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### Operations:

### Study Requests:

• Instream Flow Studies: Requested for the Saluda River and the Confluence area. An assessment on how Project operations affect stream flows, and which flow regimens would best meet the needs of the biota.

Requested by: CCL/American Rivers, City of Columbia Parks and Recreation, SCDNR\*, LSSRAC, National Marine Fisheries Service, SC Council Trout Unlimited, USFWS

\*[IFIM requested by SCDNR in lieu of implementing an instantaneous flow of at least 470 cfs needed to support one-way downstream navigation, and flows of 590 cfs (July – November), 1170 cfs (Jan-April), and 880 cfs (May, June and December) to provide seasonal aquatic habitat]

• Temperature Analysis – Downstream Affects: This request entails providing an analysis of the effects of the temperature of discharges from the Saluda Dam on downstream habitats including: (1) An analysis that determines the travel distance downstream to effectuate completion of temperature mixing in the Congaree River; (2) an evaluation of the affects to species and habitats within the downstream Congaree National Park; (3) an evaluation of the affects to upstream migrating diadromous fish.

Requested by: USFWS

### **Information Requests:**

• A Maintenance/Emergency Protocol Study: Requested in order to "develop a protocol for handling standard maintenance and emergencies on the project site that will meet the needs of SCE&G and protect public values to maximum extent possible. The study should explore how to minimize impacts to water quality and recreation when performing routine maintenance and dealing with emergency conditions such as floods or inclement weather."

Requested by: CCL/American Rivers

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• Ecologically Sustainable Water Management (ESWM): Described by the National Park Service as a "inclusive, collaborative, and consensus-based process to determine a scientifically based set of river flow prescriptions in order to protect downstream resources while balancing upstream benefits." The NPS notes that they believe this process can be readily adapted to the Saluda Project and have already began gathering information and developing an interactive GIS tool to provide information regarding the effect of various Saluda operational scenarios on the degree of inundation at the Congaree National Park. NPS seeks "partnership" with SCE&G as well as stakeholders in implementing this ESWM process.

Requested by: National Park Service

• Floodplain Flow Evaluations: A study was requested in order to evaluate the flows necessary for incremental levels of floodplain inundation for the Congaree River/Congaree National Park. It is requested that it include an inventory of floodplain vegetation as well, in order to classify and characterize the vegetative species composition and structure of the floodplain areas within the zone of operational influence of the river reaches.

Requested by: CCL/American Rivers (requested floodplain inundation study as well as floodplain vegetation component), LSSRAC (requested floodplain vegetation component only) National Park Service

\*In relation to this study, SCDNR requests that the hydrologic record associated with the operation of the project be compared to the unregulated hydrology that would have occurred under a natural flow regime over the life of the project. Including an estimate of the timing, duration and magnitude of flood events that occurred and that would have occurred in absence of the project.

• Hydrologic/Hydraulic Operations Model: Requested development of a computer simulation model that incorporates the operating characteristics of the Saluda Hydro Project. The model would be capable of simulating the Project's operations using specific hydraulic relationships based on inflows from all drainages to Lake Murray ending downstream in the Congaree River floodplain. The model would also include water flows in the Broad River above its confluence with the Saluda to accurately model combined flow conditions at the confluence and in the Congaree River.

Requested by: LSSRAC

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• Low Inflow Protocol Study: Requested study to evaluate the effects of periods of low flow on elements such as reservoir levels, water availability, river flora and fauna habitat, etc. Study leading to the development of a low flow operations plan for the Project. According to the City of Columbia Parks and Recreation, this study should include the development of a "Hydrologic/Hydraulic Operations Model"

Requested by: CCL/American Rivers, City of Columbia Parks and Recreation, LSSRAC

• **Pre-project and Project Inflows Study**: A study on "pre-Project and Project inflows" was requested by American Whitewater in order to be "used to inform decisions on flow regulation."

