

**BEFORE THE BOARD OF COUNTY COMMISSIONERS
OF LEWIS COUNTY, WASHINGTON**

IN RE:

APPROVAL OF A SUPPLEMENT TO PERSONAL SERVICES)
AGREEMENT BETWEEN LEWIS COUNTY, ACTING AS THE)
FISCAL AGENT FOR THE CHEHALIS RIVER BASIN FLOOD)
AUTHORITY, AND ANCHOR QEA FOR FISH STUDIES)
NOT TO EXCEED \$427,500.06; AND AUTHORIZATION)
FOR THE DIRECTOR OF COMMUNITY DEVELOPMENT)
TO SIGN THE SAME ON BEHALF OF LEWIS COUNTY)

RESOLUTION NO. 11 - 262

WHEREAS, the 2012/2013 Washington State budget appropriated \$1.32 million to the Chehalis River Basin Flood Authority (Flood Authority) and Lewis County acts as the fiscal agent for the Flood Authority; and

WHEREAS, Anchor QEA and Lewis County, acting as the fiscal agent for the Chehalis River Basin Flood Authority entered into an Agreement for certain fish studies related to water detention in the Chehalis River Basin as authorized and approved by Resolution No. 10-206 on August 16, 2010; and

WHEREAS, work under that contract had not been completed prior to the end of the 2010/11 state biennium, June 30, 2011 and said work still needs to be completed; and

WHEREAS, the Flood Authority, at the July 21, 2011 meeting, approved this Supplement to Personal Services Agreement contract between Lewis County and Anchor QEA for the completion of the scope of work under the original Agreement and has included an additional scope of work related to fish enhancement (Supplement to Personal Services Agreement and Enhancement Scope of Work attached); and

WHEREAS, the Supplement to Personal Services Agreement and Enhancement Scope of Work has been reviewed by the Board of County Commissioners, and it appears to be in the best interest to enter into a Supplemental Agreement with Anchor QEA upon the recommendation of the Flood Authority (see attached Executive Summary) to assist the Chehalis River Basin Flood Authority perform such fish studies as may be appropriate; **NOW THEREFORE**

BE IT RESOLVED that the Board of County Commissioners accepts and approves the Supplement to Personal Services Agreement with Anchor QEA as recommended by the Flood Authority, not to exceed \$427,500.06, and authorizes the Director of Community Development to sign the same on behalf of Lewis County, acting as the fiscal agent for the Flood Authority.

DONE IN OPEN SESSION this 8 day of August, 2011.

APPROVED AS TO FORM:
JONATHAN MEYER, Prosecuting Attorney

By: [Signature]
Deputy Prosecuting Attorney

ATTEST:

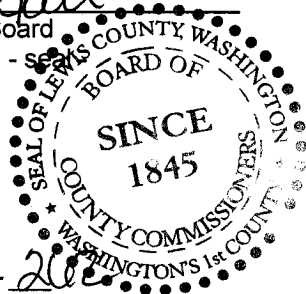
[Signature]
Karri Muir, Clerk of the Board

**BOARD OF COUNTY COMMISSIONERS
LEWIS COUNTY, WASHINGTON**

[Signature]
Chairman

[Signature]
Member

Absent
Member



RESOLUTION NO. 11- 262

ATTACHMENT TO RESOLUTION 11-262

SUPPLEMENT TO PERSONAL SERVICES AGREEMENT BETWEEN LEWIS COUNTY, ACTING AS FISCAL AGENCY FOR THE CHEHALIS RIVER BASIN FLOOD CONTROL AUTHORITY AND ANCHOR QEA –EXECUTED ON AUGUST 19, 2010 AND APPROVED BY THE LEWIS COUNTY COMMISSIONERS BY RESOLUTION NO. 10-206

SUPPLEMENT TO PERSONAL SERVICES AGREEMENT

Between

LEWIS COUNTY

and

ANCHOR QEA

THIS AGREEMENT is made and entered into by and between LEWIS COUNTY, WASHINGTON, herein referred to as "County", acting as the fiscal agency for the Chehalis River Basin Flood Authority ("Flood Authority") and Anchor QEA, 1423 3rd Avenue, Suite 300, Seattle, WA 98101, herein referred to as "Anchor" or "Contractor".

IT IS THE PURPOSE OF THIS SUPPLEMENTAL AGREEMENT to modify the Period of Performance, scope of work and compensation for services as originally agreed to by the parties in the original Agreement entered into on August 19, 2010 between Lewis County and Anchor to provide consulting services to assist the Flood Authority in fish studies related to upstream water detention for flood control in the Chehalis River Basin, consistent with the Proposal submitted by Anchor in response to a Request for Proposals offered by the County and opened on July 12, 2010, and the scope of work and budget submitted by Anchor for the same, as attached hereon and included within the original Agreement as entered into on the above date.

The Period of Performance as set forth in the original Agreement executed by the parties anticipated completion of the original Scope of Work prior to June 30, 2011. However, the Contractor was not able to complete the tasks prior to the end of June due to circumstances beyond control of the Contractor, and the State of Washington has appropriated funds in the 2012 Capital Budget to complete the tasks consistent with the Scope of Work contained within the original Agreement, with completion no later than the end of December 2011. Also, additional work has been approved by the Flood Authority and funded under the current state budget. This additional work is covered in this Supplement as shown in Attachment "C" and includes development of an enhancement plan and additional data collection and analysis.

THEREFORE, IT IS MUTUALLY AGREED THAT:

Statement of Work:

Anchor shall furnish the necessary personnel, equipment, material and/or services and otherwise do all things necessary for or incidental to, the performance of the work set forth in

the original Agreement scope of work attached hereon as Attachment "A," as included in the original Agreement entered into by both parties on August 19, 2010, with the exception of the Period of Performance which shall be amended and extended by this Supplemental Agreement. In addition, Anchor shall furnish the necessary personnel, equipment, material and/or services and otherwise do all things necessary for or incidental to, the performance of the work set forth in the Enhancement Scope of Work attached hereon as Attachment "C".

Ownership of Items Produced: All writings, programs, data, public records or other materials prepared by the Contractor and/or its consultants or subcontractors, in connection with the performance of any contract shall be the sole and absolute property of the County on behalf of the Chehalis Basin Flood Authority. The Contractor is not liable for any reuse of these materials except as it relates to this project.

Period of Performance:

Subject to all other provisions, the original Agreement was to have ended no later than June 30, 2011. The following language shall amend and replace the language contained within the Period of Performance clause contained within the original Agreement:

Subject to its other provisions, the period of performance of this Supplemental Agreement shall commence with the signing by both parties and be completed as agreed no later than December 31, 2011, but may be modified or extended by mutual agreement, provided that such agreement shall be in writing and signed by both parties.

