



State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

Alan Matheson
Executive Director

DIVISION OF WATER QUALITY
Walter L. Baker, P.E.
Director

Water Quality Board
Myron E. Bateman, Chair
Shane E. Pace, Vice-Chair
Clyde L. Bunker
Steven K. Earley
Gregg A. Galecki
Jennifer Grant
James VanDerslice
Michael D. Luers
Alan Matheson
Walter L. Baker
Executive Secretary

MEMORANDUM

TO: Utah Water Quality Board
THROUGH: Walter L. Baker, P.E. 
FROM: Emily Cantón
Administrative Services Manager
DATE: May 17, 2016
SUBJECT: Carl Adams Appointment as Signatory

Currently, Carl Adams is responsible for oversight of the State Non-point Source Program, including the \$1,000,000 annual allocation as well as special projects funded directly by the Water Quality Board. Carl currently participates in the application and award process, reviews pay requests, and assists with project closeout. Therefore, in order to increase efficiency and expedite the completion of administrative tasks, Carl will be responsible for executing grant agreements and authorizing payments for the State Non-point Source Program in behalf of the Water Quality Board.

This request is for the Water Quality Board to designate Carl Adams, Manager of the Watershed Protection Section of the Division of Water Quality, as a signatory for official documents associated with the State non-point source program.



State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

Alan Matheson
Executive Director

DIVISION OF WATER QUALITY
Walter L. Baker, P.E.
Director

Water Quality Board
Myron E. Bateman, Chair
Shane E. Pace, Vice-Chair
Clyde L. Bunker
Steven K. Earley
Gregg A. Galecki
Jennifer Grant
James VanDerslice
Michael D. Luers
Alan Matheson
Walter L. Baker
Executive Secretary

MEMORANDUM

TO: Water Quality Board
THROUGH: Walter L. Baker, P.E.
FROM: Jeff Ostermiller
DATE: May 17, 2016
SUBJECT: Willard Spur Steering Committee Recommendations

Over the past six years, the Division has been working with a diverse group of stakeholders to resolve challenges surrounding the issuance of the UPDES permit for the Perry/Willard Regional Wastewater Treatment Plant (POTW). Specifically, under the Water Quality Board's (WQB) direction, DWQ undertook several actions to help resolve these challenges. Among these actions was the creation of a *Steering Committee* of engaged stakeholders who were charged with overseeing ongoing research conducted at the behest of a *Science Panel* and ultimately making recommendations to the *Water Quality Board* on appropriate actions that would help bring long-term resolution to the underlying concerns that were raised at the inception of these investigations. **DWQ Staff will provide a history of this project and a summary of project results at the May Board Meeting.**

After reviewing the research results, the *Steering Committee* has come to unanimous agreement on several recommendations to the WQB (see attached memorandum). **Among the 10 votes received, 9 members supported all recommendations and 1 member (EPA) abstained.** These recommendations include steps that can be undertaken to minimize the risk from the discharge to Willard Spur's beneficial uses and a collaborative approach for water quality standard revisions. Completion of the latter will bring final resolution to this project in a way that minimizes further challenges to permit renewals.

The *Steering Committee* recommendations and the recommendations from DWQ staff on appropriate WQB actions follow:

Recommendation 1: Incorporate Best Management Practices into the UPDES Permit

The Steering Committee and Staff have made several recommendations for the UPDES permit renewal (see attachment, *Development of Appropriately Protective UPDES Permit for the Perry/Willard POTW*), including: a seasonal variance for phosphorus removal requirements and

alternative discharge locations.

Staff Recommendation: No specific WQB action is required. However, this approach brings sufficient certainty that future upgrades to the POTW are highly unlikely, which provided the rationale for the *Steering Committee* to recommend the release of the contingency funds (see Recommendation 4 below).

Recommendation 2: Establish a Beneficial Use Class for the Willard Spur

Among the principle objectives of the investigation was determining if changes to Utah's Water Quality Standards was necessary to ensure the long-term protection of the Willard Spur's beneficial uses. As staff will discuss, there are several unique aspects of the Willard Spur that warrant delineation of Willard Spur as a sub-class of Great Salt Lake's beneficial uses (UAC R317-2-6.5).

Staff Recommendation: No immediate WQB action is required. However, Staff is supportive of the concept, which will be presented to the WQB for discussion at this meeting with plans to approach the WQB with specific language to proceed with rulemaking.

Recommendation 3: Proceed with Site-Specific Standard Development

Staff plans to work with the *Steering Committee* and others to develop site-specific narrative criteria for the Willard Spur (see attachment, *Development of Site-Specific Narrative for Willard Spur*). This unique approach will translate important results from the investigations into specific statements of conditions or processes required to ensure long-term support of Willard Spur's beneficial uses.

Staff Recommendation: No immediate WQB action is required. Especially considering that defensible numeric nutrient criteria cannot be established for Willard Spur, Staff is supportive of this approach. Staff will introduce this concept and will request a discussion from the WQB on questions or concerns so that they can be addressed as draft rules are developed.

Recommendation 4: Release Contingency Grant Funds

Please see attached memorandum from John Mackey.