Requested by: American Whitewater

- An operations hydraulic model that reflects a basin-wide management capability. *SCDNR*
- A dataset that includes a sufficient period of record, preferably the life of the project. *SCDNR*
- A definition of dry, normal and wet water years. **SCDNR**
- Water level management strategies for the reservoir. SCDNR
- Spillway operation procedures. SCDNR
- Hydroelectric generation protocol. **SCDNR**
- Stage/storage relationships for the reservoir. **SCDNR**
- Runoff/storage relationships. *SCDNR*
- Critical lake level elevations and streamflow requirements for all water use interests (water supply, navigation, fish and wildlife, aquatic plants, hydropower, flood control, drought, boating access, recreation, etc. **SCDNR**
- Project inflows. **SCDNR**

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- Other project related information, such as sediment control/flushing plans or facilities maintenance plans, should be provided if they result in significant water level manipulation or impacts to aquatic resources. *SCDNR*
- Generation and/or Operation reports that include information on the current generating "scheme". *Lake Murray Homeowners Coalition*
- Information that explains in detail SCE&G's weather modeling and how the company uses weather predictions in managing lake levels. *Lake Watch*
- Information or a summary in layman's terms on the probable maximum flood occurrence and how SCE&G uses this information in managing lake levels. *Lake Watch*
- Information on minimum flow requirements for downstream industries. *Lake Watch*
- Information or a study to determine reservoir evaporation rates and its affect on operations and lake levels. *Lake Watch*
- Information regarding FERC requirements and/or restrictions relating to the use of flood gates. Information on impacts from using flood gates. *Lake Watch*
- A detailed description of current and past project operations pursuant to existing license conditions. This analysis should include the frequency, magnitude, and duration of turbine discharges, spills, and reservoir drawdowns. **USFWS**

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## Lake and Land Management

### Study Requests:

• Reservoir Level Study: Lake level fluctuation as it pertains to aquatic habitat, downstream flows, and recreation. More specifically the effects of drawdown on recreational boating, the ability to release downstream flows using a hydrologic/operations a model including effects of inundation patterns on the Congaree. A look at the effects of yearly lake level fluctuations on the Saluda and Congaree as well as the Congaree National Park. Also, to evaluate potential seasonal target elevations for Lake Murray that attempt to balance all related interest, including lakeside homeowners, municipal water users, environmental interests, power production capabilities, and downstream river users.

Requested by: CCL/American Rivers, City of Columbia Parks and Recreation, LSSRAC

### **Information Needs:**

• **Year-round 354' Elevation Feasibility Study**: To determine the feasibility of a 354' elevation as the minimum year round lake level for Lake Murray.

Requested by: LMA

• **Drawdown Impacts Study**: Requested in order to determine the impacts that lake drawdowns pose on public safety, economics, recreation, erosion, sedimentation and other resources.

Requested by: LMHC

• Shoreline Management Plan and Alternatives Study: A study of the shoreline classifications at Lake Murray as well as the LSR project land classifications. Land in and around the project boundary should be inventoried to best determine future management. SCDNR requests that a rebalancing occur in shoreline classifications because current classifications are weighted towards development. LMHC suggests that this include elements such as the relationship in between shoreline development and lake congestion and boating safety. Lake Watch requests a re-evaluation of "dock permitting policies on easement lands".

Requested by: CCL/American Rivers, City of Columbia Parks and Recreation, SCDNR, LMHC, Lake Watch, S. C. Parks and Recreation, USFWS

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• "Total Build-Out Study": Requested in order to identify areas not appropriate for private development and marinas.

Requested by: Lake Murray Homeowners Coalition (LMHC)

