Group 26 - Progress Reports 115

HUGHES TOOL CO. 115
MINING PAPERS
GROUP 26, MANHATTAN - PROGRESS REPORT

2960 60000324

6000 0324 (2969)

summa

Internal Communication

Date: February 12, 1976

To: Walt Simmons

From: Wallace T. Boundy

Subject: Cost Estimates for Mining At Big Pine Pit, Group 26, Manhattan

The attached estimates are based on past experience at Manhattan and have been updated somewhat due to rising costs.

A further report on the crushing and screening report will be prepared as soon as we can make some tests at the present screening plant.

WTB:sfm

Dist: WTB
WTB rf
Big Pine Pit ✓
Cost Estimates

ESTIMATED LOADING AND PIT CONTROL COSTS

BIG PINE PIT - GROUP 26 - MANHATTAN

Based on 3000 tons per 8-hour shift:

980B Cat Loader (company) -- Excellent condition, 1 year old

Operator	$ .03	per ton
Fuel, oil and maintenance	.06	per ton
Total:	$ .08	per ton

D8H Cat Dozer (company) -- Excellent shape, 2 years old

Operator	$ .03	per ton
Fuel, oil and maintenance	.06	per ton
Total:	$ .08	per ton

Haulage Costs

Outside Contracting
(See Haulage Reports & Cost Heap #4)

$ .35 per ton

Road Construction and Maintenance

Operator	$ .03	per ton
Fuel, oil and maintenance	.04	per ton
Total:	$ .07	per ton

General * $ .29 per ton

TOTAL COSTS MINING (OPEN PIT) $1.00 per ton

* General costs include: Mine Supervision, employees benefits, overtime premiums, Mine Surveying, Development Drilling, payroll taxes, insurance, assaying, mine plant depreciation.

ESTIMATED DRILLING AND BLASTING COSTS
BIG PINE PIT - GROUP 26 - MANHATTAN

Drilling Costs:

DM-3 Drill Rig (Company)presently being overhauled:

Labor (2 men)	$ .04 per ton
Fuel, oil and maintenance	.02 per ton
Bits	.013 per ton bit life
Total bare cost:	$ .073 per ton

Costs here are somewhat high due to the type of drill rig being used for short holes of 15-20'. The mast has to be lowered each time drill rig is moved from one hole to another, thus almost doubling bare drilling costs. The use of an air track or a more compatible rig would decrease the cost per ton for drilling by 50%. Blasting costs would remain much the same.

Blasting Costs:

2500 lb. blasting agent per day @ $.12	= $300.00	=	$.10 per ton
Caps, fuse and powder	= 50.00	=	.02 per ton
Labor			.01 per ton
Total:			$.13 per ton

TOTAL COST PER TON DRILLING AND BLASTING = $.20 per ton

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GROUP 26 MONTHLY PROGRESS REPORT

Drilling April 2 - May 2, 1975

By Fred Saunders

Staff Geologist

DRILLING LOCATION AND OBJECTIVE

Northeast Big Pine -- Big Screen Pile

Objective: To determine if material under Big Screen Pile is of ore grade.

Results: Extended ore boundary 50 feet north and established north ore boundary under screen pile.

Conclusion: No more drilling needed in this area.

Approximate tonnage expanded: 6,642 tons @ .05 oz./ton

Days worked: 10½ days

Total footage: 972 feet

Jumping Jack Fault -- West Big Pine

Objective: To determine if material between Jumping Jack Fault and west side Big Pine Pit is of ore grade.

Results: Limited ore grade mineralization was found in this area. Although a narrow zone (5 feet wide) on the hanging wall of the fault does have ore grade mineralization.

Conclusion: Ore zone is too narrow to work by open pit operations.

Tonnage expanded: None

Days worked: 5½ days

Total footage: 480 feet

Mayflower Fault Intersection

Objective: To drill through the overlying Mayflower schist and penetrate thrust fault near fault intersection.

Results: The thrust fault was never penetrated and no mineralization was encountered.

