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Frequently Asked Questions on Removal of Obsolete Dams

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Background

Dams provide important societal functions for drinking water supply, flood control, hydropower generation, and recreation. Although dams are common across the country, the exact number of dams in the U.S. is not known. What is known is that only approximately 40 large rivers in the U.S. remain undammed and as of 2013, more than 87,000 large and/or hazardous[1] dams were identified in the Army Corps of Engineers' National Inventory of Dams (NID). Not included in this total is a significant number of small and medium sized dams including fishing ponds, amenity lakes, farm ponds, and old mill dams. Including all of these, estimates of the total number of dams in the U.S. range from 2,000,000 to as high as 2,500,000. Many of these dams have long since lost their original beneficial use or purpose and may be aging and becoming structurally unsound. In the case of mill dams, most were developed more than a century ago when "mill acts" were passed to encourage development of the dams and impoundments needed to support the milling industry going back as early as the 1700's. However, long after alternative power sources were developed and the mills were closed, the dams remain. Estimates of the percentage of dams that no longer serve a functional purpose range from 75% to as high as 90%. *For citations and additional information, see References at the end of the document.*

These obsolete dams, regardless of size, impact the water quality of the river or stream where they are located. There is currently no database that includes all dams of all sizes in the U.S. New GIS and remote sensing tools have been used to try to fully capture the actual number of dams within some watersheds to more fully understand their numbers and to try to calculate their individual and cumulative impacts.

[1] The NID includes dams that are equal to or greater than 25 feet high and exceed 15 acre-feet of storage, equal to or greater than 50 acre-feet of storage and greater than 6 feet high, or are hazardous in that they could cause a loss of life or a potential loss of life and significant property or environmental damage. (The National Inventory of Dams).

For example, a GIS analysis of the Apalachicola-Chattahoochee-Flint basin in the southeast U.S identified over 25,000 reservoirs, only 6% of which were accounted for in the NID database.

There is a growing awareness in the U.S. of the need to address obsolete dams that impair our waterways. Removal of these dams has been on the rise in the United States for a variety of reasons, including ecological restoration, economic development of communities, addressing concerns with localized flooding, improvement of recreational opportunities, restoration of fish spawning and migration, addressing safety issues for recreational users due to dangerous hydraulics below dams, response to storm events and ensuring the safety of downstream communities. Dam removal may also be the choice of dam owners when faced with the ongoing costs and liability for needed dam repairs, maintenance, or required upgrades to meet new safety or environmental standards. Since the early 1900's, there have been more than 1,300 dam removals, with more than 60 recorded in 2015 alone. In support of these efforts and in response to an increase in the number of inquiries regarding EPA policies, regulations, and potential funding opportunities as they relate to removal of obsolete dams, the EPA is providing the following answers to Frequently Asked Questions.

WATER QUALITY

1. How do dams impact water quality?

Virtually every dam will have an impact on the river or stream where it is located, although the types and extent of the impact will vary based on the size, operation, and purpose of the dam as well as the size and general characteristics of the waterway. In general, increased retention time of water behind dams causes physical, thermal, and chemical changes to take place both in the impounded and downstream waters. Nutrients, sediments, and carbon are retained for longer periods of time behind the dam, potentially triggering harmful algal blooms and hypoxia. Reservoirs can also be sinks for mercury, pesticides, and PCBs, promoting bioaccumulation of these toxins in the food chain. Stratification of a reservoir can depress dissolved oxygen and pH, triggering the release of anoxic byproducts, such as iron, manganese, and hydrogen sulfide. These changes can lead to violations of water quality standards and/or adverse impacts to fish and other aquatic organisms.

River and stream flows are affected by the alteration of the physical features of the waterbody. The natural sediment regime is significantly impacted by dams that trap silt, sand, and gravel in the impoundments and reduce the sediment supply to the waters below. These sediment-starved waters downstream may then erode sediment from the bed and banks of the stream, impacting habitat and aquatic life. The cumulative impact of all dams may eventually result in a lack of sediment deposition in coastal zones, estuaries, and the ocean, where it is needed to maintain the physical and biological integrity of these important resources.

