

RECLAMATION PLAN, GOOSE POND
BROOKSVILLE, MAINE

Prepared by: Frederick M. Beck, Callahan Mining Corporation
Endorsed by: Goose Pond Reclamation Society
Date: July 25, 1972

Introduction

Since February, 1968, Callahan Mining Corporation has been mining and milling zinc and copper minerals from an open pit mine which occupies a portion of the former Goose Pond, a state-owned tidal estuary, and adjacent privately-owned land on the west side of Goose Pond. Goose Pond is located on the northwest coast of Cape Rosier, a peninsula located in Brooksville, Maine, on the eastern shore of Penobscot Bay.

Due to depletion of the mineral reserves, mining ceased on June 15, 1972, and milling ceased on July 14. A total of 800,000 tons of rock and mud were mined, of which 797,917 tons were milled and _____ tons were placed on waste dumps. The average grade of ore milled was 1.30% copper, 4.91% zinc, 0.35% lead, and 1/2 ounces per ton silver.

Callahan operated the mine under a number of permits, licenses, and leases. Those which would appear to have direct bearing on reclamation are listed in Appendix A. The only specific state reclamation requirement for the area underlying the former Goose Pond is contained in the state mining lease wherein "AGREEMENT TO AGREEMENT ARTICLE 2". To this end, the Goose Pond Reclamation Society was formed and provides the forum for discussion and recommendation for reclamation as envisioned by the state, town, and company, in 1967.

REMINING
COPPER
LEAD
ZINC
SILVER
20 LB/TON
MILLING
7/25/72

Appendix "B" contains the articles of incorporation and by-laws of the society. The state, town, and company are not obligated to accept the recommendations of the Society, but each group has indicated a willingness to cooperate with the Society and provide assistance and support whenever possible.

A reclamation plan has been prepared as a result of numerous meetings of the Society. The plan has been prepared by Callahan Mining Corporation, but reflects the concensus of opinion of the Goose Pond Reclamation Society and is endorsed by that group. This plan if followed requires modifications in existing federal permits, action by certain state agencies, and
The following plan provides the basis on which these decisions can be made. Lack of approval would require modifications to the plan.

Appendix C is a preprint which details the operation of the mine. Although two years old, it provides background which is sufficiently current. If the permits, it should be read prior to considering the plan. The plan is described in three parts; planting and grading of disturbed areas above sea level, economic rehabilitation of the area, and reclamation of the area which is below sea level and hence would become water covered.

Areas Above Sea Level

Grading

All Dump areas will be smoothed with bull dozer to provide more natural contours than result from normal dumping. An effort will be made to leave finer material on top and to cover the larger boulders. Not all areas lend themselves to this smoothing process. These include portions of Dyer Hill and the outer face of the tailings

pond. An effort will be made at these areas to remove hazardous boulders and make the slopes as safe as they are practical. Plate I outlines the major areas of interest.

Seeding and Planting

The University of Maine is currently conducting greenhouse tests on the rock and tailings material. From this work will be developed recommendations for seed and fertilizer mix to be used. It is anticipated that hydromulching of most areas can be accomplished in mid to late August. Some areas will not receive as much seed and fertilizer mix as others. The areas which are visible to the public or subject to erosion will receive the most care.

Roads

The principal access to the property will be blocked with a fence and locked gate. This gate will be located near the southwest corner of the tailings pond and will prevent curious sightseers from driving on seeded or dangerous areas. It will also provide security for the buildings and equipment left on the property. Other roads, such as along the tailings dam will be blocked with either berms or boulder barricades. The principal access will be from the north at Goose Falls.

Buildings and Equipment

All mining and related equipment will be sold at auction on September 22, 1972. The items not offered for sale at the auction include the following: the mill (to be sold complete or used on another Callahan project); assay, lab, shop, and office buildings.

(to be held for aquaculture project), and a few specialized items which would not sell well at an auction. When the mill is removed from the property, the mill buildings will be destroyed and removed.

Power

High voltage power () will be retained to the property until such time as the feasibility of aquaculture can be determined and the need for this power line determined.

Water wells

There are three producing water wells on the property. Two of these supply water to residences in Harborside, and will be maintained by Killahan during the period of aquaculture study. Beyond that time responsibility, ownership, and maintenance of the wells will have to be determined by the parties involved. The third well at the mine office will provide water to the tail during the aquaculture project.

