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FINDING OF NO SIGNIFICANT IMPACT
TENNESSEE VALLEY AUTHORITY

BOONE DAM SEEPAGE REMEDIATION
VEGETATION MANAGEMENT – HERBICIDE USE

In January 2016, TVA completed an Environmental Assessment (EA) and finding of no significant impact (FONSI) regarding its proposal to address and remediate seepage occurring at TVA's Boone Dam, which is a multipurpose dam on the South Fork Holston River on the border between Sullivan and Washington Counties in upper East Tennessee. The EA concluded that TVA's proposal to construct a composite seepage barrier along the crest of the dam embankment and the associated construction activities on TVA's reservation and adjoining and nearby TVA lands would not result in significant environmental impacts. The EA addressed managing vegetation that would grow in exposed shoreline areas during the extended drawdown of the reservoir.

The 2016 EA stated that:

> *TVA proposes to implement a Vegetation Management Plan to manage the successional vegetation on much of the exposed reservoir bottom. TVA would work with private landowners to manage this growth with annual or periodic mowing or bushwhacking. When approved by the landowner, TVA would use mechanical means, including tractors with bush hog attachments, extendable hydraulic arms, and other equipment to ensure safety. Mowing may occur from small barges along the reservation where access may be too hazardous. Mowing vegetation on the exposed reservoir bottom would not be intended to eliminate the vegetation. Such vegetation may also be beneficial, by enhancing wildlife habitat, reducing erosion during the drawdown, and improving fish habitat after the reservoir is returned to normal water levels. TVA's two primary objectives are to remove tree species from the newly exposed reservoir bottom areas that normally do not establish due to season pool levels and to avoid having trees mature during the drawdown period to heights that would create navigation and public safety problems once the waters are returned to normal levels.*

In 2019, working with landowners and stakeholders, TVA began clearing vegetation on exposed reservoir bottom areas around the reservoir. TVA identified areas for treatment, concentrating clearing activities in embayments with dense vegetation growth as well as areas identified by the public and stakeholders. In 2019, TVA mechanically mulched over 650 acres of vegetation in the reservoir bottom areas. In 2020, to date, over 500 additional acres have been mechanically mulched.

During 2019, TVA found that the mechanical treatments were unlikely to be adequate to treat all areas within the exposed reservoir bottom that need treatment, particularly in areas that are difficult to access (e.g., areas with steep slopes, rock outcrops, or bluffs). TVA also determined that vegetation growth within areas in which TVA did not propose mechanized vegetation removal, such as those areas with sensitive resources, was greater than anticipated and that

other means that do not result in ground disturbances were necessary to manage vegetation growth. TVA is therefore proposing to expand the suite of acceptable vegetation removal and management methods to include the use of herbicides, which kill or damage plants by inhibiting or disrupting basic plant processes. TVA has identified herbicides registered with the U.S. Environmental Protection Agency (EPA) for use in these areas. Formulations of the herbicides Imazapyr and Triclopyr have been approved for use within aquatic and riparian settings. TVA proposes to mix the products with a surfactant and marker dye and apply the mixture in accordance with the manufacturers' label directions.

TVA prepared a Supplemental EA to the 2016 EA to address the proposed action. The Supplemental EA, as well as the 2016 Final EA and FONSI, are incorporated herein by reference.

Proposed Action

Under the proposed action, TVA would expand the suite of acceptable vegetation removal and management methods to include the use of two EPA-approved herbicides in liquid forms, mixed with a surfactant and marker dye, to control successional vegetation growing in certain areas of the exposed Boone Reservoir bottom. Mechanical as well as herbicide treatments of vegetation would occur until reservoir water levels are raised beginning in Spring 2021, with normal operations planned for 2022.

TVA proposes to use a mixture of herbicides to treat approximately 600 acres of Boone Reservoir. Treatments would begin in June 2020 and would take place over a period of two to four months, through late summer 2020. TVA has identified over 500 acres for herbicide treatments that have proven to be unsuitable for or inaccessible with mechanical vegetation removal equipment. TVA also proposes to apply the herbicide mixture in some areas (up to approximately 100 acres, as determined necessary) where mechanical treatments have previously occurred, to inhibit new growth that would occur prior to inundation of the drawdown area in 2021. Mechanical treatments would continue at the same time, and TVA projects that more than 300 acres of reservoir bottom will be mechanically treated in 2020.

