



**ISO 14001 Environmental  
Management System (EMS)  
Implementation Training**  
Iowa Department of Natural Resources  
December 16, 2020

Presented by:

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**Training Agenda**

- Day 2
  - EMS Implementation Step-by-Step
    - Primary chronological steps to EMS development and implementation
    - Walk-through the major EMS components, how to develop, and provide examples
  - "Environmental Aspects" Workshop: Identifying Environmental Aspects & Impacts and Defining Significance



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**EMS Implementation  
Step-by-Step**

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### Steps to EMS Implementation

1. Determine our Goals for EMS
2. Conduct Gap Analysis
3. Determine the Scope and Context of the EMS
4. Obtain Commitment from Leadership
5. Build an Implementation Team
6. Set the Environmental Policy
7. Establish Documentation System
8. Identify Compliance Obligations



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### Steps to EMS Implementation

9. Identify Risks, Opportunities, Aspects & Impacts
10. Establish Environmental Objectives
11. Develop Procedures & Operational Controls
12. Implement EMS Training
13. Conduct EMS Audits
14. Implement Corrective Actions
15. Complete Management Review
16. ISO 14001 Registration (optional)



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### Step 1 - Determine Goals for EMS

- Why do we want to implement EMS?
- What do we want to get out of it?
- Do we want to achieve ISO 14001 certification?



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### Step 2 - Conduct Gap Analysis

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- Compare existing environmental systems with the requirements of ISO 14001
  - What do we have that can be incorporated in our EMS?
  - Existing environmental programs
  - Other management systems, documentation
  - What's in practice, not just documented
- Can be formal or informal process
- Provides a baseline
- Helps to establish implementation plan and level of effort

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### Step 3 - Determine the Scope & Context

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- Is this EMS for a single site or for a greater organization?
- What organizational units and functions are included?
- What are the physical boundaries?
- What activities, products, and services are included?
- Are there any portions of the organization to be excluded?
- What are the relevant external and internal issues?
- Who are the organizations interested parties, and what are their needs/expectations?

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### Example Internal & External Issues

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- Environmental conditions related to climate, air quality, water quality, land use, existing contamination, natural resource availability, and biodiversity, that can either affect the org's purpose or be affected by its environmental aspects.
- External cultural, social, political, legal, regulatory, financial, technological, economic, natural, and competitive circumstances.
- Internal characteristics or conditions of the organization, such as its activities, products, and services, strategic direction, culture, and capabilities (i.e., people, knowledge, processes, systems).

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### Example Internal & External Issues

- Internal Issues:
  - Mining and mineral processing operations
  - Corporate compliance obligations, requiring maintenance of ISO 14001 certification
  - Employees
- External Issues:
  - Regulatory requirements/compliance obligations
  - Location in a state/local area with stringent environmental regulations
  - Proximity of facility property to residential areas
  - NGOs and Tribal entities
  - Customer expectations

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### Example Interested Parties/Expectations

Stakeholders/Interested Parties		Needs and Expectations (i.e. Requirement)	Compliance Obligation?
Corporate	Internal	ISO 14001 certification, compliance, financial health, cost sustainability and competitiveness	Yes
Facility Employees	Internal	Compliance, safe workplace, financial health	Yes
Regulatory agencies	External	Compliance with regulations, communication	Yes
Customers	External	Corporate responsibility	No
Suppliers/contractors	External	Compliance, financial health	No
NGOs and Tribal entities	External	Corporate responsibility, compliance, pollution prevention	No
Neighbors	External	Corporate responsibility, compliance, pollution prevention, financial health	No

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### Step 4 - Obtain Commitment from Leadership

- Commitment from top management is essential for a successful EMS
- Top management is required to demonstrate leadership and commitment with respect to the EMS
- Leadership is ultimately responsible for the EMS
- Present business case based on your specific needs, goals, circumstances
- Gap assessment can help provide information on plan, level of effort, and benefits