ATTACHMENTS:

- Memorandum from Steering Committee to the WQB
- Development of Appropriately Protective UPDES permit for the Perry/Willard POTW
- Development of Site Specific Narrative for Willard Spur
- Memorandum from John Mackey to the WQB



State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

Alan Matheson
Executive Director

DIVISION OF WATER QUALITY
Walter L. Baker, P.E.
Director

MEMORANDUM

TO: Water Quality Board

THROUGH: Division of Water Quality 

FROM: Willard Spur Steering Committee

DATE: May 17, 2016

SUBJECT: Initial Recommendations: Willard Spur Project

Summary

The Willard Spur Steering Committee (herein Steering Committee) was tasked with making recommendations to the Water Quality Board (WQB) on any policy or rule changes needed to ensure the long-term protection of Willard Spur's existing uses. As outlined in the Steering Committee's Charter, these recommendations require support from a supermajority (3/4) of Committee representatives. After consideration of the recommendations from the Science Panel and Division of Water Quality (DWQ) staff, the Steering Committee reached unanimous consensus—nine members For, none Against and one formal Abstention—on the following recommendations:

- The proposal for incorporation of the proposed Best Management Practices (BMPs) into a renewed Utah Pollution Discharge Elimination System (UPDES) permit for the Perry/Willard Regional Wastewater Treatment Plant is appropriately protective of Willard Spur's existing beneficial uses.
- The WQB should proceed with the proposal to initiate rulemaking on the interim proposed designated use class and associated numeric criteria for the Willard Spur (Class 3B warm water aquatic life criteria, excluding temperature, DO and pH).
- The WQB should support the request from DWQ to use the remaining grant funds given to this project to support development of site-specific narrative criteria for the Willard Spur.
- The WQB should release the contingency hardship grant funds that were set aside in the event that the investigation demonstrated that nitrogen removal is unnecessary

These actions—if supported by the WQB and under current conditions within the Willard Spur—would be sufficient to resolve concerns about immediate risks from the Perry/Willard Regional Wastewater Treatment Plant discharge to the Willard Spur. The Steering Committee was also

tasked with making recommendations for any regulatory changes necessary to ensure the long-term support of the Willard Spur's designated uses. The above recommendations provide partial resolution to this charge. Given that the project was unable to establish numeric nutrient criteria and the importance of maintaining the yearly flushing flows to minimize the threat from nutrient enrichment, the Steering Committee believes that additional standard changes would be appropriate. The Steering Committee intends to continue to work with DWQ on plans for the development of water quality criteria for the Willard Spur. Once sufficient consensus is reached on this language, the Steering Committee anticipates returning to the WQB with a final recommendation to incorporate this language into Utah's Water Quality Standards. If these efforts are successful, the Steering Committee will recommend that the WQB formally close this project and any associated grant obligation.

Background

The cities of Perry and Willard completed construction in 2010 costing \$28 million on various sewer improvements including a new regional wastewater treatment facility to be managed jointly by the two cities through an inter-local agreement. In May 2010, as construction of the Perry/Willard Regional Wastewater Treatment Plant neared completion, DWQ public-noticed the UPDES permit for the discharge of treated effluent from the plant into the Willard Spur of Great Salt Lake. In response to this solicitation, Western Resource Advocates —on behalf of the Utah Waterfowl Association—petitioned the WQB to re-classify Willard Spur as a Category 1 waterbody, reserved for waters of exceptional recreational or ecological significance and would prohibit all wastewater discharges to Willard Spur. If this was not possible the petitioners requested to reclassify Willard Spur to protect the wetlands and current uses of the water. This led to DWQ temporarily withholding the UPDES discharge permit.

The [WQB denied the petition](#) but directed DWQ staff to develop a study design to establish defensible protections (i.e., site-specific numeric criteria, antidegradation protection classes, beneficial use changes) for the waterbody. In addition, DWQ was directed to work with stakeholders to identify a path forward to allow the Perry/Willard Regional Wastewater Treatment Plant (herein POTW) to operate while the studies were underway, with reasonable assurances that the effluent would not harm the ecosystem. The WQB also directed DWQ to work collaboratively with stakeholders to develop and implement a research program to obtain the data necessary to ensure that any regulatory changes that are ultimately proposed will be scientifically defensible.

In response to these directives, DWQ formed two workgroups. A [Science Panel](#) was established to oversee a research program aimed at collecting sufficient data to inform regulatory decisions. A [Steering Committee](#), consisting of interested stakeholders was also formed. This committee was charged with the responsibility of guiding the process of developing any water quality standard development. Also, at the end of the process, this group was asked to come to consensus—via a supermajority vote—to the WQB on any regulatory changes that are necessary to resolve either of the two framing questions for the project:

1. What are the potential impacts of the POTW on Willard Spur?

2. What changes to water quality standards will be required to provide long term protection of Willard Spur as they relate to the proposed POTW discharge?

Once these groups were formed, the most immediate task was an agreement among challenging parties to drop their permit challenges, so the POTW could start operating while the research process was ongoing. To facilitate this compromise, DWQ conducted an analysis that concluded, albeit with limited data, that the immediate (3-5 year) risk from the discharge was minimal. To further minimize the risk, the WQB funded chemical phosphorus removal, both the infrastructure and operation and maintenance expenses. This allowed the POTW to agree to a set a phosphorus reduction target of 1 mg/L. Also, to alleviate concerns from Perry and Willard cities that hardship grant funds would be unavailable at the end of the project—should the research demonstrate that additional nitrogen treatment was necessary—the WQB set aside \$1.5 M in contingency funding. Together, these agreements were successful in satisfying the challenging party such that they were willing to drop protests to the UPDES Permit, and also avoided another potential challenge in Federal Court.