All other provisions of the original Agreement shall remain in full force and effect. All provisions of the original Agreement included within the original scope of work, as shown in the attached Attachment "A", and the Enhancement Scope of Work, as shown in the attached Attachment "C", shall be completed as agreed on or before December 31, 2011.

Payment:

Compensation for the work provided in accordance with this Supplemental Agreement shall be as set forth in the original Agreement, and included therein as Attachment "B" of the original Agreement. No additional payment shall be made for work included within the original Agreement under this Supplemental Agreement in excess of the total payment for services under the original Agreement (maximum total compensation for under the original Agreement remains \$900,000, with \$188,485.06 unexpended and available to complete the tasks identified in the original Agreement). Additional compensation for additional work as contracted under the Enhancement Scope of Work, as attached as Attachment "C", shall not exceed \$239,015. Total compensation for work under the original and supplemental agreements combined shall not exceed \$1,139,015.

Future Non-Allocation of Funds:

If sufficient funds are not appropriated or allocated for payment under this Supplemental Agreement for any future fiscal period, the County, acting as the lead agency for the Flood Authority, will not be obligated to make payments for services or amounts incurred after the end of the current calendar year. No penalty or expense shall accrue to the County in the event this provision applies.

Modifications:

Either party may request changes in this Agreement. Any and all agreed modifications shall be in writing, signed by each of the parties, and effective on the latter date of execution by the respective parties.

Original Agreement to Remain in Full Force:

With the exceptions of the Period of Performance, additional tasks included in the Enhancement Scope of Work and compensation for the same as agreed by the parties and modified by mutual consent with the execution of this Supplemental Agreement, all other conditions and terms of the original Agreement entered into by the parties on [date of original agreement] shall remain in full force and effect.

Severability:

If any term or condition of this Supplemental Agreement or the application thereof to any person(s) or circumstances is held invalid, such invalidity shall not affect other terms, conditions or applications which can be given effect without the invalid term, condition or application. To this end, the terms and conditions of said contract are declared severable.

IN WITNESS WHEREOF, the parties have executed this Supplemental Agreement.

Lewis County Contract Manager

Robert A. Johnson, Director of
Community Development
2025 NE Kresky Ave.
Chehalis, WA 98532
(360) 740-2606

Date: _____

LEWIS COUNTY

By: _____
Robert A. Johnson

Date: _____

Contractor Program Manager

Anchor QEA
Robert Montgomery
720 Olive Way, Suite 1900
Seattle, WA 98101
(206) 287-9130

ANCHOR QEA

By: _____
Robert Montgomery

Attachment "A"

Chehalis River Basin Fish Studies Scope of Services -- Anchor QEA

**The scope of services shall be as agreed in the original Agreement
executed on August 19, 2010.**

Scope of Work

Working with the assumptions described in the Introduction, the following tasks are proposed to evaluate potential fish impacts. These tasks are described below in more detail.

- **Task 1: Review Existing Fish and Habitat Data**
- **Task 2: Meetings and Project Management**
- **Task 3: Hydraulics and Hydrology** – to predict changes in streamflow and sediment transport and large woody debris (LWD) recruitment; to inform other analyses
- **Task 4: Water Quality** – to predict the changes in water temperature and dissolved oxygen under different alternatives and inform the habitat simulation modeling
- **Task 5: Fish Habitat Availability Modeling Using PHABSIM** – to predict the changes in available habitat provided under different alternatives, including various flow release scenarios and ramping rates
- **Task 6: Fish Population Modeling using SHIRAZ** – to characterize the magnitude and significance of species-specific changes to fish population productivity, abundance, and spatial distributions due to the watershed changes resulting from the proposed facilities
- **Task 7: Report Preparation**
- **Task 8: Data and Model Transfer Workshop**

1 Task 1: Review Existing Fish and Habitat Data

The Anchor QEA Team will conduct a thorough review of all available resources providing information on fisheries resources and habitat conditions in the Chehalis River basin. Fish information on species/run distributions, life history characteristics (e.g., age of outmigration for juvenile salmon and age of return for adult salmon), timing, and population size will be gathered. Available habitat data to characterize substrate, habitat types, cover, and side channels will be compiled and reviewed. Anchor QEA will review available reports and publications. In addition, we will contact organizations and local fish biologists working in the watershed that may have useful data for the study.

The information compiled and reviewed in this effort will be used to inform all subsequent tasks, including the identification of analysis reaches in the PHABSIM fish habitat modeling and SHIRAZ fish population modeling.

2 Task 2: Meetings and Project Management

A key element to the successful and efficient completion of the proposed studies will be to stay on track with the vision of the Flood Authority through regular communication in meetings, calls, and correspondence. At the outset, the Anchor QEA Team proposes to meet with the Flood Authority to clarify assumptions, identify data sources and reports, address initial questions and decision points, and establish a schedule for subsequent meetings and calls. Additional meetings and calls will occur with the full group or sub-groups, as appropriate, depending on the topics to be discussed. The Anchor QEA Team will also provide monthly updates explaining the activities underway in each study element. These updates will include brief descriptions of important preliminary findings.

3 Task 3: Hydrology and Hydraulics Studies

Hydrologic and hydraulics studies are proposed to determine the post-reservoir stream flow regime in the Chehalis River and South Fork Chehalis River, estimate the flood reduction benefits along the two rivers, evaluate the sediment transport regime pre- and post-reservoir, and evaluate the potential change in LWD recruitment and transport. The proposed tasks are as follows.

3.1 Reservoir Operations Studies

A reservoir routing model will be prepared to confirm the performance of the two reservoirs in reducing flooding, to test different operational scenarios and sizes of reservoirs, and to determine the outflow throughout the year. We will analyze two sets of reservoir configurations: the reservoir configurations described in the February 2009 EES report and a set of reservoir configurations to be selected by the Flood Authority with input from Anchor QEA. The reservoir configurations described in the EES report would be operated for flood control and hydropower with instream flow augmentation in the downstream river systems resulting primarily from hydropower releases. The second set of reservoir configurations could include flood storage only or flood storage with late summer instream flow augmentation.

We propose to use a reservoir operations model such as RiverWare or HEC-ResSim. RiverWare is primarily used by the U.S. Bureau of Reclamation in multi-objective reservoir planning and operations and HEC-ResSim is commonly used by the U.S. Army Corps of Engineers (Corps) for the same type of applications. HEC-ResSim software is free while a license agreement is required for RiverWare. We will discuss the choice of model with the Flood Authority and select the most appropriate one to use.

We will use the reservoir operations model for reservoir routing and hydrologic routing of flows down the Chehalis River and South Fork Chehalis River systems. We propose to assemble a model for the entire Chehalis River Basin down to the point of interest at the U.S. Geological Survey (USGS) gaging station near Porter at River Mile (RM) 33. The model will include the Newaukum and Skookumchuck Rivers and local inflow. Operational rules and information for Skookumchuck Dam will be requested from the Corps.

