



Ken Hoffman, P.E.



UTAH DEPARTMENT *of*
ENVIRONMENTAL QUALITY
**WATER
QUALITY**

ACWA Nutrient
Permitting Workshop
Utah's Phosphorus Rule

Topics

1. Utah's Technology-Based Phosphorus Effluent Limits (TBPEL) Rule
 - Process, the Rule, and Variances
2. Lesson's learned
 - From POTWs, Legislative, and Public
3. Variance Process
 - 5 variances possible
4. Specific Projects
 - Jordan Basin, Price, Central Valley, and South Davis

Technology-based Phosphorus Effluent Limits (TBPEL)

1. Began work in 2000's
2. DWQ Commissioned:
 - Nutrient Criteria Ecological Study
 - Nutrient Criteria Economic Study
 - POTW Nutrient Removal Cost Study
 - Technical Basis for Utah's Nutrient Strategy
3. POTW Workgroup Meeting 2011
4. Core Advisory Team, Outreach to Local Government
5. Goal hold the loading at current rates when factoring future growth

<https://deq.utah.gov/legacy/pollutants/n/nutrients/rule.htm>



Technology-based Phosphorus Effluent Limits (TBPEL)

1. Required Statewide minimum nutrient monitoring
 - Influent (TP, TKN), Effluent (TP, TKN, NO₃+NO₄, Ortho-P, ammonia)
 - Started July 1, 2015, Monitoring self implementing
2. Effluent limitation 1 mg/L annual average for mechanical plants
3. 125% loading cap for lagoons
4. Variance Available
 - 5 variances: a. TMDL, b. Economic Hardship, c. Unnecessary to Protect Waters Downstream, d. Commensurate Reduction, and e. Due Diligence

Variances Requests

1. TMDL
2. No economic hardship variances requested.
3. Unnecessary to protect downstream waters
4. Innovative Alternative Approach
5. Due Diligence

Variances Requests

1. TMDL Variances – 7 Issued
2. No economic hardship variances requested.
3. Unnecessary to protect downstream waters
 - UPDES Discharge location equivalent to land application – 3 issued
 - Seasonal Limits - Perry-Willard (approved), Plain City
 - Court House Wash Water, Flaming Gorge, Moab
 - Water Quality based – ATK, South Davis North, Spanish Fork, Springville

Variances - Innovative Alternatives

1. 8 Requests

- Reuse – Land Application – 4 requested
- Projects in impaired watershed within service area – 1 requested
- Trading – 1 requested
- All of the Above - Provo
- Moving Discharge Location - North Davis

Variance e. Due Diligence

e. Where the owner of a non-lagoon discharging treatment works demonstrates due diligence toward construction of a treatment facility designed to meet the TBPEL, the compliance date shall be no later than January 1, 2025.

- Typical application requirements for approval
 1. Planning / Feasibility
 2. Schedule
 3. Finance
 4. Resolution by Board/City Council/Governing Body

Jordan Basin – Due Diligence

- 15 mgd 5-Stage Bardenpho with MBR treatment plant
- Completed July 2015 for \$98 million.
- Operational issues caused need for upgrade to consistently meet 1 mg/L TP, specifically outbreaks of filamentous organisms.
- Removal of diffusers in the third oxic zone of the process basins, Construction of aerated sludge holding basin, Construction of chemical addition facilities.
- \$4 million in upgrades
- Variance approved for extension of implementation from Jan 1, 2020 to Jan 1, 2021.



Price – Due Diligence

- 1.5 mgd average daily flow. 2.6 mgd design flow.
Activated sludge plant
- A2O was considered at estimated \$5.4 million
- A/O Process selected at \$1.6 million
- Upgrades will reconfigure the plant to create an anaerobic zone, a swing zone and an aerobic zone.
- Additional time needed to upgrade and funding issues.
Bond sunset in 2021 allowing financial capability of bonding for plant upgrade.
- Approved Variance til January 1, 2023

Central Valley - Due Diligence

- Current 56 mgd average daily Trickling Filter plant
- TP 1.0 mg/L; ammonia 3.7 mg/L Design 80 mgd
- 5SB = 5-stage Bardenpho, 4SMB = 4-stage modified Bardenpho, TFs = trickling filters, SCTs= solids contact

	Use existing TF	TP removal	Capital	Annual	20 year NPV
SCTs	Yes	Chemical	\$54	\$8	\$183
SCTs	Yes	Chemical	\$72	\$8	\$261
5SB	No	Biological	\$78	\$5	\$164
4SMB	No	Chemical	\$69	\$5	\$238
Expanded SCTs	Yes	Biological	\$155	\$11	\$330

Central Valley - Due Diligence

- Examined constructing in Phases
- Plant needing \$250 million in upgrades. Of these upgrades about \$80-\$90 million for BNR.
- Variance Approved – Interim Limit & progress reporting
- TBPEL Effective January 1, 2025

Phase		TP, Ammonia, N	Cumulative cost	User Rate
1	A/O	1, 3.7, NA	\$90	\$6
2	A/O add aeration tanks	1, 1.7, NA	\$100	\$6
3	A/O swing	1, 1.7, 10	\$136	\$8
4	5-stage	1, 1.7, 3	\$200	\$17



Salt Lake City & Provo – Due Diligence

- Submitted Variance Requests
- Potentially full plant replacement.
- SLC – Trickling filter plant
- Provo – Trickling filter plant with activated sludge.
- Potential for \$200-\$300 million each
- Milestones for reporting back to DWQ for Plant design selection and submission of construction plans.
- TBPEL Compliance January 1, 2025
- Variance approved.

South Davis Sewer District - Clearas

- 4 mgd trickling filter plant
- South Plant can flow equalize with North Plant
- Discharges to Great Salt Lake
- Effluent limits: TP 1 mg/L and Ammonia 8 mg/L
- Completing construction of a waste resource recovery (WRR) facility in Late 2018.
- WRR will have high levels of ammonia coming off



South Davis Sewer District - Clearas

- Initiated Project in February 2017
- Authorized for a \$28 million SRF loan.
- Built a “stock fence” and operating as a pilot plant for algae certification





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Ken Hoffman, P.E.
(801) 536-4313
kenhoffman@utah.gov