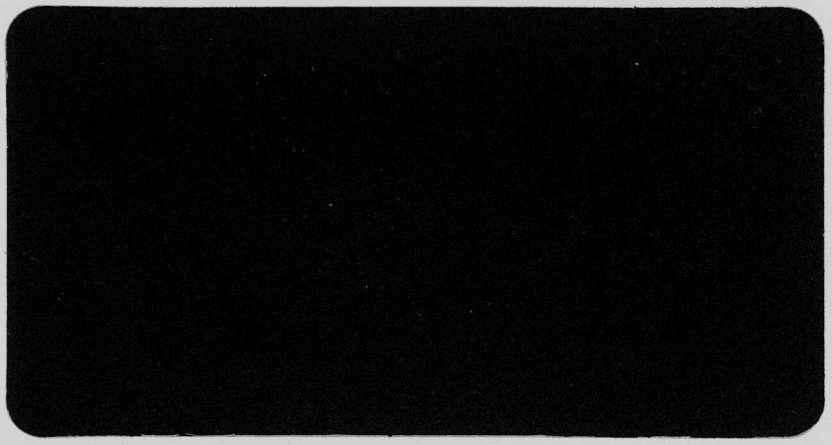

STEFFEN ROBERTSON & KIRSTEN

Consulting Engineers

020376

CURRAGH - SKAGWAY PROJECT

APPENDIX C

SEDIMENT APPENDIX

C-1 Sample Station Locations
C-2 Sediment Sampling Protocol
C-3 Core Sample Analysis, Sediment
C-4 Sediment Grab Sample Analysis
C-5 Sediment Grab Sample Size Analysis
C-6 PACE Laboratory Sediment Analysis QA/QC Split

APPENDIX C-1

Sample Locations

Station location was defined using a Mini-Ranger III range positioning system. The Mini-Ranger uses shore mounted transponders which relay distance data by calculating time delays to the receiver located on the barge. The shore transponders were located at the end of the Bowhead pier, the south end of the White Pass pier and at grid coordinates +900 north, +600 east (vacant area north of Skagway Harbor). Range markers were also erected along the Bowhead pier at 100-foot intervals and along the harbors North shore at a 50-foot spacing. The markers were used for verification of the barge position during station occupation.

At the start of the survey triplicate sediment grab samples were required at each station. To hold position for these grabs the barge would anchor upwind of the site and slack the anchor line until we were on station. This procedure was time consuming, especially during windy conditions, and resulted in a reduction in the number of station occupations during the working day. Later in the project it was realized that triplicate samples at each site would not allow completion of the survey in the scheduled time. The decision was made to take one grab at the remaining sites except for the quality control stations. At those stations requiring just one sediment grab the barge would not anchor, instead a position fix was taken when the sampler was on the bottom.

Positioning at the background stations located in Taiya Inlet and Nahku Bay was accomplished using sextant fixes.

APPENDIX C-2

Normal Station

Samples were collected with a van Veen grab sampler using EPA approved protocols (Puget Sound Estuary Program). Samples were collected from the upper 2 cm of the grab samples. Samples were be extracted from the grab sampler using glass plates and/or plastic utensils. The organic compounds being analyzed in this survey will not be contaminated through the use of plastic sampling equipment.

Most sampling stations consisted of a composite sample from 3 separate grabs. The same amount of sediment was collected from each of the three grab samples, composited in a large plastic bowl, and thoroughly mixed until the composite was homogenized. One sample for laboratory analysis was extracted from the composite. Since the possibility exists for vertical segregation of grain size in the composite, the extracted sample was taken from top to bottom in the compositing bowl. Due to time constraints only one grab was collected at some stations (numbers 8, 23-25, 32-38, and 40).

All samples were analyzed for metals (Pb, Zn, Cd, Cu, Hg, Al, Fe, Mn, Ti), and conventionals (TOC, grain size, % solids). Organics (coprostanol, linear alkybenzenes) were analyzed at stations 4, 18, 20, 27, 28, 30, 31, and 59.

QA Stations

Each standard QA station consisted of an additional 3 grabs besides the composite sample. These additional grabs were sampled, homogenized, and extracted separately. These will serve as an indicator of within-station variability. At stations 12, 20, 41 and 59 the composite sample was segregated into three equal "pie piece" sections and subsampled vertically from top to bottom into three separate containers. These served as "blind" replicates to determine overall analytical and sampling precision and were given "phony" station numbers to hide their identity from the laboratories.

There were also 2 inter-laboratory QA stations (No. 1 and 39). For these a composite sample was segregated into sections as in the standard QA station except that each of three sections was then split into two subsamples.

QA/QC Procedures

The samples were collected according to EPA Protocols including QA/QC procedures.

The sampling equipment (Van Veen) was thoroughly rinsed with site water between sampling stations to remove all sediment.

The following washing protocols were used for all sample handling equipment and utensils for metal samples.

1) Thoroughly wash with site water to remove any traces of mud, followed by;
2) Rinsing with weak acid rinse of 1% HNO3 followed by;
3) Rinsing with DI water.

The final DI water rinse was retrieved at three stations in volumetrically calibrated jugs, the volume measured, and the sample acidified with a known amount of HNO3 at a ratio of 1:100 by volume HNO3:Sample.

For stations where organic sampling occurred along with the metals, the metals samples and subsamples were collected first using glass and plastic utensils washed and prepared as described above. The organic samples were collected from the same plastic composite bowl using stainless utensils. These stainless utensils were prepared as follows:

1) Wash with site water to remove mud, followed by;
2) Rinsing with Methylene chloride and remove excess, followed by;
3) Rinsing with DI water.

If the sampling utensils become worn, nicked, scraped, gouged, or otherwise damaged so that they begin to retain any sediment between stations and can not be thoroughly cleaned, they were discarded. New utensils were thoroughly acid and DI water rinsed before use.

At the completion of the work day all samples were checked for labeled custody tape on the sample bottles and the chain of custody forms were completed. When a cooler was full the samples were given to Greg Knell of SRK who made shipping arrangements to ARI Analytical Laboratories in Seattle. Some samples were also sent to PACE Laboratories in Novato, California for interlab calibration.

The first study was performed by the USFWS, (Robinson-Wilson and Wolensky, 1982). Sampling was performed using a Smith McIntyre dredge (galvanized) and a whole sample digestion was performed using nitric acid followed by digestion with hydrogen peroxide in a UV irradiated light. Cold vapor atomic absorption was used for mercury analysis.

This contrasts with the work that was done by Debrocky in 1986 where the samples were obtained with a VanVeen sampler and alequots taken from the top two centimeters of material. The sample was then screened with a mesh screen and the fine fraction digested in a nitric acid hydrochloric acid digest, similar to those used by Acme in the recent soil samples. It should be noted that this procedure results in more complete digestion, and thus, higher values of metals than the EPA procedure.

Later re-analysis of these samples by CBR in the Fall of 1988 were done without the 100 mesh screening and digested again with nitric hydrochlorics. The work that was done by SRK in the Fall of 1988 used a somewhat different technique. The samples that were taken from the harbor area were taken with a VanVeen sampler with the top two centimeters sampled. Inner harbor samples taken near the Terminal were sampled as triplicate grabs composited into one to obtain smoothing of the data given the wide variations in small locales of analytical results.

The samples taken in the outer harbor area and by the White Pass dock were taken as single grab samples in an effort to conserve time and resources to complete the project. QA/QC samples were taken both on the composites and the three single grabs that were used to intake the composites in order to determine spacial variability in the single grabs and to get an idea of the reproducability of the composite. In several cases, the composite was analyzed in triplicate. These samples were digested using nitric hydrogen peroxide hydrofluoric acid on the whole sample. In some cases the sample analysis was repeated using the nitric/hydrochloric acid digestion procedure to define which of these digestion methods would be better for the marine sediments.

In total, the majority of the samples were analyzed by the hydrofluoric digest rather than the HN03 HCL (EPA) digest.

The consequence of evaluating material sampled, analyzed, and digested in different manners given opportunity for speculation on the time variation of metal contamination origin in the sediments. The initial study done by USFWS does not appear to have used strict QA/QC procedures, while the Debrocky/CBR samples did have considerably more QA/QC, and the most recent SRK/ARK sampling had very extensive QA/QC procedures. The analytical methodology that was used by Debrocky in 1986 to analyze these sediments entailed screening through 100 mesh screen to screen out coarse material. Only the fines were analyzed. This has a tendency to increase the level of contaminants in that lead and zinc tend to be in the finer fraction of material, rather than in the coarser sands and gravels. Therefore, a time series including the Debrocky analysis has to be questioned closely. In contrast, the re-analysis by CBR in 1988 of the archived samples are quite comparable to the samples done by SRK and analyzed by ARI, and include the total sediment sample.

To further define the comparability of these samples, the archive samples that were obtained by Debrocky and archived in the CBR labs were sent to ARK. Stations 1-7, 9, 10, 11, 12, 21 and 22 were re-analyzed by ARI using the nitric hydrochloric acid and hydrofluoric acid digestion techniques. In all cases, the results from these analyses are very comparable to those obtained by CBR in the Fall of 1982. In some cases, especially in Station 4, the re-analysis by ARI shows a level at Station 4 of 6,630 per million lead versus 10,400 ppm lead obtained by Debrocky in 1986. In other cases, samples taken at 2, 3 and 4, 6, 7, that were analyzed by CBR in the Fall of 1986, the re-analyses by ARI in 1988 were plus or minus five percent of those results obtained by CBR. There is no reason to believe that these analytical techniques are anything but reproducable between the two labs.

Program Discussion

A total of 85 samples were collected at 44 stations during the period November 13 through 22, 1988. All samples were analyzed for metals and conventionals (grain size, total organic carbon (TOC), % solids). Metals included in the analysis are aluminum (Al), silver (Ag), cadmium (Cd), copper (Cu), iron (Fe), mercury (hg), manganese (Mn), lead (Pb), zinc (Zn), and titanium (Ti). These data are presented in Table 17. The coordinates listed are based on a square grid system established for this project. Units are feet with the point (10,000, 10,000) being located at the west corner of the ore loading facility. The X direction is oriented along the pier and is positive to the NE while Y is perpendicular to the pier and is positive to the SE.

Grain size data is expressed as percent sand (i.e., % greater than 63 microns) and as median Phi size. Metals data is shown as parts per million (ppm). All statistical calculations made in this study were performed with CSS V2.1 (Complete Statistical System from StatSoft Inc., Tulsa, OK), a statistical analysis program for microcomputers.

Samples for organics analysis (alkylbenzenes and coprostanol) were collected at stations 4, 18, 20, 27, 28, 30, 31, and 59.

Results of the analysis of the 3 cores collected in close proximity at Station 4 range from 5,000 ppm lead in the upper inch to 49,000 and 15,000 in the three separate cores. Zinc has a comparable variation from 6,450, 30,000 and 38,000 in the 3 samples that were taken in the top inch of those cores. Obviously from this data there is a wide variation in spatial distribution in any localized area in the harbor.

Considering the QC data from the lab on the samples taken in 1988 and analyzed by ARI, several types of QC were run. For the first type of QC single grab samples were taken and composited and samples of each of the samples and composites were analyzed separately to identify the spatial distribution of the single grabs and evaluate the results of the compositing. Stations 1, 3, 6, 12, 20, 39, 41 and 59 were all done in this manner. Extensive database was developed using this technique for all of the metals that were analyzed, grain size, TOC percent solids, etc.

The initial comparison of the three composited samples analyzed separately indicate that in most cases the triplicates are within five percent, indicating good laboratory reproducability in these samples. Spatial variability indicated considerably more variation than the analytical reproducability analyzing three composites. As an example, in Station 12, single sample analysis for lead indicated approximately 12,000, 16,000 and 21,000 ppm lead in the three single grabs, whereas the composite values range from 26,000 to 29,000.

Evaluation of the QC data indicates that the samples collected by Debrocky and analyzed by CBR in the Fall of 1988 are comparable with ARI's analyses that were both sampled by Debrocky and analyzed by ARI in 1986 and the samples from 1988 that were sampled by SRK and analyzed by ARI. The case for comparability between the USFWS and these later samples both taken in 1986 and 1988 is not distinct. The techniques used by USFWS are the standard CLP techniques modified somewhat by USFWS for marine sediments. In the soil samples discussed previously, this analytic technique did not recover total lead and zinc in samples above 4,000-5,000 ppm. It is not clear from the information available that we can use the early USFWS study as a

comparison. The previous discussion on comparison of the nitric acid, hydrogen peroxide digestion, in comparison with the nitric hydrochloride, or the nitric peroxide hydrofluoric acid digest, indicates that at higher concentrations of lead and zinc the nitric acid peroxide digest technique does not digest all of the sulfites present in the sample, and therefore the results are generally lower than would be found with the current techniques we are using here. The problem with evaluating this data is that the lower values in the 1982 study may be due to poor metal recovery in the digestion procedure, or due to changes in the sediment concentrations itself. Therefore, it is difficult to determine the origin of these changes in concentration in the sediments. On the other hand, samples obtained in 1986 by Debrocky and analyzed by Debrocky and CBR appear to be quite comparable with the ARI techniques used in this study. The major exception to this statement is at Station 4, where Debrocky analyzed a sample with a result of 10,400 ppm lead versus the ARI resample at 6,630 ppm lead. The discrepancy between these two analyses could very well be the screening technique that was used by Debrocky in 1986, which concentrated the fine fraction and probably resulted in higher levels of lead in the sample.

A factor that complicates any comparison between sampling dates and labs is the spatial variability at any one station. This has been commented on previously for the comparison of composited samples. The problem is that the station may be slightly different spatially, and that maybe three or four grabs that were taken could be all on the high side or all on the low side. When the entire set of data is combined from 1986 and compared with the entire set of data from 1988, there definitely appears to be a reduction on overall levels, although the distribution of lead and zinc in the harbor area has not changed considerably over this period.

APPENDIX C-3

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, Wa 98109-5187
(206)621-6490

EXPLANATIONS OF INORGANIC DATA REPORT CODES

THE COLUMNS LABELED 'PREP', 'C', AND 'M' CONTAIN IMPORTANT INFORMATION ABOUT YOUR ANALYSES. THE CODES ARE DEFINED BELOW.

PREP CODES

THE 3-LETTER CODES IN THIS COLUMN ARE USED TO DESCRIBE THE METHOD USED TO PREPARE THE SAMPLE FOR ANALYSIS.

THE FIRST LETTER OF THE CODE STANDS FOR THE MATRIX TYPE OR THE FRACTION OF THE SAMPLE THAT IS BEING ANALYZED:

D = THE DISSOLVED FRACTION OF A SAMPLE (FILTERED THROUGH A 0.45 μ MEMBRANE FILTER.)
E = THE EP TOXICITY FRACTION OF A SAMPLE.
F = A PROCEDURE FOR DIGESTING FISH, OR OTHER TISSUE.
O = A DIGESTION OF AN OIL, GREASE, OR TAR.
R = A WATER SAMPLE PREPARED BY A 'TOTAL RECOVERABLE' DIGESTION.
S = A DIGESTION OF A SOIL OR SEDIMENT SAMPLE.
T = A WATER SAMPLE PREPARED BY A 'TOTAL' DIGESTION.
W = A SAMPLE ANALYZED WITHOUT ANY PREPARATION.

THE MIDDLE LETTER OF THE CODE RELATES TO THE SOURCE OF THE PROCEDURE.

A = A METHOD DEVELOPED BY ARI.
C = THE USEPA CLP PROGRAM STATEMENT OF WORK.
E = THE USEPA 1979 WATER AND WASTEWATER MANUAL.
M = A COMMON PROCEDURE FOUND IN A MANY SOURCES.
P = THE PUGET SOUND ESTUARY PROTOCOLS.
S = STANDARD METHODS.
W = THE USEPA SW-846 SOLID WASTE MANUAL.

THE LAST LETTER OF THE PREPARATION CODE REFERS EITHER TO THE FINAL MATRIX OF THE PREPARED SAMPLE OR TO A SPECIALIZED USE OF THE PROCEDURE.

A = A PROCEDURE FOR ARSENIC AND SELENIUM ANALYSIS ONLY.
C = A HYDROCHLORIC ACID MATRIX.
F = A HYDROFLUORIC ACID DIGESTION.
M = A PROCEDURE FOR MERCURY ANALYSIS ONLY.
N = A NITRIC ACID MATRIX.
P = A PERCHLORIC ACID DIGESTION.
Q = AN AQUA REGIA DIGESTION
R = A SPECIAL 'SOFT' DIGESTION OF A SOLID.

C CODES

THESE CODES ARE USED TO QUALIFY THE REPORTED CONCENTRATIONS. A CODE OF 'L' MEANS NO ANALYTE WAS DETECTED AT THE REPORTED CONCENTRATION LEVEL.

M CODES

THESE CODES SIGNIFY THE TYPE OF INSTRUMENTAL TECHNIQUE USED WHEN ANALYZING THE SAMPLES. THE CODES ARE DEFINED BELOW:

CVA = COLD VAPOR AAS
FLA = FLAME AAS
GFA = GRAPHITE FURNACE AAS
ICP = ICP-AES

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:23:54

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 100-01
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: A

Released by: NAW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	49200 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	30000 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:24:25

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 100-01
Description: LABORATORY DUPLICATE
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: ADUP

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	48600 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	30700 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:27:27

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 100-01
Description: MATRIX SPIKE
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: ASPK

Released by: MRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	52700 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	32000 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:28:37

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 100-02
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: B

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	13200 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	23600 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:30:25

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 100-03
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: C

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	5290 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	9780 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:30:31

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 100-04
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: D

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	51300 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	35300 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:30:36

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 100-05
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: E

Released by: NAW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	78200 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	48100 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:30:42

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 100-06
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: F

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	46700 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	110000 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:30:48

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 100-07
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: G

Released by: MRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	38900 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	57400 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:30:54

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 100-08
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: H

Released by: MW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	43200 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	54900 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:31:02

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 100-09
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: I

Released by: NW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	88300 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	143000 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:31:09

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 100-10
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: J

Released by: MRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	90300 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	82200 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:31:17

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 100-11
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: K

Released by: MRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	70900 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	83700 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:31:24

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 101-01
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: L

Released by: MAW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	40100 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	23500 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:31:31

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 101-02
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: M

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	15900 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	38100 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:32:12

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 101-03
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: N

Released by: MW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	9690 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	18300 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:32:18

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 101-04
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: O

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	4590 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	8940 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:32:24

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 101-05
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: P

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	28500 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	176000 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:32:29

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 101-06
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: Q

Released by: MRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	8110 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	26000 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:32:36

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 101-07
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: R

Released by: MRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	67400 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	125000 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:33:23

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 101-08
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: S

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	29000 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	57700 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:33:28

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 101-09
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: T

Released by: MW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	49700 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	56900 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:24:40

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 103-01
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: AF

Released by: NAW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	5530 mg/kg-dry		SCC	ICP
7439-92-1	Lead	5540 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	5860 mg/kg-dry		SCC	ICP
7440-66-6	Zinc	6450 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:24:49

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 103-01
Description: LABORATORY DUPLICATE
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: AFDUP

Released by: NAW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	5540 mg/kg-dry		SCC	ICP
7439-92-1	Lead	5520 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	6170 mg/kg-dry		SCC	ICP
7440-66-6	Zinc	6320 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:24:58

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 103-01
Description: MATRIX SPIKE
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: AFSPK

Released by: MW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	6340 mg/kg-dry		SCC	ICP
7439-92-1	Lead	7770 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	6420 mg/kg-dry		SCC	ICP
7440-66-6	Zinc	8610 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:25:08

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 103-02
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: AG

Released by: MAW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	3450 mg/kg-dry		SHF	ICP
7439-92-1	Lead	3600 mg/kg-dry		SKQ	ICP
7440-66-6	Zinc	4370 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	4680 mg/kg-dry		SKQ	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:25:17

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 103-02
Description: LABORATORY DUPLICATE
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: AGDUP

Released by: MW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	3210 mg/kg-dry		SHF	ICP
7439-92-1	Lead	3750 mg/kg-dry		SKQ	ICP
7440-66-6	Zinc	4130 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	4930 mg/kg-dry		SKQ	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:33:34

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 101-10
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: U

Released by: MRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	57200 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	205000 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:33:40

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 102-01
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: V

Released by: NCW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	36100 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	17600 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:33:47

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 102-02
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: W

Released by: NAW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	72800 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	63700 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:33:54

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 102-03
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: X

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	41800 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	33900 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:34:01

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 102-04
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: Y

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	25800 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	22300 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:34:09

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 102-05
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: Z

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	12000 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	38700 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:24:00

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 102-06
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: AA

Released by: NAW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	26200 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	32100 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:24:05

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 102-07
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: AB

Released by: MRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	18600 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	19000 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:24:11

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 102-08
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: AC

Released by: MRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	5360 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	6180 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:24:17

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 102-09
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: AD

Released by: MCW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	3750 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	4930 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:25:26

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 103-02
Description: MATRIX SPIKE
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: AGSPK

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	NOT ANALYZED		SHF	ICP
7439-92-1	Lead	4560 mg/kg-dry		SKQ	ICP
7440-66-6	Zinc	NOT ANALYZED		SHF	ICP
7440-66-6	Zinc	5570 mg/kg-dry		SKQ	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:25:36

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 103-03
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: AH

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	8500 mg/kg-dry		SCC	ICP
7439-92-1	Lead	7550 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	11300 mg/kg-dry		SCC	ICP
7440-66-6	Zinc	11300 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:25:45

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 103-04
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: AI

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	11300 mg/kg-dry		SHF	ICP
7439-92-1	Lead	11500 mg/kg-dry		SKQ	ICP
7440-66-6	Zinc	15700 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	15900 mg/kg-dry		SKQ	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:25:54

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 103-05
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: AJ

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	9050 mg/kg-dry		SCC	ICP
7439-92-1	Lead	10300 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	12900 mg/kg-dry		SCC	ICP
7440-66-6	Zinc	16200 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:26:03

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 103-06
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: AK

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	9160 mg/kg-dry		SHF	ICP
7439-92-1	Lead	9810 mg/kg-dry		SKQ	ICP
7440-66-6	Zinc	16600 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	17600 mg/kg-dry		SKQ	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:26:13

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 103-07
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: AL

Released by: NAW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	8210 mg/kg-dry		SCC	ICP
7439-92-1	Lead	8640 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	15200 mg/kg-dry		SCC	ICP
7440-66-6	Zinc	19800 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:26:22

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 103-08
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: AM

Released by: MCW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	11500 mg/kg-dry		SHF	ICP
7439-92-1	Lead	10000 mg/kg-dry		SKQ	ICP
7440-66-6	Zinc	27000 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	29100 mg/kg-dry		SKQ	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:26:31

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 103-09
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: AN

Released by: MRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	13700 mg/kg-dry		SCC	ICP
7439-92-1	Lead	14000 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	26100 mg/kg-dry		SCC	ICP
7440-66-6	Zinc	33100 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:26:40

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 103-10
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: AO

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	23000 mg/kg-dry		SHF	ICP
7439-92-1	Lead	23600 mg/kg-dry		SKQ	ICP
7440-66-6	Zinc	46100 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	50700 mg/kg-dry		SKQ	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:26:49

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 103-11
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: AP

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	51700 mg/kg-dry		SCC	ICP
7439-92-1	Lead	60400 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	55300 mg/kg-dry		SCC	ICP
7440-66-6	Zinc	62400 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:26:59

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 103-12
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: AQ

Released by: MRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	63300 mg/kg-dry		SHF	ICP
7439-92-1	Lead	7970 mg/kg-dry		SKQ	ICP
7440-66-6	Zinc	64500 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	69400 mg/kg-dry		SKQ	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:27:08

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 103-13
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: AR

Released by: MRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	28300 mg/kg-dry		SCC	ICP
7439-92-1	Lead	41400 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	41300 mg/kg-dry		SCC	ICP
7440-66-6	Zinc	62600 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:27:17

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 103-14
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: AS

Released by: MW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	23600 mg/kg-dry		SHF	ICP
7439-92-1	Lead	14600 mg/kg-dry		SKQ	ICP
7440-66-6	Zinc	41800 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	42200 mg/kg-dry		SKQ	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:27:32

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 103-15
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: AT

Released by: MRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	35600 mg/kg-dry		SCC	ICP
7439-92-1	Lead	30600 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	37000 mg/kg-dry		SCC	ICP
7440-66-6	Zinc	43200 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:27:42

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 103-16
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: AU

Released by: NAW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	33000 mg/kg-dry		SHF	ICP
7439-92-1	Lead	20000 mg/kg-dry		SKQ	ICP
7440-66-6	Zinc	40100 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	39700 mg/kg-dry		SKQ	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:27:51

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 103-17
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: AV

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	24400 mg/kg-dry		SCC	ICP
7439-92-1	Lead	25900 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	32300 mg/kg-dry		SCC	ICP
7440-66-6	Zinc	38100 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:28:00

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 103-18
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: AW

Released by: MAW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	16700 mg/kg-dry		SHF	ICP
7439-92-1	Lead	17500 mg/kg-dry		SKQ	ICP
7440-66-6	Zinc	22600 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	20600 mg/kg-dry		SKQ	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:28:10

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 103-19
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: AX

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	5730 mg/kg-dry		SCC	ICP
7439-92-1	Lead	8140 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	5850 mg/kg-dry		SCC	ICP
7440-66-6	Zinc	8800 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:28:19

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 103-20
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: AY

Released by: MRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	13600 mg/kg-dry		SHF	ICP
7439-92-1	Lead	14500 mg/kg-dry		SKQ	ICP
7440-66-6	Zinc	16000 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	15600 mg/kg-dry		SKQ	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:28:28

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 103-21
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: AZ

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	11100 mg/kg-dry		SCC	ICP
7439-92-1	Lead	33000 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	11200 mg/kg-dry		SCC	ICP
7440-66-6	Zinc	36100 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:28:43

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 103-22
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: BA

Released by: MRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	9320 mg/kg-dry		SHF	ICP
7439-92-1	Lead	10900 mg/kg-dry		SKQ	ICP
7440-66-6	Zinc	9850 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	10500 mg/kg-dry		SKQ	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:28:52

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 103-23
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: BB

Released by: MW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	1850 mg/kg-dry		SCC	ICP
7439-92-1	Lead	2430 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	1940 mg/kg-dry		SCC	ICP
7440-66-6	Zinc	2440 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:29:01

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 103-24
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: BC

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	2520 mg/kg-dry		SHF	ICP
7439-92-1	Lead	2920 mg/kg-dry		SKQ	ICP
7440-66-6	Zinc	2530 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	2810 mg/kg-dry		SKQ	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:29:11

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 103-25
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: BD

Released by: MRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	741 mg/kg-dry		SCC	ICP
7439-92-1	Lead	2380 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	849 mg/kg-dry		SCC	ICP
7440-66-6	Zinc	2650 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:29:20

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 103-26
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: BE

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	795 mg/kg-dry		SHF	ICP
7439-92-1	Lead	843 mg/kg-dry		SKQ	ICP
7440-66-6	Zinc	881 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	982 mg/kg-dry		SKQ	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:29:29

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 103-27
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: BF

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	791 mg/kg-dry		SCC	ICP
7439-92-1	Lead	1380 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	1180 mg/kg-dry		SCC	ICP
7440-66-6	Zinc	1730 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:29:39

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 103-28
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: BG

Released by: NAW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	1010 mg/kg-dry		SHF	ICP
7439-92-1	Lead	1110 mg/kg-dry		SKQ	ICP
7440-66-6	Zinc	1230 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	1180 mg/kg-dry		SKQ	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:29:48

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 103-29
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: BH

Released by: MW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	1760 mg/kg-dry		SCC	ICP
7439-92-1	Lead	703 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	2310 mg/kg-dry		SCC	ICP
7440-66-6	Zinc	851 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:29:57

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 103-30
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: BI

Released by: MAW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	507 mg/kg-dry		SHF	ICP
7439-92-1	Lead	555 mg/kg-dry		SKQ	ICP
7440-66-6	Zinc	584 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	593 mg/kg-dry		SKQ	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:30:06

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 103-31
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: BJ

Released by: MAW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	38 mg/kg-dry		SCC	ICP
7439-92-1	Lead	245 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	116 mg/kg-dry		SCC	ICP
7440-66-6	Zinc	326 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:30:16

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: 103-32
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: BK

Released by: MW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	304 mg/kg-dry		SHF	ICP
7439-92-1	Lead	283 mg/kg-dry		SKQ	ICP
7440-66-6	Zinc	383 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	403 mg/kg-dry		SKQ	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:31:39

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number:
Description: METHOD BLANK
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: MB1

Released by: MRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	215 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	6.9 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:31:46

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number:
Description: METHOD BLANK
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: MB2

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	5 mg/kg-dry	L	SCC	ICP
7439-92-1	Lead	177 mg/kg-dry		SHF	ICP
7439-92-1	Lead	5 mg/kg-dry	L	SKQ	ICP
7440-66-6	Zinc	0.8 mg/kg-dry	L	SCC	ICP
7440-66-6	Zinc	4.8 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	1.7 mg/kg-dry		SKQ	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:31:59

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number:
Description: METHOD BLANK
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: MB3

Released by: MRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	5 mg/kg-dry	L	SCC	ICP
7439-92-1	Lead	105 mg/kg-dry		SHF	ICP
7439-92-1	Lead	5 mg/kg-dry	L	SKQ	ICP
7440-66-6	Zinc	1.6 mg/kg-dry		SCC	ICP
7440-66-6	Zinc	4.3 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	0.8 mg/kg-dry	L	SKQ	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:32:44

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: MESS-1
Description: CANADIAN MARINE SED
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: REF1

Released by: MAW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	28 mg/kg-dry		SCC	ICP
7439-92-1	Lead	105 mg/kg-dry		SHF	ICP
7439-92-1	Lead	27 mg/kg-dry		SKQ	ICP
7440-66-6	Zinc	159 mg/kg-dry		SCC	ICP
7440-66-6	Zinc	163 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	170 mg/kg-dry		SKQ	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:32:57

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: NBS 1646
Description: ESTUARINE SEDIMENT
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: REF2

Released by: MW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	18 mg/kg-dry		SCC	ICP
7439-92-1	Lead	141 mg/kg-dry		SHF	ICP
7439-92-1	Lead	19 mg/kg-dry		SKQ	ICP
7440-66-6	Zinc	105 mg/kg-dry		SCC	ICP
7440-66-6	Zinc	106 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	114 mg/kg-dry		SKQ	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
02/13/89
10:33:10

Client: SRK
Contact: JIM CRONIN
Project: SKAGWAY
ID number: NBS 2704
Description: BUFFALO RIVER SED
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2583
ARI sample number: REF3

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	141 mg/kg-dry		SCC	ICP
7439-92-1	Lead	184 mg/kg-dry		SHF	ICP
7439-92-1	Lead	155 mg/kg-dry		SKQ	ICP
7440-66-6	Zinc	370 mg/kg-dry		SCC	ICP
7440-66-6	Zinc	385 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	408 mg/kg-dry		SKQ	ICP

ANALYTICAL RESOURCES, INC.