While TVA would treat more areas of vegetation under this alternative, TVA would not eliminate all vegetation growing in the reservoir bottoms. TVA would continue to coordinate with TWRA to address safety and navigation on the reservoir. This coordination would include providing notification and information to the public of potential hazards that may be present in the reservoir when TVA raises water levels. Once water levels are raised, TVA would assist TWRA in identifying hazards and navigation concerns.

The herbicide treatments would be conducted by qualified contractor support personnel. TVA would require that the contractor be licensed by the State of Tennessee to apply the herbicides. All persons employed by the contractor that apply herbicides must be certified as an applicator by the State of Tennessee. Each acre of vegetation would be sprayed with approximately 100 gallons of the herbicide solution; the solution would be 1 gallon of the herbicide solution mixed with 99 gallons of water. The herbicide combination includes the herbicides Imazapyr, Triclopyr, an organic surfactant, and a marking dye:

- The herbicide product Alligare Imazapyr 4 SL (“Imazapyr”) would be used to target the woody growth as well as function as some pre-emergent growth deterrent.
- The herbicide product Alligare Triclopyr 3 or Garlan 3A for Triclopyr (“Triclopyr”) would be used to target Honey Locust trees growing in the reservoir bottom.
- Alligare Methylated Seed Oil (MSO) 1 (“surfactant”) is an organic surfactant that would be used to improve herbicide effectiveness. Surfactants (short for “surface-acting agents”) are chemical compounds that reduce the surface tension of water, thereby increasing the penetration, coverage, and overall effectiveness of an herbicide on the target vegetation.
- Alligare Super Marking Dye 1 (“marking dye”) would be used to assist workers in visually identifying where vegetation has been treated; the food-grade dye would persist for a day or so.

Specific treatments of sites would be chosen by TVA’s contractor at each treatment location based on the nature of the terrain, stages of plant growth, and on whether sensitive resources are present or nearby. Depending on site access and other logistical considerations determined by TVA, the herbicide mixture would be applied to emergent vegetation from a sprayer mounted on an utility task vehicle (UTV). The UTVs would be equipped with 100-gallon spray tanks outfitted with engine-driven pumping systems.

When areas are inaccessible, spraying of shoreline vegetation would occur from a boat or barge on reservoir waters or the boat or barge would be docked as close as possible to the shore and hoses would be used from the UTV on the boat or barge on to the shoreline. Where it is possible and appropriate for the UTV to be used on the shoreline, work crews would utilize UTVs with hand wands and boom sprayers to traverse and spray target zones. Each UTV would carry a hose reel with 200 feet of hose that would be pulled by workers across the ground. Stationary loading and pumping sites would be positioned strategically along the water’s edge to facilitate loading. Containments and BMPs would be implemented to minimize risk of spills. Boomless sprayers (called Boominators), which function like booms, would be used to improve the accuracy and efficacy of spraying.

UTVs would not be used in areas with sensitive natural and cultural resources, to minimize harm to such resources. Spot treatment application methods would be utilized where feasible to reduce potential harm to non-target areas or vegetation. In addition to wheeled UTVs used on the shoreline, backpack sprayers that are capable of applying liquid herbicide to small areas may be used on shores that prove to be inaccessible by boat or wheeled vehicles.

All application equipment would be properly rinsed at the last treatment site of the day prior to the equipment being removed from the reservoir or upon completion of vegetation treatments from the shoreline. Similarly, all containers would be disposed of according to state and federal requirements.

TVA would notify private landowners in advance of vegetation treatments so that they may opt out of the vegetation management (either herbicidal or mechanical) application on their private property. The contractor would be responsible for posting signs prior to and/or during the application of herbicides. Signs would be posted at docks or similar structures at locations

clearly visible from the water and along the shoreline at lot locations visible to users that access the water from land. The signs would include information relating to the herbicide mixture that would be used, including the herbicide names, date of treatment, water use restrictions, contact information for TVA and the contractor, and other information specified by TVA. All posting would be done to correctly match treatment protocol.

Supplemental Environmental Assessment

In the Supplemental EA, TVA reviewed the potential environmental impacts of the proposed use of herbicides to treat vegetation growing in the reservoir drawdown area. The changes to TVA's original proposal are limited in scope, in comparison to the original scope reviewed in the 2016 Final EA. The primary issues under consideration would be Terrestrial Ecology; Aquatic Ecology; Threatened and Endangered Species; Surface Water Resources; Historic and Cultural Resources; and Health and Safety.

