmonid ESUs Present: Upper Columbia River Spring-run Chinook Salmon ESU (accessible) | Upper Columbia River Steelhead DPS (accessible)

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	9/1/2011	9/1/2011	Completed	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. Lead fish monitoring at 50 status and trend sites	9/1/2011	9/30/2011	Inactive	Terraqua will provide 2 personnel to lead fish monitoring at up to 50 status and trend sites in the Wenatchee (25 sites) and Entiat (25) Rivers subbasins following a status and trend fish monitoring protocol (under development by ISEMP).
C. Tag juvenile salmon and steelhead	9/1/2011	9/30/2011	Inactive	Terraqua will be part of two, four-person crews tagging juvenile salmon and steelhead as part of the ISEMP fish status and trend monitoring in the Wenatchee (25 sites) and Entiat (up to 25 sites) River subbasins.
D. Data entry and summary	10/1/2011	5/31/2012	Inactive	Synthesize data, summarize data, and store data in data management system. Data summaries of from this task will be reported in a single report described in Task 11.13.
Deliverable: E. Fish monitoring data from 50 status and trend sites		9/30/2011	Inactive	<i>See the Deliverable Specification above</i>

D: 162. Analyze/Interpret Data

Title: 11.12 Downstream Migrant Trapping Analysis

Description: The Terraqua downstream migrant trapping analysis has explored several areas of uncertainty that confront downstream migrant trapping programs within the Columbia Basin. In FY 09-10 and FY 10-11, efforts focused on comparing the relative performance of abundance estimation methods (including multivariate models), identifying the effects of daily variability in trap efficiencies on abundance estimates, and comparing catch expansions for trap downtimes. In FY 10-11, Terraqua re-prioritized downstream migrant trapping analysis efforts based upon the results of analyses to date and feedback from ISEMP science staff, and focused efforts on analyses with high publication potential. Terraqua compiled several previous analyses into a single draft manuscript comparing the performance of downstream migrant abundance estimation methods and explored refined analyses for catch expansions and modeled trap efficiency approaches.

Deliverable Specification: FY 11-12 work element will generate manuscripts for those two refined analyses that have the potential to improve the cost effectiveness of downstream migrant trapping programs: 1. Expanding the previous catch expansion analysis to incorporate the intentional use of trap downtimes in an effort to reduce trapping effort/costs; and 2. The use of multi-year trap efficiency data to generate modeled trap efficiency relationships within a given year, thereby reducing trap efficiency trial effort. As our previous analyses demonstrate that generic abundance estimation designs can perform poorly when applied to field conditions, these proposed analyses can provide the means to save effort/cost during periods when migrants are easily estimated to enable the application of greater effort during periods where estimators perform poorly.

Planned Metrics:

- * Primary R, M, and E Focal Area : Tributary Habitat
- * Primary R, M, and E Type : Status and Trend Monitoring
- * Secondary R, M, and E Type : Uncertainties Research



Milestone Title	Start Date	End Date	Status	Milestone Description
Deliverable: A. Environmental Compliance supporting documentation		6/30/2012	Inactive	See the Deliverable Specification above

G: 132. Produce (Annual) Progress Report

Title: 11.13d Produce Annual Progress Report for the period Sept 2011 to June 2012(Fast Track)

Description: The annual report summarizes the project goal, objectives, hypotheses, completed and uncompleted deliverables, problems encountered, lessons learned, and long-term planning. Examples of long-term planning include future improvements, new directions, or level of effort for contract implementation, including any ramping up or ramping down of contract components or of the project as a whole. Date range July 1, 2011 to June 30, 2012 has been agreed upon by the COTR and the contractor. This may or may not coincide with the contract period. For an ongoing project, an annual report covering a contract period may be submitted under the subsequent contract, if approved by the COTR.

Deliverable Specification: Upload annual report for the period Sept 2011 to June 2012 via attachments within Pisces. For guidance on how/where to upload:
http://www.efw.bpa.gov/Integrated_Fish_and_Wildlife_Program/technicalreports.aspx

Planned Metrics: <None>

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Review annual report format requirements	9/1/2011	10/1/2011	Inactive	Contractor must review formatting requirements before starting the first draft of their report. Please follow the BPA-required format. http://www.efw.bpa.gov/Integrated_Fish_and_Wildlife_Program/technicalreports.aspx
B. Email draft of report to COTR for review	5/16/2012	5/16/2012	Inactive	The draft annual report must be submitted to the BPA COTR in Microsoft Word format (any version of Word is fine).
C. Receive COTR review comments	5/16/2012	6/15/2012	Inactive	The BPA COTR should provide review feedback and comments within 30 days of receiving the draft annual report. This milestone should therefore have a duration of 30 days.
D. Finalize Draft Annual Report	6/15/2012	6/30/2012	Inactive	Integrate review feedback and comments, and obtain internal signatures if necessary. Convert the annual report to Adobe Acrobat PDF format. It is anticipated that this report will be uploaded to public by BPA within 30 days of its receipt on June 30, 2011.
Deliverable: E. Final report uploaded to the BPA website		6/30/2012	Inactive	See the Deliverable Specification above

H: 141. Produce Other Report

Title: 11.2 ISEMP Program Synthesis Report 2003-2010

Description: Since its inception in 2003, reporting for Project #2003-017 has been accomplished through reports prepared by individual contractors, an annual program-wide (project-wide) capstone report that collates the reports from each ISEMP pilot subbasin and the data management team, or through BiOp reporting. Also, in 2006 ISEMP produced the first Three-Year Review document, which provided a retrospective of the work that had occurred over the three years since ISEMP's inception through 2006.
<http://www.nwfsc.noaa.gov/research/divisions/cbd/mathbio/isemp/documents.cfm>

In 2011 BPA managers (and other entities) expressed the need to have a lessons learned/synthesis report covering the entire period of the program. This synthesis report will review the relevant F&W Program management questions and RPAs that ISEMP was initiated to help answer. This report will describe the lessons learned from the ISEMP for each management question and RPA that there is data at this time to address. The report will provide project data, results, synthesis, and conclusions that are relevant to ISEMP deliverables, describe how ISEMP results and synthesis can inform future implementation of the F&W programmatic strategies (e.g., Tributary Habitat Monitoring, Fish Population Monitoring), and identify any adaptive management activities relevant to the F&W programmatic strategies that ISEMP implemented, or would recommend to support future implementation.

Since this report is dependent upon collaborative work with other ISEMP contractors, Terraqua can only ensure that the deadlines outlined in the milestones are met if products pertaining to those deadlines are delivered on time.

Deliverable Specification: In this work element, Terraqua will produce a document that compiles and coordinates the work of all ISEMP contractors (from each of the three pilot subbasins and the umbrella group), describing ISEMP's progress over the life of the program in relation to its proposed goals and objectives, and documents changes in protocols/indicators being monitored that have resulted from data collected over the course of the program. This report will also focus on the lessons learned from implementing such a large program since 2003.



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Produce outline of ISEMP Review/Lessons Learned document	9/1/2011	9/16/2011	Inactive	Produce an outline of the ISEMP Lessons Learned/Review report for BPA managers to review and provide feedback on as to content and intent.
B. Receive comments from BPA	9/16/2011	9/24/2011	Inactive	Receive comments back from BPA managers on ISEMP lessons learned/synthesis report outline.
C. Produce first draft ISEMP Lessons Learned/ Review report	10/1/2011	11/15/2011	Inactive	Develop a single document that describes the lessons learned since the inception of the program, describes ISEMP progress over the course of the program in relation to ISEMP proposed goals and objectives, and documents changes in protocols/indicators being monitored that have resulted from data collected.
D. Attend coordination meeting with BPA managers	11/1/2011	11/7/2011	Inactive	Circulate the first draft document for review among ISEMP and BPA collaborators. Attend a coordination meeting with BPA managers and ISEMP staff to review first draft of the review report to ensure that report is providing the type of content that managers desire. This meeting can be in-person or by conference call.
E. Produce second draft	11/7/2011	12/1/2011	Inactive	Incorporate edits and comments from first review and coordination meeting.
F. Attend coordination meeting with BPA managers	12/1/2011	12/7/2011	Inactive	Circulate the second draft document for review among ISEMP and BPA collaborators. Attend a coordination meeting with BPA managers and ISEMP staff to review second draft to ensure that report is providing the type of content that managers desire. This meeting can be in-person or by conference call.
G. Produce final draft	12/7/2011	12/15/2011	Inactive	Produce final draft for review by BPA managers and ISEMP collaborators.
H. Produce final ISEMP Synthesis Program Report	12/16/2011	12/20/2011	Inactive	Publish an electronic, accessible, final document that describes the lessons learned over the course of implementing ISEMP, describes ISEMP's progress in relation to ISEMP proposed goals and objectives, and documents changes in protocols/indicators being monitored that have resulted from data collected during the program.
Deliverable: I. Produce final ISEMP Synthesis Program Report		12/20/2011	Inactive	<i>See the Deliverable Specification above</i>

I: 174. Produce Plan

Title:

11.3 Wenatchee/Entiat Strategy Updates and Implementation Tracking

Description:

Terraqua developed strategies for the implementation of the ISEMP program in the Wenatchee and Entiat subbasins in FY05 and FY06, respectively. These strategies were developed as working documents and were intended to be updated as needed. Continuing changes in the institutional, scientific, and policy settings within which the ISEMP program operates within these two subbasins require that these strategy documents be updated. For example, planning and implementation of ESA recovery plans is on-going and is leading to large-scale implementation of restoration programs. ISEMP needs to ensure that its goals and objectives remain consistent within these new contexts and that ISEMP program elements will continue to meet the rigorous scientific needs of the larger ISEMP program within these two subbasins. Furthermore, local groups that cooperate with the ISEMP program, including the Upper Columbia Salmon Recovery Board and its Regional Technical Team, look to ISEMP as the template for monitoring in the Wenatchee and Entiat and would like to adopt ISEMP's monitoring strategies for their recovery implementation work. For these reasons, Terraqua will review and revise the existing ISEMP monitoring strategies for the Wenatchee and Entiat subbasins within this work element to accommodate the changing institutional needs of ISEMP partners and subbasin management authorities.

Terraqua will continue to maintain and update the Project Tracking Tool developed since 2005 that serves to document changes to scientific study design that have occurred since the inception of ISEMP to assist project contractors in conducting field work and to assist ISEMP analysts in the interpretation of project data. This database will continue to be a "living" tool that will be periodically updated as necessary and will be electronically accessible to all ISEMP contractors and cooperators. This document will be updated and maintained in working draft format through June 30, 2011.

Deliverable Specification:

Revise the ISEMP implementation strategies for the Wenatchee and Entiat subbasins in a format that is accessible to all ISEMP contractors and cooperators. Maintain and update the ISEMP Wenatchee/Entiat project tracking tool in a format that is accessible to all ISEMP contractors and cooperators (preferably via a central location, e.g., web site)

Primary Focal Species:

Chinook - Upper Columbia River Spring ESU | Steelhead - Upper Columbia River DPS



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Draft Revised Entiat Implementation Strategy document	9/1/2011	12/31/2011	Inactive	Revise the ISEMP Implementation Strategy for the Entiat Subbasin and develop a draft document for review.
B. Draft Revised Wenatchee Implementation Strategy document	9/1/2011	12/31/2011	Inactive	Revise the ISEMP Implementation Strategy for the Wenatchee Subbasin and develop a draft document for review.
C. Final Revised Entiat Implementation Strategy document	1/1/2012	6/30/2012	Inactive	Produce a final working Implementation Strategy for the ISEMP program in the Entiat Subbasin.
D. Final Revised Wenatchee Implementation Strategy document	1/1/2012	6/30/2012	Inactive	Produce a final working Implementation Strategy for the ISEMP program in the Wenatchee Subbasin.
E. Maintain working draft of project tracking tool with periodic updates	9/1/2011	6/30/2012	Inactive	Continue to update and maintain the project tracking tool such that maintenance can be done by future ISEMP coordinators (whether that continues to be Terraqua or not).
Deliverable: F. Revised ISEMP strategies for the Wenatchee and Entiat subbasins		6/30/2012	Inactive	<i>See the Deliverable Specification above</i>

J: 189. Coordination-Columbia Basinwide

Title: 11.4 ISEMP Pilot Subbasin Coordination

Description: Implementation of the Project among the three pilot subbasins, particularly in the area of data management, analysis, reporting, and dissemination of information to other users in the Columbia Basin and states of OR, ID, and WA, requires close coordination of numerous entities who are participating in the Project. Terraqua will represent the interests of the Project at meetings of the pilot subbasin coordinators and will coordinate electronically and in-person with these coordinators and other entities that are developing data management systems, analysis, reporting, and document/conference preparation materials related to Project #2003-017-00.

Deliverable Specification: Attend up to two (2) two-day meetings with pilot subbasin coordinators, and participate in one (1) two-day conference/meeting to disseminate results of ISEMP work to broad monitoring/research/management communities, from Sept 2011 through June 2012 at locations in Washington, Oregon, and Idaho.

Submit an electronic version of minutes from each of up to 3 meetings attended regarding program coordination.

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Attend program coordination meetings	9/1/2011	6/30/2012	Inactive	Attend up to two (2) two-day meetings with pilot subbasin coordinators, and participate in one (1) two-day conferences/meetings to disseminate results of ISEMP work to broad monitoring/research/management communities, from July 2010 through June 2011 at locations in Washington, Oregon, and Idaho. Submit an electronic version of minutes from each of up to 3 meetings attended regarding program coordination.
Deliverable: B. Meeting minutes		6/30/2012	Inactive	<i>See the Deliverable Specification above</i>

K: 174. Produce Plan

Title: 11.5 Protocol Development

Description: Terraqua has been developing working scientific protocols for the ISEMP program since FY05, for habitat, and in FY07 for several other ISEMP survey techniques. These protocols were developed as working documents and were intended to be updated as needed. In FY11, most of the protocols are in a stable form and little change is expected in most protocols, with the possible exception of the redd survey protocol, which may need to be substantially revised. A small amount of effort is included in this release to ensure that any issues regarding the existing protocols can be noted in the project tracking tool for subsequent inclusion when protocol development is refunded.

Deliverable Specification: Update existing protocols to reflect lessons learned and promote standardized data collection across the Upper Columbia.

Primary Focal Species: Chinook - Upper Columbia River Spring ESU | Steelhead - Upper Columbia River DPS

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Update existing protocols	9/1/2011	6/30/2012	Inactive	Update existing protocols based on lessons learned to promote standardized data collection.
Deliverable: B. Updated protocols as necessary		6/30/2012	Inactive	<i>See the Deliverable Specification above</i>

L: 157. Collect/Generate/Validate Field and Lab Data



Title: 11.6 Macroinvertebrate Analysis

Description: Terraqua will subcontract with Rhithron Associates, Inc. of Missoula, MT for processing and identification of up to a total of 58 macroinvertebrate samples collected by ISEMP in the Entiat River subbasin. Terraqua will collect fifty-eight (58) samples in the Entiat Effectiveness sites (see Work Element K: 157 Task 11.7 for details regarding these sites). At the end of field sampling in fall 2011, Terraqua, Inc. will transport macroinvertebrate samples to Rhithron. Terraqua/Rhithron will provide identification of macroinvertebrates to the lowest practical levels consistent with the CHaMP protocol. Terraqua/Rhithron will deliver standardized metric calculations and will archive the identified fraction of the sample for one year.

