June 30, 2014

Carole Harrison, Administrative Manager
Cowlitz County - Health and Human Services Department
900 Ocean Beach Hwy Ste 1-B
Longview, WA 98632

Re: State Fiscal Year 2015 Final Water Quality Funding Offer List and Intended Use Plan WQC-2015-CwCoHH-00129, Water Quality Testing & Improvement at Two Cowlitz County Lakes

Dear Ms. Harrison:

The Washington State Department of Ecology (Ecology) published the State Fiscal Year 2015 (SFY15) Final Water Quality Offer List and Intended Use Plan (Final List). The SFY15 Final List identifies funding for high priority projects from three sources: the Centennial Clean Water Program (Centennial Program), the Clean Water Act Section 319 Nonpoint Source Fund (Section 319 Program), and the Washington State Water Pollution Control Revolving Fund (Revolving Fund). The Final List is available at: http://www.ecy.wa.gov/programs/wq/funding/cycles/FY2015/index.html.

I am pleased to inform you that your above referenced project is being offered funding of up to $107,271, including:

- A $107,271 grant from the Centennial Program.

This year Ecology received 89 project proposals requesting approximately $274 million in funding. To ensure that funds were directed to the highest priority projects, Ecology’s water quality specialists evaluated and scored all eligible project proposals. Scores were compiled, and a statewide priority list was developed. Projects proposed for funding are based upon the priority list, the type of project, and the funding source.

After rating and ranking all eligible proposed projects, Ecology offered approximately $202 million to 70 projects. A record of scores and evaluator comments for your project application is available through Ecology’s Administration of Grants and Loans (EAGL) system.

The final amount awarded for your project will be based on negotiations between you and Ecology regarding the project scope of work, budget, technical considerations, reasonableness of cost, and eligibility determinations.

JUL 8 2014

Environmental Health
Form: General Information

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**Project Title** [75 characters max] [COUNT WITH SPACES 66]

Water Quality Testing & Improvement at Three Cowlitz County Lakes

**Project Short Description** [500 characters max] [COUNT WITH SPACES 495]

This Lake Water Quality Testing and Improvement project will provide the data necessary to evaluate the health of the three major lakes in Cowlitz County, and to plan long-term actions by both the communities and their government agencies that will improve water quality. The work will lead to improved public access while reducing health problems that appear to be accelerating for all three lakes. The science developed will be accessible for use at other similar lakes throughout the state.

**Project Long description** [COUNT WITH SPACES 4000]

This Lake Water Quality Testing and Improvement project will provide the data necessary to evaluate the health of Silver Lake and Horseshoe Lake in Cowlitz County, and to plan long-term actions by both the communities and their government agencies that will improve natural water quality. The proposed project for which funding is requested includes:

1. Water quality data collection as prescribed by the Washington State Department of Ecology and previously sited by the Department of Fish and Wildlife,
2. The creation of weather, lake level, and inflow/outflow archives, local for each lake,
3. Scheduled Toxic Algae testing at multiple locations on each lake,
4. Lake-specific pilot projects that demonstrate the effectiveness of previously-recommended water quality improvement tasks.

The project proposal is the result of grass-roots community involvement with water quality efforts at both sites. At each lake the “trigger” is the effect of Toxic Algae, and its negative health effects and restrictions on the use of each lake, but other water quality issues (noxious invasive weeds, low cover, etc.) exist at each site. Both communities recognize their unique and diverse environment and the need to collect data and develop the science necessary to choose the management techniques and education that best fits each site. Both communities are not content to merely study, though, and have proposed to conduct pilot-project-level demonstrations of several possible restorative techniques. To that end the proposed tasks for this study include:

- Collection of water samples for laboratory testing of Total Phosphorus, Nitrate-Nitrogen and e-Coli at 8 locations on Silver Lake and 5 locations at Horseshoe Lake, with the sampling sites previously recommended by WDFW,
- In-situ testing at 20 locations at Silver Lake and 5 locations at Horseshoe Lake, again per prior WDFW siting. In each locations instruments will test for pH, Dissolved Oxygen, Water and Air Temps, TKN, Chlorophyll a, and Total Turbidity
Those laboratory and in-situ tests are proposed to be monthly from Oct-May, and bi-monthly in June, July and September. Additional data will be recorded on at least a weekly basis for rainfall, water temperature at-depth, and lake outflow.

During the summer months, Toxic Algae testing is proposed to be conducted on a weekly basis, for four Silver Lake sites and two Horseshoe Lake sites.

Pilot projects will be chosen from the recommendations of prior studies and as previously suggested by WDFW, such as native plant re-introduction, reducing the grass carp population at Silver Lake, limited introduction of mature grass carp to Horseshoe Lake, and aeration testing.

The basic goals and expectations for the project are:

1. Production of a reliable data bank in a format that is useable by water quality professionals for later analysis and making long-term mitigation, education and restoration efforts,
2. Coordination of that data with Toxic Algae testing on the lake, with enough algae and toxins data to be useful to the public and the Cowlitz Department of Health,
3. Engaging the public in the process together with all of the interested Agencies, and thereby establishing the experience and positive inertia for developing a continuing lake management plan for both lakes,
4. The expected long-term outcome for the project is the establishment of a sustainable, natural lake ecosystem, with native plants and fishery and a reasonable area of open water that can safely be used by the public for swimming, fishing and other lake activities.

Overall Goal [1,000 characters max] [COUNT WITH SPACES 990]

The long-term project goal is to improve the natural quality of the three major lakes in Cowlitz County for the public’s health and recreational benefit, minimizing the health risks posed by Toxic Algae growths, while controlling non-native noxious weeds that limit the recreational potential of each lake. Noting that maintaining lake health must be a continuous process, the immediate goal of this project is to provide the data and site-specific Pilot Project experience necessary to plan, execute and evaluate continuous improvement actions. Cowlitz County EHU requests Water Quality Grant funding to take on the collection of data prescribed by Department of Ecology. The plan also includes the addition of site-specific supporting data (e.g. rainfall, lake level, outflow) plus the coordination of toxic algae testing and other results. The equipment, process, and training developed for all three lakes, and all data collected, will be publicly available via a web site and blog.

----- Form: Scope of Work ----- (Up to 250 pts. 26%)

Task 1 Title: (50 Characters Max.) [COUNT WITH SPACES 50]

Water Laboratory Sampling and Testing, Silver Lake

Task 1 Description: (3000 Characters Max.) [COUNT WITH SPACES 2,449]

The Washington State Department of Ecology has prescribed a series of standard tests for water quality, which have been previously performed at Silver Lake. Of those tests, liquid samples are normally collected for laboratory evaluation of:

- Total Phosphorus
Nitrate - Nitrogen
• E-Coli

Since August 2012 community volunteers have regularly collected sample sets for these three tests at 8 locations that were sited with the assistance of the Washington Department of Fish & Wildlife (WDFW), transported the samples to the laboratory for testing, and collected and catalogued the results for analysis. This task continues that exact scope of work for 30 collection dates over 2 years; one collection per month from October to June, and two collections per month for July, August and September. Each sample collection date involves:

1. Collecting sample bottles from AddyLab (the nearest laboratory certified by the Washington Department of Ecology), labeling and racking of water sampling bottles.
2. Filling in tracking paperwork for AddyLab.
3. Community volunteer sample collection via private boats. A three-person sampling team is normally used, motoring to each location and taking samples using an extendable sampling pole to collect water at a 3 foot depth. WDFW previously provided the test equipment, on an irregular basis. A part of this Grant Request is to purchase a single set of similar instruments for regular use on Silver Lake and the other two Cowlitz lakes.
4. Transport of the sample bottles to AddyLab immediately after sampling. The Silver Lake – Vancouver round trip has involved 122 automobile miles and 2.5 hours of volunteer time; the Cowlitz Environmental Health Unit (EHU) Project Manager will coordinate testing at the three lakes to minimize travel trips and miles and thus greenhouse gas emissions.
5. Receive and catalog results, which involve email communication with the laboratory and entering data in Microsoft Excel. A part of the proposed scope of work is to make that data available to the public, on the Internet via a community web site and Blog.
6. With the data entered into Excel, numerical analysis and trending will be elementary, and charting of the data can be considered within this Scope of Work. Professional analysis and interpretation of the data leading to recommended long-term action is beyond the scope of this request but already being considered as a next phase by the participants.

Task 1 Goal Statement: (1,000 Characters Max.) [COUNT WITH SPACES 854]

The primary goal of performing the Laboratory Testing described above is to provide a reliable data bank with a reasonable number of data points from which water quality scientists and engineers can evaluate the health of Silver Lake, and can plan long-term actions by both the communities and their government agencies that will improve water quality.

A secondary goal of performing the sampling using community volunteers, and making the data publicly available, is to inform both local citizens and other lake users. Meeting this goal will lead to an increase in visibility of lake water quality, and encourage a local discussion and understanding of how individuals can have a positive effect, such as maintaining their septic systems, minimizing the incursion of fertilizers and grass clippings, controlling non-native plants, and boating carefully.

Task 1 Expected Outcomes: (1,000 Characters Max.) [COUNT WITH SPACES 636]

The expected short-term outcome for the laboratory testing task is to produce a reliable data bank in a format that is useable by water quality professionals for later analysis, including coordination of that data with Toxic Algae testing on the lake. The data will be used to inform the public, and to plan and evaluate short-term and long-term actions that will improve water quality. The expected long-term outcome is the establishment of a sustainable, natural lake ecosystem, with native plants and fishery.
and a reasonable area of open water that can safely be used by the public for swimming, fishing and other lake activities.

Task 1 Deliverables: (300 Characters Max.) [COUNT WITH SPACES 265]

On a semi-monthly basis in the 3 summer months, and on a monthly basis the other 9 months of the year, this task will deliver an updated chemistry testing Excel data file, which will be transmitted via email to project stakeholders, and also posted on the Internet.