Conclusion: No further work should be done in this area.

Tonnage expanded: None

Days worked: 3 days

Total footage: 665 feet

Reilley Pit Bottom

Objective: To determine depth of mineralization in the bottom of Reilley Pit.

Results: Mineralization appears to continue approximately 100 feet below the bottom of present pit.

Conclusion: More drilling needed in this area.

Tonnage expanded: Not enough drilling to project any tonnage.

Days worked: 1 day

Total footage: 150 feet

CAT WORK -- DRILL PLATFORMS

NE Big Pine:	1 hour
North Screen Pile:	2 hours
Jumping Jack -- W. Big Pine:	1 hour
Mayflower:	3 hours
Reilley Pit:	1 hour
TOTAL:	8 hours

EXPLANATION OF WORK COMPLETED:

Drilling with Summa's Drillmaster DM-3 began for the 1975 season on April 2, 1975, on the northeast side of the Big Pine Pit. The objective of this work was to expand known ore to the northeast under the Big Screen Pile. Results of this drilling indicate that ore grade mineralization trends under the screen pile to the north, but terminates approximately 60 feet east of present Big Pine Pit.

The drill rig was then moved to the north side of the Big Screen Pile to find north ore boundary. Results

indicate that the orebody terminates somewhere under the screen pile, which at this time is being mined as ore to leach pad #3.

Exploration drilling was then done in the area between the Jumping Jack Fault and the west side Big Pine pit. The objective of this was to determine if a large block of material on the hanging wall of the Jumping Jack Fault was of ore grade mineralization. Preliminary sampling done by myself and underground assays showed good potential in this area. The drilling results indicated that the mineralization is confined to within 5 feet of the fault on the hanging wall side and would not be economical to go after.

Jim Long Drilling Company was brought to the property to drill some deep holes in the Mayflower schist side of the thrust fault. The objectives of this drilling was: 1) to penetrate the thrust fault at a point near the intersection of the Big Pine, Reilley Pit shear zone and the Little Grey fault zone; and 2) to explore a large arsenic anomaly.

A 400-foot hole was drilled in this area. The hole should have penetrated the thrust fault at approximately 100 feet, but it never hit the fault at all. Another hole was drilled closer to the contact and should have penetrated the thrust at approximately 50 feet. It never hit the fault and was abandoned at 265 feet due to water pressure in the hole. These results indicate that the thrust fault is actually a high angle (75-90^{o}) fault and assays indicate that the Mayflower schist in this zone is unmineralized.

Jim Long also drilled a 150-foot hole in the bottom of the Reilley Pit. The objective was to determine how deep ore continued in the bottom of the Reilley Pit. The results indicate that the ore zone continues for approximately 100 feet below the pit bottom. It is my opinion that further drilling along the strike of pit and to the west may prove existence of a fairly large orebody dipping to the west.

Preliminary geological mapping in south Reilley indicates that the large fault which offsets the orebody could have approximately 60 feet lateral displacement to the east and

approximately the same vertical displacement. If the orebody is dipping to the west as presumed, this means that the major offset has eroded away and could account for the high placer values in the gulch to the south and that the ore zones south of Reilley Pit are relatively small in relation to Reilley pit. Further drilling and mapping in this area needs to be done.

Starting the first of May, extensive mapping and drilling will be done in the Big Four ore zone.

Fred Saunders

Fred Saunders

Dist: DJG
WS
FS
Group 26 file (original)
FS file

DRILLER'S RECORD

Date	Hole No.	Depth	Driller	Remarks
4/2/75	26 525-75	0-90	RLK	½ day - setup
4/3/75	26-525	90-97	RLK	Repaired Hammer set up on first hole ½ day
4/4/75	26-528	0-100	RLK	
4/9/75	26-527	0-100	RLK	Repaired water line on radiator ½ day
4/10/75	26-529	35 0-100	RLK	welded head on sub at 6" drill steel & finished welding sub
4/11/75	26-529	35-100	RLK	and repaired air line
4/8/75	26-526	0-100	RLK	
4/14/75	26-530	0-100	RLK	
4/14/75	26 531	0-55	RLK	
4/15/75	26-531	35-100	RLK	
4/16/75	26-540	0-30	RLK	moved and stuck in mud.
4/16/75	bad	weather		
4/17/75	26-532	0-100	RLK	
4/18/75	26-533	0-100	RLK	
4/21/75	26-534	0-45	RLK	moved to new site Lost Circulation
4/21/75	26 535	0-95	RLK	