The input to the reservoir operations model will be a time series of streamflow developed for each reservoir site along with inflow from other streams and rivers downstream of the proposed reservoirs. Regression equations have been developed by the Corps that relate flow in different reaches of the Chehalis River and tributaries during floods. The equations were developed using the network of USGS gaging stations that exist in the basin. We will utilize those regression equations to develop time series of flow in the upper Chehalis and South Fork Chehalis rivers, and downstream tributaries that are multi-year to test the performance of the reservoirs during both flood and non-flood time frames.

The reservoir operations models also use hydrologic routing routines to simulate attenuation in floodplain areas and calculate timing of peak runoff through the Chehalis River system. We will calibrate the routing parameters in the models for the Chehalis River from the site of the proposed reservoirs to the Chehalis River at Porter gage by comparing attenuation observed from gaging records and by using the HEC-RAS unsteady flow model that has been developed for the Chehalis River basin first by P.I.E., then by the Corps, and now by NHC. The use of that model is described in the Hydraulic Analyses section.

The model will test the operational scenarios agreed to by the Flood Authority. The reservoir operations model will also be used to optimize the operations of the reservoirs for a given reservoir size, hydropower operations and desired instream flow regime. The output from the model will be daily time series of flow at selected sites within the Chehalis River basin. Flow statistics will be prepared that will provide information needed for the fisheries, sediment, and woody debris recruitment analyses. The statistics will include flow duration curves by month and recurrence intervals of high flows (annual to 100-year floods).

We also propose to establish simple stream gaging stations that will provide a record of streamflow geographically closer to the proposed reservoir sites. Gaging stations that consist only of pressure transducers and data loggers housed in plastic pipes will be installed at two locations that are also being analyzed in the instream flow analysis. Gage height data will be collected throughout the time period for this study. The gaging stations can remain and collect data after this study is complete. We plan to

collect two sets of streamflow measurements at the gaging sites to assist in determining the relationship of flows at the sites to downstream gages. A complete calibration of the gage will not be possible because of time and budget constraints.

3.2 Hydraulic Analyses

A HEC-RAS model of the Chehalis River exists that is being used by a Federal Emergency Management Agency (FEMA) contractor (NHC) to route flow through the river basin and estimate flood levels. The model is being run in an unsteady flow mode to account for the large volume of floodplain storage that exists along the Chehalis River. Anchor QEA proposes to use the model to confirm the estimates of flood reduction from proposed flood retention facilities and to provide estimates of water levels in the Chehalis River and off-channel areas. The existing model will be modified to represent post-project conditions for alternatives considered. The reservoir operations model will only perform hydrologic routing and not hydraulic calculations. Hydrologic output from the reservoir model will be input to the HEC-RAS model. The HEC-RAS model will estimate the resulting flow and stage in the Chehalis River. Rating curves at selected sites will be calculated using output from the hydraulic model. Frequency analyses of flow and stage at selected sites will be calculated for pre- and post-reservoir conditions. That data will be used in the instream flow analysis.

The accuracy of the current calibration of the HEC-RAS model will be assessed through a review of existing flow and high water data. Moreover, data collected for the PHABSIM model will also be used to calibrate the model at the range of flows important to the analyses. That data will include water depth, flow, and velocity at selected cross-sections for three flows.

3.3 Geomorphic, Sediment and Large Woody Debris Evaluation

The reservoirs have the potential to change the sediment transport regime in the Chehalis River and South Fork Chehalis River. Capturing high flows will reduce flooding but will also reduce the rate and volume of sediment transport and alter the magnitude and location of erosion along the rivers. The net effect may be beneficial or detrimental with respect to future management issues or instream habitat for salmonids and other species.

A geomorphic and sediment transport study is proposed for the Chehalis River and South Fork Chehalis River for the reach extending above the reservoirs to the USGS gage at Porter. Using existing data, a preliminary geomorphic evaluation will be performed to provide reach-scale site assessments of the river, which will include evaluation of current and historic channel locations and patterns, potential sediment input areas, likely floodplain connectivity, geomorphic or geologic constraints, and potential significant sediment and large woody debris input areas. The river will be delineated into preliminary reaches with similar geomorphic and hydrologic conditions, such as slope, channel type or classification, floodplain connectivity, channel migration character, and wood and sediment regime (production, transport, or aggrading). The reach delineation will compile all existing and collected data and will be documented in a GIS database.

These evaluations will allow us to develop an informed site reconnaissance plan that will confirm findings of the evaluations and collect new data in specific areas where those data will best aid in answering the questions posed by this study. Preliminary reaches may be modified as additional analyses are conducted following site reconnaissance. The geomorphic reconnaissance will be completed for critical sections identified during the preliminary assessment and will include field review of river conditions, review of floodplain connectivity, and review of LWD recruitment and collection areas. During the geomorphic reconnaissance, visual identification of characteristic sediment size within critical reaches will be noted and mapped. This information will be used to inform the sediment transport evaluation.

The HEC-RAS model will also be used to evaluate changes to instream and floodplain hydrodynamics from proposed flood retention facilities. Water velocity, water depth, and bottom shear stress predicted in the model will be used to evaluate sediment transport potential within critical reaches. Sediment transport potential will be calculated and plotted as a function of flow rate at

each cross-section in the model within critical reaches using analytical calculations. A comparison of pre- and post-reservoir hydraulic and sediment transport conditions will be performed to estimate the effect of proposed alternatives on sediment transport in the system. A review of sediment budget information will be conducted to evaluate the body of information available within the project area. This review will include gravel mining studies, forest practices evaluations or environmental reviews, and other instream flow or sediment related studies. Flow routing from the HEC-RAS model will also be used to inform the habitat simulation module in the PHABSIM model discussed in Task 5.

Potential source areas and distribution of LWD within the project length for existing conditions will be identified from available data and geomorphic field reconnaissance. An evaluation of impacts from proposed retention facilities to recruitment and accumulation of LWD will be completed using results from the geomorphic assessment and hydraulic and hydrodynamic evaluations.

4 Task 4: Water Quality Studies

The objective of the water quality studies is to determine the impacts of the proposed structure on the primary water quality parameters of concern in the Upper Chehalis River, which are dissolved oxygen (DO), temperature, and fecal coliform. The approach proposed here integrates the use of existing data with additional data collection to develop and calibrate water quality and temperature models for the proposed structures as well as for downstream reaches of the Chehalis River. The water quality and temperature modeling efforts will inform the fish habitat assessment and help quantify the habitat changes from proposed management actions.