Task 2 Title: (50 Characters Max.) [COUNT WITH SPACES 43]

Water In-Situ Physical Testing, Silver Lake

Task 2 Description: (3000 Characters Max.) [COUNT WITH SPACES 2,974]

The Washington State Department of Ecology has prescribed a series of standard tests for water quality, which have been previously performed at Silver Lake. Of those tests, in-situ testing is normally performed for:

- pH - Acidity
- Dissolved Oxygen
- Temperature of Water and Air
- TKN (Total Kjedahl Nitrogen-Septic Scope)
- Chlorophyll a
- Total Turbidity (Secchi Disc Depth)

Since August 2012 Washington Department of Fish and Wildlife (WDFW) personnel have participated in 3 of the 18 scheduled collection dates, measuring these 6 parameters in 20 locations at 2 depths and, until prompted by County Government officials, held the results of that limited testing within the agency. In October 2013, WDFW informed Cowlitz County and the community that they would no longer participate in Silver Lake water testing. Cowlitz Environmental Health Unit (EHU) proposes to take that testing over, and with the support of community volunteers intends to expand its scope to match the 20 locations of the laboratory testing described above, and make the results public. Cowlitz EHU will conduct slightly more testing: 30 collection dates over 2 years; one collection per month from October to June, and two collections per month for July, August and September.

The tests described above are performed, and the results recorded, while on the lake. WDFW previously transported their boat from Vancouver, launched it at Silver Lake, used their own instruments to take measurements, and recorded the data on their own paper forms. Although EHU must purchase our own instruments as a one-time cost to begin testing, the overall cost to the State is expected to be significantly reduced because the tests can be conducted concurrently with the laboratory sampling discussed above, using on-lake vessels provided by community volunteers.

The testing scope of work, assuming the purchase of the instruments required, is:

1. Using a multiple-parameter testing instrument that measures Dissolved Oxygen, pH and temperature, dip a probe into the water at each location and record results. A “HydroLab” instrument is owned by and has been used by DFW (see http://www.hachhydromet.com/web/ott_hach.nsf/id/pa_multiparameter-sondes.html). Cowlitz EHU will consider that and other instruments for purchase as an initial expense. The
costs of maintenance and calibration of the instrument is also included in the project budget estimate.

2. Using a standard Secchi Disc, measure the total turbidity of the water at each location.
3. Enter the recorded data into Microsoft Excel. A part of the proposed scope of work is to make that data available to the public, on the Internet via a community web site and Blog.
4. With the data entered into Excel, numerical analysis and trending will be elementary, and charting of the data can be considered within this Scope of Work. Professional analysis and interpretation of the data leading to a long-term action plan is beyond the scope of this project.

Task 2 Goal Statement: (1,000 Characters Max.) [COUNT WITH SPACES 959]

The primary goal of performing the In-Situ Testing described above is to provide a reliable data bank with a reasonable number of data points, from which water quality scientists and engineers can evaluate the health of Silver Lake, and can plan long-term actions by both the communities and their government agencies that will improve water quality.

A secondary goal of performing the testing with the assistance of community volunteers will be a lower-cost, more-reliable collection process that is less likely to be interrupted by the unavailability of a single person, by equipment breakdown, and by competing tasks. Making the data publicly available will also result in an increase in visibility of lake water quality, and a local discussion of how individual citizens can have a positive effect, such as maintaining their septic systems, minimizing the incursion of fertilizers and grass clippings, controlling non-native plants, and boating carefully.

Task 2 Expected Outcomes: (1,000 Characters Max.) [COUNT WITH SPACES 642]

The basic short-term outcome for the In-Situ Testing Task is simply the production of a reliable data bank in a format that is useable by water quality professionals for later analysis, including coordination of that data with Toxic Algae testing on the lake. The data will be used to inform the public, and to plan and evaluate short-term and long-term actions that will improve water quality.

The expected long-term outcome is the establishment of a sustainable, natural lake ecosystem, with native plants and fishery and a reasonable area of open water that can safely be used by the public for swimming, fishing and other lake activities.

Task 2 Deliverables: (300 Characters Max.) [COUNT WITH SPACES 266]

On a semi-monthly basis in the 3 summer months, and on a monthly basis the other 9 months of the year, this task will deliver an updated In-Situ Testing Excel data file, which will be transmitted via email to project stakeholders, and also posted on the Internet.

Task 3 Title: (50 Characters Max.) [COUNT WITH SPACES 40]

Water Laboratory Testing, Horseshoe Lake

Task 3 Description: (3000 Characters Max.) [COUNT WITH SPACES 1,293]
Similar to the Laboratory Sampling and Testing scope discussed above for Silver Lake, Cowlitz EHU proposes to collect water quality data as prescribed by the State Department of Ecology for Horseshoe Lake, which are developing the same types of access, health and use issues as have affected Silver Lake.

The same laboratory testing is proposed:
- Total Phosphorus
- Nitrate - Nitrogen
- e-Coli

Because of the smaller size and simpler shape of Horseshoe Lake, and because the lake inflow is pumped from a local river, we expect to be able to reliably test overall water quality using five sampling points. The five points have already been established by prior testing at Horseshoe Lake (guided by DOE and WDFW). The same collection schedule as on Silver Lake is proposed, 30 collection dates over 2 years; one collection per month from October to June, and two collections per month for July, August and September. Each sample collection date will use the same procedure as that developed for Silver Lake, discussed in detail in Task 1 above.

However, it should be noted that Horseshoe has access / speed restrictions, so that more time is required to transit between sampling locations. Cowlitz EHU does intend to coordinate testing among the two lakes to achieve the best efficiencies possible.

Task 3 Goal Statement: (1,000 Characters Max.) [COUNT WITH SPACES 845]

The primary goal of performing the laboratory testing described above is to provide a reliable data bank with a reasonable number of data points, from which water quality scientists and engineers can evaluate the health of Horseshoe Lake and can plan long-term actions by the community and the government agencies that will improve water quality.

A secondary goal of performing the sampling using community volunteers, and making the data publicly available, is to inform both waterfront owners and other park / lake users. Meeting this goal will lead to an increase in visibility of lake water quality, and encourage a local discussion of how both individuals and communities can have a positive effect, such as minimizing the incursion of fertilizers and grass clippings, controlling non-native plants, and managing water inflows and outflows.

Task 3 Expected Outcomes: (1,000 Characters Max.) [COUNT WITH SPACES 808]

The expected short-term outcome for the laboratory testing task is to produce a reliable data bank in a format that is useable by water quality professionals for later analysis, including coordination of that data with Toxic Algae testing on the lakes, while noting that algae blooms have been less frequent in recent years on Horseshoe Lake, that may change or become more significant if/when milfoil control is exercised. The data will be used to inform the public, and to plan and evaluate short-term and long-term actions that will improve water quality. The expected long-term outcome is the establishment of a sustainable, natural lake ecosystem, with native plants and fishery and a reasonable area of open water that can safely be used by the public for swimming, fishing and other lake activities.

Task 3 Deliverables: (300 Characters Max.) [COUNT WITH SPACES 265]
On a semi-monthly basis in the 3 summer months, and on a monthly basis the other 9 months of the year, this task will deliver an updated Chemistry Testing Excel data file, which will be transmitted via email to project stakeholders, and also posted on the Internet.

**Task 4 Title: (50 Characters Max.) [COUNT WITH SPACES 37]**

Water In-Situ Testing, Horseshoe Lake

**Task 4 Description: (3000 Characters Max.) [COUNT WITH SPACES 1,590]**

Similar to the Laboratory Sampling and Testing scope discussed above for Silver Lake, Cowlitz EHU proposes to collect water quality data as suggested by the DOE for Horseshoe Lake, which is developing the same types of access, health and use issues as have occurred on Silver Lake. The same in-situ testing is proposed:

- pH - Acidity
- Dissolved Oxygen
- Temperature of Water and Air
- TKN (Total Kjedahl Nitrogen-Septic Scope)
- Chlorophyll a
- Total Turbidity (Secchi Disc Depth)

Because of the smaller size and simpler shape of the lake, and because the lake is fed with inflow pumped from a local river, we expect to be able to reliably test overall water quality using the same five sampling points established by WDFW at Horseshoe Lake which, like at Silver Lake, were irregularly tested by WDFW in 2012 and 2103. The same collection schedule is proposed, 30 collection dates over 2 years; one collection per month from October to June, and two collections per month for July, August and September.

The tests described above are performed and the results recorded while on the lake, and the project team would use the same instrument(s) purchased as described for Silver Lake, transported on the test date. Each sample collection date will use the same procedure as that developed for Silver Lake, discussed in detail in Task 2 above.

However, it should be noted that Horseshoe has access / speed restrictions, so that more time is required to transit between sampling locations. Cowlitz EHU does intend to coordinate testing among the two lakes to achieve the best efficiencies possible.

**Task 4 Goal Statement: (1,000 Characters Max.) [COUNT WITH SPACES 859]**

The primary goal of performing the In-Situ Testing described above is to provide a reliable data bank with a reasonable number of data points, from which water quality scientists and engineers can evaluate the health of Horseshoe Lake, and can plan long-term actions by both the communities and their government agencies that will improve water quality.

A secondary goal of performing the In-Situ testing using community volunteers, and making the data publicly available, is to inform both waterfront owners and other park / lake users. Meeting this goal will lead to an increase in visibility of lake water quality, and encourage a local discussion of how both
individuals and communities can have a positive effect, such as minimizing the incursion of fertilizers and grass clippings, controlling non-native plants, and managing water inflows and outflows.

**Task 4 Expected Outcomes: (1,000 Characters Max.)**

The expected short-term outcome for the In-Situ testing task is to produce a reliable data bank in a format that is useable by water quality professionals for later analysis, including coordination of that data with Toxic Algae testing on the lakes, while noting that algae blooms have become less frequent in recent years on Horseshoe Lake, they are still present an may become more significant if/when milfoil control is exercised. The data will be used to inform the public, and to plan and evaluate short-term and long-term actions that will improve water quality. The expected long-term outcome is the establishment of a sustainable, natural lake ecosystem, with native plants and fishery and a reasonable area of open water that can safely be used by the public for swimming, fishing and other lake activities.

