



CODE OF POLLUTION PREVENTION PRACTICES

For the Mining Industry in the State of Colorado

COLORADO MINING ASSOCIATION

A CODE OF
POLLUTION PREVENTION PRACTICES
For the mining industry in the State of Colorado

With Good Management Practices

Developed using a grant from the
Colorado Pollution Prevention Advisory Board

Version 1

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The Colorado Mining Association (CMA), established in 1876 and incorporated in 1897, is a trade association whose membership, numbering 70 companies and 500 individuals, is composed of both small and large enterprises engaged in the exploration for, production and refining of, metals, coal, oil shale, and industrial minerals; firms that manufacture and distribute mining and mineral processing equipment and supplies; and other institutions providing services and supplies to the mineral industry.

The CMA, headquartered in Denver, serves as a spokesman for the mining industry in Colorado. The Association works in cooperation with other state and national mining associations, keeping the industry informed on pending state and federal legislation and promulgating constructive programs and actions that will adequately recognize and serve mining's special problems and needs. It serves the industry on a wide range of subjects through the expertise of its members and member companies on standing, ad hoc, and select committees.



TABLE OF CONTENTS

Page

Table of Contents.....	3
Introduction.....	4
Hazardous Chemical Protocol.....	5
Container Management Protocol.....	6
Conservation, Recycling and Reuse Protocol.....	8
Closure and Reclamation Protocol (Operations Only).....	9
Example: Contractor Procedure – Use of Materials.....	12
Example: Purchasing Procedure.....	13
Example: Product Review Form (Hazardous Chemical Protocol).....	14
Example: Electronic Product Review Form.....	15
Example: Product Approval Procedure Form.....	17
Example: Product Inventory/Usage Information Sheet.....	18
Example: Waste Management Policy.....	19
Example: Material / Product-Requisition Evaluation.....	24
Material/Product Procurement Request	27
Administrative P2 Tips.....	29
Standard Operating Practices for Pollution Prevention.....	30
Checklist for Common Pollution Prevention Methods.....	32
List of Recycling Vendors.....	35



CODE OF POLLUTION PREVENTION PRACTICES

For the Mining Industry in the State of Colorado

INTRODUCTION

The State of Colorado has established that Pollution Prevention (P2) is an important environmental management tool in Colorado. Pollution prevention means source reduction and good management practices and procedures that reduce or eliminate pollution prior to off-site or non-process-related recycling, incineration, treatment, or disposal. The Pollution Prevention Advisory Board, established in 1993, identified the mining industry as a business category that could benefit from assistance through the Pollution Prevention Fund and awarded the grant to the Colorado Mining Association (CMA) in 2001. This grant assisted in the development of this Code of Practices.

Little information about the positive progress of P2 Programs implemented by the mining industry is disseminated to the public. Many mining companies have developed their own programs, but insufficient sharing of the technical and operational procedures has occurred. Consequently, the CMA has developed this program of P2 policies and practices to disseminate to the mining industry for their adoption.

P2 assessments were conducted by questionnaire to determine the nature of P2 programs implemented by the mining industry throughout Colorado. Results of this survey were used to develop this program.

CMA will administer this program for its member companies. While participation in this program is voluntary, eligible CMA member companies are strongly urged to

participate. At present, mining operations and administrative offices and other related offices and facilities of mining companies are eligible to participate. The Code of Practice consists of recommended protocols, a "self-certification" element, recognition of participation for adopting and implementing the specific protocols, and an awards program for innovative or superlative performance. The protocols are: Hazardous Chemical; Container Management; Conservation, Recycling and Reuse; and Closure and Reclamation.

Facilities may choose to participate in one or more of the four protocols in this code. Those who certify participation in all applicable protocols will be Senior Participants. Those that choose to participate in less than the total number of codes that are applicable to them will be Junior Participants. Junior Participants may take no more than three years of participation to achieve Senior Participant status through certifying full participation in all applicable protocols.

Compliance with federal, state and local regulations does not necessarily ensure P2 objectives will be met. To take full advantage of P2 opportunities in the mining industry, we must

Also included in this publication are Good Management Practices. They represent practices by others or practices that have already been successfully implemented at some CMA member operations. They are not requirements but can provide a means for participants to "jump start" the implementation of their P2 programs



HAZARDOUS CHEMICAL PROTOCOL

Introduction

This protocol involves a formal review and alternatives identification program for any chemical products employed, or proposed to be employed, on site. Alternatives are examined for decreased potential to cause pollution. This does not include materials mined at the facility or other direct mining related products produced or processed at a facility that are covered by specific regulatory programs. To elect to participate in this protocol, a facility must develop and implement a program addressing each of the following elements that are applicable to it (eight for operations and five for administrative facilities). Facilities that have already developed and documented programs that meet the requirements of any of the elements of this protocol do not have to prepare any additional documentation for the purposes of implementing those elements of this protocol.

Element 1. (O,A) Maintain a list of the products (generally manufactured chemicals) commonly used in the workplace.

- Includes products that are commonly used in each workplace
- List must be updated at least semi-annually
- List must Controls the temporary use of commercial chemical products in the workplace

Element 2. (O,A) Maintain a copy or other means of immediate access to MSDS's for all products used.

- Can include but not be limited to notebook, computer based system or fax-back service

Element 3. (O,A) Have a program for and keep all MSDS's current.

- Person(s) designated to perform this task
- Performed at least annually and reviewed for hazardous components
- New MSDS's acquired if manufacturer has updated it in the past year
- Element fulfilled if MSDS service used that provides up-to-date MSDS's

Element 4. (O,A) Provide means of ensuring that employees are aware of the location of MSDS's and are receiving hazardous chemical training.

- A training program, posted notices, circulars or handbooks, can provide location awareness
- Product hazardous chemical training will at a minimum be for each employee dealing with hazardous chemicals at the time of starting work in a new work area and annual refreshers thereafter
- Product hazardous chemical training will be for the commonly used chemicals in the employee's work area and common areas

Element 5. (O) Means of ensuring that new chemicals are reviewed for toxicity, hazards and waste disposal issues prior to purchase. This would include:

- Person(s) designated to perform review



- Review methodology, possibly including a product review form
- Means of approving or disapproving products for purchase
 - Means or policy preventing circumvention of this program.

Element 6. (O,A) Program to review products already in use for toxicity, hazards and waste disposal issues.

- Person(s) designated to perform review
- Review methodology, possibly including product review form
- Means of recommending and implementing changes

Element 7. (O) Program to review chemical waste streams for toxicity and determine whether the toxicity can be cost effectively reduced by altering uses of products and/or product substitution.

- Person(s) designated to perform review
- Review methodology, possibly including product review form
- Means of recommending and implementing changes

Element 8. (O,A) Develop goals for this protocol and at least annually review achievements.

