6317 U-003-307 .21

DRAG SCRAPER DEMONSTRATION; ENGINEERING PROJECT NO. G-644, FILTER CAKE DISPOSAL - (USED AS A REFERENCE IN OU1 RI)

06/17/75

G-644
PENNAK OSTENDORF
10
MEMO

NATIONAL LEAD COMPANY OF OHIO

CINCINNATI, OHIO 45239

Green cy. ok dy APP

June 17, 1975

6317

SUBJECT DRAG SCRAPER DEMONSTRATION

under NRC

TO A. F. Pennak

FROM C. W. Ostendorf

REFERENCE Engineering Project No. G-644, Filter Cake Disposal

A field demonstration at Pit 3 was held using a 3/4 yard drag scraper rental unit on June 10, 1975 in the presence of the vendor's representative, Mr. Robert Dillon from Sauerman Bros., Inc. The objective was to demonstrate that a drag scraper was feasible to disperse raffinate and Pit 5 sludge filter cake from a truck dumping point into a pit.

Conclusions

The test with the rental unit indicated that the drag scraper was feasible to move or disperse this specific cake material without any problems. With the temporary type of installation which used gravity for the drag scraper pull back, and the slower hoist drums of the 80 foot boom crane rather than the faster hoist drums of the vendor, approximately 1½ yards of cake were moved 100 feet in a one minute complete cycle. The vendor was pleased at the performance of the temporary drag scraper unit.

Comments

Minor changes were made on the 3/4 yard drag scraper, changes which made the drag scraper plane on a slack support cable rather than to sink beneath the surface. To do this, the scraper angle support cable was taken up about 1½ feet and a 1/4" crescent plate was tack welded on the top of the scraper.

The drag scraper was further used during the week of June 9 to prepare Pit 3 for more truck dumpings of cake.

C. W. Ostendorf

C. W. Ostendorf

CWO:wfk

cc: C. R. Chapman - S. F. Audia
P. G. DeFazio
E. B. Riestenberg
R. M. Spenceley - R. Kispert
W. W. Wright

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NATIONAL LEAD COMPANY OF OHIO

JOB ORDER REQUEST (NS-1082) Job No. H-8767

Equipment Code _____

Responsible Foreman A. Burns Date 4/25/75 Accounting Charge 48000 6317

☐ Safety ☐ Emergency ☐ Urgent ☐ Routine
☐ Normal Maint. ☐ Extraordinary Maint. ☒ Alteration ☐ Operation ☐ Capital

Job Details:

Rent a 3/4 yard crescent drag scraper with 5/8" diameter rope trolley for one month; and upon arrival, assemble the materials handling system at Pit 3 as shown on the attached drawing #21A-5500-G-00218. The crane will be NLO long boom 80' crane refurbished with approximately 450 to 500 feet of 5/8" diameter wire rope on the hoist cable and approximately 350 feet of 1/2" rope on the drag cable. A week prior to the system being ready for test, notify Wes Ostendorf. It is expected that the test will be of only a couple days duration and made in the presence of the vendor's (Sauerman Brothers) representative for the drag scraper.

Decontaminate the scraper after use, crate and ship back to Sauerman Bros.

Re: Engineering Project #G-644

Justification:

This test is to demonstrate the drag scraper in moving raffinate and sludge cake for possible use of a permanent type drag scraper unit in the future at Pit 5. Indications are that Pit 5 must be used in the future to store filter cake.

Engineering	$
Labor	$ 700
Material	$ 800
Contingency	$ 220
TOTAL	$ 1720

Estimated By C. W. Ostendorf

C. W. Ostendorf
1. C. W. Ostendorf
(WORK REQUESTED BY)

APPROVALS

1. _____
(DEPT. HEAD OR SUPT.)