**Task 4 Deliverables: (300 Characters Max.)**

On a semi-monthly basis in the 3 summer months, and on a monthly basis the other 9 months of the year, this task will deliver an updated In-Situ Testing Excel data file, which will be transmitted via email to project stakeholders, and also posted on the Internet.

**Task 5 Title: (50 Characters Max.)**

Scheduled Toxic Algae Testing at Cowlitz Lakes

**Task 5 Description: (3000 Characters Max.)**

Silver Lake is faced with regular, highly visible blue-green algae (cyanobacteria) blooms and scums during the year. Horseshoe Lake has had irregular blooms very recently, but in the past five years has experienced periods during the summer when blooms were significant and extended. Only limited testing has been performed on the lakes from 2008 through 2013, and none of that testing can be correlated with prior or planned Laboratory and In-Situ water quality tests. Although none of the testing performed to date has indicated toxicity levels that approach state public health guidelines, the presence of blooms and scums has led to Tier 1 ("Caution – Toxic Algae May Be Present") and Tier 2 ("Warning – Toxic Algae Present") postings. For both lakes, Cowlitz EHU therefore proposes to take surface scum photographs and collect water samples to be tested for the presence of phytoplankton and toxicity levels, at the same frequency as the water quality testing, that is, 15 test dates per year. Noting that the summer months are most important to public health and lake access, those 15 dates would be weekly, from mid-May to Labor Day. This would allow test data to be available to the public from Memorial Day through mid-September, prime use periods for all three lakes.

Although surface photographs are planned for every water quality sampling location, toxic algae testing is proposed to be more limited. We propose algae sampling for 4 locations for Silver Lake, and 2 locations at Horseshoe Lake, choosing to test in the areas that receive the most recreational use / exposure. We will consult with the community when choosing those locations, taking advantage of local experience.

In accordance with State guidelines, if there is a visibly significant bloom, or if there are reports of illness or pet death, weekly testing at additional sites will be considered.
The scope of work for scheduled toxic algae testing is expected to be:

1. Distribute sampling kit for each lake, noting that preparing for scheduled, multiple samples will minimize unit costs, especially handling and shipping of the materials.
2. Take standard photographs of the water surface, showing a common perspective for each testing location.
3. Sample water in 4 locations on Silver Lake and 2 locations on Horseshoe Lake, and ship to King County Environmental, per instructions.
4. Enter test date and locations in Excel spreadsheet, and provide sample photo on the web site and blog. Name and post all sample photographs, and provide link to Photobucket / Instagram photo web page, and link to the state’s toxic algae database.
5. Enter the results of toxicity testing when available, for numerical trending.

**Task 5 Goal Statement:** (1,000 Characters Max.) [COUNT WITH SPACES 1,126]

The primary goal of performing the scheduled toxic algae testing described above is to coordinate phytoplankton and toxicity data with water quality testing using a reasonable number of samples. Although not represented by the number of historical tests for either lake, algae blooms and scums are regular throughout the year for Cowlitz lakes, while testing only on-demand results in minimal data and history. The collection of additional data points will allow Cowlitz Health to provide better community guidance concerning safe use of the lakes throughout the year.

A secondary goal of performing scheduled algae testing during water quality sampling will be the collection of data on several important lake areas. Testing history at Silver Lake has focused on one area of the lake that is most likely to collect surface scum from prevailing wind effects, and might not represent either the highest toxicity levels, or the most exposure. Use of community volunteers for scheduled testing will also result in an increase in visibility of the actual toxicity levels and more-timely feedback to the public in a practical way.

**Task 5 Expected Outcomes:** (1,000 Characters Max.) [COUNT WITH SPACES 362]

The expected outcome for the Scheduled Toxic Algae Testing Task is the production of significantly better data from which to inform the public. Having a more-detailed historical record, especially consistent during the summer months when recreational use is highest, will allow Cowlitz EHU to provide the best information and guidance on safe uses of the lakes.

**Task 5 Deliverables:** (300 Characters Max.) [COUNT WITH SPACES 238]

On a weekly basis in the 3.5 summer months, this task will deliver water samples for toxic algae testing, a photographic record of the sampling, links to the Toxic Algae Database, and a copy of the numerical data on the testing data file.

**Task 6 Title:** (50 Characters Max.) [COUNT WITH SPACES 48]

Added Weather and Lake Water Data at Silver Lake

**Task 6 Description:** (3000 Characters Max.) [COUNT WITH SPACES 1,470]
To provide additional water level, temperature, and flow information that is simple to collect on a weekly basis, and expected to be important to an analysis of Silver Lake:

- Lake Level compared with Dam Crest
- Estimated outflow, using level and gate position data
- Local precipitation total and general lake weather (still, windy, choppy, etc.)
- Air temperatures, high / low
- Water Temperature at standard depths – surface, 3 ft., 5 ft.

The weekly scope of work for this additional testing is expected to be:

1. Precisely measure lake level in still conditions using a damped gauge
2. Calculate outflow from the lake level data and Cubic Feet per Second (CFS) estimates at the dam, using current Tainter Gate position data
3. Collect and record data from local rainfall gauge at Silver Lake and compare with National Weather Service data for Castle Rock, ZIP 98611
4. Collect and record air temperatures from local thermometer at Silver Lake and compare with National Weather Service data for Castle Rock, ZIP 98611
5. Measure water temperature at three depths in four different, standard locations on the lake, representing bulk water sheltered from the wind, bulk water unsheltered from the wind, near-shore water largely open to the sun, and near-shore water largely shielded from the sun.
6. Enter the recorded data into Microsoft Excel. A part of the proposed scope of work is to make that data available to the public, on the Internet via a community web site and Blog.

**Task 6 Goal Statement:** (1,000 Characters Max.) [COUNT WITH SPACES 498]

The primary goal of adding water temperature and flow data to the performed testing is to allow future estimating of the lake flushing and filling cycles, and to possibly correlate water inflows with changes in water quality. Algae blooms that occur along the shoreline after periods of heavy rain could indicate nutrients added to the lake via groundwater, while algae blooms across the lake after periods of wind could indicate nutrients being mixed into the lake water from the sediment bottom.

**Task 6 Expected Outcomes:** (1,000 Characters Max.) [COUNT WITH SPACES 491]

The basic expected outcome for the Additional Testing Task is simply the addition of easily-collected data into the reliable data bank in a format that is useable by water quality professionals for later analysis.

It should be noted that the additional data is proposed to be collected for Silver Lake only, not from Horseshoe Lake. This is because Horseshoe is filled via pumping from the Lewis River. Their urban watershed is therefore not expected to be an important variable nor factor.

**Task 6 Deliverables:** (300 Characters Max.) [COUNT WITH SPACES 285]

On at least a weekly basis throughout the year, this task will record water inflow, outflow and temperature data. An updated lake water testing Excel data file will be a monthly deliverable, which will be transmitted via email to project stakeholders, and also posted on the Internet.

**Task 7 Title:** (50 Characters Max.) [COUNT WITH SPACES 47]
Demonstration “Pilot” Projects on Cowlitz Lakes

Task 7 Description: (3000 Characters Max.) [COUNT WITH SPACES 2,259]

The residents of Silver Lake note that measurements and studies have been conducted on the lake for almost 40 years, but with the exception of grass carp introduction, few of the on-lake actions recommended by those studies have been carried out. Taking into account that long history, each of the lake communities request that this grant include the financial and Agency support for conducting, in the next two years, several pilot projects that multiple consultants have recommended as being potential improvements, with little-to-no chance for adverse effect:

- Reduce Grass Carp Population at Silver Lake
- Introduce Small Numbers of Silver Lake’s Grass Carp at Horseshoe Lake
- Reintroduce Native Water Plants at all lakes
- Local Aeration at Silver Lake
- Test Milfoil Control at Horseshoe Lake

The expected scope of work for these pilot projects is expected to be:

A. Support the Washington Department of Fish & Wildlife (WFWD) in planning and conducting the planned Carp Derby, followed by commercial grass carp collection, to reduce the population on Silver Lake and to introduce some of the harvested fish to Horseshoe Lake. It is expected that a “count” of both existing and remaining Grass Carp will be a part of WFWD’s population-reduction scope.

B. With the assistance of WA DOE and WFWD, identify native aquatic plant species that could be beneficially reintroduced to each lake.

C. Establish near-shoreline “nurseries” at Silver Lake using the methods outlined by Lake Conroe in Texas and others in the USA.

D. Build and install predation-resistant fence enclosures that “seed” the selected plants in non-traffic areas around Silver Lake, and public spaces at Horseshoe Lake

E. Similarly protect selected “coves” from predation of existing aquatic plants, using the experience gained from (4) (D) above.

F. Test the effect of surface and subsurface aeration in Silver Lake areas that are shown via to-date tests / local knowledge to have low dissolved oxygen levels. Of particular interest at Silver Lake is whether aerobic bacteria can be encouraged to control the nutrient levels in bottom sediments, and whether a practical aeration method can be developed.

G. Test the efficacy of chemical noxious weed control in a limited area on Horseshoe Lake.

Task 7 Goal Statement: (1,000 Characters Max.) [COUNT WITH SPACES 402]

The primary goal of these and other potential pilot projects is to demonstrate the effectiveness, practicality, and cost of already-established lake treatments. It is expected the results of the pilot projects will be referred to and used by water quality professionals, together with the test data collected in Tasks 1 – 6, in our next phase of analysis and water quality improvement recommendations.

Task 7 Expected Outcomes: (1,000 Characters Max.) [COUNT WITH SPACES 960]

The outcomes expected for each of the pilot projects include:

1. Reducing Silver Lake grass carp is expected to lead to a long-term nutrient balance, reducing cyanobacteria blooms.
2. The introduction of grass carp on Horseshoe Lake is expected to ‘gently’ begin reducing noxious weed coverage.
3. The “nursery” pilot project would be expected to help identify those plant species that can best grow at Silver Lake.
4. Protecting plant re-introduction is known to be essential; testing materials and techniques that “fit” our depth and shoreline should yield a preferred method.
5. Similarly, a preferred method and materials that “fit” a cove/area can be developed.
6. We expect to be able to show that sub-surface aeration at Silver Lake can have a beneficial effect, at least in stagnant areas and perhaps more widely.

