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What a Waste: The Damaging Use of Sewage Diversions in Louisiana Wetlands and the Implications of the Clean Water Act

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INTRODUCTION

Imagine that a family wants to hire a company to make improvements to the landscape outside of their home. In making the decision of which company to hire for the process, the family has two choices: Company *A* and Company *B*. Company *A* has years of expertise in making enhancements to landscapes. This company has a great success rate and is almost certain to get the job done. Company *B* also has many years of experience. However, despite having some successful work in the past, some of Company *B*'s more recent work has been a failure. The family, of course, chooses Company *A*, the more successful and reliable company, to get the job done at their expense.

Louisiana has not used such a sound and rational approach in deciding between methods to tackle issues of wetland loss. Over the past 200 years, approximately half of the United States' original wetland[1] habitats have disappeared.[2] This resulted, in part, from natural evolutionary processes; however, common human activities, such as dredging wetlands for canals or draining and filling for agriculture, grazing, and development, all contribute tremendously to wetland alteration and devastation.[3] Today, Louisiana's wetlands represent about 40% of the United States' wetlands but represent approximately 80% of the losses.[4] Reducing these losses and providing for coastal restoration has proven to be an extremely difficult and costly undertaking. At the present rate of wetland devastation, Louisiana will stand to lose these crucial ecosystems in the next two decades.[5]

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1. Wetlands are transitional areas between water and land. The 1977 Clean Water Act Amendments provide a broad definition of wetlands: "The term 'wetlands' means those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." *Constructed Wetlands: Using Human Ingenuity, Natural Processes to Treat Water, Build Habitat,* ARROYO NEWSL. (WATER RESOURCES RES. CTR., Tucson, Ariz.), Mar. 1, 1997, at 1, https://wrrc.arizona.edu/publications/arroyo-newsletter/constructed-wetlands-using-human-ingenuity-natural-processes-treat-wa [https://perma.cc/5WL8-V4FZ] (last visited July 20, 2019) [hereinafter *Constructed Wetlands*].

2. *Louisiana Coastal Wetlands: A Resource at Risk*, USGS, https://pubs.usgs.gov/fs/la-wetlands/ [https://perma.cc/WZQ3-M2K] (last modified Nov. 7, 2017).

3. *Id.*

4. *Id.*

5. *Id.*

One of the efforts implemented in hopes of restoring Louisiana's wetland and marsh habitats is the practice of sewage diversions. Sewage diversions, also known as wetland assimilation projects, are projects that dump partially treated sewage into wetland areas with the thought that the partially treated effluent will provide nutrients to promote sedimentation and plant growth to restore wetland areas.[6] This practice and theory are due in part to the fact that wetlands are natural repositories.[7] Occurring in low lying areas, wetlands receive runoff water and the overflow of water from rivers and streams.[8] In response to this constant inflow, various wetland biological mechanisms and processes have evolved over time to treat these inflows.[9] These wetland mechanisms trap sediments and break down a wide range of pollutants into basic compounds.[10]

Just a few decades ago, dumping treated effluent into wetlands to nourish vegetation and counter saltwater inflow was touted as a promising and cost-effective notion. The practice of natural wetland assimilation was fully supported by restoration advocates, such as the Lake Pontchartrain Basin Foundation.[11] After relying on findings from a few select experts and disregarding contrary evidence, Louisiana insistently lobbied the federal government to authorize these sewage diversion projects under the Clean Water Act (CWA).[12] The approach to these projects was thought to be a win-win—providing a cost-effective method to getting rid of wastewater while also providing wetlands with nutrients for restoration—but this idea has recently taken a turn.[13] According to some more recent observations, what was meant to help the wetlands is actually harming them. This is supported by findings from the Lake Pontchartrain Basin

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6. Sara Pagones, *Projects Aimed at Marsh Restoration Draw Concern from Lake Pontchartrain Basin Foundation*, NEW ORLEANS ADVOCATE (Oct. 13, 2017), https://www.theadvocate.com/new_orleans/news/environment/article_389fc81a-b060-11e7-bc2f-3f05e643aafb.html [https://perma.cc/NPA3-L4Y5].

7. *Constructed Wetlands, supra* note 1.

8. *Id.*

9. *Id.*

10. *Id.*

11. Pagones, *supra* note 6.

12. ROBERT H. KADLEC & ROBERT H. KNIGHT, TREATMENT WETLANDS 5–6 (1996), https://books.google.com/books?id=Y1XFb94MioUC&pg=PA7&lpg=PA7&dq=natural+wetland+assimilation+history&source=bl&ots=I7_Sk6l42q&sig=NjHAyzRt3WiX--OU6_kVqYCKEBo&hl=en&sa=X&ved=0ahUKEwjT39G1_dXMAhUUTGMKHbGaDBsQ6AEIRTAG#v=onepage&q=natural%20wetland%20assimilation%20history&f=fals [https://perma.cc/KP7R-XAFM].

13. Pagones, *supra* note 6.

Foundation,[14] a restoration organization that was once in full support of sewage diversions, and specifically by results of a sewage diversion conducted in Hammond, Louisiana, where overexposure to nutrients has led to the destruction of an area once full of wildlife and rich vegetation.[15] Apart from the "washing out" of marsh habitats and destruction of vegetation, these sewage diversion projects also pose potential harms to humans and wildlife through the build-up of pathogens that have survived the treatment process.[16] Microbiologists have expressed concerns for the risks of antibiotic-resistant bacteria and viruses that may come to thrive in these wetlands being exposed to wetland assimilation projects.[17] Because of these scientific findings and potential irreversible harms, a closer look at the legal basis for the projects is necessary. Wastewater assimilation projects continue to be practiced in Louisiana, likely due to their historical foundation and also due to issues involving oversight through overlapping authority to issue permits for operation.

The responsibility of protecting wetland systems falls on both the federal and state governments. However, the Clean Water Act intended for state governments to take on a more active role in its implementation, while the federal government offers oversight.[18] For this reason, the federal government defers most CWA responsibilities to state governments.[19] The CWA governs the permits that allow municipalities to create and conduct wetland assimilation projects.[20] These permits, which stem from the National Pollutant Discharge System (NPDES), allow the discharge of pollutants into water.[21] The Environmental Protection Agency (EPA) may delegate authority to state governments to issue these

14. The Lake Pontchartrain Basin Foundation is a non-profit organization consisting of a 14-member board of directors representing Basin parishes and regulatory agencies. The organization focuses on scientific research, education, and advocacy to solve the issues of the coastal crisis facing Louisiana.

15. Pagones, *supra* note 6.

16. Bruce Petrie, Ruth Barden & Barbara Kaspryzyk-Hordern, *A Review on Emerging Contaminants in Wastewaters and The Environment: Current Knowledge, Understudied Areas and Recommendations for Future Monitoring*, 72 WATER RES. 3, 4 (2015).

17. *Id.*

18. *See* Clifford Rechtschaffen, *Enforcing the Clean Water Act in the Twenty-First Century: Harnessing the Power of the Public Spotlight*, 55 ALA. L. REV. 775, 781 (2004).

