Power4Georgians (Plant Washington)
Surface Water Withdrawal Permit No. 150-0391-04
Interbasin Transfer Considerations

The interbasin transfer (IBT) considerations identified in the 2008 State Water Plan will officially become elements of the Rules of the Board of Natural Resources on 7 March 2011. EPD has therefore not had previous occasion to evaluate these considerations for any interbasin transfer. Likewise, the withdrawal permit for the proposed Plant Washington facility will have been issued prior to the effective date of the Rule governing considerations of new interbasin transfers. And while the application of the 22 IBT considerations is not required (because they would not have become Rule under after the issuance of the permit), EPD has sought to use this opportunity to apply the considerations to the proposed application.

The following responses to the IBT considerations reflect EPD's initial attempt at applying the considerations to an actual application, and does not reflect guidance that will - in future - be gained from a stakeholder process.

Donor Basin Considerations

i. The quantity of the proposed withdrawal and the stream flow of the donor basin, with special consideration for dry years and low flow conditions.

The proposed Plant Washington surface water withdrawal is 16.0 million gallons per day (mgd) (24.8 cfs) (24-hour maximum day), 13.5 mgd (20.9 cfs) (monthly average) from the Oconee River. The average annual flow of the Oconee River at the proposed Plant Washington site is approximately 3,000 cubic feet per second (cfs). The proposed surface water withdrawals are less than one percent of the average annual flow in the Oconee River at the proposed intake. This small fraction would not preclude future downstream withdrawals.

During times when the Oconee River experiences low flow conditions, the proposed Plant Washington surface water withdrawals would temporarily cease, and withdrawals from groundwater would be substituted. The proposed Surface Water Permit identifies the monthly low flow quantities at which the surface water withdrawals would cease and the groundwater withdrawals commence. These monthly low flow quantities (monthly 7Q10 plus a non-depletable flow) provide drought protection for the instream flow requirements and downstream permits. These low flows are listed below: The flows are in cubic feet per second.

Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
859	1018	1553	743	389	366	324	321	331	352	362	541

ii. The current and reasonably foreseeable future water needs of the donor basin, with special consideration for dry years and low flow conditions.

Regional water planning is currently underway in conformance with the Georgia Comprehensive Statewide Water Management Plan of 2008 (SWP). According to the regional water planning products already available for the Oconee River basin, surface water use by agricultural, industrial, and municipal water users in the basin downstream of the proposed Plant Washington surface water intake is estimated at 21.66 mgd. The 2050 forecast for the same group of surface water users in this portion of the basin is estimated at 26.56 mgd. This suggests a foreseeable growth in surface water demand of 4.9 mgd. Downstream of the proposed Plant Washington withdrawal, records for long-term observed flows indicate that there is sufficient flow to support this moderate increase in demand of 4.9 mgd. The monthly low flow quantities provide dry-weather flow protection for the existing and reasonable future water needs. See response to comment one above.

The Oconee River basin upstream of the proposed Plant Washington withdrawal is utilized for withdrawals, wastewater returns and associated water losses; however, the current and future uses of the Oconee River basin (upstream of Plant Washington) will not be impacted by the proposed withdrawal. This is due to the dampening effect of the two lakes (Lake Oconee and Sinclair Lake) just upstream of the proposed withdrawal.

iii. Protection of water quality in the donor basin, with special consideration for dry years and low flow conditions.

The Oconee River basin upstream of the proposed Plant Washington withdrawal has been addressed in the response to comment two above. The Oconee River downstream of the proposed Plant Washington withdrawal is protected through the NPDES discharge permit discharge limits, which includes conditions that are protective of water quality in the Oconee River. The lowest monthly flow threshold for the proposed Plant Washington permit (321 cfs in August) is more restrictive than the flow used to determine NPDES permit limits to protect instream dissolved oxygen standards. Protecting the monthly 7Q10 flow in the stream provides for the necessary instream assimilative capacity to protect water quality.

The proposed surface water withdrawal will cease during low flow conditions. During low flow periods, the plant will switch first to withdrawals from on-site storage, then to groundwater. During low flow periods the flow in the Oconee River in the donor basin will be increased by the amount of the returned discharged (an average 2.4 cfs or 1.5 mgd).

iv. Any offsetting increases in flow in the donor basin that may be arranged through permit conditions.

Under the proposed permit conditions when surface water withdrawals cease because of low flow conditions, withdrawals will be made first from on-site storage, then from groundwater. The flow in the donor basin will be increased by the amount of the returned discharged (an average 2.4 cfs or 1.5 mgd) during this time period.

v. The number of downstream river miles from which water will be diverted as a result of the transfer.