After a year of intensive monitoring in 2011, the Science Panel reviewed the data and developed a [Research Plan](#) with the goal of answering the project framing questions. This plan was used to develop a budget, which was ultimately funded by the WQB. The proposed research was conducted between 2012 and 2013, with 2014 slated for analysis and interpretation of research results. Both the Science Panel and Steering Committee met numerous times throughout the project so that the initial research plan could be adjusted, if necessary, in response to ongoing research results. These regular meetings were also helpful in moving stakeholders—who had very divergent views at the beginning of the project—toward consensus.

At the conclusion of these research efforts, the Science Panel reviewed [~20 research reports](#), to develop a conceptual model of the structure and function of the Willard Spur Ecosystem (see enclosed research summary). These data were then used to help resolve the initial framing questions. This information and related recommendations were then taken to the Steering Committee for consideration. The remainder of this memorandum provides the formal recommendations to the WQB.

Steering Committee Recommendations: Discussion and Rationale

Permit Renewal Best Management Practices and the Release of Set-Aside Hardship Grant Funds

The research conducted for this project generally demonstrates that nutrient loading from the Perry/ Willard POTW poses minimal risk to the Willard Spur. For much of the year the contributions from the POTW are relatively small and the capacity for biological uptake for nutrients exceeds external loads. On the other hand, the enrichment experiments conducted by the University of Utah demonstrated that enrichment has the potential to adversely affect the health of Submerged Aquatic Vegetation (SAV)—a keystone species in the Spur ecosystem. It is also true that the current low nutrient regime within the Willard Spur is an attribute that makes the ecosystem unique in comparison with other wetlands and brackish bays in and around Great Salt Lake. Particularly in dry years, the uptake capacity of the Willard Spur is lowest in the summer after the Willard Spur becomes isolated from Bear River Bay. This late summer period is when nutrient enrichment from the discharge has the potential to be the highest, relative to other

sources. Given these findings, the large temporal variation of ecological attributes, and remaining scientific uncertainty, some members of the Science Panel were uncomfortable with concluding that risks from the POTW were entirely non-existent. DWQ staff subsequently developed a proposal that limits ongoing phosphorus reduction requirements to a limited time (July through September) when the potential for harm is greatest. This plan reduces operation and maintenance expenses for the POTW, which creates a win-win scenario. The Steering Committee has reviewed the details of the permit proposal, which is enclosed. Based on the Committee's review of this proposal and our discussion on the topic at the most recent Steering Committee meeting, members are generally supportive of the approach. These added assurances also increase the confidence of the Steering Committee that additional research was not needed, which is why the Steering Committee is making the recommendation to release the contingency hardship grant funds so that they can be used for other important water quality projects.

Establishing the Willard Spur as a New Designated Use

The Steering Committee is generally supportive of the proposal to establish a separate designated use for Willard Spur, which is discussed in more detail in the enclosed standard revision proposal. This designation helps resolve the current issues with different areas within the Willard Spur having different designated uses and associate water quality standards. The fishery study conducted at the behest of the Science Panel under the Committee's direction confirms that a Class 3B, warm water aquatic life use is an appropriate existing use. The exclusion of temperature, pH and DO criteria is also appropriate because these parameters are naturally violated during periods when the Willard Spur becomes hydrologically isolated from Bear River Bay. Finally, and maybe most importantly, there was discussion during the Committee's last meeting that this designation has the potential to facilitate the transfer of water rights for the Willard Spur, which the investigations in this project clearly demonstrate to be of critical importance to the ecological condition of the Willard Spur and associated nutrient cycling.

Development of Narrative Criteria for the Willard Spur

At the last Steering Committee meeting, the potential for translating the research results into site-specific standards for the approach were discussed. These rules would describe conditions that are now known to contribute to the ecological health of the Willard Spur, or alternatively, conditions that should be avoided to prevent future degradation of the Willard Spur's uses. The Steering Committee was supportive of the concept. Development of these narrative criteria, if successful, would be consistent with our charge of making recommendations to the WQB that will help ensure the long-term protection of the Willard Spur's existing uses. It also provides a mechanism for capturing the knowledge gleaned from the project investigations to help ensure that they continue to be considered when management decisions are made in the future. At this meeting DWQ staff agreed to develop an approach for the development of a narrative site-specific standard. The enclosed approach is reasonable and would be a good use of the grant funds that were set aside to assist with project closure. These considerations played into the Steering Committee's recommendation that the WQB should support these efforts.