- Specific goals should be developed that can, if possible, be quantitatively measured
- A person(s) should be designated to review progress during the year and propose and implement changes if needed
- The goals should be formally reviewed at least annually

CONTAINER MANAGEMENT PROTOCOL

Introduction

This protocol involves minimizing the disposal of containers and minimizing pollution from the use of containers. This includes both containers and packaging for purchased materials and a facility's own products. This is done by minimizing the number of containers on site through the use of returnable or reusable containers, reducing the number of containers, properly managing containers, and using containers that may be disposed of without concern of pollution. These include product and chemical industrial size to consumer size containers. Hazardous waste containers are not included in this protocol as they are covered by specific regulations. Also, process tanks and non-portable bulk storage tanks are not included. To elect to participate in this protocol, a facility must develop and implement a program addressing each of the following elements that are applicable to it (four for operations and three for administrative facilities). Facilities that have already developed and documented programs that meet the requirements of any of the elements of this protocol do not have to prepare any additional documentation for the purposes of implementing those elements of this protocol.

Element 1. (O,A) Review container use at the facility and develop plan to:

- Identify significant container uses at the facility



- Determine which containers contain hazardous material
- Determine which containers, regardless of contents, can be better reused or recycled
- Determine which containers, regardless of contents, can be reduced or eliminated
- Develop and implement a plan to reduce container usage and reduce the hazards from container disposal
- Where appropriate review container options with supplier or manufacturer
- Reduce/Recycle packaging material

Element 2. (O, A) Implement a procedure to review container requirements for new products

- Evaluate container options to minimize waste generation while maintaining safety and cost effectiveness
- Where appropriate review container options with supplier or manufacturer

Element 3. (O) Develop a container management plan

- Identify the containers to be recycled and how they will be recycled
- Inform employees of the proper procedures for use of containers and proper handling when empty
- Label all containers with contents
- Regular program to check for leaks and damage
- Keep containers closed when not in use
- Segregate incompatible materials to facilitate recycling
- Where appropriate develop spill control and countermeasure plans for

containers not already required to be in a plan and periodically review plan

- Review usage of materials to determine if bulk containers can be substituted for packaged material

Element 4. (O,A) Develop goals for this protocol and at least annually review achievements

- Specific goals should be developed that can, if possible, be quantitatively measured
- A person(s) should be designated to review progress during the year and propose and implement changes if needed
- The goals should be formally reviewed at least annually



CONSERVATION, RECYCLING AND REUSE PROTOCOL

Introduction

This protocol involves recycling or reusing products and waste materials. There is some overlap with the Container Management Protocol. Recycling is conducted to reduce the potential for pollution as well as to conserve resources. To elect to participate in this protocol, a facility must develop and implement a program addressing each of the first three elements that are applicable to it. The last two elements are optional. Facilities that have already developed and documented programs that meet the requirements of any of the elements of this protocol do not have to prepare any additional documentation for the purposes of implementing those elements of this protocol.

Element 1 (O, A) Develop a program to review possibilities of product and waste reuse and recycling.

- Identify products and wastes (residuals) that can be reused or recycled. These could include:
 - Office paper (O,A)
 - Cardboard (O,A)
 - Toner cartridges (O,A)
 - Aluminum (O,A)
 - Scrap metal (O)
 - Fluorescent lights (O,A)
 - Used oil (O)
 - Pallets and other wood products (O)
 - Antifreeze (O)
 - CFCs including Freon (O,A)
 - Batteries (O)

- Solvents (O)
- Paints (O)
 - Newspaper (A)
 - Tires (O)
 - Plastics (O,A)
 - Computers (O,A)

- Identify recyclers and methods of reuse
- Implement cost effective recycling ideas

Element 2 (O, A) Develop a training or awareness program that covers this protocol

- Initial training at initiation of program and for new hires and periodic refresher training and/or
- Circulars, newsletter or posting that keep employees informed about the elements of this protocol

Element 3 (O, A) Develop goals for this protocol and at least annually review achievements

- Specific goals should be developed that can, if possible, be quantitatively measured
- A person(s) should be designated to review progress during the year and propose and implement changes if needed
- The goals should be formally reviewed at least annually

Element 4 Develop a program to review energy consumption. (Optional Participation)

- Review present and future energy consumption (O)
- Identify areas where energy use reductions are possible (O)



- Review potential for carpooling or busing (O,A)
- Implement cost effective conservation ideas (O)

Element 5 (O) Develop a program to review water consumption. (Optional Participation)

- Review present and future water consumption
- Identify areas where water use reductions are possible
- Identify areas where water reuse can be implemented

CLOSURE AND RECLAMATION PROTOCOL (OPERATIONS ONLY)

Introduction

For most operations, laws, regulations and permits require reclamation, revegetation and habitat protection. This protocol covers items that go beyond what is required. To elect to participate in this protocol, an operation has to develop a hazardous material closure plan (Element 1) and exceed minimum reclamation goals (Element 2). Operations may, at their option, participate in one or more of Elements 3 through 6. The hazardous materials closure plan would not include mining/processing area reclamation unless no such plan is required by a specific regulatory program. Facilities that have already developed and documented programs that meet the requirements of any of the elements of this protocol do not have to prepare any additional documentation for the purposes of

implementing those elements of this protocol.

Element 1 Develop, and when timely, implement a hazardous material closure plan.

- Identify all significant hazardous materials that will be present at closure such as reagents, maintenance products, fuels and lubricants
- Develop a plan to recycle, reuse, or properly dispose of these materials
- Properly close or remove any hazardous materials disposal areas that are on the property
- Include pollution prevention practices in the requirements for contractors as well as facility operations to follow during closure
- Prepare mining/operations wastes and disturbed land reclamation plan if not required by regulations, permit or law

Element 2 Review reclamation program at least annually to determine that it is achieving habitat restoration, post-mining land use and long-term sustainability in a manner that exceeds minimum regulatory requirements

Element 3 Innovative Practices-Reclamation and Revegetation. (Optional Participation)

- Participate in an innovative or experimental reclamation or revegetation procedure that improves resource utilization, decreases releases or enhances post-mining land uses in a unique manner

Element 4 Innovative Practices-Habitat or Species Protection. (Optional Participation)



