



UTAH DEPARTMENT of
**ENVIRONMENTAL
QUALITY**

SCIENCE & POLICY

Role of Independent Scientific Review

TAKE HOME MESSAGES

- ❑ DWQ is supportive of independent scientific review.
- ❑ Review process requires careful consideration to ensure objectivity, transparency, and efficiency.
- ❑ Peer review should be prospective, not retrospective.
- ❑ Peer review should inform, not prescribe, policy decisions.
- ❑ Peer review is an inappropriate tool for challenging permits.
- ❑ Technology based limits are driven by reasonable and available technology, not by scientifically derived needs for specific waters.

BENCHMARKING WITH OTHER STATES

	Mandated in Statute/Rule	Year	Detailed process	Binds agency decisions	Applicability	Process
Minnesota	Statue: Section 100. [115.035]	2015	TBD	No	Any water quality standard at discretion of commissioner.	TBD
California	Statue: Section 57004	1997	Guidance document	No	Any rule passed by CalEPA boards	Administered by the Office of Peer Review with a contract with Univ of Cal
New Jersey*	Rule: Admin Order No. 2009-05	2009	Guidance documents	No	Any issue facing NJDEP at discretion of commissioner.	Administered by Office of Science through a standing Science Advisory Board appointed by Commissioner



*DRAFT DWQ
ADMINISTRATIVE
RULES*

APPLICABILITY

- ❑ Scientific basis of rules, regulatory tools, or guidance under three circumstances

Always for a Highly Influential Scientific Assessment (HISA):

- Potentially significant financial impact on the public or private sector
- Novel
- Controversial
- Precedent-setting

Discretionary for Influential Scientific Information:

- Clear and substantial impact on rule making or regulatory decisions

Other Scientific Information at Request of External Party:

- Request made in writing
- Requesting party provides funding
- Scientific basis has not previously been peer reviewed

REVIEW PROCESS

- ❑ At least 3 panel members that do not have a conflict of interest.
- ❑ Development of clear charge questions with input from stakeholders.
- ❑ Panel members and charge questions mutually agreed if initiated by request from an external party.
- ❑ Disputes will be resolved by the Water Quality Board.
- ❑ General accordance with US EPA Peer Review Handbook.
- ❑ Completed within 1 year.

USING THE RESULTS

- ❑ Experts submit written report with responses to charge questions.

- ❑ Findings will be considered by Director in finalization of regulatory guidance or tools or by the Water Quality Board in rule-making.
 - ❑ Director will document how findings were incorporated.
 - ❑ Become part of administrative record.
 - ❑ Findings are not binding.

- ❑ Public comment
 - ❑ Results of scientific review will be made available during public comment.
 - ❑ Review panel will not solicit public comment independently of the Director or WQB.



*COMPARING THE
APPROACHES*

AREAS OF AGREEMENT

Conflict of Interest

- No conflict with DWQ or requesting party

Selecting impartial panel

- 3 mutually agreed reviewers

Funding

- Party that petitions for independent scientific review will pay cost of the review