ENCLOSED:

- Don Leonard Steering Committee Vote and Comments
- Development of Appropriately Protective UPDES permit for the Perry/Willard POTW
- Development of Site Specific Narrative for Willard Spur

Votes and Comments of Don Leonard on Willard Spur Recommendations
Wednesday, May 4, 2016

Recommendation 1: Incorporate BMP's into the UPDES Permit

- Do you support this recommendation:
 - YES
- Comments, caveats and contingencies:
 - Although we are generally supportive of the Division's recommendation of BMP's resulting in a less expensive mechanism for nutrient removal e.g.: seasonal TBPEL and the discharge diversion, we still believe the actions may be over-reaching. The uptake experiments show that the potential uptake of the ecosystem far exceeds the nutrient loads and that even during dry years, and worse case future discharge scenarios, it unlikely that loads could exceed uptake capacity. We feel that the research has shown Willard Spur to be a resilient ecosystem and the unlikely occurrence of nutrient loads exceeding the uptake capacity, coupled with a temporary variance which allows for revisions and thus an adaptive management approach, should be sufficiently protective of Willard Spur and its designated uses.

Recommendation 2: Establish a Use Class for Willard Spur.

- Do you support this recommendation:
 - YES
- Comments, caveats and contingencies:
 - None

Recommendation 3: Proceed with Site-Specific Standard Development.

- Do you support this recommendation:
 - YES
- Comments, caveats and contingencies:
 - We do recommend that the board use the remaining grant funds to support the development of a site-specific narrative criteria for Willard Spur. We believe that the establishment of narrative criteria will be appropriate to protect a highly dynamic and resilient ecosystem such as Willard Spur. We also urge the division to continue to recognize that Willard Spur is already a very resilient and dynamic system and strongly caution against development of overly stringent criteria.

Recommendation 4: Release contingency hardship grant funds.

- Do you support this recommendation:
 - YES
- Comments, caveats and contingencies:
 - We believe that the data collected during the independent investigations and the science panel evaluation show that Willard Spur is a very resilient system, that the nutrient uptake far exceeds the loads and that it is very unlikely that, even during the most sensitive period, nitrogen removal should be needed. Furthermore, the present

proposal includes additional protections during the most sensitive period. We do not believe additional research is necessary and we support the release of the contingency hardship funds.

DEVELOPMENT OF APPROPRIATELY PROTECTIVE UPDES PERMIT FOR THE PERRY-WILLARD POTW

Draft Proposal for Comment

Introduction

The Willard Spur Steering Committee charged the Science Panel with obtaining the information necessary to answer two framing questions:

1. What are the potential impacts of the Perry-Willard POTW on Willard Spur?
2. What changes to water quality standards will be required to provide long-term protection of Willard Spur as they relate to the Perry-Willard discharge (Figure 1)?

Numerous investigations were subsequently conducted to help answer both of these questions. This document provides a draft approach for incorporating the results of these investigations into the Utah Pollution Discharge Elimination System (UPDES) permit renewal for the Perry/Willard Regional Wastewater Treatment Plant (POTW). Specifically, the document provides a rationale for treating the tailrace as a drainage canal for Waste Load Analysis (WLA) modeling purposes. Mostly, however, a proposed approach for using the variance process of the Technology-Based Phosphorus Effluent Limit (TBPEL) rules (UAC R317-1-3.3) will minimize treatment costs as well as current and future risks of phosphorus inputs to the Willard Spur from the POTW's discharge. These proposed approaches present a broad framework that is intended to initiate dialogue with respect to the implementation details that will ultimately be incorporated into the renewed permit.

Background: Underlying Scientific Basis

A detailed summary of all Willard Spur investigations is beyond the scope of this document, however, a brief summary of several important conclusions are enclosed. Additional details are available in the final reports.¹ Overall, the Science Panel generally agreed that the POTW poses minimal risk to the Willard Spur provided that the current hydrologic conditions are maintained. Several panel members were unwilling to conclude that the risks associated with nutrient enrichment were nonexistent (although there was no consensus on this point in relation to the POTW), in part because it is impossible to predict how future changes to the Willard Spur will alter these conditions. Importantly, most panel members agreed that the current low nutrient conditions were unique and important ecological characteristics that warrant explicit protection.



Figure 1. Boundaries of the Willard Spur ecosystem.

To address these remaining concerns the Science Panel also discussed whether reasonable Best Management Practices (BMPs) could be established to further reduce the risk, however small, of the discharge to Willard Spur. If implemented, these BMPs would provide added protection already provided by the existing treatment process, ultimately minimizing the potential for negative impacts in the future. Several of the recommendations that are most relevant to the UPDES permit follow:

- The period of greatest concern (most sensitive condition) was late in the growing season (July-September).
- Phosphorus is a more immediate concern than nitrogen.
- Discharging to the field adjacent to the tailrace (the channel that conveys the Willard Bay releases to the Great Salt Lake), especially if combined with crop harvests, reduces the potential for nutrient accumulation.
- The future condition of the Willard Spur is critically dependent on current and future water management strategies.

Specific Proposals for the Pending Permit Renewal

Incorporation of the Tailrace into the Waste Load Allocation

A waseload allocation (WLA) determines water quality based effluent limits for discharge permits. For the WLA, and ultimately any changes to Willard Spur's designated uses, DWQ evaluated whether or not the tailrace was part of Willard Spur. Historic U.S. Geological Survey maps showed that the ditch was constructed in conjunction with Willard Reservoir (i.e., no channelization of an existing conveyance occurred). As a result, DWQ recommends that the tailrace be considered a drainage canal (designated uses 2B and 3E per UAC R312-2-13.10) and the point of compliance would be at the point where the tailrace enters the open waters of the Willard Spur. From the POTW's perspective, one distinct advantage of this decision would be additional time for ammonia decay to occur prior to the discharge entering the Willard Spur.

