

Working Smart for Environmental Protection:

State Efforts to Improve Permitting Processes
Using Lean and Six Sigma

ECOS Annual Meeting
August 27, 2006, Portland, OR

Session Outline

- Overview of Primer on State Agency Experiences with Lean and Six Sigma
- State Process Improvement Efforts
 - Iowa
 - Delaware and Michigan
 - Virginia
- Next Steps Discussion

"Working Smart for Environmental Protection" Primer Background

- Experiences of five States using Lean and Six Sigma methods to improve agency processes
 - Delaware – Department of Natural Resources and Environmental Control
 - Iowa – Department of Natural Resources
 - Michigan – Department of Environmental Quality
 - Minnesota – Pollution Control Agency
 - Nebraska – Department of Environmental Quality
- Includes background, results, & lessons learned
- EPA provided advisory and contractor support from Ross & Associates Environmental Consulting

Lean and Six Sigma Have Yielded Impressive Results for State Agencies

- Eliminated or dramatically reduced permit application backlogs
- Reduced lead times for permit reviews by more than 50%
- Decreased the complexity of permit processes
- Improved the quality of permit applications and the consistency of permit reviews
- Allocated more staff time to "mission critical" work
- Improved staff morale and process transparency

Some Background

- Techniques were originally developed for manufacturing, but have been adapted to address waste and inefficient approaches in administrative processes (e.g., permitting)
- These “Lean” methods include Value Stream Mapping, Kaizen, and Six Sigma—different names and slightly different approaches to reach the same bottom line

What Are Lean and Six Sigma?

- Lean:
 - A production approach and set of methods
 - Systematically identifies and eliminates non-value-added activity (waste)
 - Methods include value stream mapping and kaizen events
- Six Sigma:
 - A rigorous methodology to eliminate process variation and improve quality
 - Uses statistical analysis to measure and improve an organization’s performance and practices

Focus Is on Eliminating Waste, Leaving More Time for "Mission Critical" Work

- Lean and Six Sigma eliminate unnecessary process steps that have built up over time
 - Methods improve understanding of how processes really work on the ground
 - Focus is on optimizing desired outcomes
- In non-manufacturing processes, waste is most prevalent in information flows
- Process improvements enable agency staff to work on higher value activities more directly linked to environmental protection
 - Agencies work smarter, not just faster

Lean and Six Sigma Methods Have Broad Applicability

- More and more States are using Lean and/or Six Sigma methods to improve agency processes
- Process-improvement projects have included:
 - Air construction permitting
 - NPDES wastewater permitting
 - Leaking underground storage tank (LUST) corrective action reporting and implementation
 - Landfill and floodplain permits
 - Feedlot inspections and construction permits for animal feeding operations
 - Agency administrative processes

Sustained Organizational Commitment to Process Improvement is Critical

- Successful process improvement requires organizational commitment over the long term
- Other key success factors:
 - Secure top management buy-in and support
 - Articulate boundary conditions early
 - Scale project scope appropriately
 - Collect data to learn how processes really work
 - Involve stakeholders in improvement events
 - Be transparent—communicate with staff and stakeholders during planning and implementation
 - Conduct periodic project follow-up meetings

Common Reactions

- Expect some initial staff resistance:
 - “We’ve already tried that.”
 - “The focus on streamlining processes may erode environmental protections.”
 - “We don’t have time to focus on process improvement.”
- *Proactive communication and demonstrating positive results can alleviate these concerns*

Opportunities for the Future

- Potential areas for collaboration include:
 - Experience transfer – getting started, problem-solving techniques
 - Peer communications – successes, pitfalls
 - Training and agency capacity building – developing new skill sets

Summary of Lessons Learned

1. States are successfully using Lean and Six Sigma to improve regulatory and non-regulatory processes
2. States have seen impressive results while maintaining levels of environmental protection & public involvement
3. Lean and Six Sigma eliminate unnecessary process steps, enabling staff to focus on “mission critical” work
4. Lean and Six Sigma have broad applicability to help agencies achieve environmental goals more effectively
5. Sustained organizational commitment is critical to long-term success of process improvement efforts