4.1 Water Quality and Temperature Modeling

The hydraulic and sediment transport analyses proposed in the previous section will be supplemented with water quality modeling. For this purpose, we are proposing the use of water quality simulation modules in HEC-RAS and the Dynamic Reservoir Simulation Model (DYRESM) for simulating heat budgets in the proposed structure. DYRESM is a one-dimensional hydrodynamic model that is widely used for predicting the vertical distribution of temperature, salinity, and density in lakes and reservoirs (e.g., Gal et al. 2003¹; Hipsey 2007²). The numerical model simulates surface exchanges of heat, mass, and momentum; surface mixing; and deep mixing. If water quality concerns in the proposed reservoir are to be considered, additional water modeling can be accomplished through the CAEDYM model, which is the water quality counterpart of DYRESM. The overall approach is summarized as:

- Spatial changes in water quality under background (existing) conditions assessed through water quality and sediment transport capabilities in HEC-RAS. Loads of suspended solids and DO will be specified using existing data and also through focused data collection efforts proposed in this document.
- Reservoir temperature variations (including stratification) will be captured by the DYRESM model. The reservoir water levels, inflows, and outflow release information used in the DYRESM model will be based on the scenarios selected for evaluation in the reservoir operation model (HEC-ResSim or Riverware) proposed under Task 3. Temperature-DO relationships will be used to specify DO concentration to HEC-RAS if the CAEDYM model is not used.
- Water quality data will be used to establish background and stormflow loads to the system, in order to calibrate the water quality and temperature models.

The temperature and DO information from these water quality analyses will inform the habitat simulation module in the PHABSIM model.

¹Gal, G., Imberger, J., Zohary, T., Antenucci, J.P., Anis, A. & Rosenberg, T. 2003 Simulating the thermal dynamics of Lake Kinneret. *Ecol. Model.* 162, pp. 69-86.

²Hipsey, M.R. 2007. Water Quality Modeling of West Seti Hydropower Reservoir Using DYRESM-CAEDYM. Center for Water Research, University of Western Australia, Nedlands, Australia.

To the extent that slow-flowing reaches with localized water quality issues are identified, modeling efforts can be focused to answer specific questions. For instance, if thermal stratification in the deeper reaches of the Chehalis River is an issue, then a DYRESM model can be developed for the deeper portions to address temperature and DO changes.

4.2 Current Water Quality Data Available

Monthly water quality data is available at five WDOE stations in the Upper Chehalis, two of which are long-term stations at Dryad (RM 98) and Porter (RM 33) respectively. Continuous temperature data are available for summer periods from 2001 to the present at the Dryad and Porter stations. In the South Fork Chehalis River, continuous temperature is available at Beaver Creek Road.

Recently, a basin-wide water quality study was funded by WDOE (Green et al 2009³). Water samples collected between November 2006 through June 2009 were analyzed for DO, pH, temperature, fecal coliform, and turbidity. The study concluded that pH variations in the basin were generally small and within the state standards, thereby suggesting that algal photosynthesis and respiration cycles were not contributing to water quality deterioration. This dataset, if available, can be used to provide an estimate of background conditions.

In addition, other volunteer programs and historical Total Maximum Daily Load (TMDL) studies contain additional data that would be useful for characterizing the background conditions.

4.3 Water Quality Data Gaps

For the purposes of this study, additional data collection will be required. Suspended solids concentration entering the reaches upstream of the proposed structures will be critical to quantify the solids to the system. Moreover, temperature and DO vary diurnally. Under critical flow conditions, it will be necessary to understand these variations to assess violations from current water quality standards and also to assess the water quality changes from flows augmented through the structures proposed.

Biological activity can also affect DO levels in the stream. Control of flow releases will likely affect the habitat for attached algae in the stream (less scouring than what would occur at normal high flow in the absence of the structures). Because many of the peaks occur in winter months when algal activity is usually depressed due to the lower temperatures, this is unlikely to be an issue. Moreover, recent data collected from the basin did not show water quality deterioration from algal activity (see discussion under Current Water Quality Data Available section). Nutrient data collection is not proposed here. However, if spring flow peaks are mitigated by the proposed structure, there is a potential for algal blooms that can adversely affect water quality (i.e., DO and pH). In order to evaluate these effects, additional water quality parameters including nutrients (ammonia, particulate and dissolved inorganic phosphorus), and chlorophyll-a data will be required, but this work is not included in this proposal.

4.4 Proposed Water Quality Data Collection

The following surveys are proposed for temperature, DO, and other water quality parameters:

- Deployment of continuous data loggers for temperature at the headwaters, and at the confluence of each major tributary. These locations may be augmented with additional locations that are deemed to be critical in terms of flow and fish habitat, based on field reconnaissance surveys.
- Deployment of DO probes at select critical locations identified previously.

³ Green, J., Loft, D. and Lehr, R. 2009. State-of-the-river Report for the Chehalis River Basin, 2006-2009. A Water Quality Study, Grays Harbor College, Aberdeen, WA. Internet Reference: <http://www.chehalisbasinpartnership.org/technical/State-of-the-River%20JAG%2010-11-09.pdf>

In addition to the above mentioned data collection efforts, four focused surveys are proposed under critical conditions: two each under high flow and low flow, respectively. The critical conditions survey will involve measurement of several water quality parameters including DO, pH, temperature, turbidity, coliform, and Total Suspended Solids (TSS) at the same locations as the monthly surveys. If deemed necessary, nutrients and organic carbon will also be analyzed.

The data collected will be used for the following:

- Establish solids loading to the system under high flow conditions—this will be important in identifying redistribution of solids in the presence of proposed structure; it will also be critical in the assessment of sedimentation potential within the proposed structure
- Provide assessment of coliform counts encountered under different flows
- Provide an assessment of natural variations in temperature and DO under different flow conditions
- Establish turbidity versus TSS correlations for possible future monitoring and extrapolations
- Provide calibration targets to water quality and temperature models
- Provide a basis for comparing water quality and habitat changes with and without the proposed project

5 Task 5: Fish Habitat Availability Modeling Using PHABSIM

The fish habitat availability studies described in this section have not changed from the version provided at the time of the interview. However, as described above in the assumptions, the list of species/runs to be modeled will be those with habitat suitability curves established by WDFW and WDOE. This includes: coho, fall Chinook, chum, steelhead, and resident rainbow trout.

Fish habitat studies identified to evaluate the impact of proposed flood control impoundments on the Upper and South Fork Chehalis rivers include the IFIM, or more specifically, use of the PHABSIM instream flow study sub-component of the IFIM. One prior PHABSIM instream flow study was conducted on the Upper Chehalis River by WDOE and WDFW (Caldwell et al. 2004⁴), with a study site at RM 110.9. Because the proposed dam site on the Upper Chehalis River is at RM 108.3, there is the potential to use this study for habitat evaluation of the river between the dam site and RM 100.2 where Elk Creek enters the river at Doty. Other segments of the Upper Chehalis and the South Fork Chehalis have no instream flow study sites and would require additional data collection.

