

APPENDIX C

REGULATORY AND NON-REGULATORY TOOLS

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1. INTRODUCTION

Regulation of mining activities involves a complex web of sometimes overlapping jurisdictions, laws and regulations covering several media. In addition, ownership issues at many mine sites further complicate the regulatory process. In order to identify and implement effective actions, it is important to have a thorough understanding of the regulatory and non-regulatory tools that are available to the Agency.

This appendix describes the primary regulatory and non-regulatory tools that are available to EPA to prevent, control, or remediate environmental impacts at active, inactive, and abandoned mines. Appendix describes the major programs of other federal agencies. Appendix E introduces and briefly describes the nature of state regulation of mining activities.

The description of each of EPA's major regulatory tools is presented in outline form which allows comparisons among their salient feature. Descriptions are generally organized into the following categories:

- A. Jurisdiction/Applicability/Media/Constituents
- B. Implementation Mechanisms (i.e., permits, response authority, standards)
- C. Compliance/Enforcement
- D. Funding
- E. Natural Resource Restoration Provisions
- F. Good Samaritan Provisions
- G. Tribal Roles/Responsibilities
- H. Advantages/Limitations
- I. Integration with Other Statutes

Categories for which the particular tools do not contain specific provisions are identified as not applicable (N/A).

2. EXISTING REGULATORY TOOLS

I. NATIONAL ENVIRONMENTAL POLICY ACT

The National Environmental Policy Act (NEPA), 42 U.S.C. §§ 4321 *et seq.*, requires that federal agencies consider the environmental consequences of their actions and decisions as they carry out their mandated functions.

A. *NEPA Jurisdiction/Applicability/Media/Constituents*

Pursuant to NEPA, federal agencies must prepare detailed statements assessing the environmental impact of, and alternatives to, major federal actions that may significantly affect the environment. An environmental impact statement (EIS) shall provide fair and full discussion of significant environmental impacts and inform decision makers and the public of the reasonable alternatives and mitigation measures which would avoid or minimize adverse impacts or enhance the quality of the environment. EISs must rigorously explore and objectively evaluate all reasonable alternatives even if they are not within the authority of the lead agency. For lesser actions, the agency may prepare an Environmental Assessment (EA) and/or make a Finding of No Significant Impact (FONSI).

Federal actions specifically related to mining that may require an EIS include activities involving federally managed lands including approval of plans of operation for hardrock mining and/or milling operation and mineral leases and sales. In addition, certain federal permits required by EPA (i.e., new source National Pollutant Discharge Elimination System (NPDES) issued by EPA) or the U.S. Army Corps of Engineers (COE) (i.e., Section 404) may require NEPA assessments.

The scope of impacts to be assessed should include all affected media, such as air, water, soil, biological, visual, recreational, cultural, and economic resources.

B. *NEPA Implementation Mechanisms*

Under NEPA, a lead agency is designated and is responsible for preparing the EIS. Other agencies may assist as cooperating agencies. For example, the Bureau of Land Management (BLM) may have the lead for an EIS for a hardrock mining plan of operation, and EPA and COE may be cooperating agencies for purposes of the environmental assessment needs for an National Pollutant Discharge Elimination System (NPDES) permit to be issued by EPA and a Section 404 permit by the COE. For new mining projects requiring federal permits, NEPA offers the opportunity to identify permit conditions, including those needed to avoid or minimize impacts or to mitigate for unavoidable impacts.

EPA's review under NEPA assesses mining project alternatives, impacts, and mitigation. Issues may include the potential for acid rock drainage, aquatic and terrestrial habitat value and losses, sediment production, NPDES discharges, air emissions, mitigation and reclamation. Mitigation that is developed

should be included as conditions of the NPDES permit to the extent authorized by law. Standards, such as those established under the Clean Water Act (CWA) or Clean Air Act (CAA), serve as thresholds in the NEPA document for determining the acceptability of project-related impacts or mitigation requirements. Therefore, from a procedural standpoint, the NEPA compliance process provides the vehicle for agency consideration of overall project-related impacts prior to the permit decision.

New Source NPDES NEPA Compliance: In those jurisdictions where EPA retains NPDES permitting authority, a NEPA analysis (an environmental assessment or environmental impact statement) must be performed prior to taking action on the NPDES permit for a mine which is subject to new source performance standards. The NEPA review provides information for EPA's decision to issue or deny the permit pursuant to the CWA. NEPA provides authority to consider the overall impacts (i.e., not just discharge-related) of the proposed project and alternatives.

Section 309 of the Clean Air Act: In addition to EPA's obligation to comply with NEPA for certain of its actions, EPA is tasked by section 309 of the CAA to review and comment on the environmental impacts of any legislation submitted by a federal department or agency, major federal actions significantly affecting the environment, newly authorized federal projects for construction, or proposed regulations. In the event that one of the aforementioned are determined to be unsatisfactory from the standpoint of public health, welfare or environmental quality, the Administrator publishes this determination and refers it to the Council on Environmental Quality (CEQ) for its consideration. This referral authority has been used 15 times to date. Thus, pursuant to section 309, NEPA, and the CEQ NEPA Implementation Regulations at 40 CFR 1500–1508, EPA reviews NEPA documents prepared by other federal agencies.

C. NEPA Compliance/Enforcement

EPA's participation in NEPA analysis may influence federal projects that are the subject of these documents in the following ways:

- EPA comments on and rates the environmental impact of the proposed action and the adequacy of the environmental analysis contained in the draft EIS. Based on the Agency's jurisdiction and/or expertise, EPA's comment letter is intended to foster the goals of NEPA by ensuring that EPA's environmental expertise is considered by Agency decision makers. EPA's ratings of other agencies' actions are viewed with considerable interest by stakeholders.
- The EPA Administrator can refer an EIS that is rated as environmentally unsatisfactory to the CEQ. This process provides a potential avenue for elevation of the issues and resolution at higher levels if solutions cannot otherwise be reached between agencies. The CEQ can, among other things, publish findings and recommendations regarding the project, or initiate a dispute-resolution process.

- When EPA gets involved early in the development of a project and associated EIS, it can have more influence over the outcome by ensuring adequate analyses and consideration of environmental goals from the beginning. If it does not review a project until late in the development, it may be more difficult to persuade the lead agency and/or project proponent to make significant changes.
- The Agency's comments on impacts that are regulated by EPA statutes carry considerable influence. Both NEPA and section 309 of the CAA are used in conjunction with other statutes and mechanisms that regulate mining.

D. NEPA Funding

EPA actions carried out under NEPA and section 309 of the CAA authority do not have a specific appropriation. federal agency NEPA compliance is funded on an agency-specific basis and is typically considered to be a normal cost of program operations. Contract or grant funding may also be available through EPA or other federal agencies to assist in the preparation of NEPA-related documents and studies. The federal land management agency or regulatory agency can fund the preparation of the information for the NEPA document through a third-party contract with the applicant for the mining project. The CEQ does have an appropriation to support its role in the interagency NEPA process (currently, \$1 million and 10 full-time employees (FTE)).

E. NEPA Natural Resource Restoration Provisions - NA

F. NEPA Good Samaritan Provisions - N/A

G. NEPA Tribal Roles/Responsibilities - N/A

H. NEPA Advantages/Limitations

NEPA mandates that mitigation be analyzed. EISs have to discuss measures to mitigate adverse environmental impacts (40 CFR 1502.16). Records of Decision have to state whether all practicable means to avoid or minimize environmental harm from the alternative selected have been adopted, and if not, why they were not. A monitoring and enforcement program must be adopted and summarized where applicable for any mitigation (40 CFR 1505.2(c)).

The NEPA process may also enable land management agencies and/or states to address performance bonds or trust funds that are established at the start of a mining project and that would not be released at closure. EPA comments could suggest that trust amounts would be based on the level of risk involved in a project and could be used to remediate problems that arise long after the mining company is no longer managing the site. Factors such as number of years project structures would require maintenance

(e.g., in perpetuity) would be used in determining the trust amount. Performance bonding and perpetual trust funds should be considered as conditions of the lease or permit.

However, NEPA is primarily limited to providing a procedural framework which requires federal agencies to evaluate and analyze their proposed actions. NEPA does not contain substantive requirements and does not generally compel selection of the environmentally preferable alternative. A further limitation is that conditions, including mitigation identified in the Record of Decision are difficult to enforce unless they are also specifically included a permit or through some other legally binding agreement.

Categorical Exclusions further limit the availability of NEPA to provide for the review and analysis of those federal actions which are determined to be categorically excluded from NEPA. These are determined by the lead agency after there is an opportunity for public comment announced by a notice in the *Federal Register*.

I. NEPA Integration with Other Statutes

NEPA is intended to integrate decision making, under various federal statutes to promote “productive and enjoyable harmony between man and his environment”. With respect to new mining projects requiring federal actions, including permits, NEPA offers the opportunity to identify alternatives and mitigation measures in advance of permitting. NEPA provides an excellent vehicle for integrating overall project planning and permitting. Examples of how this integration can occur with respect to the specific statutes are described below.

Clean Water Act NPDES Permits. Mining projects require NPDES permits to discharge wastewater to waters of the United States (see sections 402(a)(2), 402(1)(2)) of the CWA). A NEPA analysis is required before an NPDES permit can be issued by EPA to a mine subject to a New Source Performance Standard. In addition to addressing other impacts, a NEPA EIS should project the quality of the effluent using technically sound methods and representative data. The effectiveness of alternative waste treatment methods can also be examined. Also, under EPA’s NEPA compliance regulations, mitigation measures must be included as conditions of the NPDES permit.

Clean Water Act Dredge and Fill Permits. Many mining projects involve some filling of wetlands or other waters of the United States which requires authorization under section 404 of the CWA. Pursuant to Section 404(b)(1) guidelines, only the least environmentally damaging practicable alternative can be permitted. The identification in a NEPA EIS of the environmentally preferred alternative should ideally satisfy the alternatives analysis requirements of section 404. Mitigation described in the EIS to replace unavoidable losses of aquatic habitat can then form the basis for mitigation requirements of section 404 permits. In short, the EIS should provide the information necessary to determine compliance with the requirements of section 404 of the CWA.

Clean Air Act. Where a NEPA document is prepared, compliance with CAA requirements must, to the fullest extent possible, be documented through the NEPA process. This could affect the citing of facilities and thus the overall identification of the environmentally preferred alternative. In non-attainment areas, section 176(c) of the CAA prohibits issuance of a federal permit unless it can be demonstrated that the proposal will conform with the SIP.

Federal Land Policy and Management Act (FLPMA). FLPMA governs the way the BLM and U.S. Forest Service (USFS) administer public lands, including mining on public lands. Under FLPMA, BLM and USFS land use decisions are subject to NEPA. Federal land managers generally require Plans of Operation, which include reclamation plans and describe details of the proposed operation. By describing these plans in a NEPA document, other federal and state regulatory agencies can comment on aspects of the project design that relate to their respective statutory authorities, regulatory requirements, or that pertain to their particular expertise.

Other Federal and State Statutes. Federal, state, and local agencies commenting on NEPA documents can influence the decision process and meet many of their own permitting information needs. Sixteen states have implemented NEPA type statutes.

II. CLEAN WATER ACT

The Federal Water Pollution Control Act, 33 U.S.C. §§ 1251 *et seq.* (Clean Water Act), provides that point source discharges of pollutants to waters of the United States are prohibited unless authorized by a permit. Mining activities often involve activities that result in discharges to waters of the United States. Three separate programs established by the Clean Water Act are significant when reviewing mining activities. These include the establishment of water quality standards pursuant to section 303(c) of the CWA, NPDES permit requirements set forth in section 402, and dredge and fill permit requirements set forth in section 404. Each of these three areas is discussed in the following subsections.

Section 303: The Establishment Of Water Quality Standards

A. Section 303 Jurisdiction/Applicability/Media/Constituents

Jurisdictional conditions. All states, pursuant to section 303(c) and 40 CFR 131.11 are required to establish state water quality standards for waters of the United States within their jurisdictions that take into account the beneficial uses of the water segment, including consideration of downstream uses. Beneficial uses include public water supplies, protection and propagation of fish and wildlife, recreation, agricultural and industrial water supplies, and navigation. State water quality standards must include designated uses of waters, criteria to protect those uses, and an antidegradation policy. NPDES effluent limitations necessary to attain or maintain these standards must also be established in accordance with 40 CFR 122.44(d) where a permitting authority determines that pollutants “are or may be discharged at a level

which will cause, have the reasonable potential to cause, or contribute to an excursion above a state water quality standard.”

Media. Section 303 is applicable to all waters of the United States.

Constituents: States must review, pursuant to 40 CFR 131.11(a)(2), water quality data and information on discharges to identify specific water bodies where toxic pollutants (the 126 priority pollutants identified under section 307(a) of the CWA) may be adversely affecting water quality or attainment of the designated water use or where the levels of toxic pollutant(s) warrant concern. In such circumstances, states must adopt criteria for such toxic pollutants applicable to the water body sufficient to protect the designated use. Some of these pollutants are likely to be associated with active and abandoned hardrock mines.

Where a state adopts narrative criteria for toxic pollutants to protect designated uses, the state must provide information identifying the method by which the state intends to regulate point source discharges. States must also adopt any other criteria that may be needed to protect the designated use. Criteria are to be based on sound scientific rationale if less stringent than EPA recommended criteria. EPA has issued recommended criteria pursuant to section 304(a) of the CWA. EPA’s IRIS database provides up-to-date scientific information on the toxicity and effects of a vast array of chemicals.

B. *Section 303 Implementation Mechanisms*

Permits: In accordance with 40 CFR 122.44(d), each NPDES permit shall include conditions that attain or maintain water quality standards established pursuant to Section 303 of the CWA, including state narrative criteria for water quality. Permits issued by the COE for discharges of dredged or fill material must similarly ensure compliance with such standards (See 40 CFR 230.10(b)(1)).

Review/approval: State water quality standards must be reviewed from time to time, but not less frequently than every three years, to determine whether any new information has become available for any water segments with standards that do not include the uses specified in Section 101(a)(2) of the CWA (i.e., fishable/swimmable).

Remediation: States are required to conduct and submit to EPA a use attainability analysis where a water body does not have all the uses included in section 101(a)(2) of the CWA (i.e., fishable/swimmable). Such an analysis could indicate the need for upgrading the use and attendant water quality criteria for the water segment. This provision may relate to many areas where discharges from mining operations impact use attainability.

Standard Setting: In establishing water quality standards applicable to surface waters associated with mining sites, states may use EPA’s gold book criteria (values established as guidance for the section

307(a) pollutants) or develop their own levels in accordance with regulations at 40 CFR 131 and EPA's guidance provided in the *Water Quality Standards Handbook*. NPDES water quality-based effluent limitations protective of state water quality standards for toxic pollutants must be established in accordance with the general provisions of 40 CFR 122.44(d). EPA's guidance for establishing permit limitations for toxic pollutants is provided in the 1991 *Technical Support Document for Water Quality-based Toxics Control*.

Water quality-based effluent limits are applicable where technology-based limits are not sufficiently stringent to ensure that water quality standards are attained or maintained. In developing water quality-based effluent limitations, an NPDES permitting authority must evaluate a discharge to determine whether or not pollutants are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to a violation of a state's water quality standard. Water quality-based effluent limitations must be set at a level that attains or maintains a state's water quality standards established pursuant to section 303.

C. *Section 303 Compliance/Enforcement*

EPA review and approval/disapproval of a state's triennial review of water quality standards provides a mechanism for oversight of state water quality standards and a basis for over-promulgation where states fail to establish appropriate water quality standards. Compliance and enforcement of water-quality based effluent limitations in NPDES permits is performed in the same manner as for other conditions in NPDES permits.

D. *Section 303 Funding - N/A*

E. *Section 303 Natural Resource Restoration Provisions*

States may designate waters as outstanding national resource waters where the states want to maintain and protect from degradation high quality waters that constitute an outstanding national resource (ONRW) -- such as waters of national and state parks, wildlife refuges, and waters of exceptional recreational or ecological significance.

F. *Section 303 Good Samaritan Provisions - N/A*

G. *Section 303 Tribal Roles/Responsibilities*

EPA may treat an Indian tribe in the same manner as a state for purposes of the water quality standards program if the tribe meets several criteria set forth in 40 CFR 131:

- Tribe is recognized by the Secretary of the Interior and meets the definitions of 40 CFR 131.3(k)(1).
- Tribe has a governing body carrying out substantial governmental duties and powers.
- The water quality standards program to be administered by the tribe pertains to the management and protection of water resources within the borders of the Indian reservation.
- The Indian tribe is reasonably expected to be capable, in the Regional Administrator's judgment, of carrying out the functions of an effective water quality standards program in a manner consistent with the terms and purposes of the CWA and applicable regulations.

H. Section 303 Advantages/Limitations

Historically, there has been some discrepancy in application of the above-described process to ensure that appropriate standards are established, uses maintained, and uses upgraded. EPA's December 22, 1992 rule implementing a portion of the 1987 amendments to the CWA (the so-called National Toxics Rule (NTR)) redressed this imbalance, to an extent, by promulgating standards for toxics where needed.