Iowa DNR Lean Journey

Wayne Gieselman

Iowa Department of Natural Resources

Iowa

Iowa DNR Lean Journey

- Approached by the Iowa Coalition for Innovation & Growth in April 2003
 - Hot Team on Business Development Processes
 - Improve key business development processes that are viewed as barriers to a business's ability to develop and/or grow in Iowa
 - Public-private partnership proposed

Event Results

- Air Quality New Source Construction Permits
 - Steps reduced by 70%; Lead-time reduced by 85%
- Construction permits funded by Clean Water State Revolving Fund (SRF)
 - Steps reduced by 52%; improved communication
- Landfill permits
 - Permitting time reduced from 187 days to 30 days (83%)
- Sovereign land permits, environmental review and 401 certifications
 - Steps reduced by 60%; better permit sort process

Event Results, Continued

- Leaking Underground Storage Tanks: Corrective Action Design Report
 - Steps reduced by 72%; streamlined strategy approval
- NPDES permits
 - Steps reduced by 61%; created communication plan
- Complex air construction permits
 - Reduced lead time from 214 days to 180
- SRF/IFA Financial Management (DNR/Iowa Finance Authority)
 - Established new process for more efficient financial management

Event Results, Continued

- Manure Management Plans
 - Steps reduced by 67%; prioritized inspection resources
- Legal Services
 - Delays reduced by 56%; developed compliance priorities
- Land Acquisition
 - Steps reduced by 44%
- Confined Animal Feeding Operation permits
 - Delays reduced by 92%; Lead time reduced by 45%

Event Results, Continued

- Iowa Conservationist
 - Designed new product in three days
- Small Business Air Emissions Assistance (UNI/IWRC)
 - Steps reduced by 12%; Hand-offs reduced by 15%
- Magazine Production
 - Hand-offs reduced by 46%; Developed advance planning schedule
- SRF Cross-cutters
 - Delays reduced by 40%; steps reduced by 32%; hand-offs reduced 30%

What Did We Learn?

- We could improve customer service without sacrificing the environment
- Change could occur in one week
- We could sustain the gains and continue to improve
- Removing waste allows staff to focus on mission critical activities
- The impact on Iowa's regulatory climate affects our economic competitiveness
 - Improving the turnaround time of regulatory processes and approvals enhances the ability of business to meet economic development timelines.

Critical Components

- External stakeholders need to be at the table
- Involve EPA from the beginning
- Culture Change doesn't happen overnight and it doesn't happen easily
 - You must DRIVE change from the top down
 - Change Management and Leadership training raises the bar of performance
 - Integration into performance plans establishes the mandate to meet the new expectations
- Communication - it must be frequent & consistent
 - Culture change is a non-negotiable course
 - Lean is a non-negotiable strategy

Moving Forward

- DNR sets the example, state government follows
 - Fourteen agencies involved to date
- Management agency establishes Office of Lean Enterprise
 - Full-time, permanent position to institutionalize effort
- DNR renews commitment with full-time staff
- Continuing partnership with the private sector
 - Training opportunities to build internal expertise
 - Support through the transition to a new administration