Application of PHABSIM under the IFIM consists of stream reach stratification, mesohabitat mapping, study site selection, transect placement (1-dimensional hydraulic modeling) or study site boundary delineation (2-dimensional hydraulic modeling), hydraulic and topographic data collection, hydraulic model calibration, selection of fish species and habitat suitability criteria (HSC), and linkage between the channel hydraulics and HSC to compute an index between habitat area (weighted usable area—WUA, or more accurately physical habitat index [PHI]) and discharge. Depending on the issues identified in the habitat evaluation, changes in the habitat index due to project effects can be interpreted as is, adjusted by downstream flow accretion prior to interpretation, or combined with altered flow patterns over time in a habitat time series for interpretation.

⁴ Caldwell, B., J. Pacheco, H. Beecher, T. Hegy, and R. Vadas. 2004. Chehalis River Basin WRIA 22 and 23 Fish Habitat Analysis Using the Instream Flow Incremental Methodology. Prepared by the Washington Department of Ecology and the Washington Department of Fish and Wildlife. March 2004, Open File Technical Report 04-11-006.

The standard approach to PHABSIM by resource agencies in Washington has been to select one or more study sites per river reach, place between roughly four and eight 1-D transects per site, measure complete sets of depths and velocities on all transects at three different calibration flows, and use three-point velocity-discharge regression at each transect vertical to simulate velocities over the target range of flows. Our approach is based on the assumption of seven assessment reaches for analysis.

6 Task 6: Fish Population Modeling using SHIRAZ

The fish population modeling described in this section has not changed from the version provided at the time of the interview. However, as described above in the assumptions, the SHIRAZ fish population simulations will be run for three salmonid species stocks that will provide results representative of the predicted effects that could be expected for other species. Our initial recommendation is that the SHIRAZ fish population simulations be run for Chehalis spring Chinook, winter steelhead, and coho salmon.

Within the context of the IFIM general problem solving approach, PHABSIM is a specific model designed to calculate an index to the amount of microhabitat available for different life stages at different flow levels. PHABSIM has two major analytical components: stream hydraulics and life stage-specific habitat requirements. Ultimately, however, estimating the modeled effects of flow changes on the production and productivity of fish species requires the use of a habitat-based fish population simulation model.

The Anchor QEA Team proposes to use the SHIRAZ population simulation model as a primary tool to estimate changes in the production, productivity, and spatial distribution of key fish species in the Chehalis watershed that would be expected under alternative flow regimes. SHIRAZ was developed by Dr. Ray Hilborn to model current watershed conditions, and to assist in the development of conservation and restoration strategies. SHIRAZ has become widely accepted as a modeling tool, and is being used elsewhere in Washington State by the Muckleshoot Indian Tribe in Water Resource Inventory Areas (WRIAs) 8, 9, and 10, as well as by NOAA Fisheries in WRIA 7. Anchor QEA developed and used a SHIRAZ-based coho salmon population for the Deschutes River (Washington State) that was used by the Squaxin Tribe to explore habitat restoration opportunities in this watershed.

SHIRAZ is a Microsoft Excel-based model that can be run on desktop computers. Because SHIRAZ is run in Excel, all algorithms and calculations are readily accessible and can be refined as desired. The SHIRAZ model can be "built" using specific watershed habitat and salmon population data, as well as the functional relationships between salmon productivity and habitat in the watershed(s) of interest. In this way, SHIRAZ is geared specifically to the watersheds and species being assessed and avoids relying upon any underlying assumptions that may be more appropriate in different watersheds. Another advantage of building the model for the specific watershed(s) is that it will allow Anchor to work closely with local experts to maximize knowledge of the systems.

The basic model consists of functional linkages that describe how habitat indicators (such as detailed physical factors like gradient, stream width, percent pool, vegetation cover, or quantities such as rearing area or spawning area) and stochastic variables (such as year-to-year fluctuations in marine survival, river flow, temperature, and dissolved oxygen) relate to productivity and survival. Like the Ecosystem Diagnosis and Treatment (EDT) model, the mathematical construct of SHIRAZ is based on the Beverton-Holt stock recruitment model that describes the relationship between spawners and the number of progeny (adults) that survive to return to the natal river (typically before harvests). Both productivity and capacity can be

measured from empirical data using the Beverton-Holt model (Moussalli and Hilborn 1986⁵). SHIRAZ allows for multiple stocks to be investigated, including naturally produced versus hatchery fish, as well as different species.

If any data gaps are identified and can be filled during the given time of the year, we propose that additional data are collected while the Anchor Team and Tribal staff work together to define the functional relationships. The development of functional relationships is the primary way of gearing the model to the watershed(s) of interest and maximizing the site observations and ecological insights of Tribal staff and the Anchor Team. Functional relationships can be based solely on empirical data or on expert scientific opinion.

After SHIRAZ has been populated with site-specific salmon abundance and habitat data, and functional relationships have been identified, model behavior can be tested through sensitivity analyses. These sensitivity analyses are critical for determining if realistic and believable responses are generated by the model. Once satisfied that the model is generating reliable estimates, simulations can be run to predict population responses to habitat changes. At this stage, GIS maps can be very effective for understanding the spatial distribution of specific habitat features that the model predicts are major contributors to determining salmon population responses to habitat.

For the Chehalis Basin, Anchor QEA would compile existing information on abundance, productivity, and ecology of important fish species. Next, based on known or inferred functional relationships between habitat features and conditions, and life-stage-specific survival and productivity, we would develop a set of simple models to predict changes to production, productivity and distribution of selected species in the basin. The number of species considered and the number of habitat features incorporated in the models would depend on a number of factors, including species modeled, availability of existing information, and budget and timeline. It has been our experience that simple models, limited to well established functional relationships, are the most useful for this type of project.

7 Task 7: Report Preparation

The findings of the preceding study elements will be reported in one main document. The report will include the methods, results, and interpretation of the individual elements. In addition, findings will be synthesized into overall conclusions regarding the potential impacts of the two facilities and different operation scenarios. Interpretation of flow regime management considerations that reduce or intensify potential impacts will be provided.

Ten hard copies and one electronic copy of a draft report will be provided for review. It is assumed that one set of synthesized comments will be provided. Ten hard copies and one electronic copy of a final report will be provided.

8 Task 8: Data and Model Transfer Workshop

The Anchor QEA Team will provide the modeling files for the study elements. In order to explain how to use the models, a workshop will be conducted to walk through the steps of how to set up and run the models. This knowledge transfer is intended to support the Flood Authority and stakeholders conducting subsequent model runs, if desired. Written documentation of the deliverables will also be provided.

⁵ Moussalli, E., and R. Hilborn. 1986. Optimal stock size and harvest rate in multistage life history models. *Canadian Journal of Fisheries and Aquatic Sciences*. 43: 135-141.