Addressing Phosphorus Pollution: A Proposed Seasonal Variance to the TBPEL

Ideally, the scientific investigations would have resulted in sufficient information to propose site-specific standards for nitrogen (N) and phosphorus (P) in the Willard Spur, because such criteria would provide long-term regulatory certainty with respect to nutrient pollution. However, for several reasons, the results were unable to be used to meet this management objective. In fact, the Science Panel discussed the possibility that water column numeric criteria may not ever be appropriate for the Willard Spur because the Submerged Aquatic Vegetation was negatively affected at concentrations well below saturation. The uptake rates that were calculated from the mesocosms experiments show why: the biological demands of the ecosystem complicate interpretation of water column nutrient chemistry.

Lacking numeric N or P criteria, DWQ proposes that the investigations be used to support an alternative approach for minimizing the risk of P inputs to the Willard Spur's designated uses: a seasonal variance to the TBPEL requirements. Again, several lines of evidence suggest that current risks from P pollution are relatively small. However, most Science Panel members expressed that the low nutrient conditions within the Spur were unique characteristics warranting explicit protection.

Justification and Rationale

Overall, there was general concurrence among panel members that the most sensitive condition within the Willard Spur is late in the growing season, during dry years. In the fall through spring, nutrients are transported from the Willard Spur to Bear River Bay. Most importantly, the assimilative capacity for P (uptake minus outside inputs) is extremely large early in the growing season, but diminishes as the size of the Willard Spur decreases. This evidence provides a rationale for a seasonal variance that limits the TBPEL requirements to the months of July-September under the rationale specified in UAC R317-1-3.3(c)(1)(c):

"If the owner of a discharging treatment works can demonstrate that the TBPEL...are clearly unnecessary to protect waters downstream from the point of discharge, no TBPEL...will be applied."

Another factor discussed by the Science Panel was the importance of ongoing land application being conducted by the POTW and adjacent landowners. Currently, there are periods where the discharge is diverted from the tailrace to an adjacent field. The landowner uses the discharge to irrigate livestock feed which is periodically harvested and removed. In essence, this ongoing BMP provides an inexpensive mechanism for nutrient removal. Strictly speaking, the need for a variance depends on whether the diverted discharge enters Waters of the State. Nevertheless, to incentivize ongoing implementation of these BMPs, DWQ recommends that the variance specifies that P removal is not needed during periods when the discharge is not entering the Willard Spur. This exclusion, if granted, would be based on the variance specified in UAC R317-1-3.3(c)(1)(d):

"If the owner of the discharging treatment works can demonstrate that a commensurate phosphorus reduction can be achieved in receiving waters using innovative alternative approaches such as water quality trading, seasonal offsets, effluent reuse, or land application."

Finally, it is important to note that any variance that is granted would be temporary, requiring further review at least every five years (UAC R317-1-3.3(c)(2)). As a matter of general practice, this means that the POTW will be required to resubmit the variance request as part of their permit renewal application. DWQ anticipates that these periodic variance request reviews will be fairly routine and results from recent scientific investigations suggest that the variance requests would continue to be approved on an ongoing basis. However, periodic reviews of variance requests are important because it helps address concerns raised by some Science Panel members about extrapolating the results of the recent investigation to uncertain future conditions. Specifically, these periodic reviews will provide a mechanism for formal review of ongoing monitoring data to identify and address any unforeseen deleterious impacts from the discharge.

Variance Development

The TBPEL rules specify that a rationale for any variance request needs to be developed by the facility and then submitted to DWQ for approval. This means that the POTW would need to develop a document that ties the results from the recent scientific investigations to a specific regulatory rationale. However, given the collaborative nature of the Willard Spur investigations and the integral involvement of DWQ staff, DWQ is willing to assist the POTW with the development of the variance.

In terms of timing, the TBPEL rule allows until January 1, 2018 before any variance needs to be submitted and approved by DWQ. Given that the permit renewal is imminent, DWQ recommends that the renewal keep the current limit of P concentration <1 mg/L, but specify that this limit only applies during the critical index period, during times when the discharge enters the tailrace. This decision allows the POTW additional time to work with DWQ to develop a variance request for the TBPEL rule while also avoiding unnecessary delays in the permit renewal. Once the permit is renewed, the POTW will bear the cost of Phosphorous treatment to ensure it meets its P limit.

Variance Benefits

This proposed TBPEL variance is not only technically defensible, it also addresses many of the underlying concerns that were raised in the inception of the Willard Spur project.

From the perspective of the POTW:

- Significant operation and maintenance cost savings by limiting P removal to several months

- Flexibility with respect to the use of both traditional and alternative (e.g., land application) treatment processes

From the perspective of the long-term protection of the Willard Spur ecosystem:

- Phosphorus reductions during sensitive periods provides an added layer of protection that further minimizes the risk, however small, of the POTW discharge
- The requirement to revisit the variance request provides a mechanism to periodically review new data and information to capture unforeseen impacts from the POTW to the Willard Spur's beneficial uses.

