THE ROLE OF POLITICS, COMMUNITY INVOLVEMENT AND PUBLIC PARTICIPATION IN THE RECLAMATION OF AN ABANDONED IRON MINE IN WYOMING[1]

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Abstract. The reclamation of a tailings impoundment, waste rock dumps, and a railroad grade associated with a taconite operation in Wyoming was a political and public relations challenge. Several stake-holders had strong personal agendas and objectives to be achieved through the reclamation project. Thorough newspaper coverage, numerous public meetings, and interaction with local landowners regarding innovative reclamation techniques were some of the methods used to combat the project's complicated web of miscommunication and misinformation that hindered the public's acceptance of the proposed construction plans and progress of the work.

Additional Key Words: tailings, organic soil amendments

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Introduction

The US Steel Corporation (US Steel) started work at its Atlantic City Iron Mine, located near the historic gold mining camps of Atlantic City and South Pass City, Fremont County, Wyoming in 1960. Early work included the construction of 126 km of new railroad from Rock Springs, Wyoming to the mine site; the building of the plant and support facilities, the development of an open pit mine, and the initiation of a tailings disposal impoundment (E&MJ, 1965). Operations continued until 1983 when mining and production of taconite pellets ceased. Iron mining activities resulted in many hundreds of hectares of affected ground including a flooded open pit, ore processing plant, waste rock dumps, a tailings impoundment (Fig. 1).

Figure 1 - Atlantic City Iron Mine During Tailings Impoundment Reclamation. Tailings Impoundment In Foreground, Mine Pit In Center, Waste Rock Dumps To Right and Left Of Pit, Plant And Shop Areas At Left Center Above Tailings.

The Wyoming legislature passed the Open Cut Land Reclamation Act in 1969. This legislation was superceded by the Land Quality provisions of the Wyoming Environmental Quality Act in 1973 (WDEQ 2000). US Steel initiated reclamation on portions of the waste rock dumps and the tailings impoundment in compliance with these regulatory requirements although some pre-1969 disturbances would be exempt (grandfathered) from reclamation requirements.

US Steel sold its interest in the Atlantic City Iron Mine in 1985 to a salvage operator, including its land and its remaining environmental obligations. Although the salvage operator continued to perform reclamation activities, it ultimately failed to meet the environmental obligations specified by regulatory agencies and it was soon embroiled in legal complications. One event that attracted State-wide attention was the draining of the pool of the tailings impoundment, resulting in the exposure of about 80 hectares of unstable, fine grained tailings particles to the extreme winds of South Pass, Wyoming that often reach velocities in excess of 125 kilometers per hour. The resulting dust storms occasionally caused the closure of Wyoming Highway 28, a major east-west route through the central portion of the State.

Consequently, the State and the salvage operator confronted each other in local district court and a Declaratory Judgment and Order for Reclamation Performance Bond was issued on April 9, 1991 (Fremont County 1991). Included in the judgment order was a requirement to reclaim 54 hectares of disturbed lands in addition to the areas occupied by the ore processing, maintenance, and administrative facilities. The judgment further provided for:

- increasing the reclamation performance bond to cover the anticipated costs of plugging the tailings decant line,
- seeding an additional 60 hectares of disturbed lands,
- repairing certain drainage and erosion control devices,
- demolishing the buildings and structures and burying the debris, and
- disposing of hazardous and/or unsuitable materials and other related items.

A timetable for the accomplishment of the mandated activities was also to be established. The final outcome resulted in over 140 hectares of disturbance with no identifiable responsible party to perform the remaining reclamation. It should be noted that much of the remaining reclamation needs included lands disturbed prior to the passage of State reclamation legislation.

These remaining disturbed lands therefore became eligible for reclamation by the State under the Abandoned Mine Land provisions Article 12 of the Wyoming Environment Quality Act (WDEQ 2000).

