Current as of Oct. 24, 2011

Frequently Asked Questions on Savannah River Basin Water Management

Q1: What has the Corps of Engineers done lately to manage the current (2011) drought?

A1: The year began with all three Savannah District reservoirs rising due to winter rains. Hartwell Lake and Russell Lake reached full summer pool. (Hartwell Lake reached a surface elevation of over 660 feet above mean sea level (ft-msl) and Russell Lake reached a level of 475 ft-msl.) We limited Thurmond Lake's elevation to 328 ft-msl, or 2 feet below full pool, for the safety of workers conducting repairs to the dam's floodgates.

As the current (2011) drought took hold and the reservoirs' elevations dropped below the drought level 1 trigger point, we reduced outflows in July to a maximum weekly average of 4,200 cubic feet per second (cfs), in keeping with the drought management plan. In August we reduced the outflows further to a weekly average of 4,000 cfs when the reservoirs reached drought level 2, again in keeping with the drought plan. Finally, in October we further reduced the outflows to 3,800 cfs after reviewing updated, long-range weather forecasts for the winter and spring.

We also maximized the "pump-back" capabilities at Russell Dam to re-use water for hydropower production which conserves water in the reservoir system while still providing clean energy. Four reversible turbines in the Russell Dam have the capability to move water from Thurmond Lake back upstream to Russell Lake. These four pump back turbines at Russell Dam normally generate power during daytime peak demand hours, then reverse direction at night to pull water back into Russell Lake for re-use the next day. This pump-back system allows us to conserve water in the reservoirs but still meet some of the summer's high demands for electricity. For more information on Russell Dam's pump-back capabilities, click here.

Q2: Why do you continue to release water from the reservoirs? Who benefits from downstream flows?

A2: We must release water from the reservoirs to meet downstream needs – drinking water, industrial uses, utilities, and the environment. These needs continue year round. Many thousands of people, dozens of industries, and some major utilities depend on a constant supply of water from the reservoirs. By law downstream environmental needs must also be met. As a water resource management agency, the U.S. Army Corps of Engineers seeks to balance downstream needs with other authorized purposes of the reservoirs. People benefit from water releases throughout the lower basin. For instance, Plant Vogtle nuclear powerplant, near Waynesboro, Ga., is a major user of downstream water. This utility supplies power to a large area of the lower basin for homes, businesses and industries. Other utility companies in and near Augusta, Ga., also depend on flows from the Savannah River, directly impacting local economies. Cities and counties downstream depend on the river for drinking water.

Q3: Who determines how much water can be taken out of the Savannah River?

A3: The states of Georgia and South Carolina oversee and permit withdrawals from the water system. The Corps coordinates regularly with the states' resource agencies on water management in order to gauge needs of upstream and downstream users. In addition to the states, we develop water management

plans and procedures for the reservoirs with input from other federal natural resource agencies. These agencies are charged with enforcing federal laws related to water and aquatic ecosystems.

Q4: Is 3,800 cubic feet per second (cfs) discharge from Thurmond Dam the "absolute minimum" that must be released from Thurmond for downstream water supply requirements?

A4: Based on low-flow tests conducted during the 1980-81 drought, 3,600 cfs is the accepted minimum required flow to meet water supply requirements for downstream municipalities, industry, and utilities (primarily Plant Vogtle and the Savannah River Site) plus maintain critical natural habitat. In the 2006 revisions to the drought plan, that minimum outflow was changed to 3,800 cfs. While the outflow is now greater at the more severe levels of drought than before 2006, we also placed earlier restrictions on Thurmond's discharge that did not exist before 2006. In other words, we now reduce outflows earlier in the drought than before.

Q5: Who demands that the Corps of Engineers release at least 3,800 cubic feet per second (cfs) from the reservoir system?

A5: We developed the drought plan with input from state and federal natural resource agencies, from municipalities in the Savannah River basin, and from the general public. It was agreed during the 2006 revision that as a drought progressed and reservoir levels dropped, we would reduce outflows in stages or tiers, with 3,800 cfs as the minimum needed to meet downstream water supply and water quality needs. Without an extensive study to help us reach other conclusions, we can't make a logical change beyond this level.

Q6: What other federal natural resource agencies influence your decisions on water management and what concerns to they have?

A6 We often confer with three other federal agencies: the Fish and Wildlife Service, the NOAA National Marine Fisheries Service, and the Environmental Protection Agency.