The secondary important outcome is to engage the community and show that actions beyond mere data collection can and will be taken in the future.

Task 7 Deliverables: (300 Characters Max.) [COUNT WITH SPACES 300 exactly]

A record of the actions taken and their “lay” effects will be posted on the project’s web site on a regular basis. Those actions, methods, costs and effects will also be recorded for further study by the water quality professional analysis that is expected to follow this and other monitoring tasks.

----- Form: Task Cost General Questions ----- Budget (Up to 150 pts. 16%)

Describe and provide calculations on how task costs were estimated. (2,000 characters max) [COUNT WITH SPACES 1,963]

Prior sampling at each lake provides methods, time, rates and unit cost for all three locations:

A. Rates:
1. A labor hour for the EHU Project Manager is $52.88 per hour, which is the burdened cost of a County EHS1/2 Employee.
2. The value of a volunteer hour is listed as $22.69 per hour, which is the average value calculated by The Independent Sector for Washington State.
3. The cost of a vehicle mile in a private or public vehicle is $0.565, the standard IRS / GSA rate.
4. The cost of a running hour in a private gas-powered boat is calculated as 50% of the $0.565 IRS rate at 60 MPH ($0.565 x 60 x 50% = $16.95 per hour). Half that again for electric / non-powered boats is $8.48 per hour.

B. Testing costs:
1. Laboratory testing for the parameters recommended by DOE has been $776 per cycle performed at Silver Lake - 3 tests at 8 locations. Each cycle at the other sites = half that, $388 for four locations.
2. The cost of the HydroLab instrument is from a written proposal by the manufacturer. The total cost includes the purchase price of the instrument with tax, shipping, training, self-calibration consumables and recommended spare parts.
3. The $70.80 cost of the Secchi disc tools is from the Fisher Scientific web site for their standard product with a 20% allowance for tax and freight.
4. The cost of scientific liquid sampling wands is taken from the Ben Meadows catalog, for their 7300 series jar sampler.
C. Labor hours:
1. The effort estimated to be required from the Cowlitz EHU Project Manager represents .26 FTE for the duration of the project. The tasks expected include:
2. Coordinate volunteer testing and assist at each lake,
3. Web site development and editing,
4. Public communication via email, telephone, and occasional meetings, and
5. Preparing information for and communicating with water quality professionals that would be engaged to evaluate data and the results of pilot projects, planning the next steps to be taken for each lake.

Describe the process used to control costs / Show the relationship between the cost of the project and the water quality benefit achieved. (2,000 characters max) [COUNT WITH SPACES 1,927]

Because almost all of the effective sampling performed to-date at Silver and Horseshoe Lakes has been by volunteers, the project costs have been essentially self-limiting as the volunteers are personally incentivized to complete each task with minimum effort and expense, and that inherent “value-engineering” is carried forward into the costs estimate for this grant proposal.

Similarly, Cowlitz EHU intends that volunteers continue to collect samples for the proposed Scheduled Toxic Algae testing, and that the multiple samples from the three lakes will be shipped together, minimizing the costs of that task.

It is the intent of this application that only the laboratory testing costs, instrument purchase, County transportation, and a portion of the cost of County personnel is funded by the grant.

The two most-variable “hard” costs upon which the grant request is based are the water quality instrument and the effort expended by the EHU Project Manager. Choosing a reliable, accurate instrument without “over-buying” is key to the success of the entire project, and here the project team is taking advantage of research performed by the WA Department of Fish & Wildlife (WDFW), which previously purchased the Hahn HydroLab system after significant market research. There are other manufacturers that offer similar integrated instruments, and also individual instruments, but the HydroLab has previously been evaluated as the best value and purchased by the State.

EHU has prior experience with projects of this nature and estimates that the project manager’s tasks of coordinating volunteer testing at each lake, oversee web site development and editing, engage public communication via email, telephone, and occasional meetings, as well as, beginning the next phase water quality professional analysis can be performed at 26% of a full-time-equivalent employee with the resources of the department over the next 2 years.

-- Form: Water Quality and Public Health Improvements -- (Up to 250 pts. 26%)

Define the water quality and public health problems the project will address. (5,000 characters max) [COUNT WITH SPACES 3,783]

The primary health problem the project is intended to address is the significant blooms of Cyanobacteria that appear to be accelerating at each of the Cowlitz County lakes. Although none of the three lakes
have had dramatic toxins levels measured (as a few other Washington lakes have experienced in the past 10 years), scums and “mats” of algae have been problematic at the Cowlitz Lakes. Cowlitz EHU has posted “Tier 1 Caution” signs regularly and “Tier 2 Warning” signs in 2 of the prior 5 years, with the higher-level warning being made due to reliable reports of animal sickness associated with the lake. In those years Silver Lake has had extended periods of a thick layer of algae covering virtually its entire 3000 acre surface.

Thus far, the monitoring of blue-green algae on Silver Lake has been reactive rather than proactive, and the number of tests conducted has been statistically insignificant, considering the number of bloom days and the total area of the lake. Further, although laboratory and in-situ water quality testing has been performed for Silver and Horseshoe Lakes, those tests cannot be matched with the limited number of toxic algae tests conducted at other times and in other locations. The result is that EHU is forced to post Tier 1 signs for the entirety of the lakes even when measured toxins levels are well below state health guidelines in one location, and we may “miss” the detection of a high level – both instances impacting the public in a significant way.

This project will begin to address the concern of blue-green algae more holistically, by monitoring the DOE-prescribed Water Quality factors, while also scheduling matching toxic algae testing. Together with proposed pilot projects, the objective is to identify a wide range of opportunities to improve lake water quality throughout the County, and thereby minimize the levels and effects of cyanobacteria blooms. Although we recognize that it will not be possible to predict an algae bloom and/or levels of toxicity, the data collected will also allow us to better caution the public when conditions that are unusual for each of the lakes occur.

The planned testing locations for Silver Lake specifically target areas of public use and agricultural lands that were flagged in the 1994 Silver Lake Watershed Management Plan (SLWMP) as being areas of concern. The plan specified recommended alternatives, some of which were implemented by landowners, and some of which have become obsolete through the passage of time. As examples, significantly fewer cattle are kept in the Silver Lake watershed today versus the 1990’s, and fewer shoreline properties have septic systems -- many have been connected to the Toutle sewage treatment system. This study will provide a basis to determine if these changes have had an impact on water quality in these areas, and perhaps help identify whether these factors continue to be important to overall water quality, or whether other effects such as roadways, new shoreline uses and upland development, or the “bank” of nutrients in the sediment bed (examples) are now dominant.

Furthermore, the SLWMP suggested monitoring of nonpoint source pollution through septic system management and education and outreach on fertilizer and pesticides. Fecal coliform testing is part of the purposed testing regime, and the chemical tests would help identify those and other “hot spots” that might be treated by repair or by educating the public. To that end, the Silver Lake Watershed Advisory Committee (SLWAC) and their citizen members have been instrumental in educating fellow residents on best practices to minimize their impacts on the lake, which we note as being significant goals and outcomes of many of the tasks included in the proposed work.

Describe the expected project results, including how the project will help achieve water quality and public health improvements and protection. For activity projects, describe the proximity of the proposed project area to specific water bodies. (5,000 characters max) [COUNT WITH SPACES 3,072]
In the long term, the Cowlitz Environmental Health Unit (EHU) expects that the results of this project and its expected follow-up actions will be:

- a sustainable, natural balance at each of the three Cowlitz Lakes, with reduced impact on the public health from toxic algae;
- an informed public, both for guiding individual actions that support the long-term health of the lakes, and for providing the basis to decide how and whether the lakes can be safely used;
- a template for perpetual management, guiding monitoring processes and adjustments made into the future.

To reach those results, the primary goal of performing the proposed testing, additional measurement and pilot projects is to provide a reliable data bank for analysis leading to next-phase recommendations. In the short term this information will be collected, graphed, and posted on the Cowlitz Lakes Water Quality website. By making the data available to the public we hope to promote public awareness of water quality issues around Cowlitz Lakes and encourage local discussion of how individual citizens can have a positive impact on water quality. In the medium term, the information and results gathered from this project will be used by EHU staff and potentially by water quality consultants, to update past studies and their dated recommendations.

More effective monitoring of both physical and biological processes occurring in the lakes will help residents and policymakers better understand how individual and community actions impact the lake. For example if one of the sampling locations on Silver Lake or Horseshoe Lake test high in fecal coliform, then the Lake Council(s) (SLWAC, HLC, City of Longview) could target residents adjacent to these areas to promote education of septic system maintenance, a primary producer of fecal coliform. Likewise, when the communities have a better understanding of what physical conditions promote the growth of blue-green algae they and their interested Agencies could plan and take actions to decrease their impacts on the lake, e.g. decreasing the use of fertilizers along the lakeshore, controlling grass clippings, using aeration, etc. in the summer when blooms are more likely to occur.

Using the data gathered in this monitoring study, EHU will have more evidence and a scientific baseline to define the most critical issues facing Cowlitz lakes. This will allow EHU to promote best management practices to the residents in the Silver Lake watershed, and lakeside residents and users of Horseshoe. By improving the water quality of Sucker Creek, Hemlock Creek, and Silver Lake downstream bodies of water like Outlet Creek, Toutle River and ultimately the Cowlitz River will be improved.

Although river water quality is outside the scope of the study and EHU’s responsibilities, it’s also important to note that each of the lakes is closely associated with local rivers – the Toutle, Cowlitz and Lewis Rivers and ultimately the Columbia. We expect and plan that the work done at each of the lakes will have only positive effects on the rivers.