The plant effluent will be discharged into the Oconee River approximately 3.0 river miles downstream from the proposed water withdrawal intake. The water diverted from this segment is small relative to streamflow as shown in response to comment one above.

vi. The connection between surface water and groundwater in the donor basin, and the effect of the proposed transfer on either or both.

The connection between surface water and groundwater will be evaluated for all proposed interbasin transfers applications based on site-specific circumstances. In the current case, to determine the nature and extent of connection between surface water and groundwater in the donor basin, EPD used a site-specific numeric model that was carefully calibrated and subsequently used to simulate intermittent groundwater withdrawals for cooling water. The Plant Washington modeling indicated that transient short-term groundwater withdrawals, as authorized by the groundwater withdrawal permit, would have no lasting effects on water levels in the Cretaceous aquifer, or on the overlying water table that is hydraulically connected to surface waters.

Groundwater concerns were handled through the Permit to Use Groundwater (Permit # 150-0026). The short-term use of groundwater wells would only occur during drought periods when withdrawals of surface water from the Oconee River would cease, and thereby ensure there are no violations of EPD's instream flow protection standards. Pumping of groundwater would be short-term rather than constant.

Receiving Basin Considerations

The Ogeechee River basin is considered to be the receiving basin, because that is where use of the transferred water occurs. Wastewater would be returned to the Oconee basin; considerations related to those returns are addressed under Donor Basin Considerations and Considerations Affecting Both Basins.

i. Determination of whether or not the applicant's proposed use is reasonable, including consideration of whether the applicant has implemented water conservation practices and achieved reasonable water conservation goals.

Water conservation measures were incorporated into the plant's design. These conservation measures include using a closed cycle cooling tower system, recycling industrial process water, reusing stormwater from the plant site, and reclaiming wastewater. The proposed power plant uses current technologies for the use of cooling towers and is accepted as reasonable.

ii. Assessment of the wastewater treatment capacity of the receiving basin.

The proposed Plant Washington does not anticipate discharging water to the Ogeechee River Basin; therefore, there is no need to assess the wastewater treatment capacity of the Ogeechee River Basin.

iii. The supply of water presently available to the receiving basin, as well as the estimates of overall current water demand and the reasonable foreseeable future water needs of the receiving basin.

Resource assessments conducted for statewide water planning indicate that there is not sufficient surface water supply in the upper portion of the Ogeechee River basin to support all of the proposed withdrawal quantity while meeting instream flow targets. The supply of water in the Ogeechee River is limited by the relatively small drainage area. The Ogeechee River basin and the Ogeechee River near the proposed Plant Washington site has a drainage area of approximately 400 square miles. The Oconee River basin, in contrast, is much larger, contributing to much greater water availability. The Ogeechee basin drainage is 13 percent of the Oconee basin drainage area at the proposed withdrawal site (3100 square miles).

Under federal regulations 40CFR §125.84, the proposed Plant Washington's design withdrawal is limited to 5% of mean annual flow in the source stream. Five percent of the mean annual flow in the Ogeechee near the Plant Washington site is estimated at 22 cfs, which is less than the withdrawal required to operate the plant. Also, the streams in the area are considered swamp-like, eliminating the possibility of building a reservoir.

Commenting on the overall current water demand and the reasonable foreseeable future water needs is not necessary for the receiving basin because no water from the donor basin is returned to the receiving basin; it is instead returned to the donor basin.

iv. The beneficial impact of any proposed transfer, and the demonstrated capability of the applicant to effectively implement its responsibilities under the requested permit.

Residents and businesses served by the electric membership cooperatives associated with Plant Washington located in both the Oconee and Ogeechee River basins will benefit from the electricity generated by this plant.

The applicant has satisfactorily complied with all the water permitting requirements, and completed all engineering and design studies to obtain and operate under water withdrawal permits from EPD.

v. The impact of the proposed transfer on water conservation.

Operation of Plant Washington will have no adverse impact on water conservation in either basin. Water conservation measures were incorporated into the plant's design, and the measures include using a closed-cycle cooling tower system, recycling industrial process water, reusing stormwater from the plant site, and reclaiming wastewater. The proposed power plant uses current technologies for the use of cooling towers and is accepted as reasonable.

vi. The applicant's efforts to explore all reasonable options for use of reclaimed water and recycling of available sources to meet the needs of the receiving basin.

Water conservation measures were incorporated into the plant's design, and include using a closed cycle cooling tower system, recycling industrial process water, reusing stormwater from the plant site, and reclaiming wastewater. The proposed power plant uses current technologies for the use of cooling towers and is accepted as reasonable.

Recycling of available water from mining pits was evaluated. Due to water chemistry and/or impacts on streams surrounding the mining pits, using water from this source was considered an unacceptable option.

vii. Assessment of the adequacy of treatment capacity and current water quality conditions.

The proposed Plant Washington does not anticipate discharging water to the Ogeechee River Basin; therefore, there is no need to assess the wastewater treatment capacity of the Ogeechee River Basin.