19. *See NPDES Program Management and Oversight*, ENVTL. PROTECTION AGENCY, https://www.epa.gov/npdes/npdes-program-management-and-oversight [https://perma.cc/KVU6-VAPN] (last updated Dec. 1, 2017).

20. 33 U.S.C. §§ 1251–1388 (2018).

21. 33 U.S.C. § 1342 (2018).

permits as long as the state administration meets certain requirements.[22] Presently, forty states and several Native American tribes retain this authority, while EPA regional offices exercise permit authority over states who have not been issued this delegation.[23] The EPA treats wetlands like all other water sources covered by the CWA, but the agency suggests that states consider adopting different classifications for wetlands since wetlands tend to raise different concerns from those of other water bodies.[24] Although the EPA has made this plausible suggestion, it does not have the force of law, and some states have continued to treat threatened wetlands in the same manner as other bodies of water that do not bear the same risks.[25]

This Comment addresses the legal structure of implementing the Clean Water Act and how that structure has created a loophole for issues, such as the sewage diversions in Louisiana. The Clean Water Act has a structure of "cooperative federalism"[26] that has proven to create enforcement challenges for federal and state governments.[27] This challenge is apparent in Louisiana where the State's management of wetlands and compliance with necessary permits has fallen short of the management and oversight that would be ideal. Louisiana has been criticized for this poor administration of permit authority. There are also flaws in the NPDES permits themselves. The system of allocating permits to municipalities is subject to potential abuse because the formalistic requirements tend to take priority, while reliable scientific findings fall at the wayside.[28]

Part I addresses the background of wetland assimilation projects and how they are implemented in Louisiana. Part I also examines the failure of a wetland assimilation project in Hammond, Louisiana, to illustrate the irreversible nature of assimilation harms and the practices that led to the

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22. *Id.*

23. *National Pollutant Discharge Elimination System***:** *State Program Authority,* ENVTL. PROTECTION AGENCY, https://www.epa.gov/npdes/npdes-state-program-information [https://perma.cc/2KK9-PYK8] (last visited July 20, 2019).

24. National Guidance Water Quality Standards for Wetlands, EPA 6.2.1 (1994).

25. *Id.*

26. Rechtschaffen, *supra* note 18. (Under the model of "cooperative federalism" the federal government sets national standards and is ultimately responsible for ensuring achievement of these requirements, but states can receive authorization from the EPA to implement the program under the EPA's oversight).

27. Luke Self, Drowning the Wetlands in Sewage: A Case Study of How Poor Science and Policy Fester Due to Lax Accountability (May 2016) (unpublished thesis, Louisiana State University).

28. *Id.*

subsequent damage. Part II examines the problems that lead to approval of projects with potentially damaging effects, such as issues with lax enforcement of water permitting and problems with the lack of clear water standards for wetlands. Part III establishes a solution to these issues through analyzing supportive provisions of the CWA and support from other environmental authority that all provide states with the necessary tools to properly set and follow guidelines for water practices involving wetland systems. Lastly, the Comment concludes with a brief overview of how Louisiana, and states facing similar challenges, should move forward in approaches to wetland assimilation projects.

I. BACKGROUND

A. Natural Wetlands and Their Potential to Process Waste

Wetlands were originally considered to be areas that served very few purposes, making them a popular option for wastewater dumping for convenience and cost-efficiency.[29] Research emerged in the 1970s indicating that the biological makeup of wetlands allowed wetlands to partially process wastewater. This research served as a jumpstart for municipalities to use wetlands as "treatment" for wastewater.[30] Many cities, however, did not actually wait for the results of these studies and justified the sewage diversion practices before having any reliable scientific data.[31] Many wetland areas have inadvertently received polluted runoff and served as natural water treatment systems.[32] Wetlands, as waters of the United States, have been subjected to wastewater discharges from municipal, industrial, and agricultural sources.[33] Over time, wetlands have received many different sources of water pollution, such as agricultural and surface mine runoff, irrigation return flows, and urban storm water discharges.[34] The actual impacts of such inflows on different wetlands have varied and the long-term effects are unclear.

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29. KADLEC & KNIGHT, *supra* note 12, at 5.
30. *Id.*
31. Self, *supra* note 27.
32. *Constructed Wetlands for Wastewater Treatment and Wildlife Habitat: 17 Case Studies*, ENVTL. PROTECTION AGENCY, https://www.epa.gov/sites/production/files/2015-10/documents/2004_10_25_wetlands_introduction.pdf [https://perma.cc/H2L8-TDRA] (last visited July 20, 2019) [hereinafter *17 Case Studies*].
33. *Id.*
34. *Id.*

Natural wetlands[35] are now recognized as unique habitats that offer many benefits, including: food and habitat for wildlife; flood protection; shoreline erosion control; recreational activities and aesthetic appreciation; and water quality improvement.[36] The functional role of wetlands in improving water quality has been a compelling argument for the preservation of natural wetlands, and in recent years, the construction of wetlands systems for wastewater treatment.[37] A growing number of studies have provided evidence that many wetlands systems are able to provide an effective means of improving water quality without creating problems for wildlife.[38] However, in some cases evidence has shown a resulting change in wetland community types, and this has led to a shift in using more adaptable environments, i.e., constructed, man-made wetlands.[39] Serious concerns exist over the possibility of harmful effects resulting from toxic materials and pathogens that may be present in wastewater sources despite any prior partial treatment of the effluent.[40] Other concerns are that there may be a potential for long-term degradation of natural wetlands due to the addition of nutrients and changes in the natural hydrologic conditions influencing these systems.[41] Many leading authorities endorse the use of constructed wetlands[42] for treating sewage but discourage the use of natural wetlands for assimilating sewage.[43] Globally, most natural wetlands assimilating sewage are found in third world countries where the practice is typically unmonitored and used as a convenient depository for untreated wastewater.[44] In turn, these particular

35. Natural wetlands include swamps, bogs, marshes, fens, and sloughs.

36. *17 Case Studies*, *supra* note 32.

37. *Id.*

38. *Id.*

39. *Id.*

40. *Id.*

41. *Id.*

42. Constructed Wetlands are partially man-made treatment systems that "use natural processes involving wetland vegetation, soils, and their associated microbial assemblages to improve water quality." These constructed wetlands allow for more manipulation than natural wetlands and can, therefore, yield more successful treatment of wastewater. *Constructed Treatment Wetlands*, ENVTL PROTECTION AGENCY OFF. OF WATER, https://nepis.epa.gov/Exe/ZyPDF.cgi/30005UPS.PDF?Dockey=30005UPS.PDF [https://perma.cc/8J66-8HGJ] (last visited July 20, 2019).

43. Edward Bodker, Comments Regarding the Riverbend Permit Application to Use Natural Wetlands for Assimilating Municipal Sewage Effluent (Oct. 2016) (on file with author).