Tailings Pond

CORPS CONCERN ON HAZARD POSSIBLE LIQUIFICATION (VIBRATION - SEISMIC ROOM, EARTH
TEST LOCAL BU/MINTES AUGUSTA ROBT. HOLROY ON STABILITY OF TAILINGS
- 325 - SIZE OF PARTICLES - ALL - 30

35' THICKNESS OF ROCK AT BASE OF TAILINGS POND

CONDITIONAL APPROVAL DEPENDING ON SPEC FROM CORPS OF ENGINEERS
& BUREAU OF MINES

Economic Rehabilitation

In an effort to relieve the negative economic impact of the mine closure, Callahan is conducting a pilot project to determine the commercial feasibility of raising salmon and oysters under controlled conditions. The technology has been developed in other areas and it would appear that these technologies could be successfully applied to the Cape Rosier area. It is anticipated that a modest tax-aid employment base could be developed if the project proves feasible.

As part of the aquaculture project, analyses will be conducted periodically on water quality, both within and outside the pit area, and bioassays will be performed periodically to determine heavy metal accumulation in selected marine species. The company assay lab will be used for making most tests. Analytical assistance will be provided by the University of Maine's Darling Center and the Department of Sea and Shore Fisheries.

The following periodic tests will be conducted, both in the pit and from selected control points in Penobscot Bay:

- Temperature (surficial and with depth)
- Location of thermocline
- Salinity
- Turbidity
- Dissolved oxygen
- pH
- Heavy metals in shellfish ^{WATER + SEDIMENTS (M.R. Dow)} at location agreed upon by company and Dept. of Sea & Shore Fisheries

Below-Sea Level Reclamation

It is proposed that the end result of the Goose Pond reclamation should be a fresh water pond south of the fresh water dam and a salt water pond open to the tidal action of Penobscot Bay north of the fresh water dam. Tidal exchange would be similar to the pre-1967 era.

In order to achieve this end result, the following steps are proposed:

1. Improve and raise level of fresh water dam to provide a permanent maintenance-free structure with a spillway at an elevation of _____.
2. Remove top three feet of concrete dam at Goose Falls to eliminate danger of ice damage to bridge deck, but provide a dam which would not allow tidal exchange.
3. Siphon salt water into pit to a level of 990'. Stop siphon and allow water to clarify and sediments to settle.
4. Test water at this level after one month for heavy metal content. If significant quantities of heavy metal are present, retest one month later. When the Goose Pond Reclamation Society, after review, deems it advisable, siphon salt water into pit to a level of _____.
5. Periodic testing of Goose Pond waters will be undertaken during fall and winter months. If the Goose Pond Reclamation Society determines that there is not a significant polluting problem, the Goose Falls dam will be removed by Callahan Mining Corporation and replaced with a permanent spillway at an elevation of _____, which will be riprapped and constructed in such a way that it resembles a natural ledge. A reversing tidal action will be returned to Goose Pond.

PA
JES:ASH
DEP
CORPS OF ENG.

TELETYPE ADVANTAGES, JULY 28, 1972



WHAT ABOUT THE PIT. On June 24 dynamite charges were set off in the pit area, on the right side of the photo. It had been hoped the explosion would be enough of a catalyst to start mud flowing back, refilling the pit. It didn't work, there is still a 300 ft. deep hole. Mine manager Ralph Flow reports no additional attempts will be made to fill the pit. If the Dept. of Sea and Shore Fisheries ever permits the dam to be removed so that the pit can be flooded and there can be a free tidal flow from Goose Cove, the pit area will be utilized in the aquaculture project.

Acquaculture Progress At Callahan

"We hate to leave, we've had a good relationship with the community." With these words, Callahan manager, Ralph Flow summed up the feeling surrounding the complete cessation of all mining activity at Harborside, after four years of operation. He went on to say that there were no longer any employees working as members of a mining crew. "We have a few people left around involved in clean-up and rehabilitation. But that will be completed soon, too." After that, according to Flow, anyone left will be associated with the newest field of exploration by the Callahan Corporation - the aquaculture project.