Additional Permitting Considerations

There are several permitting details that will need to be worked out and specified in the permit renewal, particularly with respect to the alternative discharge point. DWQ has specific rules with respect to land application that need to be addressed. Effluent limits for this location will need to be specified, which will likely include all permitted parameters except P. The permit will need to include a water management plan, so that monitoring requirements for the alternative discharge location can be identified and specified. These alternative monitoring requirements should result in a cost savings for the POTW because, for instance, they will likely not include Whole Effluent Toxicity testing during this period of land application.

The alternative discharge location may also require the inclusion of additional BMPs in the permit. For instance, one concern raised by the Science Panel about alternative discharge points is the potential for the additional water to create conditions that could potentially exacerbate the spread of *Phragmites*—a nuisance invasive weed of concern in many areas in Utah. To address this concern, the permit will likely require an ongoing *Phragmites* monitoring program so that any expansion can be identified early, when it can most easily be controlled. DWQ is also working with Utah's Division of Natural Resources to develop an action plan for treatment of *Phragmites*, should expansion occur. Specifics with respect to any BMPs still need to be developed, but DWQ anticipates that any of these requirements will be relatively easy to accomplish, requiring minimal resources on the part of the POTW.

Enclosed: Research Summary

The following is a summary of several scientific conclusions that were gleaned from the Willard Spur investigations:

General Conditions within the Willard Spur

- Under current conditions the Willard Spur appears to be supporting its aquatic life uses. However, the nature of these uses during the growing season varies considerably among wet and dry years.
- The Science Panel generally agrees that one of the unique characteristics of the Willard Spur is its low nutrient conditions. Protection of this characteristic is important.
- At least when wetted, the Willard Spur supports a warm water fishery. However, the nature of the fishery and the food web needed to support it varies seasonally.
- There were no violations of Designated Use 3B (protected for water water species of game fish and other warm water aquatic life including the necessary aquatic organisms in their food chain) water quality criteria, with the exception of: pH, temperature and DO.

University of Utah Experiments

- The nutrient enrichment experiments (University of Utah experiments) demonstrated that nutrient additions diminished several indices of SAV condition.
- The precise point where nutrient inputs results in the degradation of SAV cannot be determined because water column nutrient concentrations remained unchanged in all enrichment treatments. This means that protective in-lake nutrient concentrations fall somewhere between current concentrations and saturation.
- However, on low water years, SAV senesced everywhere. This means that the relative role of nutrients versus other naturally occurring stressors (e.g., increased pH, temperature, or salinity) is difficult to decouple.

Hydrology and Nutrient Loading

- On an annual basis, the contribution of nutrients from the POTW, relative to other sources, is small.
- The relative importance of plant nutrient inputs is more important in the late summer and early fall as the Willard Spur continues to evaporate. However, at least at current POTW flows, the discharge becomes disconnected from the open waters of the Willard Spur for much of this period.
- The flushing flows that occur yearly from ~October to June/July appear to be critically important in terms of preventing the accumulation of nutrients and organic matter.

Uptake Experiments

- For most of the year, under both wet and dry hydrologic conditions, the potential nutrient uptake of the ecosystem far exceeds nutrient loads.
- During dry years, and under worst case future discharge scenarios, it is possible, although unlikely, that loads could exceed capacity late in the growing season. Once this occurs, the resulting increase in nutrients could result in water column nutrient concentrations of potential concern (thresholds derived from U of U study).
- This period, in the late season (July-October) of dry years was identified as the period where increases in water column nutrients are possible. This same period also coincides with the period where the Spur may be most sensitive to nutrient inputs.
- The nighttime experiments later in the season provided support for the idea that denitrification is particularly important later in the growing season.



DEVELOPMENT OF SITE-SPECIFIC NARRATIVE FOR WILLARD SPUR

A Proposed Systematic Process for Collaborative Rule Development

Introduction

After evaluating the impacts, if any, of the Perry/Willard Regional Wastewater Treatment Plant (POTW) to the Willard Spur, the next objective of the Willard Spur project is incorporation of the results into water quality policy and regulations aimed at ensuring the long-term protection of the ecosystem's designated uses. In some respects, this objective has already been met. Data collected during the independent investigations have provided valuable insight into the ecological characteristics that make the Willard Spur a unique, dynamic, resilient and diverse ecosystem. These results have been translated into a proposal for appropriately protective permit limits for the POTW. This document describes a proposed approach for translating investigation results to water quality standards and associated implementation practices. Specifically, the procedures described in this document are intended to result in several water quality standard elements. The first step involves explicitly defining the physical boundaries of Willard Spur. This description will then be used to promulgate a new designated use class and associated numeric criteria in Utah's Water Quality Standards (UAC R317-2). Next, site-specific narrative criteria will be developed that describe specific conditions that should be maintained, or avoided, to protect the Willard Spur's designated uses. Finally, the process will establish implementation procedures for these criteria that prescribe long-term monitoring efforts and procedures for interagency collaboration to address any water quality trends that are observed.