Wyoming Abandoned Mine Land Division Involvement

The Abandoned Mine Land Division (AML) of the Wyoming Department of Environmental Quality (DEQ) was asked by the salvage company to participate in their negotiations with the Land Quality Division (LQD) of DEQ in identifying lands to be reclaimed under the judgment along with those to be reclaimed by AML in 1991. Concurrently, AML initiated selection of a professional services company to develop baseline and pre-design information and subsequently plans and designs for reclamation of AML eligible lands. A contract was awarded to the selected consulting firm and a notice to proceed was issued in January, 1992. During the negotiations between the salvage operator and the LQD, disagreements arose that prompted the salvage operator to withdraw permission for AML to enter its lands to perform the needed studies. The salvage operator's rationale was based upon the perception that AML was a state agency as was LQD; therefore, it was punishing the LQD by preventing AML from performing its work. The salvage operator hoped AML might persuade LQD to resolve the disagreements in the salvage operator's favor. These entrance prohibitions resulted in delays to AML's timely pursuit of its work since many of the base-line studies such as threatened and endangered species were required to be done during specific times of the year, and winter weather precluded performance of these and other base-line and pre-design studies.

These delays were just the beginning of a long series of frustrating events to come. The project was further complicated by the State's attorney requesting AML to add a detailed study of the salvage company's land ownership in the area to the consultant's scope of work. An appraisal of these lands was also requested along with an environmental audit for the presence of toxic and hazardous materials. The State's attorney was attempting to protect all of the State's options if it were necessary to foreclose on the property as a result of reclamation bond default. Ownership identification and appraisal of lands to be reclaimed by AML were standard practice; however, the overall scope requested by the State's attorney was considerably beyond what AML would have normally done. Once the salvage operator became aware of the State's

thoughts about foreclosure, AML's access to the property was again denied. When the negotiations were finally completed, AML accepted the responsibility to reclaim the tailings impoundment, unreclaimed portions of the waste rock dump east of the mine pit, certain portions of the abandoned railroad bed in the vicinity of the mine and nearby South Pass City, including the removal of concrete bridge abutments at the edge of Wyoming Highway 28 (Figure 2). AML and its consultant were finally granted permission to enter all of the properties in question to conduct the base-line studies in June, 1994.