Deliverable Specification: Per CHaMP protocol provide standardized metric calculations of Macroinvertebrates from up to 58 sites in the Entiat collected by Terraqua.

Quality controlled raw data and quality controlled summarized macroinvertebrate data with GPS locations, will be entered and stored on the CHaMP website. Data will be uploaded by June 30, 2012 and notice will be provided to BPA and Terraqua, Inc. when the data has been uploaded. The contractor will be responsible for all quality assurance/quality control steps necessary to ensure that data is properly collected and uploaded to the CHaMP website.

Planned Metrics:

- * Primary R, M, and E Focal Area : Tributary Habitat
- * Primary R, M, and E Type : Action Effectiveness Research
- * Secondary R, M, and E Type : Uncertainties Research
- * Secondary R, M, and E Focal Area : Population Status

Primary Focal Species: Chinook - Upper Columbia River Spring ESU | Steelhead - Upper Columbia River DPS

Country: US **NPCC Subbasin:** ENTIAT

State: WA **HUC5 Watershed:** ENTIAT RIVER

County: CHELAN **HUC6 Name:**

Salmonid ESUs Present: Upper Columbia River Spring-run Chinook Salmon ESU (accessible) | Upper Columbia River Steelhead DPS (accessible)

Data Repositories:

Protocol:

Proposed Project:

Sites for this WE:

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete			Completed	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. Samples collected	9/1/2011	9/30/2011	Inactive	Terraqua will collect macroinvertebrate samples at up to 58 sites in the Entiat (see Tasks 10.7 for details regarding these sites).
C. Samples delivered to Rhithron Associates	9/30/2011	11/3/2011	Inactive	At the end of field sampling in fall 2011, Terraqua, Inc. will transport macroinvertebrate samples collected by Terraqua to Rhithron.
D. Data generated by Rhithron Associates and delivered to Terraqua/BPA	11/3/2011	4/30/2012	Inactive	Rhithron will provide identification of macroinvertebrates to the lowest practical levels consistent with RIVPACS protocol, including midges and worms to genus or species using a 500-organism random subsample. Rhithron will deliver standardized metric calculations and will archive the identified fraction of the sample for one year.
Deliverable: E. Macroinvertebrate Analysis		4/30/2012	Inactive	<i>See the Deliverable Specification above</i>

M: 157. Collect/Generate/Validate Field and Lab Data

Title: 11.7 Entiat IMW - Effectiveness - Habitat Monitoring

Description: Terraqua will assist in the implementation of project effectiveness monitoring in the Entiat River under the ISEMP program. This work will include: monitoring of habitat/channel/riparian/macroinvertebrate conditions using ISEMP habitat protocols at fifty-eight (58) restoration project control and treatment sites; coordination of the monitoring work conducted by USFWS, CCD, and Terraqua; and data synthesis, analysis, and storage.

Deliverable Specification: Quality controlled raw data and quality controlled summarized habitat/channel/riparian/macroinvertebrate conditions data with GPS locations, will be entered and stored in the CHaMP website. Data will be uploaded by Nov 2011 and notice will be provided to BPA and Terraqua, Inc. when the data has been uploaded. The contractor will be responsible for all quality assurance/quality control steps necessary to ensure that data is properly collected and uploaded to the CHaMP website.

Planned Metrics:

- * Primary R, M, and E Focal Area : Tributary Habitat
- * Primary R, M, and E Type : Action Effectiveness Research
- * Secondary R, M, and E Type : Uncertainties Research
- * Secondary R, M, and E Focal Area : Population Status

Primary Focal Species: Chinook - Upper Columbia River Spring ESU | Steelhead - Upper Columbia River DPS

Country: US **NPCC Subbasin:** ENTIAT

State: WA **HUC5 Watershed:** ENTIAT RIVER



County: CHELAN **HUC6 Name:**
Salmonid ESUs Present: Upper Columbia River Spring-run Chinook Salmon ESU (accessible) | Upper Columbia River Steelhead DPS (accessible)

Data Repositories:

Protocol: **Proposed Project:** **Sites for this WE:**

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete			Completed	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. Conduct habitat monitoring in the Entiat IMW project area.	9/1/2011	9/30/2011	Inactive	Monitor channel/riparian/macrobenthic conditions using ISEMP habitat protocols at fifty-eight (58) restoration project control and treatment sites in the Entiat IMW project area.
C. Data entry and summary	10/1/2011	3/31/2012	Inactive	Synthesize data, summarize data, and store data in data management system. Data summaries of from this task will be reported in a single report described in WE N.157 Task 10.11.
Deliverable: D. Final field data		6/30/2012	Inactive	<i>See the Deliverable Specification above</i>

N: 158. Mark/Tag Animals

Title: 11.8 PIT tag juveniles as part of the Entiat IMW

Description: Terraqua will assist the USFWS in the implementation of project effectiveness monitoring in the Entiat River under ISEMP's Entiat Intensively Monitored Watershed program. This work will include: monitoring fish abundance, survival, and growth by capturing/sampling/tagging fish using ISEMP fish capture protocols at 14 restoration project control and treatment sites during the summer of 2011 and winter of 2012. Environmental compliance, field coordination, data entry, and storage will be performed by USFWS. As part of a mark-recapture study of juvenile anadromous salmonids, Terraqua will assist the USFWS when using Passive Integrated Transponder (PIT) tags on juvenile Spring Chinook and steelhead captured at sites in the Entiat River watershed under the Entiat Intensively Monitored Watershed (IMW) experimental design.

Deliverable Specification: Terraqua will provide up to 6 field crew personnel including as many as 4 crew leaders to participate with the USFWS in fish sampling at 14 restoration project control and treatment sites during the summer of 2011 and winter 2012. We will use capture-mark-recapture methodology to generate site level point estimates of population abundance. Each site will be sampled over a two day period (day one for marking fish and day two for recapture) and capture efficiency will be estimated per site. Fish capture will be conducted utilizing low-voltage electrofishing or seining techniques at each site dependent upon site conditions (i.e., flow, water depth, turbidity, conductivity, habitat types, etc.). At a minimum, all spring Chinook and steelhead captured will be anesthetized, checked for the presence of a passive integrated transponder (PIT) tag and have length and weight measurements recorded prior to being revived and released at the point of capture. Any spring Chinook and steelhead not previously PIT tagged will be tagged with either a 12 mm or 8.5 mm tag dependent upon their size (fork-length).

In the field all fish sampling data will be entered into a site and time specific P3 program file and stored on a laptop computer. The project leader will conduct quality assurance and quality control activities and upload PIT tag codes and accompanying biological information (e.g., length, weight, and life history stage) for sampled fish into regional databases (i.e., PTAGIS) and the ISEMP automated template modules for transfer to the ISEMP status and effectiveness monitoring database.

Planned Metrics:
 * Primary R, M, and E Focal Area : Population Status
 * Primary R, M, and E Type : Action Effectiveness Research
 * Secondary R, M, and E Type : Uncertainties Research

Primary Focal Species: Chinook - Upper Columbia River Spring ESU | Steelhead - Upper Columbia River DPS

Country: US **NPCC Subbasin:** ENTIAT
State: WA **HUC5 Watershed:** ENTIAT RIVER
County: CHELAN **HUC6 Name:**

Salmonid ESUs Present: Upper Columbia River Spring-run Chinook Salmon ESU (accessible) | Upper Columbia River Steelhead DPS (accessible)



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	9/1/2011	9/1/2011	Completed	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. Fish monitoring assistance (summer 2011 and winter 2012)	9/1/2011	3/30/2012	Inactive	Terraqua will provide up to 6 field crew personnel including as many as 4 crew leaders to participate with the USFWS in fish sampling at 14 restoration project control and treatment sites during the summer of 2011 and winter 2012.
Deliverable: C. Assist with PIT tagging fish		3/30/2012	Inactive	See the Deliverable Specification above

O: 157. Collect/Generate/Validate Field and Lab Data

Title: 11.9 Fish Habitat Status and Trend Monitoring in three subbasins
Description: This work element describes work carried out under the Columbia Habitat Monitoring Program (CHaMP, Project 2011-006-00) that is funded in part by ISEMP (Project 2003-017-00).

In support of habitat restoration, rehabilitation and conservation action performance assessments and adaptive management requirements of the 2008 FCRPS Biological Opinion (BiOp), the Bonneville Power Administration is working with NOAA and other regional fish management agencies to monitor status and trends of fish habitat for each major population group (MPG) in the Pacific Northwest identified through the Endangered Species Act (ESA). BPA is adopting a standardized fish habitat monitoring protocol, the Columbia Habitat Monitoring Program (CHaMP) for the Columbia River Basin monitoring programs.

CHaMP is a Columbia River basin-wide habitat status and trends monitoring program built around a single habitat monitoring protocol with a program-wide approach to data collection and management. CHaMP will capture habitat features that drive fish population biology and will result in systematic habitat status and trends information that will be used to assess basin-wide habitat condition and correlated with biological response indicators to evaluate habitat management strategies.

BPA is implementing CHaMP in at least one population within each steelhead and Chinook MPG which has, or will have, fish in-fish out monitoring. The goal of this work element is to implement CHaMP in the Wenatchee, Entiat and Methow watersheds. The data from this project will be used to evaluate the quantity and quality of tributary fish habitat available to salmonids across the Columbia River basin. When combined with parallel fish monitoring metrics from related projects, these data will also be used assess the impact of habitat management actions on fish population processes.

Deliverable Specification: At each site, the Terraqua crew will implement and complete a habitat survey using the CHaMP protocol. Data collected under the CHaMP protocol will include at a minimum:

- Water quality
- Water temperature
- Water Chemistry
- Stream discharge
- Drift Invertebrates
- Canopy cover
- Riparian structure
- Human influence
- Bank morphology
- Substrate composition
- Large woody debris
- Channel morphology
- Fish cover
- Particle size distribution and embeddedness
- Subsurface fines
- Solar input

Planned Metrics:
 * Primary R, M, and E Focal Area : Tributary Habitat
 * Primary R, M, and E Type : Status and Trend Monitoring
 * Secondary R, M, and E Type : Action Effectiveness Research

Primary Focal Species: Chinook - Upper Columbia River Spring ESU | Steelhead - Upper Columbia River DPS

Country: US **NPCC Subbasin:** Multiple

State: WA **HUC5 Watershed:** Multiple

County: Multiple **HUC6 Name:**

Salmonid ESUs Present: Upper Columbia River Spring-run Chinook Salmon ESU (accessible) | Upper Columbia River Steelhead DPS (accessible)

Data Repositories:

Protocol: **Proposed Project:** **Sites for this WE:**



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	9/1/2011	9/1/2011	Completed	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. Complete CHaMP monitoring at 75 sites	9/1/2011	10/31/2011	Inactive	Complete habitat monitoring at up to 75 in the Wenatchee, Entiat and Methow subbasins using the CHaMP habitat protocol.
Deliverable: C. CHaMP habitat data from 75 sites in the Wenatchee, Entiat and Methow watersheds		11/15/2011	Inactive	<i>See the Deliverable Specification above</i>

Inadvertent Discovery Instructions

BPA is required by section 106 of the National Historic Preservation Act (NHPA) to consider the effects of its undertakings on historic properties (16 USC 470). Prior to approving the expenditure of funds or conducting a federal undertaking, BPA must follow the section 106 process as described at 36 CFR 800. Even though BPA has completed this process by the time an undertaking is implemented, if cultural materials are discovered during the implementation of a project, work within the immediate area must stop and the significance of the materials must be evaluated and adverse effects resolved before the project can continue (36 CFR 800.13(b)(3)). The Inadvertent Discovery of Cultural Resources Procedure form outlines the steps to be taken and notifications to be made. If the undertaking takes place on tribal lands (16 USC 470w), BPA must also "comply with applicable tribal regulations and procedures and obtain the concurrence of the Indian tribe on the proposed action" (36 CFR 800.13(d)).

Inadvertent Discovery of Cultural Resources Procedure form:

<http://www.efw.bpa.gov/IntegratedFWP/InadvertentDiscoveryProcedure.pdf>

Terraqua, Inc.
BPA Project 2003-017-00: Integrated Monitoring Pilot
September 1, 2011 through June 30, 2012
Contract No. 27480 Release 006

	Qty	Unit	Unit Cost	COST
1 PERSONNEL SERVICES				\$475,866
Administrative Scientist II	(b)(4)	hours @	(b)(4)/hr	(b)(4)
Administrative Scientist I (2)	(b)(4)	hours @	(b)(4)/hr	
Senior Scientist I (2)	(b)(4)	hours @	(b)(4)/hr	
Technician III (4)	(b)(4)	hours @	(b)(4)/hr	
Technician II (4)	(b)(4)	hours @	(b)(4)/hr	
Technician I (8)	(b)(4)	hours @	(b)(4)/hr	
2 TRAVEL				\$67,194
<i>Airfare</i>				
EAT to Portland, OR or other loc. in OR/WA/ID	(b)(4)	trips @	(b)(4)/rt	(b)(4)
Redding, CA to Seattle, WA or other loc. In OR/WA/ID	(b)(4)	trips @	(b)(4)/rt	
<i>Rental Car and Parking</i>				
SEA or PDX (NOAA/BPA)	(b)(4)	trips @	(b)(4)/rt	
Portland, OR or other loc.in OR/WA/ID	(b)(4)	trips @	(b)(4)/rt	
Redding, CA toSeattle, WA or other loc. In OR/WA/ID	(b)(4)	trips @	(b)(4)/rt	
<i>Per Diem (Lodging plus M&IE)</i>				
Portland, OR	(b)(4)	day/night @	(b)(4)/day	
Seattle, WA	(b)(4)	day/night @	(b)(4)/day	
Other loc.in OR/WA/ID	(b)(4)	day/night @	(b)(4)/day	
Missoula, MT	(b)(4)	day/night @	(b)(4)/day	
Washington Cities	(b)(4)	day/night @	(b)(4)/day	
Washington Cities (M&IE only)	(b)(4)	day/night @	(b)(4)/day	
<i>Field Trailer Rental</i>	(b)(4)	months @	(b)(4) /month	(b)(4)
<i>POV Mileage to/from</i>				
Administrative Scientist II	(b)(4)	trips @	(b)(4) miles/trip	(b)(4)
Administrative Scientist II	(b)(4)	trips @	(b)(4) miles/trip	
Administrative Scientist II	(b)(4)	trips @	(b)(4) miles/trip	
Administrative Scientist II	(b)(4)	trips @	(b)(4) miles/trip	
Administrative Scientist II	(b)(4)	trips @	(b)(4) miles/trip	
Administrative Scientist I	(b)(4)	trips @	(b)(4) miles/trip	
Administrative Scientist I	(b)(4)	trips @	(b)(4) miles/trip	
Administrative Scientist I/Senior Scientist	(b)(4)	trips @	(b)(4) miles/trip	
Habitat and fish trucks	(b)(4)	miles @	(b)(4) cents/mile	
3 Standard Daily Field Equipment Rate				\$26,145
Field Days	(b)(4)	days @	(b)(4) /day	\$26,145
4 SUPPLIES				\$46,951
(b)(4)				(b)(4)
(b)(4)				(b)(4)
5 SUBCONTRACTS				\$54,060

Rhithron Associate, Inc. lab fees
Landowner Outreach/WRS, Inc.
Coordination/Methow Monitoring Coord
ESSA, Inc.

