
User-friendly Features

- Internet-based Decision Making Tool
- Decision Tree: Narrows down options
- Case Studies & Photo Gallery: Concrete examples
- Resource Referral
- No need to be a P2/S expert

Toolkit Components

- Decision Tree links to:
 - 15 Options, each with individual information sheet.
 - Case Studies; Resource Referral
- Showcase of Ideas: Photo Gallery
- Terms and Policy
- Voluntary Project Tracking
- Recognition and Awards

Toolkit Website

<http://www.pca.state.mn.us/programs/p2-s/toolkit/index.html>

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Seeking Enhanced Environmental Outcomes at Cleanup Sites

Pollution-prevention (P2) practices promote reducing waste generation at the source of production, recycling or reusing waste once it is generated, and conserving energy, water and other raw materials. "Reducing" means lessening the quantity or toxicity of toxic pollutants, hazardous substances and hazardous wastes used, generated or released at the source by means other than a decrease in facility output. "At the source" means eliminating waste at the point of generation, rather than controlling or treating the pollutant at the end of a discharge pipe or stack. P2 practices make almost any process more efficient or cleaner, thereby reducing the cost of operating a business or organization.

Sustainability is an approach to problem-solving that acknowledges the interconnection of environmental, economic and social decisions, and which helps ensure future generations can meet their needs. Pollution prevention, resource and energy conservation, and environmental restoration and enhancement are cornerstones of sustainability. Sustainable activities aim to:

- Conserve resources and energy;
- Use resources equitably;
- Minimize or eliminate the buildup of natural or man-made substances beyond what nature and humans can safely assimilate;
- Avoid manipulating ecosystems in ways that undermine their ability to renew themselves;
- Efficient use of natural resources to avoid further depletion;
- Production models inspired by nature's ability to consume its own waste.

Greener Practices

Pollution Prevention & Sustainable Activities



Site Cleanup

Business Practices

Site Development & Renovation

Seeking Enhanced Environmental Outcomes

Pollution prevention and sustainable activities (P2/S) can produce enhanced environmental outcomes at greenfields or contaminated and other regulated sites. With stakeholder assistance, the Minnesota Pollution Control Agency produced an Internet-based, interactive toolkit designed to promote P2/S at these sites. By relating a limited number of options to the regulatory process and increasing access to expertise, the toolkit streamlines the process of evaluating and selecting options. Through a process of elimination, the toolkit user is able to focus on the most feasible options for a site.

Innovative Results

- Voluntary enhanced environmental outcomes.
- Bridge between environmental regulatory programs and regional economic and community strategies.
- Site-appropriate options and resource referrals.



Minnesota Pollution Control Agency

GREENER PRACTICES: Pollution Prevention and Sustainable Activities (P2/S)

