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U-003-307 .6

PROJECT PROPOSAL FOR NEW SCRAP PIT - (USED AS A REFERENCE IN OU1 RI)

07/11/58

CP-58-40

10
REPORT

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CP Section

CP-58-40

NATIONAL LEAD COMPANY OF OHIO

under NLO

CONTRACT NO. AT(30-1)-1156

UNITED STATES ATOMIC ENERGY COMMISSION

000001

NATIONAL LEAD COMPANY OF OHIO

Title NEW SCRAP PIT

CP No. CP-58-40 Estimate $222,300

APPROVALS	SIGNATURE	DATE
Initiating Division	M S Nelson	7/11/58
Engineering	[illegible]	7-11-58
Plant Manager	J H Royer	7/11/58

ATOMIC ENERGY COMMISSION
FMPC

Area Manager		

AEC BACON-DAVIS REVIEW
B-D-Applies . . . . . ☐
B-D-Does Not Apply . . . ☐
Signed _____
Date _____

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NLO-ENG-584 (REV. 11/2/56)

PROJECT PROPOSAL

A. PROPOSAL NUMBER

CP-58-40

B. TITLE OF PROJECT

New Scrap Pit

C. DATE

July 11, 1958

D. DISCUSSION AND JUSTIFICATION

1. Problem

A recent survey of the scrap pits was made for the purpose of estimating the volume available for the continued disposal of residues. This survey shows that the new pit (Scrap Pit No. 2) is about three-quarters full of settled solids. Based on the present filling rate, it is estimated that the pit will be filled by October, 1958. The residues will then overflow into the old Recovery Plant digestion tailings pit (Scrap Pit No. 1), which is now being used as a clear well into the Miami River. This will create a problem because the necessary clear well capacity for proper settling will be reduced to such an extent that increased amounts of solids will be transferred into the river.

Radioactivity in the Miami River is definitely affected by the total amount of suspended solids contained in the effluent passing into the river. This has been clearly established by analyzing daily samples of our effluent and of the Miami River.

Scrap Pit No. 2 was initially constructed solely for the storage of Recovery Plant residues, but within the last year it has been necessary to use the pit for disposal of unprocessed, neutralized, concentrated, Refinery raffinate residues. This need is the result of limitations in our drum dryer capacity under current operating conditions. The limitations can be attributed to the lower raffinate boildown ratios experienced in the evaporation of raffinate from Canadian ore concentrates.

The drum dryers in the raffinate area are capable of processing only 65-75% of the current concentrated raffinate output. In order to maintain production schedules, without transferring solids into the river, it is necessary to dispose of this excess residue in the pit.

2. Solution

Construct a new residue pit. A pit is proposed with a capacity of 226,500 cubic yards (45,900,000 gal.) and a surface area of 296,000 square feet. The pit will be located in an area lying between the west embankment of the existing pits and Paddy's Run Creek. The design depth of the new pit will be approximately twenty-four feet from the top of the embankment to the bottom of the pit. The small creek now running at the toe of the west embankment of the existing pits will be diverted at a point north of the existing "burn" pit, westward through an existing ditch, toward and parallel with the railroad siding, thence to Paddy's Run Creek.

Included in the overall project will be the construction of an earthen cross dike and weir near the south end of the new scrap pit to form a clear well. A pump house will be constructed at the intersection of the embankment of the new pit and the existing west embankment of Scrap Pit No. 1. Two pumps, rated at approximately 550 gpm will be installed in the pump house. The effluent from the clear well will be pumped through a new six inch line directly to the existing 12 inch process sewer line at the General Sump, thence to the Great Miami River. A new six inch line will be constructed from the General Sump to the new pit. The discharge line from the General Sump will be continued out over the pit area, near the north end of the pit, on a wooden trestle. A series of valved outlets will be connected to the elevated section of the discharge line to allow spreading of the discharge slurry or liquid over a considerable area of the pit.

It is estimated that the life of this pit would be a minimum of five years. This period of useful life is based on a total discharge of 65 tons of settled slurry solids per day in 800,000 gallons of effluent containing these solids.

Based on information obtained in the operation of the present pit, the construction of the pit will make possible the discharge of effluent to the river containing an acceptable level of suspended solids.

3. Justification

At the current filling rate, it is estimated that the present residue pit will be full by October, 1958. Then, only the old

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digestion tailings pit, which is now being used as a clear well, will be available for storage. It is imperative that a decision to construct a new pit be expedited and the funds be made available to avoid a period of high solid discharge to the river.