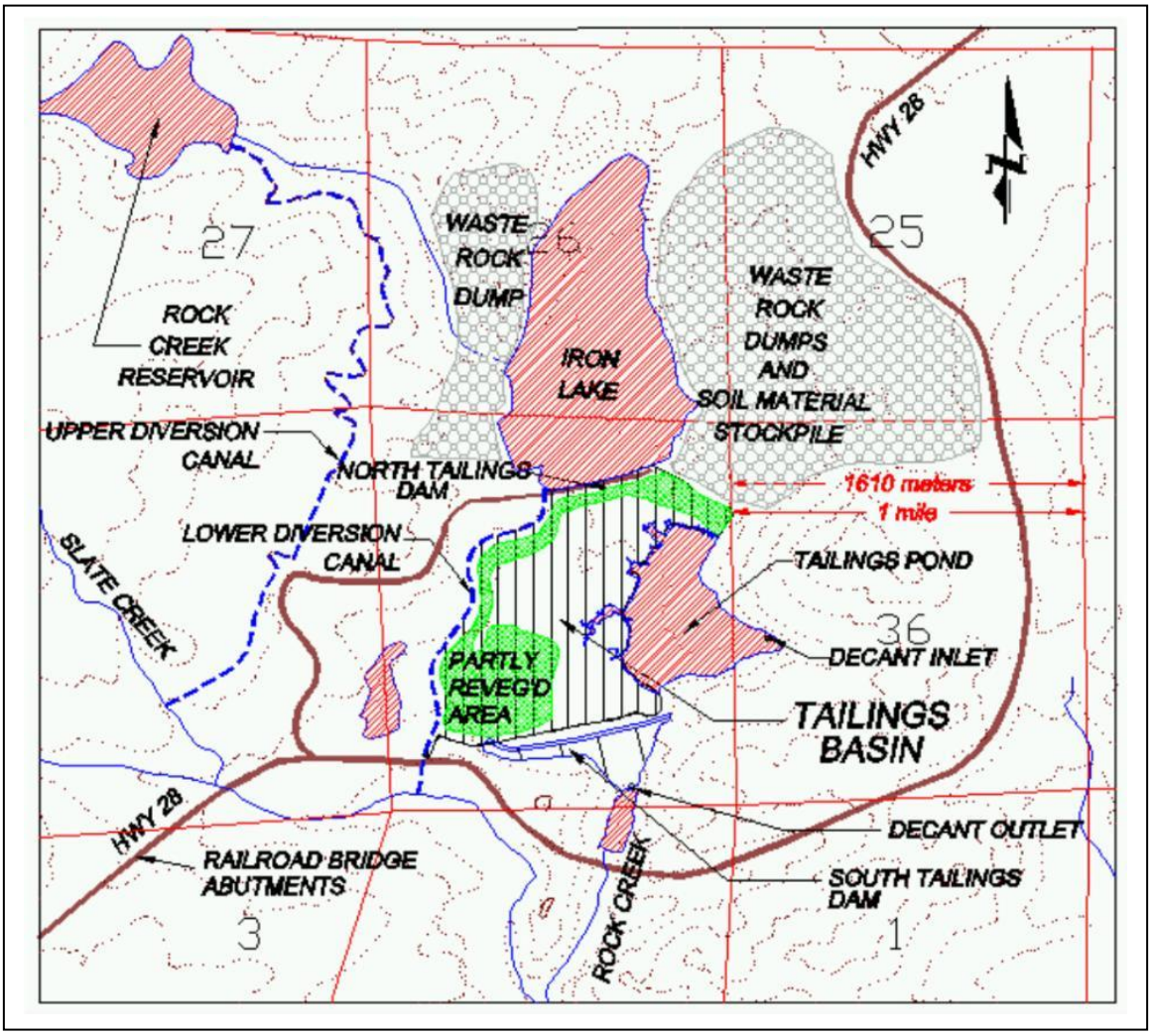

Figure 2 – Atlantic City Site Vicinity Map

Stake Holder Agendas

There were several stake holders that had an interest in the Atlantic City Iron Mine reclamation plans developed by AML. The salvage operator was most interested in maximizing the return on its investment by recovering and selling all items on the property of value, such as mining and processing equipment and railroad hardware, while minimizing its costs, including minimizing its environmental obligations. The Wyoming DEQ had a variety of interests including the reclamation of the disturbed lands, the removal of toxic or hazardous materials that may have been present such as asbestos and polychlorinated biphenyls (PCBs); and maintenance of the quality of the water leaving the mine site which was still under an NPDES permit held by the salvage operator. The LQD, the Air Quality Division, and the Water Quality Division of DEQ were all actively involved. The U.S. Department of the Interior's Bureau of Land Management (BLM) wished to have the entire 126 km of railroad bed reclaimed to the predisturbance condition even though there were no reclamation requirements attached to the railroad right-of-way issued by that agency. AML's interest was to minimize safety hazards to the public and to minimize off-site environmental degradation caused by the mining activity on lands where there was no reclamation obligation.

A major stake holder was the owner of a property some five air miles south of the mine site that had been placer mined on different occasions since the middle of the 19th Century, most recently during the 1930s and 40s by dredge. During this last placering activity, the surface soils overlying the gold-bearing gravels had been stripped and stockpiled in windrows along the outside edge of the mining activity. The property owner had apparently bought it with the intention of recovering the remaining gold values during the late 1970s or early 1980s when gold prices were high. Gold subsequently lost its value and the owner never initiated his own mining activity. In an effort to recover some of his investment, the owner proposed selling the stockpiled soils to the State of Wyoming for the reclamation of the Atlantic City Iron Mine. He would then donate his lands along the creek bottom to the State of Wyoming as a game refuge or game management area. This proposal was warmly welcomed by the outdoor interests, attracted the attention of State legislators, and received intensive media coverage (Wyoming Journal 1990, Star Tribune 1991, AML 1992).

Other stake holders with an interest included:

- The Wyoming Department of Transportation which held a mineral lease on a portion of the mine property for road construction and maintenance materials,
- The City of Lander, Wyoming that also held a lease for coarse tailings (cobbs) used as road sanding materials, and
- A local contractor who held a lease for picking large rocks and boulders from the waste rock dumps for construction purposes.

To further complicate matters, there was a brief period of two or three years during which an outside interest was evaluating reopening the iron mine property to recover remaining portions of the original iron deposit. Although this interest was very low key in its activities, AML felt it important to consider their potential activities and seek their input in the reclamation planning process. Much of the disturbed area that had been mined by US Steel was owned by another major mining company that still holds its property interest in the area.