2. _____
(DIVISION HEAD)

3. _____
(MECH. SUPERVISOR)

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NLO-ENG-183-1 (REV. 10/2/63)

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6317

NATIONAL LEAD COMPANY
OF OHIO

Date April 25, 1975

SUBJECT: LETTER OF JUSTIFICATION - JOB ORDER NO. H-8767

TO: Director of Engineering

FROM: C. W. Ostendorf (NAME) Project Engineering (DEPARTMENT)

PROBLEM:

In the future it appears that raffinate filter cake must be stored in Pit 5. In order to distribute the cake over the pit, there is a conceptual design to use a drag scraper. Because of the peculiar characteristics of this cake, the use of a drag scraper (especially in emptying) is unknown.

SOLUTION:

Set up a test with a rented drag scraper assembly in Pit 3 using our 80 foot boom crane and our backhoe to demonstrate the feasibility of a drag scraper.

JUSTIFICATION:

The method of cake disposal into Pit 5, using a ramp for truck dumping and a drag scraper for distribution, is the least expensive method conceived to date.

Estimated by C. W. O. C. W. Ostendorf

Engineering	$
Labor	$ 700
Material	$ 800
Contingency	$ 220
TOTAL	$ 1720

Signed

Department Project Engineering

Division Engineering

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NLO- -1226 (REV. 10/2/63)

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April 3, 1975

DATA AND CALCULATIONS ON RAFFINATE FILTRATION
AND CAKE DISPOSAL
A. F. Pennak

C. W. Ostendorf

In order to understand and deal with the problems of solid process waste disposal, a list of agreed upon or standardized basic data calculations is required. The author has calculated the following from actual data obtained by R. Kispert on plant operation from January 20, 1975 to February 24, 1975 and is proposing these calculations as a standard.

C. W. Ostendorf

CWO:wfk

Att.

cc: C. R. Chapman
P. G. DeFazio
W. J. Adams
J. H. Cavendish - N. F. Leist - J. Patton
R. C. Kispert
R. M. Spenceley
W. W. Wright - C. E. Block

April 3, 1975

PROPOSED STANDARD DATA

AR-RAFF. GENERATION/DAY

(Based on 27 U Tons/Day)
27 UT/D x 700 = 18,900 Gal./Day

NAR-NEUTR.RAFF. GENERATION/DAY

(1 + .85) x 18,900 = 34,965 Gal./Day

NAR FILTRATION RATE ~AVG.

On Oliver (250 ft^2) 1,760 Gal./Hr.

Calculated Hrs/Day of Filtration on Oliver

$$\frac{34,965}{1,760} = 19.9 \text{ Hrs/Day}$$

RAFF. CAKE GENERATION/DAY

0.285 x 18,900 = 5,387 Gal./Day or 720 ft^3/Day

Vol. Raff. Cake Generation/U Ton (2000# Ton)

$$700 \frac{\text{Gal. AR}}{\text{U Ton}} \times 0.285 \frac{\text{Gal. Cake}}{\text{Gal. AR}} = 199.5 \text{ Gal. } \frac{\text{R Cake}}{\text{U Ton}}$$

TOTAL RAFF. CAKE GENERATION 3/75 - 10/77

16,363 U Tons (2000# Ton) x 199.5 = 3,264,419 Gal. Raff. Cake

CALC. RAFF. CAKE VOL./AR VOL. = $\frac{5,387}{18,900}$ = 0.285

Avg. Vol. Cake/Truckload

$\frac{17,704 \text{ lbs.}}{*1.18 \times 62.43} = 240 \text{ ft}^3 \text{ or } 8.90 \text{ yards}$

No. of Avg. Truckloads of Raff. Cake/Day

$\frac{720}{240} =$ Avg. 3.0 Loads/Day of Raff. Cake

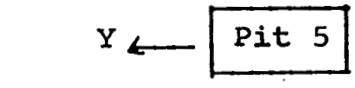
MISCELLANEOUS

Est. Total Volume of Sludge Required to be Removed from Pit 5 - Y

Assume: (a) 1×10^6 gal. of Raff. cake to be disposed of in Pit 3 and 4.

(b) 1 gal. of Pit 5 sludge will filter to .45 gal. of sludge cake.

Y - Pit 5 Sludge



R - Raffinate Cake Vol. (gal.)
.45Y - Sludge Cake Vol. (gal.)