Personnel from the Ohio Department of Health - Sewage and Industrial Waste Division are in agreement with our Health and Safety Division regarding the amount of total suspended solids that would be allowable in our effluent. They agree that about 25 ppm would meet the standards contained in the U. S. Department of Commerce Handbook No. 52, "Maximum Permissible Amounts of Radioisotopes in the Human Body and Maximum Permissible Concentration in Air and Water." Construction of the proposed new pit will enable us to maintain the solids at a permissible level.

Eliminating the disposal of excess, unprocessed, concentrated raffinate into the present pit would require additional processing equipment in the raffinate area consisting of an additional drum dryer and auxiliaries. An estimated capital expenditure of $136,800 would be necessary, in addition to increased operating costs. This expenditure could not be justified on the basis of acid recovery, because recovered acid costs are well above the cost of new acid. It is therefore not as attractive a means of residue disposal as the proposed pit because of the higher operating costs.

The proposed pit can be constructed for an estimated capital expenditure of $222,300. This will permit residue disposal

at a minimum cost, and will allow all unit operations in the Raffinate Area, except the evaporator, to be shut down. Residue disposal in this fashion will achieve an annual direct savings of $95,805 by reducing operating, maintenance and utility costs.

A more detailed listing of the anticipated savings is shown in the following Table.

ESTIMATED ANNUAL DIRECT SAVINGS

Cost Category	Estimated Saving
Direct Wages (Reduced by the elimination of two operators/shift.) 6 (Men) X 40 (Hrs/Wk) X 52 (Wks/Yr) X $3.50 1/	$43,680
Indirect Wages (6.1% of Direct Wages) .061 X $43,680	2,665
Maintenance Wages (Estimated reduction based on actual experience for May, 1958.) $5,025 X 12	60,300
Direct Materials (Increased cost of lime for neutralization, plus required make-up acid.)	-73,000
Maintenance Materials (Estimated reduction based on actual experience for May, 1958.) $3,180 X 12	38,160
Fuel Gas (Reduced consumption based on 6 month average.) $1,500 X 12	18,000
Electricity (Reduced consumption based on 6 month average.) $500 X 12	6,000
Total Estimated Annual Direct Savings	$95,805

1/ The hourly rate used is an approximate cost for an around-the-clock operation, and includes shift differential, premium pay for Saturday and Sunday work and an average overtime experience factor.

Under the proposed system, the evaporator residue will be neutralized with bulk lime and pumped directly to the new pit. A project is now approved authorizing the installation of a bulk lime handling system that can be used for raffinate neutralization. This system was authorized under the Expansion Program.

The anticipated savings will pay for the proposed installation in approximately 2.3 years. This is considered very attractive, since the facility will also put us in a position to maintain satisfactory radioactivity levels in the Miami River.

E. PRELIMINARY DRAWING

Drawing No.	Title
8-4150	Proposed Scrap Pit No. 3

F. OUTLINE SPECIFICATIONS

1. All trees, brush and vegetation will be cleared from the areas to receive the new earth embankments.

2. The pit bottom will be located at the elevation of an existing layer of impervious clay.

3. The earth fill will be free of organic matter and will be placed and compacted in successive 6 to 8 inch layers. Compaction will be achieved with sheepsfoot rollers.

4. The pipe lines to and from the new pit will conform with ASTM Designation A-120.

5. The pump house will be of concrete block, bearing wall construction. The floor will be of poured concrete and

the roof of precast concrete slabs.

6. The discharge pipe support will be constructed with oak timbers having a preservative treatment.

G. PRELIMINARY ESTIMATE OF COST

The estimated cost of the proposal is:

$222,300.

A breakdown of this estimate is shown on the attached estimate sheet.

H. ESTIMATED TIME REQUIREMENTS

1. Design will be completed 6 weeks after CP approval.

2. Procurement will be completed 10 weeks after CP approval.

3. Construction will be completed 28 weeks after CP approval. Ability to meet this construction completion time is contingent upon the date of approval, and the severity of weather encountered during the construction phase.

I. STATEMENT OF METHODS BY WHICH WORK WILL BE PERFORMED

1. Design will be by National Lead Company of Ohio.

2. Procurement of pumps and electrical equipment will be by National Lead Company of Ohio.

3. Construction will be by a Subcontractor on a lump sum basis.

J. BUDGET DATA

Funds will be available in Project 224-59L when the FY 1959 funds are approved.

SUMMARY COST ESTIMATE

PRELIMINARY PROPOSAL

CP-58-40 - New Scrap Pit

COST CATEGORY	NLO	AEC	Sub-contract	TOTAL
Direct Construction Cost	$ 4,000		$181,250	$185,250
Building Costs to 5" Line			5,000	5,000
Installed or Fixed Equipment	4,000		3,600	7,600
Building Costs Plus Installed or Fixed Equipment	(4,000)		(8,600)	(12,600)
Movable Equipment				
Improvements to Land			103,500	103,500
Outside Utilities			69,150	69,150
Engineering, Design & Inspection	18,525			18,525
Design	15,000			15,000
Inspection	3,525			3,525
Indirect Costs				
Allowance for Contingencies	18,525			18,525
Total Project Costs	41,050		181,250	222,300
Items Not Requiring Expenditure of Funds				
Reused Equipment				
Government Furnished Items				
NET COSTS	41,050		181,250	222,300

Gross Floor Area 200 sq. ft.