Guidance

- USEPA Peer Review Handbook

Efficiency

- Review will be completed within one year

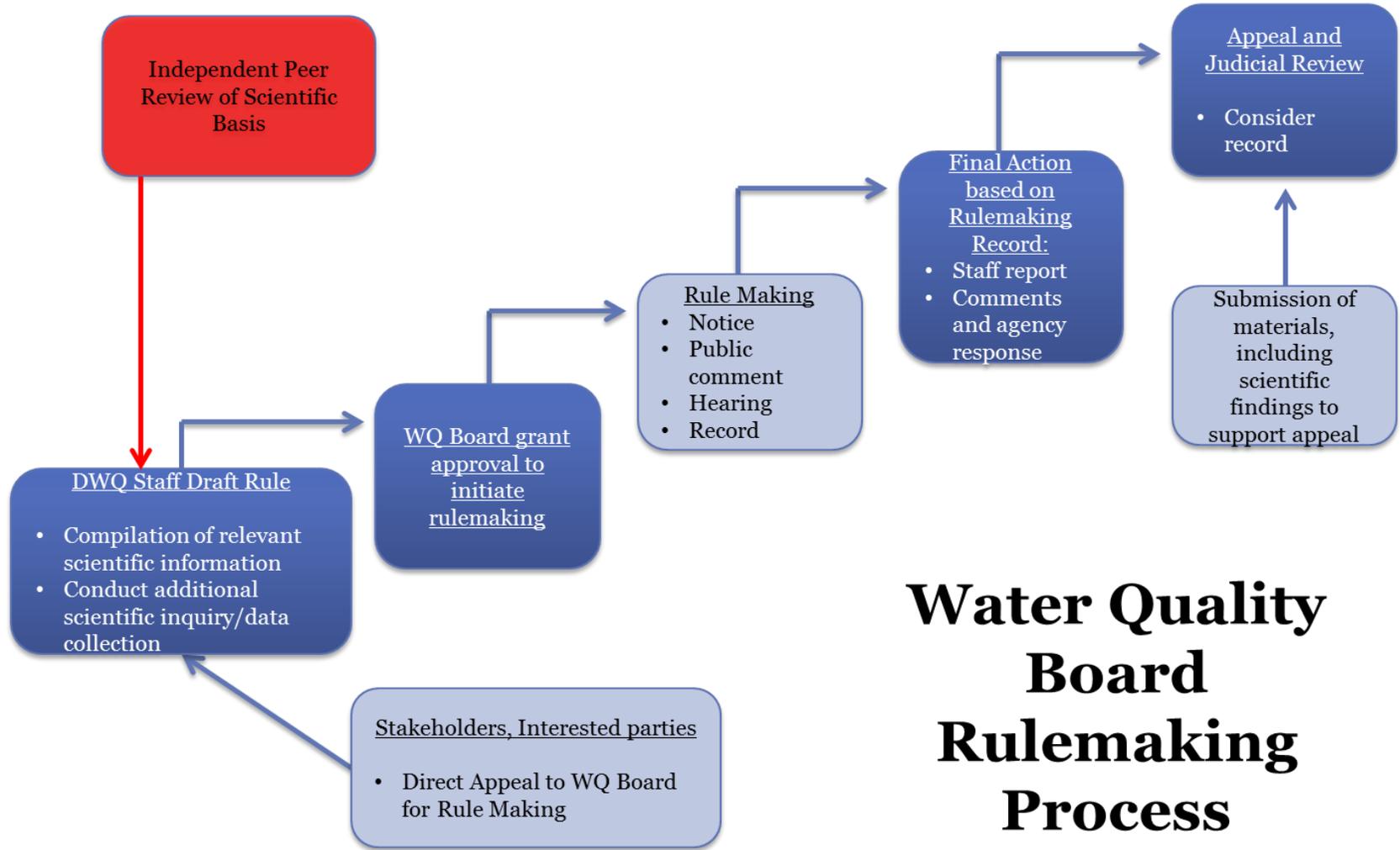
AREAS OF DIFFERENCE

Issue	POTW Draft Legislation	DWQ Draft Administrative Rules
Administrative Process	Establish all details in statute	Establish in administrative rule under existing statutory authority
Scope (DWQ initiatives)	Any DWQ initiative, study, proposal, or permit Specific provisions on <u>technology based limits</u>	Rules, regulatory guidance and tools <u>Excludes permitting</u> Scientific basis of TBPEL variance requests
Scope (time)	Retrospective and prospective	Prospective only
Scope (content)	Does not distinguish between science and policy elements	Scientific basis only
Available to?	Permittees	Any stakeholder
Development of <u>charge questions</u>	Not included	Developed in consultation with requesting party.
Type of reviewer output	<ol style="list-style-type: none"> 1. Scientifically defensible 2. Not scientifically defensible 3. Scientifically defensible with conditions 	Reviewer outputs will highlight the nuances and uncertainty associated with complex scientific questions
Authority	<u>Binds agency</u> to findings of peer review in making policy recommendations to the WQB. Silent on effect on <u>director authority</u> .	Informs the rule and policy-making processes. Requires agency to explain how findings were incorporated.

