2010 DEC 13 P 6:20

From: Pilz, Joergen (TI) [mailto:Joergen.Pilz@riotinto.com]
Sent: Monday, December 13, 2010 5:58 PM
To: zzMSHA-Standards - Comments to Fed Reg Group
Subject: Rio Tinto comments to MSHA ANPRM on Metal and Nonmetal Dams; RIN No. 1219-AB70

Dear Sir or Madam:

Please find attached comments to Advanced Notice of Proposed Rulemaking ("ANPRM") of the Mine Safety and Health Administration ("MSHA") regarding metal and nonmetal dams, published at 75 Fed. Reg. 49429 (August 13, 2010).

Regards,

Joergen Pilz, PE, PG

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AB70-COMM-25

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December 13, 2010

VIA INTERNET (www.regulations.gov) and EMAIL (zzMSHA-Comments@dol.gov)

Mine Safety and Health Administration
Office of Standards, Regulations, and Variances
1100 Wilson Boulevard, Room 2350
Arlington, VA 22209-3939
RE: MSHA ANPRM on Metal and Nonmetal Dams; RIN No. 1219-AB70

Dear Sir or Madam:

Rio Tinto appreciates the opportunity to contribute to the discussion on the Advanced Notice of Proposed Rulemaking ("ANPRM") of the Mine Safety and Health Administration ("MSHA") regarding metal and nonmetal dams, published at 75 Fed. Reg. 49429 (August 13, 2010). In the ANPRM, MSHA requested specific information from the mining industry regarding measures to assure that mine operators design, construct, operate, and maintain dams to protect miners and the public against the hazards of a dam failure.

In addition to its responses to the questions in the ANPRM that are set forth in the enclosed document, Rio Tinto wishes to emphasize the following:

- Rio Tinto believes that, as applied to the metal/nonmetal sector of the mining industry, further analysis is required to determine if it is necessary to develop additional regulations and standards regarding the design, construction, operation, and maintenance of dams on metal and nonmetal mine sites in light of the existing state and federal regulatory schemes already being enforced. In general, MSHA should survey the existing dam safety programs administered by states and/or other agencies and enter into a Memorandum of Understanding where these programs are adequate. Wherever possible, regulation and enforcement of dams and impoundments should come at the local and state level.
- Developing and administering a dam safety program requires highly specialized and technical skills. We expect that MSHA has neither the expertise nor the resources to take on or duplicate this important role. Additionally, neither the federal government nor industry can afford unnecessary duplication of regulatory programs.
- If it is determined following analysis of the current regulatory frame work and guidelines that MSHA does need to develop a separate regulatory scheme for dams on metal and nonmetal mine sites, MSHA will need to carefully develop a program that is neither duplicative nor contradictory to existing state and federal regulatory schemes nor unduly burdensome to the agency or the mining industry.

Finally, you will note in Rio Tinto's comments that we have chosen to use the terms "impoundments" and "impoundment structures" in lieu of "dams." Rio Tinto seeks to differentiate the tailings storage facilities on mine property from water impounding dams, as these have entirely different risk profiles.

Rio Tinto

About Rio Tinto

Rio Tinto is a leading international mining group headquartered in the UK. Our business is finding, mining, and processing mineral resources. Major products are aluminum, copper, diamonds, energy (coal and uranium), gold, industrial minerals (borax, titanium dioxide, salt, talc), and iron ore. Activities span the world but are strongly represented in Australia and North America (U.S. and Canada), with significant businesses in South America, Asia, Europe, and Africa. In the United States, our hard rock mining and processing operations include:

- Kennecott Utah Copper – a producer of copper, gold, silver, and molybdenum from an open pit mine with nearby concentrator, smelter, and refinery located near Salt Lake City, Utah
- Rio Tinto Minerals – operator of an open pit mine and refining facilities in Boron, California which supplies nearly half the world's demand for refined borates
- Rio Tinto Minerals – operator of talc mines in Montana and Vermont
- Rio Tinto Alcan – operator of the Sebree aluminum smelter located in Robards, Kentucky
- Kennecott Eagle Minerals – the permittee of a new underground nickel-copper mine in Ishpeming, Michigan.
- Kennecott Uranium Company – the operator of Sweetwater uranium mine near Rock Springs, Wyoming.
- Resolution Copper Company – a joint venture proponent of a large underground copper mine in Superior, Arizona

In addition, Rio Tinto has a number of U.S. exploration projects and has successfully closed copper and gold mines in Wisconsin, Utah, Nevada, and South Carolina.