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### Step 5 - Build an Implementation Team

- Establish a cross-functional team with members from key functions of the organization
- A cross-functional team will be able to provide insight on various processes
- Meet regularly
- Build ownership of the EMS



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13

### Step 6 - Set the Environmental Policy

- Establish Environmental Policy demonstrating the organization's intentions related to environmental performance.
- Must be established by top management and include the following commitments:
  - Commitment to protection of the environment, including prevention of pollution
  - Commitment to fulfill compliance obligations
  - Commitment to continual improvement of the EMS to enhance environmental performance.

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14

### Example Environmental Policy

*Sally's Salads is committed to sustainable growth and preserving the quality of the environment by managing our environmental footprint as defined in our Environmental Management System.*

*We commit to:*

- *Protect the environment and prevent pollution through our business practices and maintaining facility operational controls.*
- *Compliance with environmental laws and meeting other requirements we subscribe to as part of our business operations.*
- *Continually improve our environmental performance by setting facility objectives.*

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## Step 7 - Establish Documentation System

- Determine where EMS documents will be stored, how accessed, how controlled, how protected
  - Preferably electronic
  - Can be on shared network drive, SharePoint, Intranet
- Establish document control, update, and approval process
- Determine format for manual, procedures, forms, etc.
- Start putting a revision date on EVERYTHING
- If using existing documents, can reference, not recreate

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## EMS Documentation System - Example

North America Engineering and Maintenance Home

Environmental - ISO14001.2

+ new document or drag files here

All Documents Explorer View Find a file

Count - 1	Name	Modify
00.0 Global EMS	...	March 31
04.0 Context	...	March 31
05.0 Leadership	...	March 31
06.0 Planning	...	March 31
07.0 Support	...	March 31
08.0 Operation	...	March 31
09.0 Performance Evaluation	...	March 31
10.0 Improvement	...	March 31
A. Process Ownership Documents	...	March 31, 2016
B. Obsolete Documents	...	March 31, 2016

**8.1 Operational Planning and Control**

Control of operations at the facility is achieved by means of procedures and/or engineered controls as summarized in the "Environmental Aspects Approval" and the "EMS Process Ownership" documents.

Outstanding processes related to environmental affairs to which the facility can control and influence are identified on the Environmental Aspects Table - Significant Aspects (Outstanding Process Tab).

There are a number of Medical Waste Corporate Safety Check functions that influence operational processes at the facility: procurement of ingredients, production run schedules, sales and shipping of finished goods to customers, and time of disposal of waste materials. These processes are all within the control of the facility. The Management and are evaluated from the facility's "EMS Status" and requirement for operational planning and control. These processes are further reviewed with the Environmental Aspects Approval.

**8.2 Emergency Preparedness and Response**

Emergency preparedness and response is managed at this facility according to the "Emergency Response Plan". The Safety Manager will review the plan on an annual basis.

Our activities related to environmental plan incidents that involving emergency response will be completed on an annual basis. The observations of the O&E exercise and actual incident response will be evaluated and where necessary, changes to the procedure will be made.

In the event of an environmental emergency all incidents will be documented by the facility using the "Corrective Action Request" (CAR) form or local equivalent process.

Environmental emergency incidents will be reviewed and thoroughly discussed with Corporate Engineering prior to a facility submitting an "Incident Incident Report" to the Global Medical Waste Incident Notification system.

Rev	Date	Description of changes	Author
1	3/31/2016	New Procedure Created	Heidi Corbett
2	09/15/2017	Updated section 8.2.2F paragraph	Jeff Sauter

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## Step 8 - Identify Compliance Obligations

- Identify and have access to the compliance obligations related to environmental aspects.
- How do the compliance obligations apply to the organization?
- Organization must maintain documentation of its compliance obligations.