Results of Quality Control Duplicate Analysis

Client: SRK

Sample Identification: 2583 A

Units: ng/kg-dry

ANALYTE	ORIGINAL SAMPLE	C	DUPLICATE ANALYSIS	C	RELATIVE PERCENT DIFFERENCE
Lead (SHF)	49200		48600		1.2
Zinc (SHF)	30000		30700		2.3

ANALYTICAL RESOURCES, INC.

Results of Quality Control Matrix Spike Analysis

Client: SRK

Sample Identification: 2583 A

Units: mg/kg-dry

ANALYTE	ORIGINAL SAMPLE	C	SPIKED SAMPLE	C	AMOUNT ADDED	PERCENT RECOVERY
Lead	49200		52700		2500	140.0
Zinc	30000		32000		2500	80.0

ANALYTICAL RESOURCES, INC.

Results of Quality Control Duplicate Analysis

Client: SRK

Sample Identification: 2583 AF

Units: mg/kg-dry

ANALYTE	ORIGINAL SAMPLE	C	DUPLICATE ANALYSIS	C	RELATIVE PERCENT DIFFERENCE
Lead (SCC)	5530		5540		0.2
Lead (SHF)	5540		5520		0.4
Zinc (SCC)	5860		6170		5.2
Zinc (SHF)	6450		6320		2.0

ANALYTICAL RESOURCES, INC.

Results of Quality Control Matrix Spike Analysis

Client: SRK

Sample Identification: 2583 AF

Units: mg/kg-dry

ANALYTE	ORIGINAL SAMPLE	C	SPIKED SAMPLE	C	AMOUNT ADDED	PERCENT RECOVERY
Lead (SCC)	5530		6340		902	89.8
Lead (SHF)	5540		7770		2500	89.2
Zinc (SCC)	5860		6420		902	62.1
Zinc (SHF)	6450		8610		2500	86.4

ANALYTICAL RESOURCES, INC.

Results of Quality Control Duplicate Analysis

Client: SRK

Sample Identification: 2583 AG

Units: mg/kg-dry

ANALYTE	ORIGINAL SAMPLE	C	DUPLICATE ANALYSIS	C	RELATIVE PERCENT DIFFERENCE
Lead (SHF)	3450		3210		7.2
Lead (SKQ)	3600		3750		4.1
Zinc (SHF)	4370		4130		5.6
Zinc (SKQ)	4680		4930		5.2

ANALYTICAL RESOURCES, INC.

Results of Quality Control Matrix Spike Analysis

Client: SRK

Sample Identification: 2583 AG

Units: mg/kg-dry

ANALYTE	ORIGINAL SAMPLE	C	SPIKED SAMPLE	C	AMOUNT ADDED	PERCENT RECOVERY
Lead SKQ	3600		4560		1000	96.0
Zinc SKQ	4680		5570		1000	89.0

ANALYTICAL RESOURCES, INC.

Results of MESS-1 Marine Sediment Analysis

Client: SRK

ARI Sample number: 2583 ref1

Units: mg/kg-dry

ANALYTE	FOUND	CERTIFIED VALUE	RECOVERY
Lead SCC	28	34 ± 6.1	82.35
Lead SHF	105	34 ± 6.1	
Lead SKQ	27	34 ± 6.1	79.41
Zinc SCC	159	191 ± 17	83.25
Zinc SHF	163	191 ± 17	85.34
Zinc SKQ	170	191 ± 17	89.01

RECOVERY = Percent Recovery

ANALYTICAL RESOURCES, INC.

Results of NBS 1646 Estuarine Sediment Analysis

Client: SKR

ARI Sample number: 2583 REF2

Units: mg/kg-dry

ANALYTE	FOUND	CERTIFIED VALUE	RECOVERY
Lead SCC	18	28.2 ± 1.8	63.83
Lead SHF	141	28.2 ± 1.8	
Lead SKQ	19	28.2 ± 1.8	67.38
Zinc SCC	105	138 ± 6	76.09
Zinc SHF	106	138 ± 6	76.81
Zinc SKQ	114	138 ± 6	82.61

RECOVERY = Percent Recovery

ANALYTICAL RESOURCES, INC.

Results of NBS 2704 Buffalo River Sediment Analysis

Client: SRK

ARI Sample number: 2583 REF3

Units: mg/kg-dry

ANALYTE	FOUND	CERTIFIED VALUE	RECOVERY
Lead SCC	141	161 ± 17	87.58
Lead SHF	184	161 ± 17	114.29
Lead SKQ	155	161 ± 17	96.27
Zinc SCC	370	438 ± 12	84.47
Zinc SHF	385	438 ± 12	87.90
Zinc SKQ	408	438 ± 12	93.15

RECOVERY = Percent Recovery

APPENDIX C-4

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, Wa 98109-5187
(206) 621-6490

30 January 1989

Jim Cronin
Steffen, Robertson & Kirsten
100 Shorline Way
Suite A210
Mill Valley, CA 94941

RE: ARI Project No. 02547

Dear Jim:

Please find enclosed your data for ARI projects No. 02547

If you have any questions or need additional information, please feel free to call any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

Norman Ray Wells

Rocky Wells
Inorganics Manager

NRW/cd

enclosures

cc: file #02547

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/30/89
12:04:04

Client: URS
Contact: CHUCK BOATMAN
Project: SKAGWAY
ID number: SKMS-5
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2547
ARI sample number: B

Released by: NAW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-43-9	Cadmium	3.6 mg/kg-dry		SCC	ICP
7440-43-9	Cadmium	3.6 mg/kg-dry		SKQ	ICP
7440-50-8	Copper	98.6 mg/kg-dry		SCC	ICP
7440-50-8	Copper	81.7 mg/kg-dry		SKQ	ICP
7439-92-1	Lead	1450 mg/kg-dry		SCC	ICP
7439-92-1	Lead	1550 mg/kg-dry		SKQ	ICP
7440-22-4	Silver	1.8 mg/kg-dry		SCC	ICP
7440-22-4	Silver	1.9 mg/kg-dry		SKQ	ICP
7440-66-6	Zinc	2170 mg/kg-dry		SCC	ICP
7440-66-6	Zinc	2590 mg/kg-dry		SKQ	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/30/89
12:04:04

Client: URS
Contact: CHUCK BOATMAN
Project: SKAGWAY
ID number: SKMS-5
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2547
ARI sample number: B

Released by: MAW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-43-9	Cadmium	3.6 mg/kg-dry		SCC	ICP
7440-43-9	Cadmium	3.6 mg/kg-dry		SKQ	ICP
7440-50-8	Copper	98.6 mg/kg-dry		SCC	ICP
7440-50-8	Copper	81.7 mg/kg-dry		SKQ	ICP
7439-92-1	Lead	1450 mg/kg-dry		SCC	ICP
7439-92-1	Lead	1550 mg/kg-dry		SKQ	ICP
7440-22-4	Silver	1.8 mg/kg-dry		SCC	ICP
7440-22-4	Silver	1.9 mg/kg-dry		SKQ	ICP
7440-66-6	Zinc	2170 mg/kg-dry		SCC	ICP
7440-66-6	Zinc	2590 mg/kg-dry		SKQ	ICP

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, Wa 98109-5187
(206)621-6490

EXPLANATIONS OF INORGANIC DATA REPORT CODES

THE COLUMNS LABELED 'PREP', 'C', AND 'M' CONTAIN IMPORTANT INFORMATION ABOUT YOUR ANALYSES. THE CODES ARE DEFINED BELOW.

PREP CODES

THE 3-LETTER CODES IN THIS COLUMN ARE USED TO DESCRIBE THE METHOD USED TO PREPARE THE SAMPLE FOR ANALYSIS.

THE FIRST LETTER OF THE CODE STANDS FOR THE MATRIX TYPE OR THE FRACTION OF THE SAMPLE THAT IS BEING ANALYZED:

A = A PROCEDURE FOR DIGESTING AIR FILTERS
D = THE DISSOLVED FRACTION OF A SAMPLE (FILTERED THROUGH A 0.45 μ MEMBRANE FILTER.)
E = THE EP TOXICITY FRACTION OF A SAMPLE.
F = A PROCEDURE FOR DIGESTING FISH, OR OTHER TISSUE.
O = A DIGESTION OF AN OIL, GREASE, OR TAR.
R = A WATER SAMPLE PREPARED BY A 'TOTAL RECOVERABLE' DIGESTION.
S = A DIGESTION OF A SOIL OR SEDIMENT SAMPLE.
T = A WATER SAMPLE PREPARED BY A 'TOTAL' DIGESTION.
W = A SAMPLE ANALYZED WITHOUT ANY PREPARATION.

THE MIDDLE LETTER OF THE CODE RELATES TO THE SOURCE OF THE PROCEDURE.

A = A METHOD DEVELOPED BY ARI.
C = THE USEPA CLP PROGRAM STATEMENT OF WORK.
E = THE USEPA 1979 WATER AND WASTEWATER MANUAL.
H = A PROCEDURE DEVELOPED IN-HOUSE
M = A COMMON PROCEDURE FOUND IN A MANY SOURCES.
P = THE PUGET SOUND ESTUARY PROTOCOLS.
S = STANDARD METHODS.
W = THE USEPA SW-846 SOLID WASTE MANUAL.

THE LAST LETTER OF THE PREPARATION CODE REFERS EITHER TO THE FINAL MATRIX OF THE PREPARED SAMPLE OR TO A SPECIALIZED USE OF THE PROCEDURE.

A = A PROCEDURE FOR ARSENIC AND SELENIUM ANALYSIS ONLY.
C = A HYDROCHLORIC ACID MATRIX.
F = A HYDROFLUORIC ACID DIGESTION.
M = A PROCEDURE FOR MERCURY ANALYSIS ONLY.
N = A NITRIC ACID MATRIX.
P = A PERCHLORIC ACID DIGESTION.
R = A SPECIAL 'SOFT' DIGESTION OF A SOLID.

C CODES

THESE CODES ARE USED TO QUALIFY THE REPORTED CONCENTRATIONS. A CODE OF 'L' MEANS NO ANALYTE WAS DETECTED AT THE REPORTED CONCENTRATION LEVEL.

M CODES

THESE CODES SIGNIFY THE TYPE OF INSTRUMENTAL TECHNIQUE USED WHEN ANALYZING THE SAMPLES. THE CODES ARE DEFINED BELOW:

CVA = COLD VAPOR AAS
FLA = FLAME AAS
GFA = GRAPHITE FURNACE AAS
ICP = ICP-AES

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/30/89
12:03:45

Client: URS
Contact: CHUCK BOATMAN
Project: SKAGWAY
ID number: SKMS-4
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2547
ARI sample number: A

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-43-9	Cadmium	26.7 mg/kg-dry		SCC	ICP
7440-43-9	Cadmium	27.8 mg/kg-dry		SKQ	ICP
7440-50-8	Copper	600 mg/kg-dry		SCC	ICP
7440-50-8	Copper	521 mg/kg-dry		SKQ	ICP
7439-92-1	Lead	25400 mg/kg-dry		SCC	ICP
7439-92-1	Lead	30900 mg/kg-dry		SKQ	ICP
7440-22-4	Silver	24.9 mg/kg-dry		SCC	ICP
7440-22-4	Silver	30.1 mg/kg-dry		SKQ	ICP
7440-66-6	Zinc	18400 mg/kg-dry		SCC	ICP
7440-66-6	Zinc	18600 mg/kg-dry		SKQ	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/30/89
12:04:04

Client: URS
Contact: CHUCK BOATMAN
Project: SKAGWAY
ID number: SKMS-5
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2547
ARI sample number: B

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-43-9	Cadmium	3.6 mg/kg-dry		SCC	ICP
7440-43-9	Cadmium	3.6 mg/kg-dry		SKQ	ICP
7440-50-8	Copper	98.6 mg/kg-dry		SCC	ICP
7440-50-8	Copper	81.7 mg/kg-dry		SKQ	ICP
7439-92-1	Lead	1450 mg/kg-dry		SCC	ICP
7439-92-1	Lead	1550 mg/kg-dry		SKQ	ICP
7440-22-4	Silver	1.8 mg/kg-dry		SCC	ICP
7440-22-4	Silver	1.9 mg/kg-dry		SKQ	ICP
7440-66-6	Zinc	2170 mg/kg-dry		SCC	ICP
7440-66-6	Zinc	2590 mg/kg-dry		SKQ	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/30/89
12:04:04

Client: URS
Contact: CHUCK BOATMAN
Project: SKAGWAY
ID number: SKMS-5
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2547
ARI sample number: B

Released by: MRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-43-9	Cadmium	3.6 mg/kg-dry		SCC	ICP
7440-43-9	Cadmium	3.6 mg/kg-dry		SKQ	ICP
7440-50-8	Copper	98.6 mg/kg-dry		SCC	ICP
7440-50-8	Copper	81.7 mg/kg-dry		SKQ	ICP
7439-92-1	Lead	1450 mg/kg-dry		SCC	ICP
7439-92-1	Lead	1550 mg/kg-dry		SKQ	ICP
7440-22-4	Silver	1.8 mg/kg-dry		SCC	ICP
7440-22-4	Silver	1.9 mg/kg-dry		SKQ	ICP
7440-66-6	Zinc	2170 mg/kg-dry		SCC	ICP
7440-66-6	Zinc	2590 mg/kg-dry		SKQ	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/30/89
12:07:10

Client: URS
Contact: CHUCK BOATMAN
Project: SKAGWAY
ID number: MESS-1
Description: CANADIAN MARINE SED
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2547
ARI sample number: REF1

Released by: MRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-43-9	Cadmium	0.7 mg/kg-dry		SCC	ICP
7440-43-9	Cadmium	0.8 mg/kg-dry		SKQ	ICP
7440-50-8	Copper	24.7 mg/kg-dry		SCC	ICP
7440-50-8	Copper	22.8 mg/kg-dry		SKQ	ICP
7439-92-1	Lead	30 mg/kg-dry		SCC	ICP
7439-92-1	Lead	32 mg/kg-dry		SKQ	ICP
7440-22-4	Silver	0.6 mg/kg-dry	L	SCC	ICP
7440-22-4	Silver	0.6 mg/kg-dry	L	SKQ	ICP
7440-66-6	Zinc	179 mg/kg-dry		SCC	ICP
7440-66-6	Zinc	207 mg/kg-dry		SKQ	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/30/89
12:07:29

Client: URS
Contact: CHUCK BOATMAN
Project: SKAGWAY
ID number: NBS1646
Description: ESTUARINE SEDIMENT
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2547
ARI sample number: REF2

Released by: MRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-43-9	Cadmium	0.4 mg/kg-dry	L	SCC	ICP
7440-43-9	Cadmium	0.4 mg/kg-dry		SKQ	ICP
7440-50-8	Copper	17.3 mg/kg-dry		SCC	ICP
7440-50-8	Copper	15.3 mg/kg-dry		SKQ	ICP
7439-92-1	Lead	22 mg/kg-dry		SCC	ICP
7439-92-1	Lead	35 mg/kg-dry		SKQ	ICP
7440-22-4	Silver	0.6 mg/kg-dry	L	SCC	ICP
7440-22-4	Silver	0.6 mg/kg-dry	L	SKQ	ICP
7440-66-6	Zinc	118 mg/kg-dry		SCC	ICP
7440-66-6	Zinc	157 mg/kg-dry		SKQ	ICP

ANALYTICAL RESOURCES, INC.

Results of Quality Control Duplicate Analysis

Client: URS

Sample Identification: 2547 C

Units: mg/kg-dry

ANALYTE	ORIGINAL SAMPLE	C	DUPLICATE ANALYSIS	C	RELATIVE PERCENT DIFFERENCE	
Cadmium	1.2		1.2		0.0	
Cadmium	3.6		3.3		8.7	*
Copper	38.1		35		8.5	
Copper	122		129		5.6	*
Lead	518		455		12.9	
Lead	1560		1530		1.9	*
Silver	0.6	L	0.6	L	0.0	
Silver	2.2		2.2		0.0	*
Zinc	510		560		9.3	
Zinc	2190		2120		3.2	*

* Aqua regia results

ANALYTICAL RESOURCES, INC.

Results of Quality Control Matrix Spike Analysis

Client: URS

Sample Identification: 2547 C

Units: mg/kg-dry

ANALYTE	ORIGINAL SAMPLE	C	SPIKED SAMPLE	C	AMOUNT ADDED	PERCENT RECOVERY	
Cadmium	1.2		11.7		10	105.0	
Cadmium	3.6		14.1		10	105.0	*
Copper	38.1		85.8		50	95.4	
Copper	122		181		50	118.0	*
Lead	518		1390		1000	87.2	
Lead	1560		1700		100	140.0	*
Silver	0		11.1		10	111.0	
Silver	2.2		12.8		10	106.0	*
Zinc	510		1430		1000	92.0	
Zinc	2190		2280		100	90.0	*

* Aqua regia results

ANALYTICAL RESOURCES, INC.

Results of MESS-1 Marine Sediment Analysis

Client: URS

ARI Sample number: 2547 REF1

Units: mg/kg-dry

ANALYTE	FOUND	CERTIFIED VALUE	RECOVERY	
Cadmium	0.7	0.59 ± 0.1	118.64	
Cadmium	0.8	0.59 ± 0.1	135.59	*
Copper	24.7	25.1 ± 3.8	98.41	
Copper	22.8	25.1 ± 3.8	90.84	*
Lead	30	34 ± 6.1	88.24	
Lead	32	34 ± 6.1	94.12	*
Zinc	179	191 ± 17	93.72	
Zinc	207	191 ± 17	108.38	*

RECOVERY = Percent Recovery
* Aqua regia results

ANALYTICAL RESOURCES, INC.

Results of NBS 1646 Estuarine Sediment Analysis

Client: URS

ARI Sample number: 2547 REF2

Units: mg/kg-dry

ANALYTE	FOUND	CERTIFIED VALUE	RECOVERY	
Cadmium	< 0.4	0.36 ± 0.07		
Cadmium	0.4	0.36 ± 0.07	111.11	*
Copper	17.3	18 ± 3	96.11	
Copper	15.3	18 ± 3	85.00	*
Lead	22	28.2 ± 1.8	78.01	
Lead	35	28.2 ± 1.8	124.11	*
Zinc	118	138 ± 6	85.51	
Zinc	157	138 ± 6	113.77	*

RECOVERY = Percent Recovery
* Aqua regia results

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, Wa 98109-5187
(206) 621-6490

30 January 1989

Jim Cronin
Steffen Robertson & Kirsten
100 Shoreline Hwy, Suite A210
Mill Valley, CA 94941

RE: Project No. Bowhead: ARI Project No. 02546

Dear Sir's:

Please find enclosed the Inorganic Laboratory Data Reports for job No. 02546.

If you have any questions, please feel free to call me.

Sincerely,

ANALYTICAL RESOURCES, INC.

Norman Rocky Wells

Norman Rocky Wells
Inorganic's Manager

NRW/cd

enclosures

cc: file #02546

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, Wa 98109-5187
(206)621-6490

EXPLANATIONS OF INORGANIC DATA REPORT CODES

THE COLUMNS LABELED 'PREP', 'C', AND 'M' CONTAIN IMPORTANT INFORMATION ABOUT YOUR ANALYSES. THE CODES ARE DEFINED BELOW.

PREP CODES

THE 3-LETTER CODES IN THIS COLUMN ARE USED TO DESCRIBE THE METHOD USED TO PREPARE THE SAMPLE FOR ANALYSIS.

THE FIRST LETTER OF THE CODE STANDS FOR THE MATRIX TYPE OR THE FRACTION OF THE SAMPLE THAT IS BEING ANALYZED:

A = A PROCEDURE FOR DIGESTING AIR FILTERS.
D = THE DISSOLVED FRACTION OF A SAMPLE (FILTERED THROUGH A 0.45 μ MEMBRANE FILTER.)
E = THE EP TOXICITY FRACTION OF A SAMPLE.
F = A PROCEDURE FOR DIGESTING FISH, OR OTHER TISSUE.
O = A DIGESTION OF AN OIL, GREASE, OR TAR.
R = A WATER SAMPLE PREPARED BY A 'TOTAL RECOVERABLE' DIGESTION.
S = A DIGESTION OF A SOIL OR SEDIMENT SAMPLE.
T = A WATER SAMPLE PREPARED BY A 'TOTAL' DIGESTION.
W = A SAMPLE ANALYZED WITHOUT ANY PREPARATION.

THE MIDDLE LETTER OF THE CODE RELATES TO THE SOURCE OF THE PROCEDURE.

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C = THE USEPA CLP PROGRAM STATEMENT OF WORK.
E = THE USEPA 1979 WATER AND WASTEWATER MANUAL.
H = A PROCEDURE DEVELOPED IN-HOUSE
M = A COMMON PROCEDURE FOUND IN A MANY SOURCES.
P = THE PUGET SOUND ESTUARY PROTOCOLS.
S = STANDARD METHODS.
W = THE USEPA SW-846 SOLID WASTE MANUAL.

THE LAST LETTER OF THE PREPARATION CODE REFERS EITHER TO THE FINAL MATRIX OF THE PREPARED SAMPLE OR TO A SPECIALIZED USE OF THE PROCEDURE.

A = A PROCEDURE FOR ARSENIC AND SELENIUM ANALYSIS ONLY.
C = A HYDROCHLORIC ACID MATRIX.
F = A HYDROFLUORIC ACID DIGESTION.
M = A PROCEDURE FOR MERCURY ANALYSIS ONLY.
N = A NITRIC ACID MATRIX.
P = A PERCHLORIC ACID DIGESTION.
R = A SPECIAL 'SOFT' DIGESTION OF A SOLID.

C CODES

THESE CODES ARE USED TO QUALIFY THE REPORTED CONCENTRATIONS. A CODE OF 'L' MEANS NO ANALYTE WAS DETECTED AT THE REPORTED CONCENTRATION LEVEL.

M CODES

THESE CODES SIGNIFY THE TYPE OF INSTRUMENTAL TECHNIQUE USED WHEN ANALYZING THE SAMPLES. THE CODES ARE DEFINED BELOW:

CVA = COLD VAPOR AAS
FLA = FLAME AAS
GFA = GRAPHITE FURNACE AAS
ICP = ICP-AES

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/28/89
09:10:07

Client: URS
Contact: CHUCK BOATMAN
Project: SKAGWAY
ID number: SKMS-7
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2546
ARI sample number: A

Released by: MCW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-38-2	Arsenic	0.05 mg/L	L	EWN	ICP
7440-39-3	Barium	0.057 mg/L		EWN	ICP
7440-43-9	Cadmium	0.002 mg/L	L	EWN	ICP
7440-47-3	Chromium	0.005 mg/L	L	EWN	ICP
7439-92-1	Lead	0.22 mg/L		EWN	ICP
7439-97-6	Mercury	0.0001 mg/L	L	EWM	CVA
7782-49-2	Selenium	0.05 mg/L	L	EWN	ICP
7440-22-4	Silver	0.003 mg/L	L	EWN	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/28/89
09:10:22

Client: URS
Contact: CHUCK BOATMAN
Project: SKAGWAY
ID number: SKMS-4
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2546
ARI sample number: B

Released by: MEW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-38-2	Arsenic	0.05 mg/L	L	EWN	ICP
7440-39-3	Barium	0.174 mg/L		EWN	ICP
7440-43-9	Cadmium	0.005 mg/L		EWN	ICP
7440-47-3	Chromium	0.005 mg/L	L	EWN	ICP
7439-92-1	Lead	16.4 mg/L		EWN	ICP
7439-97-6	Mercury	0.0001 mg/L	L	EWM	CVA
7782-49-2	Selenium	0.05 mg/L	L	EWN	ICP
7440-22-4	Silver	0.003 mg/L	L	EWN	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/28/89
09:10:38

Client: URS
Contact: CHUCK BOATMAN
Project: SKAGWAY
ID number: SKMS-2
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2546
ARI sample number: C

Released by: MRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-38-2	Arsenic	0.05 mg/L	L	EWN	ICP
7440-39-3	Barium	0.080 mg/L		EWN	ICP
7440-43-9	Cadmium	0.002 mg/L	L	EWN	ICP
7440-47-3	Chromium	0.006 mg/L		EWN	ICP
7439-92-1	Lead	1.51 mg/L		EWN	ICP
7439-97-6	Mercury	0.0001 mg/L	L	EWM	CVA
7782-49-2	Selenium	0.05 mg/L	L	EWN	ICP
7440-22-4	Silver	0.003 mg/L	L	EWN	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/28/89
09:10:53

Client: URS
Contact: CHUCK BOATMAN
Project: SKAGWAY
ID number: SKMS-19
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2546
ARI sample number: D

Released by: MRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-38-2	Arsenic	0.05 mg/L	L	EWN	ICP
7440-39-3	Barium	0.067 mg/L		EWN	ICP
7440-43-9	Cadmium	0.004 mg/L		EWN	ICP
7440-47-3	Chromium	0.005 mg/L	L	EWN	ICP
7439-92-1	Lead	4.52 mg/L		EWN	ICP
7439-97-6	Mercury	0.0001 mg/L	L	EWM	CVA
7782-49-2	Selenium	0.05 mg/L	L	EWN	ICP
7440-22-4	Silver	0.003 mg/L	L	EWN	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/28/89
09:11:08

Client: URS
Contact: CHUCK BOATMAN
Project: SKAGWAY
ID number: SKMS-30
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2546
ARI sample number: E

Released by: MW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-38-2	Arsenic	0.05 mg/L	L	EWN	ICP
7440-39-3	Barium	0.060 mg/L		EWN	ICP
7440-43-9	Cadmium	0.002 mg/L	L	EWN	ICP
7440-47-3	Chromium	0.005 mg/L	L	EWN	ICP
7439-92-1	Lead	0.37 mg/L		EWN	ICP
7439-97-6	Mercury	0.0001 mg/L	L	EWM	CVA
7782-49-2	Selenium	0.05 mg/L	L	EWN	ICP
7440-22-4	Silver	0.003 mg/L	L	EWN	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/28/89
09:11:23

Client: URS
Contact: CHUCK BOATMAN
Project: SKAGWAY
ID number: SKMS-31
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2546
ARI sample number: F

Released by: 1/28/89

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-38-2	Arsenic	0.05 mg/L	L	EWN	ICP
7440-39-3	Barium	0.031 mg/L		EWN	ICP
7440-43-9	Cadmium	0.002 mg/L	L	EWN	ICP
7440-47-3	Chromium	0.005 mg/L	L	EWN	ICP
7439-92-1	Lead	0.08 mg/L		EWN	ICP
7439-97-6	Mercury	0.0001 mg/L	L	EWM	CVA
7782-49-2	Selenium	0.05 mg/L	L	EWN	ICP
7440-22-4	Silver	0.003 mg/L	L	EWN	ICP

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, Wa 98109-5187
(206) 621-6490

25 January 1989

Jim Cronin
Steffen Robertson & Kirsten, Inc.
100 Shorline Highway
Mill Valley, CA 94941

RE: Project No. Bowhead/Skagway: ARI Project No. 02547

Dear Chuck:

Please find enclosed the Inorganic Laboratory Data Reports for job No. 2547.

If you have any questions, please feel free to call me.

Sincerely,

ANALYTICAL RESOURCES, INC.

