

# Comparative Case Studies of Industry, Consultant and Government Initiated P2 Assessments

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Enviro-Stewards Inc.  
Engineers & Scientists



# Agenda

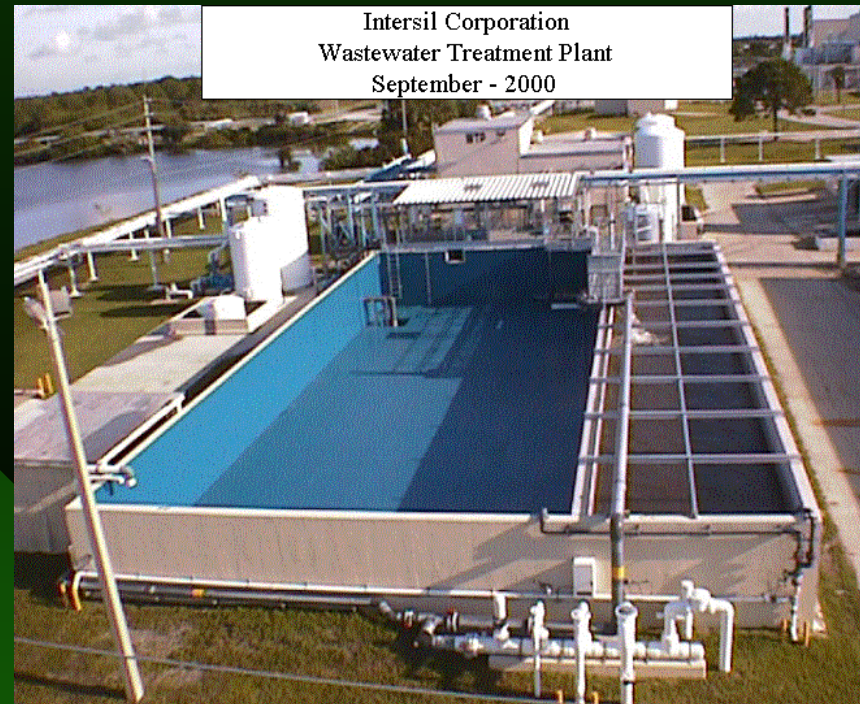
- Introductions
- Resource Efficiency Studies
  - Benefits
  - General Approach
- Case Studies of Initiated Assessments
  - Client Initiated, Aerospace
  - Consultant Initiated, Sugar Mills
  - Legislated, Paint Cleaning (DCM)
  - Co-funded, Waterloo BWQP, Foundry  
Toronto Torsus, Detergent Manufacturing
  - Development Initiated, Agricultural Cooperative
- Comparison of Initiation Sources

# 1. Introductions

Speaker: Bruce Taylor, P. Eng.  
President, Enviro-Stewards Inc.

Dedicated to helping our clients:

- conserve their resources, and
- effectively address their environmental liabilities



# Benefits of Pollution Prevention and Sustainable Development

- Identification and Justification of Cost-Effective Reduction Measures
- Reduction of Raw Material Consumption, Increase in Product Yields and Decreased Labor and Energy Usage
- Recovery of Waste Materials in a Concentrated State for Reuse/Recycle
- Increased Knowledge of Processes, Systems and Waste Reduction Techniques
- Reduced size, complexity and operating Cost of treatment facilities
- Improved Corporate Image and Marketability

# General Project Approach

## 1. In-Plant Study

- Investigating water using processes and waste generating operations
- Quantifying Process Inputs and Outputs
- Preparing Process Flow Diagrams (PFDs), Plant Layouts and Water & Material Balances

## 2. Engineering Evaluation

- Identifying Reduction, Reuse and Recycling Opportunities
- Selecting Effective Alternatives for Conceptual Design
- Determining Payback Periods and Completing Cost/Benefit Analysis
- Preparing an Implementation Plan

# Client Initiated: Kennedy Space Center and Cape Canaveral, Florida

Corporate Policy:  
Continuously Seek Ways to  
Reduce Three Largest  
Waste Streams

- Space Shuttle SRB Thrust Vector Control Clean Room
- SRB Refurbishment Facility Cooling Water System
- SRB Robotic Hydrolase Facility Washwater Recycling