NOTES:

DRILLER'S RECORD

Date	Hole No.	Depth	Driller	Remarks
4/22/75	535	75-100	RLK	changed mind finished 535 moved to 536 AFTER PAD WAS BUILT
4/23/75	536	0-70	RLK	
4-23-75 4-29-75	no drilling	—	ZH	driller never showed up for work new driller
4/30/75	536	70-100	Def	
4/30/75	537	0-80	Def	
5/1/75	538	0-100	Def	
5/1/75	541	0-3	Def	HIT A STOPE AT 3' (backfill)
~~5/2/75~~	~~539~~	~~0-70~~	~~RLK~~	
~~5/2/75~~	~~542~~	~~0-100~~	~~Def~~	

NOTES:

13½ days 2½ day down time

5 day drill shut down

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GROUP 26 MONTHLY PROGRESS REPORT

Drilling - May 1 to June 1, 1974

By Fred Saunders

DRILLING LOCATION & OBJECTIVE

East Side Big Pine Orebody

Objective: Expand ore boundary eastward

Results: The South Big Pine Pit walls on east and west side contain no values, and correspond to east pit limit.
Approximate tonnage possible ore: 3,803 tons @ .043 oz/ton

Day worked: 5 days

Total footage: 827 feet.

North East Big Pine - Big Screen Pile

Objective: To determine if material under Big Screen Pile is of ore grade.

Results: Extended NE ore boundary 70' further north under Big Screen Pile. No north boundary established, but north-east boundary was established.

Approximate tonnage: 39,860 ton @ .090 oz/ton

Days worked: 5½ days

Total Footage: 838feet

Stray Dog - Jumping Jack Fault Inter-section

Objective: To drill out area for future pad development and exploration of soil geochem anomaly.

Results: The area is apparently barren with the exception of one small high grade zone at depth. Soil geochem anomaly was apparently a product of soil creep from Reilley Pit Ore Zone.

Stray Dog - Jumping Jack Fault Intersection Continued

Approximate tonnage possible ore: 4,300 tons @ .150 oz/ton

Days worked: 5½ days

Total footage: 929 feet

ESTABLISHED TONNAGE, GRADE, FOOTAGE & DAYS WORKED

Base tonnage as of May 1, 1974:	159,444 tons @.088oz/ton
New tonnage as of June 1, 1974:	39,860 tons @.090oz/ton
Total tonnage as of June 1, 1974:	197,304 tons @.089oz/ton

CAT WORK - BIG PINE OREBODY

Northeast side

Objective: Drill platforms

Hours worked: 5 hours

East Side

Objective: Drill platforms

Hours worked: 1 hour

North central

Objective: Removal of dump material so drill platforms could be made.

Hours worked: 3 hours

Stray Dog - Jumping Jack Fault Intersection

Objective: Two roads were dozed down to bedrock so a grid of drill holes could be drilled at 100 feet intervals.

Hours worked: 4 hours

EXPLANATION OF WORK COMPLETED:

Drilling continued in May at drilling sites on east side of Big Pine South Pit where 7 holes have been drilled . The objective was to explore east side of Pit and enlarge the Big Pine Orebody to the south east. The results indicate that the Big Pine Orebody terminates on the east side of the Big Pine Pit area.

The drill rig was then moved to the south west side of Big Pine south where 2 holes were drilled. The results show a possible shallow exploration target to the west of the Reilley Pit, south west of the Big Pine South Pit. Further drilling should be continued in this area. Eight drill holes were then drilled in the north east part of the Big Pine Orebody to establish north east boundary. Results indicate that the orebody continues at least 70 feet into Big Screen Pile north and 100 feet east of the Big Pine Pit. The boundary was not established because of the location of the Big Screen Pile.