(b)(4) samples @ (b)(4) /sample
(b)(4) season @ (b)(4)
(b)(4) season @ (b)(4)
(b)(4) hours @ (b)(4) /hour

(b)(4)

6 Administrative Expense (10% of dir. exp. excl. travel)

\$10,101

Rhithron Associate, Inc. lab fees
Landowner Outreach/WRS, Inc.
Coordination/Methow Monitoring Coord
ESSA, Inc.
Supplies

(b)(4) samples @ 10% (b)(4) /sample
(b)(4) hours @ (b)(4)
(b)(4) season @ (b)(4)
(b)(4) hours @ (b)(4) /hour

(b)(4)

7 Budget Total

\$680,318

Terraqua, Inc.

BPA Project 2003-017-00: Integrated Monitoring Pilot

September 1, 2011 through June 30, 2012

Contract No. 27480 Release 006

(See TASK Tab for description)

1	PERSONNEL SERVICES	Qty	Unit	Unit Cost	COST
					\$475,866
Task 11.1	<i>Administrative Scientist II, Michael Ward</i> Coordination/QC	(b)(4)	hours	@	(b)(4)
Task 11.2	ISEMP Program Reporting	(b)(4)	hours	@	
Task 11.3	Wenatchee/Entiat Strategy Updates	(b)(4)	hours	@	
Task 11.5	Protocol Development	(b)(4)	hours	@	
Task 11.13	Proj. Mgt. and Reporting	(b)(4)	hours	@	
Task 11.1	<i>Administrative Scientist I, Nelle and Ward (admin role)</i> Coordination/QC	(b)(4)	hours	@	(b)(4)
Task 11.2	ISEMP Program Reporting	(b)(4)	hours	@	
Task 11.3	Wenatchee/Entiat Strategy Updates	(b)(4)	hours	@	
Task 11.4	Pilot Subbasin Coord.	(b)(4)	hours	@	
Task 11.5	Protocol Development	(b)(4)	hours	@	
Task 11.6	Macroinvertebrate Analysis	(b)(4)	hours	@	
Task 11.9	Upper Columbia Status/Trend Habitat	(b)(4)	hours	@	
Task 11.13	Proj. Mgt. and Reporting	(b)(4)	hours	@	
Task 11.1	<i>Senior Scientist I, Tussing and Ward (field role)</i> Coordination/QC	(b)(4)	hours	@	(b)(4)
Task 11.5	Protocol Development	(b)(4)	hours	@	
Task 11.8	Entiat Effectiveness Fish	(b)(4)	hours	@	
Task 11.9	Upper Columbia Status/Trend Habitat	(b)(4)	hours	@	
Task 11.10	Upper Columbia Status/Trend Fish	(b)(4)	hours	@	
Task 11.12	Downstream Migrant Trapping Analysis	(b)(4)	hours	@	
Task 11.7	<i>Technican III (Wittenbach, Watson, Raymond, DiModica)</i> Entiat Effectiveness Habitat	(b)(4)	hours	@	(b)(4)
Task 11.8	Entiat Effectiveness Fish	(b)(4)	hours	@	
Task 11.9	Upper Columbia Status/Trend Habitat	(b)(4)	hours	@	
Task 11.10	Upper Columbia Status/Trend Fish	(b)(4)	hours	@	
	<i>Technician II (Creager, Ezell, Koski, MillerR)</i>				

Task 11.6	Macroinvertebrate Analysis	(b)(4)	hours	@
Task 11.7	Entiat Effectiveness Habitat	(b)(4)	hours	@
Task 11.8	Entiat Effectiveness Fish	(b)(4)	hours	@
Task 11.9	Upper Columbia Status/Trend Habitat	(b)(4)	hours	@
Task 11.10	Upper Columbia Status/Trend Fish	(b)(4)	hours	@

Technician I (Hall, Doner, Kelly, Harmon, MillerJ, Williams, Lovell, Nicholson)

Task 11.7	Entiat Effectiveness Habitat	(b)(4)	hours	@
Task 11.8	Entiat Effectiveness Fish	(b)(4)	hours	@
Task 11.9	Upper Columbia Status/Trend Habitat	(b)(4)	hours	@
Task 11.10	Upper Columbia Status/Trend Fish	(b)(4)	hours	@

(b) (4)

2 Travel \$67,194

Airfare

Task 11.1	EAT to Portland, OR or other loc. in OR/WA/ID	(b)	RT	@
Task 11.2	Wenatchee to Portland, OR or other loc. in OR/WA/ID	(b)	RT	@
Task 11.4	EAT to Portland, OR or other loc.in OR/WA/ID	(b)	RT	@
Task 11.8	Redding, CA to Wenatchee, WA	(b)	RT	@
Task 11.10	Redding, CA to Wenatchee, WA	(b)	RT	@

(b) (4)

Task 11.12 Redding, CA to Seattle, WA or other loc. In OR/WA/ID

(b) RT @

Rental car and parking

Task 11.1	SEA or PDX (NOAA/BPA)	(b)	RT	@
Task 11.2	Portland, OR or other loc.in OR/WA/ID	(b)	RT	@
Task 11.4	Portland, OR or other loc.in OR/WA/ID	(b)(4)	RT	@

Task 11.12 Redding, CA toSeattle, WA or other loc. In OR/WA/ID

(b) RT @

Per Diem (Lodging plus M&IE)

Task 11.1	Portland, OR	(b)	day/night	@
Task 11.1	Seattle, WA	(b)	day/night	@
Task 11.2	Portland, OR or other loc.in OR/WA/ID	(b)	day/night	@
Task 11.2	Other loc.in OR/WA/ID	(b)(4)	day/night	@
Task 11.4	Portland, OR or other loc.in OR/WA/ID	(b)	day/night	@
Task 11.4	Other loc.in OR/WA/ID	(b)	day/night	@
Task 11.6	Missoula, MT	(b)	day/night	@
Task 11.7	Washington Cities	(b)(4)	day/night	@
Task 11.7	Washington Cities (M&IE only)	(b)(4)	day/night	@
Task 11.8	Washington Cities	(b)	day/night	@

Task 11.8	Washington Cities (M&E only)	(b)(4)	day/night	@
Task 11.9	Washington Cities	(b)(4)	day/night	@
Task 11.9	Washington Cities (M&E only)	(b)(4)	day/night	@
Task 11.10	Washington Cities	(b)(4)	day/night	@
Task 11.10	Washington Cities (M&E only)	(b)(4)	day/night	@
Task 11.12	Seattle, WA	(b)(4)	day/night	@

(b)(4) (4)

Field Trailer Rental

Task 11.7	Rental trailer (Upper Columbia: 6 trailers for 1.5 months)	(b)(4)	months	@
Task 11.9	Rental trailer (Entiat: one trailer for 1.5 months)	(b)(4)	months	@

(b)(4) (4)

POV Mileage to/from

Task 11.1	Wenatchee from Peshastin, WA	(b)(4)	trip	@
Task 11.1	Entiat, Wa. from Peshastin, WA	(b)(4)	trip	@
Task 11.1	Entiat, Wa. from Tonasket, WA	(b)(4)	trip	@
Task 11.2	Wenachee, WA from Wauconda, WA	(b)(4)	trip	@
Task 11.4	EAT from Peshastin, WA	(b)(4)	trip	@
Task 11.5	Leavenworth, WA from Wauconda, WA	(b)(4)	trip	@
Task 11.5	Red Bluff, CA to Redding, CA	(b)(4)	trip	@
Task 11.6	Missoula, MT from Tonasket, WA	(b)(4)	trip	@
Task 11.6	Wenatchee from Tonasket, WA	(b)(4)	trip	@

Task 11.7	RT to/among sites in Entiat Subbasin from Tonasket, WA	(b)(4)		@
Task 11.8	RT to/among sites in Wen/Entiat Subbasin from Tonasket, WA	(b)(4)		@
Task 11.9	RT to/among sites in Wenatchee Subbasin from Tonasket, WA	(b)(4)		@
Task 11.10	RT to/among sites in Wenatchee Subbasin from Tonasket, WA	(b)(4)		@
Task 11.12	Red Bluff, CA to Redding, CA	(b)(4)	trip	@

(b)(4) (4)

3 Standard Daily Field Equipment Rate \$26,145

Task 11.7	Field Days	(b)(4)	days	@
Task 11.8	Field Days	(b)(4)	days	@
Task 11.9	Field Days	(b)(4)	days	@
Task 11.10	Field Days	(b)(4)	days	@

(b)(4) (4)

4 SUPPLIES

zHabitat Supplies Field Paper for data sheets
zHabitat Supplies Measuring Tape (50m)

Qty	Unit	Unit Cost	COST
(b)(4)	ream	(b)(4)	\$46,951
(b)(4)	each	(b)(4)	

7

BUDGET TOTAL

\$680,318

Mail Invoice To:

F & W Invoices - KEWB-4
Bonneville Power Admin. - PBL
P. O. Box 3621
Portland OR 97208-3621

Contract : 00027480
Release : 00005
Page : 1

Vendor:

TERRAQUA INC
PO BOX 85
WAUCONDA WA 98859

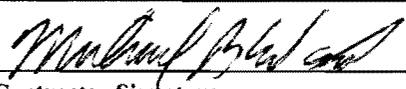
Please Direct Inquiries to:

KRISTI J. VAN LEUVEN
Title: CONTRACT SPECIALIST
Phone: 503-230-3605
Fax : 503-230-4508

Attn: MICHAEL B WARD

Contract Title: 2003-017-00 EXP ISEMP - TERRAQUA - COORDINATION WENATCHEE/ENTIAT

Performance Period: 07/01/10 - 06/30/11


Contractor Signature
Michael B Ward, President
Printed Name/Title
6/24/10
Date Signed


BPA Contracting Officer
6/24/2010
Date Signed



Master Agreement 27480

Page 2

Integrated Status Effectiveness Monitoring Project (ISEMP) Project Number 2003-017-00 Release 5

BPA TECHNICAL POINT OF CONTACT (COTR): DAVID BYRNES (503) 230-3171
BPA CONTRACTING OFFICER: KRISTI VAN LEUVEN (503) 230-3605

This release is subject to the terms and conditions of the master agreement identified above. The following documents are attached and a part of this release:

1. Face page
2. This page 2
3. Statement of Work
4. Budget

This release replaces the previous one (Release 4) which will expire 6/30/2010.

The Bonneville Purchasing Instructions, Appendix 19-A, Property Management Procedures for Contractors, is hereby incorporated by reference and made a part of this contract. Appendix 19-A may be accessed at: <http://www.bpa.gov/corporate/business/bpi/APP19-A.pdf>

The BPA COTR is authorized to perform the following:

- Inspect and review work performed;
- Inspect or witness test presentations or other activities;
- Interpret Technical Specifications;
- Approve submitted deliverables/reports (including property inventory reports);
- Approve invoices;
- Reject nonconforming services, materials, or equipment; and
- Maintain a file of all Contractor property acquisition and disposition documents.

The COTR is not authorized to perform the following:

- Contract Modifications that change the contract price, technical requirements or time for performance;
- Suspension or termination of the Contractor's right to proceed, either for default or for convenience of BPA;
- Final decisions on any matters subject to appeal, as provided in a disputes clause

Please mail invoices with release number to: Bonneville Power Administration
Attn: **Fish & Wildlife Invoices / KEWB-4**
PO Box 3621
Portland, OR 97208-3621
fwinvoices@bpa.gov



Statement of Work Report

Project Title: Integrated Status and Effectiveness Monitoring Program (ISEMP)
Project #: 2003-017-00
Contract Title: 2003-017-00 EXP ISEMP - TERRAQUA - COORDINATION WENATCHEE/ENTIAT
Contract #: 27480 REL 5
Province: Non-Provincial **Subbasin:** Basinwide
Workorder ID: 129074 **Task ID:** 1
Perf. Period Budget: \$741,848 **Perf. Period:** 7/1/2010 - 6/30/2011
Contract Type: Release **Pricing Type:** Time and Materials
Contractor(s): Terraqua, Inc. (Prime - TERRAQUA00)
BPA Internal Ref: 27480 REL 5
SOW Validation: Last validated 06/03/2010 with 0 problems, and 0 reviewable items
Contract Documents: [Property Inventory \(05/25/2010\)](#) Property Inventory for Release 5 Contract 274...
[Budget - Contract \(06/03/2010\)](#) Line Item Budget

Contacts:

Name	Role	Organization	Phone/Fax	Email	Address
David Byrnes	COTR	Bonneville Power Administration	(503) 230-3171 / (503) 230-3049	dmbyrnes@bpa.gov	Bonneville Power Administration Fish and Wildlife Program 905 NE 11th Ave. (97232) PO Box 3621 Portland OR 97208-3621
Kristi Van Leuven	Contracting Officer	Bonneville Power Administration	(503) 230-3605 / NA	kjvleuven@bpa.gov	P.O. Box 3621 NSSP-4 Portland OR 97208-3621
Chris Jordan	Supervisor	National Oceanic and Atmospheric Administration (NOAA)	(541) 754-4629 / NA	chris.jordan@noaa.gov	2725 Montlake Blvd. East Seattle WA 98112-2097
Christopher A. Beasley	Interested Party	Quantitative Consultants Inc	(360) 620-2883 / NA	chris@qcinc.org	180 Bay Run Newport NC 28570
Mike Ward	Contract Manager	Terraqua, Inc.	(509) 486-2426 / (509) 486-2423	wardski@wildblue.net	P.O. Box 85 Wauconda WA 98859-
Pamela Nelle	Technical Contact	Terraqua, Inc.	(509) 885-9046 / NA	pamela.nelle@nwi.net	PO Box 404 Peshastin WA 98847
Jody White	Interested Party	Quantitative Consultants Inc	(208) 860-5269 / NA	jody@qcinc.org	P.O. Box 8263 Boise ID 83707
Carol Volk	Interested Party	Volk Consulting	(206) 240-0301 / NA	volkconsulting@gmail.com	
Israel Duran	Env. Compliance Lead	Bonneville Power Administration	(503) 230-3967 / NA	induran@bpa.gov	P.O. Box 3621, Mailstop - KEC-4 Portland OR 97208-3967

Work Element Table of Contents:



<u>Work Element - Work Element Title</u>	<u>EC Needed*</u>	<u>Estimate</u>	<u>(%)</u>
A : 165. Produce Environmental Compliance Documentation - 9.13b Environmental Compliance (Fast Track)		\$500	(0 %)
B : 185. Produce Pisces Status Report - 9.13c Periodic Status Reports for BPA (Fast Track)		\$500	(0 %)
C : 132. Produce (Annual) Progress Report - 9.13d Produce Annual Progress Report for the period July 2010 to June 2011(Fast Track)		\$500	(0 %)
D : 189. Regional Coordination - 9.1 ISEMP Wenatchee/Entiat/Methow Coordination		\$66,547	(9 %)
E : 141. Produce Other Report - 9.2 ISEMP Program Reporting		\$38,898	(5 %)
F : 174. Produce Plan - 9.3 Wenatchee/Entiat Strategy Updates and Implementation Tracking		\$9,994	(1 %)
G : 189. Regional Coordination - 9.4 ISEMP Pilot Subbasin Coordination		\$17,829	(2 %)
H : 174. Produce Plan - 9.5 Protocol Development		\$735	(0 %)
I : 157. Collect/Generate/Validate Field and Lab Data - 9.6a Macroinvertebrate Analysis	*	\$25,052	(3 %)
J : 157. Collect/Generate/Validate Field and Lab Data - 9.6b Macroinvertebrate Analysis (Fast Track)	*	\$29,967	(4 %)
K : 157. Collect/Generate/Validate Field and Lab Data - 9.7 Entiat IMW - Effectiveness - Habitat Monitoring	*	\$95,210	(13 %)
L : 157. Collect/Generate/Validate Field and Lab Data - 9.8 Entiat IMW - Effectiveness - Fish Monitoring	*	\$96,360	(13 %)
M : 157. Collect/Generate/Validate Field and Lab Data - 9.9 Entiat IMW - Status/Trend - Habitat Monitoring (Fast Track)	*	\$87,044	(12 %)
N : 157. Collect/Generate/Validate Field and Lab Data - 9.10 Entiat IMW - Status/Trend - Fish Monitoring (Fast Track)	*	\$75,309	(10 %)
O : 157. Collect/Generate/Validate Field and Lab Data - 9.11 Methow - Status/Trend - Habitat Monitoring (Fast Track)	*	\$155,996	(21 %)
P : 162. Analyze/Interpret Data - 9.12 Downstream Migrant Trapping Analysis		\$32,675	(4 %)
Q : 119. Manage and Administer Projects - 9.13a Project Management (Fast Track)		\$8,732	(1 %)
Total:		\$741,848	

* Environmental Compliance (EC) needed before work begins.

