

An aerial photograph of a rural landscape, likely in the Spring Creek Watershed. The terrain is a patchwork of green fields, brown soil, and some wooded areas. A prominent red outline traces the boundary of the watershed, which is roughly heart-shaped and covers a significant portion of the image. The text is overlaid on this image in a bold, yellow, sans-serif font.

ADAPTIVE MANAGEMENT IN THE SPRING CREEK WATERSHED

GOVERNMENT AFFAIRS
FEBRUARY 27, 2014

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SERVICES, INC.



Wisconsin



City of Lodi Wastewater Treatment Facility

- Located on Fair St.
 - Discharges to Spring Creek
 - Serves a population of 3,050
 - Treats 350,000 gal/day
 - Phosphorus Limit = **1.0 mg/L**
- Lodi's WPDES Permit
 - Reissued Nov. 1, 2011
 - Future Phosphorus Limit = **0.075 mg/L**
 - Very costly to get this last remaining portion of phosphorus out

WWTF Aerial Photo



City of Lodi

- WPDES Compliance Schedule (Current Permit)
 - Submit Operations and Needs Review October 31, 2012 
 - Submit Facilities Planning Status Report October 31, 2013 
 - Submit Facility Plan October 31, 2014
 - Refine Facility Plan October 31, 2015
 - Construction Plan Submittal July 30, 2016
 - Next Permit (2016 – 2021)
 - Comply with limits September 30, 2020*
- *Under adaptive management, stream compliance would be required by 2026, or possibly by 2031 if certain criteria are satisfied.

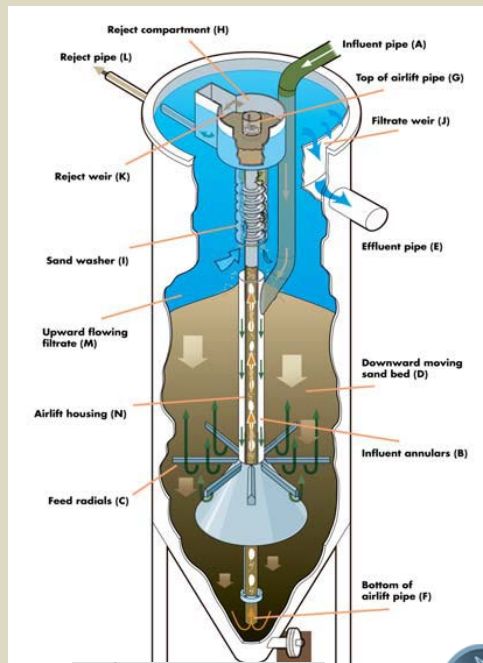
Lodi ONR Goals

- Conduct Operation and Needs Review
- Identify ways to optimize existing facility
- Identify cost of meeting WQBEL via treatment
- Determine whether Adaptive Management (AM) or Water Quality Trading (WQT) offer potential cost savings



Options for Phosphorus Compliance

- Two ways for Lodi to comply with phosphorus limit:
 - Treatment Facility upgrades to meet 0.075 mg/L
 - Watershed-Based Phosphorus Reductions



Vs.



Watershed-Based Options

- Reduce phosphorus inputs to the receiving stream instead of treating final effluent to meet permit limit
 - **VOLUNTARY** Compliance Option for Point Sources
 - Reduce nonpoint loads inside and outside the municipality
 - Work with stakeholders in the watershed (urban nonpoint, agriculture, county land and water conservation depts., other point sources, etc.)
- Adaptive Management (AM)
- Water Quality Trading (WQT)

Urban & Other Best Management Practices

- Stream bank stabilization & restoration
- Wetland restoration
- Residential fertilizer management
- Stormwater treatment, detention, minimization
- Leaf pickup programs