Rocky Wells
Inorganics Manager

NRW/cd

enclosures

cc: file #02547

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, Wa 98109-5187
(206)621-6490

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M = A PROCEDURE FOR MERCURY ANALYSIS ONLY.
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C CODES

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M CODES

THESE CODES SIGNIFY THE TYPE OF INSTRUMENTAL TECHNIQUE USED WHEN ANALYZING THE SAMPLES. THE CODES ARE DEFINED BELOW:

CVA = COLD VAPOR AAS
FLA = FLAME AAS
GFA = GRAPHITE FURNACE AAS
ICP = ICP-AES

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/25/89
07:48:02

Client: URS
Contact: CHUCK BOATMAN
Project: SKAGWAY
ID number: SKMS-4
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2547
ARI sample number: A

Released by: JKW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-43-9	Cadmium	26.7 mg/kg-dry		SCC	ICP
7440-50-8	Copper	600 mg/kg-dry		SCC	ICP
7439-92-1	Lead	25400 mg/kg-dry		SCC	ICP
7440-22-4	Silver	24.9 mg/kg-dry		SCC	ICP
7440-66-6	Zinc	18400 mg/kg-dry		SCC	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/25/89
07:48:13

Client: URS
Contact: CHUCK BOATMAN
Project: SKAGWAY
ID number: SKMS-5
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2547
ARI sample number: B

Released by: MEW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-43-9	Cadmium	3.6 mg/kg-dry		SCC	ICP
7440-50-8	Copper	98.6 mg/kg-dry		SCC	ICP
7439-92-1	Lead	1450 mg/kg-dry		SCC	ICP
7440-22-4	Silver	1.8 mg/kg-dry		SCC	ICP
7440-66-6	Zinc	2170 mg/kg-dry		SCC	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/25/89
07:51:39

Client: URS
Contact: CHUCK BOATMAN
Project: SKAGWAY
ID number: MESS-1
Description: CANADIAN MARINE SED
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2547
ARI sample number: REF1

Released by: MRV

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-43-9	Cadmium	0.7 mg/kg-dry		SCC	ICP
7440-50-8	Copper	24.7 mg/kg-dry		SCC	ICP
7439-92-1	Lead	30 mg/kg-dry		SCC	ICP
7440-22-4	Silver	0.6 mg/kg-dry	L	SCC	ICP
7440-66-6	Zinc	179 mg/kg-dry		SCC	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/25/89
07:51:49

Client: URS
Contact: CHUCK BOATMAN
Project: SKAGWAY
ID number: NBS1646
Description: ESTUARINE SEDIMENT
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2547
ARI sample number: REF2

Released by: RW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-43-9	Cadmium	0.4 mg/kg-dry	L	SCC	ICP
7440-50-8	Copper	17.3 mg/kg-dry		SCC	ICP
7439-92-1	Lead	22 mg/kg-dry		SCC	ICP
7440-22-4	Silver	0.6 mg/kg-dry	L	SCC	ICP
7440-66-6	Zinc	118 mg/kg-dry		SCC	ICP

ANALYTICAL RESOURCES, INC.

Results of Quality Control Duplicate Analysis

Client: URS

Sample Identification: 2547 C

Units: mg/kg-dry

ANALYTE	ORIGINAL SAMPLE	C	DUPLICATE ANALYSIS	C	RELATIVE PERCENT DIFFERENCE
Cadmium	1.2		1.2		0.0
Copper	38.1		35		8.5
Lead	518		455		12.9
Silver	0.6	L	0.6	L	0.0
Zinc	510		560		9.3

ANALYTICAL RESOURCES, INC.

Results of Quality Control Matrix Spike Analysis

Client: URS

Sample Identification: 2547 C

Units: mg/kg-dry

ANALYTE	ORIGINAL SAMPLE	C	SPIKED SAMPLE	C	AMOUNT ADDED	PERCENT RECOVERY
Cadmium	1.2		11.7		10	105.0
Copper	38.1		85.8		50	95.4
Lead	518		1390		1000	87.2
Silver	0		11.1		10	111.0
Zinc	510		1430		1000	92.0

ANALYTICAL RESOURCES, INC.

Results of MESS-1 Marine Sediment Analysis

Client: URS

ARI Sample number: 2547 REF1

Units: mg/kg-dry

ANALYTE	FOUND	CERTIFIED VALUE	RECOVERY
Cadmium	0.7	0.59 ± 0.1	118.64
Copper	24.7	25.1 ± 3.8	98.41
Lead	30	34 ± 6.1	88.24
Zinc	179	191 ± 17	93.72

RECOVERY = Percent Recovery

ANALYTICAL RESOURCES, INC.

Results of NBS 1646 Estuarine Sediment Analysis

Client: URS

ARI Sample number: 2547 REF2

Units: mg/kg-dry

ANALYTE	FOUND	CERTIFIED VALUE	RECOVERY
Cadmium	< 0.4	0.36 ± 0.07	
Copper	17.3	18 ± 3	96.11
Lead	22	28.2 ± 1.8	78.01
Zinc	118	138 ± 6	85.51

RECOVERY = Percent Recovery

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, Wa 98109-5187
(206)621-6490

EXPLANATIONS OF INORGANIC DATA REPORT CODES

THE COLUMNS LABELED 'PREP', 'C', AND 'M' CONTAIN IMPORTANT INFORMATION ABOUT YOUR ANALYSES. THE CODES ARE DEFINED BELOW.

PREP CODES

THE 3-LETTER CODES IN THIS COLUMN ARE USED TO DESCRIBE THE METHOD USED TO PREPARE THE SAMPLE FOR ANALYSIS.

THE FIRST LETTER OF THE CODE STANDS FOR THE MATRIX TYPE OR THE FRACTION OF THE SAMPLE THAT IS BEING ANALYZED:

D = THE DISSOLVED FRACTION OF A SAMPLE (FILTERED THROUGH A 0.45 μ MEMBRANE FILTER.)
E = THE EP TOXICITY FRACTION OF A SAMPLE.
F = A PROCEDURE FOR DIGESTING FISH, OR OTHER TISSUE.
O = A DIGESTION OF AN OIL, GREASE, OR TAR.
R = A WATER SAMPLE PREPARED BY A 'TOTAL RECOVERABLE' DIGESTION.
S = A DIGESTION OF A SOIL OR SEDIMENT SAMPLE.
T = A WATER SAMPLE PREPARED BY A 'TOTAL' DIGESTION.
W = A SAMPLE ANALYZED WITHOUT ANY PREPARATION.

THE MIDDLE LETTER OF THE CODE RELATES TO THE SOURCE OF THE PROCEDURE.

A = A METHOD DEVELOPED BY ARI.
C = THE USEPA CLP PROGRAM STATEMENT OF WORK.
E = THE USEPA 1979 WATER AND WASTEWATER MANUAL.
M = A COMMON PROCEDURE FOUND IN A MANY SOURCES.
P = THE PUGET SOUND ESTUARY PROTOCOLS.
S = STANDARD METHODS.
W = THE USEPA SW-846 SOLID WASTE MANUAL.

THE LAST LETTER OF THE PREPARATION CODE REFERS EITHER TO THE FINAL MATRIX OF THE PREPARED SAMPLE OR TO A SPECIALIZED USE OF THE PROCEDURE.

A = A PROCEDURE FOR ARSENIC AND SELENIUM ANALYSIS ONLY.
C = A HYDROCHLORIC ACID MATRIX.
F = A HYDROFLUORIC ACID DIGESTION.
M = A PROCEDURE FOR MERCURY ANALYSIS ONLY.
N = A NITRIC ACID MATRIX.
P = A PERCHLORIC ACID DIGESTION.
R = A SPECIAL 'SOFT' DIGESTION OF A SOLID.

C CODES

THESE CODES ARE USED TO QUALIFY THE REPORTED CONCENTRATIONS. A CODE OF 'L' MEANS NO ANALYTE WAS DETECTED AT THE REPORTED CONCENTRATION LEVEL.

M CODES

THESE CODES SIGNIFY THE TYPE OF INSTRUMENTAL TECHNIQUE USED WHEN ANALYZING THE SAMPLES. THE CODES ARE DEFINED BELOW:

CVA = COLD VAPOR AAS
FLA = FLAME AAS
GFA = GRAPHITE FURNACE AAS
ICP = ICP-AES

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/18/89
13:12:39

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-12
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2281
ARI sample number: A

Released by: NAW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	72500 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	39.8 mg/kg-dry		SHF	ICP
7440-50-8	Copper	768 mg/kg-dry		SHF	ICP
7439-89-6	Iron	49200 mg/kg-dry		SHF	ICP
7439-92-1	Lead	27500 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	1110 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	18.4 mg/kg-dry		SCM	CVA
7440-22-4	Silver	24.4 mg/kg-dry		SHF	ICP
7440-32-6	Titanium	3820 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	27300 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/18/89
13:12:53

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-12
Description: LABORATORY DUPLICATE
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2281
ARI sample number: ADUP

Released by: MRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	69700 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	37.8 mg/kg-dry		SHF	ICP
7440-50-8	Copper	729 mg/kg-dry		SHF	ICP
7439-89-6	Iron	48700 mg/kg-dry		SHF	ICP
7439-92-1	Lead	26300 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	1060 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	NOT ANALYZED		SCM	CVA
7440-22-4	Silver	22.9 mg/kg-dry		SHF	ICP
7440-32-6	Titanium	3770 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	25400 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/18/89
13:13:08

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-12
Description: MATRIX SPIKE
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2281
ARI sample number: ASPK

Released by: NAW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	70300 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	62.8 mg/kg-dry		SHF	ICP
7440-50-8	Copper	869 mg/kg-dry		SHF	ICP
7439-89-6	Iron	49300 mg/kg-dry		SHF	ICP
7439-92-1	Lead	26100 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	1080 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	NOT ANALYZED		SCM	CVA
7440-22-4	Silver	45.0 mg/kg-dry		SHF	ICP
7440-32-6	Titanium	3890 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	26200 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/18/89
13:13:23

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-35
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2281
ARI sample number: B

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	78200 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	27.1 mg/kg-dry		SHF	ICP
7439-89-6	Iron	40500 mg/kg-dry		SHF	ICP
7439-92-1	Lead	165 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	707 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.16 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	4120 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	279 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/18/89
13:13:37

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-36
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2281
ARI sample number: C

Released by: RAW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	77100 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	19.3 mg/kg-dry		SHF	ICP
7439-89-6	Iron	32300 mg/kg-dry		SHF	ICP
7439-92-1	Lead	130 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	638 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.08 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	3170 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	160 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/18/89
13:13:51

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-37
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2281
ARI sample number: D

Released by: MRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	80000 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	7.1 mg/kg-dry		SHF	ICP
7440-50-8	Copper	139 mg/kg-dry		SHF	ICP
7439-89-6	Iron	49200 mg/kg-dry		SHF	ICP
7439-92-1	Lead	370 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	787 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.10 mg/kg-dry		SCM	CVA
7440-22-4	Silver	5.2 mg/kg-dry		SHF	ICP
7440-32-6	Titanium	4970 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	641 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/18/89
13:14:06

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-38
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2281
ARI sample number: E

Released by: RW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	78500 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.4 mg/kg-dry		SHF	ICP
7440-50-8	Copper	30.3 mg/kg-dry		SHF	ICP
7439-89-6	Iron	43000 mg/kg-dry		SHF	ICP
7439-92-1	Lead	166 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	769 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.14 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	4370 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	298 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/18/89
13:14:20

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-40
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2281
ARI sample number: F

Released by: MAW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	77200 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	10.4 mg/kg-dry		SHF	ICP
7440-50-8	Copper	39.3 mg/kg-dry		SHF	ICP
7439-89-6	Iron	35200 mg/kg-dry		SHF	ICP
7439-92-1	Lead	226 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	674 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.08 mg/kg-dry		SCM	CVA
7440-22-4	Silver	6.4 mg/kg-dry		SHF	ICP
7440-32-6	Titanium	3460 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	797 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/18/89
13:14:34

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-41
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2281
ARI sample number: G

Released by: MRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	78300 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	3.6 mg/kg-dry		SHF	ICP
7440-50-8	Copper	43.8 mg/kg-dry		SHF	ICP
7439-89-6	Iron	40500 mg/kg-dry		SHF	ICP
7439-92-1	Lead	204 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	701 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.13 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	4130 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	434 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/18/89
13:15:03

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-71
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2281
ARI sample number: H

Released by: RAW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	67900 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	42.0 mg/kg-dry		SHF	ICP
7440-50-8	Copper	810 mg/kg-dry		SHF	ICP
7439-89-6	Iron	49900 mg/kg-dry		SHF	ICP
7439-92-1	Lead	29200 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	1050 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	NOT ANALYZED		SCM	CVA
7440-22-4	Silver	26.2 mg/kg-dry		SHF	ICP
7440-32-6	Titanium	3830 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	28600 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/18/89
13:15:17

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-72
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2281
ARI sample number: I

Released by: MW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	72100 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	38.8 mg/kg-dry		SHF	ICP
7440-50-8	Copper	757 mg/kg-dry		SHF	ICP
7439-89-6	Iron	51100 mg/kg-dry		SHF	ICP
7439-92-1	Lead	26900 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	1090 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	15.3 mg/kg-dry		SCM	CVA
7440-22-4	Silver	25.0 mg/kg-dry		SHF	ICP
7440-32-6	Titanium	4010 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	26600 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/18/89
13:15:31

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-73
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2281
ARI sample number: J

Released by: RW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	80200 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	17.0 mg/kg-dry		SHF	ICP
7440-50-8	Copper	317 mg/kg-dry		SHF	ICP
7439-89-6	Iron	53300 mg/kg-dry		SHF	ICP
7439-92-1	Lead	12400 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	1030 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	8.43 mg/kg-dry		SCM	CVA
7440-22-4	Silver	11.9 mg/kg-dry		SHF	ICP
7440-32-6	Titanium	4890 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	11400 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/18/89
13:15:45

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-74
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2281
ARI sample number: K

Released by: MRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	76700 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	28.8 mg/kg-dry		SHF	ICP
7440-50-8	Copper	552 mg/kg-dry		SHF	ICP
7439-89-6	Iron	53000 mg/kg-dry		SHF	ICP
7439-92-1	Lead	21500 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	1040 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	11.8 mg/kg-dry		SCM	CVA
7440-22-4	Silver	20.1 mg/kg-dry		SHF	ICP
7440-32-6	Titanium	4500 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	20000 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/18/89
13:16:00

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-75
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2281
ARI sample number: L

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	76200 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	24.9 mg/kg-dry		SHF	ICP
7440-50-8	Copper	430 mg/kg-dry		SHF	ICP
7439-89-6	Iron	51700 mg/kg-dry		SHF	ICP
7439-92-1	Lead	16700 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	997 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	12.8 mg/kg-dry		SCM	CVA
7440-22-4	Silver	16.4 mg/kg-dry		SHF	ICP
7440-32-6	Titanium	4440 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	17000 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/18/89
13:16:15

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-76
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2281
ARI sample number: M

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	81000 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	2.0 mg/kg-dry		SHF	ICP
7440-50-8	Copper	27.3 mg/kg-dry		SHF	ICP
7439-89-6	Iron	37400 mg/kg-dry		SHF	ICP
7439-92-1	Lead	183 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	677 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.12 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	3880 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	337 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/18/89
13:16:44

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-78
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2281
ARI sample number: N

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	81200 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.6 mg/kg-dry		SHF	ICP
7440-50-8	Copper	25.2 mg/kg-dry		SHF	ICP
7439-89-6	Iron	37500 mg/kg-dry		SHF	ICP
7439-92-1	Lead	172 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	694 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.09 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	3840 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	305 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/18/89
13:16:58

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-80
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2281
ARI sample number: O

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	80500 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.9 mg/kg-dry		SHF	ICP
7440-50-8	Copper	30.8 mg/kg-dry		SHF	ICP
7439-89-6	Iron	35900 mg/kg-dry		SHF	ICP
7439-92-1	Lead	165 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	659 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.11 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	3680 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	296 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/18/89
13:17:12

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-81
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2281
ARI sample number: P

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	79300 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	3.2 mg/kg-dry		SHF	ICP
7440-50-8	Copper	45.6 mg/kg-dry		SHF	ICP
7439-89-6	Iron	43100 mg/kg-dry		SHF	ICP
7439-92-1	Lead	223 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	738 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.14 mg/kg-dry		SCM	CVA
7440-22-4	Silver	6.6 mg/kg-dry		SHF	ICP
7440-32-6	Titanium	4500 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	429 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/18/89
13:17:27

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-82
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2281
ARI sample number: Q

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	78800 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	3.0 mg/kg-dry		SHF	ICP
7440-50-8	Copper	42.9 mg/kg-dry		SHF	ICP
7439-89-6	Iron	39100 mg/kg-dry		SHF	ICP
7439-92-1	Lead	213 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	684 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.12 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.6 mg/kg-dry		SHF	ICP
7440-32-6	Titanium	3960 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	386 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.

Results of Quality Control Duplicate Analysis

Client: URS

Sample Identification: 2281 A

Units: mg/kg-dry

ANALYTE	ORIGINAL SAMPLE	C	DUPLICATE ANALYSIS	C	RELATIVE PERCENT DIFFERENCE
Aluminum	72500		69700		3.9
Cadmium	39.8		37.8		5.2
Copper	768		729		5.2
Iron	49200		48700		1.0
Lead	27500		26300		4.5
Manganese	1110		1060		4.6
Silver	24.4		22.9		6.3
Titanium	3820		3770		1.3
Zinc	27300		25400		7.2

ANALYTICAL RESOURCES, INC.

Results of Quality Control Matrix Spike Analysis

Client: URS

Sample Identification: 2281 ASPK

Units: mg/kg-dry

ANALYTE	ORIGINAL SAMPLE	C	SPIKED SAMPLE	C	AMOUNT ADDED	PERCENT RECOVERY
Cadmium	39.8		62.8		25	92.0
Copper	768		869		125	80.8
Lead	27500		26100		250	
Silver	24.4		45		25	82.4
Zinc	27300		26200		250	

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/18/89
13:17:41

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-83
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2281
ARI sample number: R

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	82700 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	6.2 mg/kg-dry		SHF	ICP
7440-50-8	Copper	76.6 mg/kg-dry		SHF	ICP
7439-89-6	Iron	44700 mg/kg-dry		SHF	ICP
7439-92-1	Lead	393 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	749 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.22 mg/kg-dry		SCM	CVA
7440-22-4	Silver	7.6 mg/kg-dry		SHF	ICP
7440-32-6	Titanium	4580 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	716 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/18/89
13:18:09

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-84
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2281
ARI sample number: S

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	81600 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	4.0 mg/kg-dry		SHF	ICP
7440-50-8	Copper	52.9 mg/kg-dry		SHF	ICP
7439-89-6	Iron	42600 mg/kg-dry		SHF	ICP
7439-92-1	Lead	284 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	736 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.10 mg/kg-dry		SCM	CVA
7440-22-4	Silver	2.0 mg/kg-dry		SHF	ICP
7440-32-6	Titanium	4320 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	465 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/18/89
13:18:24

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-85
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2281
ARI sample number: T

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	81000 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	3.6 mg/kg-dry		SHF	ICP
7440-50-8	Copper	86.0 mg/kg-dry		SHF	ICP
7439-89-6	Iron	44200 mg/kg-dry		SHF	ICP
7439-92-1	Lead	305 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	744 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.20 mg/kg-dry		SCM	CVA
7440-22-4	Silver	8.2 mg/kg-dry		SHF	ICP
7440-32-6	Titanium	4540 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	528 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/18/89
13:18:39

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-8
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2281
ARI sample number: U

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	80000 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	12.0 mg/kg-dry		SHF	ICP
7439-89-6	Iron	36000 mg/kg-dry		SHF	ICP
7439-92-1	Lead	67 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	643 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.06 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	3710 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	135 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/18/89
13:18:53

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-24
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2281
ARI sample number: V

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	78200 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	16.1 mg/kg-dry		SHF	ICP
7439-89-6	Iron	38300 mg/kg-dry		SHF	ICP
7439-92-1	Lead	90 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	726 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.07 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	3880 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	153 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/18/89
13:19:07

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-32
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2281
ARI sample number: W

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	76900 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	15.5 mg/kg-dry		SHF	ICP
7439-89-6	Iron	38500 mg/kg-dry		SHF	ICP
7439-92-1	Lead	78 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	741 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.48 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	3850 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	146 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/18/89
13:19:34

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-33
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2281
ARI sample number: X

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	76500 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	20.4 mg/kg-dry		SHF	ICP
7439-89-6	Iron	39100 mg/kg-dry		SHF	ICP
7439-92-1	Lead	130 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	732 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.12 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	3990 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	199 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/18/89
13:19:49

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-34
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2281
ARI sample number: Y

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	77000 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.1 mg/kg-dry		SHF	ICP
7440-50-8	Copper	16.7 mg/kg-dry		SHF	ICP
7439-89-6	Iron	38900 mg/kg-dry		SHF	ICP
7439-92-1	Lead	99 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	715 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.07 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	3920 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	186 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/18/89
13:16:29

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number:
Description: METHOD BLANK
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2281
ARI sample number: MB

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	18 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	1.0 mg/kg-dry	L	SHF	ICP
7439-89-6	Iron	32.7 mg/kg-dry		SHF	ICP
7439-92-1	Lead	16 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	0.5 mg/kg-dry	L	SHF	ICP
7439-97-6	Mercury	0.05 mg/kg-dry	L	SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	2.5 mg/kg-dry	L	SHF	ICP
7440-66-6	Zinc	2.0 mg/kg-dry	L	SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/18/89
13:17:55

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: NBS 1646
Description: ESTUARY SEDIMENT
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2281
ARI sample number: REF

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	58800 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	17.4 mg/kg-dry		SHF	ICP
7439-89-6	Iron	32300 mg/kg-dry		SHF	ICP
7439-92-1	Lead	43 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	340 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.08 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	2590 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	111 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/18/89
13:14:49

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: USGS G2
Description: GRANITE
Sampled: / /
Matrix: ROCK

ARI job number: 2281
ARI sample number: G2

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	79000 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	9.6 mg/kg-dry		SHF	ICP
7439-89-6	Iron	17300 mg/kg-dry		SHF	ICP
7439-92-1	Lead	42 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	236 mg/kg-dry		SHF	ICP
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	2290 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	76.6 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.

Results of NBS 1646 Estuarine Sediment Analysis

Client: URS

ARI Sample number: 2281 REF

Units: mg/kg-dry

ANALYTE	FOUND	CERTIFIED VALUE	RECOVERY
Aluminum	58800	62500 ± 2000	94.08
Cadmium	< 1	0.36 ± 0.07	
Copper	17.4	18 ± 3	96.67
Iron	32300	33500 ± 1000	96.42
Lead	43	28.2 ± 1.8	152.48
Manganese	340	375 ± 20	90.67
Mercury	0.08	0.063 ± 0.012	126.98
Zinc	111	138 ± 6	80.43

RECOVERY = Percent Recovery

ANALYTICAL RESOURCES, INC.

Results of USGS G-2 Granite Rock Standard

Client: URS

ARI Sample number: 2281 G2

Units: mg/kg-dry

ANALYTE	FOUND	RECOMMENDED VALUE	RECOVERY
Aluminum	79000	81480	96.96
Cadmium	< 1	0.039	
Copper	9.6	11.7	82.05
Iron	17300	18500	93.51
Lead	42	31.2	134.62
Manganese	236	260	90.77
Titanium	2290	2780	82.37
Zinc	76.6	85	90.12

RECOVERY = Percent Recovery

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/18/89
13:19:21

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: USGS W2
Description: DIABASE
Sampled: / /
Matrix: ROCK

ARI job number: 2281
ARI sample number: W2

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	76400 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	105 mg/kg-dry		SHF	ICP
7439-89-6	Iron	67300 mg/kg-dry		SHF	ICP
7439-92-1	Lead	21 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	1180 mg/kg-dry		SHF	ICP
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	4960 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	64.9 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.

Results of USGS W-2 Diabase Rock Standard

Client: URS

ARI Sample number: 2281 W2

Units: mg/kg-dry

ANALYTE	FOUND	RECOMMENDED VALUE	RECOVERY
Aluminum	76400	81740 ± 850	93.47
Cadmium	< 1	3.1 (EST)	
Copper	105	106.2 ± 4.88	98.87
Iron	67300	75540 ± 1450	89.09
Lead	21	37.56 (EST)	55.91
Manganese	1180	1290 ± 30	91.47
Silver	< 1.5	0.048 (EST)	
Titanium	4960	6367 ± 78	77.90
Zinc	64.9	79.6 ± 2.3	81.53

RECOVERY = Percent Recovery

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, Wa 98109-5187
(206) 621-6490

19 January 1989

Jim Cronin
Steffen, Robertson & Kirsten
100 Shorline Way
Suite A210
Mill Valley, CA 94941

RE: ARI Project Nos. 2330,2281,2357,2322.

Dear Jim:

Please find enclosed your data for ARI projects Nos. 2330,2281,2357,2322.

If you have any questions or need additional information, please feel free to call any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

David R. Mitchell

David R. Mitchell
Project Manager

DRM/cd

enclosures

cc: file #2330,2281,2357,2322.

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, Wa 98109-5187
(206)621-6490

EXPLANATIONS OF INORGANIC DATA REPORT CODES

THE COLUMNS LABELED 'PREP', 'C', AND 'M' CONTAIN IMPORTANT INFORMATION ABOUT YOUR ANALYSES. THE CODES ARE DEFINED BELOW.

PREP CODES

THE 3-LETTER CODES IN THIS COLUMN ARE USED TO DESCRIBE THE METHOD USED TO PREPARE THE SAMPLE FOR ANALYSIS.

THE FIRST LETTER OF THE CODE STANDS FOR THE MATRIX TYPE OR THE FRACTION OF THE SAMPLE THAT IS BEING ANALYZED:

- D = THE DISSOLVED FRACTION OF A SAMPLE (FILTERED THROUGH A 0.45 μ MEMBRANE FILTER.)
- E = THE EP TOXICITY FRACTION OF A SAMPLE.
- F = A PROCEDURE FOR DIGESTING FISH, OR OTHER TISSUE.
- O = A DIGESTION OF AN OIL, GREASE, OR TAR.
- R = A WATER SAMPLE PREPARED BY A 'TOTAL RECOVERABLE' DIGESTION.
- S = A DIGESTION OF A SOIL OR SEDIMENT SAMPLE.
- T = A WATER SAMPLE PREPARED BY A 'TOTAL' DIGESTION.
- W = A SAMPLE ANALYZED WITHOUT ANY PREPARATION.

THE MIDDLE LETTER OF THE CODE RELATES TO THE SOURCE OF THE PROCEDURE.

- A = A METHOD DEVELOPED BY ARI.
- C = THE USEPA CLP PROGRAM STATEMENT OF WORK.
- E = THE USEPA 1979 WATER AND WASTEWATER MANUAL.
- M = A COMMON PROCEDURE FOUND IN A MANY SOURCES.
- P = THE PUGET SOUND ESTUARY PROTOCOLS.
- S = STANDARD METHODS.
- W = THE USEPA SW-846 SOLID WASTE MANUAL.

THE LAST LETTER OF THE PREPARATION CODE REFERS EITHER TO THE FINAL MATRIX OF THE PREPARED SAMPLE OR TO A SPECIALIZED USE OF THE PROCEDURE.

- A = A PROCEDURE FOR ARSENIC AND SELENIUM ANALYSIS ONLY.
- C = A HYDROCHLORIC ACID MATRIX.
- F = A HYDROFLUORIC ACID DIGESTION.
- M = A PROCEDURE FOR MERCURY ANALYSIS ONLY.
- N = A NITRIC ACID MATRIX.
- P = A PERCHLORIC ACID DIGESTION.
- R = A SPECIAL 'SOFT' DIGESTION OF A SOLID.

C CODES

THESE CODES ARE USED TO QUALIFY THE REPORTED CONCENTRATIONS. A CODE OF 'L' MEANS NO ANALYTE WAS DETECTED AT THE REPORTED CONCENTRATION LEVEL.

M CODES

THESE CODES SIGNIFY THE TYPE OF INSTRUMENTAL TECHNIQUE USED WHEN ANALYZING THE SAMPLES. THE CODES ARE DEFINED BELOW:

- CVA = COLD VAPOR AAS
- FLA = FLAME AAS
- GFA = GRAPHITE FURNACE AAS
- ICP = ICP-AES

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/19/89
09:13:07

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-51
Description:
Sampled: 12/04/88
Matrix: SEDIMENT

ARI job number: 2330
ARI sample number: A

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	115 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	235 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/19/89
09:13:12

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-52
Description:
Sampled: 12/04/88
Matrix: SEDIMENT

ARI job number: 2330
ARI sample number: B

Released by: NAW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	147 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	243 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/19/89
09:13:17

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-53
Description:
Sampled: 12/04/88
Matrix: SEDIMENT

ARI job number: 2330
ARI sample number: C

Released by: NAW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7439-92-1	Lead	224 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	405 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/19/89
09:13:22

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-54A
Description:
Sampled: 12/04/88
Matrix: SEDIMENT

ARI job number: 2330
ARI sample number: D

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-43-9	Cadmium	15.5 mg/kg-dry		SHF	ICP
7440-50-8	Copper	232 mg/kg-dry		SHF	ICP
7439-92-1	Lead	5190 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	4.77 mg/kg-dry		SCM	CVA
7440-22-4	Silver	4.6 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	10500 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/19/89
09:13:52

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-54B
Description:
Sampled: 12/04/88
Matrix: SEDIMENT

ARI job number: 2330
ARI sample number: E

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-43-9	Cadmium	16.3 mg/kg-dry		SHF	ICP
7440-50-8	Copper	245 mg/kg-dry		SHF	ICP
7439-92-1	Lead	4650 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	6.39 mg/kg-dry		SCM	CVA
7440-22-4	Silver	2.8 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	11100 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/19/89
09:14:02

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-56A
Description:
Sampled: 12/04/88
Matrix: SEDIMENT

ARI job number: 2330
ARI sample number: F

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-43-9	Cadmium	5.2 mg/kg-dry		SHF	ICP
7440-50-8	Copper	102 mg/kg-dry		SHF	ICP
7439-92-1	Lead	1980 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	1.62 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-66-6	Zinc	3740 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/19/89
09:14:12

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-56B
Description:
Sampled: 12/04/88
Matrix: SEDIMENT

ARI job number: 2330
ARI sample number: G

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-43-9	Cadmium	7.9 mg/kg-dry		SHF	ICP
7440-50-8	Copper	171 mg/kg-dry		SHF	ICP
7439-92-1	Lead	3790 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	2.74 mg/kg-dry		SCM	CVA
7440-22-4	Silver	2.0 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	5530 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/19/89
09:14:30

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number:
Description: METHOD BLANK
Sampled: 12/06/88
Matrix: SEDIMENT

ARI job number: 2330
ARI sample number: MB

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	1.0 mg/kg-dry	L	SHF	ICP
7439-92-1	Lead	16 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.05 mg/kg-dry	L	SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-66-6	Zinc	2.0 mg/kg-dry	L	SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/19/89
09:14:39

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: NBS 1646
Description: ESTUARY SEDIMENT
Sampled: 12/06/88
Matrix: SEDIMENT

ARI job number: 2330
ARI sample number: REF

Released by: NEW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	16.6 mg/kg-dry		SHF	ICP
7439-92-1	Lead	44 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.07 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-66-6	Zinc	110 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/19/89
09:14:21

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: USGS G-2
Description: GRANITE
Sampled: / /
Matrix: ROCK

ARI job number: 2330
ARI sample number: G2

Released by: NAW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	8.3 mg/kg-dry		SHF	ICP
7439-92-1	Lead	41 mg/kg-dry		SHF	ICP
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-66-6	Zinc	75.1 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/19/89
09:14:49

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: USGS W-2
Description: DIABASE
Sampled: / /
Matrix: ROCK

ARI job number: 2330
ARI sample number: W2

Released by: MRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	108 mg/kg-dry		SHF	ICP
7439-92-1	Lead	17 mg/kg-dry		SHF	ICP
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-66-6	Zinc	68.1 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.