The Fish and Wildlife Service has said that low flows can impact the water quality of backwater habitats, habitats that are important for bass and fishing. Reduced flows will cause salty water to move upriver, impacting highly productive freshwater marshes at the Savannah National Wildlife Refuge and the ducks that use the freshwater habitat. And the FWS is concerned that shortnose sturgeon will be cut off from the gravel bars in the river.

The NOAA National Marine Fisheries Service has written that balancing the flow carefully in the Savannah River is very important for protection and restoration of ocean, estuarine and riverine ecosystems, fisheries, and wildlife populations. Available rocky shoal spawning habitat was reduced by more than 95 percent due to blockage of upstream migrations when dams on the river were built. Carefully regulating the Savannah River's flow in important remaining spawning and maturation habitats is critical for protection of all species, particularly shortnose and Atlantic sturgeon.

The EPA has said that each surface water body [such as the reservoirs on the Savannah River] is designated by its benefits, such as: fishing, recreation, public water supply, agriculture, industrial use or navigation. Each benefit has corresponding criteria to ensure that the water is biologically healthy and doesn't have excessive levels of toxins or other pollutants. To protect fisheries, both Georgia and

South Carolina require an average of 5 milligrams per liter (mg/L) of dissolved oxygen in their freshwaters – and 6 mg/L in trout streams.

Q7: How much water is really needed to meet downstream needs?

A7: Until we can complete the Savannah River Basin Comprehensive Study (the "comp study") we won't have scientific data to guide changes to the drought plan. We know that our actions in one area of the basin impact other areas of the basin. However, without the data to be provided by the comp study, we can't determine how much our actions impact the basin – environmentally, economically, and socially. Therefore, we rely on the drought plan as the best guide we have. The plan was developed and updated with input from state and federal natural resource agencies, municipalities in the basin, and the general public, including reservoir and river stakeholders.

Q8: You didn't have the "comp study" when you created and updated the current drought plan, yet you changed the way you managed water. Why not take that kind of action now?

A8: Until we worked with the state and federal natural resource agencies, local municipalities, basin utilities, and the public to create the drought plan, the availability of water upstream and downstream varied greatly. The plan was an acceptable balance among the stakeholders based on the best judgments of the organizations and public.

The plan allows sharing the burden of regional drought for upstream and downstream users. At the same time it allows for shared benefits of the reservoirs for upstream and downstream users during drought. The comp study would give us the data needed to make logical, scientific changes to the plan. The comp study is required to make the big changes to the drought plan that are outside of our existing authorities.

Q9: Drought is a cyclic process. Why doesn't the Corps anticipate the drought periods and take action before drought occurs?

A9: Although there are numerous theories about drought cycles, based on historic data, there is no reliable method for forecasting drought. Federal climate forecasters give us a range of probabilities, but weather patterns have changed quickly. For example, the severe drought that extended to the end of 2008 was predicted to last several months longer but ended in early 2009 with a dramatic increase in rain and swift recovery in the reservoirs.

Q10: The Corps of Engineers uses reservoir level as an indicator for drought severity. Why not match them up with state drought indictors?

A10: We use a single-parameter drought indicator for simplicity. The states use multiple parameters for their drought status changes including soil moisture, rainfall deficit, groundwater levels, streamflow, and reservoir levels. Reservoir levels tend to be good cumulative indicators of drought conditions. There is generally good consistency between how the states and the Corps characterize drought severity.

Q11: What is a CFS?

A11: CFS stands for cubic feet per second. This is a measurement of flow rate. One cfs is equal to 450 gallons per minute.

1 million gallons per day = 1.547 cfs (daily average flow)

Q12: Why not go to minimum outflow of 3,600 cubic feet per second (cfs) at 2 feet below full pool? Why not reduce outflows to 3,600 cfs as soon as we enter drought?

A12: Drought impacts the entire basin. Dramatically cutting outflows early in a drought will cause unnecessary harm to the environment and unneeded suffering for downstream users. We gather water in the reservoirs during the rainy season so we have it "in reserve" for drier months. The reservoirs work much like a battery, providing resources during a shortage and recharging when resources are more plentiful. We reduce outflows in a tiered manner based on drought severity because not all droughts turn into record-breaking ones. We want to avoid putting the downstream ecosystem and human needs under the stress of the most severe drought level every time a mild to moderate rainfall shortage occurs. That level of stress does not sustain downstream resources. We reduce releases on a preplanned and mutually agreed upon basis outlined in the Savannah District Drought Contingency Plan.