Delaware and Michigan's Approach

Value Stream Mapping

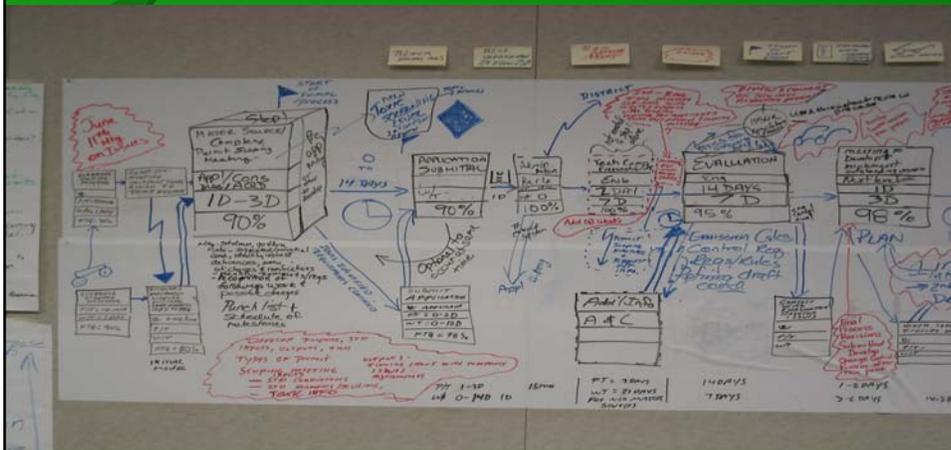
Lynn Fiedler
Michigan DEQ



What Is a Value Stream?

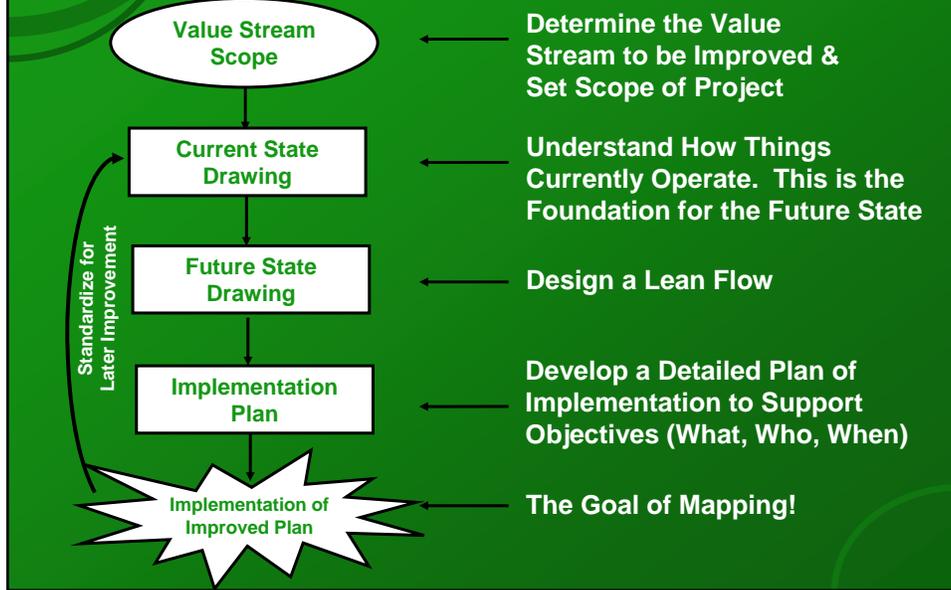
- A Value Stream Involves All the Steps, Both Value Added and Non-Value Added, Required to Complete a Product or Service from Beginning to End

Value Stream Map



- Visual Representation of a Process (Value Stream)
- Helps Reveal Waste & Problems with Flow
- Establishes a Common Language for Documentation
- Provides a Blueprint for Improvement

Using the Value Stream Mapping Tool



Timing of VSM Process in Michigan

VSM Training	March 29, 2004
Scoping Session	April 1, 2004
Workshop (Mapping & Implementation Plan)	April 26, 27, 28, 2004
Process Redesign	May – August 2004
New Process Implemented	September 7, 2004
Status Reviews	30, 60, 90, 120 Days Now Quarterly

Participants in VSM Workshop

- State Regulatory Agency Staff
 - Representing All Involved in the Process, including clerical
- Auto Companies
- Other Manufacturing Representatives
- Manufacturing Association Representative
- State Economic Development Representative

In Scope

- Interpretation of Rules, Policies, etc.
- Organizational Structure
- Communication (Internal or External)
- Electronic Submittals
- Application Content
- Agency Process & Timing
- Applicant Process & Timing
- Permit Content

