

Cost Impacts of Statewide Nutrient Standards in Utah

Statewide Results Summary

Western States Water Council
July 22, 2010

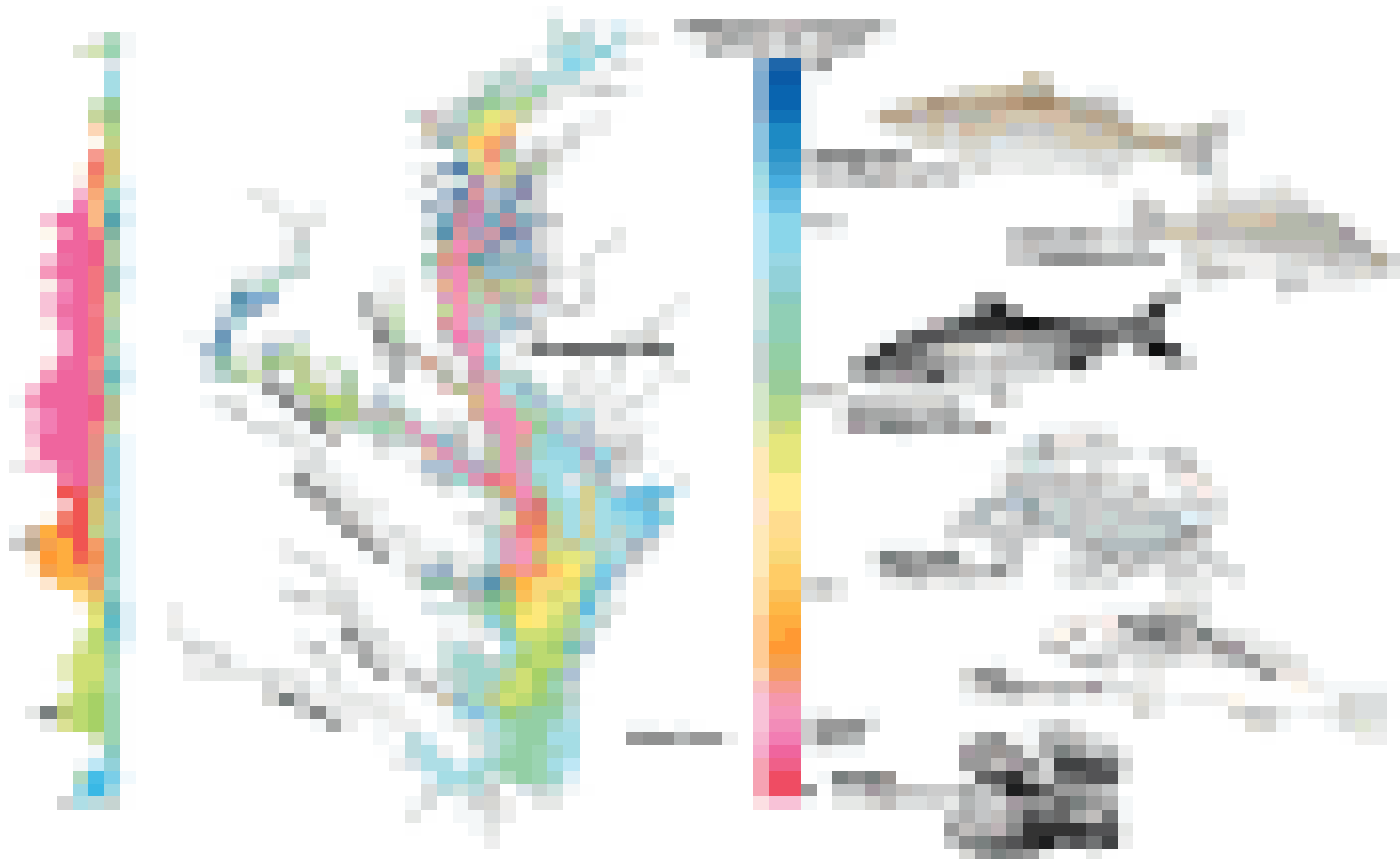
Nutrients: The Problem

- **Over-fertilization of water bodies a widespread problem nationally**
- **Beneficial uses become impaired especially due to low dissolved oxygen which is choking our water bodies**
- **Excess Phosphorus and/or Nitrogen is a source of many impairments**