Changes to the natural flow regime both above and below the dam also affect native flora and fauna. These changes can be quantified as the alteration of flow magnitude, duration, frequency, timing, or rate of change, as well as downstream temperature shifts. For instance, releases below dams may no longer have the natural seasonal or annual variability in flow or temperature that provide signals needed for aquatic life to complete life cycle events such as spawning, or allowing access to the flood plains for breeding or feeding. Alterations to natural flows below dams can also reduce the abundance and diversity

of native fish. The waters below dams may go through extended periods of low flows or no flows, which may cause heat stress, increased risk of disease, stranding of fish, mussels and other species, increased vulnerability of aquatic life to predation or may otherwise affect aquatic life survival. These reduced flows have also been shown to have impacts to riparian vegetation. These waters may instead support non-native habitat generalist species of fish or other aquatic life and become more conducive to the propagation of invasive aquatic species. Above the dam, slower, deeper, and warmer water is often no longer suitable for native riverine species adapted to flowing, shallow, cooler water.

Dams cause the overall riverine system to become fragmented, preventing the movement of fish and other aquatic life to feed, spawn, or migrate past the dam. Many endangered species in the U.S. including anadromous fish and numerous mussel species are listed as imperiled by, in part, loss of habitat or changes in the flow regime due to the presence of dams. Releases from dams can also vary dramatically over short periods of time from high to low flows. Such rapid changes can lead to conditions unsuited for aquatic life and increase scouring downstream. In all of these ways, dams can significantly alter a waterbody's water quality, natural hydrology, and adversely impact its fish and aquatic life. *See below for more information on water quality standards and impairment*.

2. Can the presence of a dam impact the ability of a waterbody to meet water quality standards under the Clean Water Act? What types of water quality standards may be affected by the presence of a dam?

Yes, the presence of a dam can affect the ability of a waterbody to meet water quality standards, including a waterbody's designated use or the narrative or numeric criteria that protect the designated use. The Clean Water Act directs states to develop and EPA to approve these narrative or numeric criteria and designated uses for surface waters. (See *State and EPA Water Quality Standards* for more detailed information.) When those water quality standards are not met, the water body is considered impaired. Impairments may be due to pollution or pollutants both above and below the dam. For instance, a designated use of 'aquatic life' in the tail waters below a dam may no longer be protected due to the impacts of a dam on stream ecology and function or through the lack of water discharged below a dam. Water quality criteria for dissolved oxygen, temperature, nutrients, metals, and other pollutants may not be met due to the impacts of a dam. Impounded waters may have less capacity for assimilating pollutants than naturally flowing waters. Water quality in dam-impounded waters may retain and be affected by higher amounts of nitrogen and phosphorus than in waters without dams. These impounded waters, once released below the dam, may have high levels of nutrients, chlorophyll *a* from increased plant growth, and ammonia. In addition, impounded waters behind the dam often experience long hydraulic residence times and high temperatures which, if occurring with nutrient-enriched waters, can be ideal conditions for the proliferation of cyanobacterial blooms or Harmful Algal Blooms (HABs). HABs in upstream reservoirs can then seed blooms in downstream riverine reaches. Iron Gate and Copco Reservoirs on the Klamath River are good examples of this phenomenon.

Certain dam conditions may result in significantly lower dissolved oxygen below a dam, for instance, if water is released from the lower level of a stratified impoundment. Depending on the method of release from dams, the natural temperature regime is often altered, which may cause temperature and biology degradation. In winter, when species are adapted to cooler water temperatures, warmer water from the tops of reservoirs may impact aquatic life growth and reproduction. Conversely, cool water released from

the lower levels of dams can alter the biota in streams adapted to warmer temperatures. Elevated amounts of metals, including manganese and iron (as well as other anoxic byproducts), have been found in tail waters below dams at levels that exceed numeric water quality standards. Released waters can alter water quality conditions for significant distances (e.g., miles) downstream. Impacts from dams may also cause narrative water quality standards, such as those protecting biological integrity, to not be met.