BOARD AUTHORITY V. DIRECTOR AUTHORITY

Draft DWQ administrative rules have a clear process for incorporating peer review into both Water Quality Board actions and Director decisions.

Water Quality Board Authority	Executive Director Authority
<ul style="list-style-type: none">• Funding of point source and nonpoint source projects• Set effluent limitations and standards• Underground wastewater disposal systems• Underground injections• Sewage sludge management• Certification of wastewater treatment operators• Standards for quality of the waters of the State• Total Maximum Daily Loads• Wastewater reuse• Settlement agreements in excess of \$25,000	<ul style="list-style-type: none">• Permit issuance• License• Registration• Certification• Other administrative authorization made by the director
Appeal process through judicial process	Appeal process through Executive Director of Department of Environmental Quality



Water Quality Board Rulemaking Process

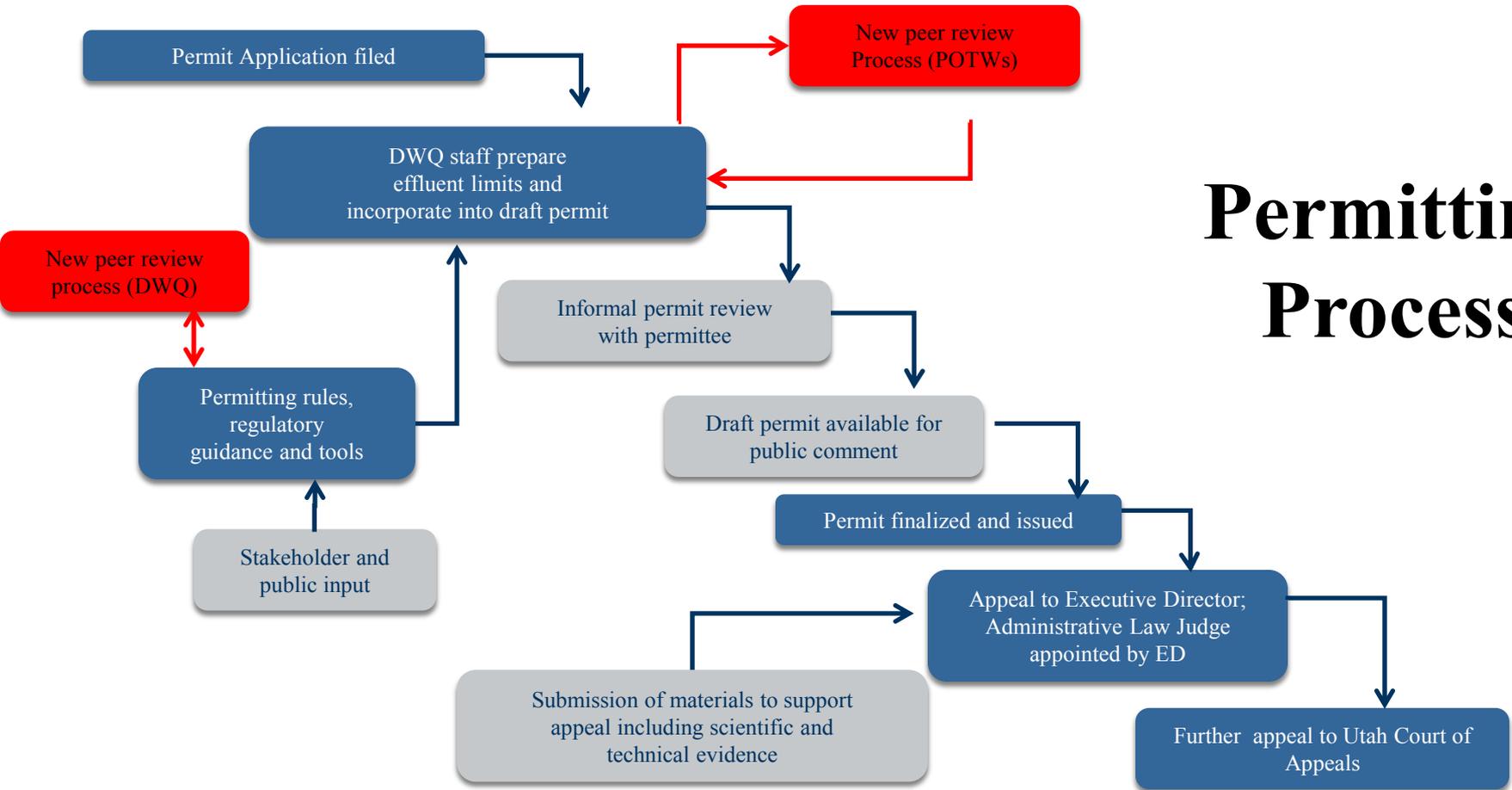
Key

Current Rule Making Process

Outside Input
Regulated, Stakeholders, Scientists, and Public

Proposed New Process

Permitting Process



Key

Current Permitting Process

Outside Input

Proposed New Process

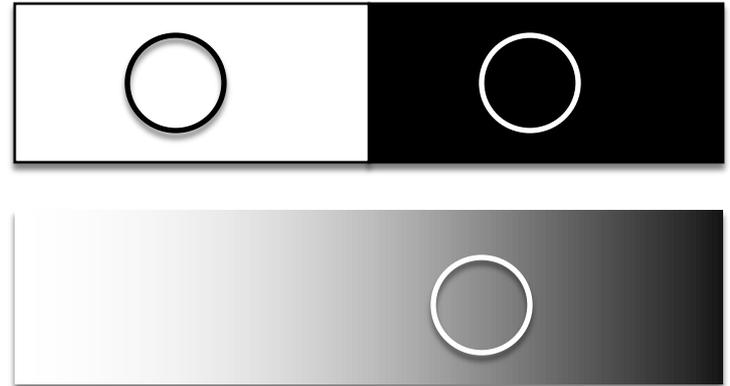
PERMITS

Permit issuance is excluded from draft DWQ administrative rules.

- ❑ There already exists an administrative procedure for challenging permits including technical and scientific evidence.
- ❑ Permit issuance incorporates regulatory guidance that includes but is not limited to science.
- ❑ Permit issuance is not under the authority of the WQB.
- ❑ Changes to the rules governing permit application, review, and approval process must be consistent with federal requirements. Interference with the Director's authority could cause EPA to re-evaluate the delegation of the permit program.
- ❑ Separation of powers