Contract Description:

This contract contains work elements that are funded under the "Fast Track" budget, including: Tasks 9.6b, 9.9, 9.10, 9.11, and 9.13.

Contract Description: Since its inception in FY2003, Project #2003-017-00 (the Integrated Status and Effectiveness Monitoring Program; ISEMP) has been developing two novel monitoring and evaluation programs: (i) subbasin-scale pilot status and trend monitoring efforts for anadromous salmonids and their habitat in the Wenatchee/Entiat, John Day and South Fork Salmon River basins, and (ii) effectiveness monitoring for suites of habitat restoration projects in selected watersheds within the three target subbasins. This work is critical for the development of a federal research. monitoring. and evaluation (FRME) program for the Columbia River Basin. which is now a



requirement under the U.S. National Oceanic and Atmospheric Administration Fisheries (NOAA-Fisheries) 2000, 2004 and 2008 Federal Columbia River Power System Biological Opinions (BiOps, NMFS 2000, NOAA 2004, NMFS-NWR 2008). In 2008, the ISEMP became a component of BPA's BiOp Program to help ensure that provisions of the BiOp are satisfied. ISEMP builds on current status and trend monitoring programs within each of the pilot basins. Several regional and local organizations are funding and implementing these programs. In short, this project has integrated existing and new monitoring and evaluation activities in three pilot subbasins to help ensure that provisions of the BiOp are satisfied. This contract is one of several contracts that will implement this project. The final report for this contract will contain data that will 1) be submitted to NOAA Fisheries (also a contractor under this project) for use in a project level integrated Annual Report and 2) be submitted to BPA as a contract final report according to the terms of this contract. Terraqua's role has been, and continues to be, to enable the Bonneville Power Administration to continue to implement Project #2003-017-00 in the Wenatchee and Entiat and other pilot subbasins. Objectives of this work have been, and continue to be:

In 2010,

- Coordinate contract development between Bonneville and entities participating in implementation of the ISEMP program in the Wenatchee/Entiat and other pilot subbasins.
- Coordinate contract implementation between Bonneville and entities participating in the ISEMP program in the Wenatchee/Entiat and other pilot subbasins to ensure that implementation activities meet the purpose and needs of the ISEMP program.
- Implement selected monitoring and analysis activities.
- Analyze and report results related to the implementation of monitoring activities.

This contract represents an increase in scope and budget of about 56 percent over the previous Terraqua Release #4 of Contract 27480 primarily due to the expansion of ISEMP monitoring and coordination activities in the Entiat and Methow subbasins (particularly the Fast Track work elements listed above).

To offset the expanded costs associated with this expanded scope of work, Terraqua has: elevated lower-cost staff to assume some of the responsibilities previously executed by more senior staff and has reduced the scope of some coordination elements that were more prominent in earlier releases as those elements have been completed or institutionalized to the point they are relatively maintenance-free. The following list describes details associated with some of the significant scope/budget differences compared to Release #4:

- The total effort and cost of coordination-related and development tasks (Tasks 8.1 through 8.5) has remained about the same (\$135K versus \$129K in Release #4) and reflects a balance of increased cost-of-business, increased efficiencies, and an expanded scope of work for the Entiat IMW project. Similarly, there is no significant change in the budget for project management (Task 9.13).
- The slight budget increase for task 9.6 over Release #4 Task 8.6 reflects constant laboratory fees and a 17% increase in the number of samples that will be processed.
- Task 9.7 represents a 25% expansion of habitat effectiveness monitoring work in the Entiat.
- The budget for Task 9.8 represents a new task of fish effectiveness monitoring in the Entiat.
- The budget for Task 9.9 is higher than in Release #3 because the larger scope of work requires more crew. All crew training falls within this work element.
- Task 9.10 Entiat Status/Trend Fish is new for Terraqua this year and was previously performed by another ISEMP subcontractor whose contract was already in place when Fast Track money was budgeted to this work.
- Task 9.11 Methow Status/Trend habitat is new for Terraqua and is a result of Fast Track budgeting.



Statement of Work Report

Work Element Details

A: 165. Produce Environmental Compliance Documentation

Title: 9.13b Environmental Compliance (Fast Track)
Description: Ensure necessary documents are provided to BPA's Environmental Compliance group in sufficient time to allow for a compliance letter to be written prior to any ground-disturbing work. Coordinate with appropriate agencies regarding any permits that may be required.
Deliverable Specification: Provide necessary supporting documentation and assistance to BPA's Environmental Compliance Group (such as maps, design drawings, survey reports, permit applications, ESA documents, etc.) to assure a timely receipt of EC compliance letter.
Planned Metrics: Are herbicides used as part of work performed under this contract?: No

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Provide BPA EC Lead with calendar year XXXX proposed herbicide use	7/1/2010	6/30/2011	Inactive	Contractor submits any proposed herbicide use on an approved form to the BPA Environmental Compliance Lead
B. Provide BPA EC Lead with calendar year XXXX actual herbicide use	7/1/2010	6/30/2011	Inactive	Contractor submits any actual herbicide use on an approved form to the BPA Environmental Compliance Lead
Deliverable: C. Environmental Compliance supporting documentation		6/30/2011	Inactive	<i>See the Deliverable Specification above</i>

B: 185. Produce Pisces Status Report

Title: 9.13c Periodic Status Reports for BPA (Fast Track)
Description: The Contractor shall report on the status of milestones and deliverables in Pisces. Reports shall be completed either monthly or quarterly as determined by the BPA COTR. Additionally, when indicating a deliverable milestone as COMPLETE, the contractor shall provide metrics and the final location (latitude and longitude) prior to submitting the report to the BPA COTR.

Deliverable Specification:

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Jul-Sep 2010 (7/1/2010 - 9/30/2010)	10/1/2010	10/15/2010	Inactive	
B. Oct-Dec 2010 (10/1/2010 - 12/31/2010)	1/1/2011	1/15/2011	Inactive	
C. Jan-Mar 2011 (1/1/2011 - 3/31/2011)	4/1/2011	4/15/2011	Inactive	
D. Final Apr-Jun 2011 (4/1/2011 - 6/30/2011)	6/16/2011	6/30/2011	Inactive	

C: 132. Produce (Annual) Progress Report

Title: 9.13d Produce Annual Progress Report for the period July 2010 to June 2011(Fast Track)
Description: The annual report summarizes the project goal, objectives, hypotheses, completed and uncompleted deliverables, problems encountered, lessons learned, and long-term planning. Examples of long-term planning include future improvements, new directions, or level of effort for contract implementation, including any ramping up or ramping down of contract components or of the project as a whole. Date range July 1, 2010 to June 30, 2011 has been agreed upon by the COTR and the contractor. This may or may not coincide with the contract period. For an ongoing project, an annual report covering a contract period may be submitted under the subsequent contract, if approved by the COTR.

Deliverable Specification: Upload annual report for the period July 2010 to June 2011 via attachments within Pisces. For guidance on how/where to upload:
http://www.efw.bpa.gov/Integrated_Fish_and_Wildlife_Program/technicalreports.aspx



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Review annual report format requirements	9/1/2010	10/1/2010	Inactive	Contractor must review formatting requirements before starting the first draft of their report. Please follow the BPA-required format. http://www.efw.bpa.gov/Integrated_Fish_and_Wildlife_Program/technicalreports.aspx
B. Email draft of report to COTR for review	5/16/2011	5/16/2011	Inactive	The draft annual report must be submitted to the BPA COTR in Microsoft Word format (any version of Word is fine).
C. Receive COTR review comments	5/16/2011	6/15/2011	Inactive	The BPA COTR should provide review feedback and comments within 30 days of receiving the draft annual report. This milestone should therefore have a duration of 30 days.
D. Finalize Draft Annual Report	6/15/2011	6/30/2011	Inactive	Integrate review feedback and comments, and obtain internal signatures if necessary. Convert the annual report to Adobe Acrobat PDF format. It is anticipated that this report will be uploaded to public by BPA within 30 days of its receipt on June 30, 2011.
Deliverable: E. Final report uploaded to the BPA website		6/30/2011	Inactive	<i>See the Deliverable Specification above</i>

D: 189. Regional Coordination

Title: 9.1 ISEMP Wenatchee/Entiat/Methow Coordination

Description: Terraqua will represent the interests of the ISEMP at meetings of the RTT, the Entiat Watershed Planning Unit, and will coordinate electronically and in-person with the following entities that may be involved in this Program: RTT, EWPU, U.S. Forest Service (USFS), Washington Department of Ecology (WDOE), Methow River Salmon Restoration Council, Chelan PUD, Yakama Nation, NOAA-Fisheries, BPA, U.S. Bureau of Reclamation, Chelan County, Cascadia Conservation District, the mid-Columbia PUD's HCP Hatchery Committee, and other parties as necessary.

Terraqua will coordinate ISEMP contractors to help insure that contractors SOWs and deliverables meet ISEMP needs and that contractor budgets stay within the overall ISEMP budget and other available funds. Terraqua will also coordinate the analysis and reporting of ISEMP products with Quantitative Consultants, NOAA, and other program analysts.

Deliverable Specification: Attend up to twelve (12) monthly Oversight Committee meetings to be held as part of regularly scheduled RTT meetings, attend up to four quarterly meetings of the EWPU and/or up to 12 monthly EWPU Habitat Subcommittee meetings from July 2010 through June 2011. Attend up to two (2) meetings with BPA or NOAA at locations in Washington, Oregon, or Idaho from July 2010 through June 2011.

Provide a copy of written minutes from all RTT and EWPU meetings attended.

Provide a monthly report of significant coordination issues.

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Submit RTT Meeting minutes	7/1/2010	6/30/2011	Inactive	For any RTT meetings attended, submit minutes to BPA COTR via email.
B. Monthly, telephonically update COTR of significant coordination issues	7/1/2010	6/28/2011	Inactive	Monthly, conduct a telephone update with the BPA COTR regarding significant coordination issues, or anything that could jeopardize the overall project.
Deliverable: C. Meeting minutes / Coordination reports		6/30/2011	Inactive	<i>See the Deliverable Specification above</i>

E: 141. Produce Other Report

Title: 9.2 ISEMP Program Reporting

**Description:**

Beginning in FY10, ISEMP will expand the yearly programmatic reporting beyond the Annual Review to also include the preparation of up to three scientific manuscripts based on data collected and analyzed by ISEMP since its inception.

The ISEMP Project Annual Review Report is the capstone report for all activities that are separately contracted under this Project #2003-017. Prior to 2006, this reporting has been completed by reports prepared by individual contractors or has been accomplished through BiOp reporting. BPA managers and ISEMP coordinators and other entities have expressed the desire to have the complete program summarized in a periodically updated program review document. In 2006, a three-year review was created; since then, it has been updated annually beginning in 2007.

In this work element, Terraqua will produce the 2010 ISEMP Project Annual Review, a document that compiles and coordinates the reports of all ISEMP contractors from each of the three pilot subbasins and the umbrella group (Note: ISEMP contractors will continue to provide BPA with annual reports regarding contract-specific progress and work performed), describes all ISEMP progress in the past year of the program in relation to ISEMP proposed goals and objectives, and documents changes in protocols/indicators being monitored that have resulted from data collected. This document will be stored on the ISEMP web site and uploaded to Pisces.

Also in this work element, Terraqua will produce up to three manuscripts that will be ready for submission to peer-reviewed journals based on data collected and analyzed by ISEMP since its inception. Terraqua will coordinate with ISEMP staff to determine which analyses/datasets to report, the extent of analyses necessary for manuscript preparation, and for editing/internal development and review of manuscripts. As of May 2010, ISEMP staff have identified several areas where data analysis will likely lead to publishable results in the next six months. Completion of this work element will depend on other ISEMP contractors and staff to provide study designs, descriptions of methodology as conducted, complete data analysis to the point that results will be publishable, interpretation of results and conclusions, and editorial review of draft and final manuscripts.

Deliverable Specification:

Produce the ISEMP Project Annual Review Report that captures accomplishments to date of all activities that are separately contracted under this Project #2003-017 for external review that can be shared with all participants as well as external parties via the ISEMP web site and Pisces. This document will be a "special progress report" that will be developed in addition to the progress report prepared in Work Element C, 9.14d Produce Annual Report. The ISEMP Project Annual Review Report will not change the need of other contractors to submit their annual reports.

Produce up to three manuscripts that will be ready for submission to peer-reviewed journals based on data collected and analyzed by ISEMP since its inception.