Rio Tinto is pleased to have had the opportunity to comment on MSHA's ANPRM on metal and nonmetal dams. We look forward to continuing a productive dialogue on the issue of whether additional regulation regarding metal and nonmetal impoundments and impoundment structures is necessary. Please feel free to contact me with any questions or requests for further information.

Regards,

Joergen Pilz
Principal Advisor – Geotechnical

Enclosure

COMMENTS BY RIO TINTO ON THE MINE SAFETY AND HEALTH ADMINISTRATION'S (MSHA) ADVANCE NOTICE OF PROPOSED RULEMAKING (ANPR) ON METAL AND NONMETAL DAMS

GENERAL QUESTIONS

1. MSHA is seeking information concerning current dam safety practices at metal and nonmetal mines. What measures do mine operators currently take to design, construct, operate, and maintain safe and effective dams? What measures do mine operators currently take to safely abandon their dams? For mine operators with dams, please provide your experiences.

RIO TINTO COMMENT:

The requirements for design, construction, operation, maintenance, and abandonment of impoundment structures and tailings storage facilities are often mandated by state and local regulations. If MSHA determines that a mine operator is governed by state and local regulations, MSHA should accept those requirements in lieu of federal regulation to avoid conflict or redundancy of requirements.

In the absence of state or local requirements for impoundments, mine operators will need to comply with the MSHA regulations at 30 C.F.R. §§ 56.20010 and 57.20010, which provide, "[i]f failure of a water or silt retaining dam will create a hazard, it shall be of substantial construction and inspected at regular intervals." Inherent in these requirements are the desired elements of hazard assessment, design, construction, operation, and maintenance to ensure safe and effective impoundment structures and tailings storage facilities.

In addition, mine operators should work with competent registered professional engineers to ensure that impoundment structures and tailings storage facilities are constructed, operated, maintained, and closed in accordance with state and local regulations. There are a number of published resources that provide recognized guidance on design and operation aspects. For high risk impoundment structures and tailings storage facilities, the State Engineer may be consulted for additional guidance on safe design, construction, operation, maintenance, and abandonment of impoundment structures and tailings storage facilities. In some States (Utah), the State Engineer's office may require independent review by recognized experts.

2. MSHA is required to inspect every mine in its entirety, which includes dams of all sizes and hazard potential. A common approach for dam safety is to have tiered requirements based on a dam's size and hazard potential. How should MSHA determine safety requirements based on a dam's size and hazard potential? Please include specific recommendations and explain your reasoning.

RIO TINTO COMMENT:

Rio Tinto agrees that a sound approach to dam safety is to have tiered requirements based on an impoundment structure's size and hazard potential. Many state and local agencies with jurisdiction over impoundment structures and tailings storage facilities on mine sites have adopted tiered requirements based on an impoundment structure's size and hazard potential. There are well accepted, formalized procedures to perform such hazard rankings that have been published by professional organizations and have been adopted by many state and federal agencies. MSHA should accept these state and local jurisdiction requirements in lieu of federal regulation to avoid conflict or redundancy of requirements. The demonstrated performance and hazard ranking of the impoundment structures and tailings storage facilities should be a factor in determining the frequency of inspections by regulatory authorities.

3. What non-Federal authority regulates the safety of dams at metal and nonmetal mines in your state, territory, or local jurisdiction? Please discuss the specific requirements, including the principles that they address. If possible, please provide information about relevant non-federal dam safety requirements through a hyperlink or other means.