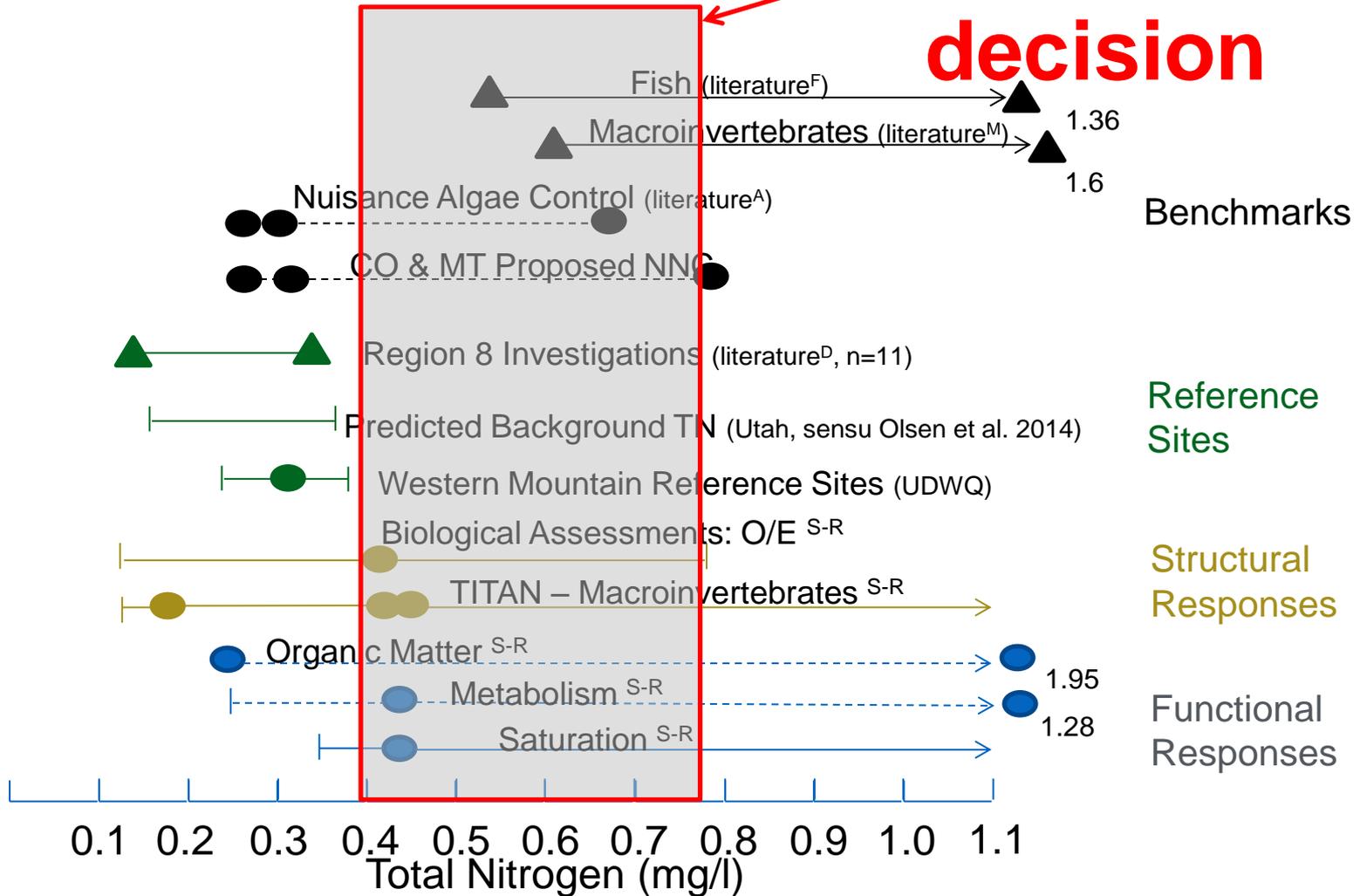
“PROOF” VERSUS EVIDENCE

- ❑ No “proof” in scientific inquiry.
- ❑ Scientific evidence supports or counters a theory or hypothesis.
- ❑ Strength of such evidence is based on statistical analysis and can be expressed as confidence or probability.
- ❑ Experimental evidence is stronger than observational evidence.
- ❑ Water quality decisions involve assessment of future risks that are difficult to assess through experiment.



COMPILATION OF EVIDENCE

**Policy
decision**



FRAMING THE REVIEW

A process for developing framing questions is clearly stated in draft DWQ administrative rules. Rules encourage reviews that document and quantify level of confidence in scientific evidence and areas of uncertainty.

- ❑ Scientific rationales differ from policy outcomes.
- ❑ Nuance is often important and informative.
- ❑ Without direction panel members naturally gravitate to topics of greatest personal interest.
- ❑ Uncertainty: The only certainty
 - ❑ More data is always desirable
 - ❑ Models require simplifying assumptions

RECENT EXAMPLE: Mercury and Great Salt Lake

FRAMING QUESTION

Are the proposed liver risk categories scientifically defensible? Please explain your yes or no answer.

Reviewer 1

- Yes, although there is a lot of variability. Might be better to use kidney.

Reviewer 2

- No. Liver may be a better indicator of long-term exposure rather than risk.

Reviewer 3

- Given the variability among species to demethylate mercury in the liver, I doubt that benchmarks based on total Hg would be useful.

Reviewer 4

- Liver is inferior to blood, which is inferior to eggs. If liver mercury is all you have, then these values may spur further work in the future to acquire eggs.

Reviewer 5

- Liver data provide some difficulty in interpretation. Liver concentrations could be converted to blood concentrations and the benchmark categories proposed could be compared with those for blood.