In addition, current information indicates that water quality standards and corresponding water quality-based effluent limitations are not always adequate in mining areas, where the waters immediately adjacent to active or abandoned mines may be badly impaired, but where downstream water quality is the key determinant.

Another limitation is the limited technical resources available to establish both appropriate water quality standards and water quality-based effluent limitations.

A key issue in connection with water quality standards and water quality-based effluent limitations for heavy metals is the manner in which a metal concentration is expressed. The focus of this issue is how to accurately express the fraction of the metal that is chemically available, and thus able to impair human health or the environment (i.e., the dissolved fraction) in relation to the total recoverable portion of the metal. In section 304(a) of the CWA, the criteria for metals are expressed as total recoverable metal and accordingly, the numeric criteria for metals in the NTR were also based on total recoverable metal. However, shortly after promulgation of the NTR, the Agency issued a policy statement recommending the use of dissolved metal to set and measure compliance with water quality standards. On May 4, 1995, EPA revised the NTR to express the numeric metals criteria in terms of dissolved metal (60 FR 22229). EPA's December 22, 1992, rule provided specific guidance in this respect. Although the water quality standard (and the effluent limitations based on the standards) must be expressed as total recoverable metal, the standard can be based upon a water effect ratio. The water effects ratio is designed to account for the phenomenon of a particular water bodies' ability to effectively bind a portion of the metal, thus making it

unavailable. In addition, guidance exists for establishing, on a case-by-case basis, a water effects ratio that can be reflected in site-specific water quality-based effluent limitations.

I. Section 303 Integration with Other Statutes

The water quality standards established under the CWA provide an important baseline for implementing the permitting requirements of the CWA as well as for implementing many of the other federal environmental statutes. (See discussion under NEPA, CERCLA)

Section 402: National Pollutant Discharge Elimination System (NPDES) Program

Over the last several years, implementation of the NPDES permitting program has moved from control of single point sources of pollution, based on a relatively small number of conventional pollutants (biological oxygen demand, total suspended solids, oil & grease, fecal coliform, pH) to more complex analyses that consider multiple sources of pollution and multiple pollutant parameters including non-conventional (e.g., ammonia, chlorine, color, iron, and total phenols) and toxic pollutants. Increasingly, permits issued by federal and state regulators include limitations necessary to meet specific in-stream water quality criteria (in addition to any applicable technology-based requirements).

Recent national initiatives are directed toward ensuring that point sources of pollution are addressed, to the maximum extent possible, on a watershed basis. This approach emphasizes addressing point and nonpoint sources of pollution in recognition of all other inputs to the basin. It is also designed to ensure that the highest priority sources (with respect to impacts on the basin) are addressed. The watershed approach can be an effective administrative mechanism to provide greater cost effective reductions of pollutant loadings.

A. Section 402 Jurisdiction/Applicability/Media/Constituents

NPDES permits are required for all point source discharges of pollutants to waters of the United States. The current operator must obtain the permit, but where there is no operator, then the owner must apply. Section 301(a) of the CWA provides that “[e]xcept as in compliance with . . . sections . . . 402 and 404 of this Act, the discharge of any pollutant by any person shall be unlawful.”

Jurisdictional conditions: Section 402 of the CWA applies to discharges of a pollutant from a point source. Under section 502(14) point sources include any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container from which pollutants are or may be discharged to waters of the United States.

Media: Point source discharges must be to waters of the United States. Waters of the United States are defined in 40 CFR 122 to include all surface waters, wetlands, streams (ephemeral, intermittent or constant), rivers, lakes, and ponds which could affect interstate or foreign commerce.

Constituents: Under the CWA pollutant is defined very broadly and generally would include any material that may be discharged to or be placed in a water of the United States as a result of any mining activity.

B. Section 402 Implementation Mechanisms

Permits are required for all point source discharges that are not expressly excluded by Section 402(1)(1) and (2) of the CWA. This includes storm water contaminated by contact with material from mining activities. Individual permits may be issued and generally must include numeric end-of-pipe limits (unless not technically feasible to develop those limits, in which case best management practices (BMP) may be required). General permits may be issued to a class or category of mines and may require BMP (including inventorying, assessment, prioritization, and identification and implementation of best management practices) necessary to meet water quality standards. All permits, whether individual or general, must contain the more stringent of technology-based or water quality-based requirements.

The NPDES regulations classify discharges from mine sites as either mine drainage, process water, storm water or unclassified. Those discharges classified as mine drainage or process water are subject to the effluent limitations guidelines restrictions set forth in 40 CFR 440. Those classified as storm water may be permitted pursuant to NPDES general storm water permits if they are not mixed with the two former types. EPA published a table in the September 29, 1995 *Federal Register* (60 FR 50804) to clarify which discharges from mining areas are subject to the effluent limitations guidelines and which may be subject to a general storm water permit. This table has been challenged by the National Mining Association.

General permits are a viable option only where EPA or the state in which the sites are located has issued a general permit for such discharges. EPA has published two general permits which may be applied to storm water discharges from mining related sources. The first is the *Baseline General Storm Water Permit* published on September 9, 1992 (57 FR 41236). The second is the *Multi-Sector General Storm Water Permit* published on September 29, 1995 (60 FR 50804).

Section 402(p) of the CWA, requires discharges of storm water associated with industrial activity to apply for coverage under an NPDES permit by October 1, 1992. On November 16, 1990 (55 FR 47990), EPA promulgated the regulatory definition of storm water discharges associated with industrial activity. (See 40 CFR 122.26(14)). This definition includes point source discharges of storm water from eleven major categories of industries, including: (I) facilities subject to storm water effluent limitations guidelines and "(iii) facilities classified as Standard Industrial Classifications 10 through 14 (metal mining

industry), including active and inactive mining operations. Storm water discharges at mine sites may include those discharges that have come into contact with, or are contaminated by contact with, any overburden, raw material, intermediate products, finished products, by-products or waste products located on the site of such operations which is consistent with section 402(1)(2).

Review/approval: New sources must have a permit before beginning to discharge. Existing sources must presently have a permit or be in violation of the CWA. Forty-one non-federal jurisdictions (42 states and the U.S. Virgin Islands) have been authorized to issue permits.

Remediation: Section 504 of the CWA provides EPA the authority to respond to situations presenting an imminent and substantial endangerment by bringing an action to restrain any person causing or contributing to the alleged pollution to stop the discharge of pollutants or to take such other action as may be necessary. In addition, EPA's policies provide that as part of a resolution of an enforcement proceeding under the CWA, EPA may enter into settlements containing Supplemental Environmental Projects (SEPs) which may involve remediation of source areas.

Standards: Technology-Based Requirements. Technology-based requirements applicable to mining operations are described by national rule, or on a case-by-case basis using Best Professional Judgement (BPJ) where no national rule is applicable. To date, EPA has established national technology-based effluent limitations guidelines (ELG) for 52 categories of industrial activities, including ore mining and dressing (See 40 CFR 440), with separate numeric limits for mine drainage and for mill discharges. In addition, there are three other effluent guidelines which apply to other hardrock mining sectors addressed by this framework: mineral mining and processing (40 CFR 436), nonferrous metal manufacturing (40 CFR 421), and ferro-alloy manufacturing (40 CFR 424). Permits are required to impose effluent limitations reflecting Best Available Technology (BAT) for nonconventional and toxic pollutants (i.e., applicable ELG or limitation based upon BPJ). (See Section 301(b)(2) of the CWA). Technology-based requirements (including zero discharge where found to be technically and economically achievable) must be met regardless of whether they are more stringent than necessary to meet water quality requirements. Water Quality-Based Requirements. Permits are required to assure compliance with all applicable state water quality standards regardless of technological or economic feasibility.

C. Section 402 Compliance/Enforcement

Injunctive relief: The CWA provides authority to seek temporary or permanent injunctive relief under section 309(b) of CWA.

Administrative/compliance orders: The CWA provides authority to issue administrative compliance orders under section 309(a) of the CWA.

Civil penalties: The CWA provides for civil penalties of up to \$25,000 per day of violation prior to January 31, 1997 and up to \$27,500 for violations after January 31, 1997 and up to one year imprisonment under section 309 of the CWA.

Criminal penalties: The CWA provides for criminal penalties of up to \$25,000 per day (and/or up to 1 year imprisonment) for negligent violations and \$50,000 per day (and/or 3 years imprisonment) for knowing violations under section 309 of the CWA.

Imminent hazardous authority: Section 504 of the CWA provides authority for EPA to bring suit to restrain pollution that presents an imminent and substantial endangerment to health or economic livelihood pursuant to section 504 of the CWA.

Information collection: The CWA provides broad authority to require submission of information, self-monitoring, entry and inspection, and record keeping under section 308 of the CWA.

G. *Section 402 Tribal Roles/Responsibilities*

Tribes may be delegated the authority to implement the NPDES program.

H. *Section 402 Advantages/Limitations*

The NPDES program provides a rigorous program with limited flexibility which, at times, can be difficult to adapt to mining situations. For instance, situations involving high levels of background pollutants are difficult to reconcile with the NPDES program.

Permits issued under the CWA could potentially limit the availability of other statutory authorities to respond to environmental problems resulting from the federally permitted release. For instance, CERCLA provides a defense for federal permitted releases.

II. *Section 402 Integration with Other Statutes*

See previous subsection.

Section 404: Discharges of dredged or fill materials

Section 404 of the CWA is jointly implemented by EPA and the COE. Section 404 generally requires a permit to discharge dredged and fill material to wetlands and other waters of the United States.

A. Section 404 Jurisdiction/Applicability/Media/Constituents

Geographical Jurisdiction Conditions: The geographic scope of the Clean Water Act is consistent across the Act's programs and covers waters of the United States. The term includes wetlands adjacent to traditionally navigable waters such as interstate rivers and streams and coastal waters, as well as isolated waters and wetlands so long as their destruction or degradation does or could affect interstate commerce. Section 404 defines wetlands in terms of three parameters: wetland vegetation, hydric soils, and hydrology (flooding/soil saturation).

Activities Jurisdiction Conditions: Section 404 regulates discharges of dredged material and of fill material. The term discharge has been interpreted to include both additions and redeposits to wetlands and other waters of the United States. The term discharge of dredged materials includes discharges associated with mechanized land clearing, ditching, channelization, and other excavation activities that destroy or degrade wetlands or other regulated waters. Discharges that have only *de minimis*, or inconsequential, effects are excluded from the definition.

Section 404(f) exempts from regulation discharges associated with certain activities specified in the statute itself. These exemptions include temporary mining roads constructed and maintained in accordance with best management practices. These exemptions are limited and do not allow the exemption of discharges incidental to any activity that converts a waters of the United States to another use and impairs the flow or circulation of the waters of the United States or reduces the reach of such waters.

B. Section 404 Implementation Mechanisms

Permits: Anyone wishing to discharge dredged and fill material to wetlands and other waters of the United States must first obtain authorization from the COE, either through issuance of an individual permit or as authorized under a general permit. General permits are authorized under section 404(e) for categories of activities that are similar in nature and will have only minimal environmental impact. General permits can be issued on a nationwide, regional, or state level. Currently, there are 37 nationwide permits (NWP) listed in 33 CFR 330. NWP 21, for example, authorizes discharges associated with surface coal mining provided they are authorized under the Surface Mining Control and Reclamation Act.

Review/Approval: Discharges to wetlands and other waters of the United States not authorized by general permits must be authorized by the COE through the individual permit process. COE bases its decision upon whether the proposed project (1) complies with EPA 404(b)(1) Guidelines (See 40 CFR 230), and (2) is in the public interest. EPA Regions review COE public notices for individual permit applications and provide comments to the COE regarding the proposed project's compliance with the Guidelines.

Criteria/Mitigation: The guidelines set forth the environmental criteria that the COE applies when reviewing individual Section 404 permit applications. The guidelines provide that a permit should not be issued if the proposed discharge would either: (1) violate state water quality standards, (2) violate toxic effluent standards, (3) jeopardize federally listed threatened or endangered species, or (4) cause or contribute, either individually or collectively, to significant degradation of wetlands or other waters of the United States. Under the guidelines' alternative analysis, consideration is given to whether the proposed discharge is the least damaging practicable alternative.

The Guidelines also require that the discharger undertake all appropriate and practicable mitigation in order to minimize any potential harm to the aquatic resources. COE evaluates permit applications to ensure that mitigation occurs in the following sequence: (1) avoidance of impacts, where practicable through the evaluation of alternative sites, (2) minimization of impacts, and (3) appropriate and practicable compensation of unavoidable impacts through wetlands creation or restoration.

C. *Section 404 Compliance/Enforcement*

The CWA gives EPA and COE joint authority to enforce the requirements of the Section 404 program. The two agencies have an enforcement Memorandum of Agreement (MOA), that allocates this shared responsibility. Under the MOA, COE is the federal permitting authority with the lead on permit violation cases; while EPA has the lead on many unpermitted discharge violations.

Injunctive Relief: EPA can seek injunctive relief administratively through issuance of an administrative compliance order under section 309(a), or judicially as provided by section 309(b). EPA's most common type of injunctive relief seeks to require a violator to stop illegal fill activity and, where appropriate, to undertake removal of a illegal discharge as well as restore the site to a functioning wetland system.

Civil Penalties: EPA can seek civil penalties in both the administrative and judicial arenas. Under section 309(g), EPA is authorized to administratively assess civil penalties up to \$25,000 per violation. Also, EPA can seek civil penalties under a civil judicial action.

Criminal Penalties: Under section 309(c), EPA is authorized to initiate criminal judicial enforcement actions for negligent violations, which are misdemeanors, and for knowing violations which constitute felonies.

Information Collection: EPA can and does avail itself of the various information gathering tools provided for in the CWA. In particular, under section 308, EPA can require the submission of information in order to determine the existence and/or extent of a violation.

D. *Section 404 Funding - N/A*

E. Section 404 Natural Resource Restoration Provisions - N/A

F. Section 404 Good Samaritan Provisions - N/A

G. Section 404 Tribal Roles/Responsibilities - N/A

H. Section 404 Advantages/Limitations

Definition of Fill Material: Historically, EPA and COE have had different definitions of the term fill material. EPA's fill material definition is based on an effects test and considers whether the discharge raises the bottom elevation of a water body or replaces a water body with dry land. The COE definition, in contrast, also includes a requirements that the discharge be for the primary purpose of filling the area, thereby excluding waste disposal. This difference has resulted in disagreements between EPA and COE over whether particular waste discharges, such as mining waste, should be regulated under section 404 or section 402.

Waste Treatment Systems: The CWA's regulatory definition of waters of the United States excludes certain waste treatment systems from the geographic scope of the Act. Efforts to interpret and clarify this exclusion have been underway for many years. The question has arisen as to the circumstances under which basins can be created in waters of the United States for the disposal and treatment of mine tailings. EPA's Office of Water (OW), in consultation with the COE, addressed this issue in a 1992 memorandum in the context of pending section 404 permit applications for two proposed gold mines in Alaska, the A-J Mine and the Kensington Mine. EPA and COE agreed that the mining companies needed a section 404 permit for the discharge of fill materials to create the basins themselves, and that a section 402 permit was needed for any discharges flowing out of the basins following treatment. The two agencies further agreed that the basins created by the discharge of fill material, if permitted pursuant to an individual Section 404 permit for purposes of creating a waste treatment system, would no longer be waters of the United States. This means that these basins could function as waste treatment systems (i.e., discharges into the basins would not have to be permitted under section 402). As part of the Section 404(b)(1) Guideline analysis undertaken during the individual section 404 permit review process, COE would consider the loss of aquatic values resulting from construction of the treatment system, including the physical impacts of the discharge of mine tailings in those systems.

I. Section 404 Integration with Other Statutes

NEPA: In those situations where section 404 is applicable and an EIS must be prepared, there is the opportunity for integration between NEPA and Section 404, especially with regard to decisions relating to the determination of practicable alternatives and requirements for practicable mitigation.

Administration Wetlands Plan: An important section 404 regulatory development is implementation of the Administration Wetlands Plan, a set of 40 initiatives to make federal wetlands policy more flexible for the landowner and more effective in protecting valuable wetlands. The initiatives, many of which have been implemented, emphasize: streamlining the permit process; increasing cooperation with private landowners; improving wetlands science; and increasing participation by states, tribes, local governments, and the public in wetlands protection.

CERCLA: Section 404 can be relevant in certain inactive and abandoned mine situations where CERCLA is applicable. Reference should be made to a guidance document entitled *Guidance for Considering Wetlands and Superfund Sites*. Wetlands issues can arise in the context of whether part of the site contamination involved unauthorized discharges of dredged or fill material to wetlands such that mitigation for such discharges should be obtained. In addition, if the proposed cleanup activities will involve discharges to wetlands or other waters of the United States, determinations need to be made as to whether section 404 is an applicable and relevant and appropriate requirements and, if so, there needs to be compliance with section 404 regulations.

III. COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION AND LIABILITY ACT

CERCLA provides EPA with authority to assess, investigate and cleanup environmental threats resulting from mining activities (42 U.S.C. § 9601 *et seq.*). Although Superfund authorities can potentially be applied to a broad range of mining sites, EPA has generally used it only at those significant sites at where other regulatory tools have not been able to achieve environmental protection goals. During the past decade, the Superfund program has been used to address the environmental threats at a number of major mineral mining/processing sites, include Bunker Hill, Anaconda, East Helena, Cal Gulch, and Summitville. Each of these sites posed a significant human health or environmental risk. Other smaller sites have also been addressed under the auspices of Superfund. Both government and privately funded response actions have been taken at sites to address localized threats to public health and/or the environment.

A. CERCLA Jurisdiction/Applicability/Media/Constituents

Jurisdictional Conditions. CERCLA applies to releases or threatened releases of: 1) a hazardous substance into the environment or 2) a pollutant and contaminant which may present an imminent and substantial danger to public health. The term release is defined broadly in the statute, including any type of emitting or leaking of substances into the environment.

Media. CERCLA is not media specific; thus, it can cover releases to air, surface water, ground water and soils.

Constituents. The definition of hazardous substance is extremely broad, covering any substances, hazardous constituents, hazardous wastes, toxic pollutants, imminently hazardous chemicals or mixtures, hazardous air pollutants, etc., under other federal environmental laws, as well as any substance listed under section 102 of CERCLA. The fact that a substance may be specifically excluded from coverage under one statute does not affect CERCLA's jurisdiction if that substance is listed under another statute or under section 102. A comprehensive list of these substances is provided in 40 CFR 302.4. From a mining perspective, only sulfates are excluded from the broad coverage of hazardous substances. Contaminants such as sulfates, however, can be covered under the more limited provisions of CERCLA relating to pollutants and contaminants, and will be discussed in the following subsections. Although certain wastes are excluded from RCRA Subtitle C regulation (i.e., Bevill wastes), they can be addressed under CERCLA. Thus, CERCLA covers almost every toxic or hazardous constituent found at mining sites. Exceptions include petroleum (that is not mixed with a hazardous substance) and naturally occurring releases. However, this exception does not include any of the releases normally found at mining sites, such as acid mine drainage, waste rock, or any ore artificially exposed to the elements by man.

B. CERCLA Implementation Mechanisms

Permits. CERCLA does not include any permit mechanism. Section 121(e) waives any requirement for a federal, state or local permit for any portion of a removal or remedial action that is to be conducted entirely on-site. However, that action must be performed in accordance with the substantive requirements of federal or state environmental laws. EPA has usually taken the position that on-site includes a discharge to surface water within the site boundaries, even though the water eventually flows off-site. However, this waiver applies to actions conducted as part of the CERCLA response. Whether it overrides pre-existing permit obligations (e.g., the requirements of a permit for a pre-existing discharge) is very uncertain. The section 121(e) exemption is essential for ensuring that EPA can take emergency actions in a timely manner.

Review/Approval. Typically, no review or approval is afforded at new or existing facilities unless there is a release or threat of release addressable under CERCLA. However, once jurisdiction is established, EPA has the capacity to review and approve any plans that address or affect that release or threatened release.

Financial assurance. Section 108(b) gives the EPA Administrator the authority to promulgate regulations which would require adequate financial assurance from classes of facilities that is consistent with the degree and duration of risk associated with the production, transportation, treatment, storage, or disposal of hazardous substances. This provides an extremely useful tool to fill the gap created in RCRA financial assurance requirements by the Bevill Amendment.

Response Authorities. CERCLA's main strength is its response authorities. EPA can either use the Superfund to perform remedial activities (section 104) or order parties to perform such activities

(section 106). CERCLA gives EPA the flexibility to cleanup sites based upon site-specific circumstances. EPA's cleanup decisions are based upon both risk assessment and consideration of applicable and relevant and appropriate requirements (ARARs). As long as the jurisdictional prerequisites have been met, CERCLA gives EPA the ability to perform any activity necessary to protect public health and the environment. CERCLA provides EPA with the authority to perform assessments, removal actions, and remedial actions.

Assessments. A CERCLA assessment generally evaluates contaminants of concern, exposure pathways and potential receptors. The assessment process includes the review of all available information as well as sampling for any other necessary information. It is broad in its application and is extremely useful in a multi-media mining program.

Removal Action. Removal actions can be performed on mining sites of any size in an emergency situation (implementation can occur within hours) or over a long period of time. Removal actions are generally subject to time (two years) and money (\$2,000,000) limits under the statute.

Remedial Actions. Remedial actions are typically long-term actions performed at those sites placed on the National Priorities List. These actions are not subject to the time or dollar limitations imposed on removal actions, but require a more detailed and formal decision process. Unlike removal actions, however, remedial actions to be implemented with Superfund dollars (when there are no viable parties) require a 10-percent state share in costs and a state assurance of operation and maintenance before remediation can commence.

Standard Setting. Under the current statute, CERCLA has no uniform national standard setting authorities. However, through the use of risk assessment and ARARs analysis, EPA can set site-specific standards for cleanup and maintenance. ARARs can be a very powerful tool, as they give EPA the authority to enforce standards which would not otherwise be applicable, if those standards are relevant and appropriate under the circumstances. For instance specifically related to mining, EPA has the authority to use appropriate parts of RCRA Subtitle C despite the Bevill amendment.

C. CERCLA Compliance/Enforcement

Potentially Responsible Parties (PRPs). CERCLA creates a broad category of persons who may be liable. This includes (1) current owners (including lessees) or operators of the facility; (2) past owner or operator at the time of disposal of hazardous substances in question; (3) anyone who arranged for the treatment, transportation or disposal of the hazardous substances in question; and (4) any transporter of the hazardous substances in question if the transporter chose the disposal location. Liability is strict. That is, if the party falls into one of the above four categories, it is liable, regardless of fault. Liability is joint and several so long as the harm is indivisible (i.e., there is no rational basis for apportionment). The burden of proof as to whether harm is indivisible is on the defendant, not on the government. Both EPA and courts,

however, have chosen to apportion liability in appropriate circumstances. Liability is retroactive, thus CERCLA can reach those responsible for disposal activities prior to enactment of CERCLA.

Prospective Purchasers of Contaminated Property. EPA has developed a prospective purchaser policy which affords a party interested in the purchase of contaminated properties with protection from CERCLA liability if that party is willing to provide some benefit to EPA not otherwise available from PRPs at the site.

Administrative and Injunctive Authorities. Section 106 provides for administrative or injunctive relief where: (1) there may be an imminent and substantial endangerment to the public health or welfare or the environment; (2) because of a release or threat of a release; (3) of a hazardous substance; and (4) from a facility. The scope of action that EPA can require under section 106 of is broad. At existing facilities, EPA could enjoin production activities or order changes to those activities (unless the activity is a discharge pursuant to a federally permitted release). Remedies can include institutional controls or removal of hazardous substances. The response action must not be inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) as listed in 40 CFR 300.

Cost Recovery. Sections 104 and 107 provide for the recovery of certain costs expended by the government in responding to environmental contamination from responsible parties (as previously defined). These response costs must be incurred as a result of (1) a release or substantial threatened release (2) of a hazardous substance (3) from a facility. In order for the United States, a state or Indian tribe to recover under these provision, the costs incurred have to be not inconsistent with the NCP. Like most recovery provisions in the law, EPA's cost recovery authority does have a statute of limitations. For removal actions, EPA must commence its cost recovery action within three years of completion of the removal action (unless the removal action proceeds into a remedial action). For remedial actions, EPA must commence its cost recovery action within six years of the initiation of physical on-site construction of the remedial action.

Civil Penalties. Under sections 106(b) and 109, EPA imposes a fine of \$25,000 per day for failure to comply with an order issued under CERCLA. In addition, if EPA spends Superfund dollars performing work where a responsible party has failed to perform such work under order, that party may be liable for punitive damages in an amount equal to three times the costs incurred by the United States under Section 107(c)(3). When EPA enters into consensual agreements with responsible parties for the performance of work, it may also require stipulated penalties for the responsible party's failure to adhere to the requirements of the agreement.

Criminal Penalties. Criminal penalties only apply to two provisions of CERCLA. The first is for failure to provide notification of a release of a reportable quantity of a hazardous substance, the second for destruction of records which are supposed to be maintained under the Act.

Information Collection. Section 104(b) allows for investigations, monitoring, surveys, testing and information gathering appropriate to identify the existence and extent of release or threat thereof, the source and nature of hazardous substances, pollutant or contaminants; and the extent of danger to public health, welfare or the environment. Studies may include planning, legal, fiscal, economic, engineering, architectural or others necessary or appropriate to plan and direct response actions, recover costs or enforce the chapter.

Section 104(e)(2) provides EPA access to information documents relating to: (1) the identification, nature and quantity of materials generated, treated, stored or disposed at a facility; (2) the nature and extent of a release or threatened release of hazardous substance, pollutant or contaminant; (3) the ability of the person to pay for or perform cleanup. Section 104(e)(3) provides EPA with the authority to enter any place where a hazardous substance, pollutant or contaminant: (1) may have been generated, stored, treated, disposed of or transported from; (2) or from which there is a release or threatened release of a hazardous substance; (3) or any place where entry needed to determine the need for response, appropriate response or to effectuate a response. Section 104(e)(4) gives EPA the authority to inspect, and obtain samples from, any location or containers of suspected hazardous substances, pollutants or contaminants. If a party refuses to consent to EPA's information collecting authorities, EPA may issue orders and/or seek court intervention providing for the collection of information and provision of access. Access may be granted through a warrant (where short-term access is necessary) or by court order (for long-term or intrusive access circumstances).

Section 103 requires any owner or operator a facility, owner at the time of disposal at a facility and transporter who chose to dispose of hazardous substances at a facility to notify EPA of the existence of such facility if storage, treatment, or disposal of hazardous substances has occurred at such facility. Thus, Section 103 provides broad authority for requiring the submission of information necessary to identify the location of sites needing EPA's attention.

D. CERCLA Funding

The Superfund, when not shadowed by its sunset provision, is funded by both a tax on the chemical industry and some smaller contribution of appropriated funds. The Superfund typically has enough money available to perform necessary investigatory and cleanup activities. CERCLA does contain fund-balancing criteria to ensure that the fund does not deplete its resources on any one site. Cost recovery by the government is a critical element of ensuring the adequacy of the Superfund.

E. CERCLA Natural Resource Damage Provisions

Section 107(C)(4) provides for the recovery of damages for injury to, destruction of, or loss of natural resources, including the reasonable costs of assessing such injury, destruction, or loss. Natural resources as defined at Section 101(16) means land, fish, wildlife, biota, air, water, ground water, drinking

water supplies, and other such resources belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by the United States, any state or local government, any foreign government or any Indian tribe. EPA is not responsible for recovering natural resources damages due the federal government, this responsibility generally lies with those agencies which administer federal lands. (See Section 107(f)(1) and (2))

F. CERCLA Good Samaritan Provisions

Section 107(d) of CERCLA provides exceptions to liability for those rendering care or advice at the direction of an On-Scene Coordinator (OSC) or in accordance with the NCP. A private party who is not otherwise liable at the site, and provides advice or care at the direction of an OSC in accordance with the NCP will be exempt from liability for any costs incurred as a result of actions or omissions by that party unless those actions or omissions are negligent.

State and local governments are exempt from liability under CERCLA for actions taken in response to an emergency created by the release or threat of release of hazardous substances from a facility owned by another person. Such exemption does not cover gross negligence or intentional misconduct. As with private parties, the state or local government cannot take advantage of this provision if it is otherwise liable for the release.

G. CERCLA Tribal Roles/Responsibilities

Section 126 of CERCLA provides that Indian tribes shall be afforded substantially the same treatment as states for certain specific purposes: notification for releases, consultation on remedial actions, access to information, health authorities, cleanup roles and responsibilities under the NCP, and establishing priorities for remedial actions. CERCLA also includes a number of additional provisions which specifically address tribes. For example, Sections 107(f) and 111(b)(1) authorize tribes to act as trustees for tribal natural resources and to seek recovery for damages to such resources. In addition, Section 104(d) authorizes EPA to enter into cooperative agreements with tribes.

H. CERCLA Advantages/Limitations

Federally Permitted Release. EPA's ability to address mine site problems may be limited when a release of concern has been permitted under a federal environmental program listed in Section 101(10). Even though such a release is addressable under Section 104 (i.e., EPA can still perform any necessary remediation), EPA's authority to cost recover for such activities is removed (Section 107(j)) and its authority to order others to do the work is uncertain.

Pollutants and Contaminants. Some contaminants, such as sulfate, do not fall under the definition of hazardous substance. These contaminants can be captured under the definition of pollutant

and contaminant in CERCLA, but using the authority afforded the Agency for such contaminants reduces flexibility. EPA may not be able to order responsible parties to address pollutants and contaminants or be able to recover costs incurred in responding to releases of such. A statutory change may be needed to address this uncertainty.

Additional Limitations. EPA's use of CERCLA to address mining sites is not without limitations. First, CERCLA resources are finite. Second, there are legal limitations on the use of the Superfund for remedial actions with respect to federally owned lands. Third, many mining sites may have permits issued under other federal environmental programs identified in section 101(10) of CERCLA. Where the release is subject to a federal permit, there may be constraints on EPA's ability to recover costs for the cleanup.

I. CERCLA Integration with Other Statutes

CERCLA's limitation on judicial review presents limitations on integration with other statutes. Under Section 113(h), CERCLA prevents courts from reviewing any pre-enforcement petitions by respondents. Other federal environmental statutes may provide for such review. CERCLA's limitation on judicial review presents issues to consider in actions that combine CERCLA enforcement with other statutes. Because CERCLA contains an express limitation on pre-enforcement review, it may be more effective to issue CERCLA orders separately from other enforcement actions.

CERCLA's broad authority means that it may be used where other tools are less effective. CERCLA provides positive synergistic effects when combined with other statutes because of its (1) retroactive, joint and several liability; (2) multi-media remedial capabilities; (3) site-specific flexibility through risk assessment and ARARs analysis (and authority to waive ARARs), and (4) the availability of Superfund financing.

IV. RESOURCE CONSERVATION AND RECOVERY ACT

RCRA is the national law governing management of solid and hazardous waste. RCRA divides wastes into one of two RCRA regulatory tracks: Subtitle D (solid waste) and Subtitle C (hazardous waste). In October, 1980, Congress amended RCRA by adding section 3001(b)(3)(A)(ii) (known as the Bevill exclusion) for solid waste from the extraction, beneficiation, and processing of ores and minerals. The Bevill amendment excluded such mining waste from regulation as hazardous waste under Subtitle C of RCRA, pending completion of a study and a Report to Congress.

A. RCRA Jurisdiction/Applicability/Media/Constituents

Jurisdictional conditions. RCRA uses the terms extraction, beneficiation, and mineral processing to describe the Bevill waste which is excluded from regulation under Subtitle C of RCRA. These initial

stages of mining (i.e., extraction and beneficiation) involve crushing and grinding of rocks to produce a valuable concentrate and relatively earthen-like large volume wastes. The latter stages of mining involve **mineral processing** which takes the valuable concentrate and uses chemical and heat intensive operations to drastically change the nature of the mineral and produce relatively low volume wastes (with some notable exceptions such as wastes from phosphoric acid production).

All extraction and beneficiation wastes, and 20 special mineral processing wastes are excluded from RCRA Subtitle C regulation by virtue of the Bevill Amendment. (See 40 CFR 261.4(b)(7)). EPA determined that Subtitle C regulation of extraction and beneficiation wastes was unwarranted in a 1986 regulatory determination (51 FR 24296, July 3, 1986) that was subsequently upheld in *Environmental Defense Fund v. U.S. EPA*, 852 F.2d 1309 (D.C. Cir. 1988).

For mineral processing wastes no longer exempt under Bevill, EPA proposed a conditional solid waste exclusion and other requirements (61 FR 2338, January 25, 1996). This proposal establishes land disposal restrictions for newly identified mineral processing wastes and rules regarding Bevill mixtures. EPA intends to refine the proposal in the late spring of 1997, and also will seek comments on the proper scope of the Bevill amendment. A final rule is expected later in 1997 or in 1998.

Media. Subtitle C permits address air, water, and soils releases from regulated units and releases from solid waste management units, which include units that contain Bevill-exempt waste. However, management of Bevill waste does not trigger Subtitle C permitting; a Subtitle C permit could only be issued to a facility that treats, stores, or disposes of non-Bevill hazardous waste.

Constituents addressed. Mineral processing wastes are considered characteristically hazardous if they exceed the toxicity characteristic leachate procedure (TCLP) as defined in 40 CFR 261.24, or if they are corrosive, ignitable, or reactive.

B. RCRA Implementation Mechanism

Subtitle D is intended to assist in developing and encouraging methods for the disposal of solid waste which are environmentally sound and which maximize the utilization of valuable resources including energy and materials and to encourage resource conservation. Subtitle D is designed to be a state-lead program. States may apply to EPA for approval of their solid waste management plans if they wish to obtain funds under section 4007(b). Subtitle D establishes minimal guidelines designed primarily for municipal landfills (See sections 4001 through 4010.) No guidelines have been developed to address mining wastes. Aside from funding incentives, Subtitle D has no practical enforcement authority.