3. Can states and tribes identify waters as impaired if adversely impacted by dams?

Yes, EPA recommends that states and tribes identify waters as impaired on their Integrated Reports where dams adversely impact water quality causing water quality criteria or designated uses to not be met. This was clarified in the August 2015 document, entitled, *Information Concerning 2016 Clean Water Act Sections 303(d), 305(b), and 314 Integrated Reporting and Listing Decisions* ("2016 IR Guidance," pages 13-16). As noted in answer to Question 2, waters above or below dams may not meet water quality criteria for parameters such as dissolved oxygen, temperature, nutrients, ammonia, manganese, iron, or other pollutants. Regarding such waters impaired by pollutants, the 2016 IR Guidance states that, "If States have data and/or information that a water is impaired due to a pollutant, it would need to be reported in Category 5…the State should list that water in Category 5 and identify the pollutant causing the impairment (e.g., nutrients) and should also indicate the nature of the pollution (e.g., hydrologic alteration) as a cause of impairment under Category 4C." For instance, in California, two reservoirs along the Klamath River are listed on the State's 303(d) list as impaired for microcystin (a cyanotoxin produced by the dominant species of cyanobacteria in the reservoirs). Where appropriate, States and tribes may also identify waters below dams as impaired due to poor biological metrics as determined through state or tribal biological monitoring for fish, macroinvertebrates, algae, or mussels.

Additionally, waters may be identified as impaired due to the effects of pollution only, such as extreme low or high flows below dams, and placed in Category 4C of a state's or tribe's Integrated Report as impaired due to pollution. These types of impairments may impact a variety of designated uses, including aquatic life, recreation, tribal cultural uses, shellfish harvesting, migration, and spawning for anadromous species such as salmon or fishing uses. The 2016 IR Guidance clarified how states and tribes can address such impairments and encourages states and tribes "to more fully monitor, assess and report the impacts of all types of pollution to improve the opportunities for increasing resilience and restoration" of waters impaired by pollution.

4. What types of improved water quality or ecological restoration can be expected after dam removal?

Restoration of free flowing streams and rivers through dam removal can provide significant improvements to water quality as well as ecological benefits. Once nutrients, carbon, and sediments are no longer impounded, chemical parameters such as dissolved oxygen, temperature, pH, and ammonia may again meet water quality standards. Returning rivers or streams to their natural flows can expose shoals and riffles that provide new habitat. Sediment transport dynamics and sediment deposition downstream are also re-established after dam removal is completed. Aquatic species benefit from the re-establishment of flows, habitat connectivity, and water quality necessary for ecosystem function. Commercially and culturally important anadromous fish, such as salmon, river herring, mackerel, and American shad have been shown to quickly move upstream to reestablish spawning habitat following dam

removal. Native fluvial species adapted for flowing waters benefit from the restoration of habitat. Terrestrial species (plants and wildlife) that rely on riverine functions may also benefit. There may also be beach replenishment following larger dam removals near coastal zones. Some changes such as access to habitat can be immediate; others may take weeks to years as the system re-adjusts. Numerous examples show improved water quality after dam removal allowing a previously impaired river to be removed from the impaired waters list. For instance, after the Edwards Dam was removed from the impaired Kennebec River in Maine, the State determined that the River met its designated use and was even able to reclassify the water to a higher designated use. An innovative dam removal on the Cuyahoga River in Ohio resulted in the formerly impaired water meeting all water quality standards.

5. In addition to water quality and ecologic benefits, are there other community, safety, or economic benefits from dam removal?

Yes, there are other significant benefits from the removal of obsolete dams. Such removals encourage locally driven solutions that restore degraded waterways and can revitalize communities and their local economy. The removal of obsolete dams has the potential to increase public safety for boating on rivers and streams, and prevent disastrous dam failure during extreme weather events.

There can be significant public safety concerns caused by "low head" dams. Although these low head dams may appear to be harmless and in some cases even attractive as "waterfalls," there is an inherent danger to swimmers, boaters, or anglers who may get trapped in the hydraulics below the dam. Hydraulics are recirculating, powerful currents that can trap people and small boats and pull them under the water and up against the dam with tremendous force. There is no official national tracking on the fatalities associated with low head dams; however, one database maintained by Brigham Young University reports that at least 527 deaths have occurred at 267 low head dams since the 1950s when people were unable to escape from the dangerous hydraulics created below the dam. Numerous dams had multiple fatalities spanning several years. Overall, more than half of those fatalities occurred in the last 15 years as water quality has improved, and kayaking and recreation in or near water has increased. Numerous communities have worked together to permanently eliminate these hazardous dams.

Old, obsolete, or unmaintained dams may also present a public safety hazard from dam failure. According to the Association of State Dam Safety Officials, dam failures resulting in property damage and loss of life have occurred throughout American history. As the dams in the United States age, there is an increased risk for potentially deadly dam failures. As extreme weather events increase, these potential failures may increase as well. For instance, according to the South Carolina Department of Health and Environmental Control, 32 dams failed during an extreme storm event in October 2015, including 17 in Richland County alone. These failures exacerbated already dangerous flooding conditions and caused mandatory evacuations of communities. The threat of weakened, rain-soaked dams failing continued well after the storm had passed, causing great concern from the threat of continued evacuations in communities already dealing with property damage and safety concerns.