Exploration drilling was then carried out in the Stray Dog-Jumping Jack fault intersection area. The objective was to explore a large soil geochemistry anomaly. The results proved negative with only one possible small exploration target at 65' depth.

Approximately 8 hours cat work was done in the north east Big Pine area to remove all dumps and screen to bedrock.

Approximately 4 hours cat work was completed in the Stray Dog - Jumping Jack exploration area to enable 13 drill holes to be drilled.

Fred Saunders

6000 0324 (2960)

GROUP 26 MONTHLY PROGRESS REPORT

Drilling - May 1 to June 1, 1974

By Fred Saunders

DRILLING LOCATION & OBJECTIVE

East Side Big Pine Orebody

Objective: Expand ore boundary eastward

Results: The South Big Pine Pit walls on east and west side contain no values, and correspond to east pit limit.
Approximate tonnage possible ore: 3,803 tons @ .043 oz/ton

Day worked: 5 days

Total footage: 827 feet.

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Approximate tonnage: 39,860 ton @ .090 oz/ton

Days worked: 5½ days

Total Footage: 838feet

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Results: The area is apparently barren with the exception of one small high grade zone at depth. Soil geochem anomaly was apparently a product of soil creep from Reilley Pit Ore Zone.

Stray Dog - Jumping Jack Fault Intersection Continued

Approximate tonnage possible ore: 4,300 tons @ .150 oz/ton

Days worked: 5½ days

Total footage: 929 feet

ESTABLISHED TONNAGE, GRADE, FOOTAGE & DAYS WORKED

Base tonnage as of May 1, 1974: 159,444 tons @.088oz/ton

New tonnage as of June 1, 1974: 39,860 tons @.090oz/ton

Total tonnage as of June 1, 1974: 197,304 tons @.089oz/ton

CAT WORK - BIG PINE OREBODY

Northeast side

Objective: Drill platforms

Hours worked: 5 hours

East Side

Objective: Drill platforms

Hours worked: 1 hour

North central

Objective: Removal of dump material so drill platforms could be made.

Hours worked: 3 hours

Stray Dog - Jumping Jack Fault Intersection

Objective: Two roads were dozed down to bedrock so a grid of drill holes could be drilled at 100 feet intervals.

Hours worked: 4 hours

EXPLANATION OF WORK COMPLETED:

Drilling continued in May at drilling sites on east side of Big Pine South Pit where 7 holes have been drilled . The objective was to explore east side of Pit and enlarge the Big Pine Orebody to the south east. The results indicate that the Big Pine Orebody terminates on the east side of the Big Pine Pit area.

The drill rig was then moved to the south west side of Big Pine south where 2 holes were drilled. The results show a possible shallow exploration target to the west of the Reilley Pit, south west of the Big Pine South Pit. Further drilling should be continued in this area. Eight drill holes were then drilled in the north east part of the Big Pine Orebody to establish north east boundary. Results indicate that the orebody continues at least 70 feet into Big Screen Pile north and 100 feet east of the Big Pine Pit. The boundary was not established because of the location of the Big Screen Pile.

Exploration drilling was then carried out in the Stray Dog-Jumping Jack fault intersection area. The objective was to explore a large soil geochemistry anomaly. The results proved negative with only one possible small exploration target at 65' depth.

Approximately 8 hours cat work was done in the north east Big Pine area to remove all dumps and screen to bed-rock.

Approximately 4 hours cat work was completed in the Stray Dog - Jumping Jack exploration area to enable 13 drill holes to be drilled.

Fred Saunders

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GROUP 26 MONTHLY PROGRESS REPORT
DRILLING OCT. 1975 - JAN. 1976

By Fred Saunders
Staff Geologist

DRILLING LOCATION AND OBJECTIVE

Big Four Shaft Area

Objective: Exploration drilling to the north of present known Big Four ore zone covered by the Big Four dump.