The Savannah River Basin Drought Plan shares the burden of drought and the benefits of the reservoirs with both upstream users and downstream users. We created the drought plan with input from state and federal resource agencies, and public stakeholders from throughout the basin. This plan sets the points where we reduce outflows and by how much we reduce them.

Q13: During droughts, why not have outflow equal to inflow? Downstream users would get the amount of water "nature intended."

A13: While this seems "logical," that logic is deceiving. The construction of the dams forever changed the geographical, ecological, and social environments of the basin. With the construction of the dams we gained some control over the flooding that took lives and ruined communities. The dams opened up the region for increased development simply by providing a reliable source of water upstream and downstream, by increasing the availability of electricity, and by removing the threat of major floods. (Augusta has not suffered a single devastating flood, similar to those of 100 years ago, since we opened Thurmond Dam.) The American people, through Congress, built the reservoirs to hold water for later use; manage the risk of flooding; provide safe drinking water; generate clean, renewable energy; and provide water for navigation. Later Congress added the missions to provide individuals the opportunity to recreate and the responsibility to care for fish and wildlife to the reservoirs' authorizations. Each of these mission areas requires an amount of water.

Even if we shifted to outflow-equals-inflow the reservoirs would still recede because there is a significant amount of water lost to evaporation off of the pools simply due to the presence of the reservoirs. All three Savannah River projects are multipurpose projects. Failure to use the water to support authorized purposes would be contrary to congressional intent in the authorizing legislation.

Q14: I recall that in 2009 you reduced outflows to 3,100 cfs. Why can't you do that now?

A14: The Corps of Engineers conducted a wintertime flow reduction to 3,100 cubic feet per second (cfs) while in level 3 severe drought conditions from December 2008 through February 2009. (The outflows had been at 3,600 cfs, also under a temporary deviation from the drought plan.) The reduction to 3,100 cfs was permitted for these months only by a one-time, temporary deviation from the existing drought rules following the completion of an environmental assessment (EA). State and federal fisheries agencies lodged numerous objections that focused on impacts to downstream habitat. In the end, the

additional reduction only saved less than 1 foot in surface elevation at Thurmond Lake and at Hartwell Lake.

Q15: How were we able to shut off Hartwell outflow for two months in 2009?

A15: During the severe drought of 2008 we had reduced outflows from the Thurmond Dam, the last of the Corps' three-dam system on the river. Near the end of the drought, the Thurmond sub-basin began receiving enough rain to meet the reduced downstream outflows without assistance from Hartwell Lake. Due to storm patterns, Thurmond Lake began refilling faster than Hartwell Lake. This allowed us to hold water in Hartwell until both reservoirs "balanced" as we came out of drought. This action followed the rules of our water management plans.

Q16: Many businesses suffer economically and many people see the economic value of their homes fall during drought. Why do you ignore economic issues when you manage the water in the basin?

A16: Congress established the reservoir projects for specific purposes – water supply, water quality, flood risk management, hydropower production, recreation, downstream navigation, and fish and wildlife management. Congress did not specify economic issues as a purpose for the reservoir projects.

Q17: What is the Savannah River Basin Drought Contingency Plan?

A17: This is a plan developed by the Corps in coordination with natural resource agencies in Georgia and South Carolina, with federal resource agencies, with municipalities, and with public input to manage drought conditions. The drought plan was originally based on the drought experienced throughout the Savannah River Basin in the late 1980s and then revised in 2006.

Q18: I've heard of something called the "Res Sim Model." What is it and does the Corps of Engineers use it to manage the Savannah River Basin?

A18: HEC Res-Sim is a reservoir simulation model developed by the Hydrologic Engineering Center of the Corps of Engineers. This computer program allows us to simulate the reservoir system, apply different operating rules, and determine the impacts to various project purposes. The Savannah District uses Res-Sim in a planning mode rather than a real-time operating mode. Res-Sim will be one of the models used in the SRB comp study to evaluation changes to reservoir operations.

Q19: The Corps recently proposed a change to our understanding of actions it would take during drought level 4. What are the results of your proposal and when will these actions take place?