6. Can there be adverse impacts associated with the removal of a dam?

Yes, there may be short- or long-term impacts to water quality and designated uses during or after dam removal. Turbidity may increase both during and for a short time after the removal. Once released,

sediment that was stored behind the dam may cause abrasion or bury aquatic plants, animals, or habitat. The sediment may have accumulated contaminants that could be released during removal.
Other physical, biological, or social impacts may also occur. Changes to the channel morphology both upstream and downstream of the dam may include either short-term or long-term channel incision or aggradation. Invasive and/or exotic plant or animal species may be released into the riverine system after the dam is removed, which can lead to the displacement of native species.

EPA recommends that all potential impacts be minimized to the greatest practical extent and be thoroughly evaluated by project proponents during applicable state and federal permitting processes (e.g. Clean Water Act Section 404, state Section 401 water quality certification, etc.). EPA recommends that each dam removal be carefully evaluated to determine if the benefits of removal outweigh impacts that may occur during and after the removal.

7. Does every dam removal require a variance from water quality standards?

No, removing a dam need not require a water quality standards variance. On August 21, 2015, the water quality standards regulations were revised to include a new section, 40 CFR 131.14, with provisions for states and authorized tribes to adopt a water quality standards variance. The EPA included in its regulation a new factor that states can use when justifying the need for a variance. Specifically, this section provides that a state or authorized tribe may adopt a water quality standards variance if it demonstrates that attaining the designated use and criterion is not feasible throughout the term of the variance because "[a]ctions necessary to facilitate lake, wetland, or stream restoration through dam removal or other significant reconfiguration activities preclude attainment of the designated use and criterion while the actions are being implemented." The EPA added this new factor to address situations when states and authorized tribes may want to adopt a water quality standards variance because they expect a time-limited exceedance of a criterion when removing a dam or during significant wetlands, lake, or stream reconfiguration/restoration efforts.

This variance provision provides a tool that states or tribes can use to address water quality standards during a significant dam removal. That variance, once adopted, could be relied upon by a state or authorized tribe when issuing certifications under Clean Water Act Section 401 in connection with an application for a federal license or permit. However, it should be noted that it is not *required* for states or authorized tribes to adopt a variance in order to remove a dam; it is simply an option provided when doing so. States and authorized tribes may also include conditions in a Section 401 certification that provide protection for water quality during the dam removal. While a variance is not required in order to establish conditions, if a state or authorized tribe chooses to adopt a variance for the water affected by the dam removal, the conditions of the variance can be used when developing conditions for the Section 401 certifications. *See below for more information on Section 404 and Section 401.*

PERMITTING

8. What kind of federal permit do I need to apply for to remove a dam?

A Clean Water Act Section 404 permit is required before dredged or fill material may be discharged into waters of the United States, unless the activity is exempt from Section 404 regulation (e.g., certain

farming and forestry activities). Activities in waters of the United States potentially regulated under Section 404 include the discharge of dredged and/or fill material for construction of water resource projects such as dams and levees and potentially the release of bottom sediment from or through a dam as a result of non-normal dam operations. U.S. Army Corps of Engineers Regulatory Guidance Letter (RGL) 05-04 on the breaching of dams and the discharge of sediments from or through a dam clarifies that if a dam operator modifies or deviates from normal operation of the dam in such a manner that bottom sediment accumulated behind a dam could be removed and transported downstream through the dam, either deliberately or accidentally, that activity may require a permit pursuant to Section 404.[2]

There are two types of Section 404 permits that may be used to authorize a dam removal project: individual permits or general permits, including Nationwide Permits (NWPs). The decision to review a proposed dam removal project under the provisions of a Section 404 individual permit or a general permit is primarily a decision of the Corps District Engineer and may depend on the characteristics of the specific project. Larger, more complex projects may be reviewed under the individual permit process, while general permits such as NWPs or regional general permits are often but not always used for smaller, more straightforward dam removals. Factors that may be considered include: whether contaminants may be present in sediment held behind the dam; volume and grain size distribution of sediment held behind the dam; nature and sensitivity of aquatic species that may be affected by the dam removal; presence of invasive or exotic plant or animal species whose distribution is restricted to only the upstream or downstream side of the dam; timing of life cycle events of species that may be affected (e.g., spawning or migration); and potential changes to geomorphology and hydrology of tributaries.