Out of Scope

- EPA Regulations
- Agency Rules
- Title V Permitting
- Additional Resources
- Public Participation Requirements
- Appeal Process
- New Software or Computer System
- Permits Involving Enforcement Actions

Permitting Metrics for Large Source (Includes Public Comment)

	Industry Estimate Before Workshop	Current State Map Workshop Day 1	Future State Map Workshop Day 2
Process Time	130 days	61 Days	100 Days
Wait Time	515 days	322 days	80 Days
Lead Time (Process + Wait)	645 days	383 days	180 Days

Creating the Future State

Delaware's Future State Where We Wanted to be in One Year:

- Internal First Pass Quality Yield - 80%
- Customer Information Quality - 80%
- Administrative Completeness - 100%
- Technical Completeness - 80%
- Re-work Less than 50%
- Construction Permit Issued Within 90 days



Delaware and Michigan

#	OBJECTIVE & METHODS	TARGET	ASSIGNED	April	May	June	July	Aug	Sept	STATUS
1.0	OBJECTIVE: Eliminate rework / waiting in permitting process ensuring requirements, issues, and goals are identified and clearly communicated prior to application submittal and/or initiating engineering review	Completion of permit evaluation by milestone dates	Bill Presson							
	METHODS / ACTION:									
1.1	Establish permit scoping meeting scheduling mechanism including dates, location and staffing	Develop written procedure	Steve Zervas		draft	2nd draft				Green - Closed
1.2	Develop Permit Scoping Meeting (PSM) information package including: -Purpose Statement -Checklist with instructions -Other related material		Bill Presson							Yellow - On Track Some Product Development will extend beyond project implementation date * see table

Getting from Current to Future Business Deployment Plan

start | Nov... | Delawar... | http://w... | 72-03 dr... | 2 Micr... | 11:47 AM

Delaware and Michigan

Results

**Average Time for Review
Decreased to Under 60 Days for Both Agencies**

**Applications Under Review Decreased
75% in DE & 50% in MI**

- Improved Morale within Agency
- Better Working Relationships with Applicants
- Staff Initiating Additional Efficiencies

Review of Virginia DEQ's Permit Programs

David K. Paylor, Director
Virginia Department of Environmental Quality

Virginia

Efficiency Review of Permit Programs

- Mandated by Legislature in 2004 in conjunction with increases to permit fees
- Permit Peer Review teams created- program staff and industry representatives
- A consulting firm experienced with conducting similar reviews was to be utilized
- Included “process mapping” to help focus discussions

Project Goals

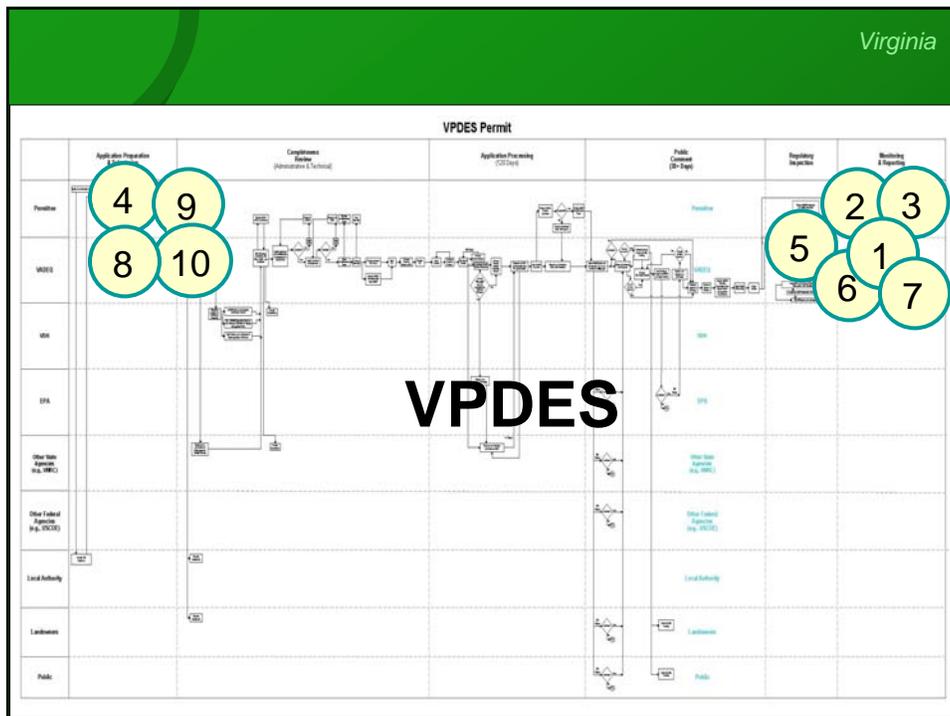
- Identify/assess operational changes in DEQ permitting programs that would improve the efficiency and effectiveness
 - Application, processing, monitoring and reporting, and inspections
 - Five programs reviewed simultaneously:
 - Air
 - Water – Virginia Pollution Discharge Elimination System Permit
 - Hazardous waste
 - Solid waste
 - Wetlands
- Identify approaches to reduce the costs of compliance for both DEQ and the regulated community