In the Supplemental EA, TVA incorporated previous analysis of using mechanized equipment to manage vegetation growth in the reservoir drawdown area, as described as the No Action Alternative in the 2016 Final EA. Mechanical removal would continue under the No Action Alternative, to address potential safety and navigation issues that may arise once reservoir operations return to normal. Generally, this alternative would result in fewer impacts to resources because less vegetation would be treated within the reservoir drawdown area and vegetation growth is generally beneficial to the environment. Generally, vegetation growth decreases soil erosion, improves wildlife and aquatic habitat, improves water quality and visual resources, and stabilizes cultural resources. These benefits would be short term, however, because reservoir operations would return to normal, inundating drawdown areas with vegetation growth. Many areas are inaccessible or difficult to treat solely with mechanical treatments. In these areas, it is likely that mature vegetation that is untreated would continue to be hazardous or restrict navigation once reservoir water levels are returned to normal. This would be most likely closer to the shoreline and in reservoir coves (rather than in the main channel), where vegetation growth would continue to limit or restrict boating/recreation access in the short term (e.g., until vegetation dies off from being inundated by normal water levels). The continued limitations would be a temporary but major impact to boaters and affected property owners in these areas.

To reduce the risk to boaters, TVA would continue to coordinate with TWRA to address safety and navigation on the reservoir. This coordination would include providing notification and information to the public of potential hazards that may be present in the reservoir when TVA raises water levels. TVA would provide information to the public through a variety of media, including through public outreach, ongoing discussions with stakeholders, social media, and direct communications with area residents and those that recreate on Boone Reservoir. Once water levels are raised, TVA would assist TWRA in identifying hazards and navigation concerns.

As discussed in the Supplemental EA, TVA found that the Proposed Action would result in minor impacts to the environment primarily because more areas of vegetation would be treated. Herbicide treatment of up to 600 acres would result in inhibited growth or mortality of vegetation,

adversely impacting and altering habitat for wildlife species and decreasing the quality of aquatic habitat. The potential for significant impacts to terrestrial birds, mammals and bees is low. In areas where all vegetation is killed, an increase in soil erosion could result, impacting water quality. The herbicide that would be used is approved for aquatic and riparian settings by the EPA and would be applied by certified and qualified individuals who must adhere to all herbicide label guidelines. Detailed records would be kept of each application. With the proper implementation and application of these products, it is expected that no significant impacts to surface water quality would result.

Under the Proposed Action, TVA would treat more vegetation in the drawdown areas than under the No Action Alternative (up to 600 acres). Herbicide use would be applied to additional areas of the reservoir drawdown zone to control undesirable or invasive species and inhibit resprouting or growth, thereby reducing the amount of potential hazards once reservoir waters are raised. Ongoing efforts conducted by private property owners and non-TVA entities to reduce the amount of vegetation in the reservoir bottom also reduce the potential for such hazards. With more areas being treated than under the No Action alternative, there would be fewer safety and navigation hazards after water levels return to normal compared to the No Action alternative. However, similar to the No Action, some mature vegetation would not be treated prior to return of water levels and some hazards and navigation issues would result. Boating/recreation access would continue to be limited and restricted in these areas in the short term, which represents a temporary but major impact to boaters and affected property owners.

Necessary Consultation

As stated in the 2016 FONSI, consultation with the Tennessee Historical Commission on the impact of federal actions on Tennessee historic and archaeological sites is required under Section 106 of the National Historic Preservation Act. In 2015, TVA consulted with interested federally recognized Indian tribes on impacts of the seepage remediation project on areas that may be of religious and cultural significance to them. Because no additional areas would be impacted under TVA's new proposal, TVA did not consult again with tribes regarding its proposal. TVA has concluded that the proposed action would not require additional consultation with the U.S. Fish and Wildlife Service under Section 7 of the Endangered Species Act.

The use of herbicides to control vegetation would fall under the State of Tennessee Department of Environment and Conservation (TDEC) General Permit for Discharges from Application of Pesticides (TNP100000). TVA would submit a notice of intent to TDEC prior to treating this previously untreated area. The contractor hired to conduct herbicide treatments would be required to provide application logs and records to TVA at the end of the calendar year for annual reporting to the State of Tennessee. Those applying the herbicide would possess applicable licenses/certification.