44. *Id.*

sites are extremely risky for outbreaks of disease.[45] At least partly due to such concerns, there has been a growing interest in the use of constructed wetlands in place of natural wetlands for wastewater treatment.[46]

B. Sewage Diversions in Louisiana vs. the "Modern" Use of Sewage Diversions

1. History of Wetland Assimilation in Louisiana and Today's Concerns

At the time of the passage of the Clean Water Act, some natural wetlands were still being used as dumping areas for wastewater.[47] Although the Environmental Protection Agency (EPA) originally grandfathered in some of these sewage diversion operations, the agency has consistently discouraged the use of natural wetlands as depositaries of wastewater except "under limited conditions."[48] Despite the EPA's reservations, sewage diversions were resurged in Louisiana in the late 1980s when the Louisiana Department of Environmental Quality (LDEQ) and a group of scientists began introducing the supposed benefits of sewage diversions, such as improved water quality, increased restoration of wetlands, and cost efficiency.[49] Today, Louisiana has around twenty wetland assimilation projects that are either in operation or have been proposed.[50]

The impacts that Hurricane Katrina left on New Orleans' infrastructure in 2005 has led to even more support for the notion of wetland assimilation.[51] Many waste treatment plants were destroyed, and wetland assimilation is seen as an option that may serve as a more

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45. *Id.*

46. *17 Case Studies*, *supra* note 32.

47. APPLIED WETLANDS SCIENCE AND TECHNOLOGY 260 (Donald M. Kent ed., 2d ed. 2000).

48. *Id.*

49. John W. Day et al., *The Use of Wetlands in the Mississippi Delta for Wastewater Assimilation: A Review*, 47 OCEAN & COASTAL MGMT. 673 (2004).

50. Chris Staudinger, *Assimilation Wetlands: Scientists Are Fertilizing Wetlands with Treated Sewage*, COUNTRY ROADS (May 24, 2016), https://countryroadsmagazine.com/outdoors/knowing-nature/assimilation-wetlands/ [https://perma.cc/UZ7Q-5HTB].

51. Sarah Mack et al., *Wetland Assimilation: Climate Change Adaptation and Restoration in the Mississippi Delta,* TIERRA RESOURCES LLC., https://tierraresourcesllc.com/wp-content/uploads/2012/08/FinalWetland-Assimilation-A-Climate-Change-Adaptation-Measure6.pdf [https://perma.cc/B5WN-QHH9] (last visited July 20, 2019).

financially feasible alternative to building new infrastructure and treatment plants.[52]

Wetland assimilation is also supported as an option that would solve issues of climate change effects on wetlands and flood protection.[53] Research shows that changes in climate will have numerous adverse effects on water and other natural resources, which will in turn have an impact on public health and safety.[54] Potential functions of wetland assimilation, such as isolating large amounts of carbon, offsetting sea-level rise, and increasing wetlands' resiliency to drought, are all mechanisms indicated to allow for adaptation to climate change.[55] These mechanisms are particularly appealing, due to the fact that coastal areas are especially vulnerable to the impacts of climate change.[56]

2. Constructed Wetlands and Their Ability to Provide Desired Benefits

Wetland-assimilation supporters who are informed of the science behind the practice urge that "conservative design approaches" with "stringent and inflexible" permit requirements be used.[57] However, Louisiana has failed at implementing this technique and has been criticized by the EPA for doing so.[58] Many other states have used the safer, more reliable method of conducting sewage diversions in constructed, man-made wetlands.[59] These constructed wetlands offer a more consistent alternative to the use of our fragile and disappearing natural wetlands.

Constructed-wetland treatment systems are engineered systems that are carefully designed and constructed to utilize the natural processes involving wetland vegetation, soils, and their associated microbial

52. *Id.*
53. *Id.*
54. *Id.*
55. *Id.*
56. *Id.*
57. KADLEC &. KNIGHT, *supra* note 12, at 12.
58. Mark Schleifstein, *Louisiana Flunks at Enforcing Air, Water Laws, EPA Inspector General Says,* TIMES-PICAYUNE (Dec. 12, 2011), https://www.epa.gov/wetlands/constructed-wetlands [https://perma.cc/K3N8-J2V4].
59. *Constructed Treatment Wetlands*, *supra* note 42.

assemblages[60] to assist in treating wastewater.[61] Constructed wetlands are designed to take advantage of many of the same processes that occur in natural wetlands but do so within a more controlled environment.[62] Some of these systems have been created and operated with the sole purpose of treating wastewater, while others have been implemented with multiple purposes in mind, such as creating a water source to sustain habitats for wildlife use and environmental enhancement.[63]

The carefully structured process carried out by constructed wetlands moves water above or below an artificial wetland, and then releases the water through defined outlets.[64] Constructed wetland treatment systems typically fall into one of two categories: Subsurface Flow Systems and Free Water Surface Systems.[65] Subsurface Flow Systems are designed to create subsurface flow through a permeable medium, keeping the water being treated below the surface.[66] These subsurface systems have also been referred to as "root-zone systems," "rock-reed-filters," and "vegetated submerged bed systems."[67] Free Water Surface Systems, on the other hand, are carefully designed to simulate natural wetlands, with the water flowing over the soil surface at shallow depths.[68] Both types of wetland treatment systems typically are constructed in basins or channels with a natural or constructed subsurface barrier to limit leakage or outflow.[69]

Constructed wetlands have diverse applications and are found not only across the United States but also around the world.[70] Another "plus" is that constructed wetlands can typically be erected at less expense than other

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60. Microbial assemblages are organisms that range from viruses to microbial-sized metazoan and make up a huge part of biodiversity. *See* Gabriella Caruso et al., *Microbial Assemblages for Environmental Quality Assessment: Knowledge Gaps and Usefullness in the European Marine Strategy Framework Directive*, CRITICAL REVIEWS MICROBIOLOGY (Nov. 20, 2015), https://www.epa.gov/wetlands/constructed-wetlands [https://perma.cc/5EHA-RDGV].

61. *Constructed Treatment Wetlands*, *supra* note 42.

62. *17 Case Studies*, *supra* note 32.

63. *Id.*

64. Ed Bodker, *Big "Green" Mistake: Dumping Sewage in Wetlands Carries Hidden Costs,* LENS NOLA (Apr. 22, 2019), https://thelensnola.org/2019/04/22/a-big-green-mistake-wetlands-wont-cleanse-partially-treated-sewage/ [https://perma.cc/5CEN-6Z7Y].

65. *17 Case Studies*, *supra* note 32.