CODE OF POLLUTION PREVENTION PRACTICES

For the Mining Industry in the State of Colorado

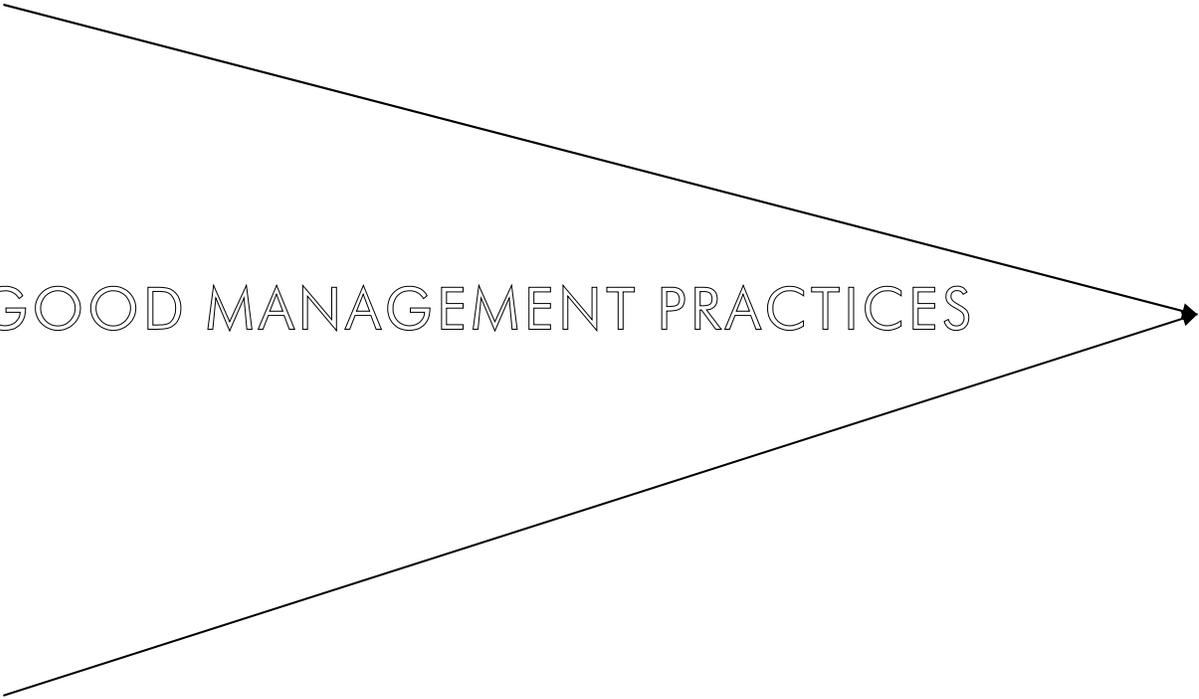
- Participate in an innovative or experimental habitat or species protection activity that is not required

Element 5 Fund or Participate in Reclamation, Revegetation, Species Protection or Habitat Protection Research Program. (Optional Participation)

- Funding or participation would have to be of a significant level to qualify

Element 6

- *Develop and implement operational changes that achieve the overall goals of Pollution Prevention, waste reduction or release reduction. (Optional Participation)*



GOOD MANAGEMENT PRACTICES



EXAMPLE: CONTRACTOR PROCEDURE – USE OF MATERIALS

(Hazardous Chemical, Container Management, and Conservation, Recycling and Reuse Protocols)

The following applies to all contractors working at the facility:

1. Department or person requesting contractor to provide services must request contractor to provide list of products they will bring onto the facility property to do job.
2. Contractor to provide MSDS for each product prior to them bringing it onto the facility property. Contractor cannot bring any products onto property which have not been reviewed. Provide list of approved materials to project manager.
3. Environmental and Safety Departments to review MSDS's for potential problems prior to product coming on property.
4. Problems noted during review will be forwarded to department or person requesting contractor and they will forward them to contractor. Department or person responsible for seeing that contractor completes job in accordance with any recommendations made by Environmental or Safety Departments.
5. Contractor to advise if any hazardous waste will be generated by their activities at the facility.
6. If answer to 5 is yes then contractor to provide estimate of waste to be generated.
7. Contractor will be responsible for coordinating shipment of waste from the property and will be responsible for cost of shipping and disposal of hazardous waste.
8. The facility will provide contractor with the facility's EPA id no. For use on hazardous waste manifests.
9. Contractor will be responsible for complying with all local, state and federal environmental regulations while working at the facility.



EXAMPLE: PURCHASING PROCEDURE

(Hazardous Chemical Protocol)

The following applies to regulated products used at the facility:

1. Department or person requesting product(s) contact purchasing department for them to obtain MSDS and completed internal form for products they will bring onto mine property.
2. Department or person requesting product(s) complete internal usage form prior to product being delivered to property.
3. Environmental and Safety departments to review MSDS's for potential problems prior to product coming on property.
4. Problems noted during review will be forwarded to department or person requesting product.
5. Person or department requesting product will be responsible for correct use of product, including delivering any waste product to Environmental Department for correct disposal, if the waste is determined to be hazardous.
6. Environmental Department to dispose of waste per regulations.



CODE OF POLLUTION PREVENTION PRACTICES

For the Mining Industry in the State of Colorado

EXAMPLE: PRODUCT REVIEW FORM (HAZARDOUS CHEMICAL PROTOCOL)

PRODUCT:

MANUFACTURER:

CHEMICAL CONSTITUENTS

CASRN

1) ARE ANY OF THE CHEMICAL CONSTITUENTS IN THE PRODUCT:

- A) A LISTED CERCLA HAZARDOUS SUBSTANCE (40 CFR 302.4)? YES ___ NO ___
B) A SARA EXTREMELY HAZARDOUS SUBSTANCE (40 CFR 355)? YES ___ NO ___
C) LISTED IN 40 CFR 261 , APPENDIX VIII ? YES ___ NO ___
D) A LISTED SARA TOXIC CHEMICAL (40 CFR 372, SUBPART D)? YES ___ NO ___
E) A CAA HAZARDOUS AIR POLLUTANT (40 CFR 61)? YES ___ NO ___
F) A CWA PRIORITY POLLUTANT (40 CFR 423)? YES ___ NO ___

2) IF THE PRODUCT IS WASTED OR RELEASED, IS IT A RCRA:

- A) CHARACTERISTIC HAZARDOUS WASTE (40 CFR 261, SUBPART C)? YES ___ NO ___
B) LISTED HAZARDOUS WASTE (40 CFR 261, SUBPART D)? YES ___ NO ___
C) ACUTELY HAZARDOUS WASTE (40 CFR 261, SUBPART D)? YES ___ NO ___

3) DOES THE PRODUCT CONTAIN ANY CHEMICALS THAT ARE HEALTH HAZARDS AS DEFINED IN 29 CFR 1910.1200? THESE INCLUDE THE FOLLOWING CHARACTERISTICS (circle those that apply): (1) CARCINOGENIC, (2) CORROSIVE, (3) HIGHLY TOXIC, (4) AN IRRITANT, (5) TOXIC, (6) A SENSITIZER, OR (7) THOSE HAVING TARGET ORGAN EFFECTS?

4) IF ANY OF THE ABOVE IS CIRCLED, PROVIDE SPECIFIC DETAILS AS TO THE CHEMICALS WITH THESE CHARACTERISTICS AND ALTERNATIVES EXAMINED. USE ADDITIONAL SHEETS IF NECESSARY.

I CERTIFY THAT THE INFORMATION PROVIDED ABOVE IS ACCURATE.