Mitigation Measures and Environmental Commitments

TVA would continue to implement the mitigation measures identified in its 2016 Final EA and associated FONSI and the 2019 Supplemental EA and FONSI to ensure that adverse impacts on the environment are avoided, minimized or mitigated. All applicable permits would be

acquired; therefore, associated permit-related mitigation measures and best management practices (BMPs) would be implemented to further minimize impacts.

In the Supplemental EA, TVA identified the following measures that are necessary to mitigate potential impacts of herbicide use:

- To avoid potential impacts to bat species, TVA will avoid use of herbicide use within 200 feet of two cave entrances to reduce the potential for herbicide inputs into sensitive cave/karst systems. There would be no clearing of vegetation within a 200-foot radius of documented caves.
- To avoid potential impacts to the bald eagle nests, TVA would avoid implementing any activities within 660 feet of nests while eagles are still actively using them.
- To minimize soil disturbance and protect sensitive cultural resources present in the reservoir bottom, TVA would continue to avoid the use of heavy equipment to treat vegetation. Herbicides would be applied by personnel using backpack sprayers or from boats on the reservoir waters.

TVA would only require the herbicide formulations at the specified rate per acre and according to the product's other specifications. Personnel applying the herbicides would be properly trained and certified. All labeled guidelines and precautions would be followed.and implemented and detailed records would be kept of all applications, per general permit requirements. TVA would also apply the following best management practices (BMP) and standard procedures associated with the herbicide use:

- Proper labeling of herbicide containers and availability of safety data sheets for all active chemicals used on a particular job site.
- Containers and other application debris would be disposed of properly per the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) regulations.
- When there is a possibility of affecting home sites, other personal property, lawns, or ornamentals, a reasonable buffer zone of at least 10 feet wide would remain untreated at the upper contours of the zones.
- The use of herbicides would be limited where there is a water intake, consistent with label directions for application and distance from water intake requirements.
- Incorporation of random safety and equipment checks to ensure public safety.
- When fueling or maintenance activities must occur in the field, absorbent pads and mobile containment pans would be placed under all equipment. Equipment would not be left unattended during these activities to avoid unplanned events such as spills or leaks. Servicing would be done with care to avoid leakage, spillage, and subsequent water contamination. Oil waste, filters, or other litter would be collected and disposed of properly. Equipment servicing and chemical or fuel storage would be limited to locations greater than 200 feet from sinkholes, fissures, or areas draining into known sinkholes, fissures, or other karst features.
- Care would be taken to minimize product spillage. If spillage occurs, clean-up using appropriate mitigation products would commence immediately. Other related BMPs include:
  - Herbicide containers would be brought to the project areas in original packaging.

  - When not in use and at night they would be securely stored.
  - Only herbicide product planned for the day would be handled and added to the materials to be transported to the application sites for the day.
  - These products would be stored in watertight containers during transportation to spray sites.
  - A plastic containment pan would be placed under the area where herbicides are poured for mixtures
  - Herbicides would be added before the 100-gallon tank is half full and would be monitored at all times by the applicator to avoid the possibility of overfilling.
- Visual observations after the application of herbicides/pesticides should be conducted to ensure that these applications did not cause unanticipated impacts on non-target organisms, species or water quality.
- Spraying would not be conducted during weather (wind, rain, etc.) that would adversely impact efficacy and would be conducted to minimize unintentional spray drift or storm water:
  - Spraying would not be conducted during inclement weather (wind, rain, etc.) that would adversely impact efficacy.
  - An official weather forecast that occurs 12 hours prior to commencement of a “spray day” would be used for a “Spray / No Spray” determination.
  - No spraying would commence on a day that begins with a forecasted rain chance of 50% are greater.
  - If rain were “radar indicated,” all spray activities would cease 6 hours prior to the forecasted arrival of the weather event.
- All application equipment would be rinsed at the last treatment site of the day prior to the equipment being removed from the reservoir or upon completion of vegetation treatments from the shoreline. Similarly, all disposable herbicide containers carried to a treatment site would be triple rinsed and the rinse would be applied prior to leaving the treatment site.

Conclusion and Findings

Based on the findings of the Supplemental EA, TVA concludes that the proposed modifications to TVA’s plan to manage vegetation growing in portions of Boone Reservoir by using herbicides that are approved for such an environmental setting would not be a major federal action significantly affecting the environment. This determination is contingent upon the implementation of the three mitigation measures identified above to avoid impacts to sensitive resources, implementation of the BMPs identified above, and the proper application of the herbicide products. Accordingly, an environmental impact statement is not required.

June 11, 2020

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Date Signed