# SRB Refurbishment Facility, Kennedy Space Center

## Clean Room

- 64% Reduction in Water Demand

## Cooling System

- 30% increase in Ozone Output
- Reduced Water Demand Due to Lower Chemical Consumption



# SRB Hydrolasing Facilities Cape Canaveral, Florida

- Sequencing of Unit Processes
- Treatability Testing of Particulate Removal Processes
- Increasing Unit Process Efficiencies
- Process Controls



# Consultant Initiated: Sugar Mills & Refineries

## First Mill

- eliminated RO water and WWTP expansions
- increased revenues by >\$1 million/year

## Second Mill

- 36% water savings, 46% sucrose savings
- 90% chemical savings facilitated wastewater reuse



## Third Mill (Land recovered for Everglades Influent Pretreatment)

- marketed and sold assets, managed abatement and dismantling, returned excess funds to owner

## Paint is Presently Removed with Methylene Chloride (DCM)

- Requires a P2 plan under pending Environment Canada legislation;
- Worker Health & Safety Concern;
- Effluent Treatment Concern;
- Air Emission Concern.

Alternatives are Being Evaluated  
such as soluble media (baking soda)  
blasting

# Funding Initiated – Waterloo BWQP Metal Finishing, Metal Foundry (Objective is Groundwater Protection)



Particulate &  
Organic Control



Flow Control

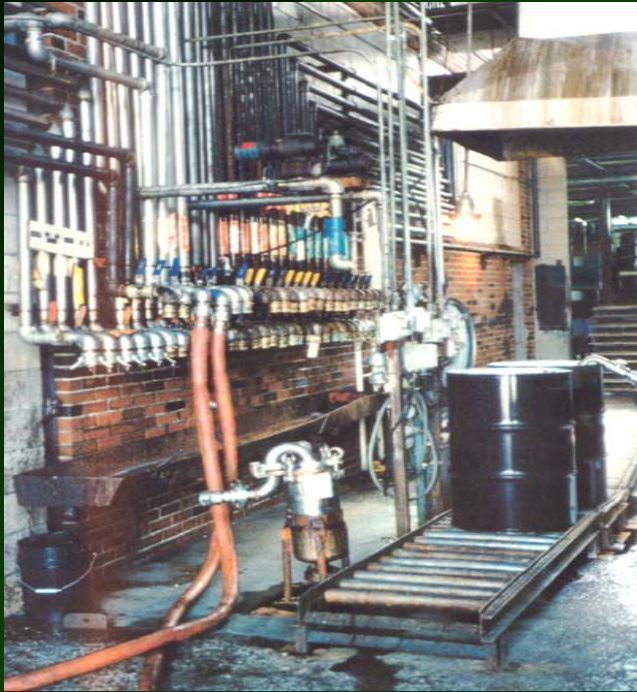


Dilution Control



TDS Control

# Funding Initiated – Toronto Torsus Detergent Manufacturer (Objective is Multiphase P2)



Subject Pollutants are presently lost during Blending and Transferring Procedures