Several years ago, EPA drafted a strawman document covering mine waste management program under Subtitle D which included the following provisions:

- Management programs would include extraction and beneficiation wastes (metallic ores and phosphate) and could cover mineral processing wastes for active and new operations.
- State and tribal programs would not be required to mirror federal requirements, but broad flexibility would be provided to states and tribes to design programs and to use existing state and federal programs as components of state and tribal plans and programs.
- Programs would address all media (ground water, air, surface water, soils) using site-specific risk-based performance standards.
- Permits would include conditions needed to achieve compliance with performance standards.
- Management programs would require monitoring and corrective action for all media, closure and post-closure care, and financial assurance.

Subtitle C applies to hazardous waste transporters, generators, and treatment, storage, and disposal facilities. Subtitle C applies on a limited basis to the 400 mineral processing sites that may generate characteristic hazardous waste. Only a few mineral processing sites have Subtitle C permits; most ship wastes off-site to avoid the stringent Subtitle C requirements.

Permits. Mineral processing and mining facilities rarely seek a Subtitle C permit. However, generator requirements, which require notification but no permit, apply to all mines and mineral processing facilities. Subtitle D has no permitting authority.

Remediation. Subtitle C, Part B subjects permitted facilities to corrective action requirements for both hazardous waste and solid waste management units. These corrective action requirements must be accomplished through the permitting process; these apply to both active and inactive waste units. . Closure and post-closure requirements apply to Subtitle C regulated units. Part 258 of Subtitle D has corrective action, closure, and post-closure requirements. Administrative orders through imminent hazard provisions can address remedial concerns

Standard setting. For Subtitle C, a host of standards apply to hazardous wastes including both technical (e.g., liner requirements) and risk based standards. Also, air emission standards, ground water monitoring, record keeping, financial responsibility, corrective action, and closure and post-closure requirements apply.

C. Compliance/Enforcement

Administrative Authorities. For Subtitle C, EPA may issue an administrative order under section 3008(a) requiring compliance or it may file suit in federal district court seeking an injunction mandating

compliance. An administrative order may also include revocation of a facility's permit and/or assessment of a civil penalty of up to \$25,000 per day of noncompliance for each requirement. RCRA provides for an additional civil penalty of up to \$25,000 per day for noncompliance with an administrative order. Section 3008(h) allows EPA to issue administrative orders requiring corrective action at interim status facilities, with specific penalties for noncompliance.

Criminal Penalties. For Subtitle C, RCRA also provides for criminal penalties for knowing violations of Subtitle C requirements including: a term of up to five years in prison for violations of section 3008(d)(1) or (2) and/or a fine of up to \$50,000 per day for knowingly transporting or causing the transport of hazardous waste to a facility without a Subtitle C permit or without the required manifest; treating, storing, or disposing of hazardous waste without a permit or in violation of any material requirement of a permit or interim status; misrepresenting information on a required document; destroying, altering, concealing, or failing to file required records; exporting hazardous waste in violation of the requirements of RCRA; or managing used oil in violation of requirements under section 3014 or other RCRA provisions. Fines and sentences may be doubled for repeat offenders. If a person, in committing one of these offenses, knowingly places another person in imminent danger of death or serious bodily injury, that offender may be subject to a \$250,000 fine (\$1 million for corporations) and/or 15 years in prison.

Imminent Hazards. For both Subtitle C and Subtitle D, section 7003 gives EPA broad authority to abate situations that may present an imminent and substantial endangerment to health or the environment. Section 7003 of RCRA authorizes EPA to obtain cleanups upon receipt of evidence that the past or present handling, storage, treatment, transportation or disposal of any solid waste or hazardous waste may present an imminent and substantial endangerment to health or the environment. The release need not be at a facility otherwise subject to RCRA regulations, and its application to solid waste as well as hazardous waste makes it available for mining waste despite the Bevill exclusion. In many respects, section 7003 order authority is comparable to orders under section 106 of CERCLA and may be issued to current or former handlers, owners, operators, transporters, and generators. EPA may issue an administrative order or seek an injunction in federal district court to stop the practice causing the danger and/or take any other action necessary. Violators of an administrative order under section 7003 may be penalized up to \$5,000 per day.

Citizen Suits. Under RCRA a citizen may file one of three types of suits in federal district court: (1) an action against any person (including the United States or a state) in violation of a RCRA permit or other requirement of any RCRA subtitle; (2) an action against any person to abate an imminent and substantial endangerment; or (3) an action against EPA to compel the completion of a nondiscretionary duty under the statute (e.g., a statutory mandate to issue regulations).

D. RCRA Funding

EPA funds substantial portions of state programs, sometimes as high as 75 percent. Under the RCRA program, several hundred thousand dollars of funding is available for mining related training, education, and technical assistance grants and extramural contracts.

E. RCRA Natural Resource Restoration Provisions - N/A

F. RCRA Good Samaritan Provisions

Active management of a grandfathered or historic waste that has lost the Bevill exemption would be considered an activity that generates a non-exempt waste. Even if an operator actively manages a grandfathered waste pile in order to alleviate an environmental release, that person may generate a new waste. In other words, the current Bevill rules may discourage cleaning up a historic waste pile that has lost the Bevill exemption.

G. RCRA Tribal Roles/Responsibilities

RCRA provides no explicit provision authorizing EPA to treat tribes as states. However, EPA has proposed a rule (61 FR 2583, January 26, 1996) that addresses authorization of Indian tribes to administer RCRA Subtitle D solid waste programs in the same manner as states and has also proposed such a rule for Subtitle C hazardous waste programs (61 FR 30471, June 14, 1996).

H. RCRA Limitations

Bevill exclusions have been described in the previous subsections.

I. RCRA Integration with Other Statutes

EPA has a policy that actions conducted pursuant to CERCLA emergency, remedial and corrective actions generally will be considered to satisfy RCRA requirements. Cost recovery is pursuant to CERCLA tools and is limited to cleanups. Section 3005(f) defers regulation of coal wastes to the Surface Mine and Coal Reclamation Act (SMCRA) at 30 U.S.C.A § 1201.

There are several RCRA Subtitle C provisions that are potentially applicable to mining situations but which have not been historically applied. These include section 2002(a) (Authorities), section 3001(b)(3)(B)(iii) (prevention of radiation human health risks from the extraction, beneficiation, and processing of phosphate rock or overburden from the mining of uranium ore), section 3001(b)(3)(C) (promulgation of new regulations under or determination that such regulations are unwarranted), and section 3004(x) (the Administrator is authorized to modify regulations for solid waste from the extraction,

beneficiation or processing of ores and minerals, including phosphate rock and overburden from the mining of uranium by taking into account the account the special characteristics of such wastes).

V. CLEAN AIR ACT

The CAA and its amendments of 1990 are codified in the United States Code at 42 U.S.C. §7401 *et seq.* The discussion that follows examines in more detail some of the CAA programs that are most relevant to the mining industry.

A. *CAA Jurisdiction/Applicability/Media/Constituents*

The CAA contains planning and control requirements that apply to existing stationary sources and provide for preconstruction review of new and modified major stationary sources to attain and maintain national ambient air quality standards. The CAA provides for motor vehicle emission standards, reformulated gasoline and the regulation of fuels and fuel additives. The CAA also provides for the regulation of hazardous air pollutants, contains an acid deposition control program, a program to protect visibility in national parks and wilderness areas, and a stratospheric ozone protection program. The CAA operating permit program promotes regulatory certainty and enforceability. The CAA contains specific enforcement provisions including information collection authorities and civil and criminal penalties.

B. *CAA Implementation Mechanisms*

Many of the CAA programs are implemented through a cooperative partnership between the states and EPA. While this partnership can take several shapes, generally EPA issues national standards or federal requirements and the states assume primary responsibility for implementing the requirements. As a prerequisite to assuming implementation responsibility, states must demonstrate to EPA that their programs meet minimum federal CAA requirements. EPA has issued proposed rules that would allow federally-recognized tribes to become CAA implementation partners with EPA in virtually the same fashion as states. (See 59 FR 43,956; August 25, 1994).

B.1. *Protection of National Ambient Air Quality Standards (NAAQS).*

Establishing the NAAQS. A purpose of the CAA is to protect and enhance the quality of ambient or outside air. EPA establishes national ambient air quality standards (NAAQS) for the protection of public health (primary standard) and welfare (secondary standard) under sections 108 & 109. Welfare includes effects on soils, water, crops, vegetation, manmade materials, animals, wildlife, weather, visibility, and climate, damage to and deterioration of property, and hazards to transportation, as well as effects on economic values and on personal comfort and well-being. (See section 302(h)).

EPA has established NAAQS for six pollutants: sulfur oxides, nitrogen dioxide, carbon monoxide, ozone, particulate matter, and lead. (See 40 CFR 50). The NAAQS represent the maximum ambient

levels of these pollutants that are allowed in any area of the country. Mining and mineral processing activities are most likely to cause significant emissions of sulfur dioxide, particulate matter, and lead.

The primary NAAQS for sulfur oxides measured as sulfur dioxide are 0.03 ppm, annual mean, and 0.14, maximum 24-hour concentration. The secondary NAAQS is 0.5 ppm, maximum 3-hour concentration. (See 40 CFR 50.4 and 50.5). The primary and secondary NAAQS for particulate matter, measured as particulate matter with an aerodynamic diameter of ten micrometers or less (PM-10), are 150 micrograms per cubic meter, 24-hour average concentration, and 50 micrograms per cubic meter, annual mean. (See 40 CFR 50.6). The primary and secondary NAAQS for lead is 1.5 micrograms per cubic meter, mean calendar quarter. (See 40 CFR 50.12)

Planning and Control Requirements for “Nonattainment” Areas. EPA designates areas nationwide based on their air quality status relative to the NAAQS. (See 40 CFR 81). A nonattainment area is an area that does not meet (or that significantly contribute to ambient air quality in a nearby area that does not meet) the NAAQS for a particular pollutant. States containing areas designated as nonattainment for a particular pollutant are required to develop state Implementation Plans (SIPs) which must bring the areas into attainment with the NAAQS as expeditiously as practicable.

Title I of the CAA contains general planning requirements that states containing nonattainment areas must meet. (See sections 110(a)(2) and 171–193). The requirements include the application of control measures to existing stationary sources and a preconstruction review permit program for new and modified major stationary sources. (See section 173).

SIPs and SIP revisions must be submitted to EPA for review. EPA approves or disapproves (in whole or part) SIP submittals based on its assessment of whether the submittals meet the applicable requirements of the CAA. (See section 110(k)(3).) Federally-approved SIPs and SIP revisions are federally-enforceable (see 40 CFR 52). A state that fails to make a required submission that meets the requirements of the CAA may be subject to certain sanctions. (See sections 110(m) and 179).

Control Measures for Existing Sources. States containing sulfur dioxide, lead, and moderate PM-10 nonattainment areas must provide for the implementation of reasonably available control measures (RACM) (including such reductions in emissions from existing sources in the area as may be obtained through the adoption, at a minimum, of reasonably available control technology). (See section 172(c)(1)). The requirement for RACM applies to mining sources located in sulfur dioxide, lead, and moderate PM-10 nonattainment areas. EPA has issued detailed guidance on the implementation of RACM and other planning requirements that apply in these nonattainment areas. (See 57 FR 13,498; April 16, 1992, 57 FR 18,070; April 28, 1992, and 58 FR 67,748; December 22, 1993).

Moderate PM-10 nonattainment areas that cannot attain the NAAQS or fail to timely attain the NAAQS are reclassified as serious. Additional, more stringent planning requirements apply in serious PM-

10 nonattainment areas. For example, states containing such areas must provide for the implementation of best available control measures (BACM) (including best available control technology) for existing mining sources located in such areas. EPA has issued detailed guidance on the implementation of BACM and other planning requirements in serious PM-10 nonattainment areas. (See 59 FR 41,998; August 16, 1994).

Nonattainment New Source Review (NSR). States containing nonattainment areas must also submit to EPA for approval a preconstruction review permit program for new and modified major stationary sources. (See section 173). For example, affected new and modified sources are required to install control technology that meets the lowest achievable emission rate, as defined in section 171(3), and to obtain enforceable offsetting emissions reductions from existing sources. Implementing regulations at 40 CFR 51.165 have not been updated to reflect changes to the program made in the 1990 Clean Air Act Amendments. EPA has issued interim transitional guidance. (See 57 FR 13,498; 57 FR 18,070; Appendix D of *New Source Review (NSR) Program Transitional Guidance*, dated March 11, 1991; and *New Source Review (NSR) Program Supplemental Transitional Guidance on Applicability of New Part D NSR Permit Requirements*, dated September 3, 1992).

A mining source or processing facility locating in sulfur dioxide, lead, and moderate PM-10 nonattainment areas is subject to NSR if it emits or has the potential to emit 100 tons per year or more of any pollutant subject to regulation under the CAA. (See 40 CFR 51.165(a)(1)(iv)). In serious PM-10 nonattainment areas the applicability threshold is 70 tons per year. (See section 189(b)(3)).

Fugitive emissions¹ are only counted in the major source determination for sources listed in 40 CFR 51.165(a)(1)(iv)(C). The list includes these hardrock mining related sources: primary zinc, copper, and lead smelters; lime plants; taconite ore processing plants; phosphate rock processing plants; sintering plants; and any other source regulated under section 111 or 112 as of 1980 (see following discussion of new source performance and air toxics standards). For all other sources, including surface mines, fugitive emissions are not included for purposes of meeting the 100 ton per year or 70 ton per year thresholds.

B.2. Prevention of Significant Deterioration of Air Quality Program (PSD) and Protection of Visibility in National Parks and Wilderness Areas.

PSD Permit Program. The PSD program provides for preconstruction review of the control technology and air quality impacts associated with new and modified major stationary sources. (See sections 160-169 and 40 CFR 51.166). This preconstruction review is implemented through a permit process, and affected sources are prohibited from beginning construction unless a permit has been issued addressing PSD requirements.

¹ Fugitive emissions are emissions that could not reasonably pass through a stack, chimney, vent or other functionally-equivalent opening. (See 40 CFR 51.165(a)(1)(ix)).

The PSD program applies to new and modified major stationary sources in areas designated as attainment or unclassifiable. (See section 161). Areas designated attainment or unclassifiable are areas that either meet the NAAQS or for which there is insufficient information to reach a conclusion about their air quality status. (See section 107(d)(1)(A)(ii) and (iii)). These areas are commonly referred to as clean air areas or PSD areas. Since all areas of the country meet at least one of the NAAQS, all states are required to have a PSD program for areas within their jurisdiction. EPA administers PSD programs for states that have failed to submit approvable programs. (See 40 CFR 52.21).

All PSD areas are categorized or designated as either class I, II or III. (See section 162). The classification of an area determines the corresponding maximum allowable increases of air quality deterioration (increments). (See section 163). Only a relatively small increment of air quality deterioration is permissible in class I areas and consequently these areas are afforded the greatest degree of air quality protection. An increasingly greater amount of air quality deterioration is allowed in class II and III areas. In all instances the NAAQS represent the over arching air quality ceiling that may not be exceeded, notwithstanding any allowable increment.

New and modified major stationary sources under the PSD program must apply best available control technology (BACT) for each pollutant subject to regulation under the Act. (See sections 165(a)(4) and 169(2)(C)). Another fundamental aspect of the PSD program is an air quality analysis which calls for an assessment of a proposed source's compliance with allowable increments of air quality deterioration and the NAAQS.

The PSD program provides an additional layer of special protection for federal class I areas. (See section 165(d)). Mandatory federal class I areas are national parks greater than 6000 acres in size, national wilderness areas greater than 5000 acres in size and other areas specified in section 162(a) of the CAA. These federal class I areas are mandatory in that they may not be redesignated as any other classification. While all other PSD areas in the country were initially designated as class II areas (See section 162(b)), federal lands not already designated as class I areas under section 162(a) may be redesignated as class I areas. (See section 164).

The federal land manager² and the federal official charged with direct responsibility for management of any federal lands within a class I area have an affirmative responsibility to protect the air quality related values (AQRVs) of such lands. (See section 165(d)(2)(B)). AQRVs include visibility impacts, aquatic and terrestrial ecosystem effects such as acid deposition and foliar injury, etc. The land manager protects AQRVs through a prescribed statutory role in assessing the potential impacts of a proposed PSD source. (See section 165(d)(2)(C)). If a proposed source does not cause or contribute to a class I increment violation, the federal land manager may, nevertheless, demonstrate to the satisfaction of

² The federal land manager is defined as the Secretary of the department with authority over such lands, i.e., Department of the Interior and Department of Agriculture. (See section 302(I)).

the permitting authority that the source will have an adverse impact on the AQRVs of a specific federal class I area and, if so demonstrated, the PSD permit shall not be issued. Conversely, if the proposed source will cause or contribute to a class I increment violation, then the owner or operator must demonstrate to the satisfaction of the federal land manager that there will be no adverse impact to AQRVs and, if the federal land manager agrees, the PSD permit may be issued. (See section 165(d)(2)(C)(ii) and (iii)).