- Request a summary of water level fluctuations for the months of March, April and May for the period of the current license in order to assess the possible enhancement of the spawning success of shallow water nest builders, such as crappie, sunfish and bass. **SCDNR**
- Information from the existing license which sets parameters for reservoir levels. *Lake Watch*
- **Newberry County** requests the posting of draw-down dates due to safety concerns for lake users.
- *SCDNR* requests the completion of the following parts of the Shoreline Management Plan:
  - 1) an erosion and sedimentation control plan
  - a map identifying intermittent and perennial streams and their associated 75' buffer
  - 3) guidelines for restrictions within the 50" buffer surrounding the ESA's
  - 4) a map showing the location of all ESA's in front of all easement properties
  - 5) a woody debris and stump management plan
  - a buffer zone restoration plan for buffer zone areas that have been improperly cleared by landowners
  - 7) the designation of new waterfowl hunting areas to compensate for those lost to land sales and development
  - 8) Per SCE&G's revisions, SCDNR requests an updated land use classification that clearly describes the existing use of the property, acreage and mileage of shoreline associated with each classification.
  - 9) SCDNR requests that specific management restrictions be developed and incorporated into the SMP that would control encroachments into ESA's, conservation areas, and other natural areas
- We request a summary of project lands and their current classifications, to include acreage and mileage of shoreline. *SCDNR*, *Lake Murray Homeowners Coalition* (LMHC would like to see this information in the form of Land use maps)

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- **SCDNR** would like to know how many acres, within the project boundary, are associated with environmental, forest and game, and vegetated land classifications, as well as wetlands.
- Request of information displaying the relationship between lake levels and shallow water habitat. This knowledge will allow in evaluating the impacts of any proposed operations on this habitat. *SCDNR*
- **Newberry County** requests that buffer zone property be mapped and posted with the applicable restrictions in order to be made available through local government offices.
- Base Flood Elevations on a lake map, preferably in GIS format, submitted in accordance with FEMA regulations. Requested in an effort to prevent construction by property owners in flood zones associated with the project boundary. *County of Newberry*

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Safety

Study Requests: None

Information Needs:

• Safety and Warning System Studies: Request of studies to improve the water level rise safety warning systems on the LSR, as well as implementing additional measures to improve safety. It is requested that SCE&G "should examine various types of warning systems at all sites used by the public for recreation" and "should include the amount of time required for various volumes of release to reach the recreation sites to give an idea of exactly how much time river users have to react. The study should also examine signs, lights and other visual warnings as well as horns or sirens to meet the needs of river users of all abilities."

Requested by: CCL/American Rivers, Lake Watch, Lower Saluda Scenic River Advisory Council (LSSRAC), S.C. Parks Rec and Tourism, SC Council Trout Unlimited

• **Ramping Study**: It was requested that the ramping of Project releases should be studied and potentially implemented, particularly during periods of high recreational use of the river.

Requested by: American Whitewater, City of Columbia Parks and Recreation, LSSRAC

• Public Information System Study: Request of studies in order to explore and decide the best way to disseminate Project operations information to river users as well as decide what information to release. The study is suggested to explore which mode of communication would benefit the largest amount of people whether it be through the use of toll free telephone lines, kiosks, brochures or the internet. CCL/Am. Rivers suggests that the public information system should include "an annual schedule of minimum flow requirements, recent rainfall, weekly forecasts of expected operations, real-time operations and flow information, and other useful information. The information should include what rapids require what levels of paddling expertise at different water levels and include warnings about dangers present in varying flow scenarios. The study should examine in what languages other than English the information should be published, such as Spanish."

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Requested by: CCL/American Rivers, City of Columbia Parks and Recreation, Lake Watch, River Runner Outdoor Center

• **Dispute Resolution Study**: Requested study in order to determine how to best improve communication with public including resolving disputes and/or complaints between the licensee and the public.

Requested by: Lake Watch

• A list of all project related accidents that occurred during the existing license period be provided, as well as any accommodations in project operations or facilities by the licensee to address these accidents. **SCDNR** 

- Inclusion of all high and seasonally high use areas in the siren and flashing light system, to warn users of rapidly rising water and dangerous conditions. That includes Tail Race, Saluda Shoals, Hopes Ferry, Mill Race, Shandon Rapid, Oh Brother and Ocean Boulevard Rapids. American Whitewater
- A dependable on-line and phone communication system informing of river flows and special conditions needs to be established. **American Whitewater**

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## Cultural

Study Requests: None

### **Information Needs:**

• **Historic/Cultural Resources Survey:** This would involve the development of a plan in conjunction with resource agencies in order to identify and protect historic and cultural resources.