The aquaculture project evolved from Callahan's reclamation responsibility. Besides smoothing the waste rock slopes and revegetating them, at the finish of mining activity, Callahan was also confronted with the problem of what to do with their 300 foot deep open pit. Simply reflooding the area raised objections from the Dept. of Sea and Shore Fisheries and Army Corps of Engineers because to open the flow of water between the pit and Goose Cove increased the possibility of spreading heavy metal toxicity. As a method of providing toxicity monitoring while creating a potential new industry for Callahan and the Brooksville area, Fred Beck, Callahan director of exploration, conceived the aquaculture plan.

The pilot project is being supervised by biologist Robert Mant, a Princeton graduate who has two years of experience culturing shellfish in San Francisco, as well as working the past year at Maine's Darling Center. Assisting Mant are Dave McGraw of Blue Hill and Steve Snow of Brooksville.

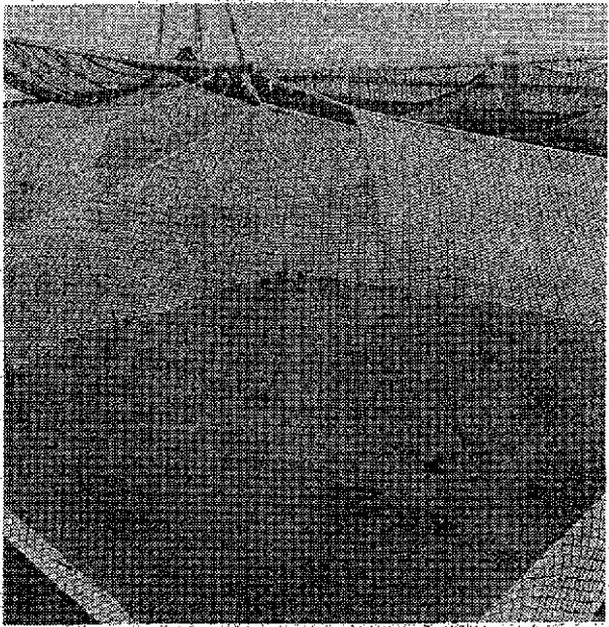
The experiment was initiated on June 14 with the arrival of 350,000 tiny seed oysters. Though growing in boxes on land now, ultimately they will be placed in trays and set out at different stations in Goose Cove area. Each of the stations will be routinely checked, monitoring the oyster meats and the water for heavy metal concentrations of zinc, copper, cadmium, lead and chromium.

Another phase of the project began this past week with the delivery of about 4,000 Coho salmon. Coming from Pennsylvania, the salmon were immediately placed in the waters of Goose Cove, confined in net pens which are suspended from an anchored float. No regular monitoring

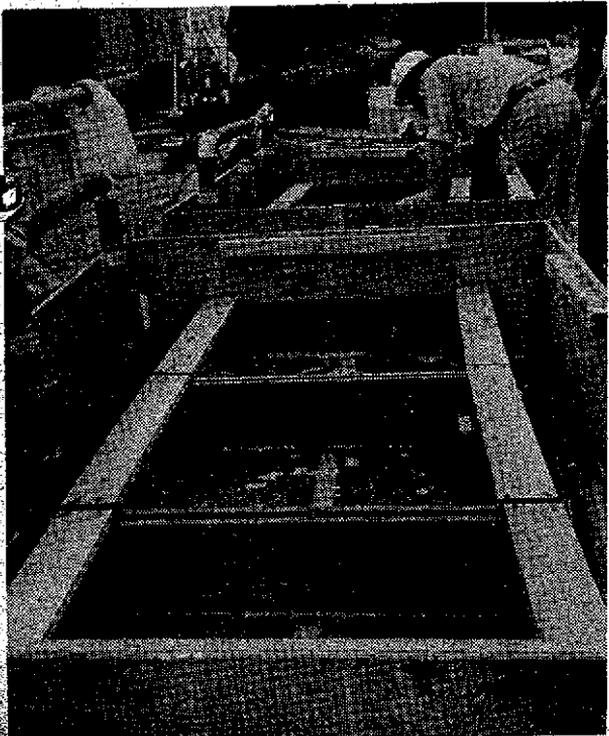
are also using because they're pushing to not
out there pushing. The only problem is those pushing
ment in this state is primarily interested in the person
with a window on water

Mr. and Mrs. Leonard Baskin and son Hosea of Northampton, Mass., are at their cottage for the summer. Darrin Parker is home from Bridgeport, Ct., where he

Richard Nixon



Shown at left are the trays in which 300,000 seed oysters are growing. 4,000 Coho salmon are confined in the 8-ft. by 8 ft. net pens, shown above.



the salmon will be done, since, according to Mant, their location about 200 yards off Holbrook Island tends to eliminate them from possible heavy metal toxicity from the mine. Rather, raising salmon is more strictly exploratory, to determine whether the fish can be raised in Maine waters and be marketed at a profit.