Review Participants

- Industry representatives
- Program staff
- Environmental advocates
- Internal and external interviews conducted by consultants to identify opportunities for improvement

Review Included

- Interviews of Industry representatives
- Interviews with Environmental groups
- Interviews of program staff
- Research of permit program processes in other states
- Reviews of agency documents
- Development of process maps to identify areas for improvement



Multi-media Improvements

- Improve regulatory rulemaking
 - Pilot proposed regulations before promulgation.
 - Broaden stakeholder input into process.
- Improve permit application process
 - Develop on-line application process.
 - Customize and streamline application forms so that the applicant completes only the information necessary for VADEQ to conduct its review.
- Standardize guidance formats
 - Improve the format and structure of VADEQ procedures and guidelines.
 - Make guidance documents across media more fluid and consistent in regard to content.

Multi-media Improvements

- Cross-train staff
 - Cross-train inspectors to handle multi-media inspections at small facilities.
- Improve inspection efficiency and effectiveness
 - Shift inspection focus to higher risk operations and activities that have historically been subject to fewer regulations/controls.
 - Explore opportunities to adjust inspection frequency or type of inspection for permittees with demonstrated environmental performance improvement programs.
- Electronic submittal and storage of monitoring data and reports
 - Redefine VADEQ's recordkeeping and document control procedures to address electronic documents.
 - Pro-actively manage transfer of documents from hard copy to electronic format.

Multi-media Improvements

- Public Participation
 - Educate public about the public comment and public hearing process, the DEQ's role, and its resource requirements.
 - Amend regulations to state that unless required by statute, public meetings and hearings will be held only when requested.
 - Facilitate implementation of "self-service" FOIA requests.
- Workforce Development and Staff Development
 - Train staff on new regulations and procedures.
 - Reward and recognition program for staff.

Lessons Learned/Outcomes

- On-line surveys vs. personal interviews
- Significant opportunities for Multi-media improvements
- Prioritize and pilot
- Transparency = trust
- Quantify savings

Status of Tasks to Implement Improvements

Program	Complete	Underway
Air	2	33
HW	6	5
SW	10	18
VPDES	10	25
Wetlands	9	31

Virginia-Specific Information

- Webpage for final report, status reports, and summaries:
<http://www.deq.virginia.gov/info/permitreview.html>

Next Steps Discussion

What Types of Assistance Would be Worthwhile?

1. Forums and other opportunities for information and experience sharing (e.g., regional briefings)
2. Peer communications (e.g., management level)
3. Training and capacity-building assistance for agency process improvement efforts (e.g., coaching skills, problem-solving methods, techniques for applying tools and running events effectively, etc.)
4. Facilitation services
5. Other ideas?