Considerations Affecting Both Basins

i. The economic feasibility, cost effectiveness, and environmental impacts of the proposed transfer in relation to alternative sources of water supply.

A screening level analysis was conducted to evaluate the potential of using the Ogeechee River, groundwater, the use of mining pits (tailing pits) and/or reservoirs for supplying water to the proposed Plant Washington power plant. The Ogeechee River basin flow near the Plant Washington site could not provide enough of the needs of the plant (see Receiving Basin Considerations comment three response).

Using groundwater as a sole supply of water would have required more wells spread out over a larger area, increasing the impact on limited groundwater resources. The use of mining pits would have taken water away from the local creeks used by the mining pits and the water in the mining pits was high in total dissolved solids making the water quality not adequate for the power plants use. The land topography in the area would not support a reservoir large enough to handle the needs of the plant.
Based on this analysis, it was determined that the best alternative is the selected integrated approach combining surface water, groundwater and on-site storage.

ii. The cumulative impacts of the current and proposed interbasin transfers in the basin.

The Oconee River basin above Lake Oconee currently has a net gain in flows due to interbasin transfers from the Chattahoochee and Ocmulgee basins, and EPD expects this trend will continue in the future.

The downstream impact on flows below Lake Oconee and Sinclair Lake, however, is dampened out by the storage in each of these two lakes. There are no current or proposed interbasin transfers below Lake Sinclair.

The proposed interbasin transfer from the Oconee River returns all water not consumed in the power production process back to the Oconee River (donor basin). Therefore, the Ogeechee River flows are completely unaffected by this proposed project.

iii. The requirements of the state and federal agencies with authority related to water resources.

The Georgia Wildlife Resources Division, Environmental Protection Division, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, and the Atmospheric Administration National Marine Fisheries Service provided input into the requirements related to this project. The robust redhorse, a species of fish, has been protected by the modified operations proposed for the project.

iv. The availability of water for responding to emergencies, including drought, in the donor basin and the receiving basin.

The proposed withdrawal will not impact the ability of the Oconee River to respond to emergencies including droughts. See Donor Basin Considerations comment one response.

The Ogeechee River will not be impacted by this proposed withdrawal. The flow of water in the Ogeechee River basin will remain unchanged.

v. The impact, whether beneficial or detrimental, on offstream and instream uses.

There are no detrimental impacts to instream and off-stream uses of water in the Oconee River basin during dry flow periods because the proposed surface water withdrawal ceases during these periods. During these low flow periods the wastewater discharge to the Oconee River continues because the use of groundwater allows continued use of the proposed plant. The dry weather discharge from the proposed plant would actually be beneficial to Oconee River flows.

During non-drought periods, the proposed withdrawal is less than 1.5 % of the lowest monthly average flow of the source stream; therefore, we conclude that the impact on instream flows and off-stream uses are minimal to non-existent.

This proposed withdrawal and discharge does not impact the Ogeechee River basin.

vi. The quantity, quality, location, and timing of water returned to the basin of donor basin, receiving basin, and basins downstream.

The only water returned (from the proposed plant) will flow into the Oconee River (donor basin). At all times the plant is in operation, there will be a continuous return of water to the Oconee River. An average of 2.4 cfs or 1.5 mgd of water will be returned approximately 3.0 river miles below the withdrawal location. Return flows will be discharged pursuant to the NPDES permit (#GA0030055). No water is returned to the Ogeechee River basin.

vii. Impact on interstate water use.

No impact on interstate water use will result from the proposed withdrawal. The Oconee River and its tributaries are entirely within Georgia, and the basin's waters flow through the middle of the state and joins with the Ocmulgee River to form the Altamaha River, which then flows into the Atlantic Ocean.

viii. The cumulative effect on the donor basin and the receiving basin of any water transfer or consumptive use that is authorized or forecasted.

With the use of mathematical modeling tools, as well as water use and stream flow data developed for other purposes, EPD is equipped to evaluate the cumulative flow impacts of historical and future sub-basin specific consumptive uses on the mainstem hydrology of the 14 major river systems in Georgia (including but not limited to the Oconee and Ocmulgee Rivers). For the Oconee and Ogeechee Rivers, these modeling tools and associated data have been used to assess the stream flow implications of previously permitted – and forecasted future –

withdrawal and discharge activities above Mount Vernon stream flow gage on the Oconee River and the Eden stream flow gage on the Ogeechee River.

Results indicate that the most significant cumulative effects manifest at low flow conditions. Since the Plant Washington withdrawals from the Oconee will cease at low flows, the proposed withdrawal will not exacerbate these effects.

ix. Such other factors as are reasonably necessary to carry out the purposes of Georgia law.

No other factors have been identified.