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18

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## Identify Compliance Obligations

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- Compliance Obligations (formally Legal & Other Requirements) include:
  - **Federal** (EPA, OSHA, DOT, ...)
  - **State** (State environmental laws)
  - **Local** (City, County, ...)
  - **Other** (Corporate, Industry, Trade, Customer, etc...)



19

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## Compliance Obligations - Documentation Examples

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- Recurrent Task List / Compliance Calendar
  - Requirements and when they are due
  - Excel, Outlook, etc.
- Legal Register/ Compliance Table
  - Listing of regulatory requirements per environmental aspect category and how they apply



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## Recurrent Task List Example

WATER	FREQU. REQ.	Next due	REQUIREMENT (legal or other)	RESPONSIBILITY	RESPONSIBILITY												Ref document	
					J	F	M	A	M	J	J	A	S	O	N	D		
Water-Record well water usage	Daily	Not Specified	PWS 75001003	Env. Supv	x	x	x	x	x	x	x	x	x	x	x	x	x	Env. Supv Office
Water-Water Sampling	Monthly	Not Specified	PWS 75001003	Env. Supv	x	x	x	x	x	x	x	x	x	x	x	x	x	e-Res, Env. Supv Office
Water - quarterly sampling	Quarterly	Not Specified	PWS 75001003	Env. Supv	x		x		x		x		x		x		x	e-Res, Env. Supv Office
Water - semi annual sampling	Semiannual	Not Specified	PWS 75001003	Env. Supv	x												x	e-Res, Env. Supv Office
WATER-High Capacity Vial Report	Annual	Not Specified	PWS 75001003	Env. Supv	x												x	e-Res, Env. Supv Office
WATERS - Vial Fees	Annual	Not Specified	PWS 75001003	Env. Supv													x	Env. Supv Office
Backflow preventer drawing review	Annual	Not Specified		Maint. Supervisor													x	e-Res, Env. Supv Office
Inspect the vent on the water tank	Annual	Not Specified	PWS 75001003	Env. Supv														e-Res
Tank inspection for both drinking water tanks	very 5 year	Not Specified	PWS 75001003	Env. Supv														e-Res, Env. Supv Office
WASTEWATER					RESPONSIBILITY												Ref document	
WWT	FREQU. REQ.	Next due	REQUIREMENT (legal or other)	RESPONSIBILITY	J	F	M	A	M	J	J	A	S	O	N	D		
WWT-Calibrate final pH probe - record flows	Daily	Not Specified	WI-005418-07-0	Env. Supv	x	x	x	x	x	x	x	x	x	x	x	x	x	Env. Supv Office
WWT-Waste water sampling for compliance	Daily	Not Specified	WI-005418-07-0	Env. Supv	x	x	x	x	x	x	x	x	x	x	x	x	x	Env. Supv Office
WWT - Waste Water Testing and Reporting (update spreadsheet)	Weekly	Not Specified	WI-005418-07-0	Env. Supv	x	x	x	x	x	x	x	x	x	x	x	x	x	e-Res, Env. Supv Office
WWT-Aviation Land Application Daily records (update spreadsheet)	Weekly	Not Specified	WI-005418-07-1	Env. Supv	x	x	x	x	x	x	x	x	x	x	x	x	x	Land application desk, Env. Supv Office
WWT-Waste Water Reporting to DHS	Monthly	21st monthly	WI-005418-07-0	Env. Supv	x	x	x	x	x	x	x	x	x	x	x	x	x	e-Res, Env. Supv Office
WWT- Land Application lab samples (all waste streams)	Quarterly	Not Specified	WI-005418-07-0	Env. Supv	x		x		x		x		x		x		x	Env. Supv Office
AWWWT- Inspect ion leachate containment on roads final pH flow meter, back flow prevention	Annual	Not Specified	WI-005418-07-1	Env. Supv														e-Res
WWT- Inspect ion leachate containment and storage ponds at Storage area (Central)	Annual	Not Specified	WI-005418-07-1	Env. Supv														e-Res



21

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## Planning to Achieve Objectives

- What will be done?
- What resources will be required?
- Who will be responsible?
- When will it be completed?
- How will the results be evaluated?