Attachment "B"

Schedule of Compensation

The Schedule of Compensation shall be as agreed in the original Agreement executed on August 19, 2010

Attachment B: Schedule of Compensation

Fee Proposal

Billing Category	Hourly Rate	Task 1	Task 2	Task 3	Task 4	Task 5	Task 6	Task 7	Task 8	TOTAL
		Review Existing Resources	Meetings and Project Management	Hydrology and Hydraulics	Water Quality	Fish Habitat Availability Modeling	SHIRAZ Fish Population Modeling	Reporting	Data and Model Transfer Workshop	
ANCHOR QEA STAFF										
Bob Montgomery	\$197	1	32	80	6	12		12	16	159
Mike Schiewe	\$197					8	160	12	16	196
Tracy Drury	\$183		8	80	2					90
Kathy Ketteridge	\$162	8		80	32			16		136
Paul Schlenger	\$162	12	83			4	200	38	16	353
Margaret Murphy	\$162					32	40			72
Carmen Andonaegui	\$142	24	24			188	700	60		996
Pradeep Mugunthan	\$142	8	40		150			40	16	254
David Gillingham	\$125				56					56
Adam Hill	\$114			200						200
Binglei Gong	\$114	8			100			12		120
Heidi Eriksen	\$105	2						16		18
John Gaffney	\$99			120	64			8		192
Marisa Lee	\$99	8		272	56					336
Gabe Nagler	\$99				40		200			240
Linnay Trail	\$82	2	20					44	8	74
THOMAS R. PAYNE & ASSOCIATES STAFF										
Tom Payne	\$138	8	40			280		16	24	368
Mark Allen	\$101					1,050				1,050
Steve Eggers	\$89					1,050				1,050
Technicians	\$60					1,050		160		1,210
RAY HILBORN CONSULTING										
Ray Hilborn	\$200						80			80
TOTAL HOURS		81	247	832	506	3674	1380	434	96	
TOTAL LABOR COST		\$11,159	\$37,442	\$104,968	\$62,272	\$337,731	\$205,600	\$46,916	\$15,124	\$821,212
REIMBURSABLES										
Anchor QEA reimbursables		\$0	\$1,500	\$10,048	\$2,220	\$2,000	\$500	\$2,000	\$500	
Subcontractors reimbursables			\$1,000			\$58,020			\$1,000	
TOTAL REIMBURSABLES		\$0	\$2,500	\$10,048	\$2,220	\$60,020	\$500	\$2,000	\$1,500	\$78,788
TOTAL COSTS										
		\$11,159	\$39,942	\$115,016	\$64,492	\$397,751	\$206,100	\$48,916	\$16,624	\$900,000

Attachment B: Schedule of Compensation

Anchor OEA 2010 BILLING RATES

Professional Level Hourly Rates

Principal CM ⁶ /Engineer/LA ⁷ /Planner/Scientist	\$197
Senior Managing Analyst/CM/Engineer/LA/Planner/Scientist	\$183
Managing Analyst/CM/Engineer/LA/Planner/Scientist	\$162
Senior Analyst/CM/Engineer/LA/Planner/Scientist	\$142
Staff 3 Analyst/CM/Engineer/LA/Planner/Scientist	\$125
Staff 2 Analyst/CM/Engineer/LA/Planner/Scientist	\$114
Staff 1 Analyst/CM/Engineer/LA/Planner/Scientist	\$99
Technician	\$75
Senior CAD ⁸ Designer	\$105
CAD Designer	\$92
Project Assistant	\$82

Special Hourly Rates

National expert consultant	\$350
All work by a testifying expert	1.5 times professional level rate

Expense Billing Rates

Expense Rates

Computer Modeling (per hour)	\$10.00
Graphic Plots (varies with plot size)	\$3-6/sf
Mileage (per mile)	Current Federal Standard

Fee on Labor and Expense Charges

Subcontracts/subconsultants	10%
Travel and other direct costs	10%
Outsourced Field equipment & supplies	10%

This is a company confidential document.

⁶ CM = Construction Manager

⁷ LA = Landscape Architect

⁸ CAD = Computer Aided Drafting

Attachment "C"

Anchor QEA Supplement to Personal Services Agreement -- Enhancement Scope of Work

ENHANCEMENT SCOPE OF WORK

1. Chehalis River Mainstem and Tributaries Comprehensive Salmon Habitat Enhancement Plan Development

As the second largest river system in the State of Washington, the Chehalis River supports numerous species and runs of salmon. Current conditions in the watershed limit fisheries production. Limiting factors for salmon include blocked habitat from fish passage blockages (e.g., impassable culverts); floodplain conditions (e.g., incised channels, drainage and filling of wetlands); streambed substrate (e.g., mass wasting, low large woody debris levels); riparian conditions (e.g., tree canopy loss); water quality (e.g., high water temperature, low dissolved oxygen); and water quantity (e.g., low summer baseflows) in the mainstem Chehalis River.

This scope of work is for the preparation of the Comprehensive Salmon Habitat Enhancement Plan for the upper mainstem Chehalis River (river miles [RMs] 33 to 118) and associated tributaries (Water Resource Inventory Area [WRIA] 23) that would identify potential opportunities to improve habitat conditions. The scope of work will be completed in two tasks. In Task 1, steps will be completed to compile reports containing relevant information for developing the Salmon Habitat Enhancement Plan, collect new data for identifying potential opportunities, and identify potential habitat enhancement opportunities. Task 2 will develop and apply criteria to prioritize the identified habitat enhancement opportunities and prepare the Comprehensive Salmon Habitat Enhancement Plan. The work will build off of the Chehalis River Basin Fish Study currently underway for the Chehalis River Basin Flood Control Authority. This scope of work describes the tasks, schedule, and budget for both tasks.

Task 1: Data Compilation, Off-Channel Delineation, and Preliminary Identification of Opportunities

To identify salmon habitat enhancement opportunities in the Chehalis River watershed, existing reports and databases will be compiled. These reports will include the WRIA 22 and 23 salmon and steelhead limiting factors report (Smith and Wegner 2001), the Chehalis Basin Salmon Habitat Restoration and Preservation Strategy for WRIs 22 and 23 (Chehalis Basin Partnership, updated 2010), Lewis County Conservation District Culvert Survey, and other recent relevant reports. Identification of available habitat data and potential enhancement opportunities will also include phone interviews/meetings with local planners and biologists. These will include any available inventories from the Weyerhaeuser Corporation, the Confederated Tribes of the Chehalis Reservation, Quinault Indian Nation, state and federal fisheries agencies, conservation districts, counties, and other sources. Existing geographic information system (GIS) layers of fish habitat and limiting factors will be compiled.