Describe how much of the problem will be addressed by the project. (5000 characters max) [COUNT WITH SPACES 3,609]

The project is intended to begin addressing the entire toxic algae issue, by taking steps towards an integrated water quality management plan and actions for sustained use of all three Cowlitz lakes. Cowlitz EHU recognizes that because all lakes are different there is no single approach that will handle all situations. The lessons learned from the long-term history at Silver Lake can, however, be applied elsewhere:
1. Don’t merely study – follow-up with mitigating and correcting work.
2. Other plants and species will move in to fill a vacuum – fully clearing a “pest” is ill-advised!
3. The natural lake balance is dynamic – the conditions that affect it, such as weather, inflows and uses change over time. As examples, wakeboarding didn’t exist in 1990, a landfill has been added to the Silver Lake watershed, community sewage treatment has reduced the number of septic systems at Silver Lake, and surrounding agricultural uses have been significantly reduced.
4. Full mitigation might be painful or not possible – surrounding development is difficult to reverse, and could have a primary impact.

In our statement above, “begin addressing” recognizes that managing lake water quality requires continuous attention and care. The current proposal for data collection and pilot projects is intended to establish a path so that the community and the interested agencies can together develop next steps for action that promotes better public health and improved water quality.

Before taking those next steps, however, EHU takes the direction of the DOE and recommendations from water quality professionals by first establishing a monitoring program – making that work scientifically reliable and sustainable is a primary short-term goal of the project. As discussed in the “Tasks” section of this application, EHU proposes to coordinate the physical and chemistry tests prescribed by DOE for all three Cowlitz lakes, filling a hole that remains since WDFW’s withdrawal of their support and instruments. Those tests will be accomplished with the assistance of community volunteers, as will additional data on local weather and lake conditions.

Because of the history of regular summer algae blooms on all three lakes, EHU also intends to coordinate a robust toxic algae monitoring program in the recreationally-important areas of each location. This will allow both proactive public information and a current database of conditions that can show recent history and trends. Detailed in the Tasks section, this work will be important not only for future analysis, but will have an immediate impact on our communications with the public on conditions and safe uses.

EHU is also guided by the clear message received from the Silver Lake and Horseshoe Lakes communities, which is to include ACTION in all plans and programs. They note that many lake and water quality studies have been performed over the years, but that follow-up on their concluding recommendations has been spotty. The proposed scope of work therefore includes Pilot Project tasks that are largely drawn from those prior studies. While the listed examples are preliminarily chosen as being those that would be expected to be only beneficial or benign, whether they are current and effective given today’s lake conditions is the point of small-scale testing. The experienced gained from the pilot projects is expected to simultaneously create data and demonstrate to the community that actions can be taken, hopefully leading to increased visibility, enthusiasm and funding, all in support of the long-term health of the lake and its users.

Describe how you will measure and document success of the project.
(5,000 characters max) [COUNT WITH SPACES 3,411]

For the data collection tasks defined for each of the lakes, the evident measure of success will be the completion of each of the sampling dates at all three lakes, and the public communication of the data. 15 water quality sampling dates per year (one per month in Spring, Fall and Winter, two per month in Summer) are scheduled as follows:
- Silver Lake, 3 lab tests in 8 locations, 6 in-situ tests in 20 locations
- Horseshoe Lake, 3 lab tests and 6 in-situ tests in 5 locations

Each sampling date generates \[ 3(8+5) + 6(20+5) \] = 189 data points
The two-year project will develop 15 dates x 2 years x 189 = 5650 data points total

In addition to those full-year tests, EHU plans to schedule 15 weekly Toxic Algae sampling dates for the Summer as follows:
- Silver Lake, 4 locations
- Horseshoe Lake, 2 locations

The two-year project will develop 15 dates x 2 years x 6 = 180 data points total

Finally, for at least Silver Lake the community plans to collect added weather and lake water data on at least a weekly basis – adding collection dates during days immediately following significant rain. See Task 6 for the detailed description of that scope; approximately 700 added data points are planned, and the data on water flows and temperature are expected to add significantly to the analysis.

The total job of measuring for over 5000 data points appears to be daunting, but EHU notes that both the Silver Lake and Horseshoe Lake communities have consistently sampled and recorded the past 16 months, generating over 600 data points. Those volunteers have enthusiastically embraced the project, and have shown that they are committed to more testing, given the support and instruments.

After the success of consistently collecting the data, a more-important measure of success will be noting the public’s use of the results and trends, especially (during the period of this project) those from Toxic Algae testing. While communicating with the community the EHU will include opportunities for “consumer satisfaction” feedback, and a trend towards increasing citizen involvement and satisfaction will be a prime measure of success.

At the beginning of and during the testing, it will be EHU’s task to develop a thorough Sample and Analysis Plan, so that all processes and results are as consistent and scientifically reliable as possible. Another measure of success that can be anticipated at this stage is the acceptance of the data and collection methods by water quality professionals. To that end, EHU personnel will perform a regular audit of the methods and data, and also consult with outside professionals that might be called upon to use the data, for their review and informal approval. “Passing” those internal and external reviews, and making adjustments when required, will be essential to the overall success of the project.

EHU would like to be able to include “evidence of improving the long-term health of each lake” as a measure of success, but improvements are likely to become evident only significantly after the term of the proposed work. Some of the Pilot Projects may show promise for further investigation, and some of the data may point towards very-evident sources of water contamination, but otherwise measurable improvements in lake health are likely to require several years. EHU will, however, be monitoring the data and trends carefully, and celebrating success whenever possible!

Describe how you will sustain the water quality and public health improvements for the long-term (5,000 characters max) [COUNT WITH SPACES 1,275]

Education is a powerful tool that can be used to help prevent further contamination on Cowlitz Lakes. On Silver and Horseshoe Lakes, existing organizations exist (Silver Lake Watershed Advisory Committee (SLWAC) and Horseshoe Lake Committee (HLC)) that will play lead roles in education and outreach with
the community. Once it can be decided what is/are the reasons behind the increased nutrient load, a plan to help stop the problem can be formulated. If levels of contaminants fall below EPA limits, monitoring can be decreased, gradually, to the point where it is no longer needed. If nutrient levels begin to rise again, obvious signs, such as algae blooms, will manifest themselves and testing can begin again.

Educating the residents along Cowlitz Lakes, ones who are connected to a septic system, the importance of having their systems maintained to prevent untreated effluent entering the water would be a beneficial task. If failing systems are not an issue now, they will be in the future if they are ignored by homeowners.

In the event of an algae bloom, the local health department will continue to post warning signs along the lakes. We hope to improve public health by targeting the problem areas and addressing them through public outreach and education.

- Form: Coordination with State and Federal Priorities - (Up to 100 pts. 10%)

Describe how this project is specifically required by a state or federal agency. Provide reference or documentation including permit conditions, Ecology orders, court orders, or other correspondence.

OR

Describe how this project implements specific actions in a TMDL Water Quality Improvement Report, Water Quality Implementation plan, or Watershed-Based Plan that includes the Environmental Protection Agency's "Nine Minimum Elements". (See Section I of http://water.epa.gov/polwaste/nps/upload/watershed_mgmt_quick_guide.pdf.) (2,500 characters max) [WORD COUNT 2,185]

In 1989, as a result of increased community activity, Cowlitz County and WA Department of Ecology DOE initiated the Silver Lake Restoration Project (SLRP), Phase I. Washington State University (WSU) was contracted to prepare a diagnostic and feasibility study for the restoration of Silver Lake, (Moore, 1990). This study, identified phosphorus as the nutrient of concern in the lake. WSU identified several restoration schemes to be considered for Phase II including dividing the lake into three management zones, biological macrophyte control, dredging, bottom screening, waterfowl management, watershed nutrient diversion and public information and education.

In 1992, Cowlitz County was granted funding through WA Department of Ecology’s Centennial Clean Water Fund to begin SLRP Phase II. Among the Phase II projects was assisting the watershed community with the development of a Watershed Management Plan. The Silver Lake Watershed Management Plan (SLWMP) was prepared and completed by the Cowlitz County Conservation District in 1994 with the overall goal to identify and manage the sources of phosphorus in the watershed.

Another of the Phase II projects in 1992 was to introduce vegetation eating fish to the lake (addressing biological macrophyte control from the 1990 diagnostic study). The 1990 study included a dire warning that failure to intervene in the advanced state of eutrophication evidenced at the time would result in the lake becoming essentially a marsh. 83,000 White Amur grass carp were introduced into the lake during March 1992.
In the intervening years, the “choking” vegetation problem has diminished, some say to a detrimental degree. Development around the lake has also continued but without a consistent water quality monitoring program in place to evaluate the changes in the lake. Consistent with the SLWMP, it is past time to monitor and adjust SLRP activities in order to continue progress toward a cleaner, healthier Silver Lake. This project seeks to address that element of the SLWMP.

Horseshoe Lake is an “oxbow” lake and is filled via pumping from the Lewis River. Their urban “watershed” does not currently have a Management Plan.

If applicable, provide the name of the Ecology TMDL Lead or Stormwater permit manager and the last date of contact. 
(1,000 characters max) [COUNT WITH SPACES 381]

Cowlitz EHU does not have a Department of Ecology stormwater permit manager or TMDL for the prior work on Cowlitz lakes, but the Silver Lake Watershed Advisory Committee has had regular DOE participation and guidance from Iloba Udum, and for each lake EHU has consulted with Kathy Hamel – both are aware of the recent sampling and monitoring work at Silver Lake and Horseshoe Lake.

If you are a local government entity, In accordance with RCW 70.235.070 (see http://apps.leg.wa.gov/rcw/default.aspx?cite=70.235&full=true#70.235.070), describe what policies or measures you have put in place to reduce greenhouse gas emissions apart from this project. 
(1,000 characters max) [COUNT WITH SPACES 626]

In 2010, the Cowlitz County Board of Commissioners adopted the Cowlitz County Greenhouse Gas Reduction Policy. The county was already engaged in many of the elements outlined in the policy, including encouraging using energy-efficient equipment and installing anti-idling devices on vehicles to avoid wasting fuel. The policy made previous voluntary actions official goals.

For this project we have considered greenhouse gas emission reductions principally via consolidating testing and transportation, minimizing the number of auto and boat trips. Non-motorized testing is planned to be used at Horseshoe Lake as applicable.