In June 2016, a new NWP specifically for low head dam removal was proposed by the Corps. The final reauthorization of all of the NWPs will go into effect March 19, 2017, and may or may not include the new NWP for low head dam removal. Corps districts may elect to place regional conditions on the use of this or any other NWP, and they may also choose to revoke the use of a particular NWP in their district entirely. Additionally, states and tribes may include conditions of their own in a Section 401 water quality certification to ensure that state water quality is protected during the dam removal. These conditions, whether associated with an individual permit or a general permit, become part of the Section 404 permit. These conditions may also be applicable in other federal actions associated with dam removal, such as revocation of a Federal Energy Regulatory Commission license for a dam. In addition, the federal permitting process or federal funding may consider other federal statutes such as the Endangered Species Act, the Magnuson-Stevens Fishery Conservation and Management Act, and the National Historic Preservation Act. Additional reviews and/or consultation may be required. *See below for more information on Section 401 certifications.*

9. How do you begin the process to apply for a Clean Water Act Section 404 permit? How long does it take?

The project applicant should contact the appropriate Corps of Engineers district office and schedule a pre-application meeting as the first step in the Clean Water Act Section 404 regulatory review process for dam removal projects. During that meeting, the project proponent will receive information from the Corps regarding permitting options and permit application requirements. A clear and open line of

[2] For any questions or additional information regarding the Army Corps of Engineers section 404 program, please contact the Corps or go to http://www.usace.army.mil/Missions/Civil-Works/Regulatory-Program-and-Permits/.

communication with the Corps of Engineers district is the best way to facilitate timely and accurate Section 404 regulatory review of the proposed project. The length of the Section 404 regulatory review process will depend in large part upon the type of permit required (e.g. individual permit, NWP, or regional general permit), the complexity of the proposed project, quality and thoroughness of information submitted by the applicant for review by the Corps, and the applicant's responsiveness to requests for information from the Corps. To determine appropriate options for Section 404 permitting of proposed dam removal projects, EPA recommends that project proponents contact the Corps of Engineers district with authority in the area where the proposed project is located. The following website can help identify Corps of Engineers district offices by location:
http://www.usace.army.mil/Contact/Office-Locator/

10. What monitoring or testing is required for dam removal? What if there are contaminants accumulated in sediment behind the dam?

Specific requirements for monitoring or testing for a dam removal project will vary based on the conditions of the individual project and will be determined during the regulatory authorization process (e.g. Clean Water Act Section 404, applicable state authorizations, etc.). Monitoring may include baseline monitoring prior to dam removal, as well as post-project monitoring necessary to document changes to the river or stream as a result of the project. The level of rigor required for monitoring and the specific parameters to be monitored will depend largely on the size and complexity of the project and the site-specific conditions. Monitoring may include physical (e.g., sediment volume and texture stored behind the dam), chemical (e.g., dissolved oxygen, temperature, metals), and/or biological parameters (e.g., fish, benthic macroinvertebrates, and mussels).

Under the Clean Water Act Section 404(b)(1) Guidelines, a sediment quality evaluation may be called for if there is reason to believe that contaminants could be present in the sediment accumulated behind the dam and if the District Engineer determines that the release of those sediments as a result of the dam removal activity will result in a regulated discharge of dredged or fill material. EPA recommends that a "reason to believe" determination that sediments may be contaminated be informed by current or historical land uses in the watershed surrounding and upstream of the impoundment, historical spills, contemporary discharges to the impoundment or upstream waters, or other factors. The regulations at 40 CFR Part 230 Subpart G (Sections 230.60 and 230.61) generally describe this evaluation and testing. Additional detail is provided in the guidance known as the *Inland Testing Manual,* which was jointly developed by the EPA and the Corps of Engineers (EPA document # EPA-823-B-98-004).

If contaminants are present in the sediment behind the dam, EPA recommends that the project proponent consider the potential for adverse impacts (e.g., to aquatic species, recreational users, or municipal water supply intakes) that could result from mobilizing or disturbing the sediment. An evaluation of the levels of contaminants present may be necessary. The nature of the contaminants and potential for adverse impacts will be weighed by the Corps of Engineers during permitting and may inform authorized methods of containment or removal, or even whether the project should be authorized.