A19: In 2011 we evaluated the 1989 Savannah River Basin Drought Contingency Plan (SRBDCP) to determine if changes are warranted for drought operation in Level 4: the Inactive Storage. Drought Level 4 occurs when Hartwell Lake is at or below 625 feet above mean sea level (ft-msl) or Thurmond Lake is at or below 312 ft-msl. The proposed Standard Operating Plan (SOP) for drought operations in Level 4 retains all major components of the 1989 SRBDCP except for one. When the Level 4 drought condition exists, the daily average release from Thurmond Dam would be adjusted from 3,600 cubic feet per second (cfs) to 3,100 cfs with an adaptive management strategy during the period from Nov. 1 through February. (The SOP would include February only after receiving separate approval from NOAA Fisheries due to concern about the potential impacts to shortnose sturgeon.) We would transition to daily average outflow equals daily average inflow when all the pools reach the bottom of their Inactive Storage. We have coordinated a Draft Environmental Assessment (EA) with the public and natural resource agencies. We have completed a Final EA dated October 2011 that supports a Finding of No

Significant Impact (FONSI). The SOP is currently under review by SAD. If implemented, the action presently being proposed would (1) reduce the rate at which all the pools would be depleted by about 2 years; (2) extend by about 2 years the minimal environmental flows needed downstream of JST; and (3) reduce the recovery time for all three reservoirs when compare to the No Action Plan that maintains 3,600 cfs throughout the year.

Q20: We understood that when you reach level 4 you were to restrict outflows to the level of inflows. Why drop the reservoirs more should we ever experience such an extreme drought?

A20: The original 1989 Drought Plan defined the operations in Level 4 to continue releasing 3,600 cfs. The proposal under consideration today clarifies operations in level 4, addressing the concerns of state and federal natural resources agencies, as well as concerns from the public. To drop suddenly to outflow-equals-inflow would endanger the water supplies of downstream communities, and habitats.

Q21: Why are you spending time and money to update the level 4 actions, when you could be using that money to update the Drought Contingency Plan (DCP) or work on the Savannah River Basin Comprehensive (SRBC) Study?

A21: After the worst drought of record (2007 to 2009), we received Flood Control and Coastal Emergency (FCCE) funds to evaluate emergency drought operation plans. The FCCE monies were provided to the Savannah District to address a drought even more severe than the one that ended in 2009. Conditions on use of the funds required that we use them for the intended purpose only. The Savannah District expects to evaluate the entire DCP in the next phase of the SRBC Study

Q22: What are the other drought trigger levels?

A22: We manage the reservoirs as one system, so when one reservoir enters a more severe drought level, all enter that level. The trigger levels vary by season since the "guide curve" or our target water level, varies by season. For the current reservoir levels, the current guide curve, and the drought trigger levels, please visit our water management page: http://water.sas.usace.army.mil/home/indexDU.htm.

Q23: Why do the pools have a winter drawdown?

A23: We have two reasons for lowering the reservoir levels in the winter. Lowering the reservoir levels gives us extra flood storage space for typical winter and spring rains. This helps us reduce the risk of downstream flooding and helps fulfill one of the dams' authorized purposes of flood risk management. In most autumns the pools decline due to the seasonally dry weather. The winter drawdown mimics this natural occurrence and is in keeping with the dams' designs and the water management plan. . We also lower the reservoir levels to prevent shoreline erosion from the high winds common on the reservoirs in the winter.

Q24: How did the pool levels, top of flood, top of conservation, bottom of conservation storage initially get established?

A24: In the design of the projects, the Corps based the flood storage capacity on the need to reduce the risk of flooding downstream. The conservation pool supports all of the non-flood risk management purposes of the project – water supply, water quality, recreation, hydropower, fish and wildlife management, and navigation. The size of the conservation pool was based on how much storage was needed to meet these project purposes through the drought of record at that time and still make the project economically justifiable. Our projects were designed as peaking hydropower facilities which

generate hydropower during the peak demand periods, when it is needed most. The sale of this electricity pays the majority of the costs of building and operating the dam and lake projects.

Q25: Why is Russell conservation pool only 5 feet from top to bottom? Why does Russell Lake always appear full?

A25: Russell was designed as a pump storage facility. This pump capability required less conservation storage to make it economically viable. Because of this design, the level will not fluctuate more than five feet.

The small conservation pool also means the reservoir has little flood risk management capability – a mission that the other two reservoirs provide.

Q26: How much savings does 200 cfs reduction in outflows create?