Requested by: SCDNR, LSSRAC, SC Parks Rec and Tourism

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### Fish and Wildlife

### Study Requests:

• **Diadromous Fish Studies**: Study requests from the CCL/American Rivers focused on a more in depth analysis of habitat conditions, feasibility of hatchery operations for diadromous fish, impacts analysis of the Project on diad. fish stocks of the Santee-Cooper Basin, the feasibility and costs of fish passage at the Project. SCDNR requests that spawning and nursery habitat for diadromous fish species in the river and lake should be identified and quantified.

Requested by: CCL/American Rivers, SCDNR, LSSRAC, National Marine Fisheries Service, USFWS

• Mussel Surveys: It was requested that the present status of mussels in the project area should be evaluated, their habitat needs assessed, and any project impacts on habitat be identified. CCL requests an evaluation of the cumulative impact analysis that the Project has on mussel stocks in the Santee Cooper Basin.

Requested by: CCL/American Rivers, SCDNR, LSSRAC, USFWS

• **Benthic Macroinvertebrate Study**: Requested in order to determine if invertebrate fauna have increased in either number or species diversity as a result of turbine venting. As well as how far downstream they are impacted.

Requested by: SCDNR, LSSRAC, National Marine Fisheries Service, SC Council Trout Unlimited, USFWS

• **Fish Community Surveys:** It was requested that these surveys be performed and include small non-game species in the Saluda River above and below the reservoir as well as in Lake Murray, to supplement existing fish community data and/or replace dated information. Specific sampling focused on determining presence or absence of the rare robust redhorse sucker, Carolina sucker, and the highfin carpsucker should be conducted in the lower Saluda River.

Requested by: USFWS

• Striped Bass Evaluations: This study would involve an evaluation of project operations on the reservoir striped bass population, particularly regarding: (1) the effectiveness of current turbine operations, (2) potential additional enhancements in association with the summer thermocline near the powerhouse; and (3)

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determine if striped bass migrate upstream of the project within the Saluda River during the spring spawning season, and if and where spawning activities occur.

Requested by: USFWS

• Migratory Bird Surveys: This survey would evaluate the effects of the project on migratory bird use at Lake Murray and the Saluda River and riparian ecosystems. Surveys of migratory birds and their habitats to provide baseline information on populations. Aerial surveys for potential roosting, nesting, and foraging sites for the federally endangered woodstork should also continue.

Requested by: USFWS

### Information Needs:

• Comprehensive Habitat Assessment: To provide quantitative and qualitative data in GIS format of available and potential spawning, rearing, and foraging habitats (i.e., riffles, shoals, open water, shallow coves, littoral zones) for diadromous and resident fishes in Lake Murray, the Saluda River and its major tributaries, and the Lower Saluda River below the Project.

Requested by: National Marine Fisheries Service, USFWS

• **Fish Entrainment Desktop Study:** This study would include conducting a desktop study of potential entrainment using previous studies conducted at other similar facilities. The objectives of the study should be to (1) quantify the numbers and sizes of fish entrained, by species, (2) estimate mortality rates associated by species, and (3) provide recommendations for project design and operation that can reasonably be made to prevent or minimize fish entrainment and associated injury/mortality.

Requested by: SCDNR, National Marine Fisheries Service, USFWS

• A Study to Determine the Factors Needed for a Self Sustaining Trout Fishery: The purpose of this study should be to determine the factors needed for a self sustaining trout fishery that can reproduce and thrive year round, and how the operation can be modified to meet the habitat needs. Dissolved oxygen, flows, spawning and rearing habitat, the aquatic food base, especially in the shallow, rocky foraging areas, and actual water chemistry should be key items in such an assessment.

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Requested by: SC Council Trout Unlimited

• Rare Threatened and Endangered Species/Habitat Studies: A study was requested to assess the condition of rare threatened and endangered species in the Project area, as well as how Project operations are affecting these species and how Project operations can be used to protect, restore, or enhance populations. Management plans be developed for species existing in the project area or under the influence of the project. Suggestions include Wood Stork and RSSL Surveys as well as SNS and American eel sampling.