RIO TINTO COMMENT:

Rio Tinto is accustomed to working with state and local agencies, such as the State Engineer's office, to regulate impoundment structures and tailings storage facilities. In the absence of the State Engineer, other regulatory agencies (State Department of Environmental Quality, U.S. Forest Service, etc.) may have regulatory authority. In this regard, the Association of State Dam Safety Officials ("ASDSO") (http://www.damsafety.org/) is an excellent resource. The ASDSO is a non-profit organization of state and federal dam safety regulators, dam owners/operators, dam designers, manufacturers/suppliers, academia, contractors and others interested in dam safety. In the case of uranium mill tailings, special regulation by the Nuclear Regulatory Commission, EPA, MSHA and State are already in effect (refer to response by Kennecott Uranium Company).

4. What records should be kept of activities related to the safety of dams? Please be specific and include your rationale. What records should be provided to miners if hazardous conditions are found?

RIO TINTO COMMENT:

Mine operators should maintain the records required in accordance with state and local regulations and as recommended by the design engineer of record. Mine operators should retain and continue to work with a competent registered professional engineer during the design process to establish guidelines on recordkeeping. Proper records should be created and maintained to document that impoundment structures and tailings storage facilities are constructed, operated, maintained, and abandoned in accordance with state and local regulations. These records may include design specifications, design drawings, QA/QC documents, photographs created during construction, "as-built" drawings, operations manuals, documentation of routine and detailed dam inspections, and abandonment plans.

DESIGN AND CONSTRUCTION OF DAMS

5. How should mine operators assure that dams are safely and effectively designed? Please suggest requirements that MSHA should consider for safe design of dams. Please be specific and include your rationale.

RIO TINTO COMMENT:

The requirements for safe and effective design of impoundment structures and tailings storage facilities should be in conformance with applicable state and local regulations. Mine operators can best assure that impoundment structures and tailings storage facilities are safely and effectively designed by having the design completed by a competent registered professional engineer with specific knowledge and experience regarding tailings facilities. Additionally, the mine operator would have the design engineering plan accepted and approved by the state or local authority with responsibility for impoundment structures and tailings storage facilities. If a design is professionally completed and accepted in conformance with state or local requirements, MSHA should accept the design. This will eliminate overlapping jurisdiction, duplication of effort, and additional cost.

6. Please suggest requirements for review of dam designs by mine operators and MSHA and include your rationale for specific recommendations and alternatives.

RIO TINTO COMMENT:

Once a state or local jurisdiction with responsibility for impoundment structures and tailings storage facilities has accepted and approved a design, there is no need for additional review by MSHA. This will

eliminate overlapping jurisdiction, duplication of effort, and additional cost. If there is no state or local authority with responsibility for impoundment structures and tailings storage facilities, a design engineering plan should be designed and completed by a registered professional engineer, and MSHA could review the plan if appropriate based upon a tiered hazard system We also recommend continued involvement by the designer and annual or biannual inspections, which are often required by the State as well. We recommend that accountability remain at the local level with personnel experienced with site specific conditions.

7. With new standards, operators may need to evaluate and upgrade existing dams. Please elaborate on how the safety of existing dams should be addressed.

RIO TINTO COMMENT:

Existing impoundment structures and tailings storage facilities should be addressed based on the impoundment structure's performance, and how the performance fits into the design assumptions. If inspection records indicate safety concerns, then a re-evaluation of the design may be warranted. The designer of record and operator should coordinate with the State Engineer's office or other state or local authority with responsibility for impoundment structures and tailings storage facilities to agree upon and implement any needed mitigation plan.

8. MSHA's existing standards for dams at metal and nonmetal mines do not address whether a dam is constructed as designed. What measures are necessary to ensure that mine operators construct dams as designed?