A26: A 200 cfs reduction saves roughly 1.5 feet per year or .12 feet per month at both Hartwell and Thurmond. While such a reduction saves some water over the long-term, its effects on habitat availability and downstream water quality are not as easily measured. In some locations along the river the impact of such a reduction is observable but we still need more study in other areas to improve water management decision making. The Comprehensive Savannah River Basin Study ('the comp study") would provide this much-needed data.

Q27: What are the seasonal evaporation rates?

A27: The estimated evaporation rates vary by season with more evaporation in the hot summer months than in the cooler winter months. We estimate that in the summer the three reservoirs lose about 1,200 cubic feet per second (cfs) just to evaporation. Evaporation is an inevitable effect of large reservoirs and part of how they alter a river system because more water quantity is lost to the atmosphere than would happen if flowing downstream in a natural river. For example, evaporation causes the Thurmond pool to drop almost 0.5 ft/month in summer.

Q28: What determines how much water is discharged from the dam during generation?

A28: The drought level sets the total amount of outflow from the reservoir system. During normal reservoir levels (no drought condition) we set the amount of outflow based on hydropower needs in the basin. During drought, the amount of outflow is set to balance downstream needs with upstream needs in the multipurpose reservoirs. We also must keep Hartwell Lake and Thurmond Lake in balance with each other.

Please note that we do not generate electricity around the clock. We carefully schedule power production to maximize benefits to the public. Many hours of the day we have no power generation, and therefore, no water discharges. We schedule power generation to match the greatest demand times.

Our outflows are measured in cubic feet per second and are averaged over a week. Some hours will have very high rates but other hours will have no discharge.

Q29: What are the action levels identified in the Savannah River Basin Drought Contingency Plan?

A29: State and federal natural resource agencies, local governments, reservoir and river stakeholders, and the general public helped the Corps develop and update the Savannah River Basin Drought Contingency Plan. In it we defined four drought levels.

Drought level 1 is reached when the pool elevation drops 4 feet (winter) to 6 feet (summer) from full pool at either Hartwell Lake or Thurmond Lake. (Russell Lake does not have drought trigger levels due to its limited, 5-foot conservation storage pool.) This begins the District's effort to disseminate public safety information. This also restricts discharges from Thurmond to a maximum average weekly discharge of 4,200 cubic feet per second (cfs).

Level 2 is activated when either reservoir drops an additional 2 feet. Upon reaching level 2, discharges from Thurmond Lake will be further reduced to a maximum average weekly discharge of 4,000 cfs, but can be set as low as 3,800 cfs.

Level 3 is reached when Hartwell Lake reaches 646 feet above mean sea level (ft-msl) or Thurmond Lake drops to 316 ft-msl at which time the maximum average daily discharge from Thurmond is reduced to 3,800 cfs. The Hartwell and Russell discharges change to keep the reservoirs in balance and to meet downstream flow needs.

Level 4 is reached when Hartwell Lake drops to 625 ft-msl or Thurmond Lake drops to 312 ft-msl.

Q30: During the drought in the late 1980s, what were the minimum releases from Hartwell and Thurmond?

A30: Until the late 1980s, no drought plan existed. Hartwell averaged as low as 2,100 cfs discharge per week, while Thurmond released flows as low as 1,700 cfs for months at a time. The drought severity of the 1980s led to the development of the Savannah River Basin Drought Contingency Plan and established several levels of conservation through flow reductions at Thurmond project. The plan, created with input from state and federal natural resource agencies, industry, utilities, and the public, established a minimum daily average release from Thurmond of 3,600 cfs. This became the minimum discharge as required under agreement with the states to meet water quality and water supply objectives. This plan also set minimum flow requirements on the Savannah River for both industry and habitat.

Q31: What are the sizes of the drainage areas for the Corps' reservoir projects on the Savannah River?

A31: Hartwell Lake's local drainage area is 1,186 square miles. The Hartwell basin also benefits from the drainage areas of reservoirs owned by Duke Power in South Carolina (439 sq. mi.) and others owned by Georgia Power in Georgia (463 sq mi.). The total Hartwell drainage area extends from the foothills of the Appalachian Mountains to the I-85 corridor.

Russell Lake's local drainage area is the smallest of the three projects at 749 square miles.

Thurmond's drainage area is 3,307 square miles and is primarily in the piedmont region that has a flatter topography.