In describing the aquaculture experiment, Mant said, "There is no biological reason why it should not work..." Not only should marketable seafood be raised, but also, hopefully, the theory that only the bottom sediments in the Cove are contaminated, not the water itself, will be proven. Crucial to testing this theory is the oyster monitoring.

To start them off, 300,000 seed oysters were divided by species, American, Japanese and European, and placed in boxes, about 30 inches by 30 inches, made of wooden frames and enclosed with fine-mesh wire screen. There are six boxes, three per tank. Water is pumped directly from Goose Cove and circulated through the tanks, providing the oysters with a continuous flow of water. This circulating water also provides a continuous food supply because the oysters rely on plankton filtered from the water for nourishment. When they first arrived the oysters did not measure over a sixteenth of an inch in diameter. When they reach three-quarters of an inch, which is expected in the next few weeks, they will be ready for placement in trays and stationing in the Cove. Marketable size is a half-shell of three to four inches, which the oysters should reach in two years.

To assure accurately monitored findings, Mant said that ten to fourteen points would be chosen throughout the Goose Cove area. At each of these stations there will be three levels of trays, one resting on the bottom sediment, one more in the center, and one closer to the surface. He expects that only the oysters in the bottom trays will accumulate heavy metal concentrations. As a test control on the experiment, 50,000 oysters, including some of each of the species, have been kept apart, receiving no Goose Cove water. They will be stationed in Blue Hill Bay near N. Brooklin, and will also be monitored regularly. If the oysters were being raised simply as a money-making project, no monitoring would be necessary and the amount of time involved with their care would be very minimal.

Speaking of the commercial potential of this phase of the project, Mant sees it as almost limitless. The current market value of a bushel of half-shell oysters is about \$20. With an estimated 150 oysters per bushel it is not difficult to anticipate a sizeable earning from the original 350,000 oysters. But, there is one major expense which must be taken into account. That is the cost of trays. The commercial trays for the final growing stage hold only about a quarter of a bushel of oysters, and cost from \$3.50 to \$8.50. If Callahan were to try and raise to marketable size each of its seed oysters, it would involve the purchase of about 9,000 of the most expensive, aluminum-coated trays (for the accuracy of the experiment.) If raising oysters were to become a long term business, the investment would soon pay off. For the more immediate future, the program will undergo its first evaluation this fall. After that, Mant will be faced with the challenge of whether the oysters will survive Maine's winter.

The Coho salmon also show good potential as profitable commercial stock. At market size, eight to sixteen inches, salmon is currently selling at \$1.75 per

pound. An aquaculture project with salmon, Mant runs from May through November starting with fingerling salmon, which have been raised to that size in fresh water. After being confined in pens in salt water, the fish are nourished on a diet of dry pellets and reach market size in six to seven months. The salmon introduced into the Cape Rosier waters, averaging five to eight inches in length, are already about three times the size that would normally be used to start this project.

The 4000 Coho, a genetic species of salmon which have been raised successfully in similar projects on the West Coast, are confined in eight foot by eight foot pens. Mant reports that the greatest problems he expects are from intruders, such as seals, shags and dogfish, trying to eat the fish. In November, the salmon will be turned over to local restaurants to test their market value locally.

Two other shellfish which Mant considers have great potential because of their ability to be cultured are bay scallops and abalone. Neither exist naturally in Maine, but both are million dollar industries in other parts of the country.

The future of Callahan aquaculture is indefinite, and very much dependent on whether marketable species can be raised, and what amount of heavy metal toxicity concentration will be found. All mining buildings are being left intact, so there is space potential for expansion. The most immediate need, Mant feels, is the installation of hatchery facilities. If any of the species works out, a local processing plant would probably be necessary, a possibility Callahan has already considered. At that point, Callahan would again become a significant area employer.