Results of Quality Control Matrix Spike Analysis

Client: URS

Sample Identification: 2330 D

Units: mg/kg-dry

ANALYTE	ORIGINAL SAMPLE	C	SPIKED SAMPLE	C	AMOUNT ADDED	PERCENT RECOVERY
Cadmium	15.5		38.9		25	93.6
Copper	232		351		125	95.2
Lead	5190		5460		250	108.0
Mercury	4.77		5.18		0.75	
Silver	4.6		26.1		25	86.0
Zinc	10500		10400		250	

ANALYTICAL RESOURCES, INC.

Results of NBS 1646 Estuarine Sediment Analysis

Client: URS

ARI Sample number: 2330 REF

Units: mg/kg-dry

ANALYTE	FOUND	CERTIFIED VALUE	RECOVERY
Cadmium	< 1	0.36 ± 0.07	#VALUE!
Copper	16.6	18 ± 3	92.22
Lead	44	28.2 ± 1.8	156.03
Mercury	0.07	0.063 ± 0.012	111.11
Zinc	110	138 ± 6	79.71

RECOVERY = Percent Recovery

ANALYTICAL RESOURCES, INC.

Results of USGS G-2 Granite Rock Standard

Client: URS

ARI Sample number: 2330 G2

Units: mg/kg-dry

ANALYTE	FOUND	RECOMMENDED VALUE	RECOVERY
Cadmium	< 1	0.039	
Copper	8.3	11.7	70.94
Lead	41	31.2	131.41
Silver	< 1.5	0.049 (EST)	
Zinc	75.1	85	88.35

RECOVERY = Percent Recovery

ANALYTICAL RESOURCES, INC.

Results of USGS W-2 Diabase Rock Standard

Client: URS

ARI Sample number: 2330 W2

Units: mg/kg-dry

ANALYTE	FOUND	RECOMMENDED VALUE	RECOVERY
Cadmium	< 1	3.1 (EST)	
Copper	108	106.2 ± 4.88	101.69
Lead	17	37.56 (EST)	45.26
Silver	< 1.5	0.048 (EST)	
Zinc	68.1	79.6 ± 2.3	85.55

RECOVERY = Percent Recovery

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, Wa 98109-5187
(206) 621-6490

4 January 1989

Jim Cronin
Steffen, Robertson & Kirsten
100 Shorline Way
Suite A210
Mill Valley, CA 94941

RE: ARI Project No. 2259

Dear Jim:

Please find enclosed the preliminary Inorganic Laboratory Data Reports For Job # 2259. The highlighted values in these reports will be re-analyzed on the graphite furnace.

If you have any questions or need additional information, please feel free to call any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

Norman R. Wells
Inorganics Manager

NRW/cd

enclosures

cc: file #022559

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, Wa 98109-5187
(206)621-6490

EXPLANATIONS OF INORGANIC DATA REPORT CODES

THE COLUMNS LABELED 'PREP', 'C', AND 'M' CONTAIN IMPORTANT INFORMATION ABOUT YOUR ANALYSES. THE CODES ARE DEFINED BELOW.

PREP CODES

THE 3-LETTER CODES IN THIS COLUMN ARE USED TO DESCRIBE THE METHOD USED TO PREPARE THE SAMPLE FOR ANALYSIS.

THE FIRST LETTER OF THE CODE STANDS FOR THE MATRIX TYPE OR THE FRACTION OF THE SAMPLE THAT IS BEING ANALYZED:

D = THE DISSOLVED FRACTION OF A SAMPLE (FILTERED THROUGH A 0.45 μ MEMBRANE FILTER.)
E = THE EP TOXICITY FRACTION OF A SAMPLE.
F = A PROCEDURE FOR DIGESTING FISH, OR OTHER TISSUE.
O = A DIGESTION OF AN OIL, GREASE, OR TAR.
R = A WATER SAMPLE PREPARED BY A 'TOTAL RECOVERABLE' DIGESTION.
S = A DIGESTION OF A SOIL OR SEDIMENT SAMPLE.
T = A WATER SAMPLE PREPARED BY A 'TOTAL' DIGESTION.
W = A SAMPLE ANALYZED WITHOUT ANY PREPARATION.

THE MIDDLE LETTER OF THE CODE RELATES TO THE SOURCE OF THE PROCEDURE.

A = A METHOD DEVELOPED BY ARI.
C = THE USEPA CLP PROGRAM STATEMENT OF WORK.
E = THE USEPA 1979 WATER AND WASTEWATER MANUAL.
M = A COMMON PROCEDURE FOUND IN A MANY SOURCES.
P = THE PUGET SOUND ESTUARY PROTOCOLS.
S = STANDARD METHODS.
W = THE USEPA SW-846 SOLID WASTE MANUAL.

THE LAST LETTER OF THE PREPARATION CODE REFERS EITHER TO THE FINAL MATRIX OF THE PREPARED SAMPLE OR TO A SPECIALIZED USE OF THE PROCEDURE.

A = A PROCEDURE FOR ARSENIC AND SELENIUM ANALYSIS ONLY.
C = A HYDROCHLORIC ACID MATRIX.
F = A HYDROFLUORIC ACID DIGESTION.
M = A PROCEDURE FOR MERCURY ANALYSIS ONLY.
N = A NITRIC ACID MATRIX.
P = A PERCHLORIC ACID DIGESTION.
R = A SPECIAL 'SOFT' DIGESTION OF A SOLID.

C CODES

THESE CODES ARE USED TO QUALIFY THE REPORTED CONCENTRATIONS. A CODE OF 'L' MEANS NO ANALYTE WAS DETECTED AT THE REPORTED CONCENTRATION LEVEL.

M CODES

THESE CODES SIGNIFY THE TYPE OF INSTRUMENTAL TECHNIQUE USED WHEN ANALYZING THE SAMPLES. THE CODES ARE DEFINED BELOW:

CVA = COLD VAPOR AAS
FLA = FLAME AAS
GFA = GRAPHITE FURNACE AAS
ICP = ICP-AES

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
08:13:38

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-28
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2271
ARI sample number: A

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	80300 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	2.1 mg/kg-dry		SHF	ICP
7440-50-8	Copper	49.5 mg/kg-dry		SHF	ICP
7439-89-6	Iron	44800 mg/kg-dry		SHF	ICP
7439-92-1	Lead	597 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	765 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.40 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	4340 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	1020 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
08:13:52

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-28
Description: LABORATORY DUPLICATE
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2271
ARI sample number: ADUP

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	73300 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.3 mg/kg-dry		SHF	ICP
7440-50-8	Copper	45.0 mg/kg-dry		SHF	ICP
7439-89-6	Iron	40600 mg/kg-dry		SHF	ICP
7439-92-1	Lead	549 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	703 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.30 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	3910 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	951 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
08:14:07

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-28
Description: MATRIX SPIKE
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2271
ARI sample number: ASPK

Released by: NAW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	81400 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	26.6 mg/kg-dry		SHF	ICP
7440-50-8	Copper	300 mg/kg-dry		SHF	ICP
7439-89-6	Iron	45900 mg/kg-dry		SHF	ICP
7439-92-1	Lead	830 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	1280 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.83 mg/kg-dry		SCM	CVA
7440-22-4	Silver	21.1 mg/kg-dry		SHF	ICP
7440-32-6	Titanium	5050 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	1430 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
08:14:23

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-27
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2271
ARI sample number: B

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	77600 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	29.0 mg/kg-dry		SHF	ICP
7439-89-6	Iron	39500 mg/kg-dry		SHF	ICP
7439-92-1	Lead	230 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	715 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.10 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	3820 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	468 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
08:14:38

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-26
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2271
ARI sample number: C

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	73000 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	24.1 mg/kg-dry		SHF	ICP
7439-89-6	Iron	34600 mg/kg-dry		SHF	ICP
7439-92-1	Lead	172 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	637 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.11 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	3360 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	323 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
08:14:53

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-22
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2271
ARI sample number: D

Released by: MRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	73000 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	14.3 mg/kg-dry		SHF	ICP
7439-89-6	Iron	28000 mg/kg-dry		SHF	ICP
7439-92-1	Lead	165 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	518 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.16 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	2710 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	225 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
08:15:07

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-25
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2271
ARI sample number: E

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	75300 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	21.9 mg/kg-dry		SHF	ICP
7439-89-6	Iron	39300 mg/kg-dry		SHF	ICP
7439-92-1	Lead	124 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	692 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.14 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	3870 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	219 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
08:15:22

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-42
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2271
ARI sample number: F

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	71000 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	15.8 mg/kg-dry		SHF	ICP
7439-89-6	Iron	32500 mg/kg-dry		SHF	ICP
7439-92-1	Lead	88 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	586 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.09 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	3200 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	162 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
08:15:36

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-23
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2271
ARI sample number: G

Released by: MRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	73900 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	14.3 mg/kg-dry		SHF	ICP
7439-89-6	Iron	35300 mg/kg-dry		SHF	ICP
7439-92-1	Lead	60 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	656 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.05 mg/kg-dry	L	SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	3500 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	124 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
08:15:51

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-59
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2271
ARI sample number: H

Released by: HRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	77000 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	15.3 mg/kg-dry		SHF	ICP
7439-89-6	Iron	45800 mg/kg-dry		SHF	ICP
7439-92-1	Lead	46 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	790 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.08 mg/kg-dry	L	SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	4500 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	140 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
08:16:05

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-60
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2271
ARI sample number: I

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	74800 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	15.5 mg/kg-dry		SHF	ICP
7439-89-6	Iron	43800 mg/kg-dry		SHF	ICP
7439-92-1	Lead	47 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	760 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.06 mg/kg-dry	L	SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	4330 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	134 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
08:16:20

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-61
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2271
ARI sample number: J

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	74400 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	14.9 mg/kg-dry		SHF	ICP
7439-89-6	Iron	43600 mg/kg-dry		SHF	ICP
7439-92-1	Lead	46 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	759 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.07 mg/kg-dry	L	SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	4290 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	135 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
08:16:34

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-62
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2271
ARI sample number: K

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	75500 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	14.8 mg/kg-dry		SHF	ICP
7439-89-6	Iron	45000 mg/kg-dry		SHF	ICP
7439-92-1	Lead	49 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	779 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.07 mg/kg-dry	L	SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	4420 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	136 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
08:16:48

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-63
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2271
ARI sample number: L

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	72200 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	14.5 mg/kg-dry		SHF	ICP
7439-89-6	Iron	42600 mg/kg-dry		SHF	ICP
7439-92-1	Lead	46 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	741 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.06 mg/kg-dry	L	SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	4150 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	129 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
08:17:03

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-64
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2271
ARI sample number: M

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	77400 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	16.7 mg/kg-dry		SHF	ICP
7439-89-6	Iron	46600 mg/kg-dry		SHF	ICP
7439-92-1	Lead	48 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	801 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.06 mg/kg-dry	L	SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	4630 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	139 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
08:17:31

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-66
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2271
ARI sample number: N

Released by: NEW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	77800 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	11.8 mg/kg-dry		SHF	ICP
7439-89-6	Iron	41800 mg/kg-dry		SHF	ICP
7439-92-1	Lead	27 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	747 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.06 mg/kg-dry	L	SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	4240 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	103 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
08:17:46

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-68
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2271
ARI sample number: O

Released by: MRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	76800 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	11.3 mg/kg-dry		SHF	ICP
7439-89-6	Iron	42000 mg/kg-dry		SHF	ICP
7439-92-1	Lead	23 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	742 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.05 mg/kg-dry	L	SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	4190 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	104 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
08:18:00

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-1
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2271
ARI sample number: P

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	72700 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	3.8 mg/kg-dry		SHF	ICP
7440-50-8	Copper	78.5 mg/kg-dry		SHF	ICP
7439-89-6	Iron	38600 mg/kg-dry		SHF	ICP
7439-92-1	Lead	1320 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	639 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	1.19 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	3630 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	2300 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
08:18:15

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-50
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2271
ARI sample number: Q

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	70900 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.0 mg/kg-dry		SHF	ICP
7440-50-8	Copper	21.7 mg/kg-dry		SHF	ICP
7439-89-6	Iron	38000 mg/kg-dry		SHF	ICP
7439-92-1	Lead	1270 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	608 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	1.47 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	3640 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	626 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
08:18:29

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-52
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2271
ARI sample number: R

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	70000 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	3.6 mg/kg-dry		SHF	ICP
7440-50-8	Copper	83.7 mg/kg-dry		SHF	ICP
7439-89-6	Iron	38900 mg/kg-dry		SHF	ICP
7439-92-1	Lead	1450 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	631 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	1.39 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	3660 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	2420 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
08:18:59

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-65
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2271
ARI sample number: S

Released by: NAW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	78200 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	11.8 mg/kg-dry		SHF	ICP
7439-89-6	Iron	42700 mg/kg-dry		SHF	ICP
7439-92-1	Lead	28 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	754 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.06 mg/kg-dry	L	SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	4310 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	109 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
08:19:13

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-67
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2271
ARI sample number: T

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	76300 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	10.3 mg/kg-dry		SHF	ICP
7439-89-6	Iron	40600 mg/kg-dry		SHF	ICP
7439-92-1	Lead	32 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	723 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.05 mg/kg-dry	L	SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	4090 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	100 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
08:19:28

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-69
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2271
ARI sample number: U

Released by: MAW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	77100 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	11.0 mg/kg-dry		SHF	ICP
7439-89-6	Iron	41900 mg/kg-dry		SHF	ICP
7439-92-1	Lead	28 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	744 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.08 mg/kg-dry	L	SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	4230 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	104 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
08:19:42

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-70
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2271
ARI sample number: V

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	75300 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	11.0 mg/kg-dry		SHF	ICP
7439-89-6	Iron	40600 mg/kg-dry		SHF	ICP
7439-92-1	Lead	31 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	725 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.06 mg/kg-dry	L	SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	4070 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	102 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
08:19:57

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-31
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2271
ARI sample number: W

Released by: NAW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	73800 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	19.6 mg/kg-dry		SHF	ICP
7439-89-6	Iron	35100 mg/kg-dry		SHF	ICP
7439-92-1	Lead	121 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	627 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.16 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	3430 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	257 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
08:20:11

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: RINSATE #2
Description:
Sampled: / /
Matrix: WATER

ARI job number: 2271
ARI sample number: X

Released by: _____

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	0.11 mg/L		WMN	ICP
7440-43-9	Cadmium	0.002 mg/L	L	WMN	ICP
7440-50-8	Copper	0.006 mg/L		WMN	ICP
7439-89-6	Iron	0.215 mg/L		WMN	ICP
7439-92-1	Lead	0.03 mg/L	L	WMN	ICP
7439-96-5	Manganese	0.005 mg/L		WMN	ICP
7439-97-6	Mercury	0.0001 mg/L	L	TMM	CVA
7440-22-4	Silver	0.003 mg/L	L	WMN	ICP
7440-32-6	Titanium	0.016 mg/L		WMN	ICP
7440-66-6	Zinc	0.026 mg/L		WMN	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
08:17:17

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number:
Description: METHOD BLANK
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2271
ARI sample number: MB

Released by: MAW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	15 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	1.0 mg/kg-dry	L	SHF	ICP
7439-89-6	Iron	25.9 mg/kg-dry		SHF	ICP
7439-92-1	Lead	18 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	0.5 mg/kg-dry	L	SHF	ICP
7439-97-6	Mercury	0.05 mg/kg-dry	L	SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	2.5 mg/kg-dry	L	SHF	ICP
7440-66-6	Zinc	2.0 mg/kg-dry	L	SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
08:18:44

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: NBS 1646
Description: ESTUARY SEDIMENT
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2271
ARI sample number: REF

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	54000 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	15.5 mg/kg-dry		SHF	ICP
7439-89-6	Iron	29600 mg/kg-dry		SHF	ICP
7439-92-1	Lead	36 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	308 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.08 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	2370 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	104 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.

Results of Quality Control Duplicate Analysis

Client: URS

Sample Identification: 2271 A

Units: mg/kg-dry

ANALYTE	ORIGINAL SAMPLE	C	DUPLICATE ANALYSIS	C	RELATIVE PERCENT DIFFERENCE
Aluminum	80300		73300		9.1
Cadmium	2.1		1.3	L	47.1
Copper	49.5		45		9.5
Iron	44800		40600		9.8
Lead	597		549		8.4
Manganese	765		703		8.4
Mercury	0.4		0.3		28.6
Silver	1.5	L	1.5	L	0.0
Titanium	4340		3910		10.4
Zinc	1020		951		7.0

ANALYTICAL RESOURCES, INC.

Results of Quality Control Matrix Spike Analysis

Client: URS

Sample Identification: 2271 A

Units: mg/kg-dry

ANALYTE	ORIGINAL SAMPLE	C	SPIKED SAMPLE	C	AMOUNT ADDED	PERCENT RECOVERY
Cadmium	2.1		26.6		25	98.0
Copper	49.5		300		250	100.2
Lead	597		830		250	93.2
Manganese	765		1280		500	103.0
Mercury	0.4		0.83		0.493	87.2
Silver	0		21.1		25	84.4
Titanium	4340		5050		500	
Zinc	1020		1430		500	82.0

ANALYTICAL RESOURCES, INC.

Results of NBS 1646 Estuarine Sediment Analysis

Client: URS

ARI Sample number: 2271 REF

Units: mg/kg-dry

ANALYTE	FOUND	CERTIFIED VALUE	RECOVERY
Aluminum	54000	62500 ± 2000	86.40
Cadmium	< 1	0.36 ± 0.07	
Copper	15.5	18 ± 3	86.11
Iron	29600	33500 ± 1000	88.36
Lead	36	28.2 ± 1.8	127.66
Manganese	308	375 ± 20	82.13
Mercury	0.08	0.063 ± 0.012	126.98
Zinc	104	138 ± 6	75.36

RECOVERY = Percent Recovery

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, Wa 98109-5187
(206)621-6490

EXPLANATIONS OF INORGANIC DATA REPORT CODES

THE COLUMNS LABELED 'PREP', 'C', AND 'M' CONTAIN IMPORTANT INFORMATION ABOUT YOUR ANALYSES. THE CODES ARE DEFINED BELOW.

PREP CODES

THE 3-LETTER CODES IN THIS COLUMN ARE USED TO DESCRIBE THE METHOD USED TO PREPARE THE SAMPLE FOR ANALYSIS.

THE FIRST LETTER OF THE CODE STANDS FOR THE MATRIX TYPE OR THE FRACTION OF THE SAMPLE THAT IS BEING ANALYZED:

- D = THE DISSOLVED FRACTION OF A SAMPLE (FILTERED THROUGH A 0.45 μ MEMBRANE FILTER.)
- E = THE EP TOXICITY FRACTION OF A SAMPLE.
- F = A PROCEDURE FOR DIGESTING FISH, OR OTHER TISSUE.
- O = A DIGESTION OF AN OIL, GREASE, OR TAR.
- R = A WATER SAMPLE PREPARED BY A 'TOTAL RECOVERABLE' DIGESTION.
- S = A DIGESTION OF A SOIL OR SEDIMENT SAMPLE.
- T = A WATER SAMPLE PREPARED BY A 'TOTAL' DIGESTION.
- W = A SAMPLE ANALYZED WITHOUT ANY PREPARATION.

THE MIDDLE LETTER OF THE CODE RELATES TO THE SOURCE OF THE PROCEDURE.

- A = A METHOD DEVELOPED BY ARI.
- C = THE USEPA CLP PROGRAM STATEMENT OF WORK.
- E = THE USEPA 1979 WATER AND WASTEWATER MANUAL.
- M = A COMMON PROCEDURE FOUND IN A MANY SOURCES.
- P = THE PUGET SOUND ESTUARY PROTOCOLS.
- S = STANDARD METHODS.
- W = THE USEPA SW-846 SOLID WASTE MANUAL.

THE LAST LETTER OF THE PREPARATION CODE REFERS EITHER TO THE FINAL MATRIX OF THE PREPARED SAMPLE OR TO A SPECIALIZED USE OF THE PROCEDURE.

- A = A PROCEDURE FOR ARSENIC AND SELENIUM ANALYSIS ONLY.
- C = A HYDROCHLORIC ACID MATRIX.
- F = A HYDROFLUORIC ACID DIGESTION.
- M = A PROCEDURE FOR MERCURY ANALYSIS ONLY.
- N = A NITRIC ACID MATRIX.
- P = A PERCHLORIC ACID DIGESTION.
- R = A SPECIAL 'SOFT' DIGESTION OF A SOLID.

C CODES

THESE CODES ARE USED TO QUALIFY THE REPORTED CONCENTRATIONS. A CODE OF 'L' MEANS NO ANALYTE WAS DETECTED AT THE REPORTED CONCENTRATION LEVEL.

M CODES

THESE CODES SIGNIFY THE TYPE OF INSTRUMENTAL TECHNIQUE USED WHEN ANALYZING THE SAMPLES. THE CODES ARE DEFINED BELOW:

- CVA = COLD VAPOR AAS
- FLA = FLAME AAS
- GFA = GRAPHITE FURNACE AAS
- ICP = ICP-AES

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
07:54:56

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-7
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2259
ARI sample number: A

Released by: NEW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	75300 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	48.6 mg/kg-dry		SHF	ICP
7439-89-6	Iron	39100 mg/kg-dry		SHF	ICP
7439-92-1	Lead	522 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	699 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.78 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	3780 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	985 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
07:55:53

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-7
Description: LABORATORY DUPLICATE
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2259
ARI sample number: ADUP

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	76000 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	57.9 mg/kg-dry		SHF	ICP
7439-89-6	Iron	39600 mg/kg-dry		SHF	ICP
7439-92-1	Lead	523 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	697 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.81 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	3890 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	960 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
07:56:08

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-7
Description: MATRIX SPIKE
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2259
ARI sample number: ASPK

Released by: MW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	74700 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	23.9 mg/kg-dry		SHF	ICP
7440-50-8	Copper	308 mg/kg-dry		SHF	ICP
7439-89-6	Iron	40600 mg/kg-dry		SHF	ICP
7439-92-1	Lead	782 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	1180 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	1.54 mg/kg-dry		SCM	CVA
7440-22-4	Silver	21.5 mg/kg-dry		SHF	ICP
7440-32-6	Titanium	4530 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	1220 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
07:56:23

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-6
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2259
ARI sample number: B

Released by: MRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	72900 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	22.1 mg/kg-dry		SHF	ICP
7439-89-6	Iron	39800 mg/kg-dry		SHF	ICP
7439-92-1	Lead	1020 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	697 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	1.24 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	3960 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	751 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
07:56:37

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-43
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2259
ARI sample number: C

Released by: RW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	70700 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	20.0 mg/kg-dry		SHF	ICP
7439-89-6	Iron	34500 mg/kg-dry		SHF	ICP
7439-92-1	Lead	1650 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	594 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	2.60 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	3430 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	1300 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
07:56:51

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-44
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2259
ARI sample number: D

Released by: MAW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	72300 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.2 mg/kg-dry		SHF	ICP
7440-50-8	Copper	59.1 mg/kg-dry		SHF	ICP
7439-89-6	Iron	40400 mg/kg-dry		SHF	ICP
7439-92-1	Lead	945 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	715 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	1.22 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	3980 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	1820 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
07:57:05

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-45
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2259
ARI sample number: E

Released by: RW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	73200 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.6 mg/kg-dry		SHF	ICP
7440-50-8	Copper	66.4 mg/kg-dry		SHF	ICP
7439-89-6	Iron	40800 mg/kg-dry		SHF	ICP
7439-92-1	Lead	1090 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	712 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	1.39 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	3940 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	2030 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
07:57:20

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-5
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2259
ARI sample number: F

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	74300 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.7 mg/kg-dry		SHF	ICP
7440-50-8	Copper	74.7 mg/kg-dry		SHF	ICP
7439-89-6	Iron	42700 mg/kg-dry		SHF	ICP
7439-92-1	Lead	1410 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	734 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	1.46 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	4130 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	2400 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
07:57:34

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-4
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2259
ARI sample number: G

Released by: NRW

A N A L Y T I C A L R E S\U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	69500 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	23.9 mg/kg-dry		SHF	ICP
7440-50-8	Copper	519 mg/kg-dry		SHF	ICP
7439-89-6	Iron	48800 mg/kg-dry		SHF	ICP
7439-92-1	Lead	28600 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	976 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	7.76 mg/kg-dry		SCM	CVA
7440-22-4	Silver	25.6 mg/kg-dry		SHF	ICP
7440-32-6	Titanium	4180 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	17400 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
07:57:48

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-3
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2259
ARI sample number: H

Released by: RW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	75900 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	6.7 mg/kg-dry		SHF	ICP
7440-50-8	Copper	134 mg/kg-dry		SHF	ICP
7439-89-6	Iron	41200 mg/kg-dry		SHF	ICP
7439-92-1	Lead	2680 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	730 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	2.61 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.6 mg/kg-dry		SHF	ICP
7440-32-6	Titanium	3920 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	4760 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
07:58:02

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-46
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2259
ARI sample number: I

Released by: RAW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	75100 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	10.7 mg/kg-dry		SHF	ICP
7440-50-8	Copper	180 mg/kg-dry		SHF	ICP
7439-89-6	Iron	37800 mg/kg-dry		SHF	ICP
7439-92-1	Lead	3120 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	693 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	3.45 mg/kg-dry		SCM	CVA
7440-22-4	Silver	2.6 mg/kg-dry		SHF	ICP
7440-32-6	Titanium	3520 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	7420 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
07:58:16

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-47
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2259
ARI sample number: J

Released by: RAW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	75700 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	7.0 mg/kg-dry		SHF	ICP
7440-50-8	Copper	133 mg/kg-dry		SHF	ICP
7439-89-6	Iron	44900 mg/kg-dry		SHF	ICP
7439-92-1	Lead	3090 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	759 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	2.88 mg/kg-dry		SCM	CVA
7440-22-4	Silver	2.0 mg/kg-dry		SHF	ICP
7440-32-6	Titanium	4280 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	4960 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
07:58:31

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-48
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2259
ARI sample number: K

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	74600 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	6.7 mg/kg-dry		SHF	ICP
7440-50-8	Copper	132 mg/kg-dry		SHF	ICP
7439-89-6	Iron	42900 mg/kg-dry		SHF	ICP
7439-92-1	Lead	2930 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	714 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	3.24 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.8 mg/kg-dry		SHF	ICP
7440-32-6	Titanium	4090 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	4740 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
07:58:45

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-2
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2259
ARI sample number: L

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	74700 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	4.2 mg/kg-dry		SHF	ICP
7440-50-8	Copper	101 mg/kg-dry		SHF	ICP
7439-89-6	Iron	40000 mg/kg-dry		SHF	ICP
7439-92-1	Lead	1750 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	669 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	2.34 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	3790 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	3470 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
07:59:00

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: 4BT
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2259
ARI sample number: M

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	72000 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	21.2 mg/kg-dry		SHF	ICP
7440-50-8	Copper	349 mg/kg-dry		SHF	ICP
7439-89-6	Iron	44900 mg/kg-dry		SHF	ICP
7439-92-1	Lead	9900 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	780 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	6.50 mg/kg-dry		SCM	CVA
7440-22-4	Silver	8.1 mg/kg-dry		SHF	ICP
7440-32-6	Titanium	3880 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	15100 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
07:59:28

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-17
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2259
ARI sample number: N

Released by: MRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	77400 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.7 mg/kg-dry		SHF	ICP
7440-50-8	Copper	64.2 mg/kg-dry		SHF	ICP
7439-89-6	Iron	40600 mg/kg-dry		SHF	ICP
7439-92-1	Lead	1010 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	682 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	1.25 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	3910 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	1730 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
07:59:41

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-18
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2259
ARI sample number: O