SIGNATURE: _____ TITLE: _____ DATE: _____

COMPANY: _____ TELEPHONE: _____

ADDRESS: _____

CASRN - Chemical Abstracts Service Registry Number
CERCLA - Comprehensive Environmental Response, Compensation and Liability Act (Superfund)
SARA - Superfund Amendments and Reauthorization Act

RCRA - Resource Conservation and Recovery Act
CAA - Clean Air Act
CWA - Clean Water Act



CODE OF POLLUTION PREVENTION PRACTICES
For the Mining Industry in the State of Colorado

EXAMPLE: ELECTRONIC PRODUCT REVIEW FORM
(Hazardous Chemical Protocol)

PROPOSAL FOR USE OF NEW CHEMICAL PRODUCT

This side of the Form is to be complete by the person(s) requesting the chemical. Obtain assistance in completion of the regulatory information from the environmental staff, if necessary.

Information about New Chemical Product:

Product Name (common): Enter common trade name if available

Product Name (chemical): Enter chemical name if available

Chemical Abstract Service (CAS) No.: 00000000 Do You Have a MSDS for Product? Yes: No:

1. **Chemistry:** Referring to the individual chemical constituents of the Product, are any constituents:
 - A. Listed "hazardous substance" per 40 CFR 302.4 Yes: No:
 If "Yes," list (%): Name of Chemical if Hazardous Substance per 40 CFR 302.4) and (%)
 - B. Listed "Extremely Hazardous Substance" per 40 CFR 355 Yes: No:
 Name of chemical if EHS per 40 CFR 355
 - C. Hazardous Constituent per 40 CFR 261 Appendix VIII Yes: No:
 Name of Chemical if Hazardous Constituent per 40 CFR 261
 - D. Listed per 40 CFR 372 (subpart D) Yes: No:
 Name of Toxic Chemicals per 40 CFR 372
 - E. Hazardous Air Pollutant per 40 CFR 61 Yes: No:
 Name of Hazardous Air Pollutant per 40 CFR 63
 - F. Hazardous Substance per 40 CFR 116 Yes: No:
 Name of hazardous Substance per 40 CFR 116

If any answer was "yes," see "Additional Information" below.

2. **Waste:** Does the use of the product have the potential to generate waste? Yes: No:
 If "Yes," what type?(check applicable) Container? Yes: No:
 Residual in Container? Yes: No:
 Contact? (e.g., rags) Yes: No:
 Spill? Yes: No:
 Other? Yes: No:
 Other:



CODE OF POLLUTION PREVENTION PRACTICES
For the Mining Industry in the State of Colorado

If "Yes," could waste be classified as "hazardous?" (40CFR261) Yes: No:
 Acutely Hazardous? Yes: No:
 Based on what information? MSDS? Other? Identify "other":

If any answer was "yes," see "Additional Information" below.

3. **Health & Safety:** Does Product contain any chemicals that are health or safety hazards per 29 CFR 1910.1200? Yes: No:

If "Yes," list: Name of Chemical Health Hazards per 29CFR1910

4. **Alternative Chemicals:** List alternative chemicals that have been examined: Names of alternatives

Reason(s) this Product was selected: Reason(s) for Selection
 (Add explanatory sheets as needed.) Other information attached

5. **Additional Information:** (For use if material is "hazardous" or if wastes are generated?)

a. Is this product to be substituted for another? Yes: No:
 Substituted for:

b. Is this product to be used in addition to another? Yes: No:
 Other products used:

c. Does this product have any advantages over products now in use? Yes: No:
 None Known Explain as necessary:

"Product Sponsor:" I certify that I have provided the information in response to Questions 1 through 3 as fully and accurately as I could based on the information I was able to obtain.

Name of Product Sponsor: Type full name Signature: _____

CASRN - Chemical Abstracts Service Registry Number

CERCLA - Comprehensive Environmental Response, Compensation and Liability Act (Superfund)

SARA - Superfund Amendments and Reauthorization Act

RCRA - Resource Conservation and Recovery Act

CAA - Clean Air Act

CWA - Clean Water Act

**POLLUTION PREVENTION IS PREVENTION OF WASTES,
 NOT MANAGEMENT OF CREATED WASTES.**

(Shaded Items Are Fields)



CODE OF POLLUTION PREVENTION PRACTICES
For the Mining Industry in the State of Colorado

EXAMPLE: PRODUCT APPROVAL PROCEDURE FORM
(Hazardous Chemical Protocol)

Please complete the procedure in order and return all documents to the ENVIRONMENTAL AFFAIRS DEPARTMENT after the product has been ordered.

ATTACHED: (Please initial and date when completed)

_____ PRODUCT INVENTORY/USAGE INFORMATION SHEET

_____ HAZARDOUS CONSTITUENTS FORM

_____ MSDS

APPROVAL: (Please initial and date when completed)

_____ ENVIRONMENTAL AFFAIRS

Comments: _____

_____ SAFETY

Comments: _____

_____ PURCHASING

Comments: _____

STOCK CODE NUMBER (s) _____

AMOUNT ORDERED: _____

SPECIAL HANDLING INSTRUCTIONS: _____



CODE OF POLLUTION PREVENTION PRACTICES
For the Mining Industry in the State of Colorado

EXAMPLE: PRODUCT INVENTORY/USAGE INFORMATION SHEET

(Hazardous Chemical, Container Management, and Conservation, Recycling and Reuse Protocols)

OPERATION: _____

EMPLOYEE REQUESTING: _____

PRODUCT TRADE NAME: _____

MANUFACTURER: _____

MSDS ATTACHED (circle one): Yes No ONE TIME USE (circle one): Yes No

HOW IS MATERIAL USED: _____

HOW IS MATERIAL STORED (bags, drums, carton, etc. and amount per container): _____

AVERAGE QUANTITY STORED: _____

MAXIMUM QUANTITY STORED: _____

AVERAGE QUANTITY USED PER MONTH: _____

MAXIMUM QUANTITY USED PER MONTH: _____

AVERAGE QUANTITY OF WASTE GENERATED PER MONTH: _____

MAXIMUM QUANTITY OF WASTE GENERATED PER MONTH: _____

COMMENTS: _____



EXAMPLE: WASTE MANAGEMENT POLICY

(Conservation, Recycling and Reuse Protocol)

In order to comply with environmental and safety waste disposal requirements, the following policy has been developed. All employees will be made aware of these requirements and those using and disposing of these materials will be responsible for proper sorting and handling procedures.

All products (i.e. aerosol cans, petroleum products, etc.) containing hazardous constituents will be signed out at the Warehouse (they will not be issued without assignment to a specific individual). Those signing out these products will be accountable for the proper disposal of empty or damaged containers and nonuseable product.

TRASH

All trash generated at the mine shall be collected and segregated into four (4) separate waste disposal dumpsters. These four (4) dumpsters will be labeled as follows:

- 1) Solid Trash and Empty Containers only (Non-Aerosol)
- 2) Full or Partially Full Containers Only (Non-Aerosol)
- 3) Empty Aerosol Spray Cans Only
- 4) Full or Partially Full Aerosol Spray Cans Only

All containers (i.e. aerosol cans, petroleum product cans, etc.) being disposed of will be collected and segregated at least monthly. All containers will be inspected before

disposal by individuals responsible for their disposal and sorted accordingly.