11. Can I get mitigation credit for dam removal?

Whether mitigation credit may be considered for dam removal depends on the nature of the specific project itself, and review by the Corps of Engineers, the U.S. Fish and Wildlife Service, the EPA, and the state and federal regulatory and/or resource agencies.

12. Do I have to mitigate for removal of wetlands that were created by the dam?

Requirements to mitigate for loss of wetlands upstream of the dam caused by its removal will depend on the permitting mechanism, policies, and guidelines of the applicable Corps of Engineers district, review by other state and federal regulatory and resource agencies, and the nature of the specific dam removal project.

13. Does the state have to issue a Clean Water Act Section 401 water quality certification for dam removal?

Section 401 of the Clean Water Act requires that any applicant for a federal license or permit proposing to conduct any activity that "may result in any discharge" into navigable waters must obtain a certification from the state or tribe in which the discharge originates ensuring that the discharge will comply with various provisions of the Clean Water Act, including Sections 301 and 303. The certification can include conditions necessary to ensure that the permit will comply with the state or tribal water quality standards or other appropriate requirements of state or tribal law. Section 401 certifications might include a wide range of specific conditions including, but not limited to, requirements for monitoring, revegetation, quality assurance plans, equipment used, and corrective measures. If the project is in the coastal zone, there will need to be an evaluation of the extent to which the activity is consistent to the maximum extent practicable with the enforceable policies of a state's approved coastal zone management plan would need to be evaluated pursuant to the Coastal Zone Management Act, 16 U.S.C. 1451 et seq.

14. Are there other state law requirements applicable to dam removal?

Many states have provisions within their state laws that specifically apply to dam removal projects, but each state varies in its specific requirements for dam removal. States may have other laws and local ordinances that are not specific to dam removal, such as buffer requirements, that may also be applicable to a dam removal project. EPA recommends that project proponents consider all applicable state and local laws on a project-by-project basis.

15. Are there any National Environmental Policy Act reviews required for dam removal?

The National Environmental Policy Act (NEPA) review process begins when a federal agency develops a proposal to take a major federal action, or when a federal action such as permitting is involved. These actions are defined under 40 CFR Section 1508.18. For dam removal projects, the most common type of actions that would trigger NEPA would include application for a Clean Water Act Section 404 permit or use of federal funds for the project.

Environmental review of a project under NEPA could involve three different levels of analysis: Categorical Exclusion (CATEX), Environmental Assessment (EA), or Environmental Impact Statement (EIS). The level of effort, review time, and public comment period varies depending on the level of NEPA analysis required. The issuance of a CATEX is the least rigorous process involving minimal environmental risk and analysis, and typically no public review requirements. Development of an EA or EIS can require substantially more time and effort than CATEXs and would require that the federal agency evaluate the 'no action' and other feasible alternatives. Issuance of a Clean Water Act Section 404 permit for a dam removal project may involve a Nationwide Permit (NWP) or an Individual Permit (IP). NEPA analyses are conducted for NWPs when they are issued by the Corps of Engineers every five years. If a NWP is used for a dam removal project, then no additional NEPA would be needed for issuance of the Section 404 permit. However, if a dam removal project involves an IP, the Corps of Engineers evaluates the potential impacts from the project and determines the level of significance of the impacts before making a decision on the level of NEPA review required. In many cases an EA would be an appropriate level of analysis. However, for more complex or controversial projects where there are potentially significant impacts, an EIS may be required. On projects that require a 404 permit, the federal agency providing the funding may adopt the Corps of Engineers NEPA document to avoid duplication, and vice-versa.

EPA Related Funding

16. Can Clean Water Act Section 319 funds be used to support dam removal?

Yes, Clean Water Act Section 319 grants issued to states, territories, and tribes may be used for dam removal. Section 319 provides grants to support a wide variety of activities related to addressing nonpoint source pollution, including technical assistance, financial assistance, education, training, technology transfer, demonstration projects, and monitoring to assess the success of specific nonpoint source implementation projects. The EPA's guidance, "Nonpoint Source Program and Grants Guidelines for States and Territories," includes hydrologic modification as a type of nonpoint source pollution and therefore projects are potentially eligible for funding.