----- Form: Project Team ----- (Up to 50 pts. 5%)
Describe roles and responsibilities of each team member/contractors and partner agency roles. Include the estimated amount of time each team member will devote to the project. (7,000 characters max) [COUNT WITH SPACES 3,359]

1) Silver Lake Watershed Advisory Council (SLWAC)

RESPONSIBILITY: Project Oversight and Volunteer Coordination

The SLWAC was formed in 2010 to address the water quality issues of Silver Lake. For this project the Council will continue to take the lead in the investigation of water quality issues with the mission to develop a long-term plan and activities that improve Silver Lake’s water quality.
SLWAC members and local volunteers will gather water samples and take relevant measurements on a monthly basis devoting 0.3 FTE. The SLWAC will additionally, receive periodic reports of project progress and recommendations for action related to the project and eventual improvements to water quality of Silver Lake.

CONTACTS: Marilyn Coleman, Chair, (360) 274-4542, shonuf@comcast.net
Del Gilkerson, Technical Coordinator, (360) 751-3321, delgil@cni.net
Gary Fredricks, Director, WSU Cowlitz County Extension, (360) 577-3014 x3, FredricksG@co.cowlitz.wa.us

2) Horseshoe Lake Committee (HLC)

RESPONSIBILITY: Project Oversight and Volunteer Coordination at Horseshoe

The Horseshoe Lake Management Committee was formed in 2009 by the Mayor of Woodland, with the support of its City Council, to advise the Council on lake-related issues, problems and possible solutions. Similar to the SLWAC, the Committee enjoys the participation and support of County and State agencies:

- WA State Department of Transportation
- WA State Department of Ecology
- WA State Department of Fish & Wildlife
- Cowlitz County, and
- Clark County (Horseshoe Lake forms the border between the counties in that area)

For this project the Committee will continue to take the lead in the investigation of water quality issues related to Horseshoe Lake’s water quality.

HLC members and local volunteers will gather water samples and take relevant measurements on a monthly basis devoting 0.3 FTE. The HLC will additionally, receive periodic reports of project progress and recommendations for action related to the project and eventual improvements to water quality of Horseshoe Lake.

CONTACT: Scott Perry, (360) 921-2306, ScottPerry@cni.net

3) Cowlitz County Department of Health, Environmental Health Unit (EHU)

RESPONSIBILITY: Project Management

The EHU, upon award of the grant, will provide a 0.5 FTE to the Cowlitz Lakes Water Quality Testing & Improvement project for the duration of the grant. This position will coordinate testing of the lakes as well as data accumulation and analysis. In addition, the position will coordinate with the already existing volunteer groups to increase the efficacy of the program by training and supervising volunteers in the monitoring and testing of the lakes. The equipment purchased through the grant will be maintained and housed by the EHU permanently. Data collected will be done with “next steps” in mind so that collaborating with researchers in anticipation of the next phase of improving the water quality at all three Cowlitz Lakes will be the Project Manger’s responsibility.

CONTACT: Chris Bischoff, RS/REHS, Environmental Health Unit Manager, (360) 577-3052, BischoffC@co.cowlitz.wa.us
4) AddyLab

RESPONSIBILITY: Water Sample Analysis and Reporting

Water Testing Laboratory, located in Vancouver, WA, provides water testing of collected samples. AddyLab is paid on a “by sample” basis.

CONTACT Carl Addy, (360) 750-0055, carl@addylab.com, www.addylab.com

Describe the relevant skills and qualifications of each team member (do not submit resumes) (12,000 characters max) [COUNT WITH SPACES 9,315]

1) Silver Lake Watershed Advisory Council (SWLAC)

The SLWAC was created by the Cowlitz County Board of Commissioners and includes seven local residents, a representative from the county; the Southwest Clean Air Agency; the Cowlitz County Tourism Bureau; the U.S. Army Corps of Engineers; the state departments of Ecology, Natural Resources, Washington Department of Fish & Wildlife; Weyerhaeuser Co.; the Cowlitz Conservation District; and the Silver Lake Flood Control District.

The Council is comprised of the stakeholders most impacted by, and responsible for, the water quality of the Lake. It is the members of the SLWAC and a devoted contingent of volunteers, with technical backgrounds sufficient to assure competent and accurate sampling practices, who have been most active to date in the gathering of samples for the past two years.

SLWAC Volunteers:

Gary Fredricks was initially the SLWAC Facilitator, helping to get the Council positions filled and the advisory process organized. Mr. Fredricks, a local Castle Rock resident, became so inspired by the work of the Council that he became an appointed member himself. Mr. Fredricks is the Cowlitz County Director. His educational background is most fitting with a BS in Bacteriology/Animal Nutrition and an MS in Dairy Nutrition from Washington State University. He has been the WSU Extension Agent for Cowlitz, Pacific, and Lewis counties since 1984. His steadfast participation and guidance for SLWAC provides continuity and professionalism. Mr. Fredricks has extensive contacts throughout Cowlitz County and is able to gather information from the right person, at the right moment, to keep the work of the SLWAC focused and efficient.

Marilyn Coleman, active since its inception three years ago, is the SLWAC Chair and has been a resident/property owner on Silver Lake, utilizing it in every capacity, for 35 years. She has partnered with WDFW, Cowlitz County and the Health Dept., to hold County-wide informational meetings educating residents to understand their necessary participation in order to maintain the health of Silver Lake. She has also accompanied the WDFW during each of their In-Situ lake sampling outings. Currently retired, Ms. Coleman holds a Psychology degree and made her career in the medical/dental industry.

Ms. Coleman offers the following personal statement: “I firmly believe that the community and our Agencies can partner to improve the water quality and use of our lakes in Cowlitz County. I’m personally
gratified by the interest shown concerning Silver Lake by the SLWAC members, and am committed to work with all parties to make the best improvements possible. My family and I deeply appreciate the opportunity to meet a wide range of friends and neighbors while protecting this unique asset that is so dear to all us. We look forward to the coming three years of engagement.”

Del Gilkerson is a citizen member of the SLWAC, appointed by Cowlitz County Commissioners on Oct 23, 2012. Mr. Gilkerson has acted as SLWAC's Technical Coordinator, managing the collection and recording of lake water samples since August 2012. He is a graduate of WSU with a BS degree in Physics, and brings to the team the unique experience of over 20 years in research and testing laboratories conducting work similar to the lake water quality testing. For the past 11 years he has also shown his commitment to the community as Manager of the Cowlitz County Mosquito Control District, which does similar sampling and testing work throughout the area, including Horseshoe Lake at Woodland.

Mr. Gilkerson offers the following personal statement, "In my 40 years of residence at Silver Lake I have personally lived through the changes in its water quality, wildlife, and environment. I'm very concerned about the dramatic increase in algae blooms, the decrease in water clarity, and the noticeable reductions in wildlife. I enjoy the volunteer work that I've done for SLWAC in the past three years, and offer my commitment to continue that work, leading to the improvement of water quality and the environment at both Silver and Horseshoe Lakes."

Dave York has assisted with Silver Lake water sampling since August of 2012. Also a shoreline resident for the past 29 years, he fishes in all corners of the lake throughout the year, bringing a unique perspective to the team. He and his family enjoy all water sports from April to October. Mr. York’s history with the testing to-date demonstrates the commitment and support that the community-at-large has for the water quality project.

Paul Moore brings a wealth of personal history to the project, as he and his family have owned property in the Silver Lake watershed for over 100 years. Paul is an avid fisherman on Silver Lake and Washington rivers. Paul has assisted with 90% of the Silver Lake water sampling, providing his boat and local knowledge. Paul brings technical experience to the sampling project as well, having developed water sampling techniques and facilities for Weyerhaeuser facilities throughout the region.

Pansy Nofsiger is a Silver Lake shoreline resident, and brings extensive river and watershed experience, having worked under three governors on the Oregon Scenic Waterways Advisory Committee. Through that committee Pansy wrote legislation for the Deschutes River Management Plan and saw it passed into law. Pansy’s husband, Elmer Nofsiger, was instrumental in developing the SLWAC and engaging its citizen and Agency members into action. Since Elmer’s recent death, Pansy continues the Nofsiger engagement.

Neil Skogland is a regular volunteer for water sampling on Silver Lake. A full-time resident on Walden Island (in the middle of the lake) he therefore crosses the water via boat nearly every day, providing "local knowledge" that will be valuable to the proposed testing. Mr. Skogland also brings a technical background to the water quality testing project; he is a Mechanical Engineer (BSME UW 1982) with over 30 years of experience with design and manufacture of custom-engineered machinery, including technical writing.

2) Horseshoe Lake Committee (HLC)
HLC is comprised of eight appointed community representatives and represented agencies including WA Departments of Transportation, Washington Department of Fish & Wildlife, Natural Resources, Department of Ecology; Cowlitz-Wahkiakum Health District; Southwest WA Health District; Clark County; Cowlitz County; and Cowlitz County Conservation District.

As with SLWAC, it is the members of the HLC and volunteers who have been most active in the gathering of water samples for evaluation of the Lake’s water quality.

HLC Volunteers:

Walt Church has lived in Woodland for 83 years and watched the creation of Horseshoe Lake by the diversion of the North Fork of the Lewis River. As Mayor of Woodland, Mr. Church initiated and signed the Resolution establishing the Horseshoe Lake Committee (HLC). Mr. Church is serving as a member of committee and participating in testing of the lake as needed. He also served 8 years as Cowlitz County Commissioner.

Mike Curry has been a resident of Horseshoe Lake since 1993, and is one of the HLC’s most-active members. He brings intimate local knowledge to the project, as he paddles his stand-up-paddleboard around the lake multiple times per week. Mike has frequently been on the water sampling team for the laboratory testing done to-date. He independently collects water level and temperature data, and regularly checks the flow through the downstream water outlet.

Scott Perry is a charter member of the HLC, becoming a Woodland City Council member thereafter. He continues to attend meetings as the designated Council member, while also assisting with sampling (contributing his pontoon boat for most sessions.) Scott has lived on the lake for the past 13 years.