Requested by: CCL/American Rivers, SCDNR, LSSRAC, National Marine Fisheries Service, USFWS

- **SCDNR** requests a summary of emergency spill gate testing protocol to include the frequency, time of year, and any adaptive measures that are used to reduce fish mortality as a result of spill gate testing.
- Information on species composition, location, and acreage of aquatic plants in the project is needed to aide in the development of an aquatic plant management plan. *SCDNR*
- Information be dispersed to lake users by SCE&G on aquatic weed control measures. *County of Newberry*
- Please provide copies of the existing environmental studies conducted at the Saluda Hydroelectric Project by SCE&G contractors and the South Carolina Department of Natural Resources that are referenced in the literature cited section of the Initial Consultation Document. These may be provided as hard copies or via CD (preferable). USFWS

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## Water Quality

### Study Requests:

• Water Quality Studies: Request of studies in order to assess the effects of Project operations on water quality, and consequently the aquatic habitat in the lake and river segments. Suggested studies include those to determine the effectiveness of newly installed hub baffles, TMDL's in Lake Murray, effects of project operations on summer habitat for striped bass including mitigative measures for fish kills, effects of operations on water temperature as affecting the spawning and recruitment of diadromous and riverine fish in the Saluda and Congaree rivers, and the effects of D.O. and water temperature on mussel populations in the LSR and Congaree. SCDNR recommends that water quality models be developed to identify any relationships between point and non-point pollutants and operations. The Lake Murray Association (LMA) and Lake Murray Homeowners Coalition (LMHC) specifically request information to be collected on cove water quality. The League of Women Voters suggests that water quality studies also include a facet on the impacts of power boats and jet skis on drinking water quality.

Requested by: CCL/American Rivers, American Whitewater, City of Columbia Parks and Recreation, SCDNR, LMA, LMHC, League of Women Voters, LSSRAC, National Marine Fisheries Service, S.C. Parks Rec and Tourism, SC Council Trout Unlimited, USFWS

• Sediment Regimen and Sediment Transport Studies: A request has been made that a study be performed on the sediment regimen in the Project area as well as the Project effects on the sediment regimen of the lower Saluda River. Should include such things as sediment composition, bedload movement, gravel deposition, sediment storage behind dams, and bedload changes below the dam; and project effects on downstream geomorphometry, sediment availability and streambank erosion, and the possible addition of gravel to mitigate for project impacts. Also, the effects of the Project operations on habitat requirements for spawning fishes.

Requested by: CCL/American Rivers, USFWS

#### Information Needs:

• Aquatic Habitat Decline Model: In order to understand the reasons and contributing factors of seasonal habitat decline associated with the combination of increasing water temperature and decreasing dissolved oxygen. Thus resulting in

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a decrease in available cool-water habitat for some species. This model would be developed to better understand the causative factors that result in habitat declines, and to evaluate scenarios that could reduce or eliminate this problem.

Requested by: SCDNR

- Request information that will help to a) forecast striped bass habitat reductions with new
  operational protocol implemented, and b) help develop an operational protocol to
  minimize impacts on striped bass habitat. SCDNR
- Temperature profiles, on at least a monthly basis, at the unit intakes in the reservoir (specifically June-September) to have a better understanding of the relationship between project operations and water temperature and dissolved oxygen as they pertain to our management programs. *SCDNR*
- We recommend that trends in water quality data associated with Lake Murray and the Lower Saluda River be reviewed and summarized. Special attention should be given to the stations and parameters that did not meet State standards or are declining. *SCDNR*
- Marina water quality monitoring records in order to understand the degree of water quality impacts related to large multi-slip docking facilities. Lake Murray Homeowners Coalition
- An updated report on the status of dissolved oxygen concentrations in the lower Saluda River and the efficacy of existing enhancement measures. **USFWS**

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### Recreation

Study Requests: None

### **Information Needs:**

• Recreational Uses and Needs Study: Requested in order to evaluate present recreation in the project area as well as future recreational uses. This study request also involves the evaluation of the best locations for future access points and what type of access is necessary. SCDNR recommends that future plans should include the development of shore based recreational access and the location and property for a large, multi-lane boating event site should be explored. SCPRT suggests that A "build out" scenario should be used to identify the volume of use based on future development proposed in the shoreline management plan and provide information on how the "build out" will affect boating carrying capacity, water quality, and fish and wildlife habitat.