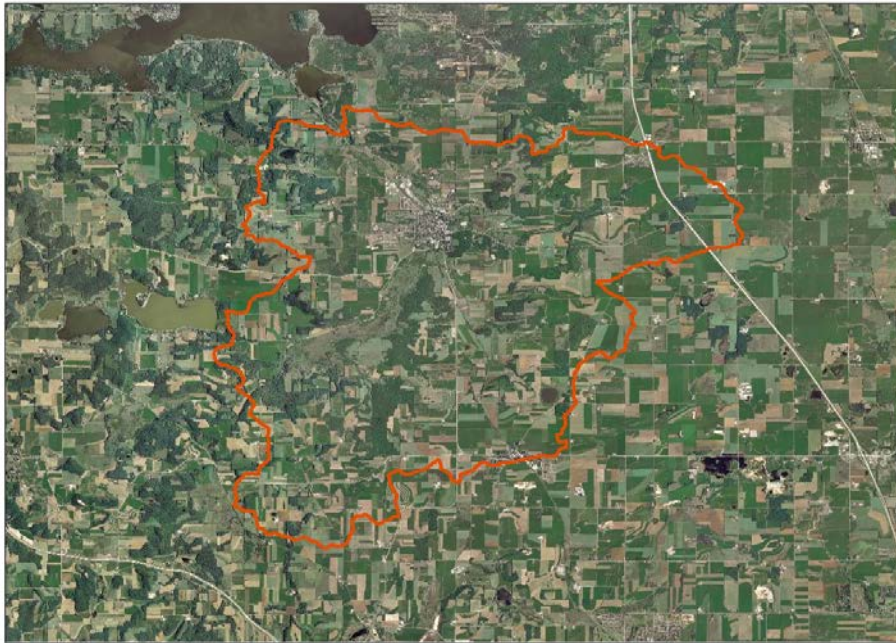


Agricultural Best Management Practices

- Example agricultural practices
 - Feedlot Production Area Mgmt
 - Vegetated buffer strips
 - Wetland restoration
 - Livestock exclusion
 - Contour farming
 - Tillage practices
 - Nutrient management plans (PI Management)
 - Manure Storage (Land Application Management)
 - Roofs/Diversions etc



Spring Creek Watershed

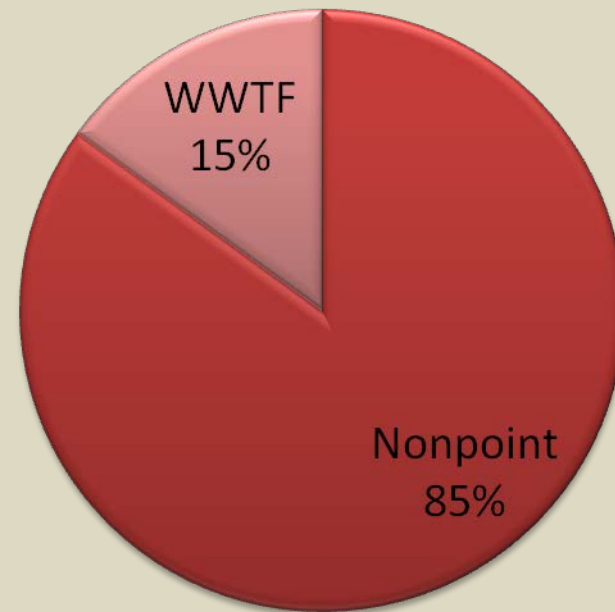


- Total HUC 12 area
 - 30,000 acres (46.88 mi²)
- Watershed area upstream of WWTF (“Action Area”)
 - 24,100 acres (37.66 mi²)
 - 43% in Columbia Co.
 - 57% in Dane Co.
- Agriculture is prevalent
- City WWTF is only municipal point source

Spring Creek Phosphorus Inputs

- Lodi WWTF P Contribution
 - ~ 900 lbs / yr into Spring Creek
 - 15% of the total P load
- Historic Data (Median Values)
 - 2002 Pleasant St : 0.13 mg/L
 - 2002 Fair St : 0.11 mg/L
 - 2008 USGS : 0.08 mg/L
 - 2011, 2012 : Close to the Stream Criterion of 0.075 mg/L

Spring Creek Phosphorus Loadings



■ Nonpoint ■ WWTF

Adaptive Management Requirements

- In order to meet stream criterion at existing WWTF flows:
 - ✦ Reduce effluent P concentrations to 0.6 mg/l or less
 - ✦ Eliminate at least **630 lb P/year** from the watershed

- In order to maintain stream quality at future WWTF design flows:
 - ✦ Maintain effluent P concentration at interim limit of 0.5 mg/l or less
 - ✦ Eliminate at least **870 lb P/year** from the watershed

ONR Conclusions

- Economic Comparison

- Treatment-Based *Present Value*: \$4.2 million
- Adaptive Management *Present Value*: \$2.7 million

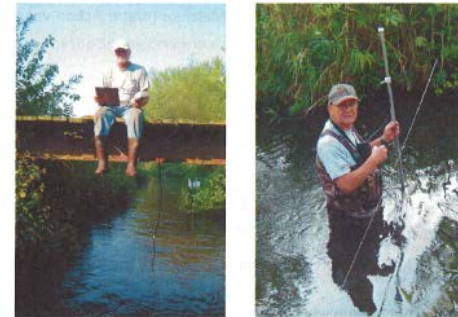
Present Value can be thought of as the amount of money you would need to have in the bank right now that would be enough to construct the improvement and then operate it for the next 20 years. At the end of 20 years, the bank account would have a zero balance.