Results: Ore body does not continue north past Big Four shaft

Conclusion: North ore body boundary is somewhere between Big Four shaft and south edge of Big Four dump, a distance of approximately 100 feet. More drilling needed in this zone.

Northeast Big Four Ore Zone

Objective: To determine if ore body terminates to the northeast as a projection of favorable stratigraphic units do.

Results: Ore zone does surface in this zone as suspected by cross sectional views.

Conclusion: : No further drilling needed in this zone. Trenching with Cat should be sufficient to delineate northeast ore boundary.

South Big Four Dump Area

Objective: Remove enough of Big Four dump to lay out grid of holes between the Big Four shaft and known north boundary of ore zone.

Results: North boundary of Big Four ore zone found approximately 25 feet further north of present ore boundary.

Conclusion: No further drilling needed on north boundary of Big Four ore zone.

Big Four Development Drilling

Objective: To close in spacing of drill holes to 25 foot centers to prove the ore body.

Results: Fill in holes projected same zones, now able to declare this a proven ore zone.

Conclusion: Big Four ore zone is drilled and blocked out and waiting for engineering and metallurgical data.

Estimated Tonnage, Grade, and Footage

Known tonnage as of May 2, 1975	21,000 tons @ .091 oz/ton
New tonnage as of July 2, 1975	168,000 tons @ .076 oz/ton
Approximate new tonnage expanded as of January 1976	82,000 tons @ .075 oz/ton
Total proven tonnage as of January 1976	250,000 tons @ .075 oz/ton

Total footage as of May 1975	3,288 feet
Footage between May to July 1975	2,570
Footage between October to January 1976	4,263
Total footage drilled in Big Four	10,121 feet

Explanation of Work Completed

Drilling began again in the Big Four area on October 21, 1975. Two trenches that had been cut through the Big Four dump were made into drill platforms with Summa's D-8 Catepillar.

Summa's drillmaster 3 drilled eight holes in this area before being shut down for overhauling. At this time, Jim Long Drilling came in and drilled four more holes

After the results were plotted, it became necessary to reevaluate the Big Four zone. It then became apparent the zone was not controlled between the two quartzite units as originally believed but was controlled by the bedding of a large quartz-mica schist unit.

Upon reevaluation and remapping of underground workings, it became apparent that the Big Four ore zone was confined within the same units as the early prospectors had stoped out on the 65 foot level, 200 foot level, and 400 foot level of the Big Four workings.

A new drilling program was then designed to test this hypothesis. Jim Long started drilling on January 7, 1976, and drilled 18 holes. The results of these holes proved this theory.

The Big Four is now a proven ore zone of 150 to 200 feet in width and 400 feet in known length and projects from the surface to 200 feet in depth.

At this time, trenching in the northeast part of the ore zone is being done to 1) test drill results, 2) obtain ore control, 3) to extend ore zone, and 4) to provide a large sample for metallurgical tests. Initial results of samples taken along these trenches seem to indicate that drilling assays are a fairly close approximation of grade of an area.

Pit design and metallurgical tests need to be concluded before mining activity can start in the Big Four ore zone.

Exploration Drilling Record - October 1975 thru January 1976

Drill Hole No.	Drilled By & Total Depth		Date
	Summa	Long	
26-433-76		150	1-13-76
26-434-76		150	1-11-76
26-435-76		150	1-13-76
26-436-76		150	1-14-76
26-437-76		150	1-15-76
26-438-76		150	1-15-76
26-439-76		175	1-16-76
26-440-76		175	1-9-76
26-441-76		175	1-8-76
26-442-76		205	1-7-76
26-443-76		85*	1-7-76
26-444-76		150	1-14-76
26-505-76	150		10-21-75
26-506-75		150	10-30-75
26-508-75		120*	10-28-75
26-509-75	84*		11-11-75
26-510-75	160		11-13-75
26-511-76		60*	1-11-76
26-512-75	60		11-5-75
26-513-75	170		10-28-75
26-514-75	90*		11-7-75
26-515-75		105*	10-28-75
26-516-75		175	10-29-75
26-517-75	96*		11-3-75
26-518-75	130**		11-14-75
26-519-76		150	1-10-76
26-520-76		150	1-10-76
26-521-75	98*		11-18-75
26-522-76		150	1-12-76
26-523-76		150	1-12-76
26-524-76		150	1-17-76
31 holes	1,038 ft.	3,225 ft.	
Total Footage		4,263 feet	