Beijing Olympic Venue

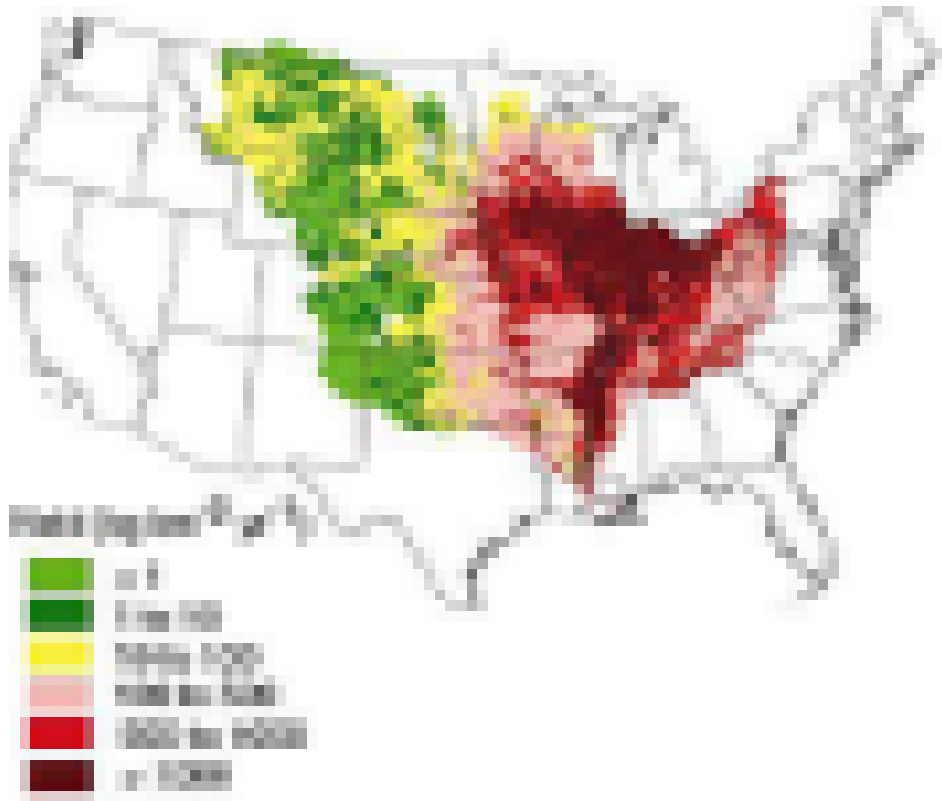


The Price: Chesapeake Bay

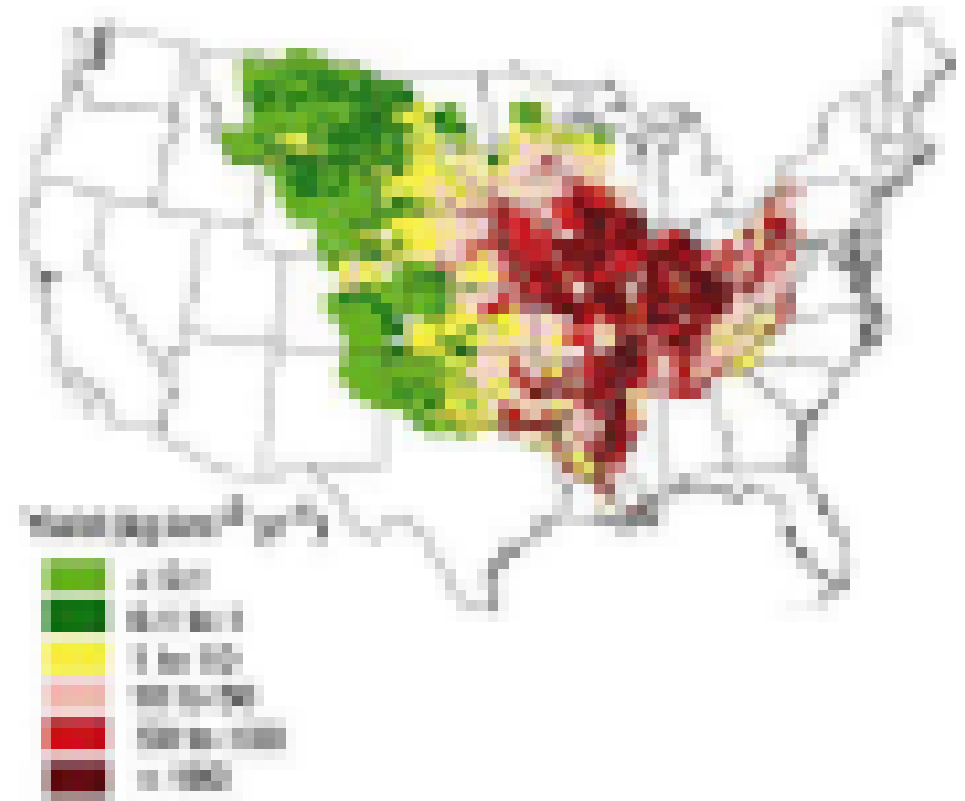


Nutrient Delivery to Gulf of Mexico

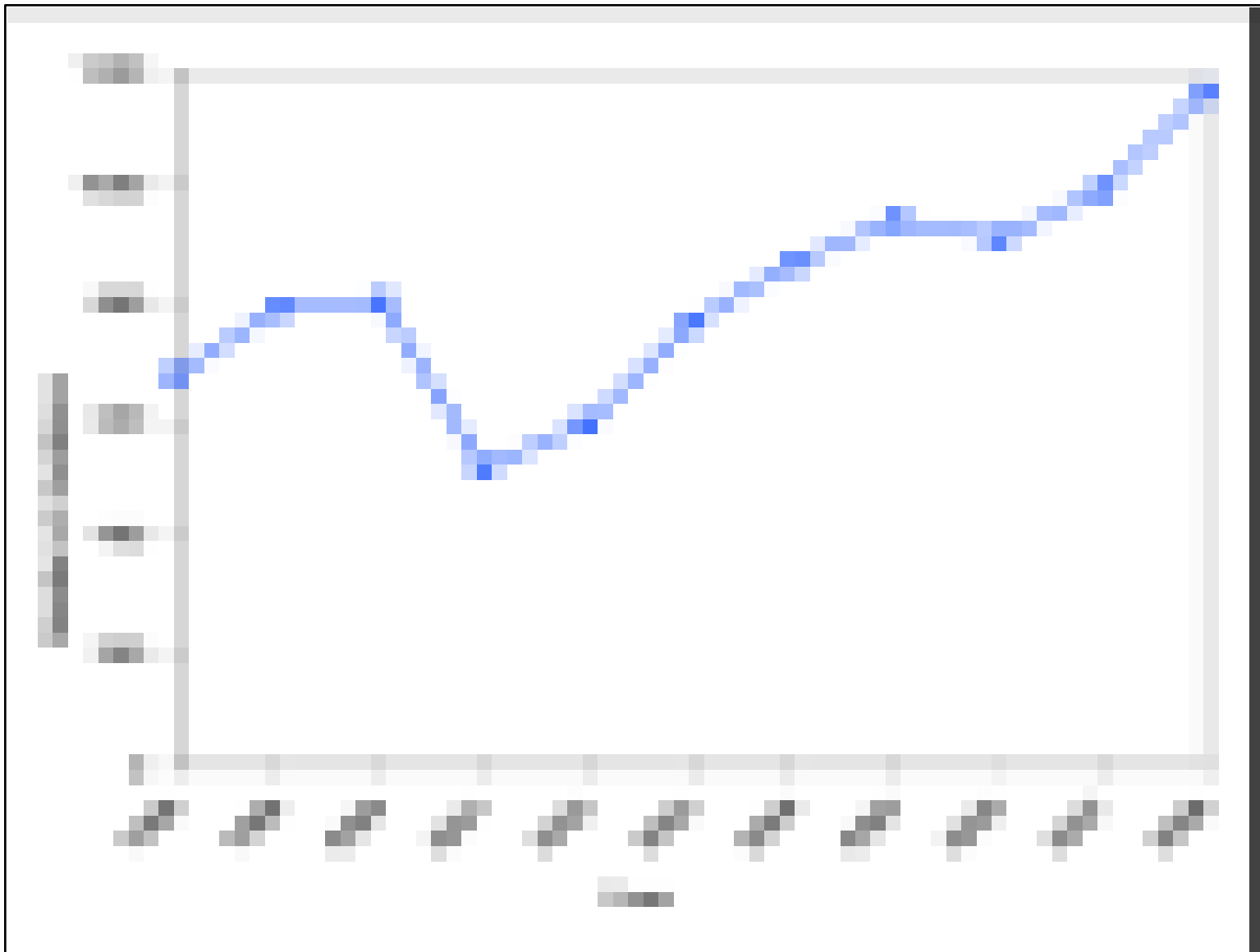
Total Nitrogen



Total Phosphorus



Annual Nitrate Violations in Community Water Systems



Utah Lakes and Reservoirs

- 97% of our lakes and reservoirs are assessed
- 48 of 132 priority lakes and reservoirs (36%) are not meeting their beneficial uses; all but 5 are “listed” due to nutrient pollution
- Matt Warner Reservoir – 2004

18 cattle died due to ingesting blue-green algae



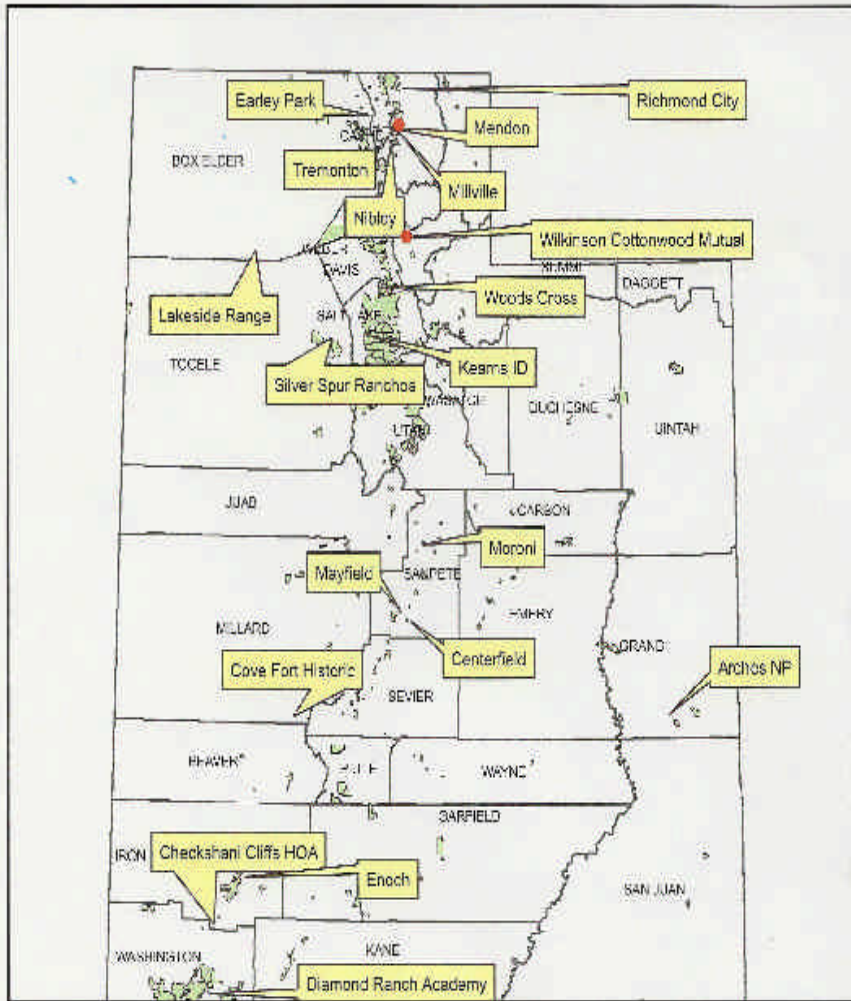
Utah TMDLs

- 164 performed or are being performed
- 35 (21%) of the waters are “listed” due to phosphorus problems

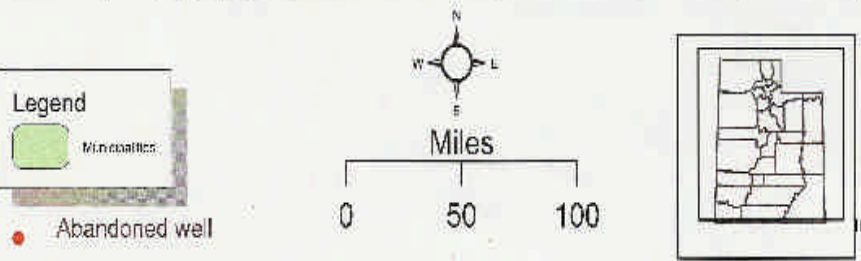
East Canyon Creek



DEQ-Division of Drinking Water
Nitrate Exceedances
2010



**Nitrate
Exceedances
in Utah Public
Drinking Water Wells**





A Tea Leaves Reading will tell you about yourself and your health. It can tell you about your past, present, and up to 15 years into your future. The reading can tell you about emotions going on currently in your life and about any enemies that you might have. Tea leaves readings can also tell you about people close to you such as your siblings.

Tea Leaves Reading must be done in person.