A major stationary source under the PSD program is any source which emits, or has the potential to emit, 100 tons per year or more of any pollutant subject to regulation under the CAA and is listed in 40 CFR 51.166(b)(1)(I)(a). This list is similar to the list for counting fugitive emissions under the NSR program and includes the same mining facilities specifically listed in part V.B.2. All other sources must have 250 tons per year or more of potential emissions to be major. The PSD rule about counting and discounting fugitive emissions in determining whether a source is major is the same as the NSR rule. EPA has declined to require the consideration of fugitive emissions in determining whether a surface coal mine is a major stationary source subject to PSD. (See 54 FR 48,870; November 28, 1989).

EPA administers the PSD and NSR permit programs for affected sources proposing to locate on lands within the jurisdiction of federally-recognized Indian tribes. (See 59 FR 43,960).

Visibility Protection Program. The CAA contains a visibility protection program for mandatory federal class I areas: certain large national parks and wilderness areas. (See sections 169A and 169B). While these provisions only apply to visibility, they are broader than the PSD program by providing direct authority to require reductions at existing sources that impair visibility in mandatory federal class I areas. In addition, new and modified stationary sources locating in both PSD and nonattainment areas are subject to visibility preconstruction review requirements.

These provisions establish as a national goal the prevention of any future, and the remedying of any existing, manmade impairment of visibility in mandatory federal class I areas. (See section 169A(a)(1)). The visibility protection program applies to mandatory class I areas (certain large national parks and wilderness areas) where visibility has been determined to be an important value. (See 40 CFR 81, subpart D).

In 1980, the EPA promulgated regulations addressing visibility impairment under section 169A of the CAA. (See 45 FR 80,084; December 2, 1980). In broad outline, the regulations required affected states to (1) coordinate development of visibility SIPs with appropriate land managers; (2) develop a program to assess and remedy visibility impairment from new and existing sources; and (3) develop a long-term strategy to assure reasonable progress toward the national visibility goal. (See 40 CFR 51, subpart P).

In the preamble to the 1980 regulations, the EPA stated that it would implement section 169A in phases. Phase I included the control of visibility impairment that can be traced to a single existing

stationary facility or small group of existing stationary facilities. (See 45 FR 80,085). The term of art for this type of impairment is reasonably attributable impairment. (See 40 CFR 51.301(s) and 51.302(c)(4)(I)). The EPA deferred addressing other types of impairment such as regional haze (widespread haze from a multitude of sources which impairs visibility in every direction over a large area).³

States must determine whether visibility impairment in a mandatory class I area may be reasonably attributable to a single or small group of existing stationary facilities. Visibility impairment means any perceptible change in visibility (visual range, contrast, coloration) from that which would have existed under natural conditions. (See 40 CFR 51.301(x)). Such impairment may be reasonably attributable by visual observation or any other technique the state deems appropriate. (See 40 CFR 51.300(s)). If the impairment is reasonably attributable, the state must analyze the best available retrofit technology (BART) for the source. (See 40 CFR 51.302(c)(4)).

Major stationary sources that may be subject to BART because of their impact on visibility in a mandatory class I area include the following mining and related sources in existence on August 7, 1977, with the potential to emit at least 250 tons per year of any pollutant: coal cleaning plants; primary zinc, copper, and lead smelters; lime plants; phosphate rock processing plants; sintering plants; and taconite ore processing facilities. (See 40 CFR 51.301(c)). Fugitive emissions must be counted, to the extent quantifiable, in determining potential to emit. (See 40 CFR 51.301(c)). Sources operating before August 7, 1962, may not be subject to BART.

Minor Source Review. The CAA also contains a minor source permit program that requires SIPs to include a program regulating the modification and construction of any stationary source, regardless of size or attainment status, as necessary to assure that the NAAQS are achieved. (See section 110(a)(2)(D)). Federally-approved minor source permit programs are federally-enforceable.

New Source Performance Standards (NSPS). EPA also issues NSPS that affected new or modified sources must meet in both attainment and nonattainment areas. (See sections 111 and 129 and 40 CFR Part 60). Several mining-related sources are regulated under NSPS, including: primary copper smelters (Subpart P); primary zinc smelters (Subpart Q); primary lead smelters (Subpart R); coal preparation plants (Subpart Y); lime manufacturing plants (Subpart HH); metallic mineral processing (Subpart LL); phosphate rock plants (Subpart NN); nonmetallic mineral processing plants (Subpart OOO); and calciners and dryers in mineral industries (Subpart UUU). These NSPS standards may be adopted by

³ The CAA, as amended in 1990, provides for the establishment of interstate regions and associated commissions to address the potential interstate transport of visibility- impairing pollutants. (See section 169B). The EPA has established a visibility transport commission for the region affecting the Grand Canyon National Park and the other class I areas in the Golden Circle of national parks and wildernesses on the Colorado Plateau. (See section 169B(f) and 56 FR 57,522; November 12, 1991). The Grand Canyon Visibility Transport Commission is issuing a that examines, among other measures, the promulgation of regulations establishing long range strategies for addressing regional haze in affected Class I areas. (See section 169B(d)(2)).

states and either approved as part of the SIP or delegated by EPA. EPA retains primary enforcement authority if a state fails to enforce a NSPS.

Regulation of Hazardous Air Pollutants (HAPs). Prior to the 1990 Clean Air Act Amendments, EPA issued hazardous air pollutant standards, still effective, for radon from uranium mines (See 40 CFR 61, subpart B), for radionuclide emissions from elemental phosphorus plants (Subpart K), and for arsenic emissions from copper smelters (Subpart O). In many instances states have adopted these standards and they have either been approved by EPA as part of the SIP or delegated by EPA. EPA retains primary enforcement authority.

The CAA, as amended in 1990, contains a list of 189 HAPs and calls for EPA to develop maximum achievable control technology (MACT) standards for all categories of major sources by the year 2000. (See section 112). A major source is any stationary source or group of stationary sources located within a contiguous area and under common control that emits, or has the potential to emit, 10 tons or more per year of one HAP, or 25 tons per year of any combination of HAPs. (See section 112(a)(1)).

New standards will be developed for primary copper smelters, primary lead smelters, primary aluminum processing, steel foundries, and site remediation. Mining does not appear on the list of categories of major HAP sources. States must impose MACT on a case-by-case basis on all new major sources and modified existing major sources until EPA issues standards for the relevant categories. (See section 112(g)). If EPA fails to issue such standards by the relevant deadlines, states must issue permits, under the Title V operating permit program, setting MACT for all major sources in the category for which a standard has not been timely issued.

B.3. Title V Operating Permit Program

Title V of the CAA requires states to develop and submit to EPA an operating permit program.⁴ (See sections 501-506). The program calls for permitting of sources by certain deadlines. Operating permits issued under EPA-approved programs to affected sources are to contain all of the applicable CAA requirements and are federally-enforceable. Title V also provides for the collection of fees by the permitting agency that reflect the reasonable cost of the permit program. EPA has issued rules specifying the minimum requirements for state operating permit programs in 40 CFR 70, and has proposed significant revisions to the rules.

C. CAA Compliance/Enforcement

⁴ The operating permit program is not the same as the NSR and PSD permit programs described previously that, by contract, require construction permits.

Notices of Violation (NOVs) and Administrative Compliance Orders (ACOs). The enforcement authorities under the CAA include provisions for NOVs and ACOs. (See section 113(a)). These pre-enforcement mechanisms are not subject to judicial review. NOVs are a pre-requisite for any action to enforce a SIP. The CAA imposes a 30-day waiting period after issuing an NOV before taking further action. An NOV may be issued without regard to the period of violation. (See section 113(a)). The CAA provides for civil action when a person has violated or is in violation of a SIP. (See section 113(b)). Thus, EPA can initiate enforcement action for a past violation of a SIP.

Most ACOs are effective only after an opportunity is provided to conference with EPA and all ACOs must require compliance within no more than one year. Permit terms may be enforced by identifying permits specifically as subjects for enforcement. EPA also has authority to prohibit the construction or modification of a source that has received a defective PSD permit, as well as for defective NSR permits. (See section 113(a)(5)).

Civil Enforcement. Section 113(b) authorizes civil enforcement for injunctive relief and monetary penalties up to \$25,000 per day per violation.

Criminal Enforcement. For SIP and other listed violations, criminal enforcement action can be brought for a knowing violation that occurs during any period of federally assumed enforcement or more than thirty days after the violator receives an NOV. (See section 113(c)). Section 113(c) also establishes felony offenses, with up to two years of imprisonment, for false statements (which include omission, alteration or concealment of required information) and tampering with a monitoring device or method. Offenses, with heavy penalties, are established for negligent or knowing release of HAPs which puts another person in imminent danger of death or serious bodily injury.

Administrative Civil Penalties. Section 113(d) authorizes administrative penalties for violations of the CAA, when the penalty sought is no more than \$200,000 and the first alleged date of violation is no more than twelve months prior to initiating the action. Section 113(d) also authorizes a field citation program for issuing “tickets” on the spot, with penalties no more than \$5,000 per day per violation. Regulations for the field citation program have been proposed by EPA.

Penalty Assessment Criteria. Several criteria for assessing penalties are set forth including seriousness of the violation and the violator’s ability to pay a penalty, history of compliance and good faith efforts to comply, duration of violation, previous payment of a penalty for the same violation, and the economic benefit of violation (avoided costs of compliance). (See section 113(e)). Section 113(e) allows EPA to establish the duration of violation by any credible evidence (including evidence other than the applicable test method).

In addition, where the source has been notified of the violation and EPA makes a *prima facie* showing that the violation was likely to have continued or recurred after the date of the notice, there is a

presumption that the violation continues each day thereafter until the violator establishes that continuous compliance has been achieved, or by a preponderance of the evidence shows that the violation was not continuing in nature. This provision shifts the burden of proof to the violator to rebut the presumption of continuing violation.

Emergency Orders. Upon receiving evidence that a source or combination of sources is presenting an imminent and substantial endangerment to public health or welfare, or the environment, EPA can immediately file suit for a restraining order or other relief, or it can issue an emergency order as may be necessary to protect such values. An order remains in effect for up to sixty days, or longer if a suit is filed. (See section 303).

Citizen Suits. In addition to the EPA enforcement authorities described above, the CAA authorizes citizens who provide the minimum required advance notice to bring a civil action against: (1) any person, including any governmental entity or agency, who is in violation of an emission limit; (2) any person who proposes to construct or constructs any new or modified major stationary source without a NSR or PSD permit that meets the requirements of the CAA; and (3) any person who is alleged to be in violation of such permit. (See section 304). The term person includes an individual, corporation, partnership, association, state, municipality, political subdivision of a state, and any agency, department or instrumentality of the United States and any officer, agent, or employee thereof. (See section 302(e)). The federal district courts have jurisdiction over citizen suits.

Citizen Awards. The CAA authorizes monetary awards, up to \$10,000, for information or services that lead to a criminal conviction or judicial or administrative civil penalty. (See section 113(f)).

Information Collection. Record Keeping, Inspections, Monitoring, and Entry. The CAA authorizes EPA to require records, reports, sampling of emissions (including stack tests), and such other information that EPA may “reasonably require.” (See section 114(a)(1)). Section 114 information requests may be detailed and extensive in scope. The CAA authorizes inspection by EPA or an authorized representative. (See section 114(a)(2)). The CAA also requires enhanced monitoring and compliance certifications for major sources. Enhanced monitoring and compliance regulations were proposed in 1993 and will be promulgated at 40 CFR 64.

Administrative Subpoenas. The CAA authorizes subpoenas for the testimony of witnesses and production of documents, for the purpose of obtaining information under any investigation, compliance inspection, or administrative proceeding under the Act. (See section 307(a)).

D. CAA Funding - N/A

E. CAA Natural Resources Restoration Provisions - N/A

F. CAA Good Samaritan Provisions - N/A

G. CAA Tribal Roles/Responsibilities - N/A

H. CAA Advantages/Limitations - N/A

I. CAA Integration with Other Statutes - N/A

VI. EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT (EPCRA)

Passed as Title III of the Superfund Amendments and Reauthorization Act of 1986, EPCRA has two main purposes: to encourage and support emergency planning for responding to chemical accidents, and to provide local governments and the public with information about possible chemical hazards and releases in their communities. The statute requires reporting of information on hazardous or toxic chemicals and substances (defined in section 329) by businesses and government agencies which produce, process, use or store them.

A. EPCRA Jurisdiction/Applicability/Media/Constituents

Jurisdiction Conditions. The statute requires reporting of information on extremely hazardous substances (EHS) by businesses and government agencies that produce, use or store them. Under section 313, which provides the authority for the Toxic Release Inventory (TRI), the law provides citizens as well as local, state, and federal government agencies with access to information on releases of toxic chemicals by manufacturing facilities (i.e., those in Standard Industrial Classification (SIC) Codes 20-39) A release may be to any of the environmental media. EPA has proposed to add SIC code 10 (Metal Mining) (61 FR 33587; June 27, 1996), with a final rule anticipated in mid-1997.

Executive Order 12856 requires all federal agencies to comply with EPCRA and phases in this reporting during 1994-1995. Executive Order 12969 (60 FR 40989; August 8, 1995) requires all federal agencies to require companies that bid on federal contracts to certify that they are in compliance with TRI reporting requirements and that they will continue to comply for the life of the contract if they receive the award.

Media. Most EPCRA provisions cover data on toxic chemicals and releases to all media.

Constituents. In addition to the over 300 toxic chemicals originally reportable under TRI, a final rule (59 FR 61432; November 30, 1994) added 286 additional chemicals and chemical categories subject to the TRI reporting requirements. These chemicals were added based on human health effects, toxicity, and significant adverse effect on the environment. Also, approximately 361 chemicals are identified as

extremely hazardous substances (EHS) for purposes of emergency planning (see following subsection. For each EHS, there is a threshold planning quantity. If this amount or more of the chemical is present at a facility, the owner or operator must notify in writing both the State Emergency Response Commission (SERC) and the local emergency planning committee (LEPC). There is a 1 percent *de minimis* threshold for mixtures and solutions. If a mixture contains an extremely hazardous substance in excess of 1 percent of the total mixture, that EHS must be considered under section 302. The facility must designate an emergency coordinator, provide planning information to the LEPC or TERC, and coordinate emergency response planning with the community.

B. EPCRA Implementation Mechanisms

Emergency Planning (Section 301). The governor appoints a SERC, which divides the state into local emergency planning districts and appoints a broadly representative LEPC for each district. Frequently, LEPC's are organized based on county boundaries. The LEPC receives information submitted by local businesses and other facilities that store, produce or use chemicals. The LEPC also conducts a community hazard analysis, identifying types and location of chemical hazards, vulnerable areas and populations, the risk of accidents and their potential effects on the community. The LEPC develops a local emergency response plan based upon the information gathered. Mining operations should be included in these plans, to the extent they use extremely hazardous substances above the threshold planning quantities. A representative from any mines within the planning area or the federal land manager could participate in the LEPC. A tribal chairman can appoint a tribal emergency response commission (TERC), with duties similar to that of a SERC.

Extremely Hazardous Substances (Section 302): For each EHS, there is a threshold planning quantity. If this amount or more of the chemical is present at a facility, the owner or operator must notify in writing both the SERC and the LEPC. There is a 1 percent *de minimis* threshold for mixtures and solutions. If a mixture contains an extremely hazardous substance in excess of 1 percent of the total mixture, that EHS must be considered under section 302. The facility must designate an emergency coordinator, provide planning information to the LEPC or TERC, and coordinate emergency response planning with the community.

Emergency Release Notification (Section 304): This section applies if there is a release from a facility of a CERCLA section 102 hazardous substance or an EHS above the Reportable Quantity within a 24-hour period. For the purposes of section 304, facility includes motor vehicles, rolling stock, and aircraft. Release reporting is not affected by the Beville exclusion.

If the chemical is a CERCLA 102 hazardous substance and the release exceeds the Reportable Quantity, the facility must immediately notify the National Response Center in addition to notifying the LEPC and the SERC or TERC. Releases of reportable quantities of CERCLA 102 chemicals must be

reported when they occur, regardless of whether they are likely to leave the property boundaries. There are more than 700 hazardous substances subject to CERCLA spill notification requirements.

If the chemical is an EHS but not a CERCLA 102 chemical, the facility must immediately notify the LEPC and the SERC or TERC when the release leaves the property boundaries. Releases of mixtures and solutions are subject to notification requirements only where a component hazardous substance or EHS of the mixture or solution is released in a quantity equal to or greater than its Reportable Quantity.

Right-to-Know Reporting (Sections 311-312): Businesses and government agencies must report amounts, location and potential effects of EHS present in the community to the SERC or TERC and LEPC. More than 500,000 products in commerce are covered by these sections. Since mines are not covered by OSHA, they do not presently have to report under these sections.