1) Solid Trash and Empty Containers Only (Non-Aerosol)

These are large dumpsters for general trash. The material in these dumpsters is to be disposed of at an approved municipal or industrial landfill. Only solid trash (no liquids or gases) and empty containers shall be put in these dumpsters.

A container is empty if: All materials have been removed that can be removed using practices commonly employed to remove materials from that type of container and no more than one (1) inch of residues remain in the container (if the container is 110 gallons or less in size) or no more than 0.3 percent by weight of -the total capacity of the container remains in the container (if the container is greater than 110 gallons in size).

In addition, all containers five (5) gallon size or larger shall be crushed or both ends removed before they are put in these dumpsters.

2) Full or Partially Full Containers only (Non-Aerosol)

These dumpsters shall be small dumpsters or 55 gallon drums that have been appropriately labeled. All non-empty containers (except aerosol spray cans) to be disposed of shall be placed in these dumpsters (see previous definition of empty). These dumpsters shall be inspected regularly to assure they are not leaking.

Full or partially full containers which must be disposed of shall be gathered from these dumpsters on a monthly basis and



placed in a temporary storage area that has been designed and labeled for this purpose. Products that can still be used shall be returned to the warehouse or other appropriate location for further use.

The Environmental Engineer shall evaluate the non-empty containers to determine the amount of Hazardous Waste that has been generated. He shall determine which containers contain hazardous waste and make a decision as to whether the facility is Conditionally Exempt.

The Environmental Engineer will notify the responsible individual to sort all these full or partially full containers. Those that contain Hazardous Waste will be stored in a location designed and labeled for their storage. Those that do not contain Hazardous Waste will be solidified and disposed of at an approved location.

The Environmental Engineer will then make arrangements for transportation and disposal of Hazardous Waste at an approved facility following RCRA requirements.

A properly trained individual shall solidify all non-hazardous liquid waste using cement or in the case of products such as versi foam, roof bolt resins, and roklok, the resins and catalysts shall be combined to solidify the products. The solidified material and empty containers will then be put in the "Solid Trash and Empty Containers only" dumpster.

3) Empty Aerosol Spray Cans Only

These dumpsters are usually large drums that have been appropriately labeled. All

empty aerosol cans shall be placed in these dumpsters.

4) Full or Partially Full Aerosol Spray Cans Only

These dumpsters are usually large drums that have been appropriately labeled. All full or partially full aerosol cans to be disposed of shall be placed in these dumpsters.

An aerosol spray can is empty when the pressure in the container approaches atmospheric.

Those spray cans that are still functional and can be used shall be returned to the warehouse or other appropriate locations for use. Full or partially full aerosol cans which must be disposed of shall be gathered from these dumpsters on a monthly basis and placed in a temporary storage area that has been designed and labeled for this purpose.

The Environmental Engineer shall evaluate the non-empty aerosol cans to determine the amount of Hazardous Waste that has been generated. He shall determine which aerosol cans contain Hazardous Waste and make the determination as to whether the facility is Conditionally Exempt.

The Environmental Engineer will then make arrangement for transportation and disposal of Hazardous Waste at an approved facility following RCRA requirements. He shall keep a file of all required records (i.e. manifests).

USED OIL

All used oil generated at the mine shall be collected and stored on site. No hazardous solvents (including those



exhibiting greater than 1000 ppm total halogens) or other hazardous wastes are permitted to be mixed with any used oil. The storage facilities shall be marked and segregated to protect against such occurrence. The Environmental Engineer will be responsible for testing each batch of used oil for used oil fuel specifications (meeting specified levels for certain metals, flash point and total halogens) and for presence of PCBS. In addition, each batch of used oil shall be tested for RCRA characteristics of hazardous waste if it is shipped off site. The requirement for RCRA tests can be modified if the used oil meets used oil fuel specifications and appropriate certifications are obtained verifying that each batch has been burned for energy recovery or recycled. For example, under these conditions RCRA tests may be required only 1 to 2 times per year or may be modified so only metals and potentially hazardous constituents are tested for. The used oil shall be managed as follows and the Environmental Engineer shall keep records of all tests, off-site shipments and required notifications.

Used Oil Burned for Energy Recovery On-Site

Where available, in-spec oil shall be burned on site in appropriate used oil-fired space heaters. Used oil fuel which is off-spec due to metals or flash point can be blended with in-spec used oil fuel to bring the mixture in-spec. However, used oil which contains more than 1000 ppm total halogens or contains PCBs shall be handled as hazardous or PCB wastes and shall not be mixed or blended with other oil, but rather managed following RCRA

hazardous waste or TSCA requirements. The Environmental Engineer will ensure that analyses be obtained and kept documenting that any blended mixture meets the specifications. No notification is required for this onsite burning of in-spec used oil fuel.

Used Oil Burned for Energy Recovery Off-site

In-spec used oil fuel which cannot, because of capacity, be burned on-site and used oil fuel which is off-spec due to metals or flash point, which is not blended, may be shipped to a used oil fuel marketer or burner approved and audited by the Environmental Engineer. Again, used oil which contains more than 1000 ppm total halogens or contains PCBs shall be handled as hazardous or PCB wastes, and managed following RCRA hazardous waste and TSCA requirements. If off-spec used oil fuel is marketed directly to a burner, notification to EPA is required (even if previous notification was made for hazardous waste management activities under RCRA 3010 and the mine already has an EPA I.D. number). Before initiating any shipment of off-spec used oil fuel, a onetime written and signed notice must be obtained from each burner certifying that (1) the receiving party has notified EPA of its location and general description of their used oil activities and (2) the off-spec used oil will only be burned in certain boilers or industrial furnaces as specified in 40 CFR 266.41. Additionally, for each shipment of off-spec used oil fuel, an invoice containing detailed information regarding the shipment must be prepared and sent to the receiving facility. See, 40



CODE OF POLLUTION PREVENTION PRACTICES

For the Mining Industry in the State of Colorado

CFR 266.43(b)(4). All shipments (in- and off-spec) shall be recorded in an operating log that includes (A) the name and address of the receiving facility, (B) the quantity of used oil delivered, (C) the shipment or delivery date, (D) a cross-reference to the lab report of the analysis of the used oil, and (E) a cross-reference to the above noted invoice and recipient's certification.

Used oil Not Burned for Energy Recovery

Used oil not burned for energy recovery, such as used oil that is discarded is classified as either a solid (liquid) waste or a hazardous waste, and shall be managed following RCRA or TSCA requirements as directed by the Environmental Engineer. Waste oil shall not be used for dust suppression, disposed of on the land or into any sewers.

Example: Product Hazard Determination

(Hazardous Chemical Protocol)

PURPOSE

The purpose of this requirement is to ensure that information concerning the potential hazards of materials/products in the workplace is reviewed prior to the acquisition of these materials/products. Review of the material/product constituents serves to ensure the health and safety of all employees and reduces environmental risk.

APPLICABILITY:

This requirement will apply to all potential new materials/products, existing materials/products, and sample materials/products provided for test purposes.