Price: \$40/reading

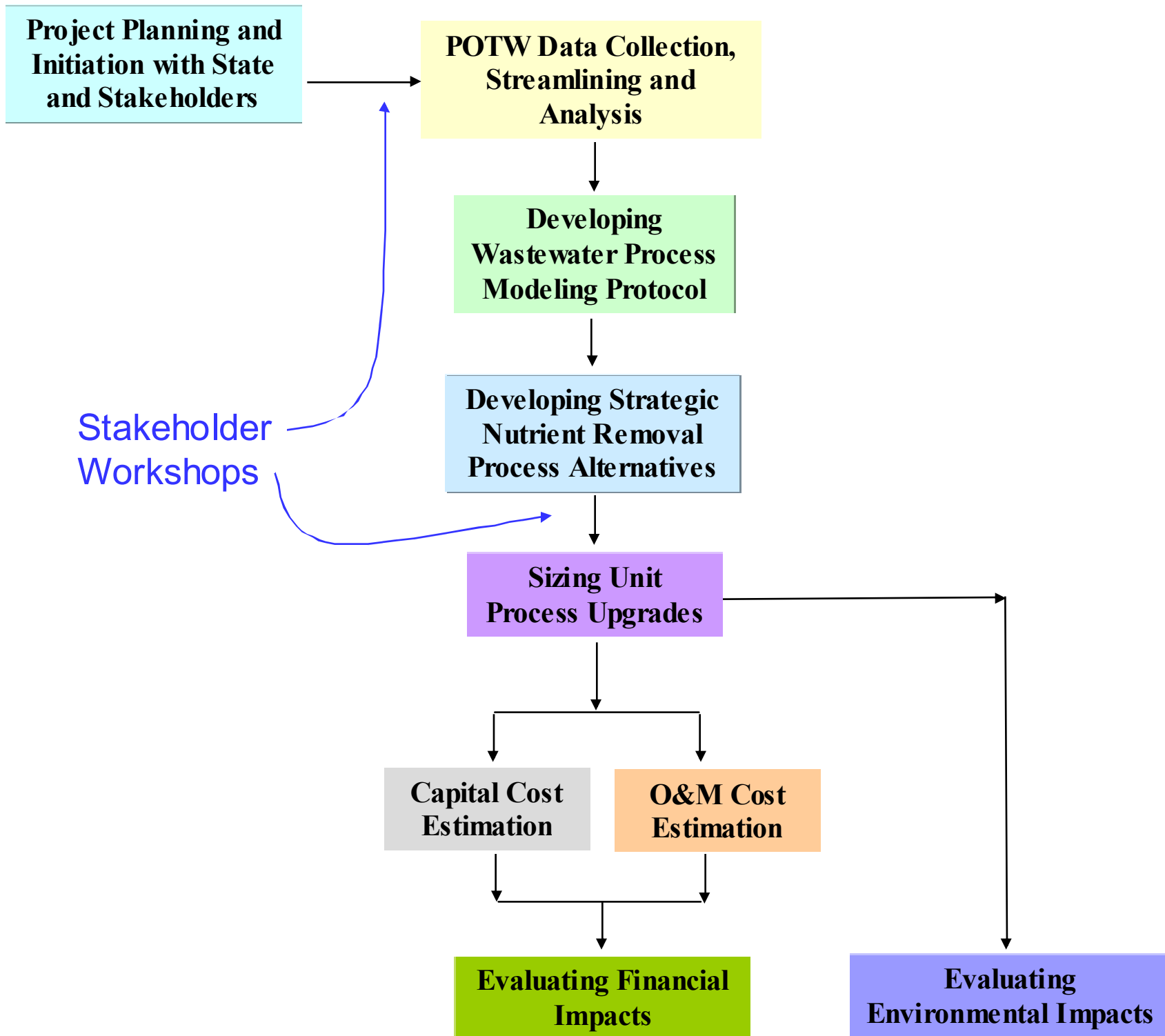
Recent Developments

- November 2007: NRDC Petition to EPA for the revising the definition of “secondary treatment” to include nutrients; 0.3 mg/l P; 3.0 mg/l N
- July 2008: EPA sued to develop numeric nutrient standards due to the failure of narrative standards
- August 2009 OIG Report: *“EPA Needs to Accelerate Adoption of Numeric Nutrient Water Quality Standards”*
- August 2009: EPA publishes “An Urgent Call to Action” to address nutrient pollution
- November 2009: Environmental Advocates issue notice of intent to sue EPA to develop numeric nutrient standards in Wisconsin
- February 2010: EPA proposes numeric nutrient standards for Florida waters
- EPA Administrator Jackson identifies addressing nutrients as a 2010 EPA priority
- Cardin Bill: Provides authority on the Chesapeake Bay for 402 permits to be issued to “any discharge from a pollution source” that alters the chemical, physical or biological integrity of jurisdictional waters

DWQ Nutrient Cost Impacts Study

If national or state-wide effluent discharge standards for nutrients are required...

- *What are the treatment technical challenges?*
- *What are the costs?*
- *What are the environmental benefits?*



Effluent Nutrient Requirement Scenarios

Tier	Total Phosphorus, mg/L	Total Nitrogen, mg/L
1	0.1	No limit
1	0.1	10 limit
2N	1.0	20
2	1.0	no limit
3	Baseline condition	Baseline condition

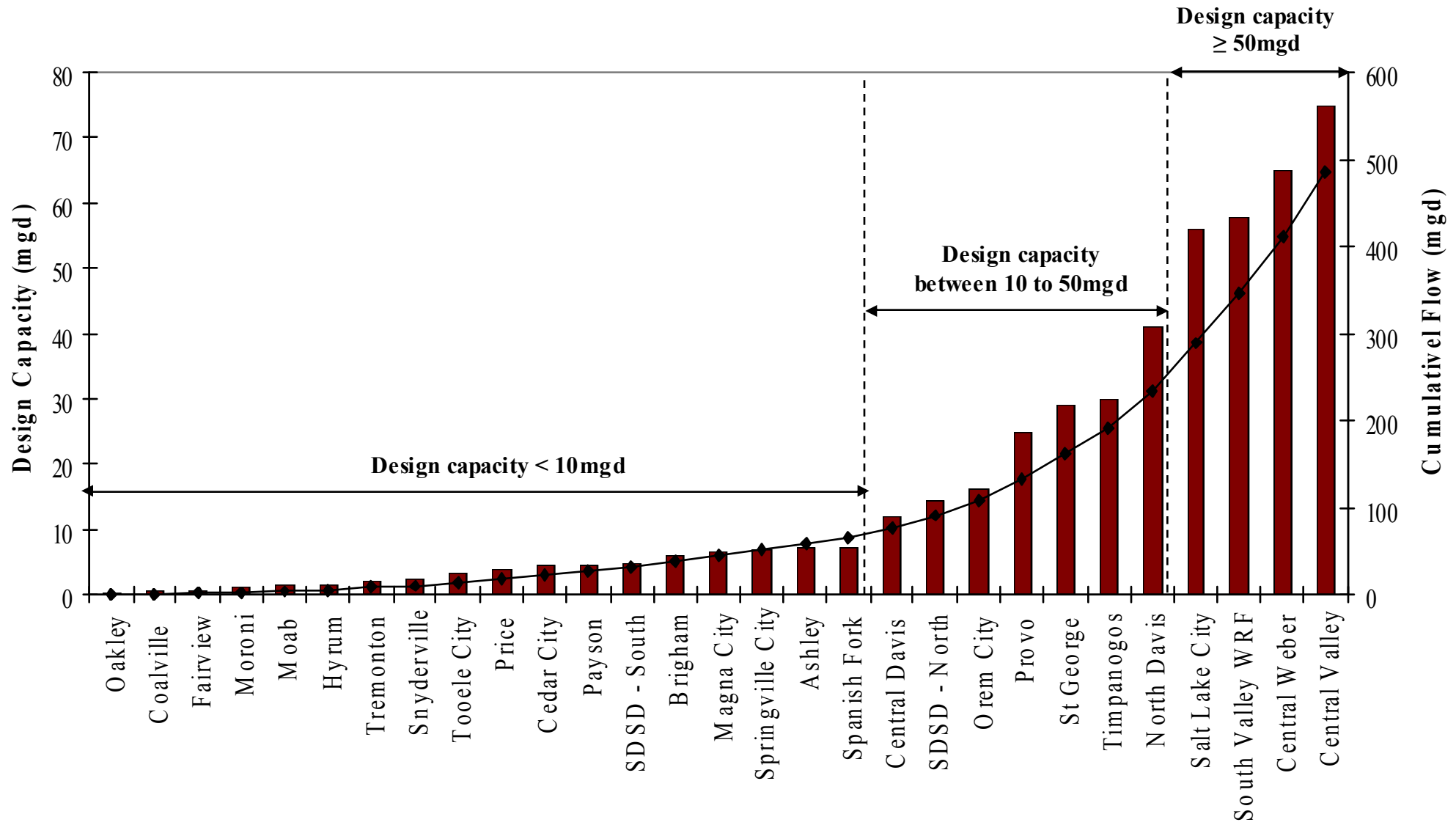
Typical Sequence of Upgrades

- T2 – Chemical Addition
- T2N – Chemical Addition + Denitrification
- T1 – Multi-Point Chemical Addition + Filters
- T1N - Multi-Point Chemical Addition + Denitrification + Filters

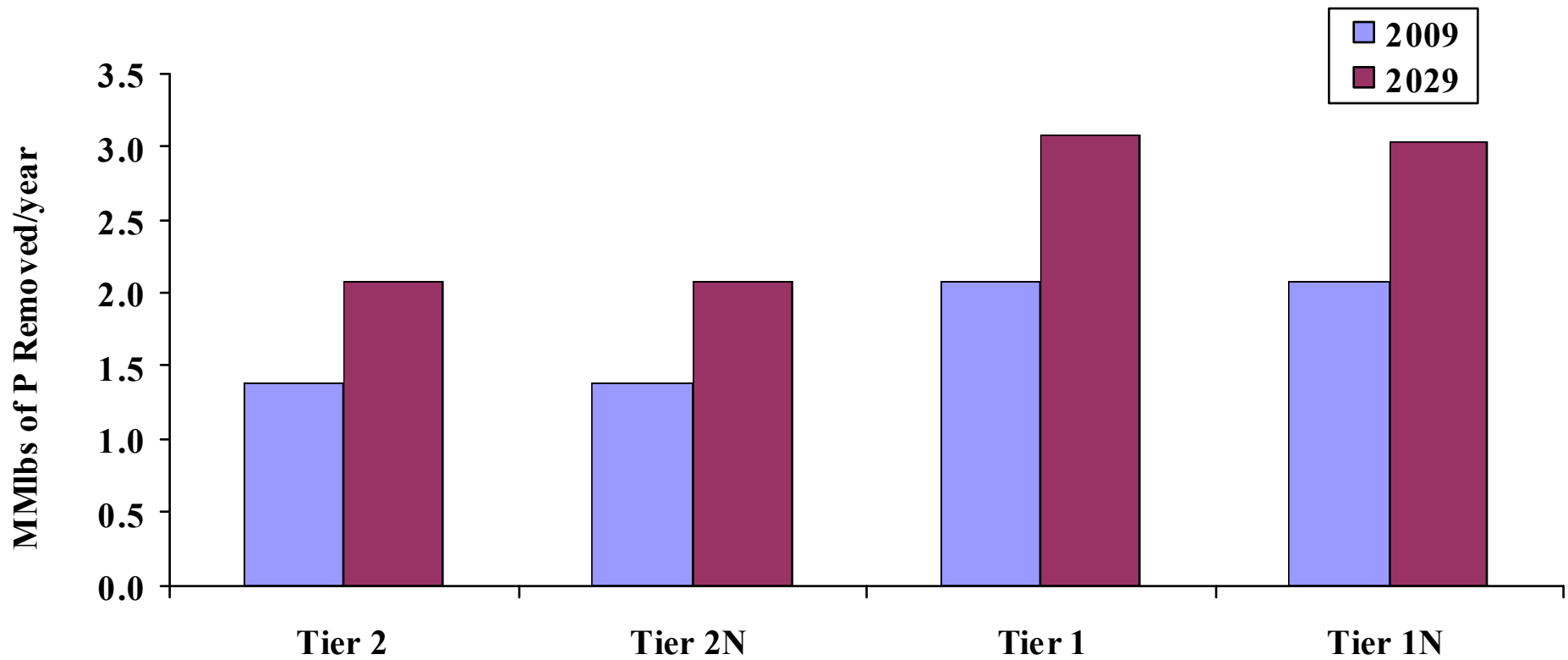
State-wide Nutrient Study

- **Assess 30 mechanical WWTPs and 1 lagoon**
- **Growth; plant capacity and capability; including optimization**
- **Determine capital and O&M costs and their affect on user rates**
- **Aggregate to a state-wide total**
- **Present the results to the governing boards**