Any business or facility that is required by OSHA regulations to keep material safety data sheets (MSDS) on file for hazardous chemicals in the workplace must determine, based upon inventories of these materials, how and if it may need to comply with the inventory provisions of this law. If the chemical is a CERCLA section 102 hazardous substance, the facility must report for chemicals for which it has 10,000 pounds or more on site at any time during the year. If the chemical is an Extremely Hazardous Substance, the amount that triggers section 311/312 reporting is 500 pounds or the TPQ, whichever is lower.

To report under section 311, the facility is required to provide the SERC or TERC, the LEPC and the local fire department with either a list of the hazardous chemicals at the facility for which MSDSs are required, or a copy of each MSDS. Approximately 4.5 million facilities are covered, including some related to mining such as smelters, refineries, fertilizer product operations, and milling operations associated with gypsum board plants not located on mine property. Under section 312, companies must submit annual inventories of EHS to the SERC, LEPC and local fire department in March every year.

Since the mines themselves, as well as preparation and milling operations, are covered by the Mine Safety and Health Administration (MSHA), not OSHA, these provisions would not apply to those operations. MSHA and OSHA have signed a national Memorandum of Agreement (MOA) to delineate their respective areas of authority. Per this MOA, MSHA jurisdiction includes mineral extraction and milling operations, salt processing facilities on mine property, electrolytic plants where the plants are an integral part of milling operations, and alumina and cement plants.

For operations near the end of the milling cycle and the beginning of the manufacturing cycle, the scope of the term milling may be extended or narrowed, as determined by agreements between the MSHA District Manager and the OSHA Regional Administrator developed in accordance with the national MOA.

Toxic Release Inventory Reporting (Section 313): This section requires manufacturing facilities having 10 or more employees and using at least a threshold amount (25,000 pounds or 10,000 pounds or 1 million pounds for small releasers) of a TRI chemical(s) to report annually on their releases of that chemical(s) to the environment (See Alternate Threshold Rule, 50 FR 61488; November 30, 1994). Pounds of chemical released to each environmental medium must be reported.

Smelters are currently covered under TRI and report for chemicals such as lead and lead compounds, copper and copper compounds, zinc fume or dust, zinc compounds, manganese and manganese compounds, sulfuric acid, and hydrochloric acid. In addition, EPA has proposed that facilities in the metal mining SIC code be subject to TRI reporting.

General Implementation. Implementation of EPCRA is split between EPA and state/local/tribal governments. EPA provides technical assistance to state, tribal, and local government agencies to help them implement most sections of EPCRA. The state, tribe, or EPA can take enforcement action for violations of sections 302, 304, and 311-312. EPA is solely responsible for both implementation and enforcement of section 313 (TRI).

C. *EPCRA Compliance/Enforcement*

Administrative and Injunctive Authorities. EPCRA grants specific state and local authority to request information from facilities and to take enforcement actions in those situations where voluntary compliance has not occurred. LEPCs, TERCs, or SERCs could file a civil action under section 326 against a facility owner or operator in the U.S. District Court for violations of EPCRA, or they could assist the EPA in an enforcement action. Citizen suits against the owner or operator of a facility, the EPA Administrator, or the Governor or SERC, are also provided for under section 326(a)(1).

Under section 325, the federal government can bring administrative and civil or criminal judicial actions against violators. Section 325(a) authorizes EPA to order owners or operators of facilities to comply with sections 302 and 303. The local U.S. District Court has jurisdiction to enforce the order and assess a civil penalty of up to \$25,000 per violation per day. EPA cannot assess these penalties administratively.

Penalties. Violations of section 304 emergency notification provisions can be addressed through administrative or judicial enforcement. There are also criminal penalties for knowingly and willfully failing to provide notice, or for providing false or misleading information. Section 304 violations can carry a Class I civil penalty of not more than \$25,000 per violation or a Class II civil penalty of not more than \$25,000 per violation per day. In the case of subsequent violations, Class II penalties of up to \$75,000 for each day a violation continues may be assessed.

For violations of sections 311, 312 and 313, EPA can assess civil penalties by issuing administrative orders or by filing actions in the U.S. District Court. Violation of section 311 subjects the violator to a civil penalty of up to \$10,000 for each violation. Sections 312 and 313 violations carry civil penalties of not more than \$25,000 for each violation. The statute establishes that every day a violation continues is considered a separate violation.

D. EPCRA Funding

Actions carried out under EPCRA do not have a specific appropriation. LEPC's and SERC's can charge fees to facilities who report information to them to cover the administrative costs of handling the information.

E. EPCRA Natural Resource Restoration Provisions - N/A

F. EPCRA Good Samaritan Provisions - N/A

G. EPCRA Tribal Roles/Responsibilities - N/A

Native American communities may benefit from improved information TRI provides on facilities in or near their communities. Tribes can also designate themselves as Tribal Emergency Response Commissions (tribal SERC's or TERC's) or they can form local Tribal Emergency Response Committees under the existing SERC.

H. EPCRA Advantages and Limitations

An advantage of EPCRA is that it could assist small communities in getting preventive emergency planning at active or inactive mines before there is a spill or accident. By including mining facility representatives on LEPC's and enforcing mine owner/operator responsibility to notify the planning committee/state commission about the presence of extremely hazardous substances on site, it may be possible to improve the owner/operator's environmental awareness and responsiveness.

There are also potentially large fines for facilities that do not report information under this statute. Threats of fines could be used to encourage pollution prevention or obtain mitigation measures.

A significant limitation is that EPCRA cannot stop releases. As long as the releases are reported properly, there is no requirement that they be eliminated (that is largely the province of other authorities). Section 103 of CERCLA does not require reporting for some federally permitted releases. And the reporting frequency for continuous releases stable in quantity and rate can be reduced under section 103 of CERCLA. It can be difficult for the Agency to quantify releases after they occur, since it must be proven that the release exceeded the Reportable Quantity to show that reporting was required under section 304.

Mines are not presently covered by the chemical inventory requirements of sections 311-312 because of MSHA jurisdiction, nor by the TRI reporting requirements of section 313. The flexibility of MSHA and OSHA to decide what portions of a mining facility are regulated under each authority could be explored to see if those agencies are willing or able to expand OSHA coverage at some problem sites within the limits of the MOA. Guidance for federal facility reporting under Executive Order 12856 also should be reviewed to determine how federal land managers may be covered by EPCRA.

Disadvantages of the TRI include:

- Rulemaking is necessary in order to require reporting to TRI of releases from mining activities.
- Listed toxic chemicals potentially represent only a subset of chemicals that may be manufactured, processed, or otherwise used in mining activities.
- The manufacturing, process, and otherwise use threshold definitions and levels may inhibit reporting of the entire universe of chemicals that may be used at a mining facility.
- The release volumes indicated in TRI for a given facility may be only estimates; facilities are not required to do any additional monitoring for purposes of TRI data collection, so many facilities provide estimates of releases based on EPA guidance.

I. EPCRA Integration with Other Statutes

There are many overlaps of chemicals/metals in EPCRA with those covered by other environmental statutes. For example, 97 of the 126 toxic chemicals known as the priority pollutants for Clean Water Act purposes are also TRI chemicals. EPA has published aquatic life and/or human health protective ambient water quality criteria for 81 of the TRI chemicals. A number of TRI chemicals are covered by state water quality standards.

Approximately 305 of the individually listed TRI chemicals are also CERCLA hazardous substances. Two thirds of the individually listed TRI chemicals are regulated under RCRA. Forty of the individually listed TRI chemicals are currently used to identify a waste as a characteristic hazardous waste. When such chemicals are found in the waste above specified levels, the waste is subject to RCRA regulation. In addition, 181 of the individually listed TRI chemicals are also listed as hazardous waste when they are unused or discarded commercial chemical products.

Approximately 180 TRI chemicals are also hazardous air pollutants under the CAA. Fifty-five TRI chemicals are regulated under the Safe Drinking Water Act.

TRI data are used to identify gaps in regulatory coverage under environmental statutes. To some degree, TRI data were used in EPA's review of states' lists of impaired waterbodies developed under section 304(l) of the CWA. TRI data is one factor which EPA is using to identify industrial categories for which effluent limitations and standards should be developed or revised under the NPDES program.

VII. SAFE DRINKING WATER ACT

In 1974, Congress amended the Public Health Service Act and retitled it the Safe Drinking Water Act (SDWA). Part C of the SDWA directed EPA to establish a federal program setting minimum requirements for effective state programs to prevent underground injection which endangers ground-water resources of public water supply systems. The resulting regulations established two methods for authorization to inject: authorization by rule (40 CFR 144, subpart C) or by permit (40 CFR 144, subpart D). Since its passage in 1974, the SDWA has been amended six times (1976, 1977, 1979, 1980, 1986, 1996). The net effect of these amendments is that federal and state regulatory agencies have modified existing programs and/or established new strategies to protect ground water by promulgating even more effective regulations to control the permitting, construction, operation, monitoring and closure of injection wells.

Over the past 50 to 60 years, the practice of underground injection has become diverse in its many applications and essential to many human activities, including petroleum production, chemical production, foods production, manufacturing, mining, and many specialty plants and related businesses. The practice has expanded from disposal of produced brine from oil production to liquid hazardous and nonhazardous industrial waste. It is also a key component in the recovery of some natural resources, such as uranium and salt, and in the remediation of uranium contamination.

A. SDWA Jurisdiction/Applicability/Media/Constituents

The goal of the underground injection control (UIC) program, as established by SDWA and UIC Regulations by 40 CFR Part 124, and 144 through 148, is to prevent contamination of underground sources of drinking water (USDW) resulting from the operation of injection wells (See 40 CFR 144.12). This program establishes minimum requirements for state, tribal, and federal programs for control of all injection activities and provides mechanisms for implementation and delegation of primary enforcement authority. Where states and tribal authorities don't seek primacy, EPA automatically assumes direct implementation authority.

B. SDWA Implementation Mechanisms

Under the EPA UIC program, injection wells are divided into five well classes for the purpose of regulations (See 40 CFR 146.5). Injection wells are divided into five classes. Class III wells are those used to inject fluids for the recovery of minerals (e.g., solution mining for salts and sulfur and in situ

leaching for uranium, copper, or (experimentally so far) gold. Class V and, for a while, some Class I wells have mining applications for the disposal of hazardous or nonhazardous wastes, including using mine wastes to backfill underground mines. The following is a general description of those classes:

- (1) Class I wells inject hazardous and nonhazardous industrial waste below all USDWs,
- (2) Class II wells inject fluids associated with oil and gas production where primary uses are injection for enhanced oil recovery, brine disposal, and storage of liquid hydrocarbons,
- (3) Class III wells are used to inject fluids for the recovery of minerals where some of the principal uses are solution mining for the extraction of salts and sulfur and in situ leaching used to recover uranium, gold, and copper,
- (4) Class IV wells are used to dispose of hazardous or radioactive wastes into or above a USDW (EPA has banned the use of these wells), and
- (5) Class V wells are wells not included in the other above-mentioned well classes that inject largely nonhazardous fluids into or above a USDW. Some Class V wells that inject below a USDW may be reclassified to one of the above well classes I - III.

A USDW is defined as an aquifer or its portion which supplies any public water system or contains a sufficient quantity of ground water to supply a public water system, or contains less than 10,000 milligrams per liter (mg/l) total dissolved solids (TDS) and is not an exempted aquifer.

The classification system allows for different regulatory schemes for each of the classes such that endangerment of USDWs can be prevented. The criteria for defining where a well fits are: (1) type of activity, (2) nature of the fluids injected and (3) location of the well to a USDW.

C. *SDWA Compliance/Enforcement*

Administrative/Compliance Orders: Section 1423(c) provides authority to issue administrative compliance orders.

Civil Penalties: Section 1423 provides for civil penalties of up to \$25,000 per day for a violation.

Criminal Penalties: Section 1423 provides for criminal penalties of up to \$25,000 per day and up to 3 years imprisonment for knowingly violating the SDWA.

D. *SDWA Funding* - N/A

E. SDWA Natural Resource Restoration Provisions - N/A

F. SDWA Good Samaritan Provisions - N/A

G. SDWA Tribal Roles/Responsibilities

EPA may treat an Indian tribe as a state for purposes of the UIC program if the tribe meets the criteria defined in 40 CFR 145.52. These criteria include: (1) the tribe is recognized by the Secretary of the Interior; (2) the tribe has a governing body carrying out substantial government duties and powers over a defined area; (3) the UIC program to be administered by the tribe is within the borders of the Indian reservation; and (4) the tribe is reasonably expected to be capable of administering an effective UIC program by the existence of management and the technical skills necessary to administer an effective program.

H. SDWA Advantages and Limitations

At this time it appears that state and federal UIC programs have adequate regulations in place to manage Class V injection wells. The Agency, in the proposed Class V rule (40 FR 44652), felt that these wells posed very little threat to the environment and determined that additional federal regulation is not warranted. The Agency will continue to emphasize the need for owners and operators of these wells under 40 CFR 144.12 and 144.25 to obtain a permit, and the submittal of information on a case-by-case basis as needed to protect USDWs under 40 CFR 144.27.

I. SDWA Integration with Other Statutes

A proposed RCRA Land Disposal Restriction rulemaking referred to as Phase IV (60 FR 43654) may ban disposal of certain mineral processing wastes currently being disposed in these wells. The significance of these injection well classes is that they provide regulation for production of wells and nonendangerment of wells for USDWs.

VIII. TOXIC SUBSTANCES CONTROL ACT (TSCA)

A. Jurisdiction/Applicability/Media/Constituents

TSCA provides EPA with authorities to regulate the manufacture (including import), processing, distribution, use, and disposal of chemical substances. Under TSCA, EPA may require health and environmental effects testing by manufacturers, importers and processors of chemical substances, which include organic and inorganic substances occurring in nature, as well as chemical elements. TSCA also authorizes EPA to: require record keeping and reporting of information that is useful for the evaluation of risk, regulate chemical substances that present an unreasonable risk of injury to health or the environment,

take action to address imminent hazards, require notification to EPA by prospective manufacturers of new chemicals, and make inspections or issue subpoenas when needed to implement TSCA authorities. Under TSCA, EPA must exercise these authorities in such a manner as not to impede unduly or create unnecessary economic barriers to technological innovation.

In practice, the most useful tool under TSCA has been section 6, PCB Regulations, as codified at 40 CFR Part 761. The mining industry has traditionally used high levels of PCBs. PCBs are most commonly found as the dielectrics in transformers and capacitors. These items are commonly found wherever there is a high electrical power demand. Transformers and capacitors, either single units or in banks, can be expected in any phase of surface or underground mining operations and the ore beneficiation process. PCB equipment has been replaced in many mines and all mines built after the ban on production of PCB equipment should not have had PCBs in transformers and capacitors.

B. TSCA Implementation Mechanisms

The PCB regulations require marking, inspections, annual document logs, and proper disposal for PCB equipment. Violations of the PCB regulations in the mining industry have been common. Increasing the EPA regulatory presence should be considered, especially for underground mines.

CERCLA has been used in conjunction with TSCA requirements to effect removal of transformers from underground mines. Actions taken at the Bunker Hill Mine in Idaho are an example where the mining company removed underground transformers prior to flooding of the mine. This prevented the future release of PCBs into the ground water system.

C. TSCA Compliance/Enforcement

Reporting and Retention of Information. Under section 8, EPA can require processors to keep records and submit information to EPA including information on the amount of the chemical substance processed; on how the material is used and disposed of; the byproducts resulting from processing, use, or disposal; health and safety studies completed; and the duration and frequency of exposure and the number of persons exposed in their places of employment. Section 8 also requires EPA notification when information in the hands of manufacturers, processors, and distributors of a chemical substance supports the conclusion that a chemical substance presents a substantial risk of injury to health or the environment. Under these provisions, EPA could write a rule requiring processors to keep records and report information that would detail the risks posed by their operations.

Citizens' Petitions. Any person can petition EPA to initiate an action under sections 4, 6, or 8 of TSCA and EPA must respond within 90 days to the petition. If EPA grants the request, it must then promptly commence the necessary rulemaking.

- D. TSCA Funding - N/A*
- E. TSCA Natural Resource Resoration Provisions - N/A*
- F. TSCA Good Samaritan Provisions - N/A*
- G. SDWA Tribal Roles/Responsibilities - N/A*
- H. SDWA Advantages/Limitations*

In the past, underground PCBs have been overlooked because inspectors have been reluctant to enter underground mines. MSHA training for EPA inspectors is available at no cost and requires little time. EPA inspectors not familiar with underground mines should request that an MSHA inspector accompany them.

I. TSCA Integration with Other Statutes

Section 9 of TSCA states that EPA will coordinate TSCA actions with actions taken under other federal laws and that TSCA will only be used in cases where other laws are not sufficient to address the risk, or in cases where the Administrator finds that it is in the public interest to take action under TSCA.