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	75600 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	3.3 mg/kg-dry		SHF	ICP
7440-50-8	Copper	85.4 mg/kg-dry		SHF	ICP
7439-89-6	Iron	41600 mg/kg-dry		SHF	ICP
7439-92-1	Lead	1410 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	681 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	1.94 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	3970 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	2460 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
07:59:56

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-19
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2259
ARI sample number: P

Released by: MRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	76600 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	5.6 mg/kg-dry		SHF	ICP
7440-50-8	Copper	145 mg/kg-dry		SHF	ICP
7439-89-6	Iron	43800 mg/kg-dry		SHF	ICP
7439-92-1	Lead	2910 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	736 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	3.25 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.7 mg/kg-dry		SHF	ICP
7440-32-6	Titanium	4150 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	4590 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
08:00:10

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-20
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2259
ARI sample number: Q

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	77500 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	4.2 mg/kg-dry		SHF	ICP
7440-50-8	Copper	118 mg/kg-dry		SHF	ICP
7439-89-6	Iron	42200 mg/kg-dry		SHF	ICP
7439-92-1	Lead	1420 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	698 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	2.27 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	4060 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	3190 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
08:00:24

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-54
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2259
ARI sample number: R

Released by: IRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	76600 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	4.1 mg/kg-dry		SHF	ICP
7440-50-8	Copper	122 mg/kg-dry		SHF	ICP
7439-89-6	Iron	43200 mg/kg-dry		SHF	ICP
7439-92-1	Lead	1450 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	716 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	2.21 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	4110 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	3330 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
08:00:53

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-55
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2259
ARI sample number: S

Released by: RW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	77500 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	4.2 mg/kg-dry		SHF	ICP
7440-50-8	Copper	122 mg/kg-dry		SHF	ICP
7439-89-6	Iron	42100 mg/kg-dry		SHF	ICP
7439-92-1	Lead	1460 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	702 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	2.28 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	3980 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	3570 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
08:01:07

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-56
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2259
ARI sample number: T

Released by: RW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	77800 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	4.0 mg/kg-dry		SHF	ICP
7440-50-8	Copper	104 mg/kg-dry		SHF	ICP
7439-89-6	Iron	43300 mg/kg-dry		SHF	ICP
7439-92-1	Lead	1270 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	714 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	2.02 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	4150 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	3090 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
08:01:22

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-57
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2259
ARI sample number: U

Released by: RW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	74100 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	4.1 mg/kg-dry		SHF	ICP
7440-50-8	Copper	114 mg/kg-dry		SHF	ICP
7439-89-6	Iron	40500 mg/kg-dry		SHF	ICP
7439-92-1	Lead	1480 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	674 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	2.30 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	3830 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	3360 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
08:01:36

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-58
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2259
ARI sample number: V

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	77500 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.9 mg/kg-dry		SHF	ICP
7440-50-8	Copper	65.0 mg/kg-dry		SHF	ICP
7439-89-6	Iron	38600 mg/kg-dry		SHF	ICP
7439-92-1	Lead	807 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	657 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	1.06 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	3790 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	1780 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
08:01:50

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-19RS
Description:
Sampled: / /
Matrix: WATER

ARI job number: 2259
ARI sample number: W

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	0.05 mg/L		WMN	ICP
7440-43-9	Cadmium	0.002 mg/L	L	WMN	ICP
7440-50-8	Copper	0.002 mg/L	L	WMN	ICP
7439-89-6	Iron	0.120 mg/L		WMN	ICP
7439-92-1	Lead	0.03 mg/L	L	WMN	ICP
7439-96-5	Manganese	0.003 mg/L		WMN	ICP
7439-97-6	Mercury	0.0001 mg/L	L	TMM	CVA
7440-22-4	Silver	0.003 mg/L	L	WMN	ICP
7440-32-6	Titanium	0.006 mg/L		WMN	ICP
7440-66-6	Zinc	0.085 mg/L		WMN	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
07:55:09

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-30
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2259
ARI sample number: AA

Released by: NRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	77900 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	2.4 mg/kg-dry		SHF	ICP
7440-50-8	Copper	59.5 mg/kg-dry		SHF	ICP
7439-89-6	Iron	41600 mg/kg-dry		SHF	ICP
7439-92-1	Lead	894 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	689 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.89 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	4020 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	1880 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
07:55:24

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-29
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2259
ARI sample number: AB

Released by: RW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	78200 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	2.0 mg/kg-dry		SHF	ICP
7440-50-8	Copper	67.9 mg/kg-dry		SHF	ICP
7439-89-6	Iron	39800 mg/kg-dry		SHF	ICP
7439-92-1	Lead	1020 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	688 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	1.56 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	3820 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	1670 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
07:55:39

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: SKMS-21
Description:
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2259
ARI sample number: AC

Released by: MRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	77400 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.8 mg/kg-dry		SHF	ICP
7440-50-8	Copper	66.4 mg/kg-dry		SHF	ICP
7439-89-6	Iron	42000 mg/kg-dry		SHF	ICP
7439-92-1	Lead	830 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	725 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	1.37 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	4090 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	1630 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
07:59:14

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number:
Description: METHOD BLANK
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2259
ARI sample number: MB

Released by: RW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	15 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	1.0 mg/kg-dry	L	SHF	ICP
7439-89-6	Iron	21.3 mg/kg-dry		SHF	ICP
7439-92-1	Lead	13 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	0.5 mg/kg-dry	L	SHF	ICP
7439-97-6	Mercury	0.05 mg/kg-dry	L	SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	2.5 mg/kg-dry	L	SHF	ICP
7440-66-6	Zinc	2.0 mg/kg-dry	L	SHF	ICP

ANALYTICAL RESOURCES, INC.
Inorganic Laboratory Data Report
01/04/89
08:00:39

Client: URS
Contact: CHUCK BOATMAN
Project: BOWHEAD
ID number: NBS 1646
Description: ESTUARY SEDIMENT
Sampled: / /
Matrix: SEDIMENT

ARI job number: 2259
ARI sample number: REF

Released by: HRW

A N A L Y T I C A L R E S U L T S

CAS Number	Analyte	Concentration	C	Prep	M
7429-90-5	Aluminum	58200 mg/kg-dry		SHF	ICP
7440-43-9	Cadmium	1.0 mg/kg-dry	L	SHF	ICP
7440-50-8	Copper	16.0 mg/kg-dry		SHF	ICP
7439-89-6	Iron	32100 mg/kg-dry		SHF	ICP
7439-92-1	Lead	45 mg/kg-dry		SHF	ICP
7439-96-5	Manganese	334 mg/kg-dry		SHF	ICP
7439-97-6	Mercury	0.09 mg/kg-dry		SCM	CVA
7440-22-4	Silver	1.5 mg/kg-dry	L	SHF	ICP
7440-32-6	Titanium	2630 mg/kg-dry		SHF	ICP
7440-66-6	Zinc	113 mg/kg-dry		SHF	ICP

ANALYTICAL RESOURCES, INC.

Results of Quality Control Duplicate Analysis

Client: URS

Sample Identification: 2259 A

Units: mg/kg-dry

ANALYTE	ORIGINAL SAMPLE	C	DUPLICATE ANALYSIS	C	RELATIVE PERCENT DIFFERENCE
Aluminum	75300		76000		0.9
Cadmium	1	L	1	L	0.0
Copper	48.6		57.9		17.5
Iron	39100		39600		1.3
Lead	522		523		0.2
Manganese	699		697		0.3
Mercury	0.78		0.81		3.8
Silver	1.5	L	1.5	L	0.0
Titanium	3780		3890		2.9
Zinc	985		960		2.6

ANALYTICAL RESOURCES, INC.

Results of Quality Control Matrix Spike Analysis

Client: URS

Sample Identification: 2259 A

Units: mg/kg-dry

ANALYTE	ORIGINAL SAMPLE	C	SPIKED SAMPLE	C	AMOUNT ADDED	PERCENT RECOVERY
Cadmium	0		23.9		25	95.6
Copper	48.6		308		250	103.8
Lead	522		782		250	104.0
Manganese	699		1180		500	96.2
Mercury	0.78		1.54		0.704	108.0
Silver	0		21.5		25	86.0
Titanium	3780		4530		500	
Zinc	985		1220		250	94.0

ANALYTICAL RESOURCES, INC.

Results of NBS 1646 Estuarine Sediment Analysis

Client: URS

ARI Sample number: 2259 REF

Units: mg/kg-dry

ANALYTE	FOUND	CERTIFIED VALUE	RECOVERY
Aluminum	58200	62500 ± 2000	93.12
Cadmium	< 1	0.36 ± 0.07	
Copper	16	18 ± 3	88.89
Iron	32100	33500 ± 1000	95.82
Lead	45	28.2 ± 1.8	159.57
Manganese	334	375 ± 20	89.07
Mercury	0.09	0.063 ± 0.012	142.86
Zinc	113	138 ± 6	81.88

RECOVERY = Percent Recovery

ANALYTICAL RESOURCES INCORPORATED

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, Wa 98109-5187
(206) 621-6490

13 January 1989

Jim Cronin
Steffen, Robertson & Kirsten
100 Shorline Way
Suite A210
Mill Valley, CA 94941

RE: ARI Project Nos. 2259, 2271, 2281

Dear Jim:

Enclosed are the results of analyses for the Skagway project. Included are the data from GC-FID analysis from alkylbenzenes and coprosterol, the PSD determinations, the TOC analyses, and the Total Solids measurement.

Preliminary Metals data has been forwarded to you by Rocky Wells of our laberatory.

The data sheet for PSD labeled SKMS 49 is incorrectly labelled, the actual sample number for that data is SKMS 42. Personnel at our subcontractor misread the sample label.

If you have any questions or need additional information, please feel free to call any time.

Sincerely,

ANALYTICAL RESOURCES, INC.

David R Mitchell

David R. Mitchell
Project Manager

DRM/cd

enclosures

cc: file #2259, 2271, 2281
Dr. Chuck Boatman-URS Consultants

ANALYTICAL RESOURCES INCORPORATED

Analytical Chemists & Consultants

333 Ninth Ave. North
Seattle, Wa 98109-5187
(206) 621-6490

ORGANICS ANALYSIS DATA SHEET - METHOD 9060

Project: BOWHEAD

QC Report No: 2259-URS

Matrix: Waters

Date Received: 11/18/88

Date of Analysis: 01/05/89

Data Release Authorized: Bryan D. Anderson

REPORT PREPARED: MAC: C - M.L. 01/05/89

	Lab ID	Sample No	Sample Dilution	Detected ppm C ± Std Dev	% SD	TOC (ppm C) Dil*ppm Detected
1	Blank #1	System Blank	1 to 1	0.22 ± 0.008	3.6	0.22
2*	2259 W	SKMS-19RS	1 to 1	0.302 ± 0.017	5.6	0.30

QA/QC Runs:

	Cali. Check	5.0 ppm C (KHP)	1 to 1	5.068 ± 0.078	1.5	**% Duplication**
2*	2259 W Dup	SKMS-19RS Duplicate	1 to 1	0.327 ± 0.009	2.8	**92**

Calibration: One 5.0 ppm C calibration run each 15 samples [Potassium Hydrogen Phthalate]

Analysis performed with a Dohrman DC180 Analyzer in non-Purgeable Organic Carbon Mode, using the persulfate-UV oxidation method.

QA/QC: One "Cold Blank" and one system blank per calibration

Ten mls of sample is acidified with phosphoric acid and purged for 10 minutes. Four 1.0 ml aliquots of each sample are analyzed, and the average and standard deviation reported for each sample.

ANALYTICAL RESOURCES INCORPORATED

Analytical Chemists & Consultants

333 Ninth Ave. North
Seattle, Wa 98109-5187
(206) 621-6490

ORGANICS ANALYSIS DATA SHEET - Alkyl Benzenes & Coprostanol by GC-FID

Data Release Authorized: Peter M Kyle
Report Prepared 12/23/88 MAC: A

QC Report No: 2259 - URS
Project: Bowhead
Date Received: 11/18/88

Date of Analysis: 12/16/88
Instrument ID: 5890-FID II

Matrix: Soil/Sediments
Level: Low

Sample No.	Method Blank	SKMS-45	SKMS-17	SKMS-20	SKMS-54
ARI ID	2259/71MB	2259G	22590	22590	2259R
Dry Wt. Analyzed	30.00 gm	21.45 gm	22.27 gm	27.64 gm	29.84 gm
Percent Solids	NR	62.6%	66.2%	71.9%	72.0%
pH	NR	6.11	6.66	6.72	6.77
Dil/Conc. Factor	1:2	1:2	1:2	1:2	1:2
Units	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
C6- Alkyl Benzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
C8- Alkyl Benzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
C10- Alkyl Benzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
C12- Alkyl Benzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
C14- Alkyl Benzene	1.0 U	3.0 U	1.0 U	1.0 U	1.0 U
C16- Alkyl Benzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
C18- Alkyl Benzene	1.0 U	**5.5**	1.0 U	1.0 U	1.0 U
Coprostanol	1.0 U	**4.5**	**0.9 J**	**1.2**	**1.4**
Terphenyl (surrogate)	101%	113%	91%	97%	95%

Sample No.	SKMS-55	SKMS-56	SKMS-57	SKMS-58	SKMS-30
ARI ID	2259S	2259X	2259Y	2259Z	2259AA
Dry Wt. Analyzed	24.84 gm	25.67 gm	23.90 gm	23.03 gm	23.88 gm
Percent Solids	69.6%	75.2%	71.7%	73.1%	69.9%
pH	6.80	6.84	6.87	6.89	7.00
Dil/Conc. Factor	1:2	1:2	1:2	1:2	1:2
Units	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
C6- Alkyl Benzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
C8- Alkyl Benzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
C10- Alkyl Benzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
C12- Alkyl Benzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
C14- Alkyl Benzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
C16- Alkyl Benzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
C18- Alkyl Benzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Coprostanol	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Terphenyl (surrogate)	97%	94%	96%	97%	76%

U Indicates compound was analyzed for but not detected at the given detection limit.

J Indicates an estimated value when result is less than specified detection limit.

ANALYTICAL RESOURCES INCORPORATED

Analytical Chemists & Consultants

333 Ninth Ave. North
Seattle. Wa 98109-5187
(206) 621-6490

ORGANICS ANALYSIS DATA SHEET - METHOD 9060

Project: BOWHEAD

QC Report No: 2271-URS

Matrix: Waters

Date Received: 11/21/88

Date of Analysis: 01/05/89

Data Release Authorized: Bryan D. Anderson

REPORT PREPARED: MAC: C - M.L. 01/05/89

	Lab ID	Sample No	Sample Dilution	Detected ppm C ± Std Dev	% SD	TOC (ppm C) Dil*ppm Detected
1	Blank #1	System Blank	1 to 1	0.22 ± 0.008	3.6	0.22
2*	2271 X	Rinsate #2	1 to 1	0.604 ± 0.008	1.3	0.60

QA/QC Runs:

	Cali. Check	5.0 ppm C (KHP)	1 to 1	5.07 ± 0.078	1.5	**% Duplication**
2*	2271 X Dup	Rinsate #2 Duplicate	1 to 1	0.638 ± 0.019	3.0	**95**

Calibration: One 5.0 ppm C calibration run each 15 samples [Potassium Hydrogen Phthalate]

Analysis performed with a Dohrman DC180 Analyzer in non-Purgeable Organic Carbon Mode, using the persulfate-UV oxidation method.

QA/QC: One "Cold Blank" and one system blank per calibration

Ten mls of sample is acidified with phosphoric acid and purged for 10 minutes. Four 1.0 ml aliquots of each sample are analyzed, and the average and standard deviation reported for each sample.

ANALYTICAL RESOURCES INCORPORATED

Analytical Chemists & Consultants

333 Ninth Ave. North
Seattle, Wa 98109-5187
(206) 621-6490

ORGANICS ANALYSIS DATA SHEET - Alkyl Benzenes & Coprostanol by GC-FID

Data Release Authorized: Peter M. Kiegle
Report Prepared 12/23/88 MAC: A

QC Report No: 2271 - URS
Project: Bowhead
Date Received: 11/21/88

Date of Analysis: 12/16/88 &12/17/88
Instrument ID: 5890-FID II

Matrix: Soil/Sediments
Level: Low

Sample No.	Method Blank	SKMS-28	SKMS-27	SKMS-59	SKMS-60	SKMS-61
ARI ID	2259/71MB	2271A	2271B	2271H	2271I	2271J
Dry Wt. Analyzed	30.00 gm	28.37 gm	25.18 gm	23.32 gm	18.91 gm	19.03 gm
Percent Solids	NR	78.6%	78.5%	75.0%	60.3%	61.3%
pH	NR	7.04	7.42	7.12	7.43	7.25
Dil/Conc. Factor	1:2	1:2	1:2	1:2	1:2	1:2
Units	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
C6- Alkyl Benzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
C8- Alkyl Benzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
C10- Alkyl Benzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
C12- Alkyl Benzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
C14- Alkyl Benzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
C16- Alkyl Benzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
C18- Alkyl Benzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Coprostanol	1.0 U	**0.7 J**	1.0 U	1.0 U	1.0 U	1.0 U
Terphenyl (surrogate)	101%	91%	97%	97%	88%	89%

Sample No.	SKMS-61MS	SKMS-61MSD	SKMS-62	SKMS-63	SKMS-64	SKMS-31
ARI ID	2271JMS	2271JMSD	2271K	2271L	2271M	2271W
Dry Wt. Analyzed	18.57 gm	20.47 gm	19.25 gm	19.28 gm	14.92 gm	29.33 gm
Percent Solids	61.3%	61.3%	60.2%	63.1%	48.4%	72.3%
pH	7.25	7.25	7.49	7.29	7.77	7.54
Dil/Conc. Factor	1:2	1:2	1:2	1:2	1:2	1:2
Units	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
C6- Alkyl Benzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
C8- Alkyl Benzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
C10- Alkyl Benzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
C12- Alkyl Benzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
C14- Alkyl Benzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
C16- Alkyl Benzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
C18- Alkyl Benzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Coprostanol	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Terphenyl (surrogate)	95%	83%	91%	75%	92%	93%

U Indicates compound was analyzed for but not detected at the given detection limit.

J Indicates an estimated value when result is less than specified detection limit.

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TOC SEDIMENT ANALYSIS DATA SHEET - PUGET SOUND ESTUARY PROGRAM
PUGET SOUND PROTOCOL

PROJECT: BOWHEAD

QC Report No: 2259-URS
Matrix: Soil/Sediment

Date of Analysis: 11/18/88
Date Received: 12/22/88
Data Prepared: MACC-M.L. (01/12/89)

Data Release Authorized DR Mutchler

	Lab ID	Sample No	Sample Weight (mg)	ppm C	TOC (ppm C) Blank Corrected	% TOTAL SOLIDS
1	2259 A	SKMS-7	25	2966.	2900.	65.2
2	2259 B	SKMS-6	26	3562.	3500.	66.0
3	2259 C	SKMS-43	20	3106.	3040.	68.8
4	2259 D	SKMS-44	23	3641.	3580.	65.9
5	2259 E	SKMS-45	20	2860.	2800.	65.8
6*	2259 F	SKMS-5	26	3787.	3720.	64.0
7	2259 G	SKMS-4	28	4418.	4350.	58.3
8	2259 H	SKMS-3	29	5118.	5050.	59.2
9	2259 I	SKMS-46	24	4883.	4820.	65.8
10	2259 J	SKMS-47	21	6462.	6400.	60.5
11	2259 K	SKMS-48	26	6111.	6050.	60.5
12	2259 L	SKMS-2	28	5353.	5290.	62.6
13	2259 M	4BT	28	3146.	3080.	60.9
14	2259 N	SKMS-17	34	3871.	3810.	67.1
15	2259 O	SKMS-18	27	3797.	3730.	63.2
16	2259 P	SKMS-19	26	4773.	4710.	65.4
17	2259 Q	SKMS-20	23	3859.	3790.	69.0
18	2259 R	SKMS-54	22	5955.	5890.	67.7
19	2259 S	SKMS-55	21	3289.	3220.	66.5
20	2259 T	SKMS-56	21	3292.	3230.	67.1
21	2259 U	SKMS-57	30	4122.	4060.	68.4
22	2259 V	SKMS-58	23	2537.	2470.	73.5
23	2259 AA	SKMS-30	31	4829.	4760.	67.8
24	2259 AB	SKMS-29	19	3342.	3280.	64.3
25*	2259 AC	SKMS-21	26	3307.	3240.	68.6

QA/QC Runs:

	Cali. Check #1	2000 ppm KHP	40	2106.		
	Cali. Check #2	2000 ppm KHP	40	2130.		
	Cali. Check #3	2000 ppm KHP	40	2120.		
	Blank #1	System Blank #1	40	65.46		
	Blank #2	System Blank #2	40	51.08		%
	Blank #3	System Blank #3	40	78.61		Duplication
6*	2259 F Dup	SKMS-5 Duplicate	33	4134.	4070.	91
25*	2259 AC Dup	SKMS-21 Duplicate	30	3318.	3250.	100

Calibration: One 2000 ppm C calibration run each 20 samples [Potassium Hydrogen Phthalate]

Analysis performed with a Dohrman DC 80 Sediment Analyzer.

QA/QC: One system blank per calibration. Blank subtracted from sample.

Sample is acidified with hydrochloric acid. Dried to a constant weight. Dried sediment is oxidized at 850 degrees C and the CO2

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TOC SEDIMENT ANALYSIS DATA SHEET - PUGET SOUND ESTUARY PROGRAM
PUGET SOUND PROTOCOL

PROJECT: BOWHEAD

QC Report No: 2271-URS
Matrix: Soil/Sediment

Dates of Analysis: 12/27/88 & 12/28/88
Date Received: 11/21/88

Data Release Authorized DR Whitney

Data Prepared: MACC - M.L. (01/09/89)

	Lab ID	Sample No	Sample Weight (mg)	ppm C	TOC (ppm C) Blank Corrected	% TOTAL SOLIDS
1	2271 A	SKMS-28	22	2632.	2620.	78.3
2	2271 B	SKMS-27	33	945	933.	77.8
3	2271 C	SKMS-26	24	1511.	1500.	76.4
4	2271 D	SKMS-22	14	1670.	1660.	71.9
5	2271 E	SKMS-25	15	2290.	2280.	67.3
6*	2271 F	SKMS-42	23	3489.	3480.	67.5
7	2271 G	SKMS-23	17	3512.	3500.	70.5
8	2271 H	SKMS-59	14	6136.	6120.	57.5
9	2271 I	SKMS-60	24	5177.	5170.	56.3
10	2271 J	SKMS-61	20	6160.	6150.	56.8
11	2271 K	SKMS-62	18	4818.	4810.	58.6
12	2271 L	SKMS-63	18	4427.	4420.	58.6
13	2271 M	SKMS-64	18	5062.	5050.	58.5
14	2271 N	SKMS-61	28	3184.	3170.	66.9
15	2271 O	SKMS-68	19	2556.	2540.	67.8
16	2271 P	SKMS-1	30	4824.	4810.	67.7
17	2271 Q	SKMS-50	25	3615.	3600.	65.2
18	2271 R	SKMS-52	19	3755.	3740.	66.5
19	2271 S	SKMS-65	14	2945.	2930.	69.0
20	2271 T	SKMS-67	22	3137.	3130.	69.5
21	2271 U	SKMS-69	14	1537.	1530.	65.4
22	2271 V	SKMS-70	18	1760.	1750.	70.6
23	2271 W	SKMS-31	13	2109.	2100.	74.9

QA/QC Runs:

	Cali. Check #1	2000 ppm KHP	40	2021.		
	Cali. Check #2	2000 ppm KHP	40	2191.		
	Cali. Check #3	2000 ppm KHP	40	2141.		
	Blank #1	System Blank #1	40	11.88		
	Blank #2	System Blank #2	40	12.09		%
	Blank #3	System Blank #3	40	11.11		Duplication
6*	2271 F Dup	SKMS-42 Duplicate	24	3410.	3400.	98

Calibration: One 2000 ppm C calibration run each 20 samples [Potassium Hydrogen Phthalate]

Analysis performed with a Dohrman DC 80 Sediment Analyzer.

QA/QC: One system blank per calibration. Blank subtracted from sample.

Sample is acidified with hydrochloric acid. Dried to a constant weight. Dried sediment is oxidized at 850 degrees C and the CO2 liberated measured by IR.

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333 Ninth Ave. North
Seattle, Wa 98109-5187
(206) 621-6490

TOC SEDIMENT ANALYSIS DATA SHEET - Puget Sound Estuary Program

Puget Sound Protocol

PROJECT: BOWHEAD

QC Report No: 2281-URS
Matrix: Soil/Sediment

Dates of Analysis: 01/03/89 & 01/04/89
Date Received: 11/23/88
Data Prepared: MACC - M.L. (01/12/89)

Data Release Authorized DR Mitchell

	Lab ID	Sample No	Sample Weight (mg)	ppm C	TOC (ppm C) Blank Corrected	TOTAL SOLIDS
1	2281 A	SKMS-12	25	4728.	4710.	61.0
2	2281 B	SKMS-35	14	4304.	4280.	65.0
3	2281 C	SKMS-36	32	1335.	1320.	74.9
4*	2281 D	SKMS-37	13	8552.	8530.	51.0
5	2281 E	SKMS-38	16	4469.	4450.	61.7
6	2281 F	SKMS-40	28	1119.	1100.	75.9
7	2281 G	SKMS-41	14	7907.	7890.	56.9
8*	2281 H	SKMS-21	24	3891.	3870.	61.9
9	2281 I	SKMS-72	17	3666.	3650.	61.9
10	2281 J	SKMS-73	15	4619.	4600.	55.9
11	2281 K	SKMS-74	12	4056.	4040.	58.9
12	2281 L	SKMS-75	11	4315.	4300.	57.0
13	2281 M	SKMS-76	12	2213.	2190.	68.3
14	2281 N	SKMS-78	16	2416.	2400.	66.2
15	2281 O	SKMS-80	10	2208.	2190.	65.5
16	2281 P	SKMS-81	11	3835.	3820.	60.8
17	2281 Q	SKMS-82	16	6592.	6570.	59.6
18	2281 R	SKMS-83	11	6608.	6590.	59.8
19	2281 S	SKMS-84	14	7439.	7420.	58.2
20	2281 T	SKMS-85	16	3878.	3860.	61.5
21	2281 U	SKMS-8	15	1917.	1900.	69.3
22	2281 V	SKMS-24	12	1644.	1620.	66.0
23	2281 W	SKMS-32	16	1980.	1960.	67.0
24	2281 X	SKMS-33	26	2930.	2910.	64.5
25	2281 Y	SKMS-34	13	2421.	2400.	63.6

QA/QC Runs:

	Cali. Check #1	2000 ppm KHP	40	2079.		
	Cali. Check #2	2000 ppm KHP	40	2068.		
	Cali. Check #3	2000 ppm KHP	40	2091.		
	Blank #1	System Blank #1	40	11.82		
	Blank #2	System Blank #2	40	11.55		%
	Blank #3	System Blank #3	40	34.8		Duplication
4*	2281 D Dup	SKMS-37 Duplicate	22	5756.	5740.	67
8*	2281 H Dup	SKMS-21 Duplicate	23	4353.	4330.	89
8*	2281 H Tripl	SKMS-21 Triplicate	19	4476	4460.	87

Calibration: One 2000 ppm C calibration run each 20 samples [Potassium Hydrogen Phthalate]

Analysis performed with a Dohrman DC 80 Sediment Analyzer.

QA/QC: One system blank per calibration. Blank subtracted from sample.

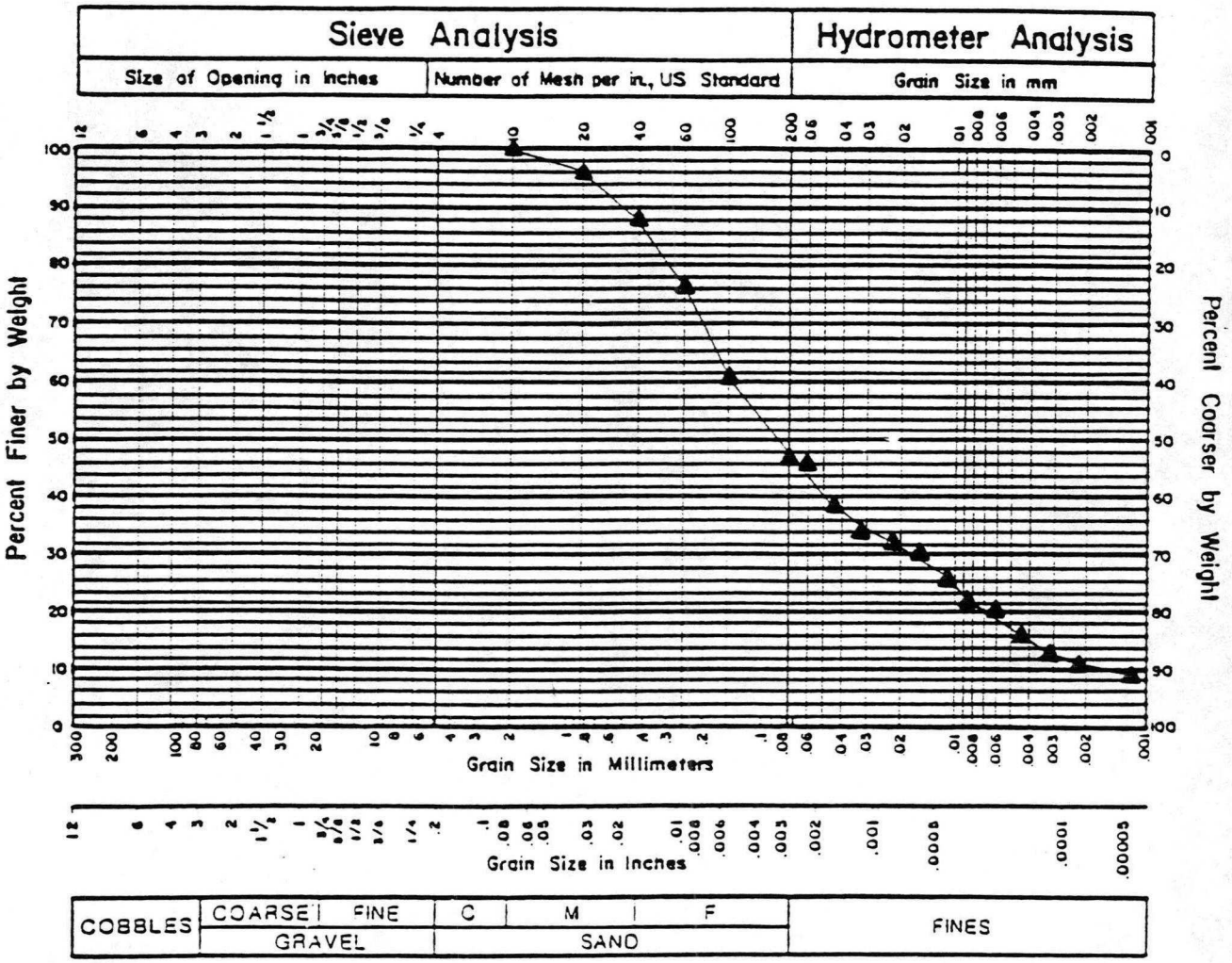
Sample is acidified with hydrochloric acid. Dried to a constant weight. Dried sediment is oxidized at 850 degrees C and the CO2 liberated measured by IR.