*Indicates drill hole that hit underground working.
**Indicates last drill hole drilled by Summa's DM-3.

6000 0324 (2960)

GROUP 26 MONTHLY PROGRESS REPORT
Drilling May 2 - July 2, 1975

By Fred Saunders
Staff Geologist

DRILLING LOCATION AND OBJECTIVE

Big Four Area

Objective: Exploration drilling in potential ore zone southeast of Big Four shaft.

Results: Determined there exists an ore body north and northeast of presently known North Big Pine ore zone.

Conclusion: More drilling needed to north and northwest under the Big Four Dump.

Known Tonnage: 21,000 tons @ .091 oz./ton

Approximate tonnage expanded: 147,000 tons

New possible tonnage: 168,000 tons @ .076 oz./ton

Days worked: 14 days

Total footage: 2,570 feet

East Big Pine

Objective: To close in the spacing on the drill holes for better ore control.

Results: Small ore zone that was missed in original drilling was found.

Conclusion: Need closer spacing of drill holes for future development of ore zones.

Approximate tonnage expanded: Undetermined

Days worked: 5 days

Total footage: 760 feet

Big Pine Ore Zone -- Blast Holes

Objective: To blast quartzite unit and speed up production of ore.

Results: Very effective -- ore moving at a faster rate.

Conclusion: The ore should be blasted about every 30' in depth.

Tonnage expanded: Limited, due to the fact we were drilling in a known ore zone.

Days worked: 10 days

Total Footage: 1,410 feet

West Reilley Pit Wall

Objective: to determine if Reilley ore zone dips to west.

Results: Very limited tonnage was found.

Conclusion: Ore zone does not dip to west as assumed.

Tonnage expanded: None

Days worked: 4 days

Total Footage: 1,200 feet

EXPLANATION OF WORK COMPLETED:

On the 2nd of May, 1975, Summa's drill-master 3 was moved to the Big Four Area. Underground sampling and geologic mapping indicated that there exists favorable conditions for an ore zone to the north of presently known North Big Pine ore body.

Summa's DM 3 drilled 8 holes and Jim Long drilled 11 holes in this area. These holes showed the existence of mineralization to the northeast of present North Big Pine ore body. The ore zone is terminated to the east and southeast by the Jumping Jack fault, but is open to the northwest. It is believed to be confined between two quartzite units that strike approximately N 45° W and dip 45° SW and are 300 feet apart.

More drilling to the north and northwest should be done on the 50' grid along with developmental drilling at 25 foot centers in the known ore zone. When this information is obtained, a pit design and ore ratios can be determined.

Summa's DM 3 was then moved to the Big Pine Pit are where further drill data was needed in the east side of the pit. These results showed the existence of a small ore zone in the east part of the pit. It was concluded that development drilling in the future will have to be conducted on a tighter grid for better control for engineering and designing work.

A grid of approximately 60 blast holes were then drilled in the Big Pine Pit to help speed up production. The blast proved to be very effective as ore was moved at a much faster rate.

Jim Long Drilling drilled six 200-foot holes on the west side of the Reilley Pit to test the dipping ore zone hypothesis. These holes projected no new ore zones and it is therefore assumed that the Reilley Pit ore zone does not dip to the west.

This concluded the drilling for May and June. The next drilling program will be in the Big Four area and should

start sometime in the middle of October. At present time Summa's DM 3 is being used to drill blast holes in Big Pine Pit.

Fred Saunders

Fred Saunders
Staff Geologist

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