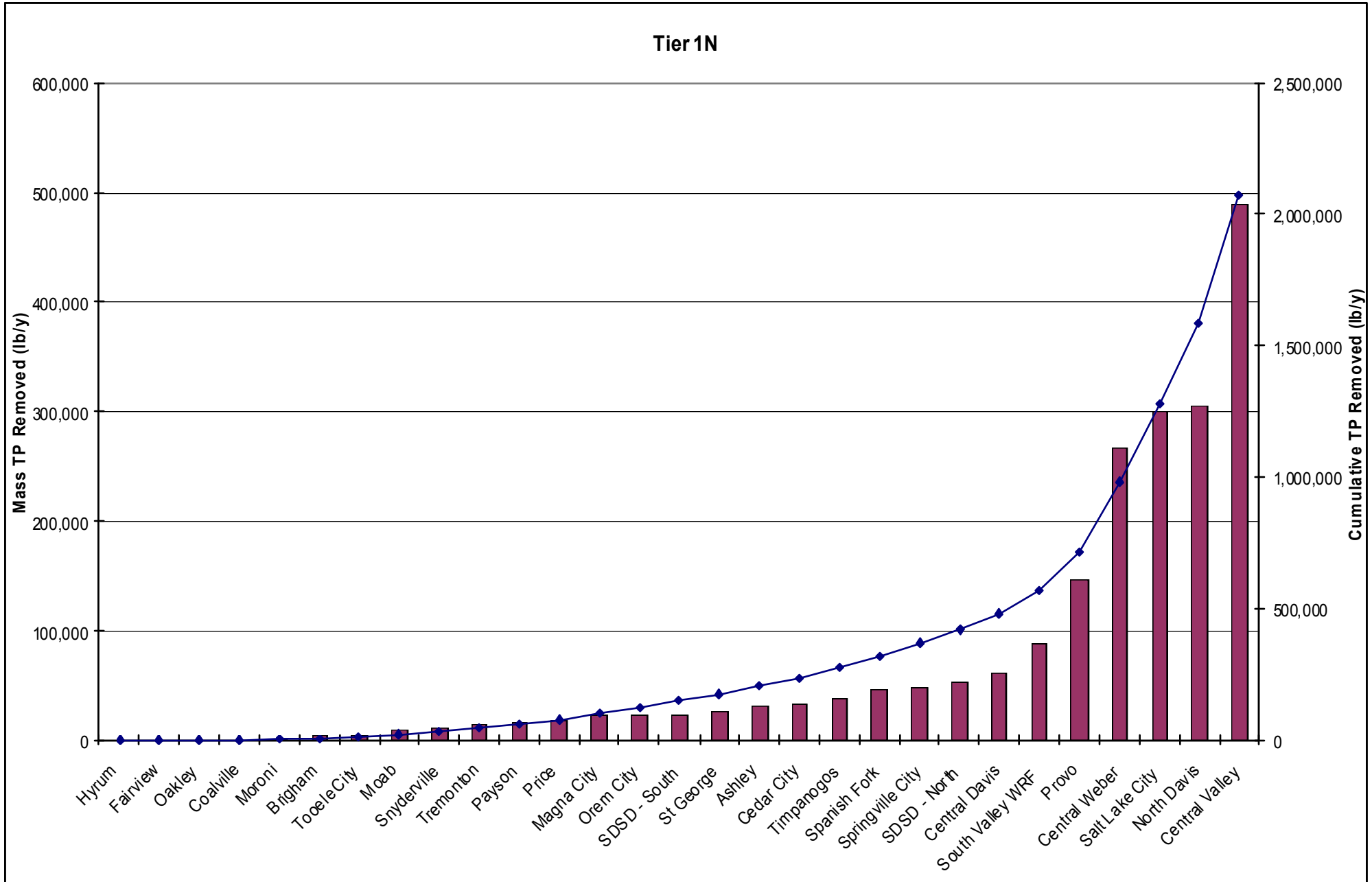
Utah's Mechanical Treatment Plant Capacity