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Produce draft ISEMP Annual Review	10/1/2010	12/31/2010	Inactive	Develop a single document that compiles and coordinates the reports of all ISEMP contractors, describes all ISEMP progress in the past year of the program in relation to ISEMP proposed goals and objectives, and documents changes in protocols/indicators being monitored that have resulted from data collected. Circulate this draft document for review among ISEMP and BPA collaborators.
B. Produce final ISEMP Annual Review	1/1/2011	6/30/2011	Inactive	Publish an electronic, accessible, final document that compiles and coordinates the reports of all ISEMP contractors, describes all ISEMP progress in the past year of the program in relation to ISEMP proposed goals and objectives, and documents changes in protocols/indicators being monitored that have resulted from data collected over the past year of the program. Store this document on the ISEMP web site.
C. Coordinate ISEMP contributions to the preparation of three manuscripts	7/1/2010	6/30/2011	Inactive	Coordinate with ISEMP staff to determine which analyses/datasets to report, the extent of analyses necessary for manuscript preparation, and for editing/internal development and review of manuscripts. Completion of this work element will depend on other ISEMP contractors and staff to provide study designs, descriptions of methodology as conducted, complete data analysis to the point that results will be publishable, interpretation of results and conclusions, and editorial review of draft and final manuscripts. The coordination milestone and budget includes up to 6 meetings (up to 12 days) and associated travel expenses to meet in-person with ISEMP staff for development of draft and final manuscripts if necessary.
D. Produce draft of Manuscript 1	7/1/2010	12/30/2010	Inactive	Produce a draft of 1 of 3 manuscripts including all analysis work completed by December 1, 2010.
E. Produce draft of Manuscript 2	7/1/2010	12/30/2010	Inactive	Produce a draft of 2 of 3 manuscripts including all analysis work completed by December 1, 2010.
F. Produce draft of Manuscript 3	7/1/2010	12/30/2010	Inactive	Produce a draft of 3 of 3 manuscripts including all analysis work completed by December 1, 2010.
G. Produce final version of Manuscript 1	1/1/2011	6/30/2011	Inactive	Produce a final draft of 1 of 3 manuscripts that will be ready for submission to a peer-reviewed journal.
H. Produce final version of Manuscript 2	1/1/2011	6/30/2011	Inactive	Produce a final draft of 2 of 3 manuscripts that will be ready for submission to a peer-reviewed journal.
I. Produce final version of Manuscript 3	1/1/2011	6/30/2011	Inactive	Produce a final draft of 3 of 3 manuscripts that will be ready for submission to a peer-reviewed journal.
Deliverable: J. ISEMP Annual Review and Manuscript Preparation		6/30/2011	Inactive	<i>See the Deliverable Specification above</i>

F: 174. Produce Plan

Title:

9.3 Wenatchee/Entiat Strategy Updates and Implementation Tracking

Description:

Terraqua developed strategies for the implementation of the ISEMP program in the Wenatchee and Entiat subbasins in FY05 and FY06, respectively. These strategies were developed as working documents and were intended to be updated as needed. Continuing changes in the institutional, scientific, and policy settings within which the ISEMP program operates within these two subbasins require that these strategy documents be updated. For example, planning and implementation of ESA recovery plans is on-going and is leading to large-scale implementation of restoration programs. ISEMP needs to ensure that its goals and objectives remain consistent within these new contexts and that ISEMP program elements will continue to meet the rigorous scientific needs of the larger ISEMP program within these two subbasins. Furthermore, local groups that cooperate with the ISEMP program, including the Upper Columbia Salmon Recovery Board and its Regional Technical Team, look to ISEMP as the template for monitoring in the Wenatchee and Entiat and would like to adopt ISEMP's monitoring strategies for their recovery implementation work. For these reasons, Terraqua will review and revise the existing ISEMP monitoring strategies for the Wenatchee and Entiat subbasins within this work element to accommodate the changing institutional needs of ISEMP partners and subbasin management authorities.

Terraqua will continue to maintain and update the Project Tracking Tool developed since 2005 that serves to document changes to scientific study design that have occurred since the inception of ISEMP to assist project contractors in conducting field work and to assist ISEMP analysts in the interpretation of project data. This database will continue to be a "living" tool that will be periodically updated as necessary and will be electronically accessible to all ISEMP contractors and cooperators. This document will be updated and maintained in working draft format through June 30, 2011.

Deliverable Specification:

Revise the ISEMP implementation strategies for the Wenatchee and Entiat subbasins in a format that is accessible to all ISEMP contractors and cooperators. Maintain and update the ISEMP Wenatchee/Entiat project tracking tool in a format that is accessible to all ISEMP contractors and cooperators (preferably via a central location, e.g., web site)



Primary Focal Species: Chinook - Upper Columbia River Spring ESU | Steelhead - Upper Columbia River DPS

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Draft Revised Entiat Implementation Strategy document	7/1/2010	12/31/2010	Inactive	Revise the ISEMP Implementation Strategy for the Entiat Subbasin and develop a draft document for review.
B. Draft Revised Wenatchee Implementation Strategy document	7/1/2010	12/31/2010	Inactive	Revise the ISEMP Implementation Strategy for the Wenatchee Subbasin and develop a draft document for review.
C. Final Revised Entiat Implementation Strategy document	1/1/2011	6/30/2011	Inactive	Produce a final working Implementation Strategy for the ISEMP program in the Entiat Subbasin.
D. Final Revised Wenatchee Implementation Strategy document	1/1/2011	6/30/2011	Inactive	Produce a final working Implementation Strategy for the ISEMP program in the Wenatchee Subbasin.
E. Maintain working draft of project tracking tool with periodic updates	7/1/2010	6/30/2011	Inactive	Continue to update and maintain the project tracking tool such that maintenance can be done by future ISEMP coordinators (whether that continues to be Terraqua or not).
Deliverable: F. Revised ISEMP strategies for the Wenatchee and Entiat subbasins		6/30/2011	Inactive	<i>See the Deliverable Specification above</i>

G: 189. Regional Coordination

Title: 9.4 ISEMP Pilot Subbasin Coordination
Description: Implementation of the Project among the three pilot subbasins, particularly in the area of data management, analysis, reporting, and dissemination of information to other users in the Columbia Basin and states of OR, ID, and WA, requires close coordination of numerous entities who are participating in the Project. Terraqua will represent the interests of the Project at meetings of the pilot subbasin coordinators and will coordinate electronically and in-person with these coordinators and other entities that are developing data management systems, analysis, reporting, and document/conference preparation materials related to Project #2003-017-00.

Deliverable Specification: Attend up to two (2) two-day meetings with pilot subbasin coordinators, and participate in one (1) two-day conference/meeting to disseminate results of ISEMP work to broad monitoring/research/management communities, from July 2010 through June 2011 at locations in Washington, Oregon, and Idaho.

Submit an electronic version of minutes from each of up to 3 meetings attended regarding program coordination.

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Attend program coordination meetings	7/1/2010	6/30/2011	Inactive	Attend up to two (2) two-day meetings with pilot subbasin coordinators, and participate in one (1) two-day conferences/meetings to disseminate results of ISEMP work to broad monitoring/research/management communities, from July 2010 through June 2011 at locations in Washington, Oregon, and Idaho. Submit an electronic version of minutes from each of up to 3 meetings attended regarding program coordination.
Deliverable: B. Meeting minutes		6/30/2011	Inactive	<i>See the Deliverable Specification above</i>

H: 174. Produce Plan

Title: 9.5 Protocol Development
Description: Terraqua has been developing working scientific protocols for the ISEMP program since FY05, for habitat, and in FY07 for several other ISEMP survey techniques. These protocols were developed as working documents and were intended to be updated as needed. In FY10, most of the protocols are in a stable form and little change is expected in most protocols, with the possible exception of the redd survey protocol, which may need to be substantially revised. Also in FY10, budget constraints require that this task be moth-balled for at least one year. A small amount of effort (about 10 hours) is included in this release to insure that any issues regarding the existing protocols can be noted in the project tracking tool for subsequent inclusion when protocol development is refunded.

Deliverable Specification: Capture notes regarding any protocol changes in the project implementation tracking tool.

Primary Focal Species: Chinook - Upper Columbia River Spring ESU | Steelhead - Upper Columbia River DPS

Milestone Title	Start Date	End Date	Status	Milestone Description
Deliverable: A. Notes in project tracking tool		6/30/2011	Inactive	<i>See the Deliverable Specification above</i>



I: 157. Collect/Generate/Validate Field and Lab Data

Title: 9.6a Macroinvertebrate Analysis

Description: Terraqua will subcontract with Rhithron Associates, Inc. of Missoula, MT for processing and identification of up to a total of seventy-six (76) macroinvertebrate samples collected by ISEMP in the Wenatchee and Entiat subbasins. Twenty (20) samples will be collected by WDOE in the Wenatchee subbasin in 2010 while Terraqua will collect fifty-six (56) samples in the Entiat Effectiveness sites (see Work Element K: 157 Task 9.7 for details regarding these sites). At the end of field sampling in fall 2010, Terraqua, Inc. will transport macroinvertebrate samples to Rhithron. Terraqua/Rhithron will provide identification of macroinvertebrates to the lowest practical levels consistent with the River Invertebrate Prediction and Classification System (RIVPACS; Hawkins et al. 2001) protocol, including midges and worms to genus or species using a 500-organism random subsample. Terraqua/Rhithron will deliver standardized metric calculations and will archive the identified fraction of the sample for one year.

Deliverable Specification: Per RIVPACS protocol (Hawkins et al. 2001), provide standardized metric calculations of Macroinvertebrates from up to 76 sites (20 in the Wenatchee collected by WDOE, 56 in the Entiat collected by Terraqua).

Quality controlled raw data and quality controlled summarized macroinvertebrate data with GPS locations, will be entered and stored in Microsoft Access databases known as Automated Template Modules (ATMs) if available or in an Excel spreadsheet. Data will be uploaded by June 30, 2011 to NOAA Fisheries using the ATM and notice will be provided to BPA and Terraqua, Inc. when the data has been uploaded. The contractor will be responsible for all quality assurance/quality control steps necessary to ensure that data is properly collected and entered into the ATM.

Reference: Hawkins, C., J. Ostermiller, M. Vinson, and J. Stevenson. 2001. Stream algae, invertebrate, and environmental sampling associated with biological water quality assessments: field protocols. Utah State University, Logan, UT. web link: <http://www.usu.edu/buglab/monitor/USUproto.pdf>

Planned Metrics:

- * Primary R, M, and E Focal Area : Tributary Habitat
- * Primary R, M, and E Type : Action Effectiveness Research
- * Secondary R, M, and E Type : Status and Trend Monitoring

Primary Focal Species: Chinook - Upper Columbia River Spring ESU | Steelhead - Upper Columbia River DPS

Country: US **NPCC Subbasin:** ENTIAT

State: WA **HUC5 Watershed:** ENTIAT RIVER

County: CHELAN **HUC6 Name:** ENTIAT RIVER/MUD CREEK

Salmonid ESUs Present: Upper Columbia River Spring-run Chinook Salmon ESU (accessible) | Upper Columbia River Steelhead DPS (accessible)

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	7/1/2010	6/30/2011	Completed	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. Samples collected	7/15/2010	9/30/2010	Inactive	Terraqua will collect macroinvertebrate samples at up to fifty-six (56) sites in the Entiat (see Tasks 9.7 for details regarding these sites). Also during this time, Washington Department of Ecology will be collecting samples in the Wenatchee subbasins at 20 sites.
C. Samples delivered to Rhithron Associates	9/30/2010	11/3/2010	Inactive	At the end of field sampling in fall 2010, Terraqua, Inc. will transport macroinvertebrate samples collected by Terraqua and WDOE to Rhithron.
D. Data generated by Rhithron Associates and delivered to Terraqua/BPA	11/3/2010	4/30/2011	Inactive	Rhithron will provide identification of macroinvertebrates to the lowest practical levels consistent with RIVPACS protocol, including midges and worms to genus or species using a 500-organism random subsample. Rhithron will deliver standardized metric calculations and will archive the identified fraction of the sample for one year.
Deliverable: E. Macroinvertebrate Analysis		4/30/2011	Inactive	<i>See the Deliverable Specification above</i>

J: 157. Collect/Generate/Validate Field and Lab Data

Title: 9.6b Macroinvertebrate Analysis (Fast Track)

Description: Terraqua will subcontract with Rhithron Associates, Inc. of Missoula, MT for processing and identification of up to a total of eighty-five (85) macroinvertebrate samples collected by ISEMP in the Entiat and Methow subbasins. Thirty (30) samples will be collected by Terraqua at Entiat Status/Trend sites, and fifty-five (55) in the Methow (see Work Elements M: 157 Task 9.9 and Work Element O: 157 Task 9.11 for details regarding these sites). At the end of field sampling in fall 2010, Terraqua, Inc. will transport macroinvertebrate samples to Rhithron. Terraqua/Rhithron will provide identification of macroinvertebrates to the lowest practical levels consistent with the River Invertebrate Prediction and Classification System (RIVPACS; Hawkins et al. 2001) protocol, including midges and worms to genus or species using a 500-organism random subsample. Terraqua/Rhithron will deliver standardized metric calculations and will archive the identified fraction of the sample for one year.



Deliverable Specification: Per RIVPACS protocol (Hawkins et al. 2001), provide standardized metric calculations of Macroinvertebrates from up to eighty-five (30 in the Entiat and 55 in the Methow collected by Terraqua).

Quality controlled raw data and quality controlled summarized macroinvertebrate data with GPS locations, will be entered and stored in Microsoft Access databases known as Automated Template Modules (ATMs) if available or in an Excel spreadsheet. Data will be uploaded by June 30, 2011 to NOAA Fisheries using the ATM and notice will be provided to BPA and Terraqua, Inc. when the data has been uploaded. The contractor will be responsible for all quality assurance/quality control steps necessary to ensure that data is properly collected and entered into the ATM.

Reference: Hawkins, C., J. Ostermiller, M. Vinson, and J. Stevenson. 2001. Stream algae, invertebrate, and environmental sampling associated with biological water quality assessments: field protocols. Utah State University, Logan, UT. web link: <http://www.usu.edu/buglab/monitor/USUproto.pdf>

Planned Metrics:

* Primary R, M, and E Focal Area : Tributary Habitat
 * Primary R, M, and E Type : Status and Trend Monitoring

Primary Focal Species:

Chinook - Upper Columbia River Spring ESU | Steelhead - Upper Columbia River DPS

Country:

US

NPCC Subbasin: Multiple

State:

WA

HUC5 Watershed: Multiple

County:

Multiple

HUC6 Name: Multiple

Salmonid ESUs Present:

Upper Columbia River Spring-run Chinook Salmon ESU (accessible) | Upper Columbia River Steelhead DPS (accessible)

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	7/1/2010	6/30/2011	Completed	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. Samples collected	7/15/2010	9/30/2010	Inactive	Terraqua will collect macroinvertebrate samples at up to eighty-five (30+55=85) sites in the Entiat and Methow subbasins (see Tasks 9.9 and 9.11 for details regarding these sites).
C. Samples delivered to Rhithron Associates	9/30/2010	11/3/2010	Inactive	At the end of field sampling in fall 2010, Terraqua, Inc. will transport macroinvertebrate samples collected by Terraqua and WDOE to Rhithron.
D. Data generated by Rhithron Associates and delivered to Terraqua/BPA	11/3/2010	4/30/2011	Inactive	Rhithron will provide identification of macroinvertebrates to the lowest practical levels consistent with RIVPACS protocol, including midges and worms to genus or species using a 500-organism random subsample. Rhithron will deliver standardized metric calculations and will archive the identified fraction of the sample for one year.
Deliverable: E. Macroinvertebrate Analysis		4/30/2011	Inactive	<i>See the Deliverable Specification above</i>

K: 157. Collect/Generate/Validate Field and Lab Data

Title: 9.7 Entiat IMW - Effectiveness - Habitat Monitoring

Description: Terraqua will assist in the implementation of project effectiveness monitoring in the Entiat River under the ISEMP program. This work will include: monitoring of habitat/channel/riparian/macroinvertebrate conditions using ISEMP habitat protocols at fifty-six (56) restoration project control and treatment sites; coordination of the monitoring work conducted by USFWS, CCD, and Terraqua; and data synthesis, analysis, and storage.