Existing Assets for Adaptive Management

- Stream sampling data
 - Columbia County LWCD, UWSP, Friends of Scenic Lodi Valley
 - DNR funding
- 2011 and 2012 Data – Very Comprehensive
- Columbia County LWCD Priority Watershed/ Priority Farm Approach (farm inventories and existing knowledge)

Spring Creek Watershed Survey

River Grant Project No. RP-157-09



Project Sponsor – Friends of the Scenic Lodi Valley

Prepared by

Ron Martin

Friends of the Scenic Lodi Valley

And

Jean Unmuth

Wisconsin department of Natural Resources

February, 2012



0 0.25 0.5 1 Miles

— Spring Creek
● Monitoring Stations

Image: UW-Stevens Point and Columbia County LWCD

Water Quality by Sample Location

2012 Results

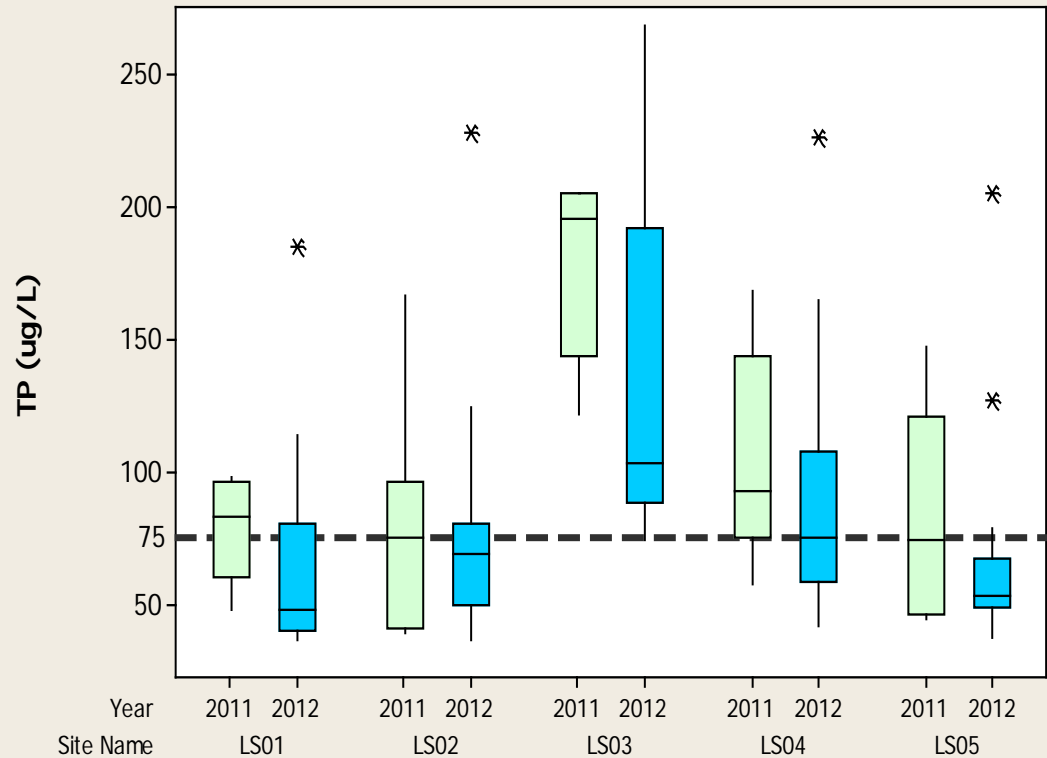
Spring Creek Watershed Water Quality Report