66. *Id.*

67. *Id.*

68. *Id.*

69. *Id.*

70. *Id.*

treatment options.[71] Operation and maintenance costs are also likely to be less than those of conventional treatment plants, since less energy and supplies are needed to function.[72] Because constructed wetlands can offer the same benefit of water quality improvement without having to interfere with natural wetland systems, the approach has become the more "modern" practice among the states.[73] States who implement these constructed systems carefully study and analyze the potential treatment levels needed for wastewater to be processed in the constructed wetland.[74] Such systematic planning has yielded positive results in treating wastewater without causing any damage to natural wetlands.[75]

The two different concepts of constructed wetlands and wastewater-assimilation sites are sometimes conflated because both concepts hinge on the idea of wetland "treatment."[76] However, constructed wetlands are the systems that are specifically engineered to use aquatic vegetation to treat sewage.[77] On the other hand, the concept of wastewater assimilation is centered around the discharge of treated or partially treated sewage into naturally-occurring wetlands.[78] To the extent that any "transformation" of wastewater actually occurs at wastewater-assimilation sites, the transformation is not the equivalent of treatment that would occur at a treatment facility.[79]

C. Hammond Wetland Assimilation

Although wastewater assimilation in natural wetlands has been assumed to have some potential benefits, several concerns have arisen in more recent years after ten years of projects were actually conducted, yielding more accurate information.[80] Among various other concerns, the Lake Pontchartrain Basin Foundation indicates that the continuous discharge of nutrients and water can overload wetland ecosystems.[81] Constant high water levels at assimilation sites are essentially drowning

71. *Constructed Wetlands*, *supra* note 1.
72. *Id.*
73. *17 Case Studies*, *supra* note 32.
74. *Id.*
75. *Id.*
76. Bodker, *supra* note 64.
77. *Id.*
78. *Id.*
79. *Id.*
80. Pagones, *supra* note 6.
81. *Id.*

the wetlands.[82] Wetland ecosystems are meant to have fluctuating water levels and putting these systems in a state of permanent flooding will typically yield harsh results.[83] Other concerns include the introduction of chemicals and pharmaceuticals into unmonitored wetlands and the lack of signage in discharge areas to alert people of the presence of wastewater.[84] Another issue is that these projects tend to be designed by commercial firms that are then contracted to monitor the sites, rather than independent third-party scientists.[85] More assistance from scientists would provide more expertise and better security against potential issues of bias.[86]

Many of these problems became more apparent at workshops held by the Lake Pontchartrain Basin Foundation in 2010 and 2016.[87] A marsh where the city of Hammond, Louisiana, discharged treated wastewater had actually seen a loss in wetlands; particularly, 160 to 300 acres of marsh were converted to water.[88] Before this "washing out" occurred, the project seemed to be functioning well and yielded tremendous vegetation growth in the marsh.[89] However, this initial success and the positive results of other projects may be attributed to other factors, such as a decrease in the salinity of water and soil from the 2009 closing of the Mississippi[90] River-Gulf Outlet.[91]

The City of Hammond, Louisiana began operating the sewage diversion site in 2006 in the "South Slough Wetlands"—a 130-acre tract surrounded by a state-owned wildlife management site, that makes up part of the Lake Pontchartrain Basin.[92] The sewage diversion operates by

82. *Id*.
83. *Id.*
84. *Id*.
85. *Id.*
86. Pagones, *supra* note 6.
87. *Id.*
88. *Id.*
89. *Id.*
90. The Mississippi River-Gulf Outlet is a channel that was built in the 1960s, cutting through St. Bernard Parish, to provide a shipping shortcut from the Mississippi River to the Gulf of Mexico. The U.S. Army Corps of Engineers constructed a barrier closing off the channel after the channel was blamed for Hurricane Katrina flooding issues and the destruction of protective wetlands. Martha Carr, *Mississippi River Gulf Outlet now blocked with 352,000 tons of rock,* TIMES-PICAYUNE (Jul. 24, 2009), https://www.nola.com/news/index.ssf/2009/07/tp_archivethe_us_army_corps.html [https://perma.cc/9VVX-L6UV].
91. Pagones, *supra* note 6.
92. Self, *supra* note 27.

dispersing secondarily treated effluent[93] from the city's waste treatment facility into the wetlands through a system of 900 nozzles placed along the wetlands' northern edge.[94] Prior to this operation, the wetlands were full of vegetation and made up a habitat healthy enough to support wildlife in the area. However, the marsh quickly disintegrated and where there was once rich vegetation, there is now open and contaminated water.[95] Despite the concerns voiced about natural wetland assimilation sites being vulnerable to these harmful effects, there were very few safeguards to ensure that the Hammond assimilation site would not cause wetland loss.[96] This is particularly alarming since the Hammond sewage diversion operated on a temporary permit from the LDEQ in 2006, while a full five-year permit would not be issued until 2010, at which time the detrimental loss was apparent.[97] An independent study of the Hammond assimilation site found that the root structure of plants that were exposed to effluent had decomposed, a result that is expected when marsh plants are overexposed to nutrients.[98] Wetlands are made up of highly sensitive systems, and even minor changes to a system's water levels can produce dramatic consequences.

Many wetland assimilation projects are designed without any alternative.[99] Therefore, once the discharging begins, the assimilation can never be "turned off."[100] The Lake Pontchartrain Basin Foundation recommends that independent reviews serve as the basis for future decisions on managing and allowing such projects, including potentially abandoning existing assimilation projects.[101] The foundation operates under the belief that the wastewater itself should be treated to the same level required for discharging into surface water.[102]

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93. Effluent is any liquid waste or sewage, discharged into waters of the state. "Secondarily treated effluent" is effluent that has not only undergone primary treatment from a facility—which involves treatment to remove large inorganic solids and settle out sand and grit—but has also undergone a "secondary" biological process to remove dissolved and suspended organic compounds.

94. Self, *supra* note 27.

95. *Id.*

96. *Id.*

97. *Id.*

98. *Id.*

99. Pagones, *supra* note 6.

100. *Id.*

101. *Id.*

102. *Id.*

D. Required Permits and Processes

Under Section 402 of the Clean Water Act, permits must be issued by the National Pollutant Discharge Elimination System (NPDES) in order to perform discharging operations into waters.[103] However, the authority for issuing permits for these operations may be delegated to state governments.

Under title 33 of the Louisiana Administrative Code, Louisiana's Water Quality Regulations require permits for the discharge of pollutants from any point source[104] into waters of the state of Louisiana.[105] This surface water discharge permitting system is administered under the Louisiana Pollutant Discharge Elimination System (LPDES) program. Water quality in Louisiana is managed under the two broad areas of surface water and groundwater.[106] Prior to 1996, in Louisiana, NPDES permits were issued by the EPA.[107] However, in 1996 permitting authority was transferred to Louisiana Department of Environmental Quality (LDEQ) under the Louisiana Pollutant Discharge Elimination System's (LPDES) program.[108] Prior to 1996, water discharge permittees were required to maintain two water discharge permits, one from the state and another from the federal government. With the transfer of permitting authority, permittees now only need one, all-encompassing permit.[109] The

103. *Water Permits 101: Understanding the Process,* LA. DEP'T OF ENVTL. QUALITY, http://deq.louisiana.gov/assets/docs/About_LDEQ/enviroschool/Enviroschool-Water-Permits-Feb-09.pdf [https://perma.cc/W4NB-ZKMU] (last visited July 20, 2019).

104. LA. ADMIN. CODE tit. 33, pt. 9, § 2313 (2008). (A point source is "any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.").

105. *LPDES Permits,* LA. DEP'T. ENVTL. QUALITY, http://www1.deq.louisiana.gov/portal/DIVISIONS/WaterPermits/LPDESPermits.aspx [https://perma.cc/LKZ5-8RZD] (last updated Nov. 4, 2015).

106. *Id.*

107. *Water Permits 101: Understanding the Process, supra* note 103.