3. OVERVIEW OF NON-REGULATORY TOOLS

I. OVERVIEW

Non-regulatory approaches available to EPA to address environmental challenges posed by mining are typically employed to complement existing regulatory programs in addressing mining impacts. While recognizing that each non-regulatory effort is unique, there are certain themes that are common to the most successful ones, both site specific and non-site specific:

- **Active participation by principal stakeholders**, including a recognition of the environmental problems and a willingness to take on the issues.
- **Creative use of limited funding resources**, promoting coordination and research on mining issues. These include the University of Montana's Mining Waste Institute, a variety of groups comprising the Mining Information Network, and the Western Governors' Association (WGA). Some programs, such as CWA section 319 funds, have been successfully used to fund portions of cleanup projects.
- **Site specific flexibility** in adapting non-regulatory tools to fit the specifics of the site and the interest of the stakeholders.
- **Pollution prevention efforts supported by** federal and state agencies, tribes, and other stakeholders, limiting the generation and use of waste materials.
- **Prioritization of cleanup projects**, often on a watershed basis, as a way of allocating limited resources and focusing on worst cases first.
- **Regulatory discretion** as a tool to promote creative problem solving and early implementation of cleanup projects. For example, having a site listed as a Superfund site might reduce local involvement.
- **Key Characteristics of Non-regulatory Tools.** Most non-regulatory approaches contain one or more of the following characteristics:
 - **Financial.** Financial support often comes from a variety of sources when non-regulatory approaches are used. Funds are often leveraged, and budgets are typically tight. Examples include: EPA staff resources, RCRA 7007 and 8001 grant funds, CWA section 319 funds, other federal agency funds, state/local partnerships, and private initiatives.

- **Institutional.** These include Interagency Agreements, regional and national initiatives, and outreach in a variety of forms, (e.g., participation in and support of Idaho's Mining Advisory Committee).
- **Technical Assistance and Outreach.** This includes technical assistance, standardization of analytic methodologies, technology demonstrations, and education and training.

II. OBJECTIVES

The purposes of this discussion of non-regulatory tools include the following:

- Illustrate the key traits of effective non-regulatory tools. Sometimes these will be based on tools that have a regulatory connection, although the emphasis will be on the non-enforcement aspects of those authorities.
- Using specific case examples, point out areas where these tools have filled gaps in the current regulatory framework.
- Highlight model policies and approaches that could be the basis for future regulations or legislation.
- Point out the main limitations of non-regulatory approaches.

III. BACKGROUND

Non-regulatory tools to manage environmental problems posed by mining are typically employed to complement existing regulatory programs in addressing mining impacts. While current regulatory programs can often be adapted to address the environmental problems posed by mining, they can be cumbersome, expensive to administer, and understaffed. Non-regulatory tools have been developed to take advantage of the incentives created by a backdrop of enforcement oriented regulatory programs, or to coordinate these programs to maximize their overall impact. For example, when cleanups precede active enforcement of regulatory programs they may be easier and less expensive to implement. While recognizing that each non-regulatory effort is unique, there are certain themes that are common to the most successful efforts.

- Active participation by principal stakeholders, including a recognition of the environmental problems and a willingness to take on the issues. This typically includes federal, state and local governments, tribes, industry, citizens, and affected landowners. Participation does not necessarily mean funding, but it does mean cooperation.

- Creative use of funding resources. While little public money is specifically earmarked for mine site cleanup other programs, such as CWA section 319 funds, have been successfully used to fund portions of cleanup projects. State programs, local contributions, and private funding by responsible parties have all been tapped for assessment and cleanup projects. Technology demonstrations have sometimes been used to get seed money to develop a new cleanup approach.

An important category of non-regulatory tools is based on the principles of geographic based environmental management. These geographic approaches often have the following features:

- Site specific flexibility. The adaptation of non-regulatory tools needs to fit the specifics of the site and the interest of the stakeholders.
- Pollution prevention efforts supported by federal and state agencies, tribes, and stakeholders, limiting the generation and use of waste materials.
- Prioritization of cleanup projects, often on a watershed basis, as a way of allocating limited resources and focusing on worst cases first.
- Regulatory discretion as a tool to promote creative problem solving and early implementation of cleanup projects. Good Samaritan provisions are an example.

IV. KEY CHARACTERISTICS OF NON-REGULATORY TOOLS

Most non-regulatory approaches contain one or more of the following characteristics.

Financial

Financial support often comes from a variety of sources when non-regulatory approaches are used. Funds are often leveraged, and budgets are typically lean.

EPA Staff Resources. Non-regulatory approaches often take a large amount of staff time and energy to implement.

RCRA 7007, 8001 grant funds. Section 7007 funds are grants for a wide range of training programs, for either states or individuals. Section 8001 funds cover research, training, and other studies related to solid and hazardous waste. Funds in both these sections cover potentially a wide range of projects and have been used extensively to fund mining research and technical assistance throughout all agency media program offices as well as the Office of Enforcement. Funding in recent years has been as high as \$2.5 million, in FY 95 it is expected to be \$500,000. In FY 89 and FY 90 most of the money went

to support WGA related activities, now funds used for a variety of media related projects. Categories of funding typically include research at the Colorado School of Mines on mine waste, funding to maintain an environmental mining network, and funding to regions on mining related projects.

CWA Section 319 Funds. Section 319(h) established a demonstration grant program to assist states in implementing specific projects to demonstrate effective NPS control projects. Approximately \$1,000,000 per year is spent through this mechanism on inactive mine projects, with oversight in the Regional offices. Types of activities funded include: education, staff development, technical assistance, project demonstration, and ground water protection.

Other Federal Agency Funds. These are often used to either supplement EPA funds or to support specific pieces of a non-regulatory approach or initiative. In some instances land management agencies have large budgets devoted to mining related programs. These can be significantly greater than the EPA funds discussed above.

State/Local Partnerships. Although usually smaller in size than federal monies, support from state and local stakeholders can often fill financial holes in geographic based approaches.

Voluntary Efforts. Good Samaritan work by private parties can contribute a significant amount towards clean-up of inactive and abandoned mines (IAMs).

Institutional

Interagency Agreements. MOUs, MOAs, and IAGs are all tools that can be used to deal with the large number of agencies that regulate mining. When used effectively, they can help clarify roles and streamline the overall regulatory process. For example, as part of the Coeur D'Alene Restoration Project a MOA between EPA, the State of Idaho and the Coeur D'Alene tribe was instrumental in helping reduce differences among the parties and focusing efforts on restoration goals.

External/internal teamwork. At a less formal level, interagency groups are often an effective means of focusing attention on certain projects or issues. They provide a way for individuals with expertise to interact. These coalitions are also an important first step in breaking regulatory impasses. The WGA Mine Waste Task Force is such an example. Within a region, internal teams also help focus efforts on mining issues, such as in Regions 8, 9, and 10, where most of the staff participation on mining teams is voluntary.

Regional and National Initiatives. These are also a useful way of improving communications and focusing efforts on addressing mining problems. The site specific approaches described in more detail in this appendix are all examples of such initiatives at the regional level.

Outreach. This ranges from detailed outreach to a local community to simply providing on-site staffing at critical junctures during a remediation. One type of outreach, involving community based environmental indicators, can provide an important link with strategically significant technical tool, watershed planning.

Technical

Technical assistance. This would include the dedication of either EPA staff or contractor hours to providing direct help to a stakeholder. This is often an effective tool in working with other agencies and states.

Analytic methodologies. These can range from predictive tools to well developed monitoring and testing standards that help make data analyses consistent. Examples include: resource assessment and goal setting methods, alternatives development, and cost effectiveness methodologies. One specific example of this is the State of Montana, which has developed an HRS type system used for priority setting.

Technology demonstration. Technology demonstration efforts have had a couple of roles in non-regulatory efforts. One is a traditional means of identifying new and effective treatment technologies. Another is that non-regulatory approaches themselves have been able to attempt less proven methods than more regulatory, Superfund type approaches to remediation.

Education and Training. Because of the multimedia nature of mining issues, training is often necessary to bring key players up to speed on technical or regulatory issues. Education efforts on a more broader scale have been used to highlight and respond to community concerns regarding the impacts of mining and regulatory activities.

Standardized analysis and monitoring methods. Different agencies use different methods for measurements ranging from simple location data to kinetic testing methodologies. Efforts to standardize this information make priority setting and monitoring significantly easier.

Other Characteristics

Compromise/Enforcement Discretion. Where there is a significant enforcement history in connection with a non-regulatory initiative, enforcement discretion is often a factor in helping to build a working coalition amongst a variety of players.

Institutional Controls. These include a variety of approaches, such as deed restrictions and other local regulations, that can be useful as part of an overall strategy.

Limits

Staff resources. One of the main drawbacks of non-regulatory tools are the large amount of staff time needed to make them successful. To some extent, though, this may be a matter of perception only. Although these approaches can require significant staff resources, they can avoid a much higher resource cost in the future if properly focused.

Enforcement related issues. As a result of the regulatory backdrop for many of these examples, enforcement and liability issues can obstruct or delay non-regulatory, cooperative or Good Samaritan efforts.

V. EXAMPLES OF NON-REGULATORY TOOLS

This sections describes several examples where non-regulatory tools were used to address various aspects of mine sites. Three of the examples are site-specific and the remainder are not site-specific but are more programmatic in nature.

Site Specific Examples:

- A. Coeur D'Alene Basin Restoration Project
- B. Clear Creek Watershed Project
- C. Arizona Copper Mine Initiative

Non-Site Specific Examples:

- D. RCRA Subtitle D Strawman Guidelines
- E. Mine Waste Technology Demonstration Project
- F. Region 8 Nonpoint Source Mining Project
- G. Bubble Trading
- H. Remining
- I. Wellhead Protection Programs

A. Coeur D'Alene Basin Restoration Project

The Coeur d'Alene Basin in northern Idaho has been heavily impacted by the effects of over 100 years of hardrock. Water quality has been severely degraded, habitat destruction is widespread, and extensive depositional areas have been impacted by mine wastes, including the Coeur d'Alene River and Lake Coeur d'Alene.

The Coeur d'Alene Basin Restoration Project (CBRP) brings together many of the tools which are commonly utilized in non-regulatory approaches to addressing environmental problems caused by mining.

However, like many other projects that are used as examples of non-regulatory success stories this project has a strong regulatory basis.

Against that regulatory backdrop, however, many of the features of the CBRP serve as an example of ways in which non-regulatory tools can be used to address the environmental problems posed by mining.

Key features of the project:

- MOA between EPA, the State of Idaho and the Coeur d'Alene Tribe of Idaho to coordinate activities and work towards consensus decision making in addressing environmental problems in the Basin.
- Establishment of a technical working groups composed of the major stakeholders in the Basin (including such federal agencies as the BLM as well as state and local government, citizens, and industry) to set priorities and develop technical approaches to problem solving.
- Establishment of a Citizens Advisory Committee to serve as a point of contact with technical working groups and help focus outreach efforts.
- Using a mix of resources to get work done on the ground.

Technical approach

A basin wide analysis of environmental problems (not only problems caused by mining) is underway. This effort involves a variety of stakeholders and has helped focus public attention on the project. Efforts to characterize the impacts of mining, agriculture, forestry, urban runoff, and recreational use on the rivers and lakes of the watershed are being used as the basis for a Lake Management Plan for Lake Coeur d'Alene. Concurrently, the Natural Resource Trustees for the Basin are studying the environmental impacts caused by historic mining practices and beginning to evaluate restoration options.

As an interim approach to moving cleanup projects forward while environmental studies are under way technical work groups have developed Best Management Practices to use in implementing cleanup projects. The effectiveness of these projects is being monitored as a guide to planning future cleanup efforts. Meanwhile, basin wide priority setting by technical working groups helps focus cleanup projects in those areas where the benefits will be the greatest.

Institutional Approach

A MOA between EPA, the State of Idaho, and the Coeur d'Alene Tribe of Idaho established a Steering Committee for the project, a Management Advisory Committee (MAC), a Citizens Advisory

Committee (CAC), and recognized the Coeur d'Alene Basin Interagency Group (CBIG) as a technical support group. The three parties to the MOA have all dedicated a staff person to the project. Supporting these three staff are a Public Involvement Coordinator and an Executive Secretary (both positions will be filled this winter). Other stakeholders in the CBRP contribute staff time and expertise through the MAC or CBIG.

Financial Considerations

Money to finance the CBRP has come from a variety of sources. Internal resources of the agencies involved have been used to fund staff and undertake investigations, participate in technical workgroups, and work with other stakeholder to set priorities and develop cleanup strategies.

Funding for cleanup projects has included:

- CERCLA Removal Funds
- Section 319 of CWA Funds
- RCRA Special Project Funds
- Idaho Natural Resource Damage Settlement Funds
- State Water Pollution Control Funds
- Privately funded cleanup projects (industry)
- County/local funding and in-kind contributions
- Volunteer efforts
- Other federal agencies on federal lands (e.g., BLM)

Other Characteristics

Many of the successful aspects of this project fit into the regulatory backdrop of CERCLA, CWA, and state and local regulations. Enforcement discretion has played a major role in moving projects forward. For example, the voluntary cleanup projects undertaken by industry in the Basin have been undertaken, in part, because EPA has stated its intention to use CERCLA enforcement authority to compel private parties to undertake work at high priority sites if they do not initiate cleanup projects on their own. The five million dollars available in the State Natural Resource Damage Settlement Fund is the result of settlement of a CERCLA case. The reliance on the backdrop of regulatory programs does not in any way diminish the success of the CBRP. Development of cleanup priorities and implementation approaches by all the Stakeholders in the Basin has sped up projects, created incentives to participate by moving aside regulatory constraints, and has demonstrated a willingness by all involved to move the process of restoration of the Coeur d'Alene Basin forward in a cooperative fashion.

B. Clear Creek Watershed Project

From the headwaters on the continental divide to the plains near Denver, Clear Creek connects small mountain communities with Colorado's largest metropolitan area. Covering roughly 600 square miles, the Clear Creek watershed includes 5 counties and more than 13 communities and provides more than 165,000 people with their drinking water supply. The water and watershed through which it flows easily establishes a sense of place for the citizens and a focus for efforts to protect the environment. Over 85 percent of the water is used as a drinking water supply for the metro area, therefore the people of the lowlands have a special interest in remediation of the impacts of the past mining activities.

Key features of the project include:

- No one organization initiated the watershed project, per se. It resulted from a critical mass of representative groups from industry, agencies, local organizations and private citizens that joined together to protect the one thing they all have in common, the waters of Clear Creek.
- Many of these projects and programs were instigated or facilitated by the two Clear Creek Watershed Forums organized and attended by a diverse group of stakeholder interests, bottom up.
- In 1983 the Clear Creek/Central City site was included on the Superfund National Priorities List. It is one of the largest Superfund study areas in the nation encompassing all of two counties in the upper watershed. Prior to the Watershed effort, Superfund activities were not welcomed (This is an understatement).
- Mining is part of the history and culture of the area that must be respected. A comprehensive approach is the only way that the locals have been able to approach the facts of mining environmental impacts.

Technical

Technical aspects of the Clear Creek watershed effort are characterized by complex past mining sources, complex hydrology and complex treatment technology. Joint sampling efforts by the full range of stakeholders and training of local personnel has not only established a shared, workable water quality baseline but a basis for trust among the stakeholders. In addition, a willingness to risk new technologies and bring in the experts if needed is a key component of the project. Demonstrating new technologies, such as passive mine treatment, provide a non-threatening form of technical assistance. Furthermore, a focus on problem identification and site specific resolution of problems is a strength of this approach as is the realization that we all live downstream.

Institutional Approach

Unlike the Coeur D'Alene project, formal arrangements between stakeholders were rejected. Because the Superfund action and a major lawsuit between parties came first in the process, there was a great deal of distrust between the stakeholders. The institutional approach for Clear Creek has been very flexible. A local watershed coordinator was key in making the process work. Local stakeholders wanted reassurance that this effort would not create another layer of government. The focus first was on information sharing, then joint identification of the problem. In the interest of avoiding duplication of efforts and to avoid arguments about data collection in possible future lawsuits, multiple interests are now sampling together. Joint project cleanups have been established. Enforcement actions for 404 and Superfund administrative orders proceeded unincumbered but possibly facilitated by relationships developed as part of the watershed effort. More difficult, multiple funding projects were then started. The local governments have, in some cases, taken on more responsibilities of environmental protection by way of ordinances, enforcement and project sponsorship.

Financial

EPA initially identified the upper portion of the watershed as a fund lead Superfund site. Because of the complexity and adverse local reactions a limited number of operable units were targeted for remediation. Limited stakes gambling was voted for two small towns in the upper watershed in resulting in Superfund sites being sold for millions of dollars and giving EPA the opportunity to negotiate compliance orders with the new owners. Much of the mining waste material in the area was remined for reprocessing at a nearby heap leach processing facility. EPA funds from nonpoint source and the Mining Headwaters Initiative were used as seed money for locally identified projects. Making sure everyone gets credit for participation is an important financial consideration. There are over 50 different projects involved in this initiative. Money to finance the watershed efforts has come from a variety of sources including:

- EPA financial support came from: Superfund, section 319 of CWA funds, Rocky Mountain headwaters initiative, and Pollution Prevention funds.
- Other federal funds came from USFS, BLM, BOM, USFWS, COE, and the Federal Highways Administration.
- State funding came from Department of Health, Department of Minerals and Geology, Department of Transportation, and Division of Wildlife. Each of the affected counties also provided funds.
- Corporate funding came from Gaming Associations, Coors, AMAX, Western Mobil, and Cooley Sand & Gravel.