APPENDIX C-5

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 30
Sample Depth

Date 12-22-88
Tested By JPB/SAS
Plotted By JLM
Checked By JPB



EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	30		49			*SM	*Slightly Clayey, Very Silty, Med-Fine SAND

*42 Percent Sand Grain Size

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm D60=	mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cz = (D30)^2/(D10 × D60) =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	1 ≤ Cz ≤ 3
SAND (SW): Cu > 6	and	1 ≤ Cz ≤ 3

NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

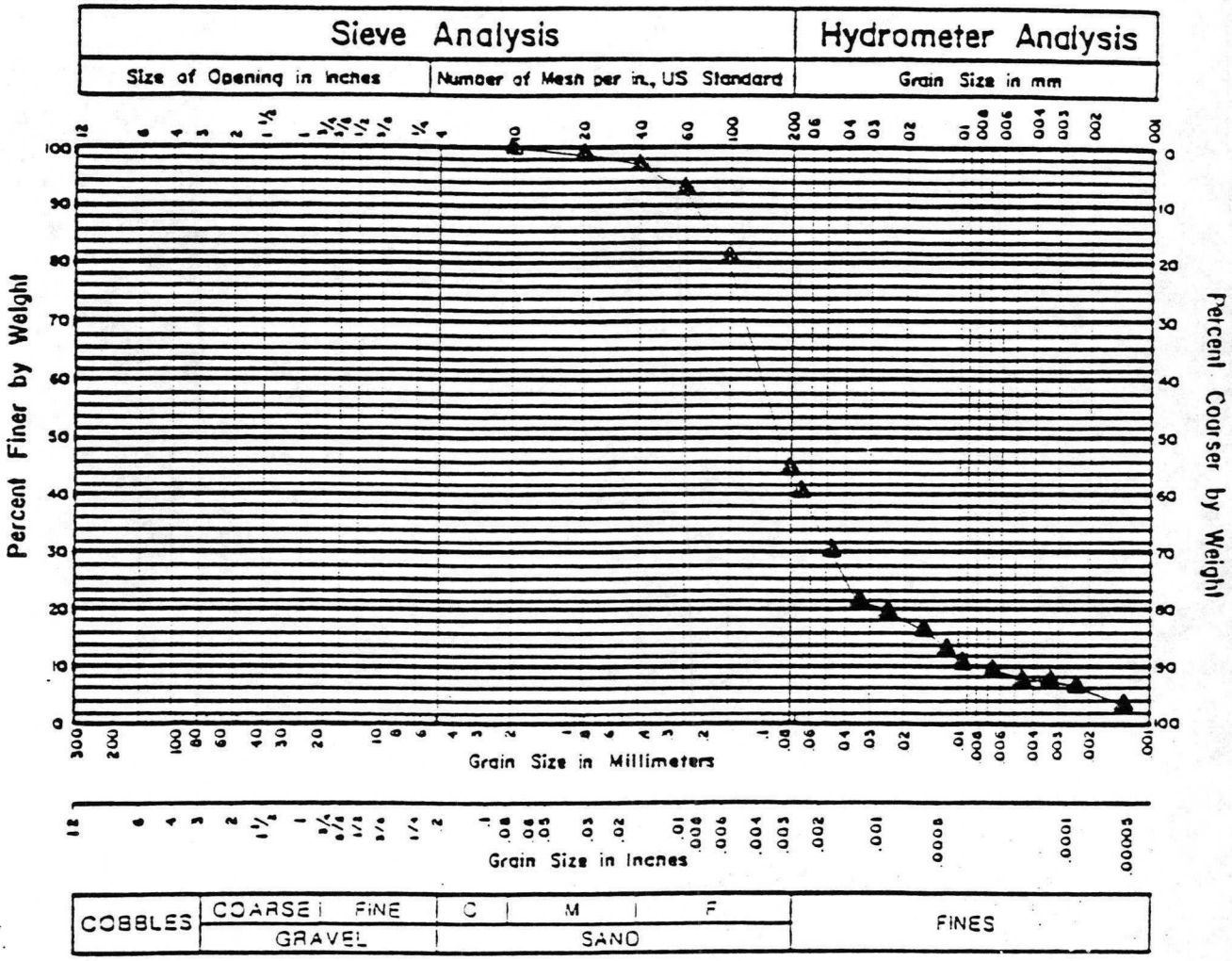
HART-CROWSER & associates inc.

Form 1126-86

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 22
Sample Depth

Date 12-12-88
Tested By JPR / JLM
Plotted By JLM
Checked By JDB



COBBLES	GRAVEL: COARSE	GRAVEL: FINE	SAND: C	SAND: M	SAND: F	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	22		24			*SM	*Slightly Clayey, Very Silty Medium - Fine Grained Sand

* Based on Grain Size

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%. SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%. VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm	D60= mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF. OF CURVATURE: Cz = (D30)^2/(D10 x D60) =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	1 ≤ Cz ≤ 3
SAND (SW): Cu > 6	and	1 ≤ Cz ≤ 3

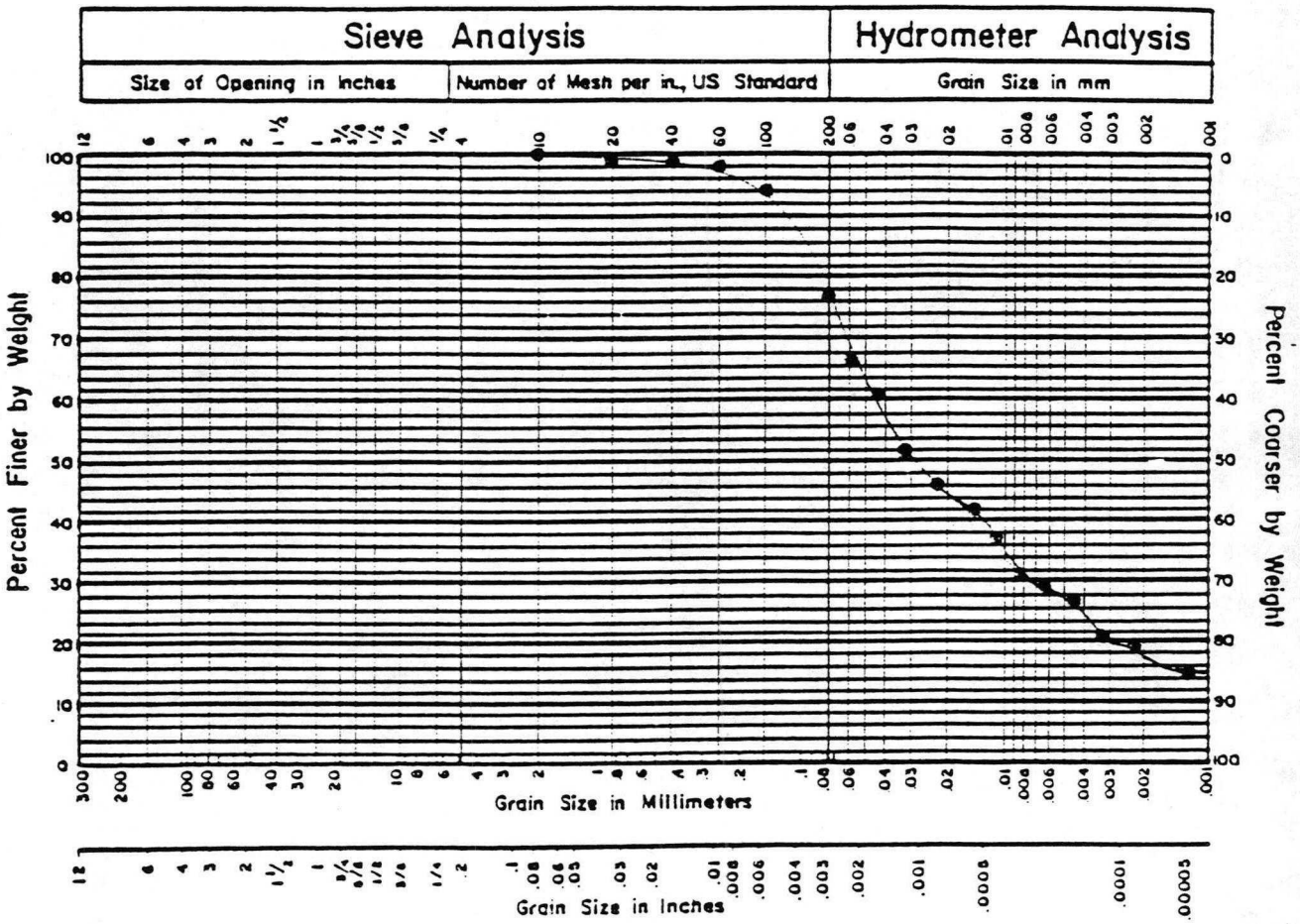
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 44
Sample Depth

Date 12/21/88
Tested By JLM/JPB
Plotted By GWK
Checked By JLM



COBBLES	COARSE | FINE (GRAVEL)	C | M | F (SAND)	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	44		39			ML*	clayey sandy SILT*

*based on fraction < #40

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm	D60= mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cz = (D30)^2/(D10 × D60) =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	1 ≤ Cz ≤ 3
SAND (SW): Cu > 6	and	1 ≤ Cz ≤ 3

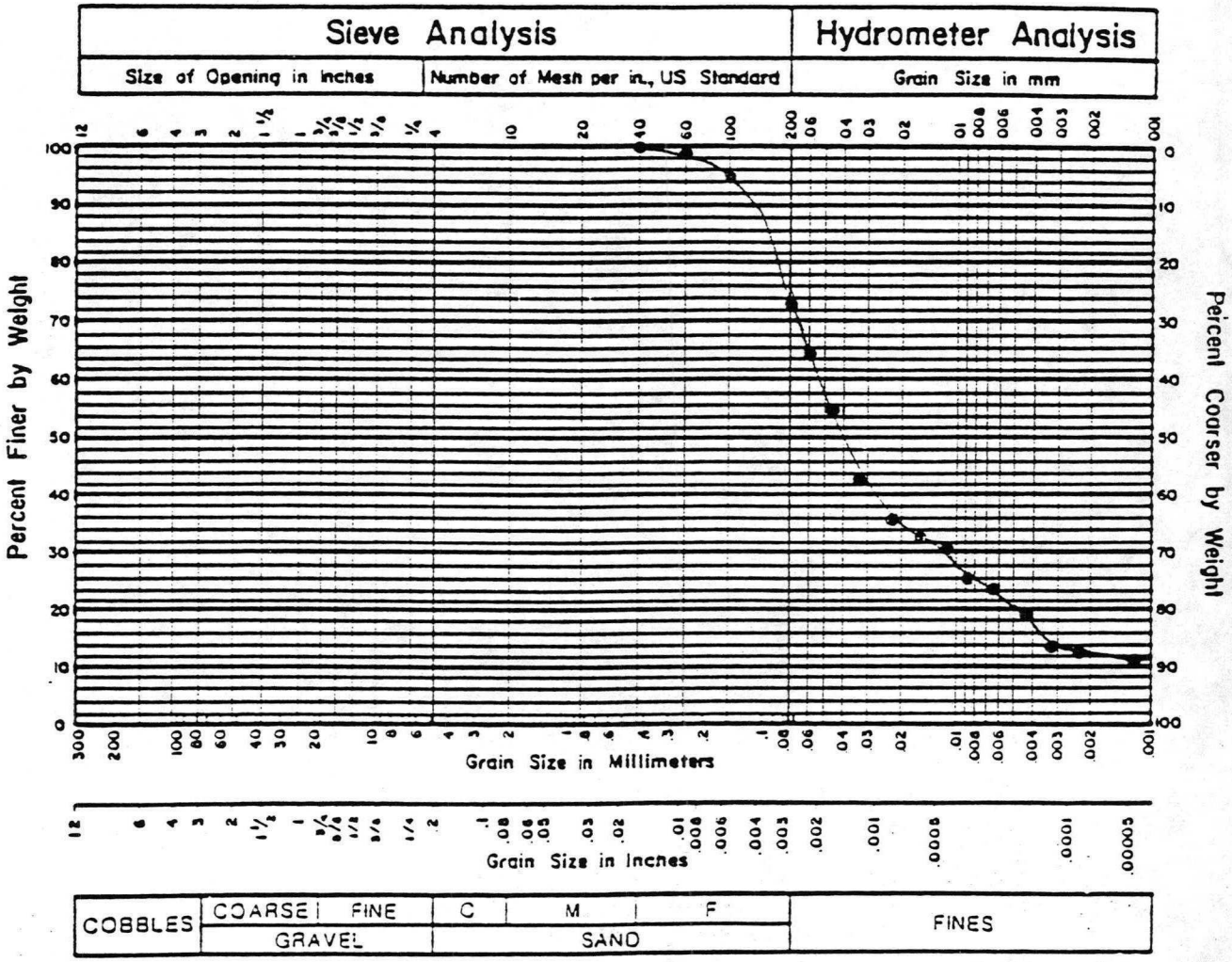
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 7
Sample Depth

Date 12/22/88
Tested By SAS / JPB
Plotted By GWK
Checked By JLM



EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	7		41			ML	clayey sandy SILT -

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm	D60= mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cz = (D30)^2/(D10 x D60) =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	1 ≤ Cz ≤ 3
SAND (SW): Cu > 6	and	1 ≤ Cz ≤ 3

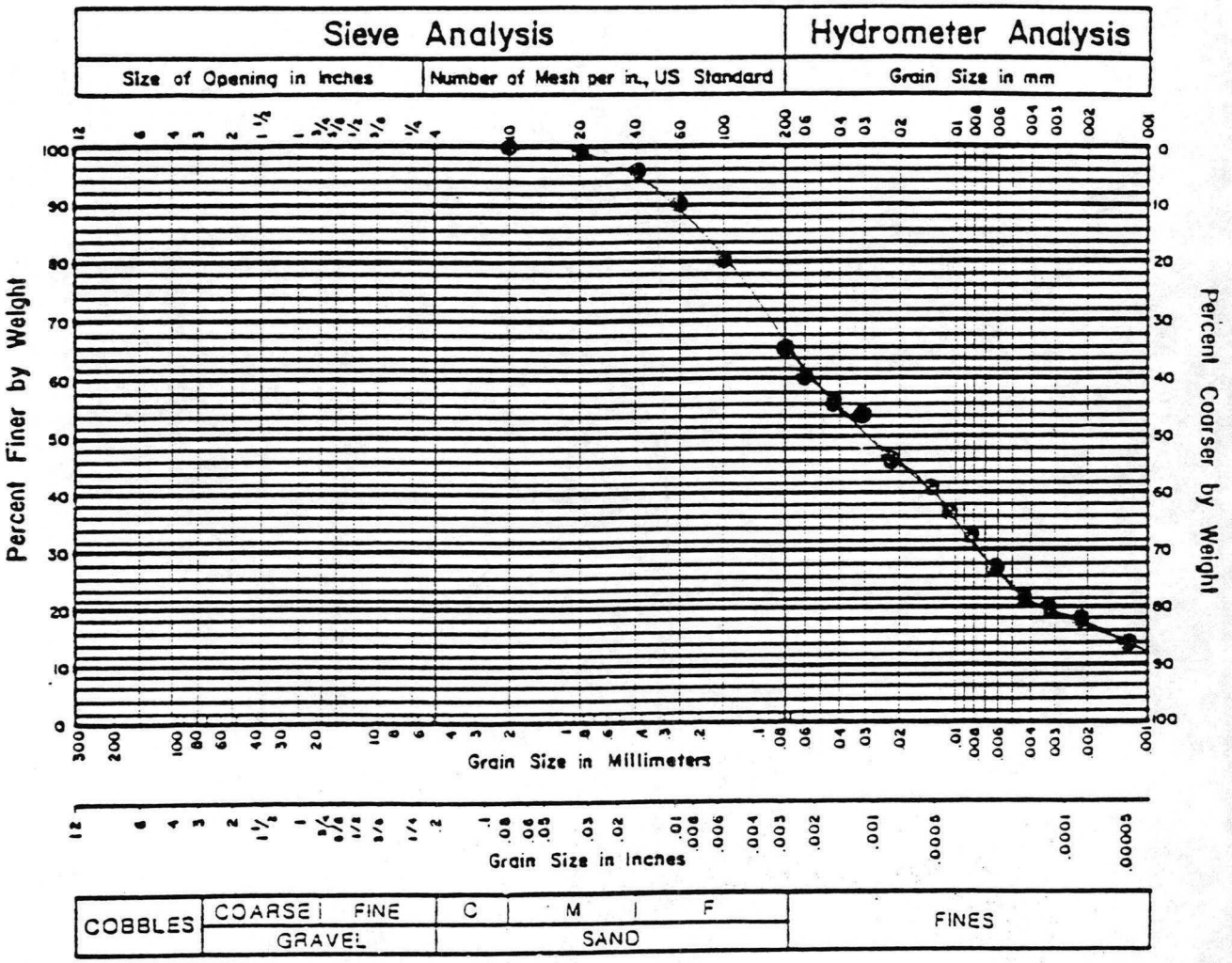
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 17
Sample Depth

Date 12/21/88
Tested By TJF
Plotted By GWR
Checked By WLM



EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	17		38			*ML	*clayey very sandy SILT

*Based on Laboratory Tests

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm D60=	mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cz = $(D30)^2/(D10 \times D60)$ =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	$1 \leq Cz \leq 3$
SAND (SW): Cu > 6	and	$1 \leq Cz \leq 3$

NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

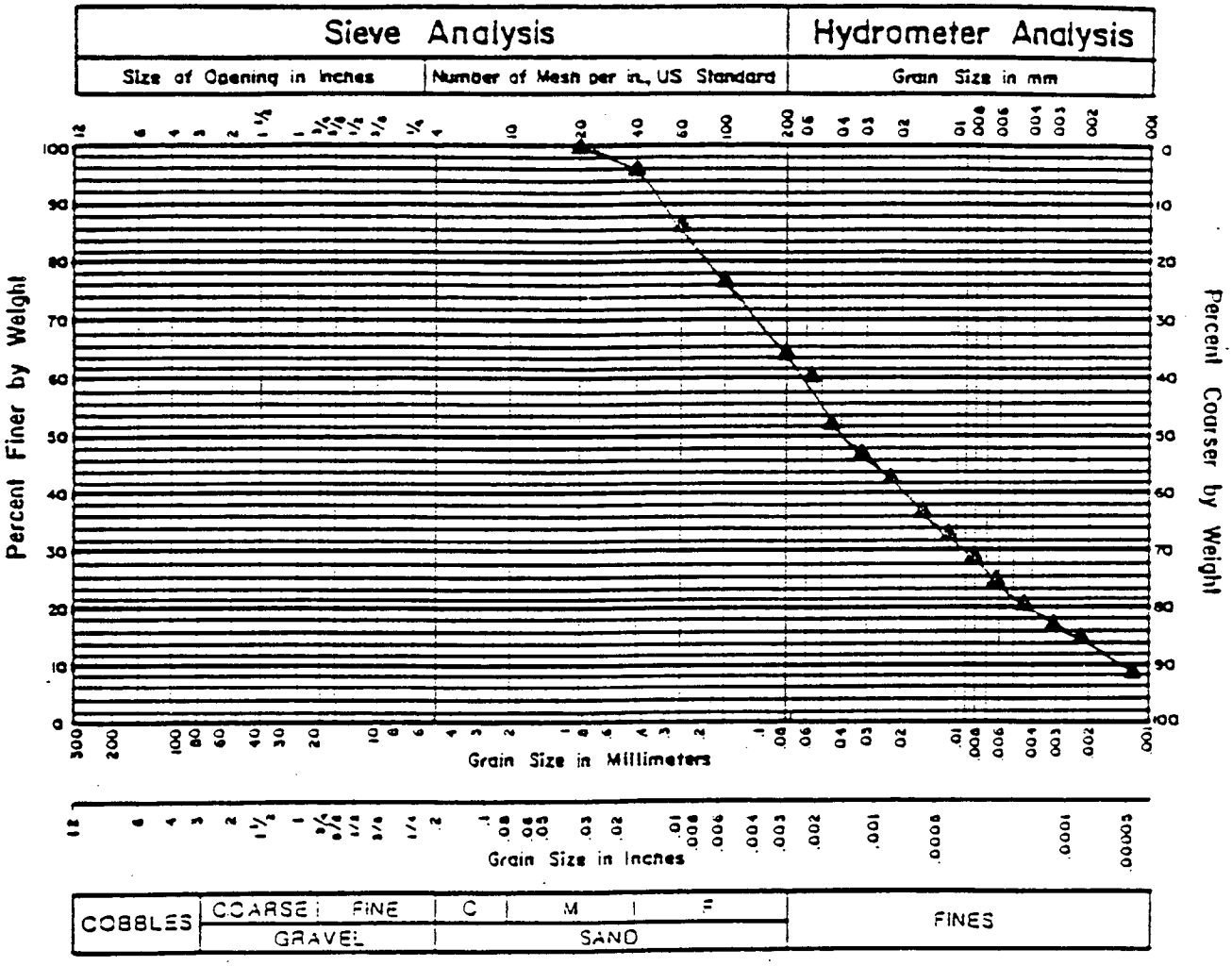
HART-CROWSER & associates inc.

Form 1.126-00

Grain Size Classification

Job BOWHEAD
Job No. 2291
Exploration No. Skms - 71
Sample No.
Sample Depth

Date 12/22/88
Tested By JPB/SAS
Plotted By SAS
Checked By JLM



EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
Skms 71			12			ML*	Clayey, very sandy SILT*

* based on grain size

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm D60=	mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cc = (D30)^2/(D10 x D60) =	

Well Graded Soil (ASTM D 2487)

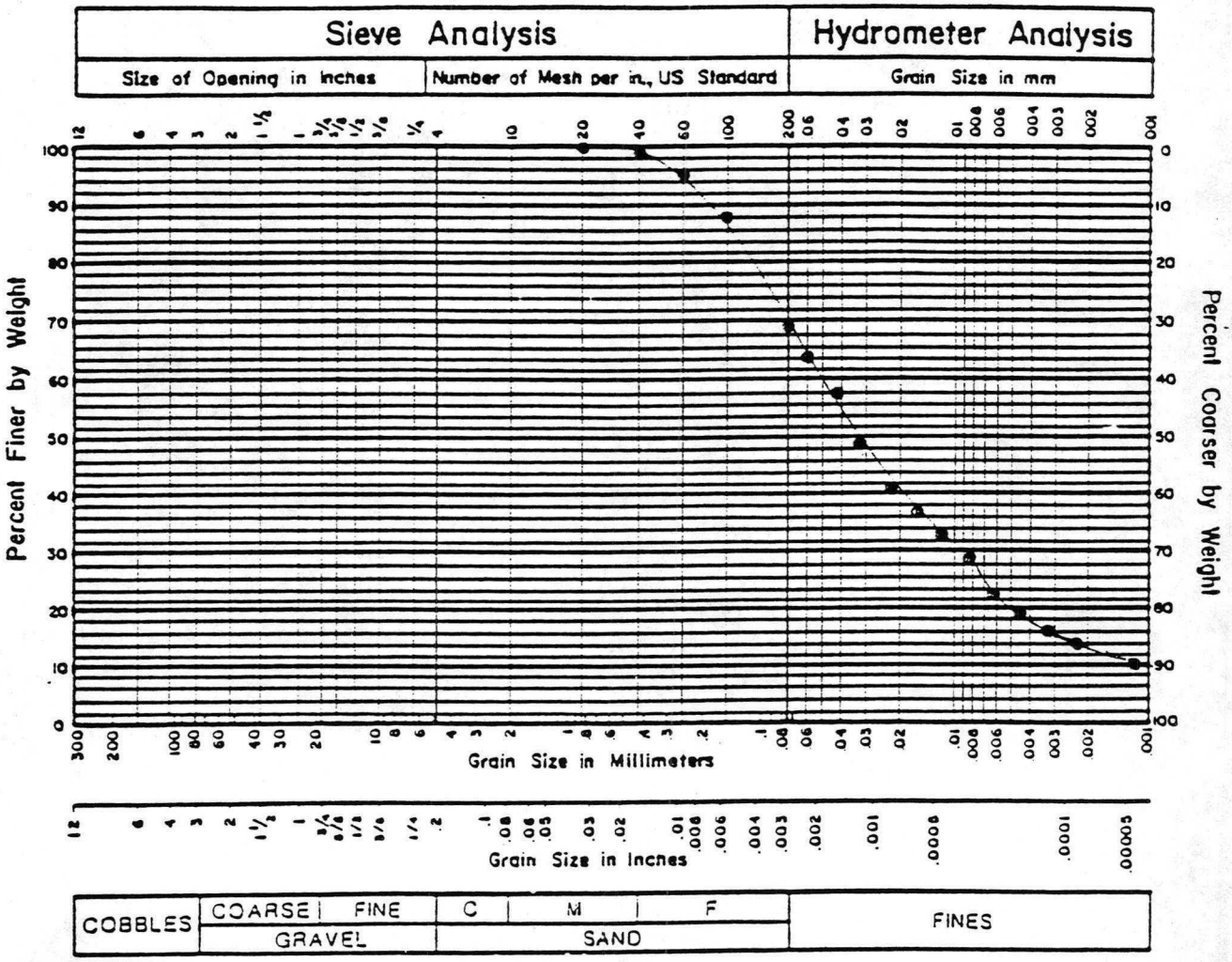
GRAVEL (GW): Cu > 4	and	1 ≤ Cc ≤ 3
SAND (SW): Cu > 6	and	1 ≤ Cc ≤ 3

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 29
Sample Depth

Date 12/22/88
Tested By JPB
Plotted By GWK
Checked By JLM



EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	29		42			ML*	clayey very sandy SILT *

* based on grain size

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm	D60= mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cz = $(D30)^2/(D10 \times D60)$ =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	$1 \leq Cz \leq 3$
SAND (SW): Cu > 6	and	$1 \leq Cz \leq 3$