REFERENCES:

OSHA Chemical Information Manual.

OSHA Instruction CPL 2-2.43A, October 20, 1987.

NIOSH/OSHA Occupational Health Guidelines.

Current Threshold Limit Values (TLVs).

National Toxicology Program (NTP) Summary of the Annual Report on Carcinogens.

IARC Monographs.

Code of Federal Regulations (CFR), Part 40

DEFINITIONS:

MSDS - Material Safety Data Sheet, which provides printed information about a hazardous chemical and which, is prepared in accordance with 29 CFR §1910.1200 (g).

RCRA - Resource Conservation and Recovery Act encompassing the federal hazardous waste regulations, see 40 CFR §260 - 263, 266E 268.

RESPONSIBILITIES AND AUTHORITIES:

HSEO Department. The Health, Safety, and Environmental Quality Department (USEQ) is responsible for reviewing MSDS information. The evaluation will assess the hazards associated with the materials/products including toxicity, carcinogenic properties, Cure hazards, industrial hygiene, and environmental impact. The RSEQ Department will aid with the review for substitution of the proposed material/product with items, which are less toxic and environmentally preferable.

GUIDELINES:



Hazard Evaluation. Obtain the appropriate MSDS for the material or product under evaluation. Any chemical regulated in part 1910, Subpart Z, including those listed in the Z Tables or for which there is a ThV in file latest edition of the American Conference of Governmental Industrial Hygienists (ACGIH), Threshold Limit Values listing, is considered to be part of the "floor" or group of hazardous chemicals covered by the OSHA Hazard Communication Standard. The floor of chemicals consists of three sources:

- 1) Any substance for which OSHA has a permissible exposure limit (PEL) in 1910.1000, or a comprehensive substance-specific standard in Subpart Z. This includes any compound of such substances where OSHA would sample to determine compliance with the PEL.
- 2) Any substance for which the American Conference of Governmental Industrial Hygienists (ACGHI) has a Threshold Limit Value (TLV) in the latest edition of their annual list. Any mixture or combination of these substances would also be included,
- 3) Any substance which the National Toxicology program (NTP) or the International Agency for Research on Cancer (IARC) has found to be a suspect or confirmed carcinogen or which OSHA regulates as a carcinogen.

Any material containing constituents in excess of the RCRA regulatory limits set forth in 40 CFR § 261.20 through § 261.33 shall be considered

environmentally hazardous. Generally, materials, which meet any combination of the following, shall be considered environmentally hazardous.

- 1) Ignitable as defined in 40 CFR § 261.21;
- 2) Corrosive as defined in 40 CFR § 261.23;
- 3) Reactive as defined in 40 CFR § 261.23;
- 4) Toxic as defined in 40 CFR § 261.24;
- 5) Listed hazardous wastes from non-specific sources as defined in 40 CFR § 261.31, unless they are excluded under § 260.20 and 260.22 and listed in Appendix IX;
- 6) A mixture of a non-hazardous material and a listed hazardous waste;
- 7) Chemicals covered under the Emergency Planning and Community Right-To-Know Act 40 CFR 302, 304, 311, 312, 313
- 8) A material determined to be hazardous by the HSEQ Department Determine whether the constituents of the material are part of the "floor" of chemicals to be considered hazardous or; are identified in the RCRA regulations; or Emergency Planning and Community Right To Know Act (EPCRA) regulations or; the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, Superfund Law). If these criteria are met, inform the employee requesting the product and the employee's supervisor. Identify all regulatory requirements applicable to the company if the material/product is



CODE OF POLLUTION PREVENTION PRACTICES

For the Mining Industry in the State of Colorado

brought on the property. Review within the HSEQ Department. If it is determined that the material or product under review cannot be brought on the property, assist the employee with the identification of a substitute product.

MSDS Completeness Review. The following questions may be helpful when reviewing an MSDS for completeness:

- 1) Does the MSDS contain at least the following?
 - a. Identity used on the label?
 - b. Chemical and common name(s) for single substance hazards chemicals?
 - c. Chemical and common name(s) of the ingredients which contribute to the known hazards?
 - d. Common name(s) of the mixture itself?
 - e. Chemical and common name(s) of ingredients which are health hazards (contains one (1) percent concentration or greater), including carcinogens (0.1 percent concentration or greater)?
 - f. Chemical and common name(s) of all ingredients, which have been determined to present a physical hazard when, present in the mixture?
 - g. Physical and chemical characteristics of the hazardous chemical including the potential for fire, explosion, and reactivity?
 - h. Health hazards of the hazardous chemical (including signs and symptoms and medical conditions aggravated)?

- i. Primary body entry routes?
 - j. Exposure limits?
 - k. Information on carcinogen listings?
 - l. General precautions for safe handling and use of the chemical (hygienic practices, maintenance and spill procedures)?
 - m. General control measures (engineering controls, work practices and personal protective equipment)?
 - n. Emergency and first aid procedures?
 - o. Date the MSDS was prepared or the date of the last change?
 - p. Name, address and telephone number of the manufacturer?
- 2) Is MSDS in English?
 - 3) Are all sections of the MSDS complete?

EXAMPLE: MATERIAL / PRODUCT-REQUISITION EVALUATION

(Hazardous Chemical Protocol)

PURPOSE:

The purpose of this requirement is to ensure that information concerning the potential hazards of the use of materials/products in the workplace is reviewed prior to the acquisition of these items. Management of the acquisition of materials/products helps ensure the health and safety of all employees and reduces environmental risk.

APPLICABILITY:

This requirement will apply to all potential new products/materials, existing materials/products in age at the facility,



CODE OF POLLUTION PREVENTION PRACTICES

For the Mining Industry in the State of Colorado

and sample materials/products provided to the facility for trial test purposes.

DEFINITIONS:

EPCRA - Emergency Planning and Community Right to Know Act

MSDS - Material Safety Data Sheet, which provides printed information about a hazardous chemical and which, is prepared in accordance with 29 CFR 1910.1200 (g).

RCRA - Resource Conservation and Recovery Act

TRI - Toxic Release Inventory, under EPCRA

RESPONSIBILITIES AND AUTHORITIES:

HSEQ Department. The Health, Safety and Environmental Quality Department (HSEQ) is responsible for reviewing MSDS information, HSEQ will provide supplemental safety information on materials/products used by employees. HSEQ will inspect evaluate and provide advice concerning specific jobs that involve the use of potential toxic, carcinogenic, flammable, or corrosive chemicals. HSEQ must approve all materials/products or the introduction of trial materials, HSEQ will assist the employee with the identification of substitute products that are more suitable. This determination will be based on cost, effectiveness, potential toxicity, and environmental preference

Supervision. Each supervisor shall have knowledge of the materials/products used in his or her work area. Each Supervisor shall evaluate the required job needs for material selection and consult with HSEQ when appropriate. Proper

material/product selection shall include considerations of potential toxicity, carcinogenic properties, fire hazards, industrial hygiene, and environmental impact, including the requirement to monitor and track materials covered by RCRA and EPCRA TRI reporting.