POLICY IS MORE THAN SCIENCE

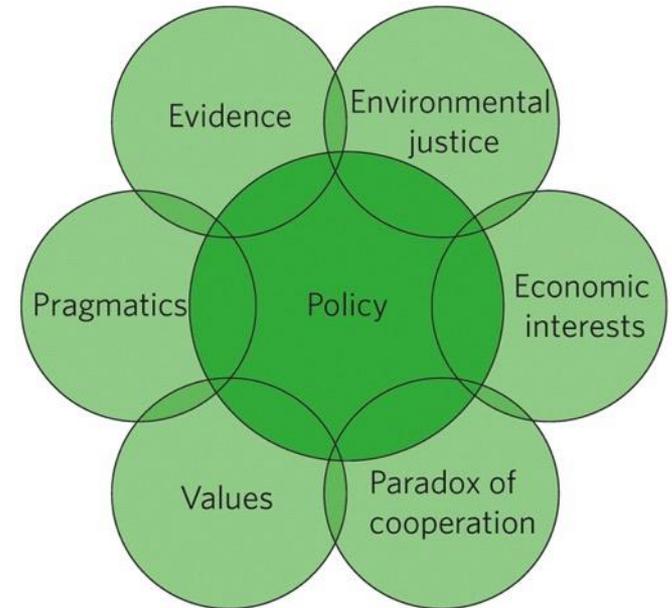
Draft DWQ administrative rules require the Director or the Water Quality Board to consider review findings in final initiative or rule making and to document this process.

ADDITIONAL CONSIDERATIONS

- ❑ **Economic**
 - ❑ Both costs and benefits

- ❑ **Values**
 - ❑ Acceptable risk depends on perspective

- ❑ **Legal Framework**
 - ❑ Rules and regulations
 - ❑ Court decisions



TECHNOLOGY BASED EFFLUENT LIMITS

- ❑ Technology based effluent limits are based on reasonable technology not water quality needs of receiving waters.
 - ❑ Similar to best available technology applied to industry

- ❑ Secondary wastewater treatment standards (adopted in 1970s)
 - ❑ Biological oxygen demand: 25 mg/L
 - ❑ Suspended solids: 25 mg/L
 - ❑ Fecal coliform: 200 per 100 mL
 - ❑ pH: 6.5 - 9

- ❑ Not appropriate to review scientific merit of technology based limits
 - ❑ May be appropriate to review engineering and cost analyses

UTAH'S TECHNOLOGY BASED PHOSPHORUS EFFLUENT LIMIT

Draft DWQ administrative rules would provide for review of scientific basis of a TBPEL variance request.

- ❑ TBPEL rule includes a “science based” variance request
 - ❑ *“If the owner of a discharging treatment works can demonstrate that the TBPEL or phosphorus loading cap is clearly unnecessary to protect waters downstream from the point of discharge, no TBPEL or phosphorus loading cap will be applied.”*

- ❑ Variance reviews could include independent scientific review
 - ❑ Based on highly influential scientific assessment or influential scientific information
 - ❑ Scientific test is to “clearly demonstrate” that TBPEL is not needed
 - ❑ Alternative is that there is sufficient uncertainty that TBPEL is prudent and reasonable
 - ❑ Scientific test should not be that TBPEL is “scientifically necessary”