Gross Cubage 3,000 cu. ft.

	Direct Cost to 5' Line	Direct Cost Plus Contingencies	Direct Cost Cont. & Indirect Cost
Unit Cost Without Equipment (Area)	$25.00/sq.ft.	$ 2.75/sq.ft.	Not Applicable
Unit Cost Without Equipment (Cubage)	1.67/cu.ft.	1.83/cu.ft.	Not Applicable
Unit Cost With Installed Equipment (Area)	63.00/sq.ft.	69.30/sq.ft.	Not Applicable
Unit Cost With Installed Equipment (Cubage)	4.20/cu.ft.	4.62/cu.ft.	Not Applicable

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NATIONAL LEAD COMPANY OF OHIO
ENGINEERING DIVISION
ESTIMATE SHEET

Project No. 8-47

Sheet 1 of 1

CP No. CP-58-40

Estimator EAH

Date June 2, 1958

Production Division Plant 3 Department

Job Description Scrap Pit No. 3

Job Location Scrap Pit Area

Work Area Construction of a Third Scrap Pit

CODE	DESCRIPTION OF ITEM	ESTIMATED COST LABOR	ESTIMATED COST MATERIAL
599	Clear and Grub	3,000	
599	Excavation	70,500	
599	Embankment (Dike)	12,500	
599	Hauling Waste	6,900	
599	Overflow, Including Weir	5,850	4,750
690	Discharge Pipe Support	4,400	2,750
690	Piping	29,000	34,000
701	Pumps	800	3,800
599	Pump House	2,000	2,000
620	Electrical Service to Pump House	1,200	1,800
	Totals	$136,150	$49,100
	Total Labor and Material	$185,250	
999	Engineering	18,525	
	Contingency	18,525	
	OVERALL TOTAL	$222,300	

8-4150

8-4151

REV.
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℄ RAILROAD

PROPOSED DIVERSION DITCH

FUTURE FENCE LINE

GRADE THIS AREA TO EL. 575.0

℄ PROPOSED DIKE

PIPE SUPPORT

BOTTOM OF PIT EL. 550.0

PROPOSED SCRAP PIT NO. 3
CAPACITY 226,500 C.Y.
CAPACITY 460,000 GAL.
SURFACE AREA 236,000 SQ. FT.

TOP OF DIKE EL. 575.0

SCRAP PIT NO. 2
CAPACITY 13,000 C.Y.

EXISTING DIKES

DIKE & WEIR

CULVERT & PAD

SCRAP PIT NO. 1
CAP. 40,000 C.Y.

CLEAR WELL

PUMP HOUSE

12' GRAVEL ROAD

PROPOSED 6" LINE

PROPOSED 8" LINE

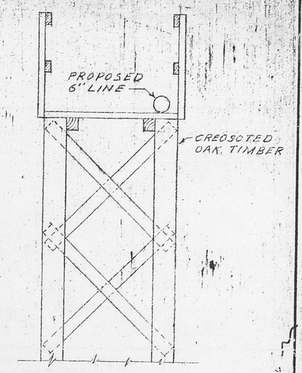
EXISTING FENCE LINE

EXISTING ACCESS ROAD

6" LINE FROM GENERAL SUMP

6" LINE TO MANHOLE #12

585 580 575 560 590 555 550



TYPICAL SECTION
OF PIPE SUPPORT
NO SCALE

ARCH. & STR.	
MECHANICAL	
ELECTRICAL	
CHEMICAL	
PROJ. ENGR.	

JUL 17 1958

PRELIMINARY

NATIONAL LEAD COMPANY OF OHIO
FEED MATERIALS PRODUCTION CENTER
FERNALD, OHIO

U.S. ATOMIC ENERGY COMMISSION

K-65 AREA
PROPOSED SCRAP PIT #3
LOCATION PLAN

BE ALERT - PREVENT ACCIDENTS

REF. DWG. NO.	REF. DWG. TITLE	NO.	REVISIONS	DATE	BY

ENGINEERING DIVISION

PROJECT NO. 8-47		CP-■- 58140	
DRAWN TRACED H.R. Roman	CHECKED APPROVED		REV.
DATE 10 July 1958		DWG. NO.	0
SCALE 1" = 100'		8-4150	

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DIETZGEN CO.