RIO TINTO COMMENT:

Whether an impoundment structure or tailings storage facility has been constructed as designed is best evaluated by reference to the engineering design plan. During construction, periodic inspections by the state or local personnel with responsibility for impoundment structures and tailings storage facilities and familiar with the design details and design assumptions, should verify that the impoundment structure or tailings storage facility is constructed in accordance with the engineering design plan. Records of construction inspection should be maintained to document that the impoundment structure or tailings storage facility is constructed as designed. Mine operators should also have a change management process to identify when operational changes require the input from a competent registered professional engineer.

9. How should MSHA verify that dams have been constructed as designed? Please explain your rationale.

RIO TINTO COMMENT:

The state or local agency with responsibility for impoundment structures and tailings storage facilities should evaluate whether appropriate quality assurance and inspection programs exist and are implemented at the mine operation. If the inspection records indicate safety concerns, then a re-evaluation of the impoundment structure or tailings storage facility may be warranted. The agency with regulatory authority can verify the structure was constructed as designed by examining available construction specification criteria, monitoring data and the construction inspection records.

OPERATION AND MAINTENANCE OF DAMS

10. What should a mine operator do to operate and maintain a safe dam? How should MSHA verify that dams are safely operated and maintained? Please be specific.

RIO TINTO COMMENT:

Mine operators are responsible for "routine" inspection by trained and qualified personnel at regular intervals if failure would create a hazard. Records of these inspections should be maintained at the mine site. Secondly, most designs require some form of instrumentation and monitoring program. Records of the instrumentation should be maintained and reviewed at the time of periodic site inspections. "Detailed" inspections, as warranted, should be conducted by a knowledgeable registered professional engineer familiar with the site specific conditions.

MSHA can verify that impoundment structures and tailings storage facilities are safely operated and maintained by conducting field inspections and examining the inspection records maintained by the mine operator in conformance with the regulations at 30 C.F.R. §§ 56.20010 and 57.20010.

11. What measures should mine operators take to assure that dams are adequately inspected for unusual conditions and signs of instability?

RIO TINTO COMMENT:

Mine operators should ensure that personnel assigned to perform routine inspection receive adequate training to qualify them to carry out these tasks. Mine operators should also inspect impoundment structures and

tailings storage facilities in conformance with the recommendations of a competent registered professional engineer and state and local regulations.

12. How often are routine inspections of dams conducted? How often should they be conducted? What determines the frequency? Who conducts the routine inspections? Please be specific and include your rationale.

RIO TINTO COMMENT:

The number of routine inspections conducted of impoundment structures and tailings storage facilities varies by site. The frequency of routine inspections should be based on need, the past performance of the impoundment structure and the risk or hazard ranking of the facility. In general, routine inspections should be performed at least daily under operating conditions. A routine inspection is considered as a minimum to be an operator driving along the embankment to observe unusual or varying hazardous conditions.

13. Instruments, such as weirs, provide information on the performance of a dam. How frequently should mine operators monitor dam instrumentation? Please provide your rationale.

RIO TINTO COMMENT:

If any instrumentation has been installed on-site, the frequency of the monitoring should be based on the design engineer's recommendations and the anticipated performance of the impoundment structure. The continued frequency of monitoring should be based on observed performance and may be adjusted appropriately during the periodic inspections by the designer of record. Instrumentation may also be automated to provide data on a more frequent basis if conditions require additional information on performance.

14. What information should be documented during routine dam inspections? Please provide your rationale.

RIO TINTO COMMENT:

The information required to be documented during routine impoundment structure or tailings storage facility inspection should be based on the design engineer's recommendations, as these requirements vary based on site specific conditions.

15. Does a competent engineer inspect your mine's dam? If so, at what frequency? Please explain the rationale for these inspections and what is evaluated.

RIO TINTO COMMENT:

A competent engineer performs a detailed inspection of impoundment structures and tailings storage facilities on Rio Tinto mine sites at least every two years. However, detailed inspections may occur more frequently based upon need.

16. How often should detailed inspections be conducted? Please include your rationale.

RIO TINTO COMMENT:

The frequency of detailed inspection should be site specific and consistent with generally accepted practice of applicable state and local agencies responsible for impoundment safety.