$R = 3.26 \times 10^6 - 1.0 \times 10^6$

$R = 2.26 \times 10^6$ Gals.

$Y = R + .45Y$

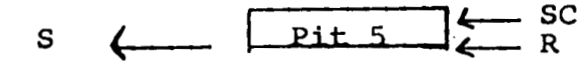
$.55Y = R = 2.26 \times 10^6$ Gal.

$Y = \frac{2.26}{.55} =$ 4.11 x 10^6 Gal. of Sludge in Pit 5 Required to be Removed

*Density of Raffinate Cake from Analytical Department Data

Est. Volume of Pit 5 Sludge Required to be Removed Before Disposal of Raffinate Cake to Pit 5 - S_B

Time Period When Raffinate and Sludge Cake are being disposed of into Pit 5



Assume: (a) Oliver is 100% on Raffinate Cake.

(b) Eimcos are 100% on Sludge Cake.

(c) Eimcos' Sludge Cake Prod. - P
where S.C. = $\frac{300 \text{ ft}^2}{250 \text{ ft}^2} \times 2.26 \times 10^6$

S.C. = $1.2 \times 2.26 \times 10^6$ Gal. Sludge

$S = S.C. + R$; where $R = 2.26 \times 10^6$ Gal. Cake

$S = 2.26 \times 10^6 (1.2 + 1.0) = 4.97 \times 10^6$ Gal. Sludge

As only 4.11×10^6 gal. of sludge must be removed this means that under the above assumptions we have sufficient sludge filtering capacity in both Eimcos that we do not require any lead time for sludge removal in Pit 5.

April 3, 1975

6317

RAFFINATE FILTRATION

(Data from Mr. R. C. Kispert)

	Assumed	Actual (Represents plant data 1/20-2/24
Raffinate Generation		
Gal. AR/U Ton (2000#) - 600		700
Gal. of Water Added/Gal. AR	0.70	0.85
Oliver Avg. Filtration Rate		
2500 Gal./hr. incl. 85% on stream		1760
Eimcos Avg. Filtration Rate		
3000 Gal./hr. incl. 85% on stream		2400 Est.
Cake Generation		
Gal. Cake/Gal. AR	0.337	0.285
Gal. Cake/Gal. NAR	0.198	0.154
Avg. Cake Truckload Weight	18,000 lbs.	17,704 lbs.

GENERAL DATA

345 operating days/year

Refinery Production Schedule

3/75 - 7/75	2,626 U Tons (Metric)
7/75 - 7/76	8,700 U Tons
7/76 - 10/76	2,000 U Tons
10/76 - 10/77	1,518 U Tons
Total	14,844 U Tons
	or
	16,363 U Tons (2000 lbs.)

NATIONAL LEAD COMPANY OF OHIO
ENGINEERING DIVISION – PROJECT ENGINEERING DEPARTMENT

MONTHLY PROJECT RECORD

Project No. G-644

CP Number ~~CP-75-3~~

CP Approved

Job Order No.

Title: FILTER CAKE DISPOSAL - PIT 5 (AFP)

6317

ASSIGNED TO — ENGINEER: C. Ostendorf — DATE: 3/11/75

DATE	COMMENTS	
4/1/75	Results of the Test using Moyno Type Pumps ~~was~~ were negative. Use of drag-scrapers is being investigated. The CP based on cake pumping has been shelved - CWO	Drawings 18X-5500-M-00146 / CWO/RAB
5/1/75	A Job Order Request is awaiting approval for a demonstration test of a drag-scraper rental unit in Pit 3. - CWO	
6/1/75	The ~~[illegible]~~ feasibility demonstration of drag-scraper has been set for June 16, 1975. Materials, including the scraper are on site. CWO	
7/1/75	The drag-scraper [illegible] test performance was [illegible]. Further action is awaiting receipt of the [illegible] quotation [illegible] a [illegible] unit. - CWO	
8/1/75	No action. CWO	
9/1/75	A definitive operational plan together with a cost estimate has been written and issued to management. No further action is necessary with this job. Job is completed. C.W.O.	

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