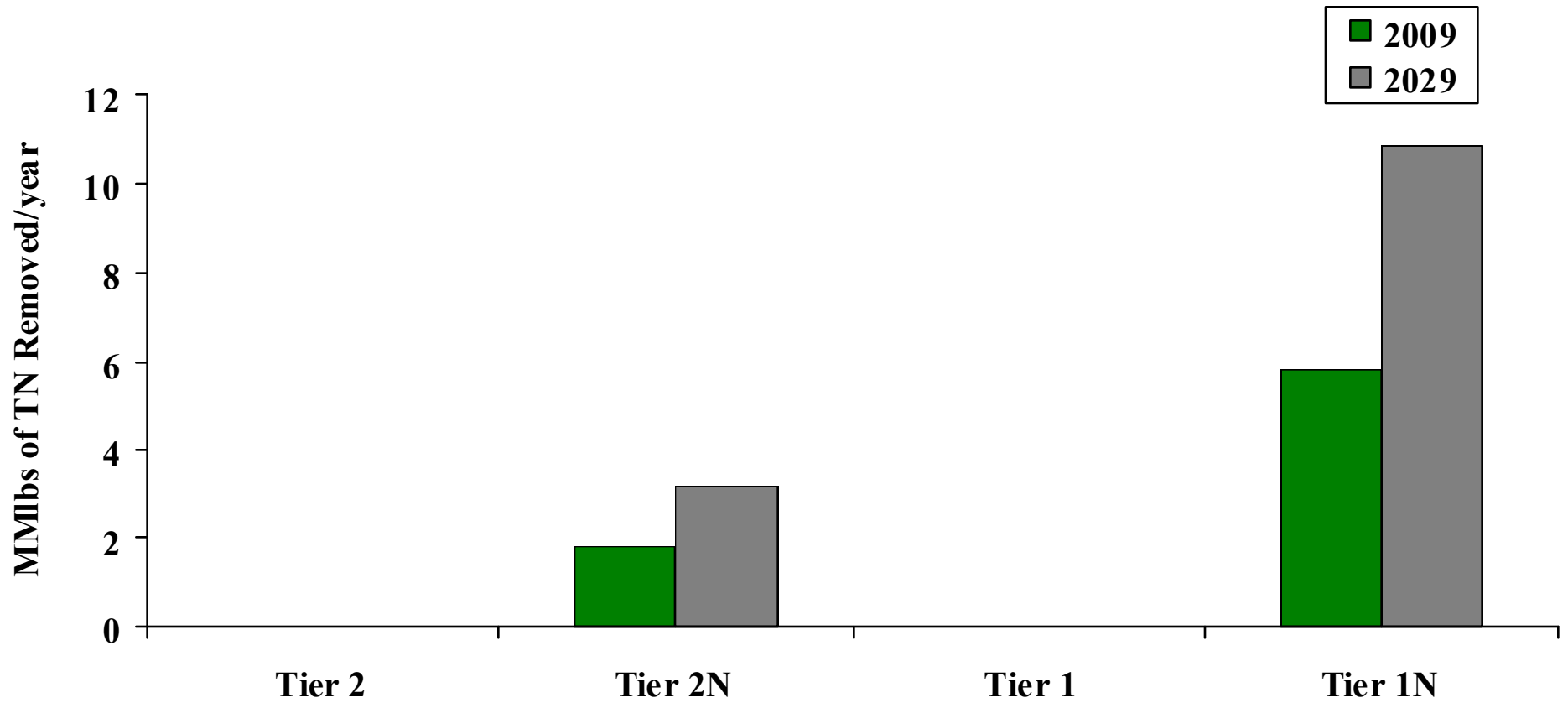
Mass Phosphorus Removed



Tier 1 Phosphorus Removed

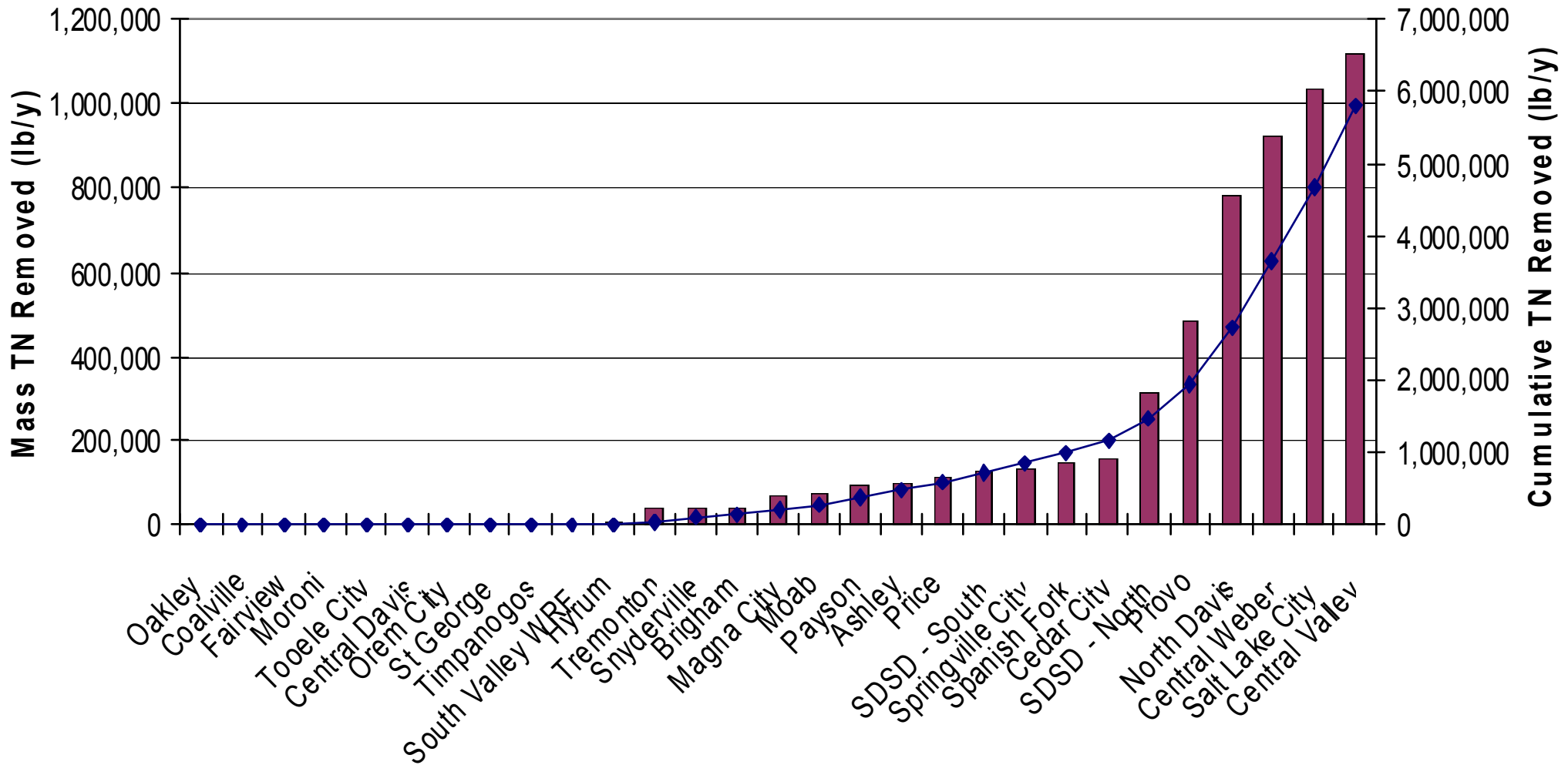


Mass Nitrogen Removed



Tier 1N Nitrogen Removed

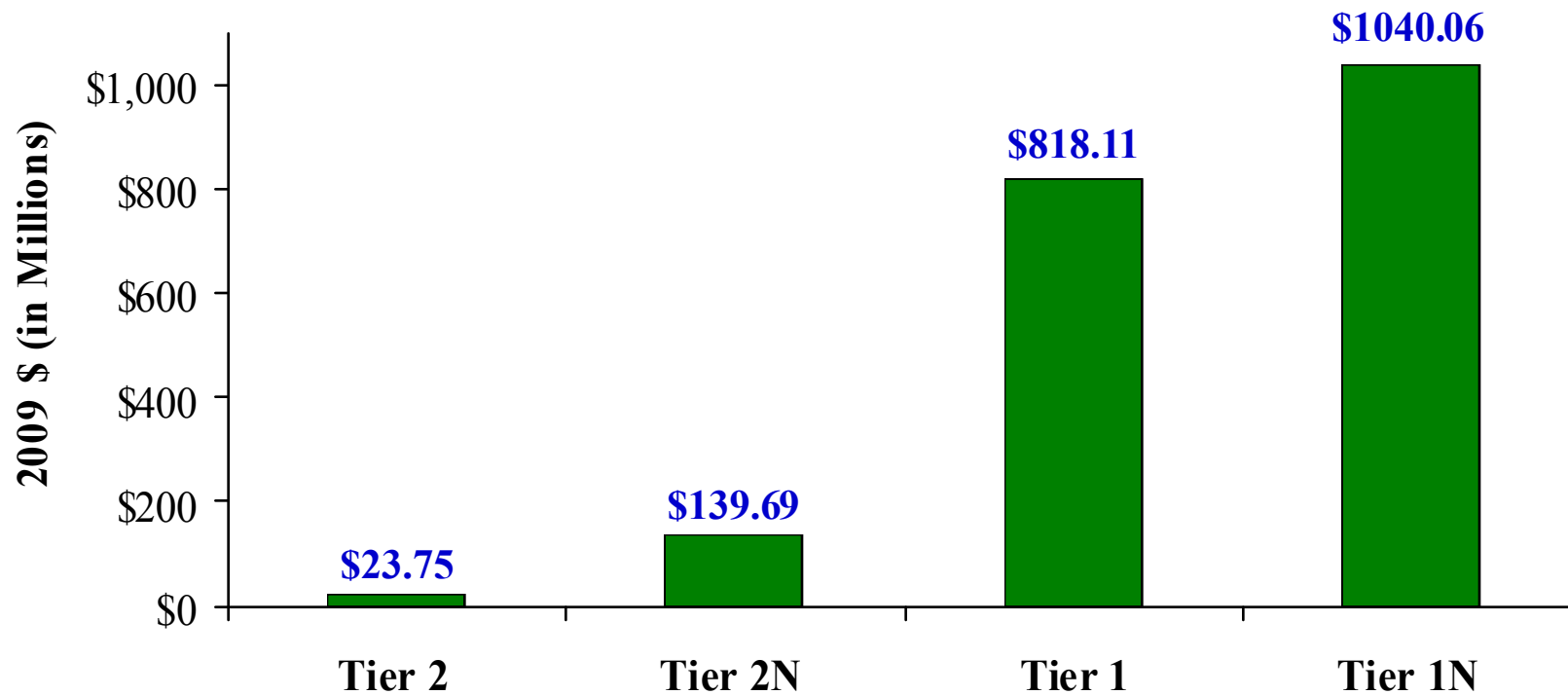
Tier 1N



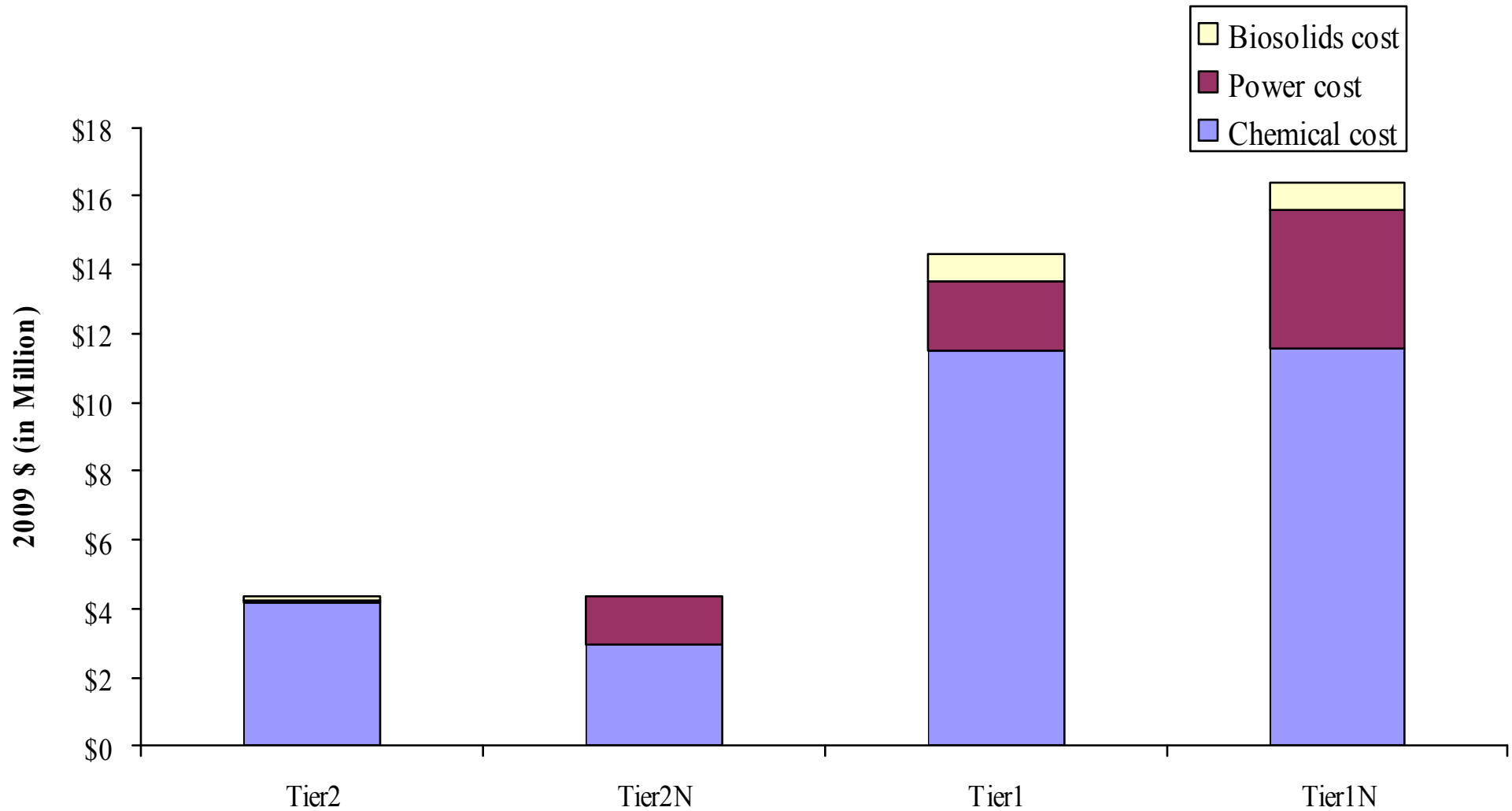
Cost Estimating Basis

- Financing Term – 20 years
- Interest rate – 5.0 %
- Inflation Rate – 0 %
- Affordability Criterion – 1.4 % MAGHI
(\$43.96/month)