Requested by: CCL/American Rivers, City of Columbia Parks and Recreation, SCDNR, LMA, Lake Watch, LSSRAC, SC Parks Rec and Tourism, SC Council Trout Unlimited

Available Lands for Recreation and Protection of Environmental Resources
 Survey: Requested inventory of land ownership around the project boundary to
 determine the feasibility of aggregating desirable parcels for parks, open space,
 other recreation, habitat preservation, and viewshed protection. Such an inventory
 could also provide valuable information about the current and proposed rate of
 development, thereby determining the urgency of assembling valuable parcels for
 the public benefit.

Requested by: LSSRAC

• Boat Carrying Capacity Study: This study was requested in order to identify concerns with current or future over-crowding and safety on Lake Murray. As part of the process, this study includes an inventory of current and future residential docks, public and private marinas, dry storage, and other boat access opportunities. Project related accidents during the current license period should be identified for use in addressing safety needs. This study will identify areas to target or avoid for new boating facilities.

Requested by: S.C. Parks Rec and Tourism

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• Recreational Flow Study: Requested to study the effects that Project operations have on instream flow and the recreation that occurs on the Saluda and at the confluence area. This study requests that flow levels that best benefit anglers, paddlers and swimmers be evaluated as well as safety during recreational activity. Also to determine flows needed to support boat passage (canoe, kayak, and small motor boat) on the lower Saluda and into the Congaree River

Requested by: CCL/American Rivers, City of Columbia Parks and Recreation, SCDNR, LSSRAC, S.C. Parks Rec and Tourism

• Spillway Releases for Recreational Purposes: "The value of the spillway as a whitewater recreation resource should be studied following peer reviewed methods. These methods should include at a minimum an on-water single flow whitewater boating feasibility study, possibly followed by a controlled whitewater flow study."

Requested by: American Whitewater

• A description of public recreation sites that includes information capacity and handicapped accessibility. *SCDNR* 

- Upgrading and repairing of all existing access points. American Whitewater
- Creation of a take out above Mill Race Rapid (class IV,) to provide a safe and legal area above a known river hazard for float trips. **American Whitewater**
- Scheduled flow releases for recreational events and at desired times of the year when flows can support optimal conditions for recreational uses, such as whitewater boating, special events, and rescue training should be studied and provided. American Whitewater
- Acreage be added to all small recreation access sites to the extent possible to allow for future expansion as recreational needs change and to provide options for shore based recreation. SC Dept. of Parks Rec. and Tourism
- An estimate of remaining legal waterfowl hunting areas should be mapped for consideration of designated waterfowl hunting areas. SC Dept. of Parks Rec. and Tourism

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• A plan should be developed to protect islands in the lake and river while allowing recreational use. Population growth and increasing boat use may severely affect these recreational resources over the term of the license. SC Dept. of Parks Rec. and Tourism

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## Other Information Requests:

- Information on other SCE&G owned hydro electric generating resources and how these facilities interact with Saluda Hydro operations. *Lake Watch*
- An assessment and explanation of SCE&G's responsibilities as stated in the standard license articles. *Lake Watch*
- A study to determine any existing legal obligations which might exclude certain aspects of the project from the relicensing process. *Lake Watch*
- A copy of the VACAR agreement. *Lake Watch*
- A financial breakdown of revenues SCE&G receives from permits and marina fees and the sale of project lands. This information will be necessary in order to evaluate any recommendations to increase residential permitting fees. Lake Watch
- A report on revenues paid to the FERC for administrative services *Lake Watch*