17. What information and findings should be documented during detailed dam inspections? Please be specific and include your rationale.

RIO TINTO COMMENT:

The specific information and findings to be documented during detailed impoundment structure or tailings storage facility inspections should be determined by the competent design engineer based on the anticipated performance of the facility to ensure the safety of the impoundment and the impoundment structure. There are a number of well accepted published guidelines and procedures available in the industry stipulating the type of information to be gathered and these should be referenced.

18. How should MSHA verify that mine operators conduct routine and detailed inspections? Please explain how your suggestion would work.

RIO TINTO COMMENT:

It is possible for MSHA to verify that mine operators conduct routine and detailed inspections by examining inspection records maintained by the mine operator. MSHA should clearly identify the minimum information or documentation required to be maintained to achieve its objectives and avoid overlapping jurisdiction, duplication of effort, and additional cost. Any records MSHA would require to be maintained should focus on the design engineer's requirements for a particular impoundment structure or tailings storage facility.

QUALIFICATIONS OF PERSONNEL

19. What qualifications do mine operators currently require of persons who design, inspect, operate, and manage dams? In what capacities are engineers used? Please be specific in your response.

RIO TINTO COMMENT:

Mine operators can best assure that impoundment structures and tailings storage facilities are safely and effectively designed by having the design completed by a registered professional with specific experience in the design and operation of tailings facilities. The inspection, operation, and maintenance of impoundment structures and tailings storage facilities can be performed by mine personnel that have either received formal training (education in the geotechnical sciences) or have received training by the design engineer's firm, recognized associations and/or short courses specific to tailings operations.

20. The Guidelines recommend that dams be designed by competent engineers. What specific qualifications or credentials should persons who design dams possess? Please include your rationale.

RIO TINTO COMMENT:

The requirements for persons who design impoundment structures or tailings storage facilities should be determined by the state or local authority to avoid overlapping jurisdiction, duplication of effort, and additional cost. For designed impoundment structures and tailings storage facilities, the design function should generally be performed by a registered professional engineer. The qualifications or credentials of a competent engineer are based on education, work experience, and professional engineering registration. The education component typically would cover a B.S., M.S., or Ph.D. in mining engineering, civil engineering, or geotechnical engineering. A competent engineer could be qualified by education and experience. He or she typically would have basic training in geology, soil mechanics, rock mechanics, hydraulics, hydrology, mining methods, or mining operations. It is important that the work experience include impoundment structure or tailings storage facility design and inspection.

21. The Guidelines recommend that a dam be constructed under the general supervision of a competent engineer knowledgeable about dam construction. What specific qualifications or credentials should a person have who verifies that a dam is being constructed as designed? Please provide your rationale.

RIO TINTO COMMENT:

The qualifications or credentials of a competent engineer are based on education, work experience, and professional engineering registration. The education component typically would cover a B.S., M.S., or Ph.D. in mining engineering, civil engineering, or geotechnical engineering. A competent engineer could be qualified by education and experience. He or she typically would have basic training in geology, soil mechanics, rock mechanics, hydraulics, hydrology, mining methods, or mining operations. The work experience component typically would include impoundment structure or tailings storage facility design and inspection.

22. What training should personnel receive who perform frequent, routine inspections and who monitor instrumentation at dams? In your response, please suggest course content and the frequency of the training, including the rationale for your recommendations.

RIO TINTO COMMENT:

Mine personnel assigned to perform "routine" inspection should receive adequate training to qualify them to carry out these tasks. The training should provide skills adequate to conduct an inspection and identify any unusual conditions or signs of instability. Training should also cover proper monitoring of any instrumentation required by a competent registered professional engineer for the impoundment structure or tailings storage facility.

23. What qualifications or credentials should be required of persons who perform detailed inspections to evaluate the safety of a dam? Please be specific and include your rationale.