NUTRIENT POLLUTION THREATENS UTAH'S WATERS



Aquatic life



Aesthetics



Livestock



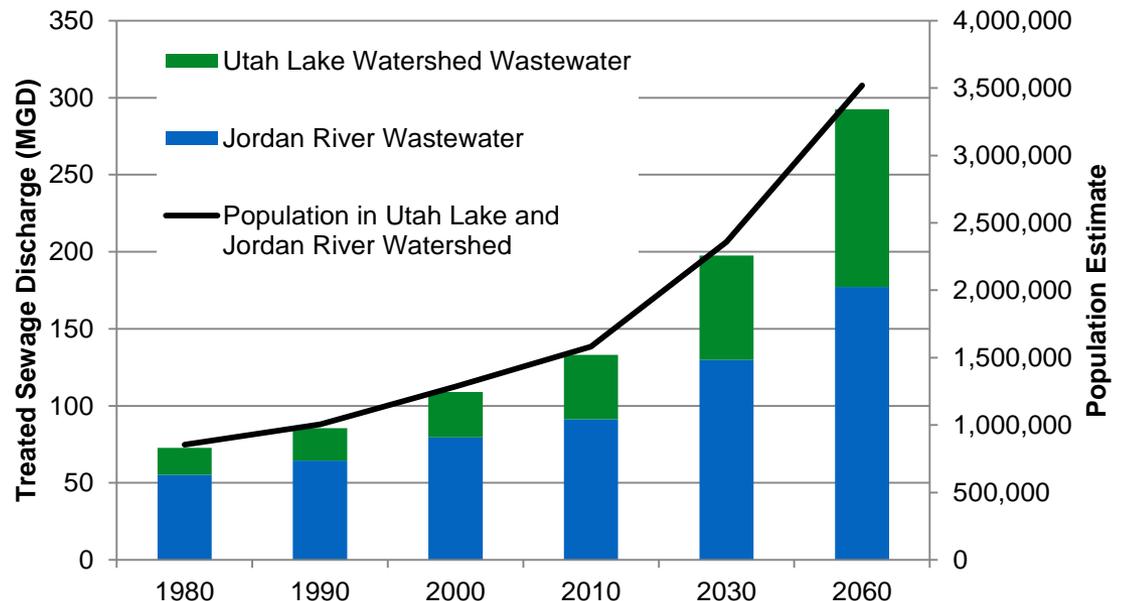
Recreation



Drinking Water

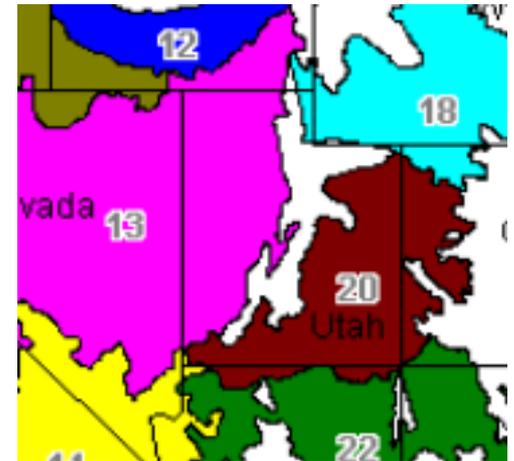
TECHNOLOGY BASED LIMITS ARE AN INTERIM MEANS TO REDUCE NUTRIENT LOADINGS

- ❑ Treated sewage is significant portion of flow to urban waters
 - ❑ Jordan River: 30% to 66%
 - ❑ Utah Lake: 10% – 20%
 - ❑ Farmington Bay: TBD
- ❑ Projected growth from 2010 to 2060
 - ❑ State of Utah: 115%
 - ❑ Jordan River Basin: 94%
 - ❑ Utah Lake Basin: 176%

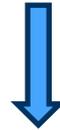
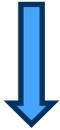


ALTERNATIVES TO TECHNOLOGY BASED LIMITS

- ❑ Adopt EPA's ecoregional standards promulgated in 2004
 - ❑ TP: 0.01 – 0.03 mg/L
 - ❑ TN: 0.3 – 0.5 mg/L
- ❑ Develop alternative ecoregional standards for Utah's waters
 - ❑ Headwaters
- ❑ Science-based site-specific standards for receiving waters
- ❑ Identify impairments and conduct TMDLs
- ❑ “Do nothing” is not an option



INFRASTRUCTURE INVESTMENT TO ACCOMMODATE GROWTH



SUMMARY

- ❑ DWQ is supportive of independent scientific review.
- ❑ Review process requires careful consideration to ensure objectivity, transparency, and efficiency.
- ❑ Peer review should be prospective, not retrospective.
- ❑ Peer review should inform, not prescribe, policy decisions.
- ❑ Peer review is an inappropriate tool for challenging permits.
- ❑ Technology based limits are driven by reasonable and available technology, not by scientifically derived needs for specific waters.

A scenic landscape featuring a calm lake that reflects the surrounding environment. The background consists of rugged mountains with patches of evergreen trees. The foreground shows large, light-colored rocks on the left side. The entire image has a monochromatic teal or cyan tint. The word "DISCUSSION" is centered over the lake in a white, elegant serif font.

DISCUSSION