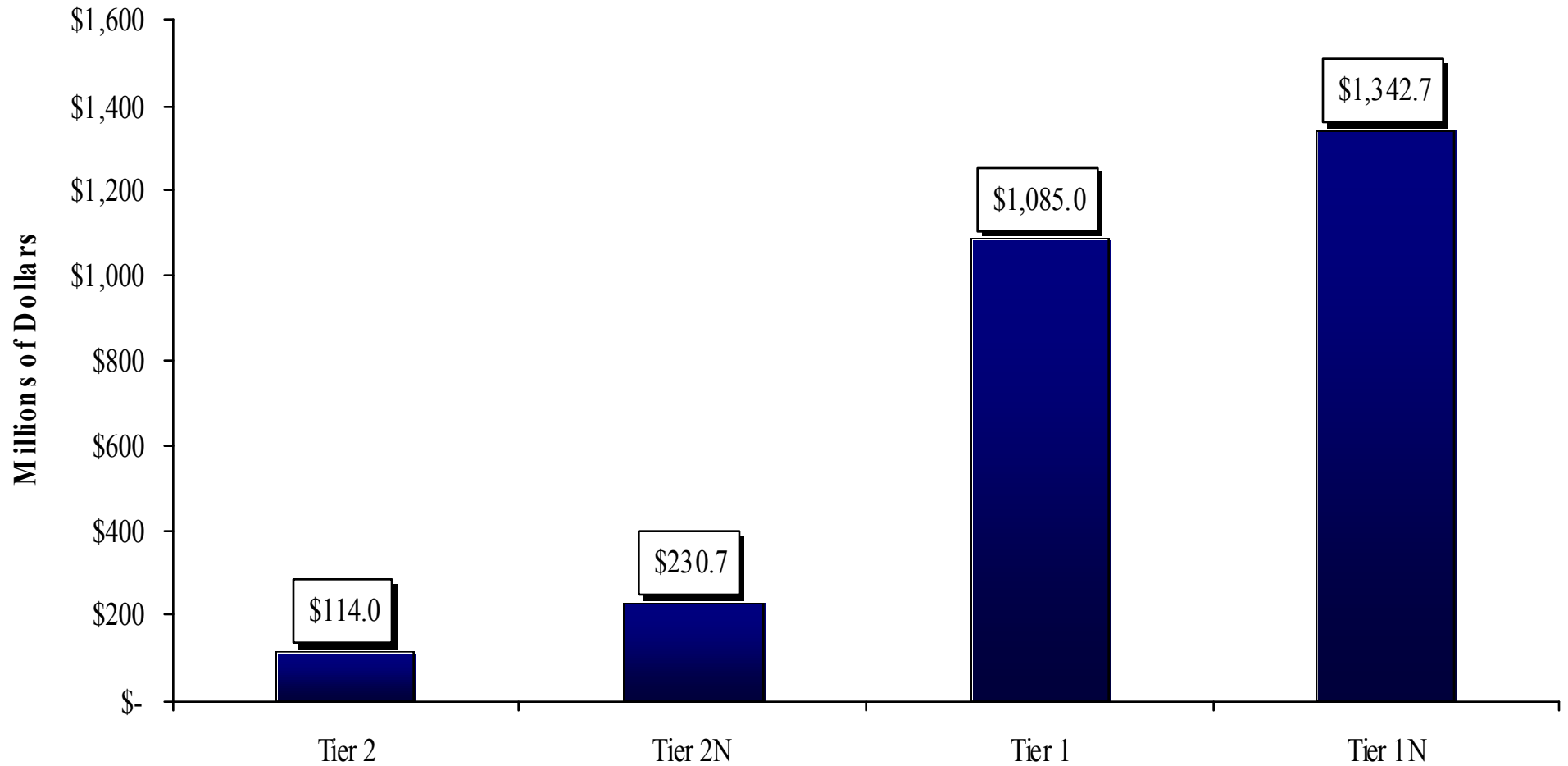
Capital Costs - Statewide



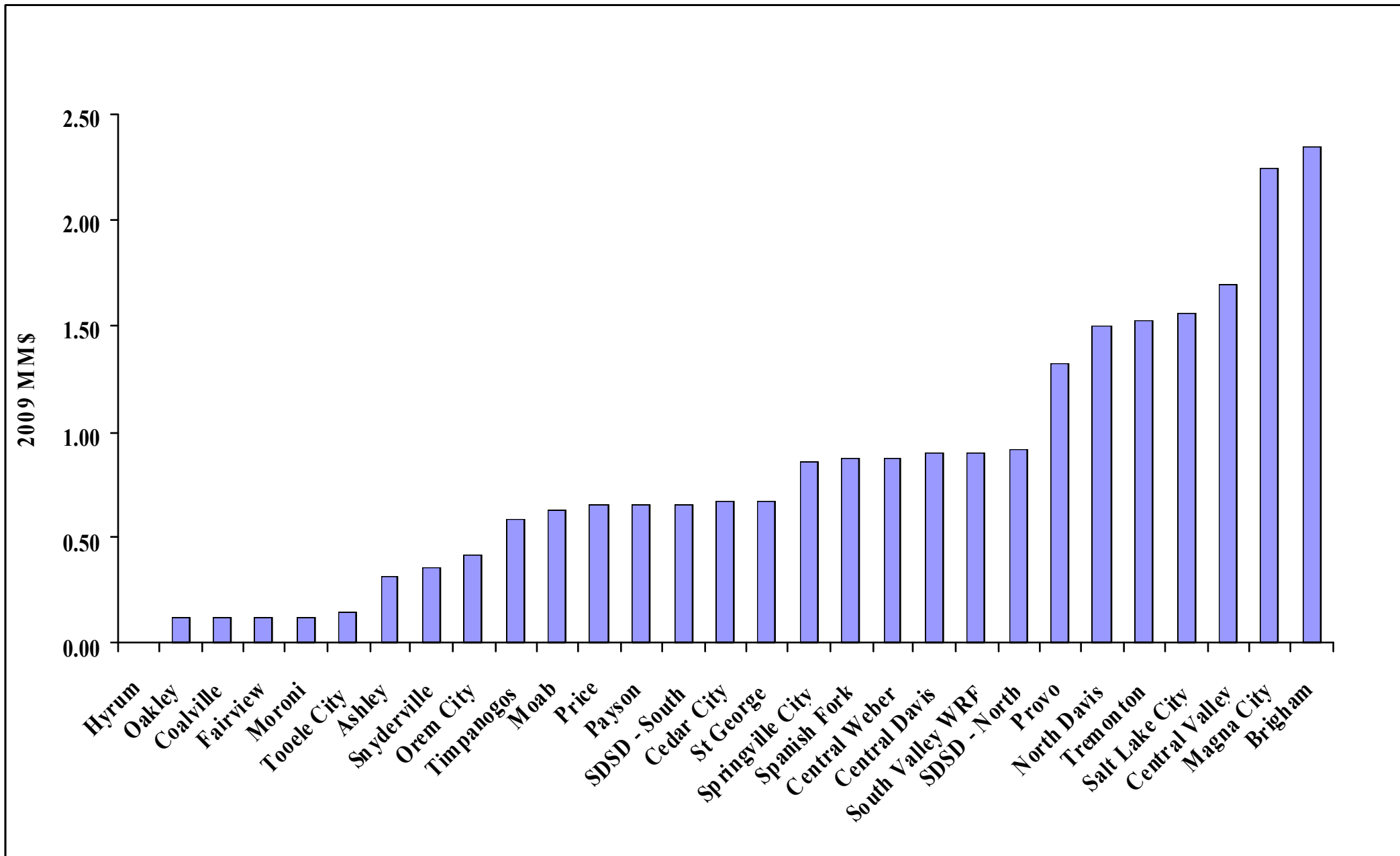
Operating Costs - Statewide



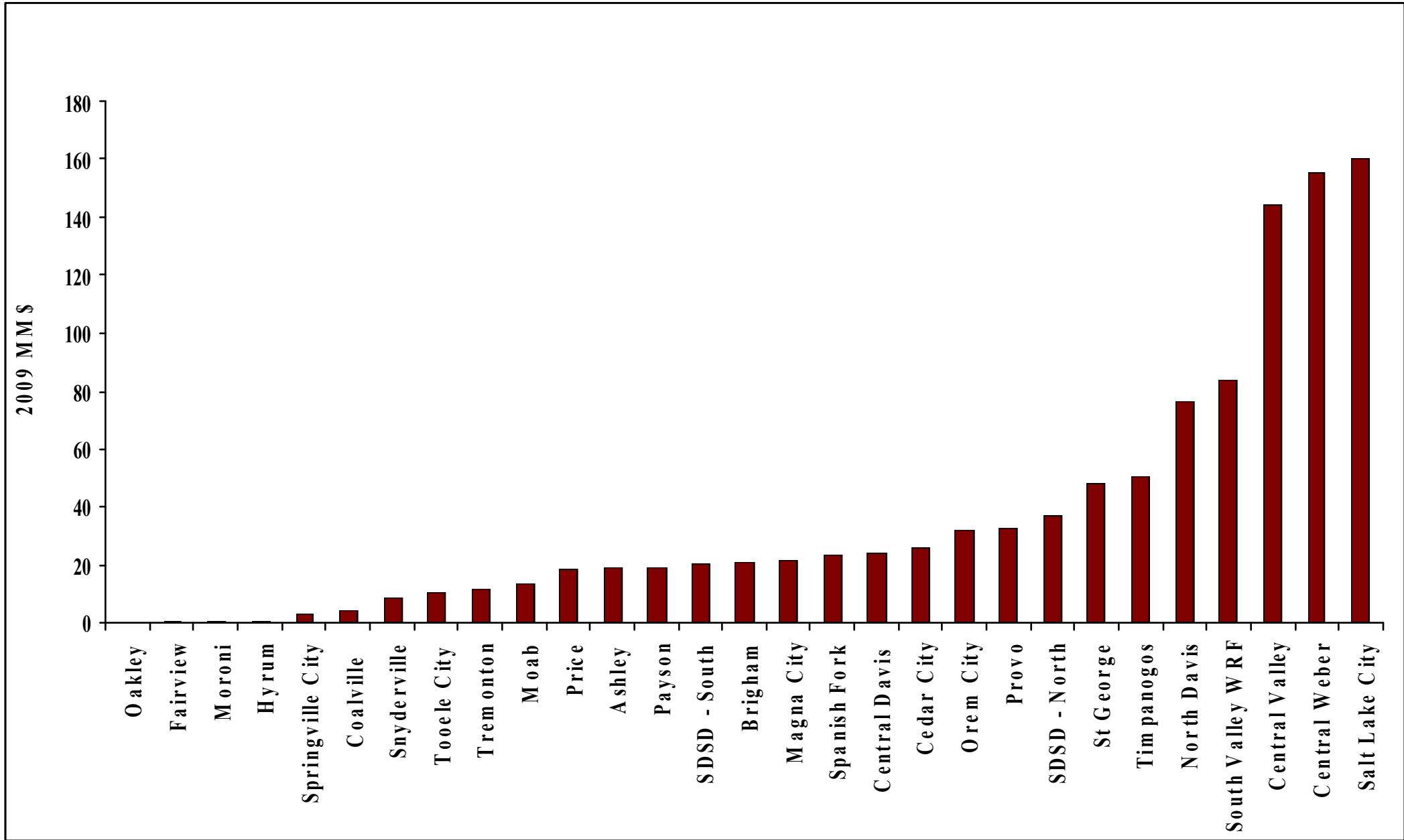
Net Present Value



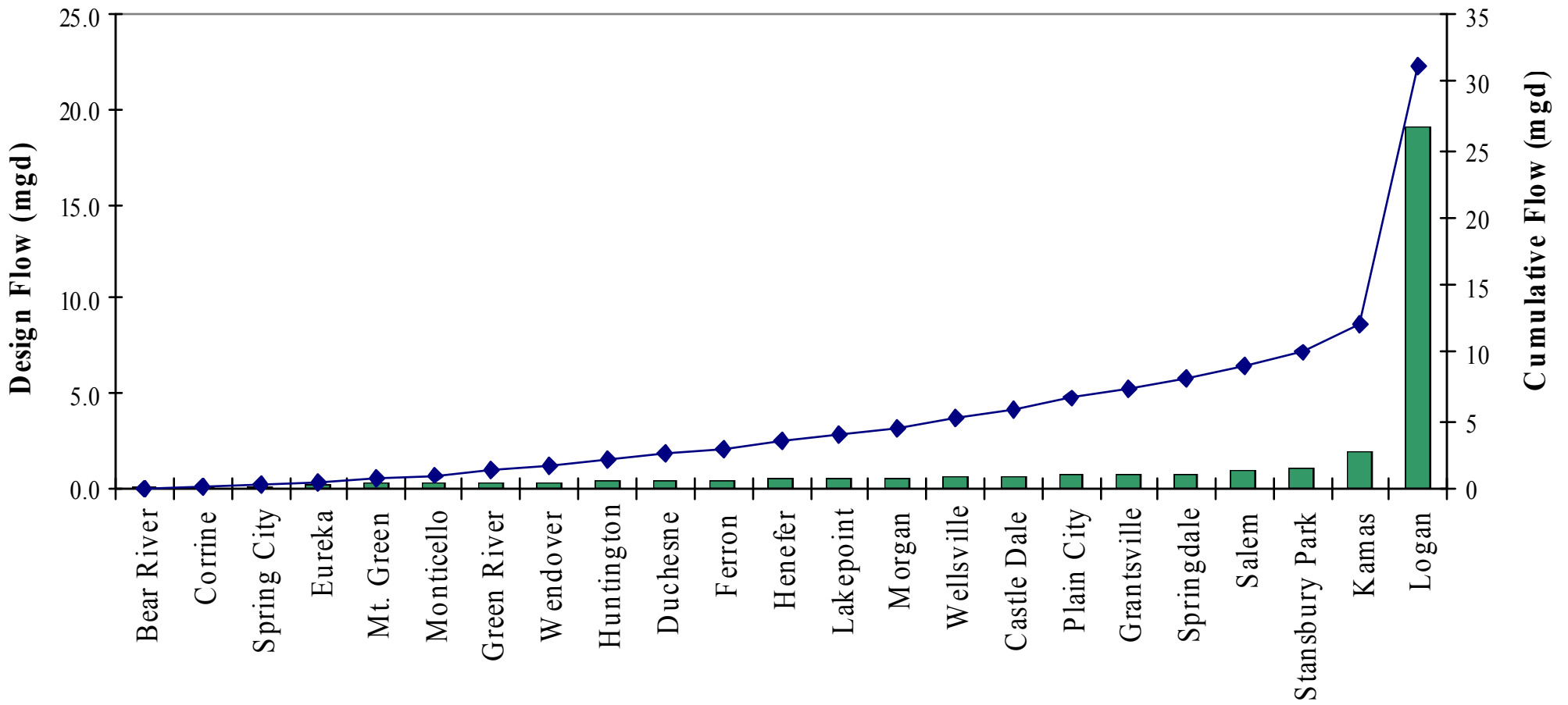
Tier 2 Capital Costs



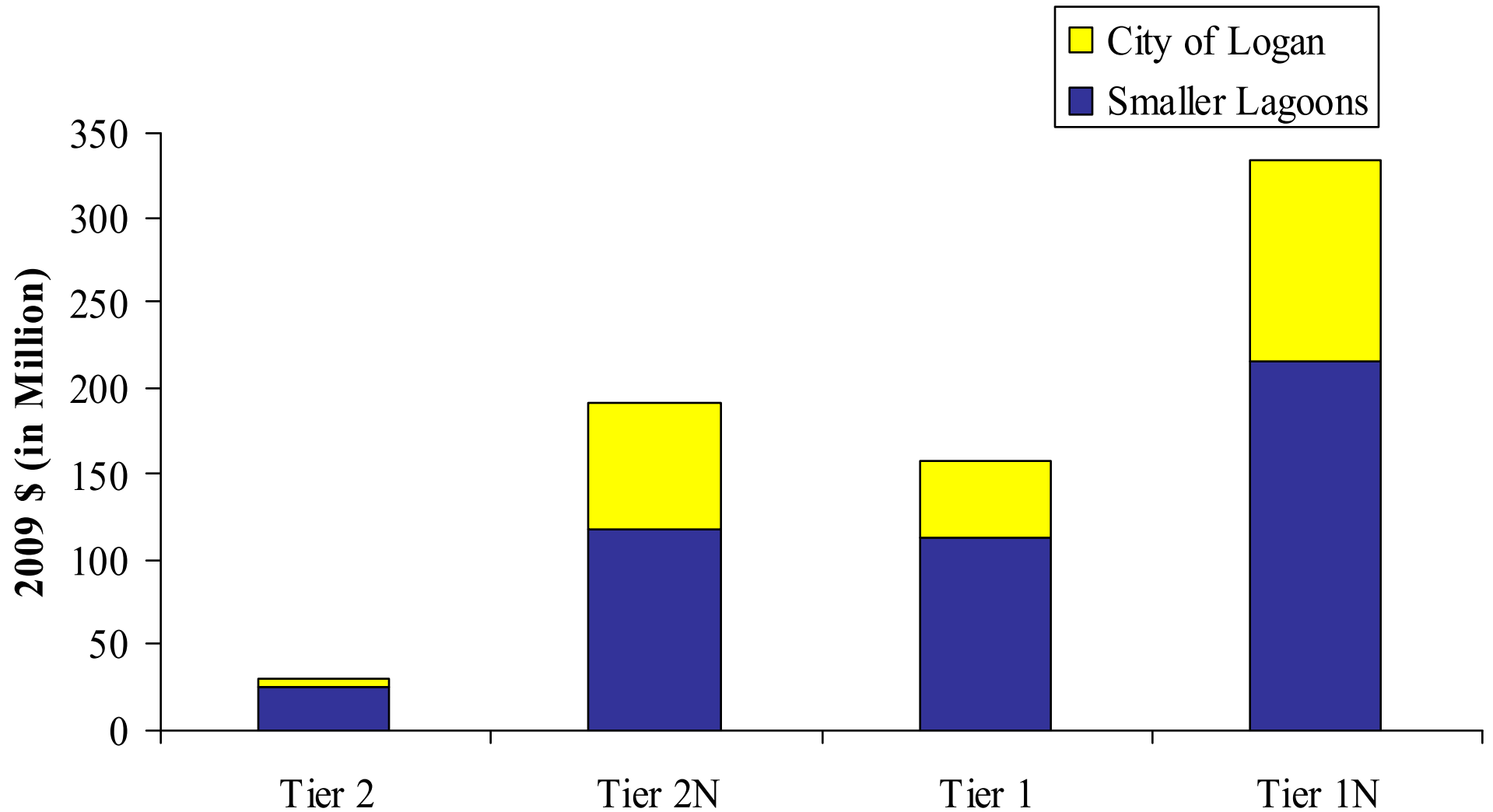
Tier 1N Capital Costs



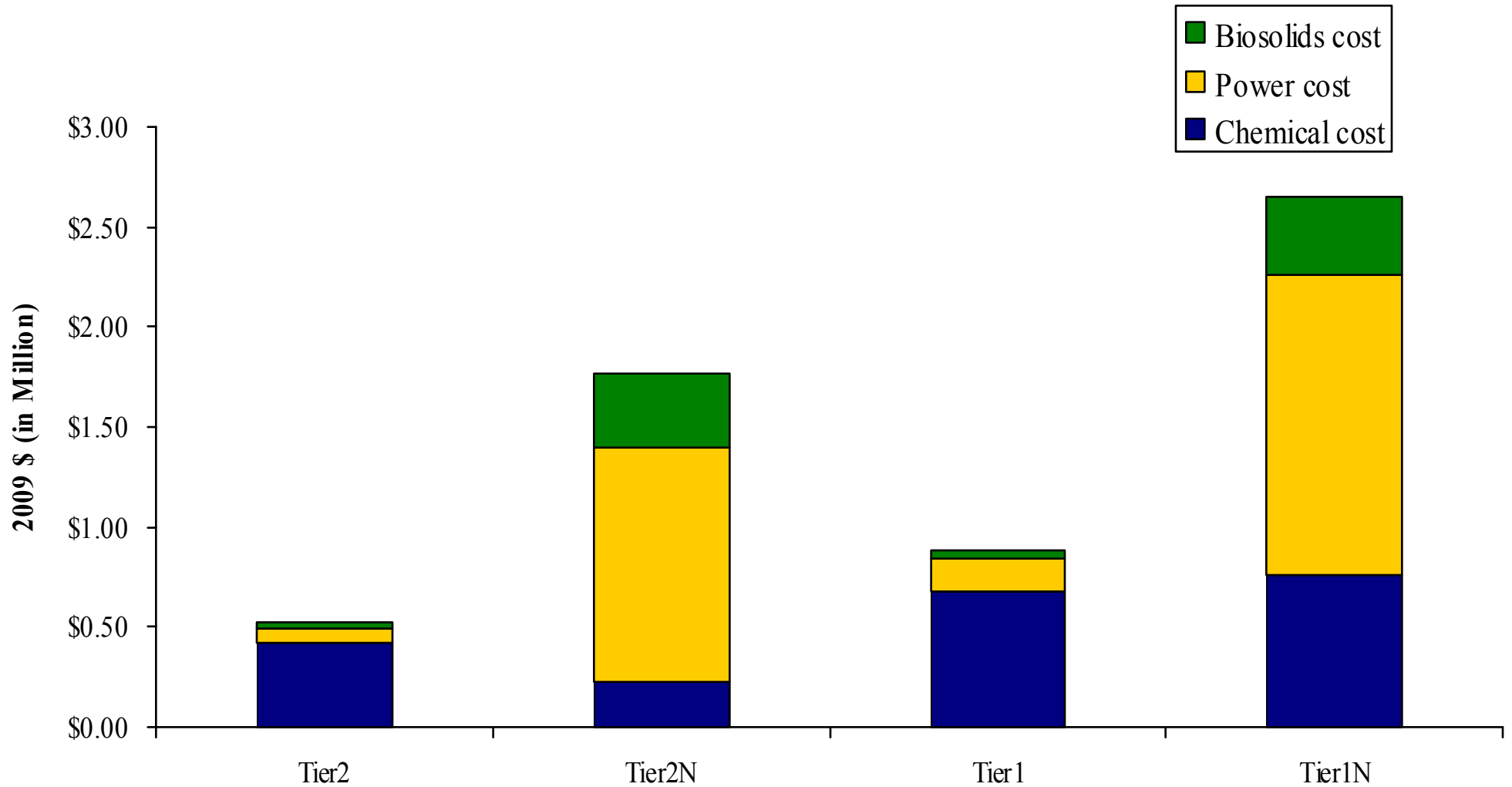
Utah's Discharging Lagoon Treatment Capacity



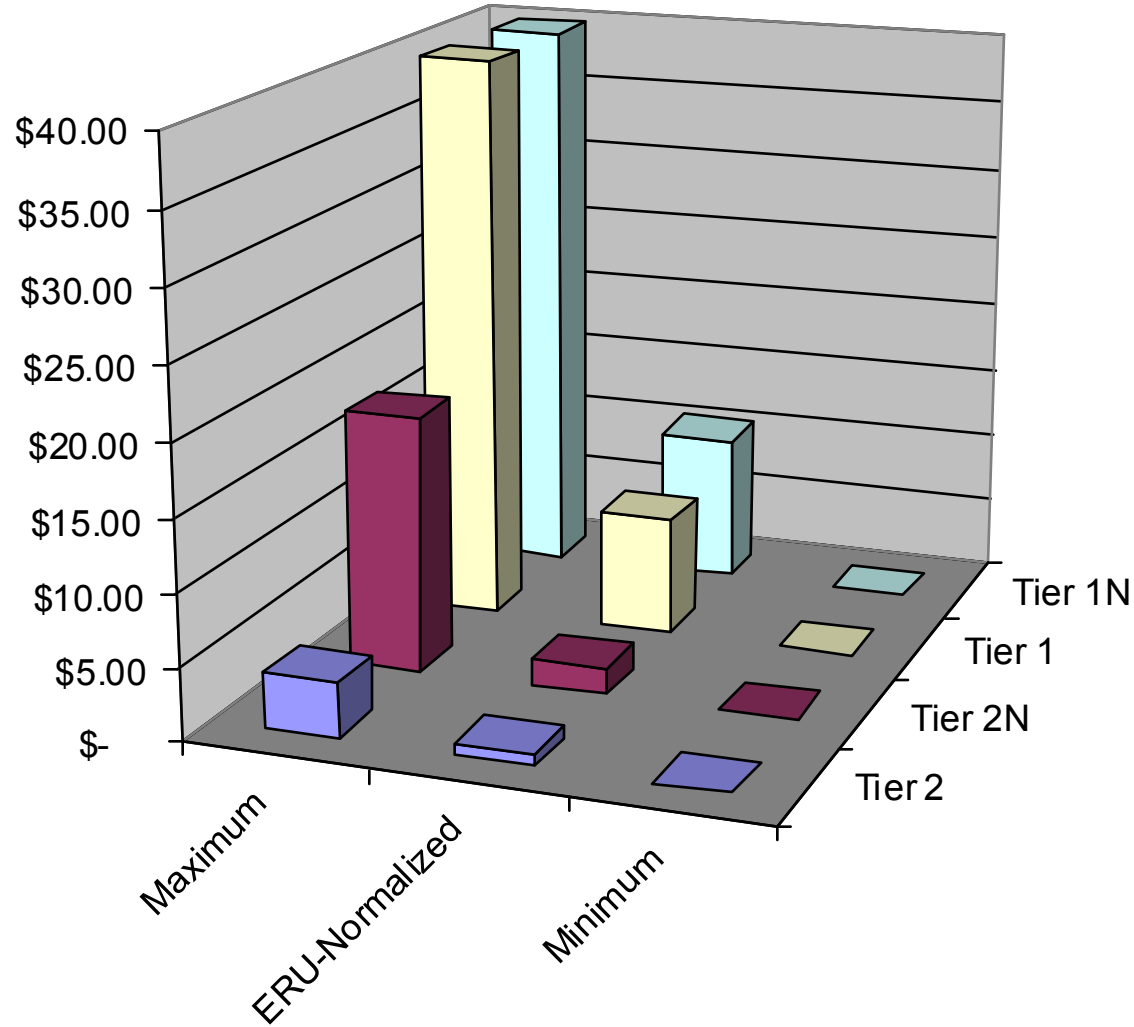