Proposed Criteria Development Procedures

Utah's Division of Water Quality (DWQ) proposes following The Nature Conservancy's (TNC) Conservation Action Planning (CAP) process as a framework to guide the incorporation of Willard Spur investigation results into appropriately protective site-specific standards. CAP is a generalized conservation planning process that involves prescribed steps that are revisited on a recurring basis, following adaptive management principles. While other organizational frameworks could potentially be used for criteria development, the CAP process has several distinct advantages. First, the process is intrinsically collaborative, which will facilitate incorporation of the diverse perspectives and expertise among stakeholders who have already been working collaboratively as members of the Willard Spur Steering Committee and Science Panel workgroups throughout the standard development process. This diverse input will help ensure that the standards that are developed capture, to the extent possible, different values and regulatory responsibilities among workgroup members. Capturing overlapping objectives in the conservation goals that are developed will help ensure ongoing support of the Willard Spur's uses by encouraging collaborative resource management among agencies. Another related advantage to the CAP process is that it has already been employed for previous planning efforts for Great Salt Lake and for the Bear River Migratory Bird Refuge, and the use of a similar framework for standard development will help ensure that ongoing agency actions are as collaborative as possible, which should increase the efficiency and efficacy of ongoing management efforts. Another advantage of CAP is its flexibility. While the process has not yet been used to establish water quality criteria, it has been used for a wide range of conservation planning efforts and was intentionally structured to be flexible. Moreover, TNC has incorporated lessons that have been learned from

these previous case studies into extensive guidance and tools intended to streamline implementation of the CAP process.

At present, DWQ envisions that standards for the Willard Spur will be developed in four distinct phases. Three of these phases include meetings with the Science Panel and Steering Committee to solicit input, whereas the fourth involves one-on-one interviews with panel members. A brief description of each of these phases and the underlying rationale is discussed briefly in the sections below. This proposed process may be modified based on comments and recommendations received by stakeholders.

Phase 1: Establishing Willard Spur as a Unique Waterbody in Utah's Water Quality Standards

The first phase of standard development for the Willard Spur involves defining the boundaries and then incorporating this description into Utah's Water Quality Standards as an independent and unique designated use class (UAC R317-2-6). Also, all of the numeric water quality criteria that are currently used to ensure the protection of warm water fisheries (Designated Use Class 3B), except pH, DO and temperature, will be assigned to the Willard Spur. DWQ intends to propose the delineation when the Steering Committee recommendations from the first objective of the project are presented to the Water Quality Board on May 27, 2016.

Clearly defining the boundaries of the Willard Spur will resolve the disconnect between the ecological and regulatory boundaries of the ecosystem. At present the Willard Spur is assigned different uses. Within the boundaries of the Bear River Refuge, the Willard Spur is protected as a warm water fishery (Designated Use 3B) and for support of waterfowl and shorebirds (Designated Use 3D). In contrast, areas outside of the Willard Spur are protected under the designated uses assigned to Bear River Bay (Designated Use 5C). The former has explicit numeric criteria, whereas the latter class exclusively depends on the Narrative Standard for the protection of aquatic life uses. The current permit for the POTW ultimately resolved this problem by having the Waste Load Allocation and resulting permit limits on the more protective 3B uses, but formally adopting this in Utah's regulations will help avoid confusion with respect to the appropriate regulations in the future. This new use class will also create a bin that will ultimately help facilitate the adoption of site-specific narratives that are developed through the CAP Process.

Phase 2: Development of Site-Specific Narrative Criteria

In this phase site-specific narrative criteria will be drafted. This narrative will include explicit descriptions of conditions that should be maintained to ensure the long-term support of the Willard Spur's designated uses.

This process will use the CAP framework and associated tools to translate knowledge gleaned from the Willard Spur investigations into conservation targets that explicitly describe the conditions necessary to protect the Willard Spur's designated uses in the long-term. The first step in this process will be more clearly articulating and ranking conservation targets that best express implicit aquatic life use protections of the Willard Spur. Next, potential threats to this ongoing maintenance of these conservation goals will be identified and ranked by their relative threat to ecosystem health. This exercise will also involve identification of specific ecological processes, known as key ecological attributes in CAP, that need to be maintained, or avoided, to minimize the risk posed by these threats. Together, these processes will then be used to articulate desirable—or undesirable—conditions in brief narrative statements. Those narrative statements that are collectively thought to be most important in ensuring the long-term health of the Willard Spur will be compiled into site-specific narrative criteria. Finally, assuming that language can be drafted that has supermajority support in the Steering Committee, these draft criteria would be forwarded to the Water Quality Board as a formal recommendation to meet the objective established at the inception of the Willard Spur investigations: ensuring the long-term health of the Willard Spur's designated uses.

Narrative criteria for the Willard Spur will be developed collaboratively with ongoing input from the Steering Committee and Science Panel. Three working meetings are suggested, each with specifically identified

objectives and outcomes. In addition, members of both workgroups will be surveyed independently to capture stakeholder input and to provide the data necessary to rank and prioritize narrative criteria elements.

Phase 3: Formalization of a Long-Term Monitoring Plan

DWQ will submit a draft of the current monitoring approach to the Science Panel for review. This plan will be discussed and revised, as appropriate, by the Science Panel. The final plan, along with tradeoffs and resource constraints, will then be shared with the Steering Committee to ensure that the plan is appropriate and seek collaborative management opportunities for the collection, management and interpretation of monitoring data to better meet interagency data requirements.