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28

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## Environmental Objective Form Example

**Environmental Objective #1 – Landfill Waste Reduction**

The objective is to reduce solid waste to landfill by 25%.  
 Baseline - Final FY18 - 70% of waste to landfill  
 This objective will be completed by this date - 7/1/2019

Planning Actions to Achieve Environmental Objectives									
Action Number	What?	Resource	Who?	When?	Start/End	Result	Notes	Status of Completion	Comments on Progress
	Description of Activity	Description of Resources Required - Financial, Capital, Personnel, Time, etc. #	Responsible Party#	Date Initiated	Expected Completion Date	Expected Effectiveness of Action#	Costs/Estimation for last year's waste (see attached) evaluate current waste generation and management practices		
1a	Implement cross department waste management teams	Plant leadership (by an Environmental Supervisor, Maintenance Supervisor)	Sally Stappeler	Jun-18a	Aug-18a	="		="	First meeting scheduled for August 2018a
2a	Select recycling vendors	Environmental Supervisor, Maintenance Supervisor	Joe Schipper	Jun-18a	Aug-18a	="	Vendors are selected that fit under budget, containers in place by completion date	="	Reviewing 3 local vendors - Waste Management, Recycle Plus, etc. etc. etc.

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29

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## Environmental Objectives

- Objectives should be approved by top management.
- Objectives and action plans should be documented and communicated.
- Performance against objectives should be reported regularly.
- Objective goals can be adjusted, as needed, with changing circumstances, but MUST document why.
- Objectives should be SMART.

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30

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**SMART Objectives**

**S M A R T**  
**G O A L S**

- **Specific:** What exactly are we trying to achieve?
  - Some questions to ask when determining objectives are WHY is this important, WHERE the improvement takes place, WHAT are the conditions and limitations involved?
- **Measurable:** Define the physical manifestation of the objective; define concrete evidence. Determine what will be tracked and how often to measure progress.
  - What are the metrics that can demonstrate effectiveness?
- **Attainable:** Don't over commit. Set a target that is reasonable and attainable.
  - Also consider available resources, time, and costs associated with attaining the objective.
- **Relevant:** Why does this matter?
  - Develop objectives that are relevant to your organization and mean something to your team and location. Engage employees where possible.
- **Timely:** Set a defined timeline that is realistic.
  - Can be for a year or can be for a longer period of time.

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31

**Step 11 - Develop Procedures & Operational Controls**

- The EMS should include documented information necessary for the effectiveness of the EMS
- EMS Manual
  - Not required, but can help show overall framework of EMS and direct to other documents.
- EMS Procedures
  - What processes do we want to be documented procedures?
  - Documented procedures help promote consistency and continuity and can serve as a training tool
  - Procedures should be designed in a way to prevent error and ensure consistent results

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32

**Operational Controls**

- Can include engineering controls and procedures
- Processes to manage environmental aspects and risks and help to ensure compliance
- Processes for management of change
- Processes for procurement and management of contractors, including communication of requirements
- Controls to ensure environmental requirements are addressed in design/development (if applicable)
- Provide info regarding impacts associated with transportation, delivery, use, end-of life, or final disposal of products (if applicable)

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33





## Step 15 - Management Review

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- Top management must review the EMS at planned intervals
  - Should be at least annual, but can consist of a series of meetings throughout the year.
- Need to have a process for management review and ensure all required inputs are addressed
- Specific outputs must also be discussed/documentated
- Review the EMS, changes, status of performance, trends, resources, communication, and opportunities for improvement

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## Management Review Example

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**Agenda Items:**  
**The INPUTS of the management review shall include consideration of:**