Reclamation Plan Development

The AML consultant prepared and delivered a draft Report of Investigation (ROI) to AML late in 1994 followed by a final version in January, 1995. The consultant recommended the Atlantic City Iron Mine be divided into four major categories of work: railroad bridge abutment removal, tailings impoundment reclamation, waste rock dump reclamation, and railroad fill breaching. Design of the bridge abutment removal was performed concurrently with the initial base line work, and demolition started on that phase of the project in October, 1994. Initial thoughts for reclamation of the tailings impoundment included using a soil-like material that had been stockpiled during the mining operation. The recommended approach was the development of a suitable plant growth material using a 15 cm layer of “manufactured topsoil” placed over a 46 cm thick layer of the stockpiled soil-like material which in turn would be placed atop the tailings surface. The manufactured topsoil was composed of a mixture of the soil-like material, and a composted mixture of livestock manure and sawdust. The finished manufactured topsoil would contain more than 3% organic matter. The use of the suitable plant growth material was

estimated to be less costly than placement of borrowed soils (AML 1995-1). The ROI further addressed recommended reclamation approaches for the waste rock dumps and railroad fills.

Public Participation Approach

Early in the process AML recognized the highly sensitive nature of the project and included the following provision in the contract with the professional services contract (AML 1991):

> *I.E.5. Public Participation. The site is located in an area subject to considerable public interest. The Consultant shall conduct the project activities with a full recognition and understanding of this sensitivity and the need for caution in dealing with the public. Efforts will be made to accommodate public interest, consideration and participation consistent with AML policies and practices.*

In addition to the above contractual provision, the federal AML regulations that govern state AML programs require a public notice to be published in newspapers of record for the project area and to provide an opportunity for public comment prior to commencement of the reclamation work. Copies of the final draft of the ROI were made available for public review at the DEQ offices in Lander and Cheyenne, Wyoming as well as at the public library in Lander.

AML staff had received training in public participation and also held a one-day training session for its professional service consultants that emphasized the need and benefits of achieving public cooperation through public information and participation. For the Atlantic City Iron Mine project, extensive use was made of a public participation training program and workbook conducted by the Institute for Participatory Management and Planning (IPMP 1993). The emphasis of this public participation approach is truthfulness and openness; not to try to hide or cover up what may appear to be unpleasant, unacceptable, or controversial aspects of a project.

An open house format meeting was held in Lander, Wyoming on the evening of February 28, 1995 to present the Report of Investigation to the public. The professional service consultant and its specialty sub-consultants set up individual displays of their activities and were available to answer questions from interested parties regarding the findings of the base line and pre-design studies as well as the proposed reclamation approaches. AML staff members were also present

to assist the public in understanding the project approach. The open house meeting was well attended by the public. Written comments were received from some of the attendees of the open house, and some oral comments were also given to a professional recorder present for that purpose. An additional thirty-day period following the open house meeting was also provided to receive comments.

In spite of its public participation training, the AML project staff and the consultants were totally unprepared for the public response to the proposed use of composted livestock manure and sawdust as a constituent in the development of the plant growth material. The staff, however, was even less prepared for the distortion and the exaggeration of the facts regarding the preparation of the plant growth material as contained in some of the comments received. Letters to the editor of the local newspapers, as well as to the AML Administrator, portrayed the development of the plant growth medium as the placement of 61 cm of raw livestock manure and sawdust over the entire area of the tailings basin. To compound the situation, many of the comments identified potential impacts to Rock Creek, which passes through the mine and tailings impoundment and on down through the Atlantic City, Wyoming townsite, some 7 kilometers down stream of the project area. The comments focused on how the stream is the source of drinking water for the community and the stream's regional status as a gold-medal trout fishery. Comments from two citizens cited how sawdust and wood waste from lumbering activities in the California Sierra Mountains during the late nineteenth century resulted in massive fish kills and elimination of cut-throat trout from streams in that area and implied the same would happen at Atlantic City. Several comments specifically endorsed use of the soils from the placer dredged site, some identifying the dredge site owner by name. Other comments received were somewhat more constructive. There were inquiries about downstream flooding potential resulting from reclamation, and impacts to water quality resulting from the use of the composted material.

An analysis of comments was prepared following the close of the comment period in which the substance of the comments was identified and the responses thereto provided. The analysis was presented to all attendees of the open house public meeting, persons who had submitted comments, all surface and mineral owners of the project area, and the other identified stake holders (AML 1995-2). Comments continued to be received from interested parties well after the close of the formal comment period, including an inquiry from the U.S. Environmental

Protection Agency about the reclamation plans for the Atlantic City Iron Mine site. A copy of the Analysis of Comments was provided to the EPA along with the observation that composted municipal solid waste, composted sewage sludge, and composted livestock manure have all been successfully used for landscaping and agricultural purposes for some time (AML 1995-3).