Deliverable Specification: Quality controlled raw data and quality controlled summarized habitat/channel/riparian/macroinvertebrate conditions data with GPS locations, will be entered and stored in Microsoft Access databases known as Automated Template Modules (ATMs) previously provided by NOAA Fisheries. Data will be uploaded by June 30, 2011 to NOAA Fisheries using the ATM and notice will be provided to BPA and Terraqua, Inc. when the data has been uploaded. The contractor will be responsible for all quality assurance/quality control steps necessary to ensure that data is properly collected and entered into the ATM.

Planned Metrics:

* Primary R, M, and E Focal Area : Tributary Habitat
 * Primary R, M, and E Type : Action Effectiveness Research

Primary Focal Species:

Chinook - Upper Columbia River Spring ESU | Steelhead - Upper Columbia River DPS

Country:

US

NPCC Subbasin: ENTIAT

State:

WA

HUC5 Watershed: ENTIAT RIVER

County:

CHELAN

HUC6 Name: ENTIAT RIVER/MUD CREEK

Salmonid ESUs Present:

Upper Columbia River Spring-run Chinook Salmon ESU (accessible) | Upper Columbia River Steelhead DPS (accessible)



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	7/1/2010	6/30/2011	Completed	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. Conduct habitat monitoring in the Entiat IMW project area.	7/1/2010	9/30/2010	Inactive	Monitor channel/riparian/macroinvertebrate conditions using ISEMP habitat protocols at fifty-six (56) restoration project control and treatment sites in the Entiat IMW project area.
C. Data entry and summary	10/1/2010	3/31/2011	Inactive	Synthesize data, summarize data, and store data in data management system. Data summaries of from this task will be reported in a single report described in WE N.157 Task 9.11.
Deliverable: D. Final field data		6/30/2011	Inactive	See the Deliverable Specification above

L: 157. Collect/Generate/Validate Field and Lab Data

Title: 9.8 Entiat IMW - Effectiveness - Fish Monitoring

Description: Terraqua will assist the USFWS in the implementation of project effectiveness monitoring in the Entiat River under ISEMP's Entiat IMW program. This work will include: monitoring fish abundance, survival, and growth by capturing/sampling/tagging fish using ISEMP fish capture protocols at 14 restoration project control and treatment sites during the summer of 2010. Environmental compliance, field coordination, data entry, and storage will be performed by USFWS.

Deliverable Specification: Terraqua will provide up to 9 field crew personnel including as many as 4 crew leaders to participate with the USFWS in fish sampling at 14 restoration project control and treatment sites during the summer of 2010.

Planned Metrics:
 * Primary R, M, and E Focal Area : Population Status
 * Primary R, M, and E Type : Action Effectiveness Research

Primary Focal Species: Chinook - Upper Columbia River Spring ESU | Steelhead - Upper Columbia River DPS

Country: US **NPCC Subbasin:** ENTIAT

State: WA **HUC5 Watershed:** ENTIAT RIVER

County: CHELAN **HUC6 Name:** ENTIAT RIVER/MUD CREEK

Salmonid ESUs Present: Upper Columbia River Spring-run Chinook Salmon ESU (accessible) | Upper Columbia River Steelhead DPS (accessible)

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	7/1/2010	6/30/2011	Completed	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. Fish monitoring assistance (summer 2010)	7/1/2010	9/30/2010	Inactive	Terraqua will provide up to 9 field crew personnel including as many as 4 crew leaders to participate with the USFWS in fish sampling at 56 restoration project control and treatment sites during the summer of 2010.
Deliverable: C. Fish monitoring assistance		9/30/2010	Inactive	See the Deliverable Specification above

M: 157. Collect/Generate/Validate Field and Lab Data

Title: 9.9 Entiat IMW - Status/Trend - Habitat Monitoring (Fast Track)

Description: Terraqua will assist in the implementation of project effectiveness monitoring in the Entiat River under the ISEMP program. This work will include: monitoring of habitat/channel/riparian/macroinvertebrate conditions using ISEMP protocols at an annual panel of twenty-five (25) randomly located reference sites used for comparison of watershed status and trends with sites in the restoration project area. This work also includes data entry and storage.

Deliverable Specification: Quality controlled raw data and quality controlled summarized habitat data with GPS locations, will be entered and stored in Microsoft Access databases known as Automated Template Modules (ATMs) previously provided by NOAA Fisheries. Data will be uploaded by June 30, 2011 to NOAA Fisheries using the ATM and notice will be provided to BPA and Terraqua, Inc. when the data has been uploaded. The contractor will be responsible for all quality assurance/quality control steps necessary to ensure that data is properly collected and entered into the ATM.

Planned Metrics:
 * Primary R, M, and E Focal Area : Tributary Habitat
 * Primary R, M, and E Type : Status and Trend Monitoring

Primary Focal Species: Chinook - Upper Columbia River Spring ESU | Steelhead - Upper Columbia River DPS

Country: US **NPCC Subbasin:** ENTIAT

State: WA **HUC5 Watershed:** ENTIAT RIVER

County: CHELAN **HUC6 Name:** ENTIAT RIVER/MUD CREEK

Salmonid ESUs Present: Upper Columbia River Spring-run Chinook Salmon ESU (accessible) | Upper Columbia River Steelhead DPS (accessible)



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	7/1/2010	6/30/2011	Completed	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. Conduct habitat monitoring	7/1/2010	9/30/2010	Inactive	Monitor channel/riparian/macroinvertebrate conditions using ISEMP habitat protocols at an annual panel of twenty-five (25) randomly located sites in the Entiat IMW project area.
C. Participate in annual training with WDOE	6/1/2011	6/30/2011	Inactive	Participate in up to 5 days of field training with WDOE habitat crews in advance of the 2009 field season. Included within this training will be any revisions to the field manual and may include training in any database advancements that may have occurred since spring of 2008.
D. Data entry and summary	10/1/2010	3/31/2011	Inactive	Synthesize data, summarize data, and store data in data management system. Data summaries from this task will be reported in a single report described in WE N.157 Task 9.11.
Deliverable: E. Final survey data		6/30/2011	Inactive	<i>See the Deliverable Specification above</i>

N: 157. Collect/Generate/Validate Field and Lab Data

Title: 9.10 Entiat IMW - Status/Trend - Fish Monitoring (Fast Track)

Description: Terraqua will assist in the implementation of project effectiveness monitoring in the Entiat River under the ISEMP program. This work will include: monitoring of fish abundance using ISEMP protocols at an annual panel of twenty-five (25) randomly located reference sites used for comparison of watershed status and trends with sites in the restoration project area. This work also includes data entry and storage.

Deliverable Specification: Quality controlled raw data and quality controlled summarized habitat data with GPS locations, will be entered and stored in Microsoft Access databases known as Automated Template Modules (ATMs) previously provided by NOAA Fisheries. Data will be uploaded by June 30, 2011 to NOAA Fisheries using the ATM and notice will be provided to BPA and Terraqua, Inc. when the data has been uploaded. The contractor will be responsible for all quality assurance/quality control steps necessary to ensure that data is properly collected and entered into the ATM.

Planned Metrics:
 * Primary R, M, and E Focal Area : Population Status
 * Primary R, M, and E Type : Status and Trend Monitoring
 * Secondary R, M, and E Type : Action Effectiveness Research

Primary Focal Species: Chinook - Upper Columbia River Spring ESU | Steelhead - Upper Columbia River DPS

Country: US **NPCC Subbasin:** ENTIAT

State: WA **HUC5 Watershed:** ENTIAT RIVER

County: CHELAN **HUC6 Name:** ENTIAT RIVER/MUD CREEK

Salmonid ESUs Present: Upper Columbia River Spring-run Chinook Salmon ESU (accessible) | Upper Columbia River Steelhead DPS (accessible)

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	7/1/2010	6/30/2011	Completed	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. Conduct fish monitoring at annual panel sites	7/1/2010	9/30/2010	Inactive	Monitor fish abundance using ISEMP snorkeling protocols at an annual panel of twenty-five (25) randomly located sites in the Entiat River subbasin.
C. Data entry and summary	10/1/2010	5/31/2011	Inactive	Synthesize data, summarize data, and store data in data management system. Data summaries of from this task will be reported in a single report described in WE N.157 Task 9.11.
Deliverable: D. Final survey data		6/30/2011	Inactive	<i>See the Deliverable Specification above</i>

O: 157. Collect/Generate/Validate Field and Lab Data

Title: 9.11 Methow - Status/Trend - Habitat Monitoring (Fast Track)

Description: Terraqua will assist in the implementation of status and trend monitoring in the Methow River. This work will include: monitoring of habitat/channel/riparian/macroinvertebrate conditions using ISEMP protocols at an annual panel of fifty (50) randomly located sites within the subbasin and conduct repeat sampling at five (5) of these sites. This work includes data entry and storage, and preparation of a brief technical summary report that will include results from status and trend habitat and snorkeling work by Terraqua under this release.



Deliverable Specification: Submit in Microsoft Word format electronically

Quality controlled raw data and quality controlled summarized habitat/channel/riparian/macroinvertebrate conditions data with GPS locations, will be entered and stored in Microsoft Access databases known as Automated Template Modules (ATMs) previously provided by NOAA Fisheries. Data will be uploaded by June 30, 2011 to NOAA Fisheries using the ATM and notice will be provided to BPA and Terraqua, Inc. when the data has been uploaded. The contractor will be responsible for all quality assurance/quality control steps necessary to ensure that data is properly collected and entered into the ATM.

Planned Metrics:
 * Primary R, M, and E Focal Area : Tributary Habitat
 * Primary R, M, and E Type : Status and Trend Monitoring

Primary Focal Species: Chinook - Upper Columbia River Spring ESU | Steelhead - Upper Columbia River DPS

Country: US **NPCC Subbasin:** METHOW

State: WA **HUC5 Watershed:** MIDDLE METHOW RIVER

County: OKANOGAN **HUC6 Name:** LOWER MIDDLE METHOW RIVER

Salmonid ESUs Present: Upper Columbia River Spring-run Chinook Salmon ESU (accessible) | Upper Columbia River Steelhead DPS (accessible)

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	7/1/2010	6/30/2011	Completed	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. Conduct habitat monitoring in the Entiat IMW project area.	7/1/2010	9/30/2010	Inactive	Monitor channel/riparian/macroinvertebrate conditions using ISEMP protocols at fifty (50) randomly-located status and trend sites (plus 5 sites to be repeat sampled) in the Methow subbasin.
C. Data entry and summary	10/1/2010	3/31/2011	Inactive	Synthesize data, summarize data, and store data in data management system.
D. First draft report	10/1/2010	3/31/2011	Inactive	Produce a draft field data summary report that will include results from ISEMP status and trend habitat and fish monitoring in the Methow and Entiat subbasins. This report will present status and trend data (collected under this work element and WE L. 157 Task 9.9 and WE M. 157 Task 9.10) and will briefly summarize these data in the context of the Upper Columbia Implementation Strategy goals and objectives for these two subbasins. This report will not include in-depth analysis of data as that will be accomplished by other ISEMP contractors at different scheduling under related contracts.
E. Final draft report	4/1/2011	6/30/2011	Inactive	Produce a final field data synthesis report that will include results from ISEMP status and trend habitat and fish monitoring in the Methow and Entiat subbasins. This report will present status and trend data (collected under this work element and WE L. 157 Task 9.9 and WE M. 157 Task 9.10) and will briefly summarize these data in the context of the Upper Columbia Implementation Strategy goals and objectives for these two subbasins. This report will not include in-depth analysis of data as that will be accomplished by other ISEMP contractors at different scheduling under related contracts.
Deliverable: F. Final field data and summary report		6/30/2011	Inactive	<i>See the Deliverable Specification above</i>

P: 162. Analyze/Interpret Data

Title: 9.12 Downstream Migrant Trapping Analysis



Description:

In FY09, we investigated fully three of the following five areas of scientific uncertainty, and partially investigated the remaining two areas. In FY10, we will complete investigations of the two remaining areas by running simulations that were not afforded under the FY09 budget and we will follow up with additional work in the third area that has come to light during work performed under the first release. Results from FY09 and FY10 work will be incorporated into one of the manuscripts described in WE E. 141 Task 9.2 ISEMP Program Reporting.

There are five areas of scientific uncertainty associated with downstream migrant trapping programs all of which call into question the validity of population estimates of outmigrating salmonids. Bonneville Power Administration and the co-managers of salmonid populations in the Columbia Basin rely heavily on these estimates of population abundance making the accuracy of these estimates of paramount importance to the management of salmonids in the Columbia Basin.

The five areas of scientific uncertainty include: 1) the relative performance of common statistical/ sampling designs; 2) the performance of common catch expansion methods; 3) the potential effect that daily variability in trap efficiencies has on abundance estimates; 4) the feasibility of using PIT tag-based abundance, survival and migrant timing estimates as an alternative to rotary screw trapping; and 5) exploring potential multivariate relationships for modeled trap efficiency methods.

This work element will investigate each of these areas of uncertainty and will produce recommendations on how to improve downstream migrant trapping programs to provide more defensible population abundance estimates. These five areas of uncertainty will be investigated in five steps. Our approach will be collaborative and will seek the participation of ISEMP partners involved in trapping programs in the Upper Columbia, Snake and John Day Rivers to have the broadest applicability. In addition, the results will be incorporated into the ISEMP Juvenile Trapping Protocol (2008) to provide recommendations to trapping programs on methods that may better meet assumptions with estimating abundance and improve precision of abundance estimates.

These five analysis steps were generated after the review of: Trapping programs throughout the Columbia River Basin (Tussing 2007); The Trinity River Trapping Program; The Implementation Strategy for the Wenatchee River Subbasin Monitoring (Nelle and Ward 2008); Recent trapping reports from the Wenatchee and Entiat River Basins; ISEMP Data Analysis Priorities for Fiscal Year 2008 (Beasley 2008); Recent research proposals for the use of PIT Tag Interrogation Systems (PTIS); The Field Manual of Scientific Protocols for Downstream, Migrant Trapping within the Upper Columbia River Monitoring Strategy (Tussing 2008); and discussions with ISEMP science staff and Upper Columbia River downstream migrant practitioners.

In Step 1, we will perform a series of comparisons on the relative performance of common statistical/ sampling designs to provide trapping programs with information that will help them maximize the precision of juvenile production estimates relative to river characteristics, migrant abundance, trap efficiencies, and effort (cost). In Step 2 we will build upon datasets and efforts from Step 1 and we will assess the performance of common catch expansion methods. In Step 3 we will explore the potential effect that daily variability in trap efficiencies has on abundance estimates. In Step 4 we will scope the feasibility of using PIT tag-based abundance, survival and migrant timing estimates as an alternative to rotary screw trapping; and in Step 5 we will address the Modeled Trap Efficiency approach by exploring potential multivariate relationships for modeled trap efficiency methods.

Deliverable Specification:

Figures, tables and text will be generated from the remaining tasks of this analysis to support the development of at least one of the three manuscripts to be developed under WE E. 141 Task 9.2 ISEMP Program Reporting.