Employees. All employees are responsible for reading the MSDS for each material/product they use. The MSDS should be read before the first use of the material/product. If an employee has any doubt about the safe use of a material/product, he or she should contact his or her supervisor prior to use.

GUIDELINES:

Pre-Acquisition Evaluation. The employee will complete a Material/Product Procurement Request and attach a copy of the associated MSDS to the request. The request will be forwarded to HSEQ for review and approval prior to requisitioning. HSEQ will evaluate the constituents of the material/product in question to determine if acquisition of the material/product will pose a potential health or safety hazard, additional training, tracking reporting, or disposal activities. Results of this evaluation will be forwarded to the person requesting the material/product in the form of a Material/Product Procurement Response. Any material/product not having an MSDS available shall not be purchased or used at the facility.

The person requesting the material / product approval will forward an



approved Material/Product Procurement Response form including the requisition number, and MSDS to Purchasing. Purchasing will forward a copy of the completed Material/Product Procurement Response form and MSDS to HSEQ. This will notify HSEQ that the material has been ordered and the MSDS can be maintained in the facility's tracking system.

Product Trial Use Procedures. All provisions of the Material/Product Pre-Requisition Evaluation outlined in this guideline will be adhered to whenever a material/product is procured on a trial basis. These procedures will be completed prior to the acquisition of the product.

At the completion of a trial period, the person performing the trial will notify HSEQ of the outcome of the trial; specifically, whether or not the product will continue to be acquired and utilized on the site.

Discontinued Use of a Product. Upon the decision to discontinue the use of a material/product, a representative of the department using the product will notify HSEQ. HSEQ will archive the associated MSDS.

Procurement Procedures. All applicable requisitioning and purchasing policies will apply.



CODE OF POLLUTION PREVENTION PRACTICES
For the Mining Industry in the State of Colorado

MATERIAL/PRODUCT PROCUREMENT REQUEST

Date _____

Person Requesting Material/Product: _____

Common Name of the Material/Product: _____

Synonyms: _____

Product Manufacturer: _____

Is This Material/Product for Test Purpose? Yes / No

Why Is This Product Under Evaluation (IE: Economics, Performance, Safety, Health Or Environmental Concerns, New, etc.): _____

Area the Material/Product Will Be Used: _____

Product Application, Be Specific: _____

Potential Future Uses of the Material/Product: _____

Will the Use of this Product Take the Place of Another Product Currently Being Used at the Facility Yes / No

If "Yes", If "Yes" Identify the Product Currently in Use/Application/Cost Comparison: _____

Supervisor Approval for Evaluation: _____

ATTACH A CLEAR COPY OF THE MSDS TO THIS FORM.

FORWARD COMPLETED FORM AND MSDS TO HSEQ FOR REVIEW.

Part 1 of 2



CODE OF POLLUTION PREVENTION PRACTICES
For the Mining Industry in the State of Colorado

MATERIAL/PRODUCT PROCUREMENT RESPONSE

Date Received At HSEQ _____

Identification Of Material/Product: _____

Approved By (Name, Date): _____

(Forward Back To Requisitioner)

Denied (Name, Date): _____

(Forward Back To Requisitioner)

HSEQ Comments: _____

HSEQ Evaluators: _____

Requisitioner: _____

Requisition No.: _____ (Forward Material/Product Procurement to Purchasing to Obtain a Purchase Order)

Purchasing Department: _____

Purchase No.: _____

Warehouse Item: Yes / No
Stock No.: _____

One Time Buy: Yes / No
Quantity Ordered: _____

(Include unit of measure)

PURCHASING FORWARDS THIS COMPLETED FORM TO HSEQ.

HSEQ ENTERS MSDS INFORMATION INTO DATABASE.

Part 2 of 2



ADMINISTRATIVE P2 TIPS

(Hazardous Chemical, Container Management, & Conservation, Recycling and Reuse Protocols)

- **Use Bulletin Boards** - Rather than routing memos, post information on bulletin boards, circulate copies, or use the company's network for electronic mail.
- **Reuse/Recycle laser cartridges** – You can use remanufactured laser jet toner cartridges for a substantial savings as well as get a credit for the spent cartridges or utilized manufacturer's recycling program
- **Lug a Mug** – Eliminate the single-use cups in favor of a ceramic or other non-disposable material.
- **Two-sided copies** – This can save paper. Remind people by posting a sign near the copy machine.
- **Recycle office products** – Your office can recycle white and colored office paper, newspapers, cardboard, and aluminum cans.
- **Standardize products** – If you standardize products within your department, it is easier to distribute surplus materials.
- **Labels** – Make sure all containers are labeled with their contents and expiration dates, where applicable. This will help you reduce the amount of unused material thrown away.
- **Free samples** – Only accept free samples of products if you have a use for them and receive and review MSDS.

- **Trading Post** – When you have excess materials available, see if they can be transferred to another department avoiding disposal
- **Remodeling** – Review products to be used in building or remodeling offices. Try to use recycled materials when cost and functionally affective and try to reduce releases and potential causes of indoor air pollution from paints, adhesives, carpets and other materials.
- **Clean air with house plants** – Houseplants can absorb air pollutants in the office – but they are selective. Different plants absorb different pollutants. Here are some examples.
Formaldehyde, commonly found in clothing, carpeting, furniture and paper goods:
 - Spider plant
 - Golden pathos
 - Bamboo palm
 - Corn plant*Benzene*, commonly found in synthetic fibers, plastics, inks:
 - Janet Craig dracaena
 - Chrysanthemum
 - Gerber's daisy



STANDARD OPERATING PRACTICES FOR POLLUTION PREVENTION

(All protocols)

Operating Guideline	Program Ingredients
Waste Segregation	Prevent mixing of hazardous wastes and nonhazardous wastes. Store materials in compatible groups. Segregate different <i>solvents</i> . Isolate liquid wastes from solid wastes.
Preventive Maintenance	Maintain equipment history cards on equipment Programs location, characteristics, and maintenance. Maintain a master preventive maintenance schedule. Keep vendor maintenance manuals handy. Maintain a manual or computerized repair history file.
Employee Training/ Awareness-Building	Provide training for: <ul style="list-style-type: none">– Operation of equipment to minimize Programs energy use and material waste– Proper materials handling to reduce waste and spill.– Explanation of the economic and environmental ramifications of hazardous waste generation and disposal.– Detecting and minimizing material loss to air, land, or water.– Emergency procedures to minimize lost materials during accidents.
Effective Supervision	Improve production efficiency and reduce inadvertent waste generation by direct supervision. Centralize waste management. Appoint a safety/waste management officer for each department. Educate staff on the benefits of pollution prevention. Establish pollution prevention goals. Perform pollution prevention assessments.
Employee Participation	Establish “quality circles” between employees and supervisors to identify ways to reduce waste. Solicit and reward employees for suggestions for waste reduction, “incentives for action” ideas.
Production	Maximize batch size to reduce clean-out waste.