The controversy generated by the distortion of the compost component of the suitable plant growth material caught the attention of the Fremont County, Wyoming Board of County Commissioners, who requested a presentation by AML on March 19, 1996. The County Commissioners were also skeptical, at best, of the compost plans; some also openly supported the borrowed soil approach.

At about the same time, the salvage operator notified AML in July, 1996 that it would not grant permission to AML to use the stockpiled soil-like material at the mine site without AML first paying a royalty. The other property owner of the mine site, upon which the stockpile was located, believed the material belonged to them. AML policy was not to pay a property owner for material to be used on that owner's property. AML also chose not to play referee or judge between two conflicting landowners. AML and its consultant then evaluated alternative approaches that had been used elsewhere for the revegetation of taconite tailings in conditions that would be similar to those at South Pass, Wyoming. The modified approach would be to deep rip the tailings surface to mix the layer of coarse "cobbs" into the finer sands/slimes fractions of the tailings. The compost would be incorporated into the upper 15 cm thickness of the mixed tailings.

No clear consensus could be reached regarding the use of the artificial plant growth material. An article appeared in the Cheyenne newspaper June 10, 1996 with the headline "Riverton balks at topsoil compost plan" and noted area residents were concerned about water contamination. The article further noted AML would advertise the project in the late fall with both the composted material and the borrowed soil as separate bid items (Tribune Eagle 1996).

The tailings impoundment reclamation project was advertised and bids were opened on the first of November, 1996. Bidders were instructed to bid on both of the soil items, and AML would select the lowest qualified bid using that bidder's lowest bid soil method, either borrowed or composted (AML 1996-1). The successful low bid did, in fact, select the composted plant growth material method, and the cost difference between the two methods was approximately half of the estimated savings.

The requiring of bids for both the composted manure/sawdust and for the borrowed soil seemed to settle most of the concerns about the reclamation approach. AML met again with the Fremont County Commissioners in November of 1996 and an article appeared in the Lander paper with the headline "Commission approves 'compost' for Atlantic City Mine reclamation" (AML 1996-2, Wyoming Journal 1996).

Contractor's Innovative Reclamation Approach

The contractor that held the "rock picking" lease on the Iron Mine site was the successful bidder for the reclamation of the tailings impoundment. A pre-construction meeting was held in December, 1996 during which the contractor presented a suggestion for a change in the plant growth material design under the Value Incentive provisions of AML's construction documents at that time. The proposed change would substitute a sterile, geologic soil material borrowed from undisturbed ground adjacent to the tailings impoundment. The contractor proposed placement of this material to a depth of 38 cm and amending it with the commercially available soil supplements Fertil-Fiber® and Kiwi Power® to achieve the desired levels of organic matter and the desired carbon-nitrogen ratio that was to be provided by the composted livestock manure/sawdust prescription. Note that WDEQ-AML does not endorse any specific product. The use of trade names is for reference, only.

The change as proposed by the contractor resulted in an estimated savings to AML of a little over $100,000 from the bid price. Interestingly, the contractor paid a royalty to the landowner of the borrow site, who happened to be the salvage operator. As a result, the salvage operator received his royalty, the concerns expressed by the public about the use of the composted manure were resolved, and AML had the work performed for a fair price by competitive bidding.

The reclamation of the tailings impoundment started in January, 1997. The winter construction start was intended to take advantage of the frozen tailings to support the earthmoving equipment, and the seasonal low water conditions for repair and installation of water flow control structures. Work tasks under this contract included:

- Repair of an outlet control structure on a dam upstream of the mine site that has a direct impact on the water flows into the tailings impoundment,

- Closure of a decant tower that served as the principal tailings impoundment discharge structure,
- The construction of a rip-rapped channel to serve as the principal spillway from the impoundment into the natural surface water drainage system,
- closure of a culvert, and the back filling of a ditch that carried overflow from the open pit ore mine around the tailings impoundment,
- The construction of a new channel and spillway from the mine pit into the tailings impoundment that lowered the mine pit water level by some seven feet, relieving the hydraulic head between the two,
- Installation of French drains in the toe of the north tailings dam (separating the tailings impoundment from the mine pit) to further relieve and control the seepage from the mine pit into the tailings basin, and
- Placement of sinuous earthen berms at intervals across the stabilized tailings approximately perpendicular to the prevailing winds.