Cumulative drainage basin totals are 2,088 sq. mi. for Hartwell; 2,837 sq. mi. for Russell; and 6,144 sq. mi. for Thurmond. It is much harder to refill Hartwell than Thurmond after a drought, due to its smaller drainage area from which to accumulate runoff.

Q32: After a drought when rainfall returns to normal or above normal, why do reservoirs continue to drop?

A32: Severe drought causes the ground to dry out significantly. When the rainfall initially returns, the dry soil soaks up much of the rainfall, preventing significant runoff into streams and creeks feeding the reservoirs. Until the soil is saturated, very little water finds its way into the reservoirs. In addition, the reservoirs must continue to supply minimum downstream water supply needs

Q33: How does Georgia Power Company keep their reservoirs full while the Corps reservoir elevations are down?

A33: Georgia Power Company's North Georgia Development consists of six hydroelectric generating projects on the Tallulah and Tugaloo Rivers upstream of Hartwell Lake. Only the uppermost of these projects, Lake Burton, is designed with usable storage that can be drawn down. The others, designed as smaller, single-purpose reservoirs, operate most efficiently by simply passing through their inflow as outflow. However, even these reservoirs are subject to drought and lose water during extreme drought. Georgia Power also uses more fossil fuel sources for their peaking power and draws less on hydropower sources during drought.

Q34: What are the authorized purposes of the Corps projects?

A34: Corps' projects on the Savannah River are "multi-purpose." These congressional mandated purposes include: water supply, water quality, hydropower, flood risk management, downstream navigation, recreation, and fish and wildlife management. During periods of severe drought, water supply and water quality are the Corps' foremost priorities, both at the reservoirs and downstream.

Q35: How can recreation be made a higher priority?

A35: Project authorization mandates us to achieve a balance among project purposes. In order for any specific project purpose to be designated as a "higher" priority, legislation to amend or change the existing authorizations would have to be passed by Congress.

Major changes in operation of the reservoirs require careful study of the benefits and impacts associated with the proposed changes. The Comprehensive Basin Study would produce the analyses needed to update operating rules and revise cost allocations among the purposes.

We know that actions taken in one area of the basin impact other areas.

Q36: Why doesn't the Corps remove the stumps sticking out at low water?

A36: We remove or mark all stumps or other hazards located within marked navigational channels. During extreme low water conditions, thousands of small trees, sand bars, and stumps are exposed, creating hazards for recreational boaters. The vast majority of these hazards are away from the marked channels. Our public safety programs remind users to exercise caution during these low water periods.

If boaters should find a hazard within the channel, notify the project office for the reservoir and the hazard will be checked as soon as possible. We cannot mark or remove all stumps exposed by unpredictable and constantly changing water conditions. (Hartwell: 888-893-0678 or 706-856-0300; Russell: 800-944-7207 or 706-213-3400; Thurmond: 800-533-3478 or 864-333-1100)

We constantly remind users to wear a life jacket whenever swimming, boating, fishing or participating in other activities while in, on, or near the water. This includes when anchored or on boat docks.

Q37: What ramps are usable during these low water conditions?

A37: Information is available from the Project Offices (Hartwell: 888-893-0678 or 706-856-0300; Russell: 800-944-7207 or 706-213-3400; Thurmond: 800-533-3478 or 864-333-1100) or on the Web at: www.sas.usace.army.mil (choose "Lake Information" from the drop-down menu).

Q38: Why are the three projects on the Savannah River designed as they are with so little storage at Russell, and such large amounts at Hartwell and Thurmond?

A38: Thurmond Dam was completed in 1954 as the first major storage project on the Savannah River. Its primary purpose focused on flood risk management and rural electrification. The completion of Hartwell Dam in 1962 lessened the conservation storage demands on Thurmond Reservoir and led to the designation of the Thurmond conservation pool from 330' to 312' msl.

While the Hartwell and Thurmond pools have roughly the same volume, there is more depth and less surface area at Hartwell. Russell Dam was designed after Thurmond and Hartwell had essentially satisfied the need for conservation storage on the Savannah River. It was designed as a pump-back facility which can operate more efficiently by minimizing the drawdown, and satisfied the national cost benefit analysis with only a 5 foot fluctuation. Click here for an explanation of Russell Dam's pump-back capabilities.