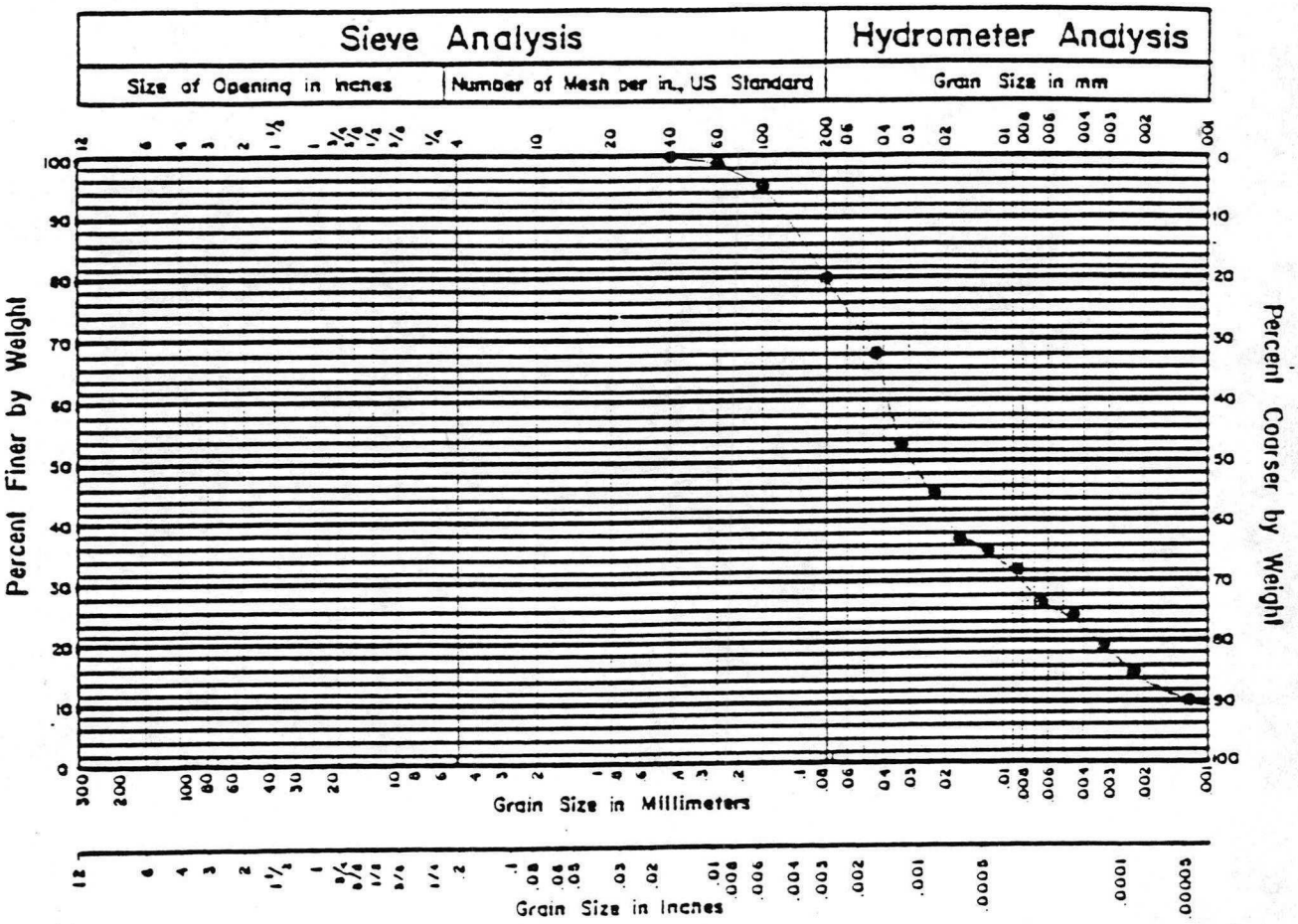
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 33
Sample Depth

Date 12-21-88
Tested By JPB
Plotted By GWK
Checked By JLH



COBBLES	GRAVEL: COARSE / FINE	SAND: C / M / F	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	33		41			ML*	Clayey, sandy silt

* based on grain size

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm D60=	mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cc = (D30)^2/(D10 x D60) =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	1 ≤ Cc ≤ 3
SAND (SW): Cu > 6	and	1 ≤ Cc ≤ 3

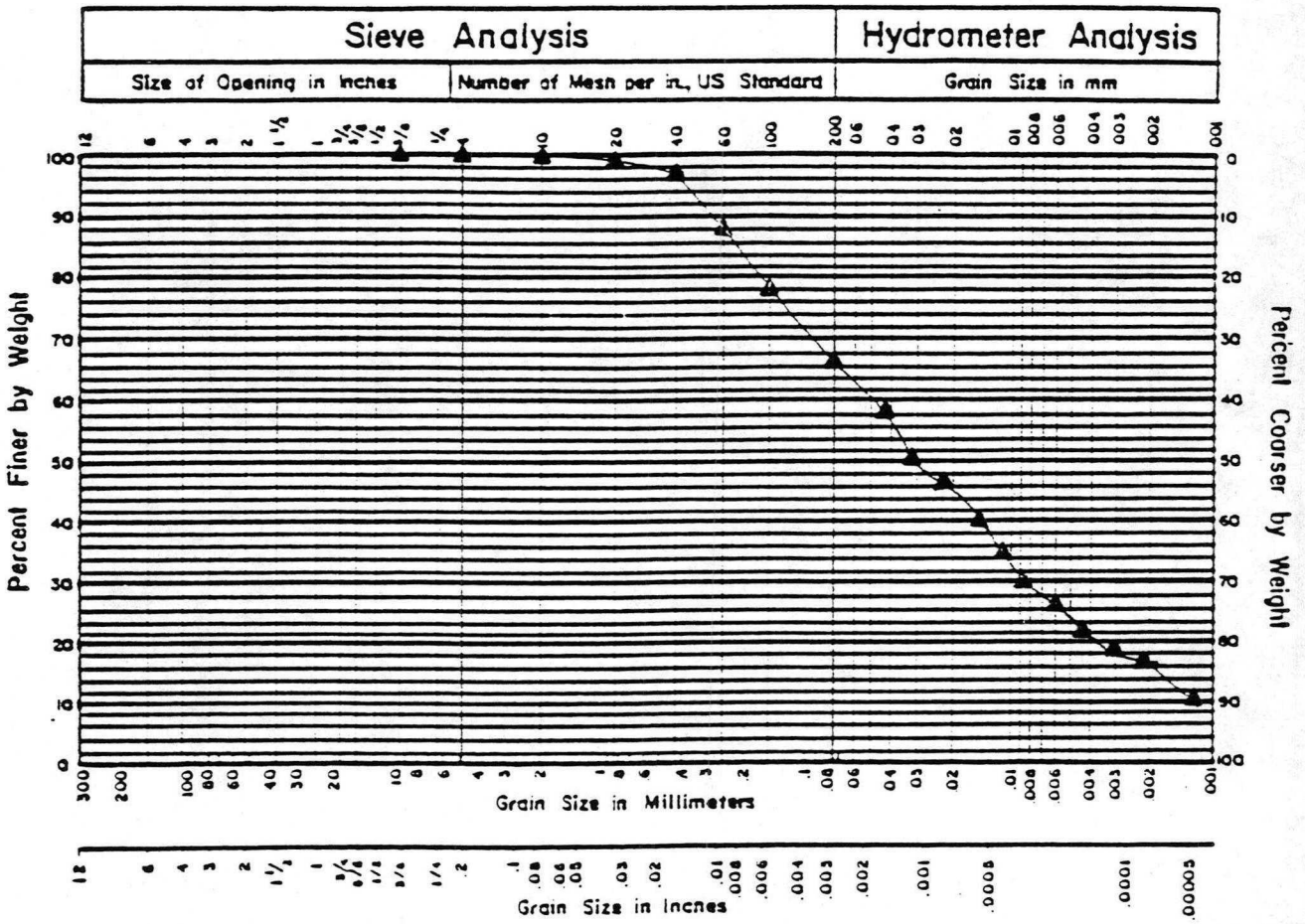
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job BOWHEAD
Job No. 2291
Exploration No. SKMS-72
Sample No.
Sample Depth

Date 12/23/88
Tested By JPB/SAS
Plotted By SAS
Checked By JLM



EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	72		48			ML*	Clayey, very sandy SILT*

* BASED ON GRAIN SIZE

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%. SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%. VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm D60=	mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cz = (D30)^2/(D10 x D60) =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	1 ≤ Cz ≤ 3
SAND (SW): Cu > 6	and	1 ≤ Cz ≤ 3

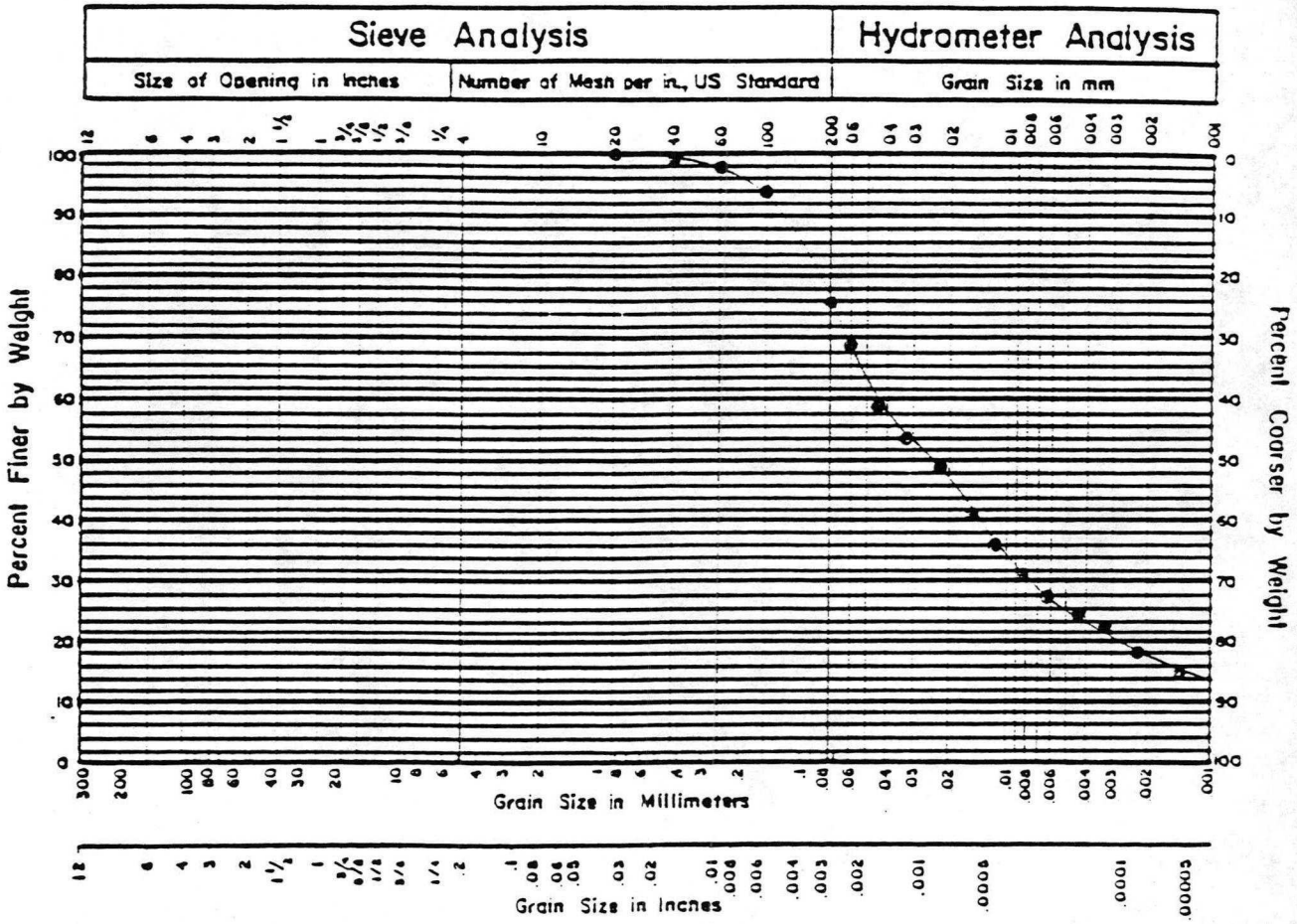
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 6
Sample Depth

Date 12/22/88
Tested By JPB / SAS
Plotted By GWK
Checked By JLM



EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	6		40			ML*	clayey sandy SILT*

*based on grain size

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%, SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%, VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE, D10=	mm
D30= mm	D60= mm
UNIFORMITY COEFFICIENT Cu = D60/D10 =	
COEF OF CURVATURE: Cz = (D30)^2/(D10 x D60) =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	$1 \leq Cz \leq 3$
SAND (SW): Cu > 6	and	$1 \leq Cz \leq 3$

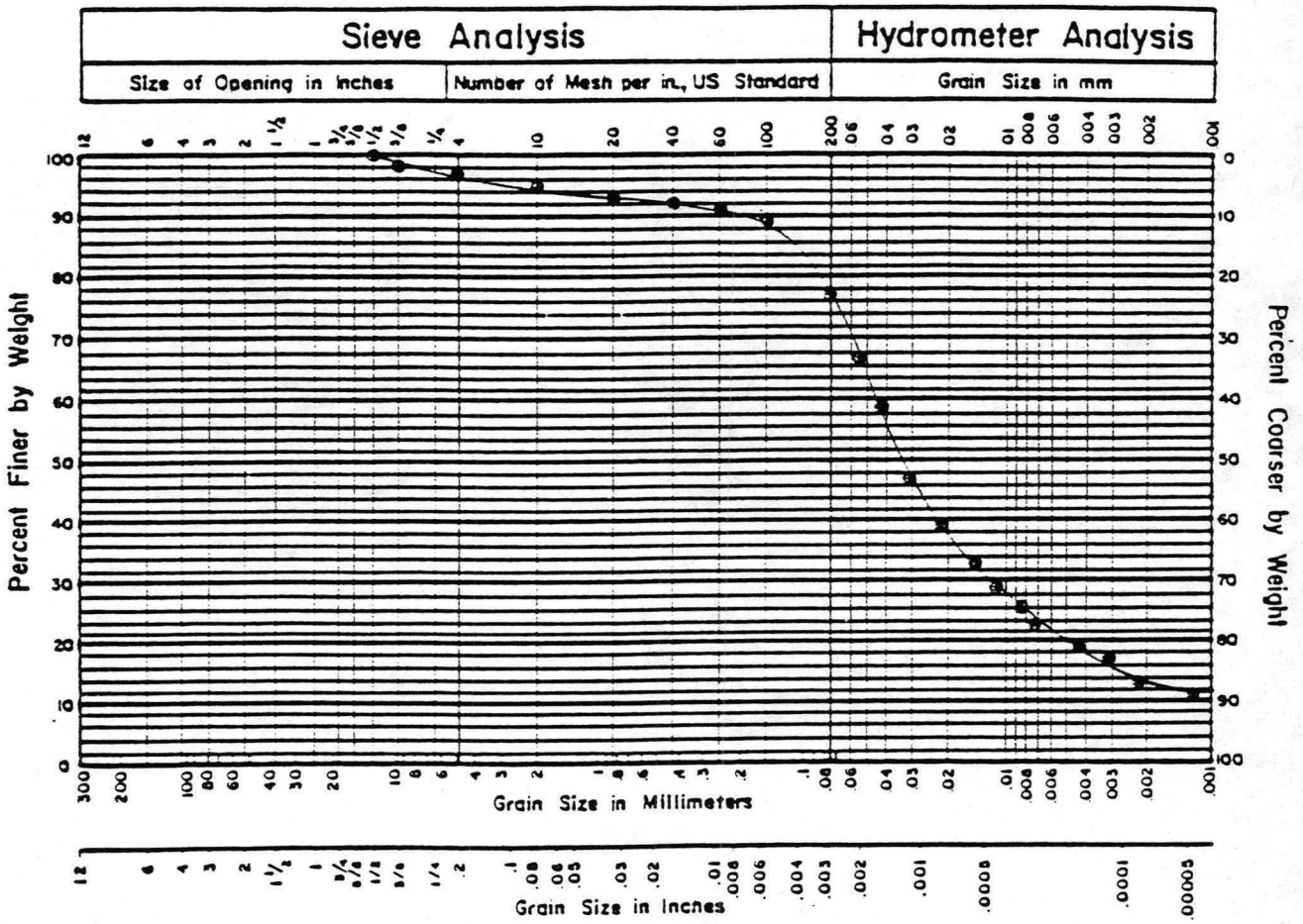
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bawhead
Job No. 2291
Exploration No. SKMS
Sample No. 82
Sample Depth

Date 12/21/88
Tested By JPB/RLM
Plotted By GWR
Checked By JLM



COBBLES	GRAVEL: COARSE / FINE	SAND: C / M / F	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	82		74			ML*	clayey sandy SILT*

*Based on grain size

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm D60=	mm
UNIFORMITY COEFFICIENT: Cu=D60/D10=	
COEF OF CURVATURE: Cz=(D30)^2/(D10×D60) =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	$1 \leq Cz \leq 3$
SAND (SW): Cu > 6	and	$1 \leq Cz \leq 3$

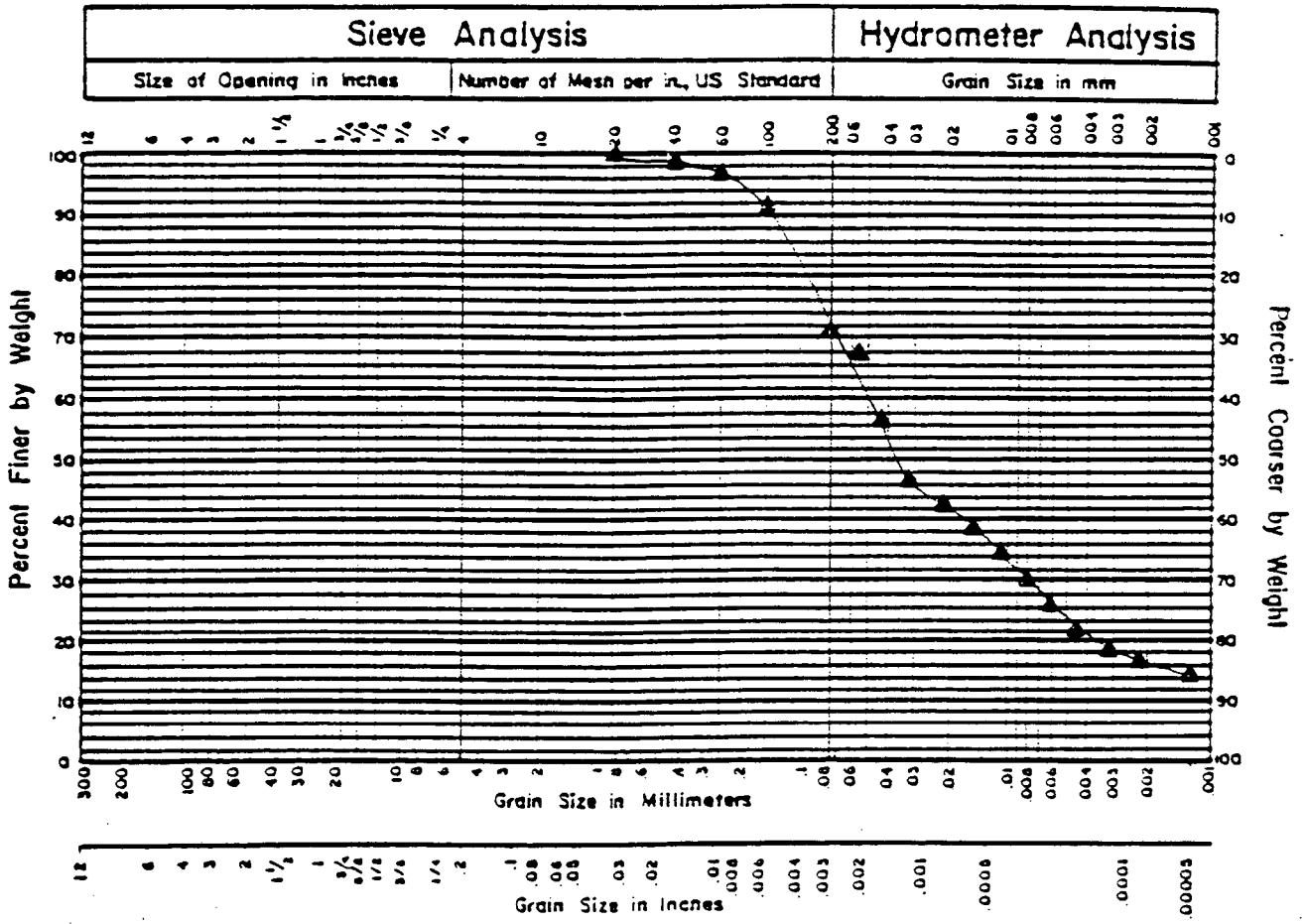
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job BOWHEAD
Job No. 2291
Exploration No. SKMS
Sample No. 45
Sample Depth

Date 12/22/88
Tested By JPB/SAS
Plotted By SAS
Checked By SLM



EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS 45			39			ML*	Clayey, sandy, SILT*

*Based on fraction < #40

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30% VERY

NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D_{10} =	mm
D_{30} = mm	D_{60} = mm
UNIFORMITY COEFFICIENT: $C_u = D_{60}/D_{10}$ =	
COEF OF CURVATURE: $C_z = (D_{30})^2/(D_{10} \times D_{60})$ =	

Well Graded Soil (ASTM D 2487)

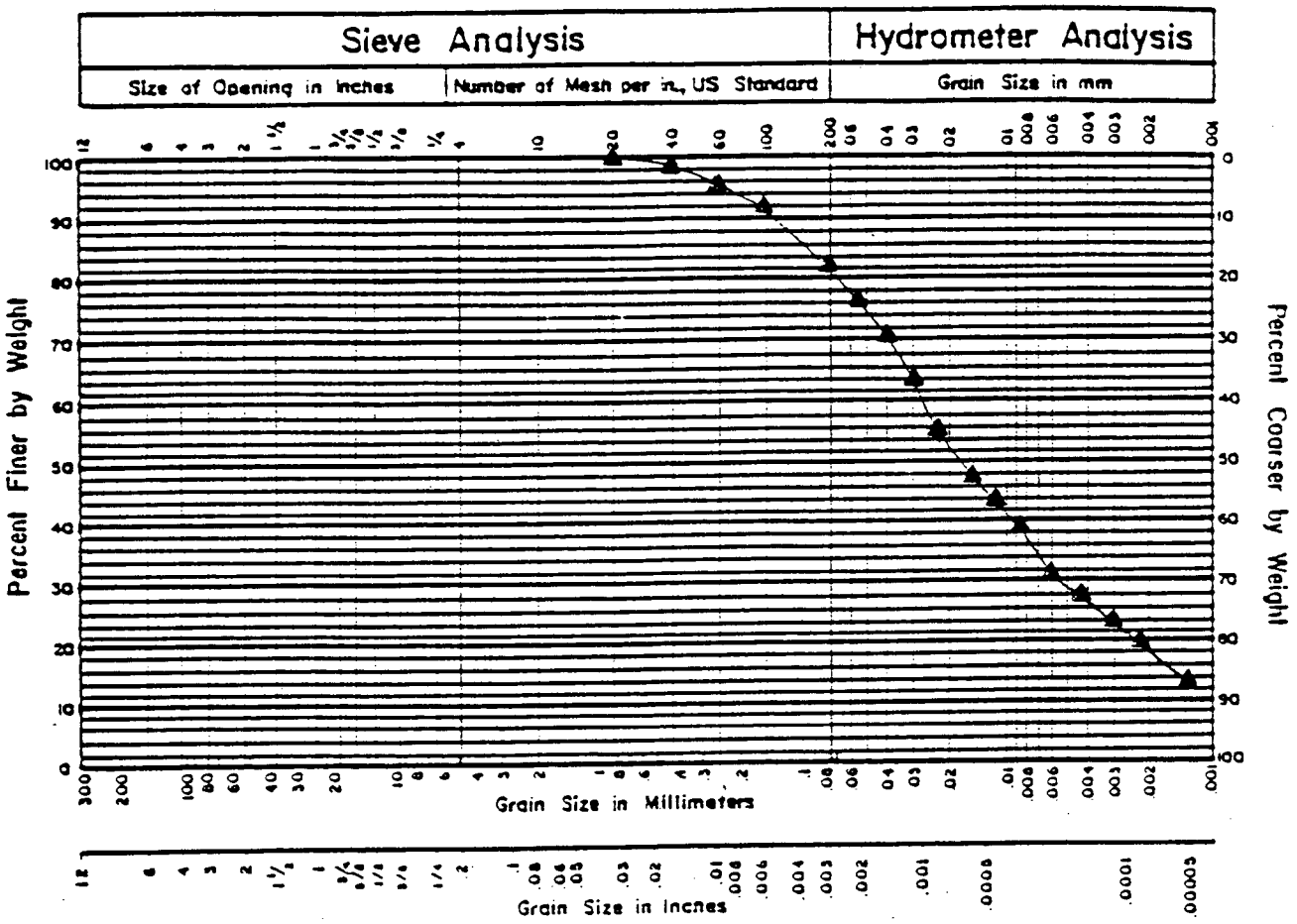
GRAVEL (GW): $C_u > 4$	and	$1 \leq C_z \leq 3$
SAND (SW): $C_u > 6$	and	$1 \leq C_z \leq 3$

HART-CROWSER & associates inc.

Grain Size Classification

Job BOWHEAD
Job No. 2291
Exploration No. SKMS-74
Sample No.
Sample Depth

Date 12/22/88
Tested By JPB/SAS
Plotted By JPB
Checked By LM



COBBLES	COARSE GRAVEL	FINE GRAVEL	C SAND	M SAND	F SAND	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS 74			62			ML*	Clayey, sandy, SILT *

*based on grain size

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%, SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%, VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm D60=	mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF. OF CURVATURE: Cc = (D30)^2/(D10 x D60) =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	1 ≤ Cc ≤ 3
SAND (SW): Cu > 6	and	1 ≤ Cc ≤ 3

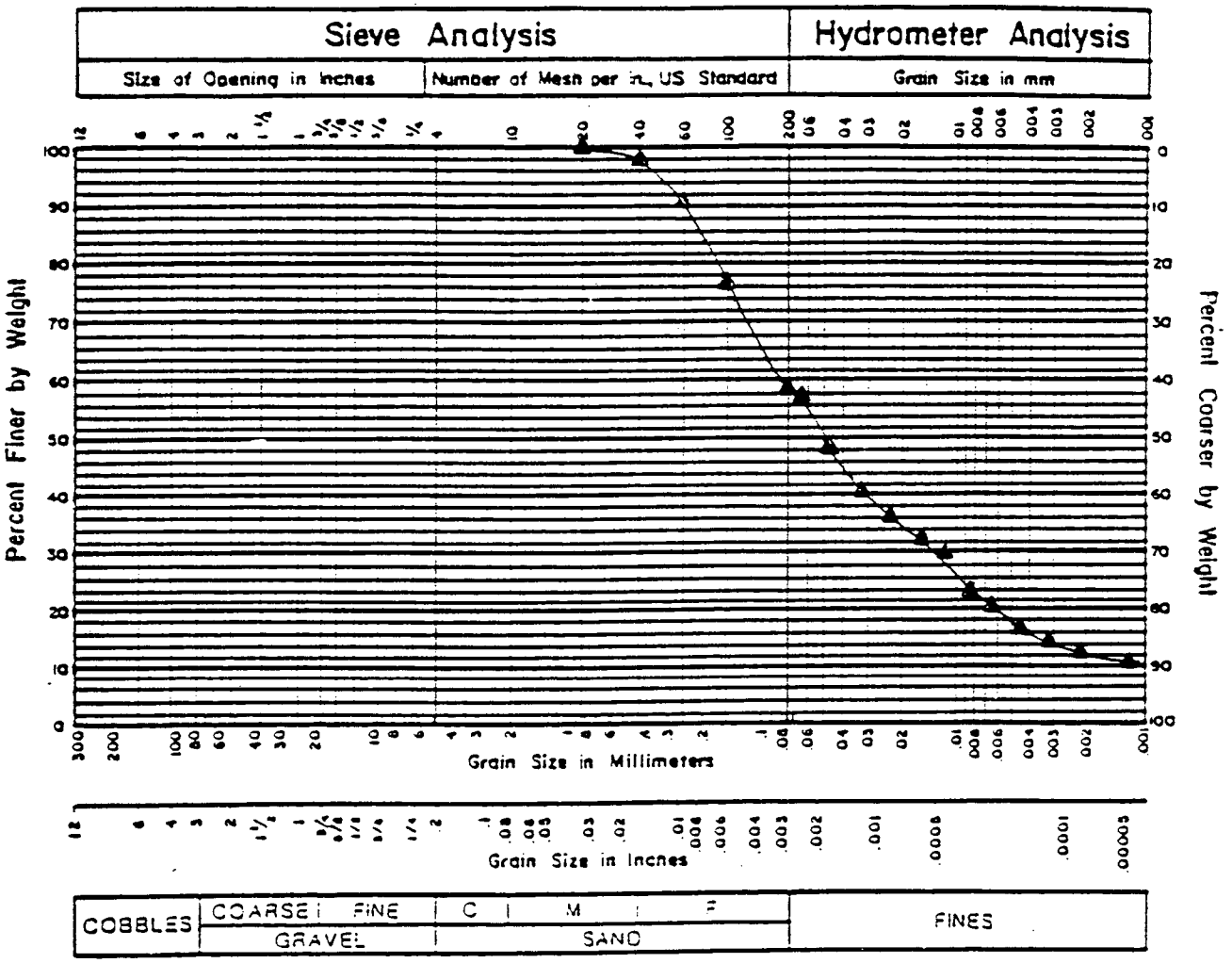
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job BOWHEAD
Job No. 2291
Exploration No. SKMS-20
Sample No.
Sample Depth

Date 12/22/88
Tested By JPB/SAS
Plotted By SAS
Checked By JLM



EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS 20						ML*	Slightly clayey, very sandy SILT

* BASED ON VISUAL

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm	D60= mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cc = (D30)^2/(D10 x D60) =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	1 ≤ Cc ≤ 3
SAND (SW): Cu > 6	and	1 ≤ Cc ≤ 3

NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

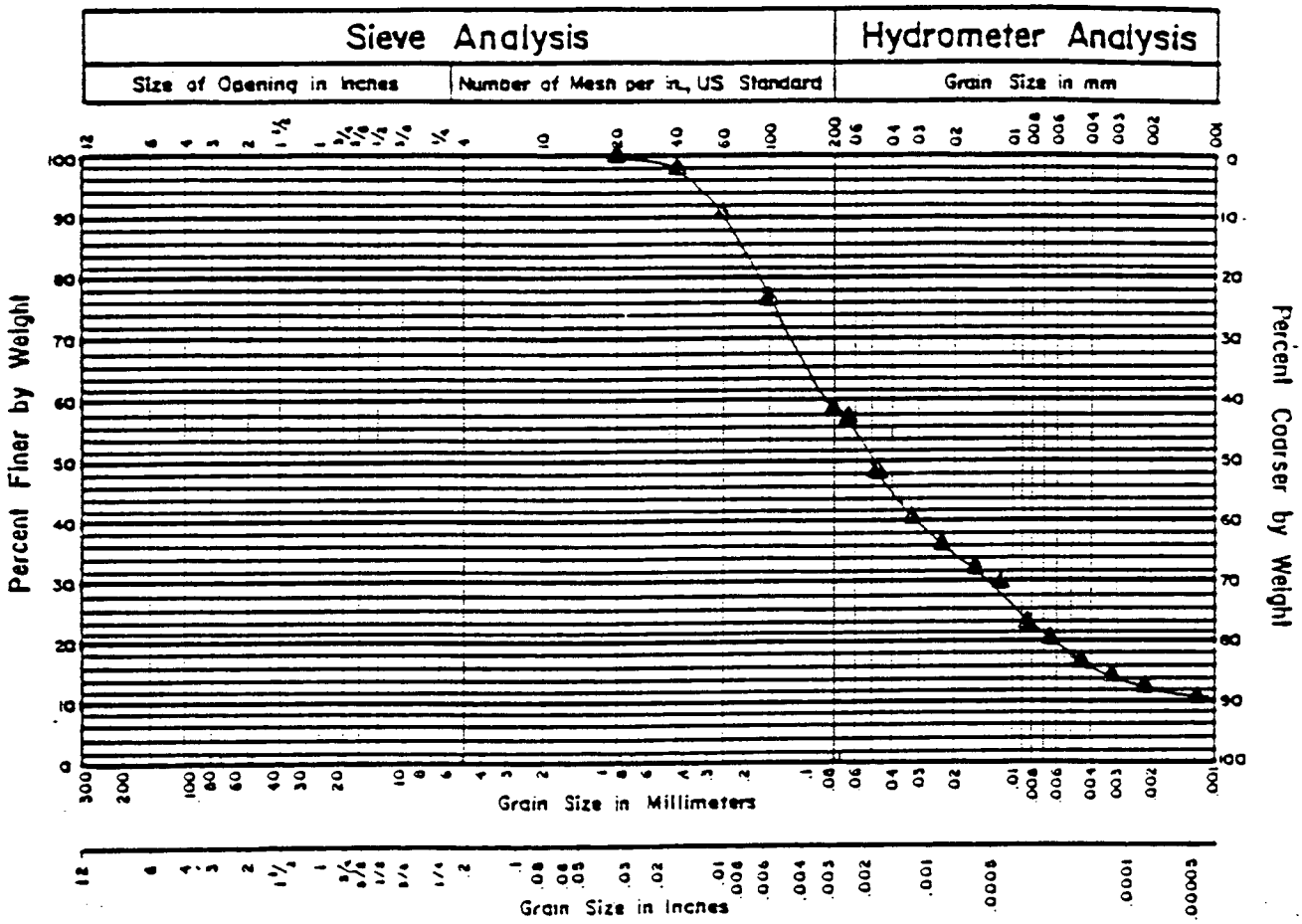
HART-CROWSER & associates inc.