Attachment "C"

Anchor QEA Supplement to Personal Services Agreement -- Enhancement Scope of Work

This task will include the delineation of side channel and off-channel habitats in the Chehalis Basin. Restoration of side channel, wetland, and off-channel habitats can address salmon limiting factors including floodplain conditions and water quantity (e.g., increased summer flows due to slow release of runoff to the mainstem from wetlands, off-channel areas, and groundwater seeps). The distribution of side channels and existing and potential off-channel habitats will be delineated using recent and historic aerial topography and LIDAR. The photo interpretation will be conducted for the mainstem Chehalis River, the South Fork Chehalis River, the Newaukum River, the Skookumchuck River, and other major tributaries where those habitats were identified as a limiting factor. Limited ground-truthing will be conducted to verify the photo-interpretation results. The interpreted results will be prepared using GIS and compiled with other GIS layers. The side channel GIS layer that is created will include metadata describing the methods and other details of the dataset.

A workshop will be organized and convened in order for Anchor QEA to present the projects identified in Task 1 to the Flood Authority, basin fisheries biologists, and other interested stakeholders. Comments on the projects will be received with the intent to improve and further develop the projects.

Deliverables

- Memorandum summarizing enhancement opportunity review efforts, which will include a list and summary of currently identified projects and location of existing and potential off-channel habitat along the Chehalis River
- Organization and summary of workshop to review and further develop enhancement projects including compilation of comments from basin fish biologists and stakeholders on the projects

Assumptions

- Readily available aerial imagery, LiDAR, culvert inventories, and other data sets regarding enhancement projects will be compiled and used in this task

Task 2: Enhancement Opportunity Planning and Prioritization

The goal of this task is to develop specific projects or actions that comprehensively address the habitat limiting factors. This task will start by developing the potential project opportunities identified in Task 1 to a point where their relative benefits to addressing limiting factors can be assessed. The projects identified in Task 1 and reviewed in the Task 1 workshop will be revised in accordance with comments received and then analyzed to characterize the habitat limiting factor(s) addressed and the relative magnitude of potential benefits provided for each project.

Attachment "C"

Anchor QEA Supplement to Personal Services Agreement -- Enhancement Scope of Work

Anchor QEA will develop criteria and apply those to prioritize the salmon enhancement opportunities. The prioritization criteria will include physical habitat criteria, anticipated enhancement benefits relative to habitat limiting factors, and project feasibility. Possible physical habitat criteria that may be used include: extent of habitat opened to access through removal of barriers, water temperature reduction, and rearing/holding/spawning habitat created. For mainstem Chehalis River opportunities, the Shiraz modeling results of the Fish Study can be used to predict to magnitude of benefits to salmon that potential opportunities can provide. Feasibility criteria that may be used include: estimated cost, land ownership, and regulatory factors.

Anchor QEA will apply these criteria as part of this scope and identify projects, both singular and in combination, that will best fit the criteria and provide the most restoration benefit under current conditions and under future climate change conditions. A ranking by limiting factor and an overall ranking will be provided for each project or combination of projects. Estimates of implementation costs will be provided, as well as potential implementation issues for each project.

This task also includes communications and coordination with the Chehalis River Basin Flood Authority. Monthly updates will be prepared to describe the ongoing work and will include brief descriptions of important preliminary findings. In addition, team coordination, invoicing, and client meetings will be completed in this task.

The Comprehensive Salmon Habitat Enhancement Plan will report on the findings of the analysis and prioritization. The plan will present the following:

- Descriptions of potential enhancement projects, including general costs, implementation issues, and enhancement benefit
- Description of criteria used in evaluation of projects
- Ranking of projects and combinations of projects to provide the most enhancement
- Conclusions regarding overall robustness of the plan to limit effects of climate change

All new data, report figures, and GIS layers will be provided to the client in electronic format and provided in the report. The report will contain any new data created from the aerial topography and photography interpretation

Deliverables

- Work plan or scope for any field efforts
- Monthly updates describing ongoing work, bimonthly attendance at Flood Authority meetings

Attachment "C"

Anchor QEA Supplement to Personal Services Agreement -- Enhancement Scope of Work

- The Draft Salmon Habitat Enhancement Plan will be delivered electronically
- The Final Comprehensive Salmon Habitat Enhancement Plan will be delivered electronically and with 25 printed copies

Budget/Compensation

The table below shows a budget based on time and materials not to exceed the maximum without written consent.

Task	Budget
Task 1: Data Compilation, Off-Channel Delineation, and Preliminary Identification of Opportunities	\$ 76,597
Task 2: Enhancement Opportunity Planning and Prioritization	\$ 112,643
Total Budget	\$ 189,240

Compensation for work under the above section 1 shall be consistent with this budget as shown.

2. Supplemental Analyses to Support the Chehalis River Fish Study

The schedule extension for the completion of the Chehalis River Fish Study provides the opportunity to improve the study by filling data gaps and running additional analyses. This scope of work describes data collection activities to improve data inputs to the SHIRAZ model and modeling analyses to improve the interpretation of model outputs.

Task 1: Additional Sediment Analysis

The draft analysis of the effects of the potential flood control structure on the sediment transport, geomorphology, fish habitat, and large woody debris in the Chehalis River showed that there is the potential for fairly major changes to substrate composition in the river between the impoundment and the confluence with the South Fork Chehalis River. The draft analysis was based on existing landslide and cross sectional data; the results could be refined by collection of data to reflect current sediment input/storage conditions in the river upstream of the confluence with the South Fork. Recommended additional tasks include the following:

- A more detailed analysis of aerial photographs following the 2007 storm to estimate sediment delivery rates from the slides and track gravel bar growth in the river. One

Attachment "C"

Anchor QEA Supplement to Personal Services Agreement -- Enhancement Scope of Work

- day of field work will be conducted to measure slide depths (to more accurately determine volumes) and grain size distribution of soils in the slide areas.
- Collection of historic channel cross sections at bridge crossings from as-built bridge drawings. These cross sections will be re-surveyed during low water to determine changes in channel configuration under recent sediment input/flow conditions. Historic and current cross section data from the U.S. Geological Survey (USGS) stream gages will be obtained from the USGS to allow analysis of the long-term trends in channel form. River cross-sections from other agencies such as FEMA and the COE will also be obtained.
 - The updated sediment input and cross section data will be used to refine the HEC-RAS modeling of sediment transport under current conditions and the flood control and multi-purpose scenarios between the proposed impoundment and the confluence with the South Fork.
 - The results of the analysis will provide a better understanding of the effects of the structures on the channel and substrate within and downstream of the impoundment.

Deliverable

- Revised sediment analysis in Fish Study Report

Assumptions

- Historic and current cross-section data from USGS stream gages will be available from USGS, FEMA and the U.S. Army Corps of Engineers.

Task 2: Flood Authority and Fish Subcommittee Meetings; Project Management

Anchor QEA will meet every other month with the Flood Authority and one time per month with the Flood Authority's Fish Subcommittee. The Flood Authority meetings will be to provide updates on the fish study efforts. Every other month (i.e., August, October, and December) Anchor QEA will attend the regularly scheduled Flood Authority meetings held the third Thursday of the month. The Fish Subcommittee meetings will be convened to discuss data inputs regarding the salmon populations and habitat, as well as modeling assumptions and outputs of the SHIRAZ fish population model.