108. *Id.*

109. *Id.*

EPA issues NPDES permits on tribal lands; however, all other permits are issued by the Louisiana Department of Environmental Quality.[110]

When the issuing of an LPDES permit is considered, the LDEQ holds a 30-day public comment period.[111] If there is significant public response to the draft permit action, a public hearing or public meeting may be held.[112] Challenges to any permit must go through an administrative process before becoming appealable.[113]

II. PROBLEMS FLOWING FROM STATE CONTROL OVER WETLAND ASSIMILATION

A. The Need for Wetland-Specific Water Quality Standards

Due to the unique functions of Louisiana's wetlands and their threatened conditions, wetland habitats should be treated as having special characteristics from those of other water sources in order to promote and protect proper restoration efforts.

Discharges into the waters of the United States must comply with applicable State water quality standards. However, very few states have developed water quality standards specifically catered to wetlands, and the EPA has not mandated federal water quality criteria specifically for wetlands.[114] In the late 1980s, an internal EPA task force concluded that the lack of EPA water quality criteria for wetlands and the resulting absence of state water quality standards for wetlands is one of the most serious impediments to a consistent national policy on use of wetlands for wastewater treatment or discharge.[115] The EPA has also interpreted the CWA to *require* state adoption of specific wetland water quality standards to ensure that provisions of the CWA are accurately applied to wetlands.[116]

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110. *Louisiana NPDES Permits*, ENVTL. PROTECTION AGENCY, https://www.epa.gov/npdes-permits/louisiana-npdes-permits [https://perma.cc/ABN5-ENAV] (last visited July 19, 2019).

111. *Water Permits 101: Understanding the Process, supra* note 103.

112. *Id.*

113. 33 U.S.C. § 1369(b)(1)(F) (2018).

114. ENVTL. PROTECTION AGENCY, OFFICE OF WATER, OFFICE OF MUNICIPAL POLLUTION CONTROL REPORT ON THE USE OF WETLANDS FOR MUNICIPAL WATER TREATMENT AND DISPOSAL 9 (October 1987) [hereinafter POLLUTION CONTROL REPORT].

115. *Id.* at 11.

116. JON KUSLER, ASS'N OF STATE WETLAND MANAGERS, A DISCUSSION PAPER ON DEVELOPING STATE WATER QUALITY STANDARDS FOR WETLANDS 2 (2011), https://www.aswm.org/wetland-programs/water-quality-standards-for-wetlands/834-

In lieu of separate wetland standards, some states have simply applied water quality standards for adjacent streams or lakes to wetlands.[117] These water quality standards are often inappropriate for wetlands, because wetlands are vastly different ecosystems.[118] Many wetlands have the ability to process higher levels of nutrients than what streams or lakes can process from wastewater. This of course assumes that contaminated materials are not contained in the suspended solids at levels that would be harmful to fish and wildlife or would pose threats to human health.[119] Water quality standards for wetlands must reflect these concerns. In the late 80s, an internal EPA task force concluded that natural wetlands should be viewed primarily as "protected water bodies," and that, in the absence of water quality criteria for wetlands, it is not possible to broadly identify conditions where they could be safely regarded as part of the "treatment system."[120]

According to the Environmental Law Institute (ELI), all states now directly or indirectly have the authority to regulate wetlands because wetlands are explicitly or implicitly included within the definition of state waters although the term wetland may not be used.[121] Fourteen states have adopted wetland-specific water quality standards for wetlands including California, Wisconsin, Minnesota, Hawaii, Colorado, Wyoming, Maine, Massachusetts, Nebraska, Ohio, North Carolina, Florida, Iowa, and Washington.[122] For these states, explicit water quality standards aid in determining the appropriate level of protection for specific waters and wetlands, the adequacy of existing protection measures, and the potential need for restoration.[123] Explicit water quality standards can help establish site-specific and more generic goals for protecting and restoring wetlands and watersheds.[124]

In 1990, EPA published guidance for the states in developing water quality standards for wetlands.[125] The EPA's guidance included the suggestion that state water quality standards for wetlands apply the relevant state's antidegradation policy and implementation methods to

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state-water-quality-standards-for-wetlands [https://perma.cc/E8F7-XND9] (emphasis added).

117. POLLUTION CONTROL REPORT, *supra* note 114, at 10.
118. *Id.*
119. *Id.*
120. *Id.* at 12.
121. KUSLER, *supra* note 116, at 11.
122. *Id.*
123. *Id.*
124. *Id.*
125. *Id.* at 2.

wetland areas.[126] This is especially important due to the fact that the EPA does not require that states "list" wetlands or adopt TMDLs[127] for wetlands impaired by non-pollutants such as flow alterations.[128] Despite the various restoration efforts implemented in Louisiana, explicit water quality standards for wetlands have not been established.

B. Framework Far Off from Requirements of the National Environmental Policy Act

The National Environmental Policy Act (NEPA) sets out requirements for construction projects associated with federal agencies.[129] NEPA applies only to construction projects that are considered "federal actions."[130] Therefore, if a construction project is entirely or partly financed, assisted, conducted, regulated, or approved by a state agency, only the requirements set out by state authority must be met.[131] NEPA requires federal agencies to incorporate environmental considerations in their planning and decision making.[132] This is done by ordering the agencies to prepare detailed statements assessing the environmental impact of their actions significantly affecting the environment and also the possible alternatives to the agencies' actions.[133] These statements are commonly known as environmental impact statements (EISs).[134] NEPA ensures that federal agencies substantially consider environmental impacts not only on agencies' planning processes and construction activities, but also impacts on post-construction activities.[135] This protects against the potential long-term environmental effects of these projects that are often

126. *Id.*
127. Total Maximum Daily Loads (TMDLs) are used to establish the maximum amount of a pollutant allowed in a waterbody and acts as the starting point or planning tool for restoring water quality. *Clean Water Act Section 303(d): Impaired Waters and Total Maximum Daily Loads (TMDLs)*, EPA, https://www.epa.gov/tmdl [https://perma.cc/FJ55-E6AC] (last visited Jan. 21, 2019).
128. KUSLER, *supra* note 116.
129. *Managing Your Environmental Responsibilities: XII. National Environmental Protection Act,* ENVTL. PROTECTION AGENCY ARCHIVE, https://archive.epa.gov/compliance/resources/publications/assistance/sectors/web/pdf/myer1c_nepa.pdf [https://perma.cc/UG8W-WFYB] (last visited Aug. 23, 2019).
130. *Id.*
131. *Id.*
132. *Id.*
133. *Id.*
134. *Id.*
135. *Id.*

overlooked or under-analyzed by permitting authorities, particularly state permitting authorities that do not follow similar enforcement.[136]

In NEPA's operation as a procedural law for large "federal actions," the environmental assessments (EAs) and EISs often require tremendous resources in the form of time, money, and technical expertise to complete.[137] However, some states have requirements that nearly mirror the requirements established for federal agencies by NEPA and have been able to do so without spending as much time and money.[138] Nevertheless, Louisiana does not have a state law that closely corresponds with NEPA.[139] Louisiana has incorporated some guidelines established by EISs, but the requirements are not as straightforward as those laid out by NEPA.[140] These EIS-like guidelines only apply to water projects that are funded by municipal "revolving loan" funds, which excludes many assimilation projects.[141] Louisiana's requirements are instead more formalistic and implement very little scientific or environmental background and support for water projects. For instance, Louisiana wetland assimilation projects require performance of a feasibility study before LDEQ approval is allowed.[142] However, the "biological" components of the feasibility study do not dig deep enough to address the potential environmental impacts of a particular project. One example of this is that the study requires assessment of aboveground vegetation, but the study does not require assessment of vegetation root structures, a more accurate indicator of potential nutrient effects.[143] The feasibility study also requires assessment of long-term average loading rates for effluent, but the estimated rates are nearly impossible to translate into actual permit

136. *Id.*

137. Patrick Marchman, *"Little NEPAs": State Equivalents to the National Environmental Policy Act in Indiana, Minnesota and Wisconsin*, DUKESPACE, https://dukespace.lib.duke.edu/dspace/bitstream/handle/10161/5891/P.%20Marchman%20Little%20NEPAs_Final_w%20endnotes.pdf [https://perma.cc/U53Q-4NRZ] (last visited July 20, 2019).