- Environmental groups that contributed include: Clear Creek Land Conservancy, Trout Unlimited, Jefferson County Open Space, Canyon Defense Coalition, and the Sierra Club Legal Defense Club.

About 1.0 full time employee (FTE) divided among five individuals is allocated to this project.

Limitations

- Good Samaritan clause for CWA is needed for voluntary efforts to proceed
- Establishing the trust to make this initiative successful took a long time and a lot of effort.
- The transition between regulatory efforts and non-regulatory efforts in this watershed approach was difficult. Some of the activities that were thought achievable via voluntary means ended up as enforcement actions. In addition, some of the other federal agencies have lost their interest in participation as a result of proposed weakened regulations.

Other Characteristics

- Pollutant trading within the watershed
- Regulation of nonpoint source impacts by locals (septic tanks and storm water)

C. Arizona Copper Mines Initiative

The Arizona Copper Mines Initiative was implemented to better characterize the impact of active, inactive and abandoned copper mines on surface water and ground water, to develop an inventory of Arizona copper mines, and to ensure the cleanup and remediation of contaminated sites. A federal/state Arizona Copper Mines Task Force was formed to implement the Initiative. Its non-enforcement objectives include:

- Develop an inventory of active, inactive, and abandoned copper mines in Central and Southeast Arizona.
- Assess and characterize the impacts on natural resources from mining operations on the major watersheds in central and southeast Arizona including the impacts on surface water, ground water, and riparian habitats.
- Define methods to minimize and mitigate impacts of copper mines on surface water, ground water and riparian habitats.

- Conduct outreach to and develop cooperative agreements with the mining industry to enlist financial and technical support for demonstration projects, and for cleanup of inactive and abandoned mines.

Technical Approach

Priorities for mine evaluation were established. Steps included developing an inventory of mines (over 7,000), this was put together by the former U.S. Bureau of Mines, USFS, Arizona State Mine Inspector's Office, Arizona Department of Environmental Quality, and EPA Region 9.. This list was sorted to include sites with reactive type minerals (sulfides, pyrites) because of their higher acid production potential, and known problem mines. The list of high potential problem mines was narrowed to about 700. These mines were then plotted in the GIS according to their longitude and latitude location and mapped. Inconsistencies in format on how mines are located were resolved. Region 9 also developed a standard format for data base structure. Each agency has its own environmental evaluation forms and data base. These data bases are being incorporated into one data base that can be accessed by all participating agencies. This data base will be maintained by the Arizona State Lands Department. The Arizona State Parks Department under contract to the National Park Service prepared an Arizona Rivers Assessment Report that received input from various federal and state resource agencies. This report lists the outstanding waterways within the State of Arizona. The locations of these priority waterways were overlaid on the problem mines map. As a next step, water quality data obtained from the State of Arizona 305(b) report and other sources were analyzed to detect water quality standards violations. Water quality standards violations for metals and turbidity that occurred during the last five years were overlaid on the priority waterways. Those mines located on impacted priority waterways will be selected for further investigations.

Institutional

Members of Arizona Copper Mines Initiative task force which consists of federal and state agencies, work cooperatively without any formal arrangements. The Arizona Mining Association has also been invited to provide technical and financial assistance in the cleanup of abandoned mines. At one general meeting of all resource agencies, it was determined there was an overlap of mine inventory activities and inconsistencies between database structures. A separate subgroup was formed to resolve inconsistency of database formats between agencies and to reduce the possibility of duplication of inventory activities. The State of Arizona is involved in cooperative water quality monitoring and bioassessment efforts. Frequent coordination between agencies has been helpful in concluding enforcement cases, improving program communication, and in improving cooperation between various agencies.

Financial

Little funding has been dedicated to date. One CWA section 319 project to demonstrate impacts of inactive and abandoned mines through the collection of water quality data has been funded. The next step will be to remediate an abandoned mine. Most of the money to implement the Arizona Copper Mines Initiative is coming out of Water Management Division operating funds. RCRA funds were provided by EPA headquarters to buy equipment for implementation of the initiative. Additional RCRA funds will be used to perform biological assessments on Boulder Creek that will bracket active and abandoned mines.

Limitations

This has been largely a voluntary effort on the part of Region 9 staff, and consequently is limited at times by staff availability and conflicts with other regional priorities. Total staff resources are estimated at 1 FTE per year.

Non-Site Specific Approaches

D. RCRA Subtitle D Strawman Guidelines

Although this strawman was designed as part of the RCRA subtitle D regulatory program, it is non-enforcement in nature, and has many of the characteristics of other non-regulatory tools. EPA developed a series of non-regulatory alternative mine waste management approaches, Strawman I and II, in 1988 and 1990. These approaches addressed extraction and beneficiation wastes. These Strawman documents were staff-level trial balloons and were heavily based on approaches developed by the WGA Mine Waste Task Force. These approaches embraced the idea that a RCRA mine waste program would have to be tailored to the unique aspects of each state's situation, considering the distinct climatic, geological, and ecological characteristics of each mine. Strawman II was developed in anticipation of additional statutory authorities provided by the re-authorization of RCRA. It was released to the public in May 1990 and was designed to solicit comment from interested parties. Its non-regulatory characteristics included:

Institutional

- State implementation and enforcement of regulatory programs upon approval of Mining Waste Management Plans by EPA. EPA would retain oversight and enforcement authorities.
- State plans would be required to provide for coordination with programs of all state and federal agencies, including those of the BLM and the USFS.

- Would not require state programs to be structured so as to mirror federal requirements. Instead, would provide broad flexibility to states to design programs and to use existing state and federal programs as components of state plans and programs.

Technical

- Plans would have to be adequate to ensure that site-specific permits would be protective of human health and the environment.
- Would not prohibit mining in any location, but would place more stringent procedural and technical requirements in sensitive areas.
- Program would address all media (ground water, air, surface water, soils) using site-specific risk based performance standards. Permits would have to include conditions needed to achieve compliance with performance standards.
- Would require states to establish or use existing multi-media performance standards: ground and surface water, soils, and air. Standards could be established on state-wide or site-specific basis.
- Would require monitoring and corrective action for all media, closure and post-closure care, and financial assurance.
- In 1991, states, industry, and the environmental community approached EPA and requested that a forum be created to further discuss mine waste issues. In 1991 EPA chartered the Policy Dialogue Committee (PDC) on Mining under the Federal Advisory Committee Act (FACA). Meetings were held through January, 1993.
- The PDC had representatives from the states, the mining industry, the environmental community as well as from the major federal agencies (i.e., Department of the Interior (DOI), the Department of Agriculture (DOA), and EPA).
- The purpose of the PDC was to inform the various parties of each others positions and further the debate on development of a national mine waste program.
- No consensus was reached, however, the basic elements of a mine waste program were identified including, reliance on existing state programs, protection of ground water, limited federal oversight, and public participation.

E. Mine Waste Technology Demonstration Programs

This research demonstration program, administered by EPA's National Risk Management Research Laboratory in Cincinnati, Ohio focuses on treatment aspects of mining problems in the Butte, Montana area. Its non-regulatory features include:

Financial

- A total of \$5 million has been allocated to this program. These were earmarked appropriations.

Technical

- The focus is on the engineering treatment aspects of mine wastes.
- Demonstration projects include clay based grouting, biocyanide treatment, sulfate reducing bacteria, nitrate removal using a combination of ion exchange and nitrate selective resins.

Institutional

- The project involves interaction between EPA, DOE and Montana Technical College gets some of the money. The project includes such technology transfer features as training on abandoned mines.

Limits

- There are questions as to how applicable these demonstration projects will be on a larger scale.

F. Region 8 Nonpoint Source Mining Projects

Several states have identified inactive and abandoned mines as one of the major categories of nonpoint source pollution within their states. The CWA states in section 319(h)(5) that grant funds are to be made available to control particularly difficult or serious nonpoint source pollution problems, including but not limited to problems resulting from mining activities.

Key features

- The projects under the nonpoint source program have focused on inactive and abandoned mines with no viable potentially responsible party.

- This program has been able to implement technically innovative demonstration projects that are very difficult under other clean-up programs.
- Because this is a non-regulatory, voluntary, Good Samaritan dependant program, it is able to leverage other funding sources.
- The projects focus on smaller areas and on low maintenance options.
- The projects also tend to focus on environmental rather than human health impacts.

Technical and Institutional Approach

A state must identify its areas of priority and must develop a management plan including best management practices (BMPs). Individual project proponents in high priority areas then submit proposals for funding of BMP implementation. There is a requirement of 60% match on the projects. In most states, technical assistance is provided to the project proponents by state and federal experts. The projects then compete for funding at an EPA regional level.

Financial considerations

For under one million dollars, Colorado's nonpoint source program has funded thirteen projects, ranging in cost from 12k to 250k. Total clean-up costs for these projects have often been an order of magnitude higher. This is due in part that the 309 projects are smaller and less complex, and address control of sources are opposed to remediating past releases. Typical projects include:

French Gulch. The French Gulch project addresses metals loading from the Wellington D'Oro Mine near Breckenridge. Concentrations of zinc below the mine have ranged from 1,000 - 10,000 ug/l with several samples much higher. Stream standards are exceeded in the Blue River during both high and low flow periods. Mine drainage and ground water movement are being characterized and the shaft of the mine was sealed to isolate the mine pool for possible future treatment. A portion of the French Gulch stream channel was reconstructed in 1993 through the dredge tailings blockage south of the Wellington Mine. The new channel has reduced the flow of ground water through the tailings pile. Geophysical work done by the former Bureau of Mines indicated that there may be another mine opening under the waste rock piles that is draining.

Peru Creek Pennsylvania Mine. The Peru Creek Pennsylvania Mine project includes a limestone feed system to the mine drainage, a settling pond, and a zeolite polishing unit for metals reduction. After start up of the project it was discovered that the lime storage and feed mechanism was not sufficient to deal with the high acidity of the drainage and winter inaccessibility of the site dictated that the neutralization system be re-engineered. Laboratory bench testing of other neutralized agents, zeolite testing, and field

testing showed that a bioreactor was possibly the best solution. Two large bioreactors (manure, sand and gravel mix) have been constructed but have not been activated.

St. Mary's Glacier. This project is intended to reduce acid mine drainage from the Alice Mine adjacent to Silver Creek, which is tributary to Fall River, which is tributary to Clear Creek in Clear Creek County. Drainage water from the old glory hole will be treated by a four stage system, which includes anoxic limestone drain, settling pond, pond for addition of fireplace ashes from nearby residences, and a final settling pond.

Animas River Targeting. This project was designed to target potential nonpoint source project areas in one of Colorado's most severely impacted river basins, the Animas Basin. The project included sampling of selected locations on three major tributaries in the basin in the vicinity of the Silverton/Ouray mining district in southwest Colorado. Mine drainage from inactive sites is being sampled, and a biological assessment of aquatic and recreation use potential is also being conducted. Eleven field crews are assisting with the project, including teams from the Bureau of Reclamation, BLM, USGS, USFS, Sunnyside, Homestake, and Solution Gold mining companies, and the Colorado Division of Wildlife. Sampling has shown that many stations in the basin have metal concentrations in excess of state-recommended criteria. Therefore new standards have been proposed. Potential for remediation of some sites is being assessed by the local Animas Basin association with help from the USFS, BLM, USGS, and Bureau of Reclamation.

Limitations

With the use of a CERCLA memorandum of understanding, these projects have been conducted as removal actions with on-scene coordinators ensuring that requirements under CERCLA are fulfilled. There is no such provision under the CWA. Several projects are on hold because of the fear of third party lawsuits under CWA based upon a recent ruling by the Supreme court not to hear the California Penn Mine case. Good Samaritan language has been drafted for inclusion in the reauthorization of the CWA in order to continue with mining nonpoint source projects.

G. Bubble Trading

A market-based or trading approach seeks to achieve water quality improvements in the most economically efficient manner by affording individuals and institutions choices on how to meet environmental objectives.

Trading means establishing upstream controls to compensate for new or increased downstream sources, resulting in maintained or improved water quality at all points, at all times, and for all parameters. Trading may involve point sources, nonpoint sources, or a combination of point and nonpoint sources. Although it can take many different forms, effluent trading, in principle, allows dischargers to allocate

discharge reductions (beyond those required by technology-based standards) according to relative economic efficiency.

The statutory and legal framework for water quality-based trading can be found in section 303(d) of the CWA regarding Total Maximum Daily Loads (TMDLs). TMDLs are comprehensive in that they address all sources: point sources, nonpoint sources, atmospheric and ground water to evaluate all uses aquatic, domestic water sources, agricultural, and industrial. While using a watershed in decision-making, TMDLs also identify where the most limiting use is within the watershed as well as identifying the most limiting season or critical condition. TMDLs make a clear identification of what assemblage of regulatory and non-regulatory controls will be used to attain water quality goals and standards. This linkage between controls and instream standards so often illusive. The development of a TMDL affords the stakeholders the opportunity to negotiate what combination of controls are needed to attain goals as well as explore opportunities between control options.

It is one thing to collect data to characterize a mining problem but to put the information into a logical framework identifying what level of controls are needed to attain and maintain goals is not always evident. Consideration of instream standards including numeric criteria, narrative provisions including antidegradation criteria and all physical (flow), chemical and biological standards needed to support designated uses is embodied within a TMDL.

The conditions necessary to run an effective point and non-point source trading program include:

- a. Identifiable watershed.
- b. Sufficient point and nonpoint sources.
- c. Ambient water quality goal.
- d. Accurate and sufficient data.
- e. Technology-based discharge requirements met.
- f. Overall costs less.
- g. Point source allocations are limiting.
- h. Institutional structure.
- i. Compliance incentive and enforcement mechanisms.

For example, a proposed mine project may be willing to clean up historical sources even if the cost of implementing the end of pipe technology is less than the nonpoint source cleanup costs, especially if it means the project could proceed more expeditiously. In other words, looking at the full financial picture may render incentives that go beyond the treatment cost differential.

H. Remining

A new cost-effective way to reclaim an abandoned mine may be to re-mine it (i.e., re-open the mine or re-process old waste to recover any ore left behind when the mine was closed), then complete the reclamation process.

For example, the typical site was abandoned when the operator deemed the mine no longer profitable, often after encountering difficult geologic conditions or low-grade ore. But with today's mining technology, many previously mined areas can be re-opened and re-mined at a profit -- and have been, particularly during the boom in the early 1980s. Re-mining usually means re-opening or enlarging an old mine pit to recover the remaining ore. But it can also involve re-processing old tailings piles, or removing old mine waste piles that block access to ore.

Re-mining has appeal. It offers a way to reclaim land according to current environmental standards, with no need for outside funding. But there are at least three potential problem areas that must be considered: first, reopening of a mine by an someone not familiar with all ramifications due to exposing additional discharge areas; second, mining companies will sometimes ignore certain previously mined areas to avoid potential legal liability; and finally, an operator may avoid re-mining, even though it is in close proximity to a new mining venture because the mine is still not economical.

I. Wellhead Protection Programs

The purpose of the Wellhead Protection (WHP) Program is to protect ground water-based public drinking water supplies from contamination and prevent the need for costly treatment to meet the drinking water standards. The WHP program is based on the concept that the development and application of pollution prevention land-use controls and other preventive management measures can protect ground water.

The program provides protection from contaminants in the surface and subsurface area surrounding a well or wellfield supplying water to a public system. WHP area boundaries are determined by hydrogeologic characteristics having a direct effect on the likelihood and extent of contamination including factors such as well pumping rates, time-of-travel of ground water flow to the well, aquifer boundaries, and the degree of confinement.

EPA approves WHP programs state-by-state, which are administered by the states. As of December 31, 1995, 41 states and territories have EPA approved Wellhead Protection Programs (see Table 1). Presumably, hardrock mining activities would be allowed within a WHP area providing they would not generate sources of contamination which may have any adverse effect on the health of persons. The probable causes of contamination of ground water can be difficult to identify, but once ground water becomes contaminated, cleanup (if possible) becomes very expensive. Ground water is used by the

majority of the people in the United States for drinking water because it is less costly to use than surface water as a drinking water source. The higher costs for using surface water are primarily due to land acquisition and treatment requirements.

Table 1. States and Territories with Approved Wellhead Protection Programs			
Alabama	Indiana	Nevada	Rhode Island
Arizona	Kentucky	New Hampshire	South Carolina
Arkansas	Louisiana	New Jersey	South Dakota
Connecticut	Maryland	New Mexico	Tennessee
Colorado	Massachusetts	New York	Texas
Delaware	Michigan	North Carolina	Utah
Guam	Mississippi	North Dakota	Vermont
Georgia	Missouri	Ohio	Washington
Hawaii	Montana	Oklahoma	Wisconsin
Illinois	Nebraska	Puerto Rico	West Virginia