CODE OF POLLUTION PREVENTION PRACTICES

For the Mining Industry in the State of Colorado

Scheduling/Planning	Dedicate equipment to a single product. Alter batch sequencing to minimize cleaning frequency.
Cost Accounting/Allocation	Charge direct and indirect costs of all air, land, and water discharges to specific processes or products. Allocate waste treatment and disposal costs to the operations that generate the waste. Allocate utility costs to specific processes or products.

Source: Adapted from Appendix A of the Pollution Prevention in Mining and Mineral Processing, U.S. Bureau of Mines (1995).



CHECKLIST FOR COMMON POLLUTION PREVENTION METHODS

(Hazardous Chemical, Container Management, and Conservation, Recycling and Reuse Protocols)

Waste Origin/Type	Pollution Prevention Method
Material Receiving	<p>Use “just-in-time” ordering system. Establish a centralized purchasing program.</p> <p>Select <i>quantity and</i> package type to minimize packing waste.</p> <p>Order reagent chemicals in exact amounts.</p> <p>Encourage chemical suppliers to become responsible partners (e.g., accept return of outdated supplies)</p> <p>Establish an inventory control program to trace chemical from cradle to grave.</p> <p>Develop a running inventory of unused chemicals for other departments’ use.</p> <p>Inspect material before accepting a shipment.</p> <p>Review material procurement specifications.</p> <p>Validate shelf-life expiration dates.</p> <p>Test effectiveness of outdated material.</p> <p>Eliminate shelf-life requirements for stable compounds.</p> <p>Conduct frequent inventory checks.</p> <p>Use computer-assisted plant inventory system.</p> <p>Conduct periodic material tracking.</p> <p>Properly label all containers.</p> <p>Set up staffed control points to dispense chemical and collect wastes.</p> <p>Buy pure feeds.</p> <p>Find less critical uses for off-spec material that would otherwise be disposed or refused acceptance.</p>
Raw Material and Product Storage	<p>Change to reusable shipping containers. Switch to less hazardous raw material.</p> <p>Use rinse-able/recyclable drums.</p> <p>Establish Spill Prevention, Control, and Countermeasures (SPCC) plans.</p> <p>Use properly designed tanks and vessels only for their intended purposes.</p> <p>Install overflow alarms for all tanks and vessels.</p> <p>Maintain physical integrity of all tanks and vessels.</p> <p>Set up written procedures for all loading/unloading and transfer operations.</p> <p>Install secondary containment areas.</p> <p>Isolate equipment or process lines that Storage-- leak or are not in service.</p> <p>Use seal-less pumps.</p>



CODE OF POLLUTION PREVENTION PRACTICES

For the Mining Industry in the State of Colorado

Waste Origin/Type	Pollution Prevention Method
Raw Material and Product Storage (continued)	<ul style="list-style-type: none"> Use bellows-seal valves. Document all spillage. Instruct operators not to bypass interlocks, alarms, or significantly alter set-points without authorization. Perform overall materials balances and estimate the quantity and dollar value of all losses. Use floating-roof tanks for VOC control. Use conservation vents on fixed roof tanks. Use vapor-recovery systems. Store containers so as to allow for visual inspection for corrosion and leaks. Stack containers in a way to minimize the chance of tipping, puncturing, or breaking. Prevent concrete "sweating" by raising the drum off storage pads. Maintain Material Safety Data Sheets to ensure correct handling of spills. Provide adequate lighting in the storage area. Maintain a clean, even surface in transportation areas. Keep aisles clear of obstruction. Maintain distance between incompatible chemicals and different types of chemicals to prevent cross contamination. Avoid stacking containers against process equipment. Follow manufacturers' suggestions on the storage and handling of all raw materials.
Operation and Process Changes	<ul style="list-style-type: none"> Use proper insulation of electric circuitry and inspect regularly for corrosion and potential sparking. Use large containers for bulk storage whenever possible. Use containers with height-to-diameter ratio equal to one to minimize wetted area. Use squeegees to recover residual fluid on product prior to rinsing. Use closed storage and transfer systems. Provide sufficient drain time for liquids from solids. Use cleaning system that avoids or minimizes solvents. Clean only when needed. Use countercurrent rinsing. Use clean-in-place systems. Maximize dedication of process equipment. Empty drums and containers thoroughly before cleaning or disposal. Clean equipment immediately after use.



CODE OF POLLUTION PREVENTION PRACTICES For the Mining Industry in the State of Colorado

Waste Origin/Type	Pollution Prevention Method
	Reuse cleanup solvent.
	Line equipment to reduce fluid holdup.
	Reprocess cleanup solvent into useful products.
	Segregate wastes by solvent type.
	Standardize solvent usage.
	Schedule production to lower cleaning frequency.
	Use mechanical wipers on mixing tanks.

Source: Adapted from Appendix B of the Pollution Prevention in Mining and Mineral Processing, U.S. Bureau of Mines (1995).



CODE OF POLLUTION PREVENTION PRACTICES
For the Mining Industry in the State of Colorado

LIST OF RECYCLING VENDORS

<u>Material</u>	<u>Vendors</u>	<u>Location</u>	<u>Phone</u>
Carbon Slag, Fines, Crucibles	Just Refiners	Sparks NV	775-331-1663
Cardboard	Recycle America	CO	719-633-0955
White paper	Recycle America	CO	719-633-0955
Plastic bottles	Recycle America	CO	719-633-0955
Scrap Metal	Western Scrap	Pueblo, CO	719-390-7986
Used Antifreeze	Irvin Oil	Penrose CO	719-275-4075
Used Oil	Irvin Oil	Penrose, CO	719-275-4075
Used Oil/Antifreeze	MESA	Denver, CO	303-426-4777
Fluorescent Bulbs	AERC (MTI)	Hayward CA	510-429-1129
Fluorescent Bulbs	Superior Specialty Services	AZ	800-368-9095
Mercury	Bethlehem	Hellertown PA	610-838-7034
Dry Cell Batteries	Battery Solutions, Inc	Wayne MI	734-467-9110
Dry Cell Batteries	AET	Denver, CO	303-333-8521
Computer Monitors	Envirocycle	Hallstead PA	800-711-6010 x 231
Computer Monitors	Superior Specialty Services	AZ	800-368-9095
Used Small Tires	Midway	Fountain CO	719-382-3019
Used Large Tires	Tuff Tanks	Byers CO	303-822-5595
Paper	Evergreen Disposal Services	Golden CO	303-278-8600
Tires: large, small	Cobre Tires		
Aluminum	EDS	Golden CO	303-278-8600
Solvents	Safety Kleen	Denver, CO	Safety Kleen
Paints	AET	Denver, CO	303-333-8521
Cardboard	EDS	Golden, CO	303-278-8600

The Colorado Mining Association is NOT making any representation concerning the quality of service provided by the listed companies. The list is solely a compilation of Vendors that Colorado Mining Association member companies reported to have used in the past.