The City of Woodland is engaged with the volunteers; the city’s Public Works Director, Bart Stepp, attends meetings regularly and coordinates work on the regulation of the water level and inflow pump maintenance with Jody Bartkowski on his staff.

3) Cowlitz County Department of Health, Environmental Health Unit (EHU)

Though the project manager for this project has not yet been named, the EHU has multiple staff that are well qualified to administer this project. All members of staff hold, at a minimum, a Bachelor of Science degree in either Biology or Nutrition with one higher education degree in the form of a Master of Water Resource Management. Additionally, EHU staff has logged a combined total of 14 years work in water quality for both private and Government agencies. Services offered by the EHU are provided in conjunction with the WA State Department of Health and WA State Department of Ecology. Both of these agencies possess the experience and qualifications to supplement EHU’s own staff.

4) AddyLab

AddyLab opened in 2000 to provide affordable, convenient, and quality water testing. AddyLab is accredited by the WA State Department of Ecology and Oregon Department of Environmental Quality (ORELAP). AddyLab is co-owned and operated by Tom Newman and Carl Addy. Carl is the former SW WA Health District Laboratory Manager and Environmental Health Supervisor. Tom has a laboratory background in public health, wastewater treatment, and environmental chemistry.
Discuss your commitment to maintain staff competencies and responsibilities over the life of the project (2,000 characters max) [COUNT WITH SPACES 691]

The volunteer corps at both Silver and Horseshoe Lakes have already proven consist and reliable in spite of governmental agency inconsistency. By funding EHU assistance, this project provides the stability the community is seeking to move forward and address the water quality issues evident at the Cowlitz Lakes.

Likewise, acquiring the tools needed for the sampling and monitoring program on Cowlitz Lakes, the community will not be limited by availability of other agency resources.

Cowlitz EHU assumes the responsibility of coordinating volunteers, assuring that volunteers are trained and maintaining the integrity of the sampling program even if turnover among volunteers should occur.

Form: Project Development, Local Support and Past Performance (Up to 75 pts. 8%)

Describe the decision making process used to select this project.
Describe efforts to include the community in the decision making process.
Why was this project chosen as the best solution over other projects?
If the project is described in a local plan, list and discuss the plan. (2,500 characters max) [COUNT WITH SPACES 2,472]

The Water Quality Testing and Improvement Project was developed and chosen largely because of the grass-roots involvement of and request by the Silver Lake and Horseshoe Lake communities, who have been instrumental in making this grant request. In both locations the citizens are organized and have shown a commitment to long-term lake monitoring and improvement. Although the Cowlitz Environmental Health Unit (EHU)will manage the proposed testing and pilot projects, in both locations it is the community that is leading the call for the testing scope outlined in this application, recognizing that work as being the foundation of a sustainable lake maintenance plan.

Although the two lakes are significantly different in type and environment, both have been the subject of numerous prior studies that recommend a sustained monitoring program and certain mitigating actions. Because conditions on the lakes have changed since the most recent studies, proceeding with prior recommendations without current data is not wise. That is why this proposed scope of work is chosen – prior studies have recommended it and the communities seek water quality improvements that meet current conditions. For Silver Lake, particularly, few of the actions recommended by past studies have been followed. Testing some of those prior recommendations via Pilot Projects is now a part of this project’s recommended scope.

It is also important to note that blue-green algae and Toxic Algae testing has been the galvanizing factor at both lakes. In recent years cyanobacteria scums have become more prevalent, leading to Tier 1 Cautions and Tier 2 Warning notices being posted, limiting lake use. These conditions were not present during the years when previous studies were conducted. Twice in recent years, at both lakes, lake-wide thick mats of algae have been seen. This was very dramatic at 3000-acre Silver Lake in particular.

That and other concerns about taking actions that will be effective in the long term, while minimizing toxic algae growths, leads EHU to propose the scope of work detailed in the application:
- sampling and testing
- scheduled toxic algae testing, and
- pilot projects that may demonstrate today’s effectiveness of previously-proposed lake treatments.

It is Cowlitz EHU’s intent that the data collected and processes established lead to a long-term, sustainable monitoring program, and to actions that will produce a long-term natural balance at each lake.

Describe how you have developed and fostered local, regional and statewide partnerships that will contribute to the success of the project. Describe tangible contributions made by these partners. For nonpoint activity projects implementing BMPs, upload landowner agreements or letters of commitment. (2,500 characters max) [COUNT WITH SPACES 1,427]

WDFW took the initial lead with technical expertise and equipment necessary to begin a water testing program in consultation with Ecology and EHU. WDFW proposed an initial budget, selection of elements to test for, and how many specific locations would be necessary to compile useful data. The plan is consistent with the recommendations from Ecology’s Citizen’s Guide to Understanding and Monitoring Lakes and Streams and forms the basis of the program adopted for Silver Lake.

The WDFW test program document, which consisted of several pieces; including funding, staffing, equipment procurement, retaining active volunteers, and the implementation of the specific testing and monitoring system formed the testing proposal.

Using that proposal, the members of the Silver Lake Watershed Advisory Council (SLWAC) and Horseshoe Lake Committee (HLC) were able to each procure funding from the Cowlitz County Board of Commissioners to commence their testing and monitoring programs.

In addition the SLWAC approached Silver Lake Flood Control District (SLFCD). Silver Lake is a reservoir, managed by a dam at its east end. The SLFCD is the agency responsible for the management of the dam. The SLFCD agreed to provide funding for lab analysis of the water samples from Silver Lake.

Horseshoe Lake sits on the Cowlitz-Clark county line. Clark County also agreed to provide funding for lab analysis of water samples from Horseshoe Lake.

Describe past project performance on similar water quality projects. Include overall management of project, meeting project timelines and deliverables, water quality benefits achieved, fiscal accountability, and water quality benefits achieved compared to project cost. [Max word count 2,500]

Although the Cowlitz Environmental Health Unit (EHU) has been aware of and involved with prior work at Silver Lake and Horseshoe Lake, we have not been the managers of the projects and therefore have no “hard” data to draw from to address these details. We can, however, address the recent and current lake water quality testing that the proposed project is intended to extend at both Silver Lake and Horseshoe Lake, and the history of projects at Silver: For both lakes each community, through local grass-roots efforts, engaged Cowlitz County, State Ecology, Fish & Wildlife, Transportation, USACE and other interested Agencies and parties in an effort to improve the lakes’ water quality. The joint recommendation for each lake was to start by
developing the data and science necessary for a lake management plan. The communities arranged for local funding to conduct water sampling and laboratory testing for e-coli, nitrates and phosphorus, with the assistance of local volunteers. The Department of Fish and Wildlife agreed to take on in-situ physical testing, to complete the suite of tests prescribed by the Department of Ecology. The volunteers have been highly successful at each lake, organizing and being prepared for 100% of scheduled test dates, and actually conducting the tests themselves 83% of the scheduled dates being stymied by lack of promised testing materials on the remaining dates. WDFW has unfortunately been less productive, conducting only 17% of the scheduled tests at Silver Lake and then withdrawing their support. The communities remains enthusiastic and engaged, and with the support of Cowlitz EHU would like to continue the water quality testing, leading to a long-term lake water quality improvement and management plan.

In summary, the current performance of the communities has been excellent, but the State has not matched that performance and has not provided the water quality support that was promised. Through the proposed project Cowlitz EHU will provide the testing support and resulting water quality improvements that will support a long-term natural balance at each lake for maximum public health benefit.

There is a long history of study at Silver Lake, but unfortunately few of the “hard” recommendations from those studies have actually been conducted. The one dramatic result of prior work is the success of grass carp introduction that has actually been TOO successful, leading to other problems including turbidity and Toxic Algae.

----- Form: Readiness to Proceed ----- (Up to 75 pts. 8%)

Describe the steps you have taken to be ready to proceed immediately with the project. Provide detailed information and documentation on project elements such as status of designs, permits, interlocal agreements, landowner agreements, easements, other secured funding, staff, or agency approvals. (4,000 characters max)

[COUNT WITH SPACES 3,789]

The WDFW testing and monitoring plan recommendations were adopted by SLWAC in 2011. The plan was to test for specific elements at a total of 26 initial locations in and around Silver Lake to determine potential causes to a decline in overall water health and quality. The selected locations were based on their significance regarding location and upland activities. Some sites have been eliminated based on determinations of non-significance revealed in testing data. The program at Silver Lake now consists of sampling from 20 locations.

The chemical and physical properties being tested are the specific elements recommended in former research studies and analysis, selected for their significance in pinpointing determining factors in water quality changes. These are confirmed as the preferable elements to test for by WA Ecology’s Citizen’s Guide to Understanding and Monitoring Lakes and Streams (www.ecy.wa.gov/programs/wq/plants/management/joy MANUAL/chapter2.html), as well.

The elements tested for are the following:

1. Total Phosphorous
2. Nitrate-Nitrogen
3. Ph-Acidity  
4. Dissolved Oxygen  
5. Temperature of water and air  
6. TKN (Total Kjeldahl Nitrogen-Septic scope)  
7. Chlorophyll a  
8. E-coli  

The Plan called for SLWAC-led volunteers to collect samples for phosphorus, nitrate-nitrogen, and E-coli, while the WDFW sampled for the remaining elements using their HydroLab equipment, which was not accessible to volunteers. The first Silver Lake tests were taken on January 27 of 2012.

The Silver Lake Plan initiated in 2012 was for WDFW to bring the sample bottles from AddyLab, their boat, and sampling equipment to the lake each month. Volunteers would use their boat to collect the AddyLab samples and WDFW would use their boat to collect the rest of the data using the HydroLab. Through 2012 the collection of data was not as consistent as hoped for. WDFW was only able to be on-lake for three collection dates. In January, February, and March of 2013 WDFW delivered AddyLab sample bottles to volunteers and transported the samples back to the lab. Since April 2013, the SLWAC volunteer group has collected data on a monthly basis and transported samples themselves to AddyLab in Vancouver, WA for testing and results.