- a) The status of actions from previous management reviews;
- b) Changes in:
  1. external and internal issues that are relevant to the EMS
  2. needs and expectations of interested parties, including compliance obligations
  3. significant environmental aspects
  4. risks and opportunities
- c) The extent to which environmental objectives have been achieved.
- d) Information on the organization's environmental performance, including trends in:
  1. nonconformities and corrective actions;
  2. monitoring and measurement results;
  3. fulfillment of its compliance obligations
  4. audit results
- e) Adequacy of resources
- f) Relevant communications from interested parties, including complaints;
- g) Opportunities for continual improvement

**The OUTPUTS of the management review shall include:**

1. Conclusions on the continuing suitability, adequacy, and effectiveness of the EMS;
2. Decisions related to continual improvement opportunities
3. Decisions related to any need for changes in the EMS, including resources
4. Actions, if needed, when environmental objectives have not been achieved
5. Opportunities to improve integration of the EMS with other business processes, if needed
6. Any implications for the strategic direction of the organization.

**Plant Manager Sign-Off (see below)**

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41

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## Management Review Example

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**a) The status of actions from previous management reviews:**

Document Input	Discussion	Action Required	Responsibility
Previous Management Review Output Document 18/0119	<ul style="list-style-type: none"> <li>• Internal Audit summary states that "an effective EMS at the facility that is in conformance with ISO14001:2015(E) and facility requirements.</li> <li>• Water and Energy reduction opportunities are identified in Targets and Objectives documents.</li> </ul>	<ul style="list-style-type: none"> <li>• Site 1A will be part of the Global audit requirement TSD</li> <li>• Site 1A Leadership Team must drive water reduction efforts.</li> </ul>	<ul style="list-style-type: none"> <li>• No follow ups at this time.</li> <li>• Joe Smith</li> </ul>

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42

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## Management Review Example

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b) Changes in:

1. external and internal issues that are relevant to the EMS
2. needs and expectations of interested parties, including compliance obligations
3. significant environmental aspects
4. risks and opportunities

Document Input	Discussion	Action Required	Responsibility
External NOV's DEQ / EPA	No NOV's since last Management Review DEQ visit on October 22, 2020	None Pending receipt of DEQ report re NOV's expected	Joe Smith
SWPPP SPCC	Updated SWPPP/SPCC in October of 2020 for detail updates.	Review as needed.	Joe Smith
Aspects/Impacts list (8.12)	No new significant aspects - same 5 that we've always had <ul style="list-style-type: none"> <li>• Waste Generation</li> <li>• Wastewater Generation</li> <li>• Chemicals and Bulk Ingredients</li> <li>• Air Emissions</li> <li>• Water and Energy Consumption</li> </ul>	None	Joe Smith
Risks & Opportunities List (9.3)	Review List <a href="#">Risk and Opportunities List</a>	Per discussion See Section g)	Environmental Mgmt Team

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43

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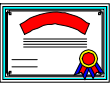
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## Step 16 - ISO 14001 Registration (optional)

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- Conduct registration audit
  - EMS must go through at least one complete cycle prior to the Stage 2 audit.
- Respond to nonconformities.
- Achieve successful recommendation for registration.
- Maintain and continually improve management system.



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44

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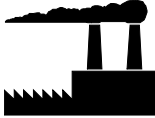
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## Environmental Aspect

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Definition ISO 14001:2015

Element of an organization's activities, products or services that interacts or that can interact with the environment.



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## Environmental Impact

Definition: ISO 14001:2015

Change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects.