Potential 319 funding applicants should note that dam removal projects need to be consistent with a state's written Nonpoint Source Management Program Plan. These documents are five-year strategic plans that describe the state's priorities for its nonpoint source program. Some states may have already explicitly included hydrologic modification, and even dam removal, in their nonpoint source program. Even in states that do not explicitly discuss hydrologic modification or dam removal as priorities in their Nonpoint Source Management Plan documents, dam removal projects could be eligible for 319 funding. All states have prioritized implementation of watershed-based plans. The EPA requires states to use at least half of their annual 319 grant funds to implement watershed projects guided by watershed-based plans. Dam removal projects that are included in local watershed-based plans that are consistent with EPA Guidelines would also be eligible for 319 funds.

For funding, EPA recommends that dam removal project proposals be sent to state nonpoint source agencies, usually as part of an annual competitive Request for Proposals process. EPA recommends that project applicants carefully review individual state application requirements, and meet early with their state nonpoint source program staff to discuss proposed dam removal projects. The following are some successful Section 319-funded dam removal projects that helped restore impaired waters:

- https://www.epa.gov/sites/production/files/2015-10/documents/ma_eel.pdf
- https://www.epa.gov/sites/production/files/2015-10/documents/nh_maxwell.pdf
- https://www.epa.gov/sites/production/files/2015-10/documents/mi_thornapple.pdf
- https://www.epa.gov/sites/production/files/2015-11/documents/pa_manatawny.pdf

17. Are dam removal projects eligible for the Five Star and Urban Water Restoration Grant Program?

Yes, a dam removal project could be eligible for support if it met the requirements of the Five Star Grant Program. The program seeks to develop community capacity by providing modest assistance to diverse local partnerships for river, wetlands, riparian, forest and coastal restoration, and wildlife conservation. The program gives priority to projects that improve and protect urban waterways in overburdened or economically distressed communities, so dam removals that are part of such efforts would likely be given the highest consideration. For more information on this program and to get updates on deadlines for applications, see https://www.epa.gov/urbanwaterspartners/five-star-and-urban-waters-restoration-grant-program-2016. Key elements for a dam removal restoration project to be eligible, include:

- On-the-ground restoration
- Integrated education, outreach, and training into the restoration project through broad community engagement activities
- Measurable ecological, educational, and community benefits
- An appropriate and diverse partnership of five or more organizations (public and private, including the applicant) that exists to implement the project, leverages additional contributions, and sustains the project after the life of the grant
- Community partnerships that directly engage a diverse group of partners to achieve ecological and specific educational outcomes including partnerships among upstream and downstream communities
- Demonstration that the project will advance existing local planning and development for resilient communities and/or propose to foster new collaborations to coordinate a diverse stakeholder partnership that develops new plans

18. Can Wetland Program Development Grants be used by states for dam removal?

The Wetland Program Development Grants (WPDGs) provide eligible applicants an opportunity to conduct projects that promote the coordination and acceleration of research, investigations, experiments, training, demonstrations, surveys, and studies relating to the causes, effects, extent, prevention, reduction, and elimination of water pollution. These grants, provided to state, tribal, and local government agencies, as well as interstate/intertribal entities, could fund studies to identify how dam removal can improve wetland restoration and also include those options in states' wetland protection plans. Therefore, WPDGs may be a potential source of funding for states and tribes that want to develop their in-house technical expertise (e.g., obtain training) and/or conduct scientific studies about the effects of dam removal. For instance, states have used WPDGs to conduct studies to monitor and assess the impacts of small impoundments in tailwaters below dams (*see references*). However, use of WPDGs for construction activities (including restoration projects) is specifically prohibited, unless those efforts are

being undertaken as part of a scientific demonstration or "study." In general, WPDGs are not intended to financially support individual, on-the-ground projects, even if they restore wetlands or waterbodies; WPDGs are targeted towards building technical and programmatic capacity of state and tribal water agencies (primarily) and secondarily, local government agencies. It should be noted that there is a distinction between wetland program "development" and program "implementation" activities and EPA refrains from funding the latter category of activities.

19. Would dam removals be an acceptable supplemental environmental project (SEP) in the settlement of a federal enforcement action?

Yes, in certain circumstances, dam removals have the potential to meet the conditions set forth in the EPA's March 10, 2015, National Supplemental Environmental Projects Policy Update (SEP Policy). Supplemental Environmental Projects (SEPs) are defined, in part, as "environmentally beneficial projects…which the defendant, or any other third party, is not otherwise legally required to perform," and there is no doubt that dam removal projects can provide significant environmental benefits, such as improved water quality, reduction of localized flooding, and restoration of aquatic habitats.