February 2013

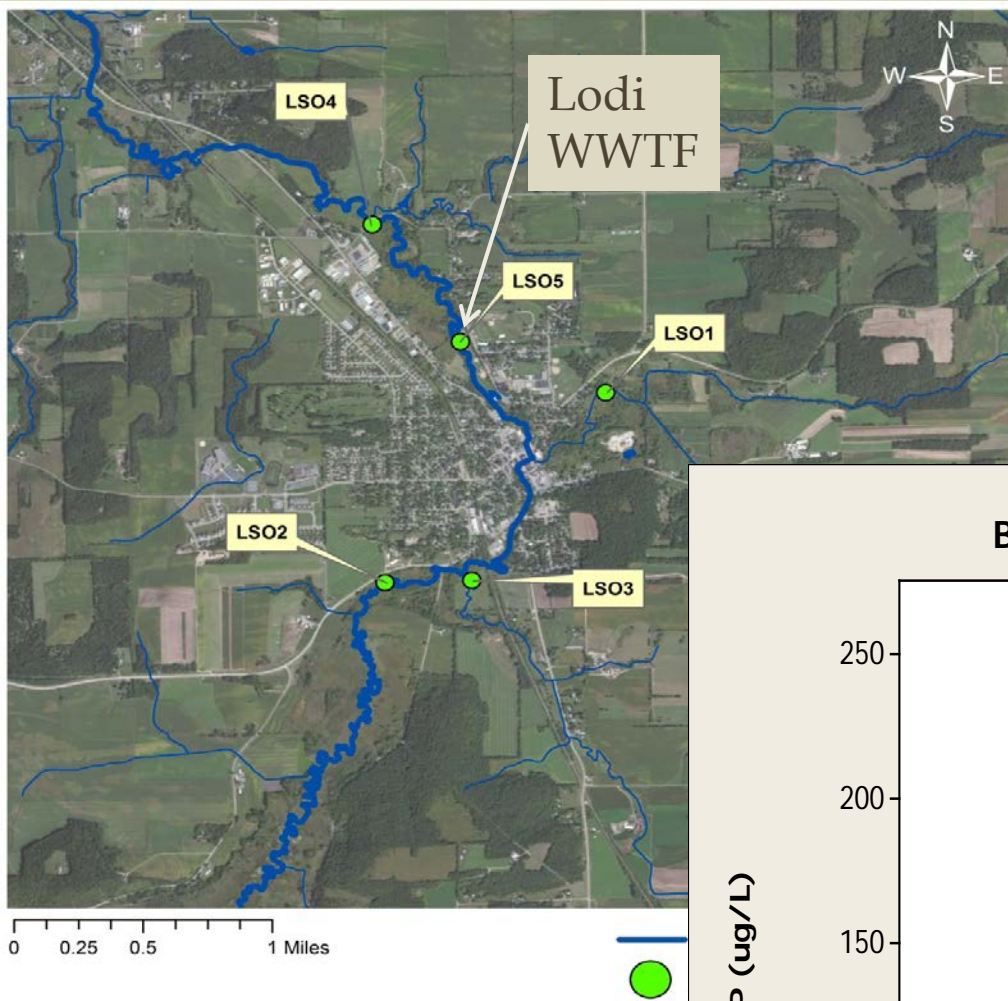
Prepared by M. Radske and N. Turyk



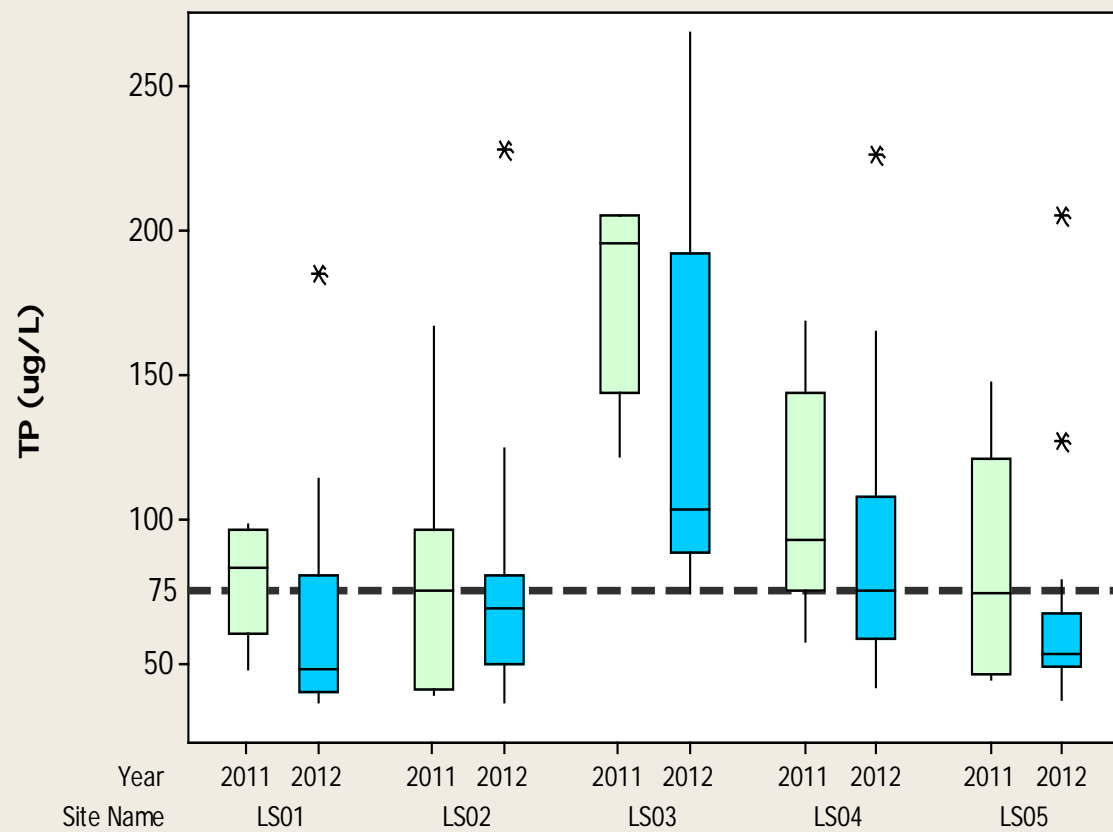
Boxplot of TP (May 1st - October 31st)