WDFW did train volunteers to collect samples and data and took the volunteers to each sampling location specified on Silver Lake; however, WDFW did not provide written procedures or put the sampling locations in writing. In April 2013, the SLWAC technical coordinator, Del Gilkerson wrote specific sampling protocols and produced maps for every sampling location on Silver Lake. The procedures and directions provide consistency and have guided the sampling project since. The inability of the volunteers to use the HydroLab during sampling dates when WDFW was not available, however, means that incomplete testing and sampling was performed in 2012 and 2013, which results in an incomplete study and analysis of limited value.

Horseshoe Lake adopted the same testing and monitoring program with the same division of labor.

In the fall of 2013, WDFW withdrew from participation in the Testing and Monitoring Programs at both Silver and Horseshoe Lakes.

The SLWAC-led volunteers have proven their commitment and ability to follow protocols, and to collect and log data with consistency. This will continue through 2014. However, due to the lack of access to a HydroLab only 1/3 of the original data is being collected. Once funds are secured that provide for the purchase of the HydroLab equipment dedicated to the testing of the Cowlitz Lakes, along with the technical assistance of Cowlitz County’s Environmental Health Unit then collection of data for the missing elements will re-commence immediately.

----- Form: Financial Hardship -----

(Applicants not requesting Hardship consideration in EAGL do not have to complete this form in EAGL)

========================================================================
Ecology Application Evaluation (Scoring) Criteria:
========================================================================
1. Scope of Work (Up to 250 pts.)

* A good answer will fully describe how the applicant will achieve the WQ improvement from question 3.

* For full points, the Scope should be ready to paste directly into the agreement.
  a. Has the applicant followed our format?
  b. Are all tasks described? (Are critical tasks left out?)
  c. Are all the tasks well described? (Can you understand what work the applicant is agreeing to do?)
  d. Do all the tasks have deliverables and timelines?

* When assigning points for ‘directly and measurably addresses a water quality problem’, construction projects get more points than planning or design.

* Look for deliverables with clear numeric commitments (# of animals fenced, # of miles of stream restored, population served).

* The application question specifically asks for maps and locations of work.

* Land owner commitment is critical for non point BMP projects.

* Scoring should reflect fatal flaws in the Scope.

* Check that attachments are present, and that they are consistent with the application.

* The applicant may refer to Facility Plans or TMDLs. They do not have to repeat work they have done before.

2. Proposed Budget (Up to 150 pts.)

* Award points for a budget that is consistent with the scope of work.

* Look for details in the applicant’s cost estimating process. Simply answering "Based on past experience" gets a low score. Describing that experience and how it was used for this estimate gets a better score.

* Look for supporting documents (engineer’s cost estimate, etc.)

* Value Engineering may earn points here if used intelligently.

* Award points for ‘good value’ based on the type of project. For example, consider whether the project is a good value for a design project, or good value for a sampling project.

3. Water Quality and Public Health Improvements (Up to 250 pts.)

* A good answer will fully explain “Why” the applicant is doing this specific project.

* Consider how much of the water quality improvement is related to the project scope of work.
* Supporting data should reflect measurable improvements (e.g. # of failing OSS fixed, increased fecal counts, beach closures). Documentation and data need to be provided for supporting the statement.

* Human Health benefits rate equally with Water Quality benefits.

* Rate planning and design projects based on the ultimate benefits from a completed project for question 3.

4. State and Federal Priorities (Up to 100 pts.)

* Award full points for a project that directly addresses a permit, TMDL requirement, or PSP Action Agenda, and addresses greenhouse gases (RCW 70.235.070).

* Projects that address other priorities (not permit, TMDL, PSP Action Agenda, or other plans) can score points, but should not receive full points.

* Check with the permit manager / TMDL lead to make sure that this project actually implements the requirements.

* Score Ecology designated 4b (Straight to Implementation) projects as if the project is implementing a TMDL. But only if Ecology has designated the project as 4b (you should confirm).

5. Project Team (Up to 50 pts.)

* Look for all the project roles that will be necessary to implement the scope of work, and whether the role will be filled by the applicant or a hired contractor or consultant.

* Score applications that are missing critical roles on the project team lower.

* Assign points for ‘roles and responsibilities’ and ‘skills and qualifications’ that benefit the project.

* For full points applicants must commit to maintain adequate staffing with proper training throughout the life of the project.

* Consider the ability of existing applicant staff to take on additional work, as appropriate.

* You may use your knowledge of the project team’s past performance when scoring.

6. Project Development and Local Support (Up to 75 pts.)

* Award more points for projects that describe the decision making process than those that state that a facility plan or TMDL was prepared.

* For non-point projects, look for local support and efforts to leverage local efforts with our money. Award points for local out-reach and public involvement in the selection process, but award full points only for projects that leverage local support to contribute to the success of the project.
Look for land owner agreements at the time of application for non point BMP projects

* For facilities projects, have ratepayers, landowners, local governments, citizen groups, etc., been involved in the process? Award points according to level of involvement.

* If the applicant is an existing or recent funding recipient, consult the current or former project manager or read the Final Performance Evaluation to evaluate past performance.

7. Readiness to Proceed (Up to 75 pts.)

* For full points, applicants should be able to sign an agreement on July 1, and immediately start work. (While Applicants have 10 months to start work, this should be the goal for full “Readiness to Proceed” points.)

* GMA compliance can affect the Readiness to Proceed score. If you have questions, contact the CTED GMA planner for the county.

* Look for land purchase, permits in place, design complete, landowner agreements in place, equipment purchased, GMA compliance, companion funding or match in place, environmental review 100% complete, etc.

* Cross check this answer with the scope of work timeline.

8. Hardship - HQ will assign points for qualified hardship applications.
### Cost Basis:

- **Volunteer $/hr value**: 22.69
- **Cost per vehicle mile**: 0.565
- **Cost per vessel hour**: 16.95
- **Project Manager $/hr**: 52.88

### One-time Costs and Management

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**Total Costs**: 41,247.37

**Funding Request**: 38,978.37

### Silver Lake Testing Costs, per date:

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**PM hrs/date = 9**

**Total Costs**: 1,374.91

**Average $ per testing date**: 1,299.28

### Horseshoe Lake Testing Costs, per date:

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**PM hrs/date = 9**

**Total Costs**: 1,923.98

**Average $ per testing date**: 1,618.06

### Total Testing Costs:

- **Number of testing dates over 2-year project term**: 30
- **Vol Total / Date**: 27.5
- **PM Total / Date**: 18
- **X Dates**: 30
- **Volunteer Coord**: 130
- **Laboratory**: 540
- **Website**: 200
- **Total Estimated cost for 2-lake testing**: 107270.67

**Total estimated cost for 2-lake testing**: 107270.67
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### Toxic Algae Testing, both lakes:
- **Volunteer Mobilization**: 1 hr 22.69 22.69 0.00 2 Volunteers x 1/2 hour
- **Boat value**: 1.5 hrs 16.95 25.43 0.00 1 hr Silver + 1/2 hr Horseshoe
- **Data entry**: 1 hr 22.69 22.69 0.00 1 Volunteer x 1 hour
- **Website update**: 1 hr 22.69 22.69 0.00 1 Volunteer x 2 hours 93.50 0.00 Cost of each independent test
- **x 9 independent tests**: 841.46 0.00
  - **Toxic Algae Shipping - Silver**: 1 Set 30.00 30.00 0.00 Shipping costs for 4 of 6 samples to King County Lab
  - **Toxic Algae Shipping - Horseshoe**: 1 Set 22.00 22.00 0.00 Shipping costs for 2 of 6 samples to King County Lab
- **52.00 0.00**
  - **x 15 shipment dates**: 780.00 0.00
  - **TOTAL**: 1,621.46 0.00

#### Additional Water & Weather Data, Silver Lake & Horseshoe Lake
- **Silver Water Temp, Level & Outflow Info**: 1 hr 22.69 22.69 0.00 At least one measurement per week
- **Silver Weather & Data Entry**: 0.5 hr 11.35 0.00 Daily Check
- **Silver Boat Costs**: 1 hr 16.95 16.95 0.00 Cost per hour = 0.565*60/2
- **Horseshoe Water Temp, Level & Outflow Info**: 1 hr 22.69 22.69 0.00 One measurement per week
- **Horseshoe Weather & Data Entry**: 0.5 hr 11.35 0.00 Daily Check
- **Horseshoe Boat Costs**: 1 hr 16.95 16.95 0.00 Cost per hour = 0.565*60/2

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### Pilot Projects, Silver Lake
- **Carp Derby Support**: 200 hrs 4,538.00 0.00 Volunteer hours for planning and conducting derby
- **Carp Removal and Stocking**: 40 hrs 907.60 0.00 Support of WDFW for post-derby electroshock & collection
- **Aquatic Plant Nursery Labor**: 120 hrs 2,722.80 0.00 Establishing shoreline enclosures for boat-up “gardening”
- **Aquatic Plant Nursery Material**: 6 sets 600.00 0.00 Tight-screen “raised beds” for establishing starts
- **Sample plant cage labor**: 60 hrs 1,361.40 0.00 Assembly and placing weighted, screened enclosures 5 x 5 x 5
- **Sample plant cage material**: 6 sets 390.00 0.00 PVC pipe, plastic mesh screen, grout for ballast
- **Aeration trial labor**: 80 hrs 1,815.20 0.00 Assembly & installation of surface & subsurface systems
- **Aeration trial material**: 2 sets 1,300.00 0.00 Gas-powered pump, tubing, eductor, bubbler, etc.

| 13,635.00 | 0.00 Total Pilot Costs |

### Total Two-Year Project Costs
- **158,284.86 107,270.67 Requested Funding From DOE Grant**

#### Task 1 - Management
- **$28,391.720 26,122.720**

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<td>Task Description</td>
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<tr>
<td>------------------------------------------</td>
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<tr>
<td>Task 2 - Silver Laboratory Testing</td>
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<td>Task 3 - Silver In-situ Testing</td>
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<td>Task 7 - Weather Data Archive</td>
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