This manuscript(s) will include, in addition to results from FY09, results from the following FY10 tasks:

- 1) Determination of the feasibility of replacing a network of rotary screw traps with PIT Tag interrogations systems (PTIS) in the Wenatchee and Entiat Rivers and alternative designs for status and trend monitoring of population abundance, survival and migrant timing and an informed project design for implementation to test its actual effectiveness. Comparisons will be made at the cost level of existing smolt trapping operations in terms of annually recurring labor and equipment costs. The abundance estimates using the PIT tag based design at a range of array detection efficiencies will be compared to the current trapping program results. PTIS related costs will be based upon recent in-river PIT tagging efforts and local expert opinion on the ability to effectively capture the desired numbers of fish in tributaries and mainstems.
- 2) Identification of methods to generate a more robust multivariate trap efficiency model from a single trapping season, e.g., where data exists for potential covariates from sources such as water quality/climate monitoring that is performed within watersheds, to increase the precision of abundance estimates and reduce the reliance on a number of untested assumptions.
- 3) Continued investigation of the potential effect that daily variability in trap efficiencies has on abundance estimates.

Planned Metrics:

- * Primary R, M, and E Focal Area : Tributary Habitat
- * Primary R, M, and E Type : Status and Trend Monitoring
- * Secondary R, M, and E Type : Action Effectiveness Research
- * Secondary R, M, and E Focal Area : Systemwide

Primary Focal Species:

Chinook - All Populations | Steelhead - All Populations



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Project Coordination	7/1/2010	12/30/2010	Inactive	Coordinate with ISEMP staff, trapping program partners, and biometrician on project design and establish performance measures.
B. Analyze the performance of sampling designs, catch-expansion methods, trap-efficiency variability	7/1/2010	9/30/2010	Inactive	Compare performance measures of sampling designs and related estimators, for two levels of effort using both migrant universes. Use previously established migrant universes to compare performance of multiple catch expansion methods and determine their overall effect on performance measures (e.g. population abundance estimates). Use previously established migrant universes and hypothesized daily variability in capture efficiencies to: 1) explore the performance of common abundance estimators; 2) determine if alternative release methods increase precision of performance measures.
C. Final reporting materials	9/30/2010	12/30/2010	Inactive	Prepare final reporting materials (figures, tables, and text) to support the development of a manuscript summarizing FY09 and FY10 ISEMP downstream migrant trapping analyses.
Deliverable: D. Downstream Migrant Trapping Analysis		6/30/2011	Inactive	<i>See the Deliverable Specification above</i>

Q: 119. Manage and Administer Projects

Title: 9.13a Project Management (Fast Track)
Description: Manage the project. Also covers administrative work in support of on-the-ground efforts and in support of BPA's programmatic requirements such as metric reporting, financial reporting (e.g., accruals), and development of an SOW package (includes draft SOW, budget, spending plan, and property inventory).
Deliverable Specification: Submit next year's SOW, Budget, and Property Inventory to the BPA COTR. The SOW should include location information (latitude and longitude) for those work elements that require it. If contractor or contractor's organization takes longer than 30 days to sign the contract, the contractor will need to send this funding package to BPA more than 90 days before the end of the current contract.

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Manage the project.	7/1/2010	6/30/2011	Inactive	Manage personnel allocation and workflow, accounting, and file management to insure that this release is properly carried out.
B. Accrual - Submit September estimate to BPA	8/15/2010	9/10/2010	Inactive	Provide BPA with an estimate of contract work that will occur prior to September 30 but will not be billed until October 1 or later. Generally, this should be done by September 10.
C. Prepare FY08 SOW, budget, etc	3/1/2011	4/30/2011	Inactive	Provided funding is made available for additional work as defined under this current SOW, and additional protocol testing is required, submit a new SOW (via Pisces), budget, etc., no later than 90 days prior to the expiration of the current contract (i.e., June 30, 2010).
D. Funding Package - Conduct internal review (e.g., Supervisor or Interagency)	3/1/2011	4/30/2011	Inactive	If necessary, submit next year's SOW and Budget for internal contractor review before submitting to BPA. Assuming this review takes 30 days, start this milestone 120 days before the end of the current contract.
Deliverable: E. Funding Package - Submit draft to COTR		6/30/2011	Inactive	<i>See the Deliverable Specification above</i>

Inadvertent Discovery Instructions

BPA is required by section 106 of the National Historic Preservation Act (NHPA) to consider the effects of its undertakings on historic properties (16 USC 470). Prior to approving the expenditure of funds or conducting a federal undertaking, BPA must follow the section 106 process as described at 36 CFR 800. Even though BPA has completed this process by the time an undertaking is implemented, if cultural materials are discovered during the implementation of a project, work within the immediate area must stop and the significance of the materials must be evaluated and adverse effects resolved before the project can continue (36 CFR 800.13(b)(3)). The Inadvertent Discovery of Cultural Resources Procedure form outlines the steps to be taken and notifications to be made. If the undertaking takes place on tribal lands (16 USC 470w), BPA must also "comply with applicable tribal regulations and procedures and obtain the concurrence of the Indian tribe on the proposed action" (36 CFR 800.13(d)).

Inadvertent Discovery of Cultural Resources Procedure form:
<http://www.efw.bpa.gov/IntegratedFWP/InadvertentDiscoveryProcedure.pdf>

Terraqua, Inc.

Release #5, Master Agreement #27480 (CR-120982)
 BPA Project 2003-017-00: Integrated Monitoring Pilot
 July 1, 2010 through June 30, 2011

		Qty	Unit	Unit Cost	COST
1	PERSONNEL SERVICES				\$522,390

<i>Administrative Scientist II, Michael Ward</i>					
Task 9.1	Coordination/QC	(b)(4)	hours	@	(b)(4)
Task 9.2	ISEMP Program Reporting		hours	@	
Task 9.3	Wenatchee/Entiat Strategy Updates		hours	@	
Task 9.5	Protocol Development		hours	@	
Task 9.13	Proj. Mgt. and Reporting		hours	@	

<i>Administrative Scientist I, Nelle and Sloan</i>					
Task 9.1	Coordination/QC		hours	@	(b)(4)
Task 9.2	ISEMP Program Reporting		hours	@	
Task 9.3	Wenatchee/Entiat Strategy Updates		hours	@	
Task 9.4	Pilot Subbasin Coord.		hours	@	
Task 9.5	Protocol Development		hours	@	
Task 9.6a	Macroinvertebrate Analysis		hours	@	
Task 9.9	Entiat Status/Trend Habitat		hours	@	
Task 9.11	Methow Status/Trend Habitat		hours	@	
Task 9.13	Proj. Mgt. and Reporting		hours	@	

<i>Senior Scientist I, Tussing and Ward field</i>					
Task 9.1	Coordination/QC	(b)(4)	hours	@	(b)(4)
Task 9.5	Protocol Development		hours	@	
Task 9.8	Entiat Effectiveness Fish		hours	@	
Task 9.9	Entiat Status/Trend Habitat		hours	@	
Task 9.10	Entiat Status/Trend Fish		hours	@	
Task 9.11	Methow Status/Trend Habitat		hours	@	
Task 9.12	Downstream Migrant Trapping Analysis		hours	@	

<i>Scientist I</i>					
Task 9.1	Coordination/QC		hours	@	(b)(4)
Task 9.5	Protocol Development		hours	@	
Task 9.6b	Macroinvertebrate Analysis		hours	@	
Task 9.7	Entiat Effectiveness Habitat		hours	@	
Task 9.8	Entiat Effectiveness Fish		hours	@	
Task 9.9	Entiat Status/Trend Habitat		hours	@	
Task 9.10	Entiat Status/Trend Fish		hours	@	
Task 9.11	Methow Status/Trend Habitat		hours	@	

<i>Technican III</i>					
Task 9.7	Entiat Effectiveness Habitat		hours	@	(b)(4)
Task 9.8	Entiat Effectiveness Fish		hours	@	
Task 9.9	Entiat Status/Trend Habitat		hours	@	
Task 9.10	Entiat Status/Trend Fish		hours	@	
Task 9.11	Methow Status/Trend Habitat		hours	@	

Technician II

Task 9.7	Entiat Effectiveness Habitat	(b)(4)	hours	@
Task 9.8	Entiat Effectiveness Fish	(b)(4)	hours	@
Task 9.9	Entiat Status/Trend Habitat	(b)(4)	hours	@
Task 9.10	Entiat Status/Trend Fish	(b)(4)	hours	@
Task 9.11	Methow Status/Trend Habitat	(b)(4)	hours	@

(b)(4)

Technican I

Task 9.7	Entiat Effectiveness Habitat	(b)(4)	hours	@
Task 9.8	Entiat Effectiveness Fish	(b)(4)	hours	@
Task 9.9	Entiat Status/Trend Habitat	(b)(4)	hours	@
Task 9.10	Entiat Status/Trend Fish	(b)(4)	hours	@
Task 9.11	Methow Status/Trend Habitat	(b)(4)	hours	@

2 Travel \$61,093

Airfare

Task 9.1	EAT to Portland, OR or other loc. in OR/WA/	(b)(4)	RT	@
Task 9.2	Wenatchee to Portland, OR or other loc. in C	(b)(4)	RT	@
Task 9.4	EAT to Portland, OR or other loc.in OR/WA/I	(b)(4)	RT	@
Task 9.5	Redding, CA to Portland, OR or other loc. In O	(b)(4)	RT	@
Task 9.8	Redding, CA to Wenatchee, WA	(b)(4)	RT	@
Task 9.12	Redding, CA to Seattle, WA or other loc. In C	(b)(4)	RT	@

(b)(4)

Rental car and parking

Task 9.1	SEA or PDX (NOAA/BPA)	(b)(4)	RT	@
Task 9.2	Portland, OR or other loc.in OR/WA/ID	(b)(4)	RT	@
Task 9.4	Portland, OR or other loc.in OR/WA/ID	(b)(4)	RT	@
Task 9.5	Portland, OR or other loc.in OR/WA/ID	(b)(4)	RT	@
Task 9.12	Redding, CA toSeattle, WA or other loc. In C	(b)(4)	RT	@

Per Diem (Lodging plus M&IE)

Task 9.1	Portland, OR	(b)(4)	day/night	@
Task 9.1	Seattle, WA	(b)(4)	day/night	@
Task 9.2	Portland, OR or other loc.in OR/WA/ID	(b)(4)	day/night	@
Task 9.2	Other loc.in OR/WA/ID	(b)(4)	day/night	@
Task 9.4	Portland, OR or other loc.in OR/WA/ID	(b)(4)	day/night	@
Task 9.5	Leavenworth, WA	(b)(4)	day/night	@
Task 9.5	Portland, OR or other loc.in OR/WA/ID	(b)(4)	day/night	@
Task 9.4	Other loc.in OR/WA/ID	(b)(4)	day/night	@
Task 9.6b	Missoula, MT	(b)(4)	day/night	@
Task 9.7	Washington Cities	(b)(4)	day/night	@
Task 9.7	Washington Cities (M&IE only)	(b)(4)	day/night	@
Task 9.8	Washington Cities	(b)(4)	day/night	@
Task 9.8	Washington Cities (M&IE only)	(b)(4)	day/night	@
Task 9.9	Washington Cities	(b)(4)	day/night	@
Task 9.9	Washington Cities (M&IE only)	(b)(4)	day/night	@
Task 9.10	Washington Cities	(b)(4)	day/night	@
Task 9.10	Washington Cities (M&IE only)	(b)(4)	day/night	@
Task 9.11	Washington Cities	(b)(4)	day/night	@
Task 9.11	Washington Cities (M&IE only)	(b)(4)	day/night	@
Task 9.12	Seattle, WA	(b)(4)	day/night	@

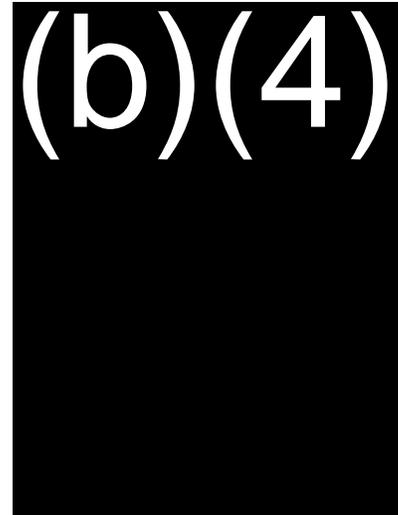
(b)(4)

Field Trailer Rental (in lieu of approx. 466 nights of lodging)

split 1/2 am	Rental trailer (Entiat)	(b)(4)	months	@
Task 9.11	Rental trailer (Methow)	(b)(4)	months	@

(b)(4) /month (b)(4)
(b)(4) /month (b)(4)

	<i>POV Mileage to/from</i>	(b)(4)		
Task 9.1	Wenatchee from Peshastin, WA	(b)(4)	trip	@
Task 9.1	Entiat, Wa. from Peshastin, WA	(b)(4)	trip	@
Task 9.1	Entiat, Wa. from Riverside, WA	(b)(4)	trip	@
Task 9.2	Wenatchee, WA from Wauconda, WA	(b)(4)	trip	@
Task 9.4	EAT from Peshastin, WA	(b)(4)	trip	@
Task 9.5	Leavenworth, WA from Riverside, WA	(b)(4)	trip	@
Task 9.5	Red Bluff, CA to Redding, CA	(b)(4)	trip	@
Task 9.6b	Missoula, MT from Riverside, WA	(b)(4)	trip	@
Task 9.6a	Wenatchee from Riverside, WA	(b)(4)	trip	@
Task 9.7	RT to/among sites in Entiat Subbasin from Riverside	(b)(4)		
Task 9.8	RT to/among sites in Wen/Entiat Subbasin from Riverside	(b)(4)		
Task 9.9	RT to/among sites in Wenatchee Subbasin from Riverside	(b)(4)		
Task 9.10	RT to/among sites in Wenatchee Subbasin from Riverside	(b)(4)		
Task 9.11	RT to/among sites in Wenatchee Subbasin from Riverside	(b)(4)		
Task 9.12	Red Bluff, CA to Redding, CA	(b)(4)	trip	@



3 Standard Daily Field Equipment Rate \$25,110

Task 9.7	Field Days	(b)(4)	days	@	(b)(4)	/day	(b)(4)
Task 9.8	Field Days	(b)(4)	days	@	(b)(4)	/day	(b)(4)
Task 9.9	Field Days	(b)(4)	days	@	(b)(4)	/day	(b)(4)
Task 9.10	Field Days	(b)(4)	days	@	(b)(4)	/day	(b)(4)
Task 9.11	Field Days	(b)(4)	days	@	(b)(4)	/day	(b)(4)