DWQ currently monitors the Willard Spur on an ongoing basis. Members of the Science Panel and Steering Committee generally agreed that ongoing monitoring is critically important because it will allow early detection of unforeseen problems that threaten the Willard Spur's uses. The current monitoring approach involves the collection of several lines of evidence that are intended to provide integrative measures of condition. Science Panel members have already discussed alternative measurements as well, but not all of these have been adopted. To be sustainable, the final monitoring strategy needs to consider DWQ's resource constraints. Clearly, this involves consideration of the time involved in data collection and sample processing costs. Perhaps less obvious is the potential for establishing interagency collaborations of data collection.

Phase 4: Development of a Collaborative Management Process

The final phase will be used to develop strategies to facilitate ongoing collaborative management procedures. These plans will be developed by asking stakeholders to consider several framing questions, such as the following:

- How will cooperating agencies continue to communicate on an ongoing basis?
- How will the monitoring data be summarized and disseminated?
- Will the monitoring plans provide the data necessary for the program to be adaptive?
- Are there opportunities to generalize the relationships of processes that have been developed through the Willard Spur investigations to other Great Salt Lake or wetland management objectives?

Successful resolution of a project of this magnitude requires reflection on the history of the project and the lessons that have been learned along the way. In several respects, to say that this project has made considerable progress would be an understatement. At the beginning, little was known about the Willard Spur's ecosystem. All stakeholders were in agreement that the Willard Spur was a unique and diverse ecosystem worthy of protection, yet there was considerable disagreement about how to best accomplish this goal. Some were convinced that the POTW discharge would cause irreparable harm to the ecosystem, while others were equally concerned about heavy-handed, overly-protective regulations. An objective resolution to the controversy was impossible due to a paucity of data. In fact, the sum total of data available was limited to results from two water chemistry samples, poorly calibrated models and empirical projections of risk based on data collected elsewhere. The intersection of regulatory roles among management agencies was equally vague, and interception of regulations and policies among agencies was equally obscure and sometimes contradictory.

Today, most members of the Steering Committee and Science Panel see the Willard Spur project as a successful case study in effective collaborative management. There is now sufficient data to understand what is required to ensure the long-term health of the ecosystem, which will be captured in changes to water quality regulations, including the site-specific narrative that will be finalized in this phase of the project. The relationships that have been developed throughout the project is equally important, which provides an opportunity to apply integrative resource management principles to help ensure the long-term protection of the Willard Spur's beneficial uses.

The final meeting of the Willard Spur project aims to finalize the rule, which will resolve all of the funding obligations to the Willard Spur project. Another, meeting objective will be a discussion about how to build on the project's successes. While the Willard Spur is unique, management of Great Salt Lake and its surrounding wetlands is similarly complicated by disparate values among stakeholders and overlapping responsibilities among agencies charged with protecting the values—both market and intrinsic—and services that these ecosystems provide. Successful continuation of these collaborative efforts will require the development of processes for the ongoing collection, analysis, and interpretation of data that are collected to quantify trends in important conservation goals. In addition, processes for interagency communication and response to any trends that are observed need to be considered. This final meeting among all participants is intended to discuss and develop long-term collaborative processes to improve broader resource management objectives.



State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

Alan Matheson
Executive Director

DIVISION OF WATER QUALITY
Walter L. Baker, P.E.
Director

Water Quality Board
Myron E. Bateman, Chair
Shane E. Pace, Vice-Chair
Clyde L. Bunker
Steven K. Earley
Gregg A. Galecki
Jennifer Grant
James VanDerslice
Michael D. Luers
Alan Matheson
Walter L. Baker
Executive Secretary

MEMORANDUM

TO: Utah Water Quality Board

THROUGH: Walter L. Baker, P.E.

FROM: John K. Mackey, P.E.
Manager, Engineering Section

DATE: May 25, 2016

SUBJECT: Perry-Willard Cities Joint Wastewater Treatment Facility
Resolution of Hardship Grant Funds for Additional Nutrient Removal

On February 23, 2011 the Utah Water Quality Board (Board) authorized Hardship Grant funding in the amount of \$1,500,000 to be set aside in an escrow account pending the outcome of water quality studies on the Willard Spur. This funding was established for capital improvements for possible nutrient removal or effluent discharge relocation that may be required if water quality studies indicated a negative impact on Willard Spur wetlands. The results of water quality studies in Willard Spur will be presented to the Board on May 25, 2016. The water quality study results show that the wetlands can be protected without the capital improvements that were being considered at the time the Hardship Grant funds were set aside. Therefore, staff recommends that the set aside \$1,500,000 plus interest be de-obligated and returned to the Hardship Grant Fund.

Previously, on October 20, 2010, the Board authorized hardship grant funding for Willard City and Perry City to:

- a) Cover engineering costs to investigate the costs of adding nitrogen and phosphorus removal facilities to the treatment plant;
- b) Pay the costs of adding chemical phosphorus removal equipment that allowed the plant to treat down to 1 mg/L total phosphorus;
- c) Cover costs to operate and maintain the treatment plant prior to initial permit issuance;
- d) Pay the operations and maintenance costs for phosphorus removal until the water quality studies had been completed and a new discharge permit (that incorporates nutrient limits determined by the studies) issued.

All of the above costs have been settled except for ongoing operations and maintenance costs for phosphorus removal that were authorized until a new discharge permit was issued. These operations and maintenance costs run an average of about \$1,400 per month. Staff recommends that the Board continue to pay these costs until the new discharge permit is issued at which time the remaining escrow account balance can be de-obligated.