138. *Id.*

139. *See States and Local Jurisdictions with NEPA-like Environmental Planning Requirements,* NAT'L ENVTL. POLICY ACT, https://perma.cc/JW4W-DJ8V (last visited Aug. 23, 2019).

140. *Id. See also* LA. ADMIN. CODE tit. 33, pt. 9, § 2125.

141. *See* LA. ADMIN. CODE tit. 33, pt. 9, § 2125.

142. WATER QUALITY MANAGEMENT PLAN, LA. DEP'T ENVTL. QUALITY, WETLAND ASSIMILATION OF NUTRIENT RICH DISCHARGE 10 (2010), https://deq.louisiana.gov/assets/docs/Water/IMPV35_final_110210version8.pdf [https://perma.cc/3JT6-V3JV].

143. *Id.*

requirements, such as monthly averages for loads because the estimates are too speculative to correlate with the current requirements.[144]

C. Performance Gaps in Permits

When the Clean Water Act was enacted, the act codified a national commitment to "restore and maintain the chemical, physical, and biological integrity of the nation's waters."[145] The statutory objective of achieving "chemical, physical, and biological integrity" may have been "aspirational" on Congress' part to begin with.[146] However, in the context of wetland assimilation projects, many possible solutions exist being that the projects themselves are mostly rooted in the theory of cost efficiency, with very little scientific proof of any other benefits. In implementing the CWA, strong enforcement was a central Congressional goal.[147] Since the CWA's enactment, controlling point source discharges has yielded impressive improvements in water quality, although considerable problems still exist. A prominent drawback is the spotty record of government enforcement of the CWA's permitting requirements.[148] At the same time, resources for water quality control programs, particularly for state level programs, are scarce and creating a daunting gap between the resources that are needed and resources that are actually available.[149]

Many states and the EPA do not promptly renew and update permits once they expire.[150] Facilities with outdated permits may easily get by and operate with weak or inadequate regulation.[151] As of September 2003, the EPA reported that approximately 15% of major facilities[152] and one-third

144. *Id.*

145. *A Brief History of the Clean Water Act*, PBS, https://www.pbs.org/now/science/cleanwater.html [https://perma.cc/7PLF-M4AK] (last visited July 20, 2019).

146. Robert W. Adler, *The Decline and (Possible) Renewal of Aspiration in the Clean Water Act*, 88 WASH. L. REV. 759, 780–81 (2013).

147. Rechtschaffen, *supra* note 18, at 775–76 (2004).

148. *Id.*

149. *Id.*

150. *Id.* at 781.

151. *Id.*

152. Major facility dischargers include all facilities with design flows of greater than one million gallons per day and facilities with EPA-approved/state-approved industrial pretreatment programs. *DMR Search Statistics Definitions*, ENVTL. PROTECTION AGENCY, https://echo.epa.gov/help/loading-tool/water-pollution-search/search-results-help-dmr/dmr-search-statistics-help [https://perma.cc/75J8-WX9J] (last visited July 20, 2019).

of minor facilities[153] were operating with outdated permits.[154] Compared to prior years, this was considered an improvement; the EPA estimated in 2002 that 20% of major facility permits had expired.[155] In some states the percentage of outdated permits was much higher, including the percentage in Louisiana which was 30%.[156] This lax enforcement of permitting substantially contributes to the lack of structure in admitting permits for wetland assimilation projects. This is especially illustrated in the Hammond assimilation site where a mere temporary permit served as the basis for an assimilation project with many huge potential effects.

A 2002 report by the Legislative Auditor's Office documented extensive failures in Louisiana's water enforcement performance.[157] The report indicated that Louisiana failed to conduct required inspections for 31% of "minor" facilities, that 26% of required self-monitoring reports for water were either not submitted or could not be located, that 80% of water enforcement actions were not filed in a timely fashion, and that the department had not collected 58% of the monetary penalties assessed for water quality violations in fiscal years 1999 to 2001.[158] Although the LDEQ made strides to improve in areas of enforcement, Louisiana was again criticized in a 2011 report by the EPA inspector general.[159] The report highlights Louisiana's lax regulatory scheme and a general failure to carry out required inspections and cite violators as some of the main issues.[160] The report indicates the weak enforcement might be driven in part by "a culture in which the state agency is expected to protect industry."[161]

Both Congress and the public have expressed strong support for vigorous and effective enforcement of the CWA.[162] This Congressional desire for strong enforcement is reflected in numerous provisions of the statute. For example, section 309 appears to *require* the EPA to take enforcement action to remedy statutory violations, an unusually strong directive from Congress.[163] When the CWA was amended in 1987,

153. *Id.* Minor facilities include all "non-major" facilities.
154. Rechtschaffen, *supra* note 18.
155. *Id.*
156. *Id.*
157. *Id.* at 785.
158. *Id.*
159. Schleifstein, *supra* note 58.
160. *Id.*
161. *Id.*
162. Rechtschaffen, *supra* note 18, at 776.
163. "Section 309(a) provides: In the event a state-issued NPDES permit is violated, the EPA either 'shall' issue a notice of violation to the state and the

Congress strengthened the statute's enforcement provisions, granting the EPA authority to impose administrative penalties for violations and again expressing support for forceful and effective enforcement.[164] The amendments also provided for stiffer penalties for violations of the CWA under its criminal penalty provisions.[165]

On the state level, despite the discrepancy in Louisiana's enforcement of water permit programs, many states have strengthened their enforcement and compliance laws in recent years.[166] This has been accomplished for states such as California and New Jersey, where state governments enacted laws requiring that agencies impose penalties for repeat, serious violations of water pollution requirements.[167] This also reiterates the importance for states developing clear water pollution limitations and explicit water quality standards for wetlands. Clear water quality standards for wetlands can serve as the basis for enforcing penalties when necessary to promote better practices involving natural wetlands.

III. SOLUTIONS FOR BETTER ENFORCEMENT PRACTICES IN LOUISIANA

A. Provisions of the CWA That May Apply Indirectly to Wetland Assimilation Practices

1. Section 404 of the Clean Water Act

Although certain regulations do not apply directly to wetland assimilation, they may have residual effects and their applications can make for better wetland practices. The EPA, along with the Army Corps

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polluter, or 'shall' issue an administrative compliance order or institute suit against the polluter. If the Agency chooses the first alternative, and appropriate state enforcement is not forthcoming within thirty days, the EPA 'shall' issue an administrative compliance order or commence civil enforcement. In the event of any other relevant violation of the Act, the EPA 'shall' issue a compliance order or bring a civil enforcement action.