4 SUPPLIES \$21,808

	Qty	Unit	Unit Cost	COST
split 1/3 9.7 Field Paper for data sheets	(b)(4)	ream	(b)(4)	(b)(4)
split 1/3 9.7 Measuring Tape (50m)	(b)(4)	each	(b)(4)	(b)(4)
split 1/3 9.7 Measuring Tape refill (100m)	(b)(4)	each	(b)(4)	(b)(4)
split 1/3 9.7 Hand Level	(b)(4)	each	(b)(4)	(b)(4)
split 1/3 9.7 Binders	(b)(4)	each	(b)(4)	(b)(4)
split 1/3 9.7 Note paper refills	(b)(4)	each	(b)(4)	(b)(4)
split 1/3 9.7 Notebooks	(b)(4)	each	(b)(4)	(b)(4)
split 1/3 9.7 Densimeter (convex)	(b)(4)	each	(b)(4)	(b)(4)
split 1/3 9.7 Macroinvertebrate containers	(b)(4)	case	(b)(4)	(b)(4)
split 1/3 9.7 Surveyor Rod	(b)(4)	each	(b)(4)	(b)(4)
split 1/3 9.7 Denatured alcohol	(b)(4)	gal.	(b)(4)	(b)(4)
split 1/3 9.7 Kicknet	(b)(4)	each	(b)(4)	(b)(4)
split 1/3 9.7 Miscellaneous	(b)(4)		(b)(4)	(b)(4)
Task 9.4 Conference fees	(b)(4)	conference @	(b)(4)	(b)(4)
split 1/2 9.8 Drysuits	(b)(4)	each	(b)(4)	(b)(4)
Task 9.8 Misc snorkel equipment (fleece suits, replace masks, gloves, hoods, snorkel etc.)				\$1,594
split 1/3 9.7 Temperature data loggers	(b)(4)	each	(b)(4)	(b)(4)
split 1/3 9.7 Data logger - repair old hand held	(b)(4)	each	(b)(4)	(b)(4)
split 1/3 9.7 Solar Pathfinder	(b)(4)	each	(b)(4)	(b)(4)
split 1/3 9.7 Flow meters	(b)(4)	each	(b)(4)	(b)(4)
split 1/3 9.7 Drift nets accessories	(b)(4)	each	(b)(4)	(b)(4)
split 1/3 9.7 Alkalinity test kits	(b)(4)	each	(b)(4)	(b)(4)
split 1/3 9.7 Conductivity Meters	(b)(4)	each	(b)(4)	(b)(4)
split 1/2 9.8 Electrofishing Unit	(b)(4)	each	(b)(4)	(b)(4)
split 1/2 9.8 Electrofishing gear - electrode	(b)(4)	each	(b)(4)	(b)(4)
split 1/2 9.8 Electrofishing gear - ring and pack	(b)(4)	each	(b)(4)	(b)(4)
split 1/2 9.8 Electrofishing gear - battery and wiring	(b)(4)	each	(b)(4)	(b)(4)

split 1/2 9.8 Seine net
Task 9.2 Printing Costs

(b) each

(b)(4)

(b)(4)

5 SUBCONTRACTS

\$99,334

Task 9.6a Rhithron Associate, Inc. lab fees
Task 9.6b Rhithron Associate, Inc. lab fees
Task 9.12 ESSA, Inc.
Task 9.11 Landowner Outreach/WRS, Inc.
Task 9.11 Coordination/Methow Monitoring Coord
Task 9.11 Data Administration

(b)(4) samples @
samples @
hours @
season @
season @
season @

(b)(4)

6 Administrative Expense (10% of dir. exp. excl. travel)

\$12,114

Task 9.6a Rhithron Associate, Inc. lab fees
Task 9.6b Rhithron Associate, Inc. lab fees
Task 9.12 ESSA, Inc.
Task 9.11 Landowner Outreach/WRS, Inc.
Task 9.11 Coordination/Methow Monitoring Coord
Task 9.11 Data Administration
split 1/5 all Supplies

(b)(4) samples @
samples @
hours @
season @
season @
season @

(b)(4)

7 BUDGET TOTAL

\$741,848

Terraqua, Inc.
Release #4, Master Agreement #27480
BPA Project 2003-017-00: Integrated Monitoring Pilot
July 1, 2009 through June 30, 2010

	Qty	Unit	Unit Cost	COST
1 PERSONNEL SERVICES				\$351,273
<i>Administrative Scientist II, Michael Ward</i>				
Task 8.1 Coordination/QC	(b)(4)	hours @	(b)(4)	(b)(4)
Task 8.3 Wenatchee/Entiat Strategy Updates	(b)(4)	hours @	(b)(4)	(b)(4)
Task 8.5 Protocol Development	(b)(4)	hours @	(b)(4)	(b)(4)
Task 8.10 Proj. Mgt. and Reporting	(b)(4)	hours @	(b)(4)	(b)(4)
<i>Administrative Scientist I</i>				
Task 8.1 Coordination/QC	(b)(4)	hours @	(b)(4)	(b)(4)
Task 8.2 Implementation Tracking	(b)(4)	hours @	(b)(4)	(b)(4)
Task 8.3 Wenatchee/Entiat Strategy Updates	(b)(4)	hours @	(b)(4)	(b)(4)
Task 8.4 Pilot Subbasin Coord.	(b)(4)	hours @	(b)(4)	(b)(4)
Task 8.5 Protocol Development	(b)(4)	hours @	(b)(4)	(b)(4)
Task 8.6 Macroinvertebrate Analysis	(b)(4)	hours @	(b)(4)	(b)(4)
Task 8.7 Entiat Effectiveness	(b)(4)	hours @	(b)(4)	(b)(4)
Task 8.10 Proj. Mgt. and Reporting	(b)(4)	hours @	(b)(4)	(b)(4)
Task 8.11 ISEMP Annual Program Review	(b)(4)	hours @	(b)(4)	(b)(4)
<i>Senior Scientist I</i>				
Task 8.1 Coordination/QC	(b)(4)	hours @	(b)(4)	(b)(4)
Task 8.5 Protocol Development	(b)(4)	hours @	(b)(4)	(b)(4)
Task 8.12 Downstream Migrant Trapping Analysis	(b)(4)	hours @	(b)(4)	(b)(4)
<i>Scientist I</i>				
Task 8.1 Coordination/QC	(b)(4)	hours @	(b)(4)	(b)(4)
Task 8.5 Protocol Development	(b)(4)	hours @	(b)(4)	(b)(4)
Task 8.6 Macroinvertebrate Analysis	(b)(4)	hours @	(b)(4)	(b)(4)
Task 8.7 Entiat Effectiveness	(b)(4)	hours @	(b)(4)	(b)(4)
Task 8.8 Field Survey Assistance	(b)(4)	hours @	(b)(4)	(b)(4)
Task 8.9 Repeat Sampling	(b)(4)	hours @	(b)(4)	(b)(4)
<i>Technician III</i>				
Task 8.7 Entiat Effectiveness	(b)(4)	hours @	(b)(4)	(b)(4)
Task 8.8 Field Survey Assistance	(b)(4)	hours @	(b)(4)	(b)(4)
Task 8.9 Repeat Sampling	(b)(4)	hours @	(b)(4)	(b)(4)
<i>Technician II</i>				
Task 8.7 Entiat Effectiveness	(b)(4)	hours @	(b)(4)	(b)(4)
Task 8.8 Field Survey Assistance	(b)(4)	hours @	(b)(4)	(b)(4)
Task 8.9 Repeat Sampling	(b)(4)	hours @	(b)(4)	(b)(4)
<i>Technician I</i>				
Task 8.7 Entiat Effectiveness	(b)(4)	hours @	(b)(4)	(b)(4)
Task 8.8 Field Survey Assistance	(b)(4)	hours @	(b)(4)	(b)(4)
Task 8.9 Repeat Sampling	(b)(4)	hours @	(b)(4)	(b)(4)
2 Travel				\$44,145
<i>Airfare</i>				
Task 8.1 EAT to Portland, OR or other loc. in OR/WA.	(b)(4)	RT @	(b)(4) /RT	(b)(4)

Task 8.4	EAT to Portland, OR or other loc.in OR/WA/	(b)(4)	RT	@	(b)(4)	/RT	(b)(4)
Task 8.5	Redding, CA to Portland, OR or other loc. In	(b)(4)	RT	@	(b)(4)	/RT	(b)(4)
Task 8.12	Redding, CA toSeattle, WA or other loc. In C	(b)(4)	RT	@	(b)(4)	/RT	(b)(4)
<i>Rental car and parking</i>							
Task 8.1	SEA or PDX (NOAA/BPA)	(b)(4)	RT	@	(b)(4)	/RT	(b)(4)
Task 8.4	Portland, OR or other loc.in OR/WA/ID	(b)(4)	RT	@	(b)(4)	/RT	(b)(4)
Task 8.5	Portland, OR or other loc.in OR/WA/ID	(b)(4)	RT	@	(b)(4)	/RT	(b)(4)
Task 8.12	Redding, CA toSeattle, WA or other loc. In C	(b)(4)	RT	@	(b)(4)	/RT	(b)(4)
<i>Per Diem (Lodging plus M&IE)</i>							
Task 8.1	Portland, OR	(b)(4)	day/night	@	(b)(4)	/day	(b)(4)
Task 8.1	Seattle, WA	(b)(4)	day/night	@	(b)(4)	/day	(b)(4)
Task 8.4	Portland, OR or other loc.in OR/WA/ID	(b)(4)	day/night	@	(b)(4)	/day	(b)(4)
Task 8.5	Leavenworth, WA	(b)(4)	day/night	@	(b)(4)	/day	(b)(4)
Task 8.5	Portland, OR or other loc.in OR/WA/ID	(b)(4)	day/night	@	(b)(4)	/day	(b)(4)
Task 8.6	Missoula, MT	(b)(4)	day/night	@	(b)(4)	/day	(b)(4)
Task 8.7	Washington Cities	(b)(4)	day/night	@	(b)(4)	/day	(b)(4)
Task 8.7	Washington Cities (M&IE only)	(b)(4)	day/night	@	(b)(4)	/day	(b)(4)
Task 8.8	Washington Cities	(b)(4)	day/night	@	(b)(4)	/day	(b)(4)
Task 8.8	Washington Cities (M&IE only)	(b)(4)	day/night	@	(b)(4)	/day	(b)(4)
Task 8.9	Washington Cities	(b)(4)	day/night	@	(b)(4)	/day	(b)(4)
Task 8.9	Washington Cities (M&IE only)	(b)(4)	day/night	@	(b)(4)	/day	(b)(4)
Task 8.12	Seattle, WA	(b)(4)	day/night	@	(b)(4)	/day	(b)(4)

<i>Field Trailer Rental</i>							
Task 8.7	Rental of trailer (in lieu of approx. 199 nights	(b)(4)	months	@	(b)(4)	/month	(b)(4)

<i>POV Mileage to/from</i>							
Task 8.1	Wenatchee from Peshastin, WA	(b)(4)	trip	@	(b)(4)		
Task 8.1	Entiat, Wa. from Peshastin, WA	(b)(4)	trip	@			
Task 8.1	Entiat, Wa. from Riverside, WA	(b)(4)	trip	@			
Task 8.4	EAT from Peshastin, WA	(b)(4)	trip	@			
Task 8.5	Leavenworth, WA from Riverside, WA	(b)(4)	trip	@			
Task 8.5	Red Bluff, CA to Redding, CA	(b)(4)	trip	@			
Task 8.6	Missoula, MT from Riverside, WA	(b)(4)	trip	@			
Task 8.6	Wenatchee from Riverside, WA	(b)(4)	trip	@			
Task 8.7	RT to/among sites in Entiat Subbasin from Riverside	(b)(4)					
Task 8.8	RT to/among sites in Wen/Entiat Subbasin from Riverside	(b)(4)					
Task 8.9	RT to/among sites in Wenatchee Subbasin from Riverside	(b)(4)					
Task 8.12	Red Bluff, CA to Redding, CA	(b)(4)	trip	@			

3 Standard Daily Field Equipment Rate \$12,690

Task 8.7	Field Days	(b)(4)	days	@	(b)(4)		
Task 8.8	Field Days	(b)(4)	days	@			
Task 8.9	Field Days	(b)(4)	days	@			

4 SUPPLIES \$9,425

	Qty	Unit	Unit Cost	COST
split 95% £ Field Paper for data sheets	(b)(4)	ream	(b)(4)	(b)(4)
split 95% £ Measuring Tape (50m)	(b)(4)	each		
split 95% £ Measuring Tape refill (100m)	(b)(4)	each		
split 95% £ Hand Level	(b)(4)	each		
split 95% £ Binders	(b)(4)	each		
split 95% £ Note paper refills	(b)(4)	each		
split 95% £ Notebooks	(b)(4)	each		
split 95% £ Densimeter (convex)	(b)(4)	each		

split 95% { Macroinvertebrate containers
split 95% { Surveyor Rod
split 95% { Denatured alcohol
split 95% { Kicknet
split 95% { Miscellaneous
split 95% { Taxes and Shipping at 15%

(b) case
(b) each
(b) gal.
(b) each

(b)(4)

Task 8.4 Conference fees

(b) conference @

Task 8.8 Drysuits

(b) each

Task 8.8 Misc snorkel equipment (fleece suits, replace masks, gloves, hoods, snorkel etc.)

(b)(4)

5 SUBCONTRACTS

\$52,084

Task 8.6 Rhithron Associate, Inc. lab fees

(b)(4) samples @

Task 8.12 ESSA, Inc.

(b)(4) hours @

(b)(4)

6 Administrative Expense (10% of dir. exp. excl. mileage/per diem)

\$6,151

Task 8.6 Rhithron Associate, Inc. lab fees

(b)(4) samples @

Task 8.12 ESSA, Inc.

(b)(4) hours @

split 1/3b Supplies

(b)(4)

7 BUDGET TOTAL

\$475,768



TERRAQUA INC.

TERRESTRIAL AND AQUATIC APPLIED RESEARCH AND MANAGEMENT

MEMORANDUM

TO: Lisa Gang, BPA
 FROM: Michael Ward, Vice-President of Terraqua, Inc.
 DATE: June 11, 2009
 SUBJECT: Rate schedule for inclusion in new Master Agreement

Please accept these revisions to the hourly rate Schedule, consistent with your observations of the CPI. Please note that I have provided columns for Release 4 and "Personnel Category Clarification" that may not be appropriate for inclusion in the new master agreement but are included to help you understand the transition from rates-by-person to rates-by-Personnel Category.

		Release 4, Contract 0027480	New Master Agreement		
Personnel Category	Personnel Category Clarification	FY2009	FY2010	FY2011	FY2012
Administrative Scientist III	Not anticipated for FY09; may use this category between FY10-FY12	(b) (4)			
Administrative Scientist II (Michael B. Ward)	This category consistent with Contract 0027480				
Administrative Scientist I	This category first used in FY07, Release 2.				
Senior Scientist II	Not anticipated for FY09; may use this category between FY10-FY12				
Senior Scientist I	This category first used in FY08, Release 3.				
Scientist I	This category first used in FY08, Release 3.				
Technician III	This category first used in FY08, Release 3.				
Technician II	This category consistent with Contract 0027480				
Technician I	This category consistent with Contract 0027480				

Lisa, I have revised the following language to make it more absolutely consistent with BPI 22.1.3. Please use the following language in our Master Agreement. “Charges for personnel performing technical and related services include wages, indirect costs, general and administrative expense, and profit. Overhead costs comprise (b)(4) of personnel charges.”

cc: Holiday Sloan, Terraqua, Inc.

Sent by email on June 17, 2009