The SEP Policy provides guidance for EPA's enforcement personnel, and for the regulated community, on how and when EPA may consider including a SEP in a civil enforcement settlement. A SEP is a project performed voluntarily by a defendant/respondent in an enforcement action, and EPA can never require that a SEP be part of a settlement. Nor can EPA require a specific SEP. SEPs must be projects that go beyond what is required for compliance, and there are several important conditions that must be met before a project can be considered as a SEP. Most importantly, SEPs must have a "nexus," or connection, to the particular violations being resolved in the settlement, and provide an environmental or public health benefit related to the impacts of those violations of environmental laws. In addition, generally SEPs must be performed within fifty (50) miles of the site of the violation to ensure that the community placed at risk by the violations receives the benefit of the SEP.

Whether a dam removal project would be an appropriate element of a particular settlement is determined in the context of the environmental enforcement settlement for which the project has been proposed. Violations that have impacted, or could have impacted, the waterway containing the dam might have a nexus to a dam removal project. For example, there might be a nexus for a dam removal project in a Clean Water Act settlement for violations that resulted in a fish kill, where removing the dam will enhance the condition of the ecosystem, restore fish passage for spawning, help to restore the fish population, and, in certain cases, provide for protection of endangered species. Where dam removal is done at or near water supply intakes, it may be possible to demonstrate improvements to drinking water and a nexus to Safe Drinking Water Act violations. Dam removal projects that will result in the restoration of wetlands and improvements in water quality, ecosystems, and habitat may have a nexus in settlements resolving wetlands violations. Waters impounded behind dams have been shown to have adverse impacts on air quality from the generation of greenhouse gasses such as methane. Since dam removals have the potential to reduce methane emissions, it may even be possible to demonstrate a nexus for a dam removal project in a Clean Air Act settlement resolving violations related to methane or other greenhouse gases, and, if so, since such SEPs restore natural ecosystem function, they could have the added benefit of helping make communities more resilient to the effects of climate change. As noted, the potential for including a dam removal project as a SEP in a settlement will depend on the specific facts of the case at

hand, the location of the violations, and the willingness of the defendant/respondent to perform a project that is not legally required.

One of the unique features of dam removal projects is the tremendous variability in the size of dams and the related costs of removal, providing potential opportunities for inclusion as SEPs in a wide range of settlements. For instance, the median cost of dam removal projects can range from tens of thousands of dollars for removal of a two- to five-foot high dam, to hundreds of thousands of dollars (or more) for the removal of larger dams. Multiple federal, state, academic, and non-governmental groups have partnered to develop tools to assist in review of dam removal prioritization and selection that could aid in analyzing whether there might be an opportunity for a SEP in a particular enforcement situation, and could even help target opportunities that could benefit overburdened communities. These include, for instance, the Southeast Aquatic Connectivity Assessment Project (The SEACAP Tool) and the Chesapeake Fish Passage Prioritization tool.

Considering the various sources of potential federal funding for dam removal, care must be taken to ensure that a SEP does not augment federal funding that could pay for the same work (e.g., a Section 319 grant). In addition, SEPs may not be used to satisfy EPA's or another federal agency's obligation to perform a particular activity, nor can SEPs provide additional resources to support specific activities performed by EPA employees or EPA contractors. SEPs cannot be used to help accomplish work that a federal agency is already doing or to perform work on federally owned property.

The violations at issue and the facts of the specific settlement will be important factors in determining whether a nexus for a dam removal project exists. For this reason, every SEP proposal has to be evaluated on a case-by-case, fact-specific basis, and there can be no pre-approved or off-the-shelf SEPs. The nexus requirement is vital as it ensures the appropriate use of EPA's prosecutorial discretion. This discretion does not extend to the inclusion of SEPs that do not have a strong nexus to the violations being resolved. Nexus ensures that the SEP is not perceived as a diversion of penalty funds to a project, in violation of the Miscellaneous Receipts Act.

20. Would dam removals be an acceptable supplemental environmental project (SEP) in the settlement of a state enforcement action?

The answer to this question depends on the applicable state's SEP policy. State SEP policies may differ from the federal SEP Policy, because federal fiscal law constraints would not directly apply to the states. EPA recommends that interested stakeholders contact individual states for more information on state SEP policies.

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