Report courtesy of UW-Stevens Point and Columbia County LWCD

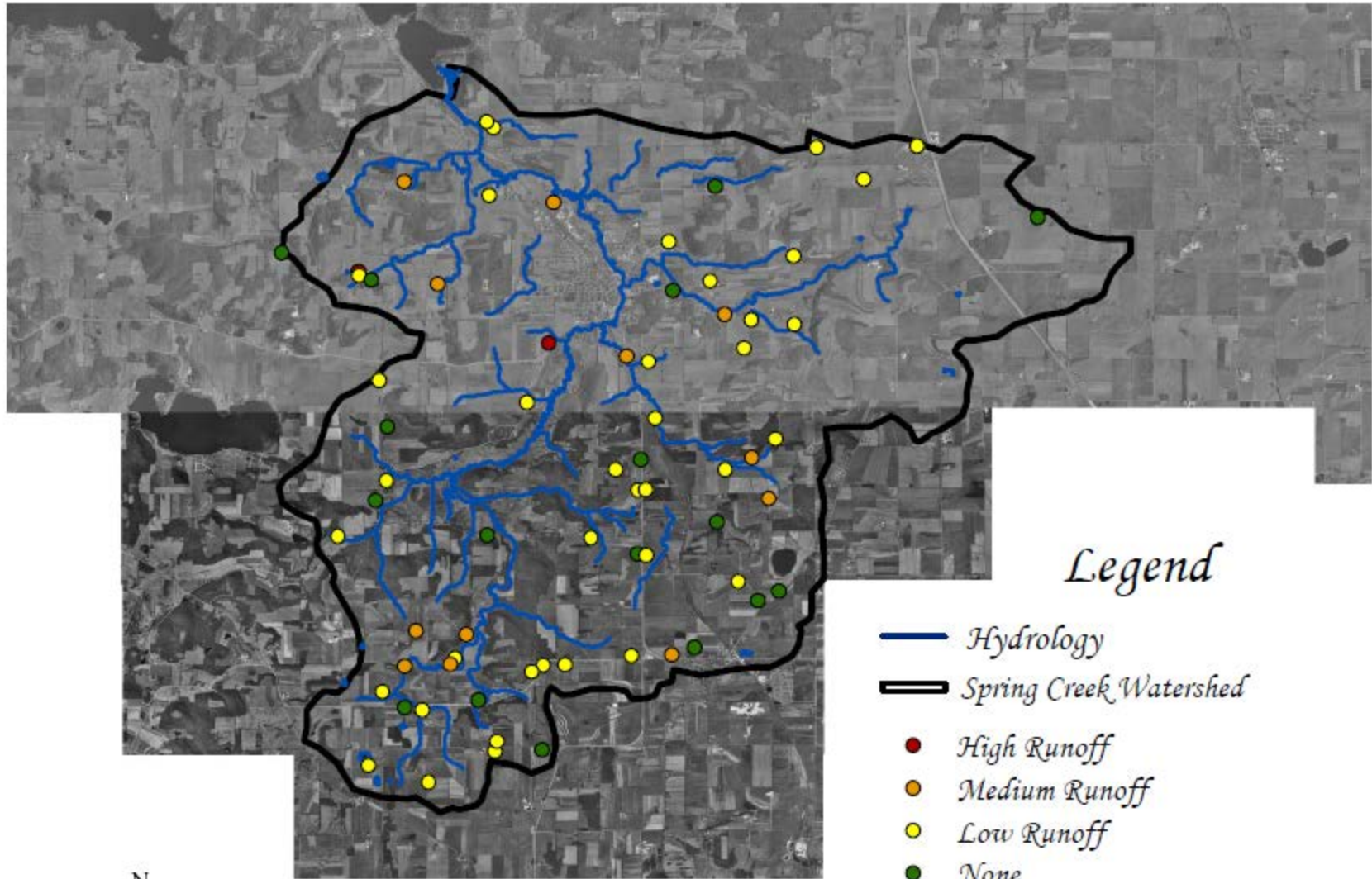


Boxplot of TP (May 1st - October 31st)



Spring Creek Watershed

Direct Runoff from Barnyards



Legend

- Hydrology
- Spring Creek Watershed
- High Runoff
- Medium Runoff
- Low Runoff
- None

Columbia & Dane County Aerial Photograph



Adaptive Management

- DRO Sites and Potential P Reductions

Runoff Category	Livestock Sites	Estimated Average P DRO Reduction (lbs/yr)	Estimated High P DRO Reduction (lb/yr)	Estimated Total Available DRO P Reduction at Average Range (lbs/yr)	Estimated Total Available DRO P Reduction at High Range (lbs/yr)
1	14	60	85	840	1190
2	38	17.5	34	665	1292
3	17	na	na	na	na
Totals	69	-	-	1505	2482

Table courtesy of Columbia County Land and Water Conservation Dept.

1,505 lb P removal potential from 52 sites > 870 lb/year
Sufficient P removal likely obtained through barnyards alone

Moving Forward – Stakeholder Involvement

- City of Lodi
- Landowners
- Columbia County LWCD
- Dane County LWCD
- Friends of Scenic Lodi Valley
- UW-Stevens Point
- DNR
- Others?



Moving Forward – Short Term

- Lodi is currently in Year 3 of their Permit
 - Counties perform barnyard inventories in First Part of 2014
 - Confirm stream loads and load reductions required
 - Confirm load reductions available and refine cost estimates
 - Identify if threshold exists where ‘soft practices’ become more cost effective than ‘hard practices’ currently proposed at barnyards
 - Develop watershed model / foundation for eventual Adaptive Management Plan
 - **Submit Facilities Plan by October 31, 2014**
- Goal for Year 4
 - **Submit Adaptive Management Plan to DNR 2015**

Moving Forward – Short Term

- Education and Outreach
 - Producer Meeting – Held January 30, 2014 Done
 - ✦ Education regarding the new phosphorus rule