Section 309(b), on the other hand, uses *discretionary* language when referring to civil actions and compliance orders. It provides that the EPA is 'authorized' to initiate a civil action 'for any violation for which [the EPA] is authorized to issue a compliance order' under section 309(a)." *Id.* at 777 n.15 (quoting William L. Andreen, *Beyond Words of Exhortation: The Congressional Prescription for Vigorous Federal Enforcement of the Clean Water Act,* 55 GEO. WASH. L. REV. 202, 203 (1987)) (emphasis added).

164. Rechtschaffen, *supra* note 18, at 778.

165. *Id.* at 779.

166. *Id.* at 785.

167. *Id.*

of Engineers, has the ability to implement clear provisions that require solid scientific evidence of the benefits of each sewage diversion. With the proper enforcement of structured permitting and the more innovative notions of constructed wetlands, Louisiana can be on its way to participating in safer and more reasonable wetland practices, which in turn may yield more successful restoration efforts.

Generally, proposals to use natural wetlands for wastewater treatment involve some alteration of the wetland, such as building dikes.[168] Section 404 of the Clean Water Act requires parties to obtain a permit for the discharge of dredged or fill material from the Army Corps of Engineers (or appropriate state agency for states with their own permitting authority) before such construction can be allowed.[169] EPA guidelines stipulate that a Section 404 permit will not be issued if the proposed discharge would cause or contribute to "significant degradation of the waters of the United States."[170] When considering the "significant degradation" standard, the relevant permitting authority (typically the Corps) must assess possible adverse effects of the discharge upon the following: human health or welfare, including effects on water supplies, marine species, and wildlife; life stages of species dependent upon aquatic ecosystems; aquatic ecosystem diversity, productivity and stability; and recreational, aesthetic and economic values.[171]

Section 404 permits are applicable to the dredging and filling for the structures used in conducting wetland assimilation projects.[172] Although these permits are not applicable to the practice of *discharging* wastewater per se, the 404 permit-bound structures used for wetland assimilation allow for an indirect application of Section 404 to the projects.[173] The EPA's language is relevant regarding wetland assimilation practices and should be applied to these operations. In reviewing Section 404 permits, the Corps and the EPA are to "minimize unavoidable impacts" and "mitigate the impacts through practicable compensatory actions."[174] Wetland habitats are highly sensitive to any disturbances. Even if the

168. POLLUTION CONTROL REPORT, *supra* note 114, at 11.

169. *Id.*

170. George F. Gramling III, *Wetland Regulation and Wildlife Habitat Protection: Proposals for Florida,* 8 HARV. ENVTL. L. REV. 365, 376 (1984) (citing 40 C.F.R. § 230.10 (c) (1983)).

171. *Id.*

172. POLLUTION CONTROL REPORT, *supra* note 114, at 11.

173. *Id.*

174. Jae-Young Ko et al., *Policy Adoption of Ecosystem Services for a Sustainable Community: A Case Study of Wetland Assimilation Using Natural Wetlands in Breaux Bridge, Louisiana* 38 ECOLOGICAL ENGINEERING 114, 115 (2011).

construction of dikes or other necessary structures may not be presumed to cause harm to a particular assimilation site, the practice of wastewater dumping that will be made possible through these constructions are more than capable of causing significant "degradation" of wetland areas. This issue should be considered when Section 404 permits are being issued.

2. Section 401 of the Clean Water Act

Section 401 of the Clean Water Act requires that an applicant for a federal water permit provide a certification that any discharges will comply with the statute, including state-established water quality standard requirements.[175] This establishes that a federal agency cannot issue a permit or license for an activity that may result in a discharge into waters of the United States until the state or tribe where the discharge would originate has granted or waived Section 401 certification.[176] The central feature of Section 401 of the Clean Water Act is the state or tribe's ability to grant, grant with conditions, deny, or waive certification.[177] In using this discretion, states consider whether the activity leading to the discharge will comply with any applicable effluent limitations guidelines, new source performance standards, toxic pollutant restrictions, and other appropriate requirements of state law.[178]

Section 401 is limited in scope and application to situations involving federally-permitted or licensed activities.[179] Although Section 401 certification by itself is not a comprehensive water quality program for states and tribes, it can nevertheless be an effective water quality protection tool.[180] Because participation by states in Section 401 certification is capable of being waived, state implementation varies.[181] However, more recently many states appreciate Section 401 as an

175. Claudia Copeland, *Clean Water Act Section 401: Background and Issues*, CONGRESSIONAL RESEARCH SERV. (July 2, 2015), https://fas.org/sgp/crs/misc/97-488.pdf [https://perma.cc/QCB4-M52R].

176. CLEAN WATER ACT SECTION 401: WATER QUALITY CERTIFICATION: A WATER QUALITY PROTECTION TOOL FOR STATES AND TRIBES, U.S. EPA OFFICE OF WETLANDS, OCEANS, AND WATERSHEDS 1 (2010), https://www.epa.gov/sites/production/files/2016-11/documents/cwa_401_handbook_2010.pdf [https://perma.cc/25AG-ZQQR] [hereinafter WATER QUALITY CERTIFICATION].

177. *Id.*

178. *Id.*

179. *Id.* at 2.

180. *Id.*

181. Copeland, *supra* note 175.

important tool in their overall programs to protect the physical and biological integrity of their waters.[182]

When Congress enacted the water quality certification provisions in 1970, it wanted to warrant that no federal license or permit would be issued "for an activity that through inadequate planning or otherwise could in fact become a source of pollution."[183] As incorporated into the 1972 CWA, Congress intended Section 401 water quality certification to ensure that no federal license or permits would be issued that would prevent states or tribes from achieving their water quality goals, or that would violate CWA provisions.[184] Despite this Congressional goal, disputes arose based on whether the authority granted to states under Section 401 was appropriate.

In 2010, based on two decades of case law and state and tribal program experience, the EPA substantially updated its handbook on CWA Section 401 water quality certification, including how states can use 401 certifications to protect wetlands and other aquatic resources.[185] The updated handbook describes CWA Section 401 certification authorities, the way different state and tribal programs use the certification, and how states may leverage available resources to operate their own state certification programs.[186] Although the handbook does not create any legal requirements or set policy, it provides a comprehensive description of Section 401 certification provisions and practices which may be helpful to states and tribes interested in using Section 401 as an effective water resource protection tool.[187]

B. Wetland Protection Based on Public Interest and Welfare

The Louisiana Constitution establishes environmental preservation as the public policy of the state.[188] The Louisiana Constitution also directs that the "natural resources of the state including air and water, and the healthful, scenic, historic, and esthetic quality of the environment" are to "be protected, conserved, and replenished."[189] Moreover, it mandates the

182. *Id.*

183. WATER QUALITY CERTIFICATION, *supra* note 176, at 17.

184. *Id.*

185. Water Quality and Wetlands, 2010 ENV'T. ENERGY & RESOURCES L.: YEAR REV. 144, 156 (2010).

186. *Id.*

187. *Id.*

188. Kenneth M. Murchison, *Enforcing Environmental Standards Under State Law: The Louisiana Environmental Quality Act*, 57 LA. L. REV. 497 (1997).