RIO TINTO COMMENT:

The qualifications or credentials of a competent engineer are based on education, work experience, and professional engineering registration. The education component typically would cover a B.S., M.S., or Ph.D. in mining engineering, civil engineering, or geotechnical engineering. A competent engineer could be qualified by education and experience. He or she typically would have basic training in geology, soil mechanics, rock mechanics, hydraulics, hydrology, mining methods, or mining operations. The work experience component typically would include impoundment design and inspection.

ABANDONMENT OF DAMS

24. Some regulatory authorities require that dam owners obtain approval of a plan to cap, breach, or otherwise safely abandon dams. What actions should mine operators take to safely abandon dams? Please include specific suggestions and rationale.

RIO TINTO COMMENT:

Rio Tinto prefers the term "closure" versus abandonment. Closure plans are an integral aspect of the design and operation. A post-closure monitoring and observation plan should be developed on a site-specific basis in conformance with state and local regulatory requirements.

25. How can MSHA verify that a mine operator has safely abandoned a dam?

RIO TINTO COMMENT:

MSHA can verify that a mine operator has safely abandoned an impoundment structure or tailings storage facility by receiving a copy of the approval or acceptance of the change issued by the state or local regulatory agency responsible for impoundment safety. If the state or locality does not have a dam safety program, MSHA should accept an abandonment plan if it is certified by a competent registered professional engineer.

ECONOMIC IMPACT

MSHA seeks information to assist the Agency in deriving the costs and benefits of any regulatory changes for dams at metal and nonmetal mines. In answering the following questions, please indicate the dam's storage capacity, height, and hazard potential and characterize the complexity of each dam referenced. Also, please include the state where each dam is located, and the number of employees at the mine.

RIO TINTO COMMENT:

It is extremely difficult to provide costs for a "typical" impoundment structure or tailings storage facility structure, as site conditions, type of embankment, age and numerous other factors impact the costs. The costs for smaller facilities are likely to be higher than for larger facilities in terms of percent of total capital expenditure. For moderate to large (1000 acre and larger) facilities, typical cost ranges as a percentage of the total capital expenditures may be as follows:

Item	*Percent of Total Capital*
Engineering and Design	*5 – 10%*
Observation and inspection (excluding instrumentation)	*< 1 %*
Instrumentation / monitoring	*1 – 2 %*
Operation personnel (excluding management)	*~ 5%*
Annual operation (construction)	*20 – 50 %*

26. What are the costs of designing a new dam? Please provide details such as hours, rates of pay, job titles, and any contractual services necessary. How often is the design of an existing dam changed? What are the costs of a redesign?

RIO TINTO COMMENT:

The costs of engineering and design are highly dependent on the facility and cannot be provided in absolute terms. This cost would be minor when compared to capital and operating costs for impoundment structures and tailings storage facilities. Typically, costs of engineering and design run from five to ten percent of capital expenditure, but could be more or less depending on facility size and complexity. In addition, designs for impoundment structures and tailings storage facilities may change due to alteration of mine plans and required capacity. Impoundment structures and tailings storage facilities design changes are considered and must be supported economically in altered mine plans.

27. What are the costs of constructing a dam? Please provide details based on: Size of dam; labor costs, including hours, rates of pay, job titles; costs of equipment and materials; and any contractual services necessary.

RIO TINTO COMMENT:

Costs of construction are highly project specific and can range from several million to hundreds of millions of dollars, depending on the facility type, complexity, and other factors. Costs are normally presented in terms of dollars per ton of material stored and can vary significantly by project.

28. Please describe the oversight you provide during dam construction to assure it complies with the design plan. How much does it cost per year per dam for oversight and quality control? What special knowledge, qualifications, or credentials do you require of those who provide oversight?

RIO TINTO COMMENT:

Costs for construction oversight and quality control for impoundment structures and tailings storage facilities are project dependent.

Construction oversight and quality control testing is normally a fraction of a percentage of the operating costs and are considered to be minor in relation, especially for larger facilities where operating costs can reach several hundred thousand dollars per year. QA/QC firms and individuals performing QC testing are often accredited by National Institute for Certification in Engineering Technologies ("NICET") or other organizations.