 - ✦ Explain the City's permit and adaptive management
 - ✦ Discuss challenges, concerns from all parties, and benefits
 - ✦ Let them know that the County will be doing site visits
 - Mailings to City residents – May 2014 (Coming)
 - ✦ Education regarding the new phosphorus rule
 - ✦ Spring Creek as an underutilized resource for residents
 - ✦ Activities that the residents can do to help reduce phosphorus discharges (phosphate-free products, fertilizers, reduced runoff, etc)

Upcoming Activities – Long Term

- Assuming that Adaptive Management is the final recommendation:
 - Lodi would become an active partner in the Spring Creek Watershed Initiative that began in 2008
 - Implement Nutrient Management Plans and BMPs to reduce phosphorus loads to Spring Creek (2016-2021)
 - Implement additional BMPs as deemed necessary and demonstrate compliance with criterion (2021-2026)
 - Maintain improvements and maintain water quality
- Producer input, engagement, and cooperation with Columbia and Dane County Land and Water Conservation Departments will be critical toward the success of this project.

New Roles and Opportunities

- LWCD is new player in point source world, or Municipalities are new player in nonpoint source world?
- Either way, both entities have learning curves to overcome
- Both bring unique skill sets to the fusion of point and nonpoint source compliance

Takeaways (LWCD Perspective)

- Consultants and municipalities aren't all that familiar with activities at the County level and what producers are up against
- We don't know a lot about what municipalities and consultants do as far as wastewater treatment.
- The key is bridging gaps and sharing knowledge
- The biggest challenges lying ahead:
 - Staff & resources, Funding for improvements
 - Long Term Compliance
 - Modeling tools necessary for prediction and quantification of loads

QUESTIONS and DISCUSSION