◆ Remediation Scenario	◆ Internet Toolkit Options	◆ Minnesota Case Studies	◆ Goals of P2/S Options	◆ Regulatory Staff Role
<p>Cleanup Remedy Selection</p> <p>“How can cleanup enhance the environment and avoid creating new pollution sources?”</p>	<p>Option 1-1: In-situ Treatment</p> <p>Option 1-2: Innovative and More Efficient Remedies</p> <p>Option 1-3: Constructed Wetland Treatment Systems</p> <p>Option 1-4: Natural Habitat Restoration, Enhancement or Replacement - Green Space Development</p> <p>Option 1-5: Deconstruction</p> <p>Option 1-6: Recyclable or Recovered Environmental Material</p>	<ul style="list-style-type: none"> ■ In-situ treatment of chlorinated solvents with potassium permanganate (Pilot) ■ Sandhill Crane habitat at landfill ■ Diminished efficacy of groundwater sparging: Irrigation Polishing Pilot ■ Twin Cities Army Ammunitions Plant: deconstruction of buildings ■ Constructed wetlands at landfill and restored wetlands elsewhere 	<ul style="list-style-type: none"> ■ Avoid cross-media transfer. ■ Enhance, restore and replace habitat. ■ Encourage reuse of recovered product or salvage construction materials. ■ “Sustainable” remedies that take advantage of natural systems. 	<p>For sites at which a No Action remedy is not adequate, regulatory staff review and approve response action plans that may include P2 or sustainable activity:</p> <ul style="list-style-type: none"> ■ Alternatives to groundwater pumpout systems that are energy efficient and avoid discharge to WWTPs (e.g., constructed wetlands); ■ Treatment that avoids cross media transfer; and ■ Building deconstruction (salvage materials for reuse). <p>Staff who encourage clients to pursue alternate cleanup remedies can raise confidence in the level of regulatory support for P2/S approaches.</p>
<p>Ongoing or New Business</p> <p>“How can P2/S approaches bring regulatory and economic benefits to my business?”</p>	<p>Option 2-1: Pollution Prevention Evaluation</p> <p>Option 2-2: Materials Exchange</p> <p>Option 2-3: Reduce Regulatory Burden</p> <p>Option 2-4: Environmental Management System Approaches</p> <p>Option 2-5: Design for the Environment</p>	<ul style="list-style-type: none"> ■ Several metal-plating operators have improved their processes with help from Minnesota Technical Assistance Program (MnTAP) ■ Companies use Minnesota Office of Environmental Assistance’s Design for Environment Workbook ■ MPCA EMS Pilot Programs ■ Minnesota Materials Exchange 	<ul style="list-style-type: none"> ■ Help avoid future releases like those being cleaned up. ■ Reduce regulatory burden. ■ Design manufacturing processes and products that contain the least amount of toxic materials or enable end-of-life takeback. ■ Environmental Management Systems. ■ Purchase environmentally friendly products. 	<p>For sites at which a known or threatened (potential) release can be attributed to an operating business or a new business that is subject to environmental regulations. Regulatory staff may refer clients for P2/S assistance to:</p> <ul style="list-style-type: none"> ■ MPCA compliance programs, ■ MPCA Small Business Assistance Program or Ombudsmen, ■ Minnesota Office of Environmental Assistance, ■ Minnesota Technical Assistance Program.
<p>Development-Renovation</p> <p>“How can I enhance the property value my bottom line, or livability by incorporating P2/S principles?”</p>	<p>Option 3-1: Deconstruction</p> <p>Option 3-2: Cleanup Remedy Incorporates Development Plan</p> <p>Option 3-3: Environmentally Friendly Building & Site Design</p> <p>Option 3-4: Environmentally Friendly Office & Property Management</p> <p>Option 3-5: Low/No Discharge Stormwater Management Strategies</p> <p>Option 3-6: Natural Habitat Restoration, Enhancement or Replacement - Green Space Development</p> <p>Option 3-7: Design for the Environment</p>	<ul style="list-style-type: none"> ■ St. Paul Port Authority’s Maxson Steel site: Design remedial investigation data collection with details of development in mind (e.g., on-site stormwater management and some building designs) ■ The Green Institute: on-site storm water management and smart building design ■ Building footprints as caps. ■ Natural Resource Damages provisions of Superfund: Grey Cloud Dunes Prairie ■ Greenways along river corridor: Lower Phalen Creek site 	<ul style="list-style-type: none"> ■ Early planning: acknowledge links between cleanup and redevelopment plans so that the greatest economic flexibility and innovation can be realized. ■ Apply environmental valuation and long-term return-on-investment models unique to sustainable designs and low-impact development. ■ Treat brownfield risk management as a design asset. ■ Enhance, restore and replace habitats. 	<p>For sites at which development or renovation is planned, regulatory staff can provide interested regulatory customers with appropriate referrals. Some opportunities for P2 and sustainable activity that are within direct MPCA jurisdiction include preventing threatened releases of hazardous substances, storm water management, and management of air emissions and hazardous waste. MPCA staff must be ready for unexpected delays or abandonment of P2/S projects due to real estate transaction timelines or other conditions at cleanup sites. Options 2-1, 2-3, 2-4, and 2-5 may also be applicable.</p>