29. How often do you add height to an existing dam or modify it in some other way? Who supervises the design and construction of these modifications, for example, a professional engineer, competent engineer, contractor, etc? Please be specific and provide rationale for your answer. How much does it cost? Please provide details such as labor costs, including hours, rates of pay, job titles, and costs of equipment and materials and any contractual services necessary.

RIO TINTO COMMENT:

Costs for modification of impoundment structures and tailings storage facilities are very project dependent and a function of the type of facility (cross valley, side hill, and/or perimeter embankment). Tailings storage facility raises can occur annually for many impoundments and vary by site. Raise rates for tailings storage facilities are important criteria in the stability assessment of the embankment and must be addressed in design and monitoring. Embankment modifications should be based on engineered design drawings and specifications. The allowable raise rate must be specified in the report accompanying the design drawings.

30. How much does it cost per year per dam for routine inspections? If you incur separate costs for monitoring instrumentation, how much is that cost? How often do you have a detailed inspection conducted? How much does it cost per year for these inspections?

RIO TINTO COMMENT:

Yearly costs for routine and detailed dam inspections are generally minor in comparison to the operating and capital expenditures. Typically these costs amount to a fraction of a percentage of operating expenditures for large facilities, but for smaller facilities these costs may represent a higher percentage. Instrumentation costs may be slightly more significant and amount to larger percent of the operating expense, depending on facility type.

31. Does the state or local jurisdiction in which you operate require you to use a professional engineer? If so, when is a professional engineer specifically required? (If you have dams in more than one state please identify which states require a professional engineer and which do not).

RIO TINTO COMMENT:

State and local regulatory criteria may vary as to exact requirements for routine and detailed inspections. Routine inspections can be completed by mine personnel that have been trained to conduct routine inspection and identify any unusual conditions or signs of instability. However, it is good practice to utilize a competent registered professional engineer or an individual who was involved in the details of the original design of the impoundment structure or tailings storage facility to perform detailed inspections. These persons are normally registered professional engineers. Consistency in implementation of detailed inspection programs is also important.

32. What are the costs associated with training personnel who conduct frequent, routine inspections and monitor instrumentation at dams?

RIO TINTO COMMENT:

The costs associated with training personnel who conduct frequent, routine inspections and monitor instrumentation at dams can vary by site and project. These costs are considered minor in comparison to capital and operating expenses.

33. What costs are involved in capping, breaching, or otherwise properly abandoning a dam? Please provide details of your experience and what was involved when you properly abandoned a dam. Describe any impact of a properly abandoned dam.

RIO TINTO COMMENT:

Costs for closure of an impoundment structure or tailings storage facility can vary widely by project. Costs are normally considered in terms of dollars per unit area. Published costs may range from $10,000 to $100,000 per acre. Incorporation of closure planning into the operating procedures can reduce closure costs.

34. What are the costs to a mine operator if a dam fails? Please characterize other impacts such as loss of life, environmental damage, etc.

RIO TINTO COMMENT:

The potential loss of life is an unacceptable risk. Environmental costs, physical costs, and costs to company and industry reputation associated with a failure may exceed original operating and capital expenditures of a facility.

35. Do you have insurance against a dam failure? If so, please specify cost and coverage. Does the insurance carrier require the use of a professional engineer for specific dam activities? If a professional engineer is not required, does the insurance carrier give a

discount if one is used? Does your insurance company have any other requirements related to dam safety?

RIO TINTO COMMENT:

This is confidential for our facilities and likely most others.

36. What quantifiable and non-quantifiable costs and benefits for the downstream community are involved when a dam is properly designed and constructed? In addition, MSHA welcomes comments on other relevant indirect costs and benefits.

RIO TINTO COMMENT:

The costs to company and industry reputation must be considered in all decision-making processes. A mine operator should be involved in the community to inform the public of the actions implemented to assure safe operation of mine facilities.