Standard wooden slat snow fences were initially specified in the construction plans. The contractor submitted a Value Incentive proposal to substitute rock and boulder construction of the snow fences, which AML accepted. These snow fences were also sinuous in layout, and perpendicular to the prevailing winds. The purpose of the snow fences was to trap snow for moisture retention and site enhancement. At the completion of construction activity, the permanent tailings basin pool, 27.5 hectares in size, was left to develop aquatic habitat characteristics on its own, and 44 hectares of tailings beach were revegetated using species suited to the area. Some 36 hectares of tailings beach previously reclaimed by the salvage operator were left unaffected. The area was fenced to exclude livestock grazing. The work was completed in October, 1998. The total cost of this work was less than $2.2 million, and was some $138,000 under the initial contract price after the Value Incentive adjustments.

Waste Rock and Railroad Reclamation

The salvage operator ultimately gave up its claim to the stockpiled soil-like material in March, 1998, enabling AML to proceed with reclamation of the waste rock areas. AML's

reclamation approach for the waste rock included grading of the very hard rock to an approximately smooth surface, given the size of the rock fragments and boulders encountered, to permit placement of approximately 60 cm of the soil-like material and placement of the organic amendments used for the tailings basin. Steep slopes were reduced to a maximum of 3 horizontal to 1 vertical. The earthen berms and rock snow fences used on the tailings impoundment were also placed on the waste rock. There were three contracts let for the reclamation of about 100 hectares of waste rock at a total cost of $2.381 million

Four railroad fills located off of the mine site were breached to allow unrestricted passage of flows up to the 100 year event, and to remove culverts that might become catch points for trees and other debris and result in plugging and perhaps catastrophic failure. Two of the fills were simply breached, the water channel rip-rapped, and revegetated. The two remaining fills, on BLM lands, were completely removed, the material placed in nearby rail bed cuts, or in one case, placed in a waste dump. Like the non-BLM sites, the channels were rip-rapped and the areas revegetated. The railroad fill removal contract included a remedial project to repair erosion damage to the tailings spillway outlet and protect a phone line and natural gas pipeline that had become exposed. The railroad fill work was completed for $400,000, with an additional $65,000 contributed by the BLM for the additional cost of total fill removal instead of breaching to pass the 100 year storm event.

Decant Pipe Plugging, Tree Planting, and One More Ownership Change

One of the last construction contracts let at the mine site was for the plugging of the tailings decant pipeline to prevent possible failure and draining of the tailings pool. The cost of this work was $137,000. A contract for the collection of tree seed from local sources, the propagation of seedlings, and the planting of the seedlings in the tailings basin and on the waste rock areas was let in the summer of 1999 and the work completed in 2003. This work was scheduled to be completed in two years, but was delayed because of contract award difficulties and because of a delay in a waste rock reclamation contract. The construction schedule was also impacted by the ongoing drought in the western US.

In June 1999, the salvage operator sold his interests to the contractor holding the “rock picking” lease on the mine site. This change of ownership was announced during a pre-bid site

tour for prospective bidders for one of the last waste rock contracts. This change in ownership prompted inquiries from some of the other prospective bidders who perceived a possible conflict of interest. New project work was delayed for a construction season because of this change in ownership and the AML administrative procedures it precipitated. The Casper, Wyoming newspaper noted the change in ownership with a story headlined "Reclamation Projects Continue Despite Ownership Change" (Star Tribune 1999).

The new owner has subdivided some of the undisturbed land in the vicinity of the mine as vacation cabin properties and has begun to sell some of these lots. The mine pit lake now has some very large fish.

Summary

Public interest in the AML reclamation of the Atlantic City Iron Mine diminished upon the commencement of the tailings impoundment work. One would presume the public participation process served its purpose of presenting the known aspects of the work to all concerned parties. Each of the major stake holders had the opportunity to provide input into the reclamation planning process and to influence the decisions regarding the final approach; some of the stakeholders were more successful at this than others. Nevertheless, the mission of the AML reclamation project was achieved; the known safety hazards to the public have been minimized and degradation of the off-site environment has been controlled (See Figure 3). The work was accomplished at a reasonable cost through competitive bidding while allowing some innovative reclamation practices to be employed.

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Figure 3 – Tailings Basin Revegetation Coverage after Two Growing Seasons. More Recent Waste Rock Reclamation At Right.

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