During drought, the Corps attempts to draw Hartwell and Thurmond Reservoirs down equally, foot for foot for the top 15 feet. Below this point, Hartwell and Thurmond reservoirs are drawn down based on the percentage of depth remaining in each reservoirs conservation pool.

Q39: What is conservation storage?

A39: Conservation storage is that portion of range of depth in the reservoirs designed to conserve, or store, water during normal and high-flow periods for use during low flow periods. We also refer to it as the "usable pool." Other than flood risk management, the usable pool fulfills the congressionally authorized purposes of water supply, water quality, downstream navigation, recreation, fish and wildlife management, and hydropower production.

The top of conservation storage marks the bottom of the "flood storage," where excess water would be kept temporarily following heavy storms. Also, the bottom of conservation storage marks the top of the inactive storage pool – that part of the reservoir designed for storing sediment, typically holding lower quality water due to its depth.

Q40: Why can you draw Hartwell down so far, and Thurmond only half that?

A40: While the Hartwell and Thurmond pools have roughly the same volume, there is more depth and less surface area at Hartwell. This is because Hartwell, being farther upstream is located in steeper terrain.

To meet downstream needs during a drought, the Corps initially brings Hartwell Lake and Thurmond Lake down equally, foot-by-foot. However, when Thurmond falls below 315 feet above mean sea level (ft-msl), water managers can no longer match the pool level foot-by-foot. Instead the Corps changes to an equal percentage of elevation remaining it their respective conservation pools. This means Hartwell Lake's greater depth of conservation storage must provide more of the downstream water supply needs once Thurmond Lake falls below 315 ft-msl. For an explanation of conservation storage, see Q35.

Q41: You claim that you must release water to meet downstream needs. Why do you continue to release water after heavy downstream rains?

A41: There may be short periods of high inflow downstream of the dam due to heavy localized rainfall, when Thurmond Dam releases would not be necessary to satisfy water supply requirements. However, there is generally not enough "lead time" and the inflow not dependable enough to allow us to modify project operations.

In addition, rain may fall too far downstream. For instance, the critical habitat in the Augusta Shoals, only a short distance downstream of Thurmond Dam, do not receive water from storms that occur lower in the basin.

Q42: During drought conditions, is power generation reduced? Can water be released in other ways so that power is not produced?

A42: During drought conditions, we only generate electricity when we make water releases required to meet downstream needs. Generating electricity is strictly incidental to the release of water for other purposes once any reservoir reaches drought level 1 of the Savannah River Basin Drought Contingency Plan.

We always pass water through the dams' turbines as we make required releases. To do otherwise would be to waste the energy potential of sending water downstream. This not only allows us to provide low-cost, clean energy to communities, it also allows us to keep strong control of the outflow, thus protecting downstream homes and businesses. Only in very rare circumstances would we discharge water through the flood gates – either as a result of long-term extreme rain, or when conducting a short test of the floodgates.

In an extreme, multi-year drought, reservoir levels could reach (but never have) levels below the turbine intakes (called penstocks). In this case it is possible to release water through sluices located near the bottom of the dams. However, the water being released from the bottom of the reservoirs' inactive storage would be of lower quality. It has, low levels of dissolved oxygen, plus high levels of silt and other deposits.

The sale of electricity generated through the dams repays the American taxpayers for building and operating the dam and lake projects. Even so, we must cut back power generation during drought. During drought we only generate electricity while meeting downstream water needs.

Q43: Where can I read more about water management in the Savannah River Basin?

A43: Visit the Savannah River water management page, http://water.sas.usace.army.mil/home/indexDU.htm. There you can find near real-time reservoir levels, information about drought levels, and a schematic of the reservoir system. The page also contains links to a variety of websites with additional information. One of those helpful links is to the Environmental Assessment on the current Drought Contingency Plan: Read more about it here.

For additional information on water management in the Savannah River Basin, visit the Savannah District website, www.sas.usace.army.mil, or stop by the visitor centers at any of dam and lake projects.

The U.S. Army Corps of Engineers' Savannah District manages three lakes and hydroelectric dams along the Savannah River. It also oversees a multi-billion dollar military construction program at 11 Army and Air Force installations in Georgia and North Carolina. Corps' projects range from barracks, hospitals and clinics to maintenance facilities, headquarters buildings and aircraft hangars. The Savannah District also has oversight and maintains additional civil works projects – from the Savannah and Brunswick harbors to the Atlantic Intracoastal Waterway.