Deliverable

- Minutes from the Fish Subcommittee meetings will be prepared for review and acceptance among meeting participants.

Attachment "C"

Anchor QEA Supplement to Personal Services Agreement -- Enhancement Scope of Work

Assumptions

- Fish Subcommittee meetings will include non-subcommittee members who may be able to provide data or constructive input to the meeting topics.
- Anchor QEA will handle meeting logistics for the Fish Subcommittee meeting.

Budget/Compensation

Table 1 shows a budget based on time and materials, not to exceed the maximum without written consent.

Table 1
Estimated Costs

Task	Description	Budget
1	Additional Sediment Analysis	\$37,504
2	Flood Authority and Fish Subcommittee Meetings; Project Management	\$12,471
Total Budget		\$49,775

Compensation for work under the above section 2 shall be consistent with this budget as shown.

BOCC EXECUTIVE SUMMARY

Proposed Action(s): Approval of a resolution authorizing a Supplement to Personal Services Agreement between Lewis County, acting as the fiscal agent for the Chehalis River Basin Flood Authority, and Anchor QEA to complete fish studies related to upstream water detention in the Chehalis River Basin, and for additional fish enhancement studies including a fish enhancement plan and additional data collection consistent with a scope of work authorized by the Chehalis River Basin Flood Authority.

Summary prepared by: Robert A. Johnson, Director of Community Development

Date: July 26, 2011

Date of Board action: August 8, 2011

Summary of proposal(s):

An appropriation in the 2012/2013 Washington State budget authorized and set aside \$1.32 million funding for the Flood Authority which may be used for administrative costs, studies, consultants and facilitators as necessary to formulate and prioritize potential flood control projects within the Chehalis River Basin and in formation of a flood district.

Anchor QEA has been under contract with the Flood Authority for fish studies related to upstream detention and the Supplement to Personal Services Agreement will contract for additional data gathering, a fish habitat enhancement plan, and a report on opportunities for fish enhancement in the river. The original Agreement was approved on August 16, 2010 by Resolution No. 10-206. The Supplemental Agreement will authorize the following:

- Completion of the fish studies under the original Agreement and scope of works. \$188,485.06
- Salmon Enhancement Plan Development. \$189,240.00
- Additional Analysis, meetings and project management. \$49,775.00
 - TOTAL: \$ 427,500.06

Acting as the fiscal agency for the Flood Authority, this resolution will authorize a contract between Anchor QEA and Lewis County, not to exceed \$427,500.06 in addition to payment received for work performed prior to July 1, 2011, to complete the fish studies, prepare a habitat enhancement plan, perform additional data gathering, prepare reports and provide other deliverables as may be agreed, consistent with the 2011 state budget appropriation and the submitted scope of work and budget submitted by Anchor QEA and as authorized and recommended by the Flood Authority at the July 21, 2011 Flood Authority meeting.

The period of performance under this contract will be from the date the agreement is executed through June 30, 2012, but may be extended to June 30, 2013 by mutual agreement.

Result of disapproval: In the event the Board does not approve the above actions, the Office of Financial Management will not release funding for the Anchor QEA supplemental contract, and no fish studies or enhancement studies will be conducted.

Staff recommendation: Approve the resolution and authorize the Director of Community Development to sign a personal services supplemental agreement so that an amount not to exceed \$427,500.06 can be funded from the Washington State 2012/2013 budget appropriation and managed through a contract between the Office of Financial Management and Lewis County, acting as the Lead Agency for the Flood Authority, for Anchor QEA to provide the necessary fish studies and enhancement scope of work.

Lewis County

Details of Budget or Request For Budget Amendment

Fund	122
Department	CD
Program	Flood Authority

Type of appropriation:

- Supplemental-has new offsetting revenue
- Emergency-using fund balance

Please Discuss Current Budget Uses or Describe a Need For Additional Funding

Personal service agreement for water retention and fish enhancement studies for Flood Authority

ANCITOR QEA

Use of Funds

- New Expenditure New Transfer Out or Currently Budgeted

Account Description	BARS Account Number								Amount
Professional Services	122	505	000	000	558	70	41	00	427,500
Total Use of Funds:									\$427,500

Source of Funds

- New Revenue Use of Fund Balance New Transfer In or Currently Budgeted

Account Description	BARS Account Number								Amount
Office of Financial Management	122	505	000	000	334	00	40	00	1,320,000
Total Source of Funds:									\$1,320,000

Elected / Director Robert A. Johnson

Date ##

AGENDA ITEM #: _____ RESOLUTION#: 109 BOCC MEETING DATE: August 2011

SUGGESTED WORDING FOR AGENDA ITEM: Notice Consent Discussion Hearing

Approval of a Supplement to Personal Services Agreement between Lewis County, acting as fiscal agent for the Cherokee River Basin Flood Authority, and Archer GEA for fish studies not to exceed \$427,500.00, and authorization for the Director of Community Development to sign the same on behalf of the County.

BRIEF REASON FOR BOCC ACTION: Supplement to Personal Services Agreement with Archer GEA to complete fish studies in the Cherokee River basin related to upstream deforestation, and to complete a scope of work for fish enhancement and authorization for the Director to sign the contract on behalf of the County regarding said action.

Contract approved by Flood Authority on July 21, 2011.

SUBMITTED BY: Bob Johnson PHONE: 5255 DATE SUBMITTED: 07/26/2011

CONTACT PERSON WHO WILL ATTEND BOCC MEETING: Bob Johnson

TYPE OF ACTION NEEDED:

- Approve Resolution
- Approve Ordinance (Traffic or other)
- Execute Contract / Agreement
- Other (please describe): _____
- Call for Bid / Proposals
- Bid Opening
- Notice for Public Hearing (New Provisions Recommended)

PUBLICATION REQUIREMENTS:

- Resolution referred to Clerk
- Not applicable

Hearing Date: _____
 Publish Date(s): _____
 Publication(s): EAST COUNTY JOURNAL CHRONICLE OTHER: _____

ALL AGENDA ITEMS:

Department Director / Head _____
 Chief Administrative Officer: _____
 Prosecuting Attorney: _____

EMPLOYEE ITEMS: (relating to employment, salary, benefits, discipline, union, etc.)
 Human Resources Director: _____

BANKING OR REVENUE ITEMS:

Treasurer: _____

BUDGET AND PAYROLL ITEMS:

Chief Accountant: _____
 Fiscal: _____
 Chairperson: _____
 Total Amount: \$ 427,500.00

CLERKS DISTRIBUTION OF SIGNED DOCUMENTS:

Send cover letter: _____
 (cityweb@nc.gov)
 File original: BOCC mp files
 File copy: hearing folder
 File copy: working file

Additional copies:
Bob Johnson
Pat Anderson
Doris DeLo
Doris Truitt