189. *Id.* (citing LA. CONST. art. IX, § 1).

legislature to "enact laws to implement this policy."[190] The constitutional policy is not absolute; certainly, other economic and social concerns of the state temper it. However, the overall obligation imposed by the constitution is a substantial one. The constitution commits the state to the protection, conservation, and replenishment of its natural resources "insofar as possible and consistent with the health, safety, and welfare of the people."[191]

Save Ourselves, Inc. v. Louisiana Environmental Control Commission is the leading decision interpreting the constitutional mandate.[192] In *Save Ourselves,* Justice Dennis, while opining for a unanimous Louisiana Supreme Court, construed the constitutional provision as continuing the "public trust doctrine" established in the 1921 Constitution.[193] According to Justice Dennis, the effect of this continuation of the public trust doctrine is to impose "a duty of environmental protection on all state agencies and officials," establishing "a standard of environmental protection" and mandating "the legislature to enact laws to implement fully this policy."[194]

The *Save Ourselves* opinion also recognized the significance of the qualifying language in the constitutional text. Justice Dennis defined the obligation imposed by the state constitution as "a rule of reasonableness."[195] Although the constitution "does not establish environmental protection as an exclusive goal" explicitly, it does require "a balancing process in which environmental costs and benefits must be given full and careful consideration along with economic, social and other factors."[196] Following this reasoning, the environmental costs and benefits involved in wetland assimilation projects should also be applied in a balancing process before any permits are issued. The focus on these projects is often centered around the cost-effectiveness and the supposed restorative properties that they offer. However, not enough attention has been given to scientific findings and the damaging, irreversible effects that may potentially follow from sewage diversions.

The "Public Trust Doctrine" is the principle that certain natural and cultural resources are preserved for public use, and that the government

190. *Id.*
191. *Id.*
192. 452 So. 2d 1152 (La. 1984).
193. Murchison, *supra* note 188 (citing Save Ourselves, Inc. v. La. Envtl. Control Comm'n, 452 So. 2d 1152, 1156 (La. 1984)).
194. *Save Ourselves, Inc.*, 452 So. 2d at 1157 (La. 1984).
195. Murchison, *supra* note 188, at 498 (citing Save Ourselves, Inc. v. La. Envtl. Control Comm'n, 452 So. 2d 1152, 1156 (La. 1984)).
196. *Id.*

owns and must protect and maintain these resources for the public's use.[197] The public trust doctrine traditionally protected the states' interest in keeping large public waterways free for navigation and public use.[198] Since then, state entities have greatly expanded the doctrine to allow for the protection of a variety of different interests in waters that would otherwise not be considered navigable in the formal sense.[199] Therefore, the public trust doctrine can now be applied to protect wetlands from their destruction, regardless of their navigability.[200] The doctrine may place a responsibility on states to take affirmative actions to protect wetlands and implement more careful practices. Thus, the public trust doctrine fills a vital gap in the protection of wetlands which the present federal and state schemes have left unprotected.[201]

C. Enforcement Framework of Other States

1. Comparison to Florida's Approach to Wetlands

Faced with many of the same environmental challenges to its natural wetlands as Louisiana, the state of Florida is intentional about its approach to natural wetland practices and has shown a strong hesitation to using its natural wetlands for wastewater treatment. In 1986 Florida established standards for the use of wetlands for treatment. These standards are considerably more complex than conventional water quality standards. Florida's wetland standards include design criteria and regulation at three levels: effluent limits; standards to be met within the treatment wetland; and standards for discharge from the wetland to downstream water bodies. The Florida standards contain traditional parameters and physical and chemical parameters, as well as new "wetland biological quality" standards. Thus, the standards recognize and allow wetland treatment capacity to be used while at the same time protecting the unique values and functions of wetlands and the water quality standards of the receiving waters.

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197. Cornell Law School, *Public Trust Doctrine,* LEGAL INFORMATION INST., https://www.law.cornell.edu/wex/public_trust_doctrine [https://perma.cc/JG2T-K9T4].

198. Michael L. Wolz, *Applications of the Public Trust Doctrine to the Protection and Preservation of Wetlands: Can It Fill the Statutory Gaps?*, 6 B.Y.U. J. PUB. L. 475, 478 (1992).

199. *Id.*

200. *Id.*

201. *Id.*

In most cases the NPDES permitting authority, or relevant state authority, must review the use of wetlands systems to achieve downstream water quality standards on a case-by-case basis.[202] This method leads to inconsistent findings, since a uniform standard is not being implemented concerning the use of natural wetlands as advanced treatment systems.[203] Florida's use of water quality standards, at least in part, combats this issue. The standards allow for more accurate and useful foresight in determining the impact of wastewater flows. Also, unlike Louisiana, Florida's rules distinguish between natural and man-made wetlands and strongly encourage the use of constructed wetlands for wastewater treatment. Florida's enforcement framework and use of water quality standards provides a more biologically-based background for wastewater assimilation practices than what is available in Louisiana.

2. Solution for Tackling Louisiana's Approach to Wetlands

In order to incorporate a better understanding of the biological processes and potential risks involved in sewage diversion practices, Louisiana should adopt specific water quality standards for wetlands. Aside from adopting these water quality standards for natural wetlands, Louisiana should also adopt the practice of using constructed wetlands for wastewater treatment to alleviate the damage being imposed on natural wetlands. These practices have served as a cost-effective advantage to other states, such as Florida, and Louisiana's wetland areas desperately need this more structured alternative if any wetlands are going to be used as treatment systems.

In addition to implementing constructed wetlands and wetland-specific water quality standards, Louisiana's requirements for conducting sewage diversion projects should more closely mirror the requirements set out by NEPA, fully applying the use of environmental impact statements. States that follow NEPA requirements more closely than Louisiana have the opportunity to implement stricter guidelines for projects that may have huge impacts on the environment, and more specifically on wetland areas. EISs ensure that true long-term analysis and justification is given for a project before it can be conducted. This element is crucial in making decisions for projects that have the potential to impact Louisiana's already disappearing wetland systems.

202. *Id.*
203. *Id.*

CONCLUSION

Despite the initial lack of knowledge on wetland systems, over time wetlands have proven themselves to be unique and fragile water bodies that are capable of providing many environmental benefits and habitat necessities. Water systems with such complexity need special standards for water quality in order to ensure their essential protection. Louisiana should develop standards and regulations that reflect the risks that face natural wetland systems.

The practice of sewage diversions is one that requires complex scientific research and observation in order to be successful. The complexity of these practices should also be considered in issuing permits because their effects are often irreversible. Recommendations from the EPA regarding wetlands, combined with provisions of the CWA that focus on refraining from practices that will be detrimental to specific water bodies should be the driving force behind Louisiana authorities' execution of permit procedures. In turn, Louisiana will be more equipped to successfully implement reliable restoration efforts and better protection of its coastal areas.

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