Capital Costs – Statewide Discharging Lagoons



Statewide Lagoon O&M Cost



Projected Monthly Rate Increases



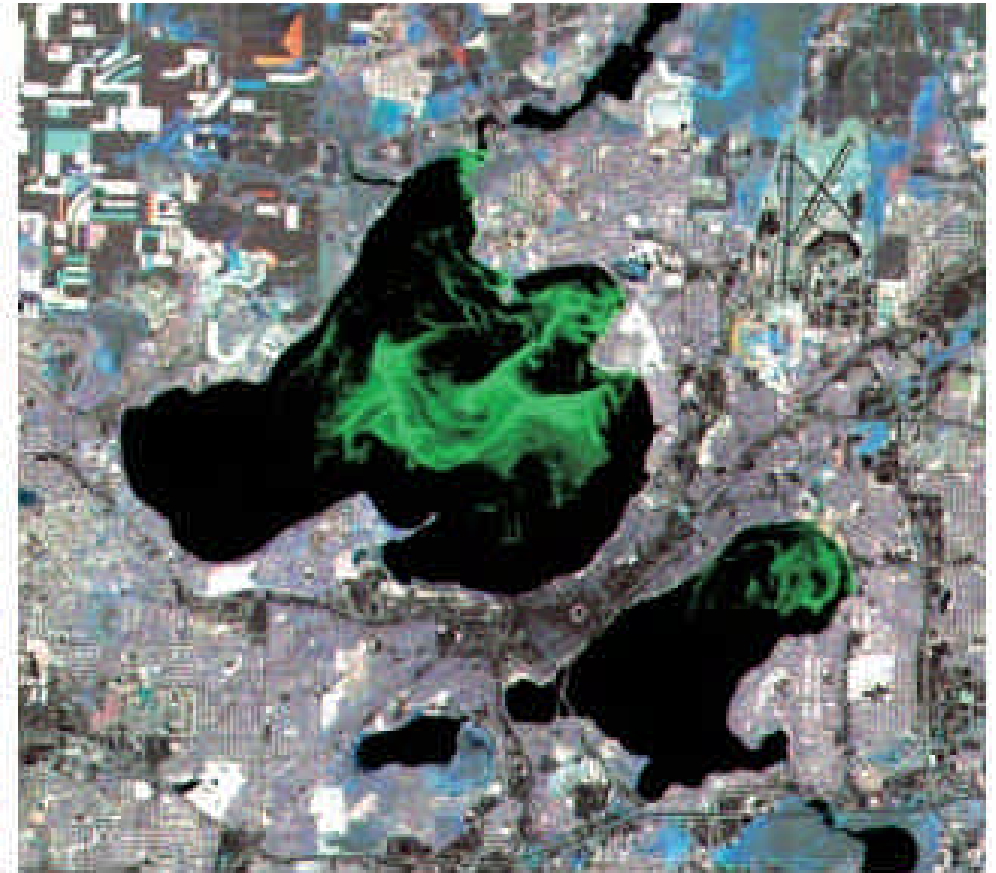
The Effect of Nutrient Removal on the Average Monthly User Fee

- Tier 3 (current): \$15.83 (nic property taxes)
- Tier 2: \$16.58 (4.7% increase)
- Tier 2N: \$17.69 (11.8% increase)
- Tier 1: \$24.09 (52.2% increase)
- Tier 1N: \$26.20 (65.5% increase)

Phase II of the Nutrient Study: Ecological and Recreational Benefits

- Quantify the cost of excess nutrients, in recreation activities:
 - Fishing, Boating, Swimming, Duck hunting, Tourism
- Quantify the cost of excess nutrients in treating our drinking water
- Quantify the effect of excess nutrients on livability, property values, social well-being

Environmental Impacts



Lakes Mendota and Monona, Madison Wisconsin

North Temperate Lakes Long Term Ecological Research Program,
<http://lter.limnology.wisc.edu>



Questions?