**Long Term P2:** Products are Being Reformulated to Eliminate Subject Pollutants

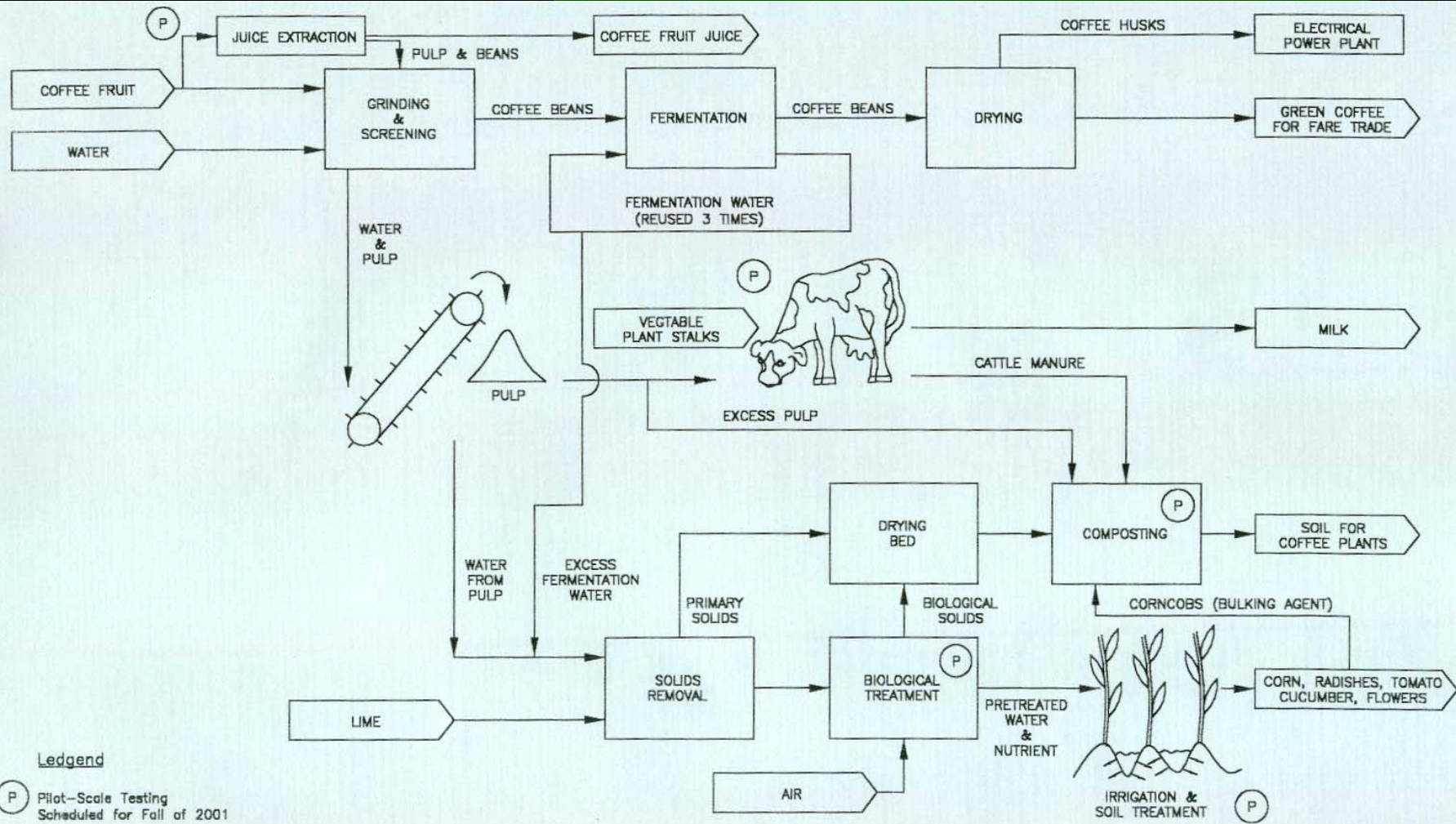
**Short Term P2:** Use of Dedicated equipment, containment and reuse of rinse water to minimize discharges

# Development Initiated: Las Lajas Agricultural Cooperative, El Salvador

## Sustainable Development

- Environmental Sustainability
- Social Sustainability
- Economic Sustainability





**Legend**

(P) Pilot-Scale Testing  
Scheduled for Fall of 2001



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Figure 3

PROPOSED SUSTAINABLE DEVELOPMENT STRATEGY  
CONCEPTUAL PROCESS DESIGN  
LAS LAJAS COOPERATIVE  
SONSONATE, EL SALVADOR

# Las Lajas Environmentally Sustainable Development Program

# Comparision of Initiation Sources

- **Client Initiated**
  - Excellent Commitment to implementation,
  - Too Few Clients have this Mindset.
- **Consultant Initiated**
  - Excellent Results,
  - Works Best With Large, Sophisticated Clients
- **Legislated**
  - Good For Broad Scale Mobilization
  - Single Media Focus Can Miss Opportunities
- **Co-Funded**
  - Excellent for Elevating Priority of P2
  - Multiphase is Difficult with Funds Allocated
- **Development Initiated**
  - Excellent Long Term Benefits for Communities<sub>16</sub>
  - Lack of Funding for Planning Stages

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