(The change to the environment as a result of the aspect)

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46

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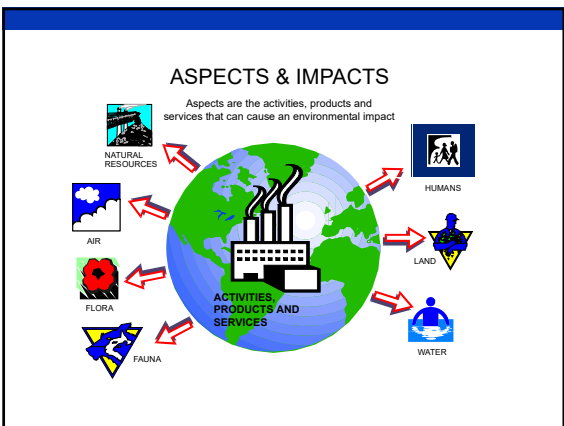
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47

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## Environmental Aspects

- Identify environmental aspects
- Select what the organization can control/influence
- Set significance criteria
- Determine aspects with significant impacts
- Keep up-to-date

*Significant aspects must be taken into account in establishing, implementing, and maintaining the EMS.*

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48

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### Environmental Aspects

Getting started

- Examine the entire organization
  - By department, by product, by process
- Create list of aspects that affect the environment
  - Through flowcharting
  - Through brainstorming
  - Through evaluation of processes
  - Utilize employees

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49

### Aspects: Inputs and Outputs

Major Activity / Operation: Air Compressors

The diagram shows a central box labeled 'PROCESS STEPS' containing 'Power On (Various Processes)'. To the left, 'INPUTS' include Energy Used, Electricity, Lubricant, Filters, and Water-chilled. To the right, 'PRODUCTS' include Compressed Air. Below that, 'BY-PRODUCTS' include Water Condensation, Heat- Recycled, Used Oil- recycled, and Filters- Landfilled.

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### Aspects and Impacts

The diagram features a red box on the left labeled 'EMS' containing 'Suppliers', 'Organization' (with sub-items: Activities, Products, Services), and 'Contractors'. A yellow vertical bar labeled 'ASPECTS' is positioned to the right of the EMS box. An arrow points from the 'ASPECTS' bar to a green box labeled 'Environment' which contains a pink vertical bar labeled 'IMPACTS'. The BURNS MCDONNELL logo is at the bottom right.

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51

### Environmental Aspects and Impacts – Basic Steps

- Identify environmental aspects
- Identify associated environmental impacts
- Undertake “scoring” for each
- Allocate significance - threshold/ cut-off point
- Produce register of environmental aspects and significant environmental aspects (SEAs)



**ENVIRONMENTAL CONCERNS**

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52

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### Examples of Aspects

- Energy usage
- Water consumption
- Raw material selection and usage
- Air emissions
- Wastewater
- Solid waste generation

• Aspects are the inputs and outputs your activities and processes



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53

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### Example Impact Categories

- Impacts to:
  - Air Quality (AQ)
  - Land Quality (LQ)
  - Water Quality (WQ)
  - Natural Resources (NR)
  - Human Health (HH)

	Air
	Land
	Water

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54

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### Tips

- Identify aspects for each major process/activity
- Combine similar or like processes into one category, if the aspects are the same
- Identify aspects under normal, abnormal, and emergency conditions
- When in doubt, K.I.S.S.



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### Significance Scoring

- Choose a significance scoring system to apply to aspects
- Choose categories/scale for scoring
  - Examples: Frequency, compliance/regulatory, severity, etc.
- Choose formula for calculating significance



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56

### Significance Scoring Example

- Impact scored from 1 (least) to 5 (highest) for each criterion
- Criteria categories
  - Frequency (F)
  - Severity (S)
  - Regulatory (R)
  - Community Concern (C)
- Overall significance score (SS) is product of individual criterion scores
  - $F \times S \times R \times C = SS$
  - A "5" regulatory is automatically significant

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57

### Environmental Aspects Workshop

- Choose an example activity/operation.
- List the environmental aspects (by input and output).
- Identify the associated environmental impacts.
- Rank the aspects for significance using the criteria provided.

Major Activity / Operation: \_\_\_\_\_

INPUTS      PROCESS STEPS      OUTPUTS

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58

### Questions?

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59