Form 1126-88

Grain Size Classification

Job BOWHEAD
Job No. 2291
Exploration No. SKMS-20
Sample No.
Sample Depth

Date 12/22/88
Tested By JPB/SAS
Plotted By SAS
Checked By JLM



EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS 20						ML*	Slightly clayey, very sandy SILT*

* BASED ON % FINER

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm D60=	mm
UNIFORMITY COEFFICIENT: $C_u = D60/D10$ =	
COEF. OF CURVATURE: $C_z = (D30)^2/(D10 \times D60)$ =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): $C_u > 4$	and	$1 \leq C_z \leq 3$
SAND (SW): $C_u > 6$	and	$1 \leq C_z \leq 3$

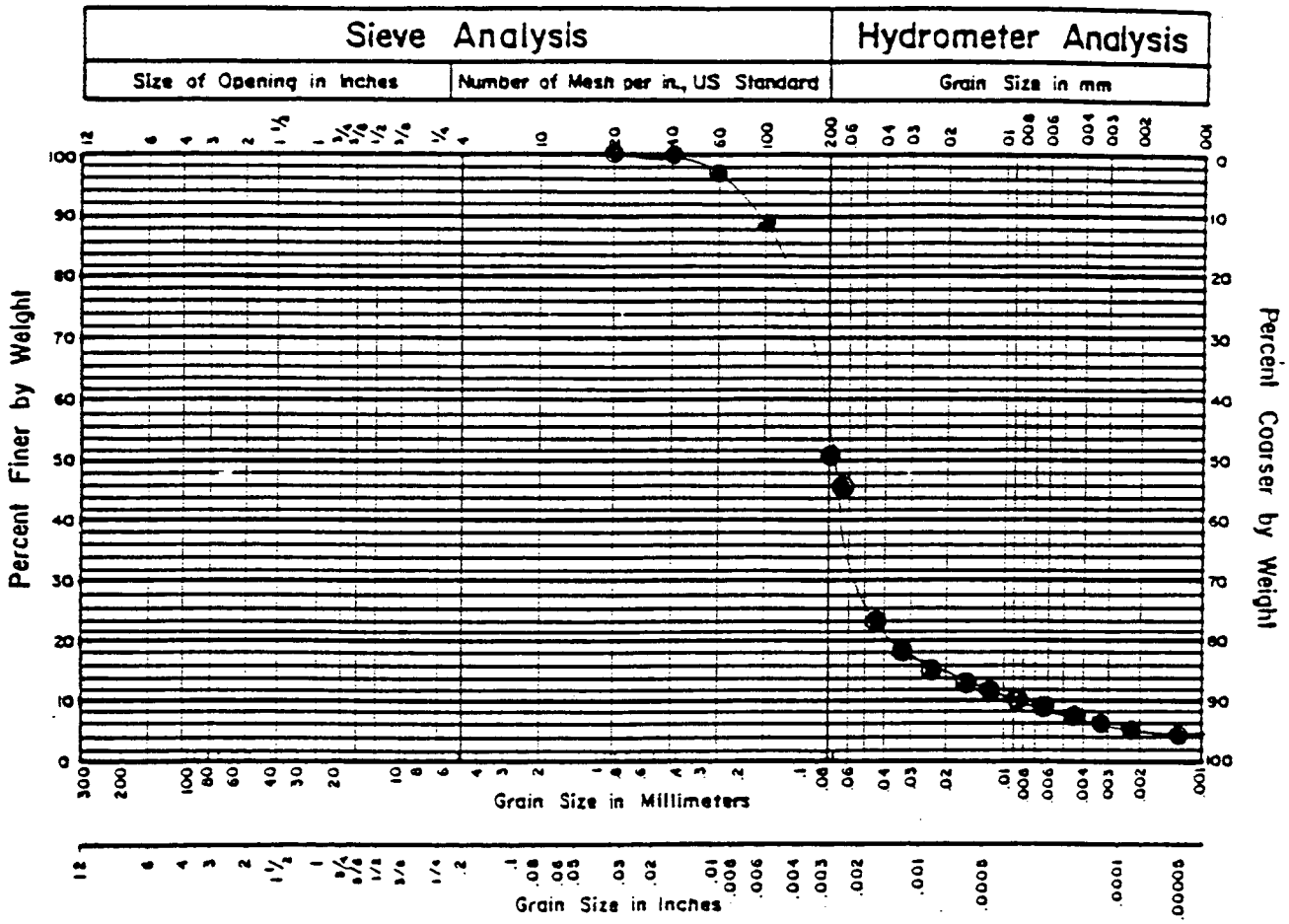
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 8
Sample Depth

Date 12/14/93
Tested By JPB
Plotted By GWK
Checked By JLM



COBBLES	GRAVEL: COARSE / FINE	SAND: C / M / F	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	8		50			ML	slightly clayey very sandy SILT *

* coarse in grain size

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm D60=	mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cz = (D30)^2/(D10 × D60) =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	1 ≤ Cz ≤ 3
SAND (SW): Cu > 6	and	1 ≤ Cz ≤ 3

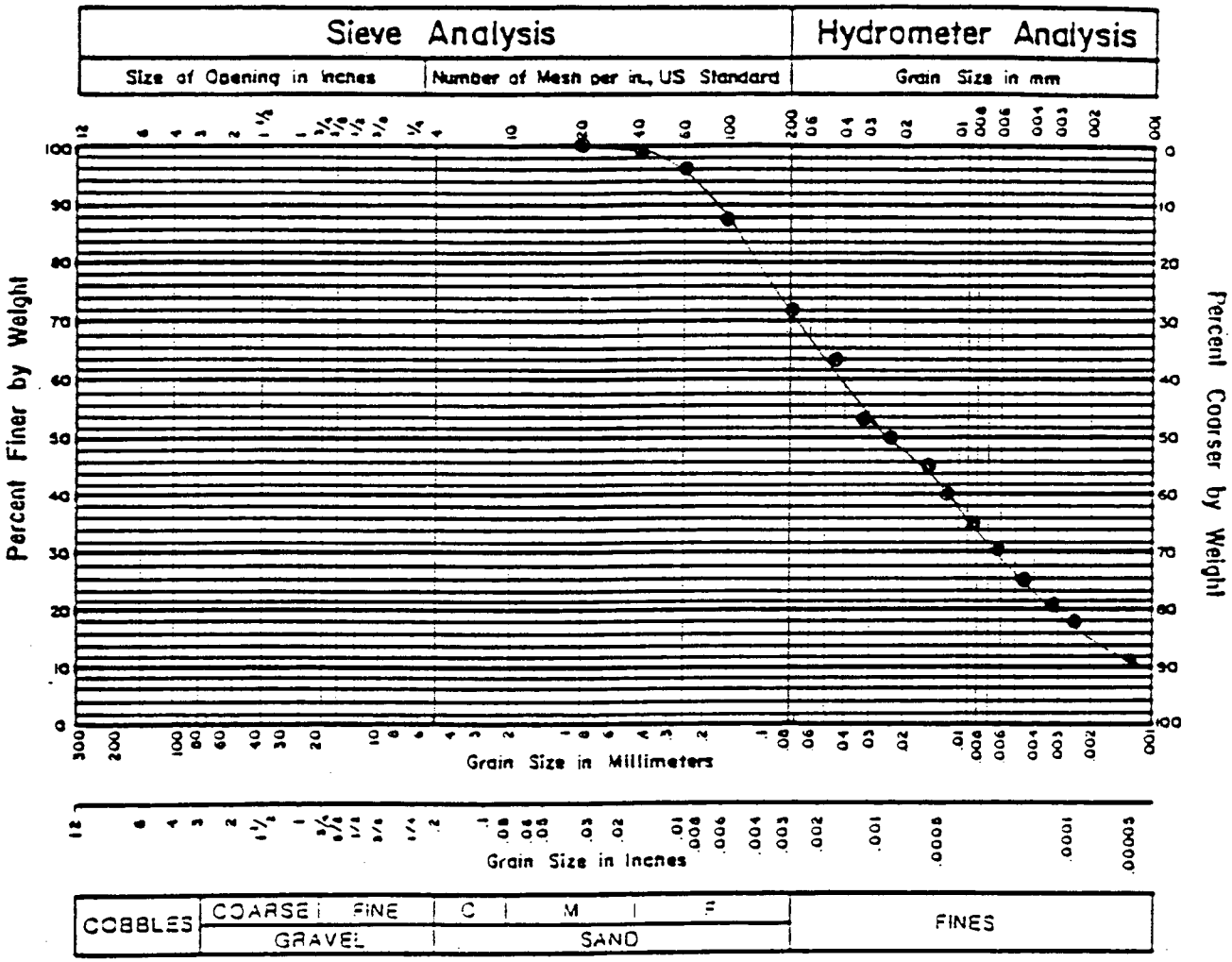
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.
Form 1126-26

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 19
Sample Depth

Date 12/21/82
Tested By JPB
Plotted By GWK
Checked By JLM



COBBLES	COARSE | FINE (GRAVEL)	C | M | F (SAND)	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	19		40			ML*	clayey sandy SILT *

* BASED ON GRAIN SIZE

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm D60=	mm
UNIFORMITY COEFFICIENT: $C_u = D60/D10$ =	
COEF OF CURVATURE: $C_z = (D30)^2/(D10 \times D60)$ =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): $C_u > 4$	and	$1 \leq C_z \leq 3$
SAND (SW): $C_u > 6$	and	$1 \leq C_z \leq 3$

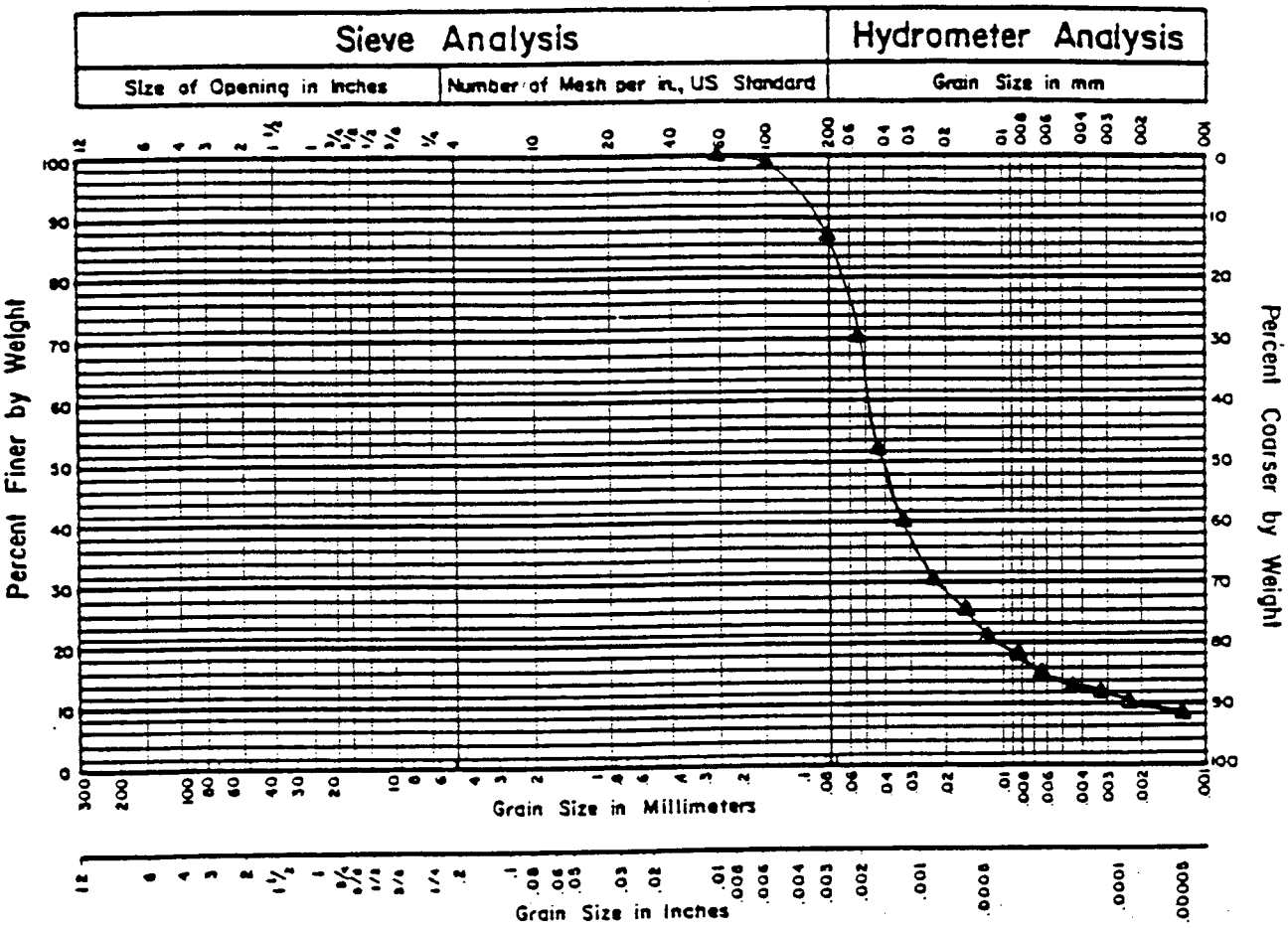
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. J-2291
Exploration No. SKMS
Sample No. 80
Sample Depth

Date 12/23/88
Tested By JPB
Plotted By C.S.
Checked By JLM



COBBLES	GRAVEL: COARSE / FINE	SAND: C / M / F	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	80	/	33	/	/	*ML	*Slightly clayey, sandy SILT

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= / mm D60=	mm
UNIFORMITY COEFFICIENT: Cu=D60/D10=	
COEF OF CURVATURE: Cc=(D30)^2/(D10 x D60) =	

* BASED ON GRAIN SIZE ONLY.

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	1 ≤ Cc ≤ 3
SAND (SW): Cu > 6	and	1 ≤ Cc ≤ 3

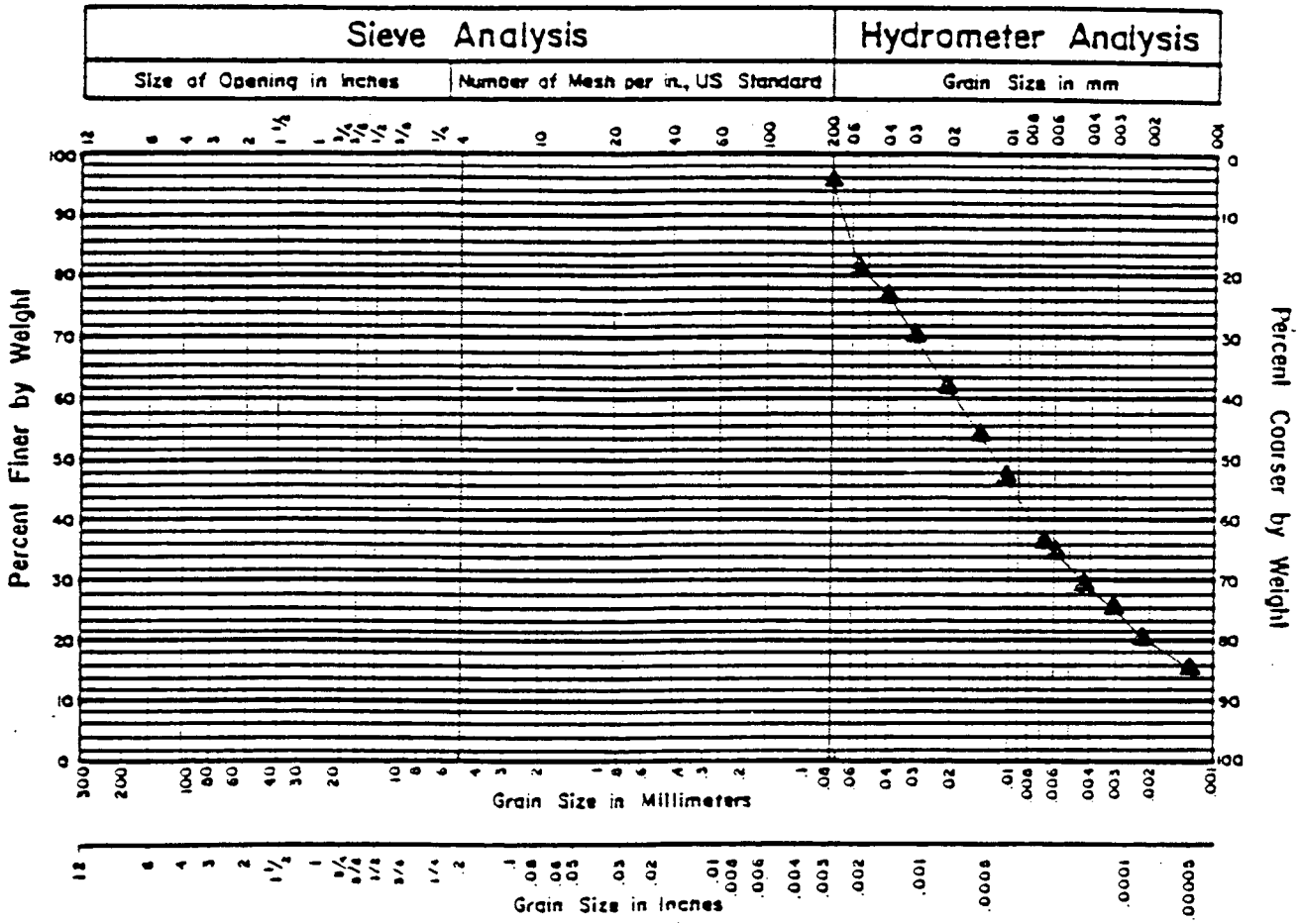
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bouthead
Job No. 2291
Exploration No. SKMS
Sample No. 60
Sample Depth

Date 12-12-77
Tested By JPB
Plotted By ILM
Checked By JPB



EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	60		63			*ML	*Clayey Silt

*Based on Grain Size

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm D60=	mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cc = $(D30)^2/(D10 \times D60)$ =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	$1 \leq Cc \leq 3$
SAND (SW): Cu > 6	and	$1 \leq Cc \leq 3$

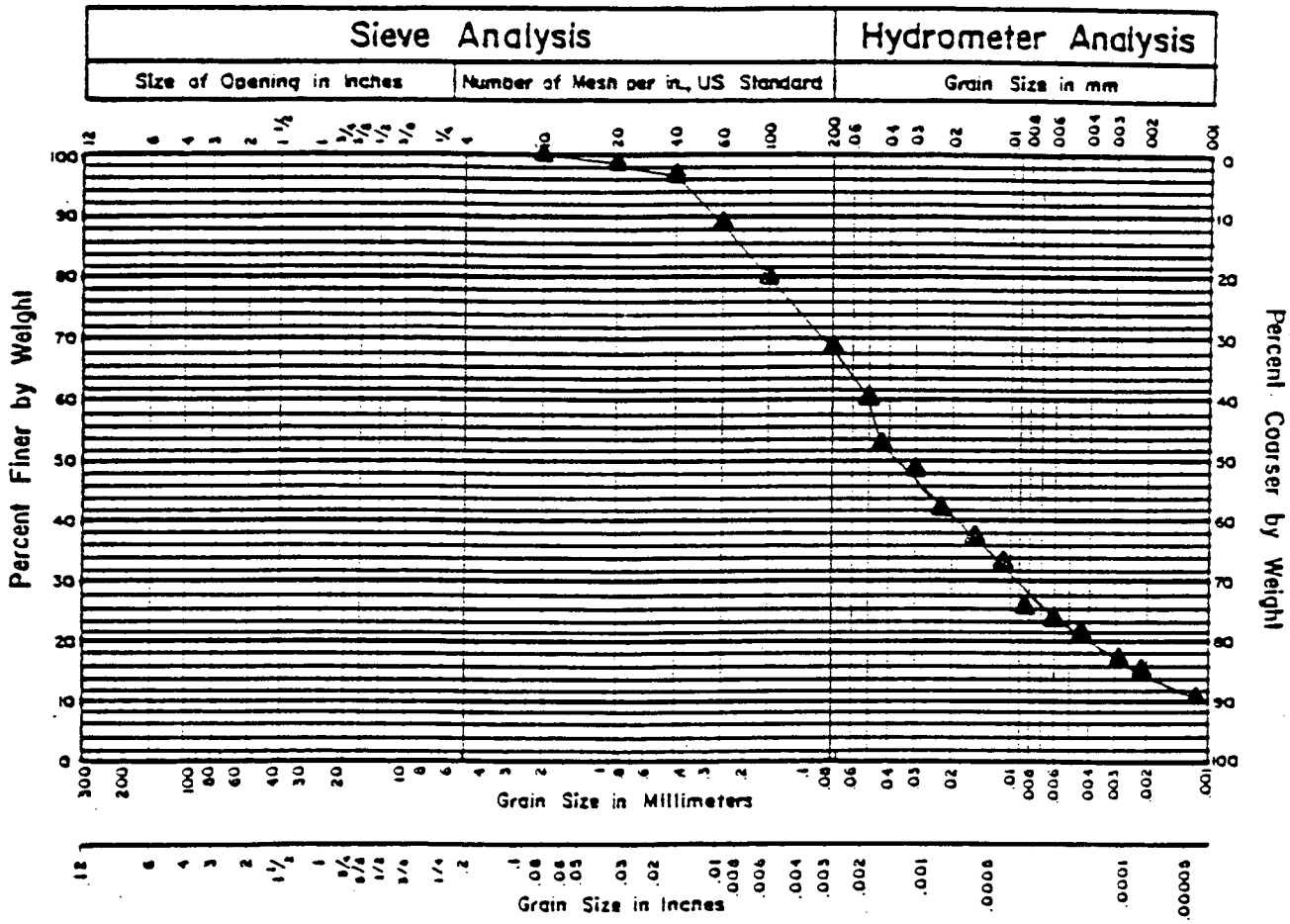
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Brwhead
Job No. 2291
Exploration No. SKMS
Sample No. 12
Sample Depth

Date 12-15-88
Tested By JPB/JLM
Plotted By JLM
Checked By JPB



COBBLES	GRAVEL: COARSE / FINE	SAND: C / M / F	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	12		52			*ML	*Clayey, Very Sandy, Silt

*Based on Grain Size.

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%. SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm	D60= mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cc = (D30)^2/(D10 x D60) =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	1 ≤ Cc ≤ 3
SAND (SW): Cu > 6	and	1 ≤ Cc ≤ 3

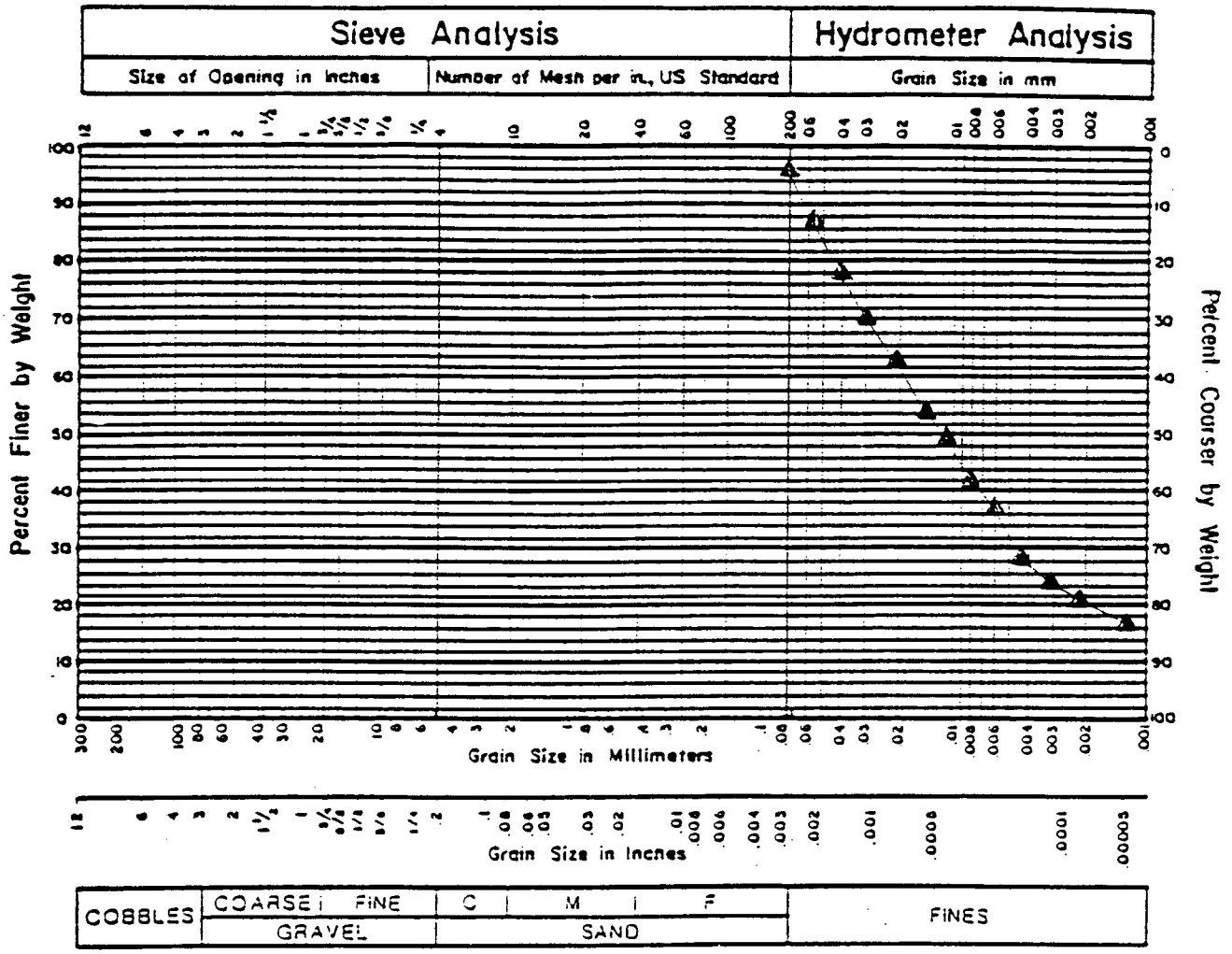
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 61
Sample Depth

Date 12-12-88
Tested By JPB
Plotted By JLM
Checked By JPB



EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	61		64			*ML	*Clayey, Silt

*Based on Grain Size.

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%. SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%. VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm	D60= mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cc = (D30)^2/(D10 x D60) =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	1 ≤ Cc ≤ 3
SAND (SW): Cu > 6	and	1 ≤ Cc ≤ 3

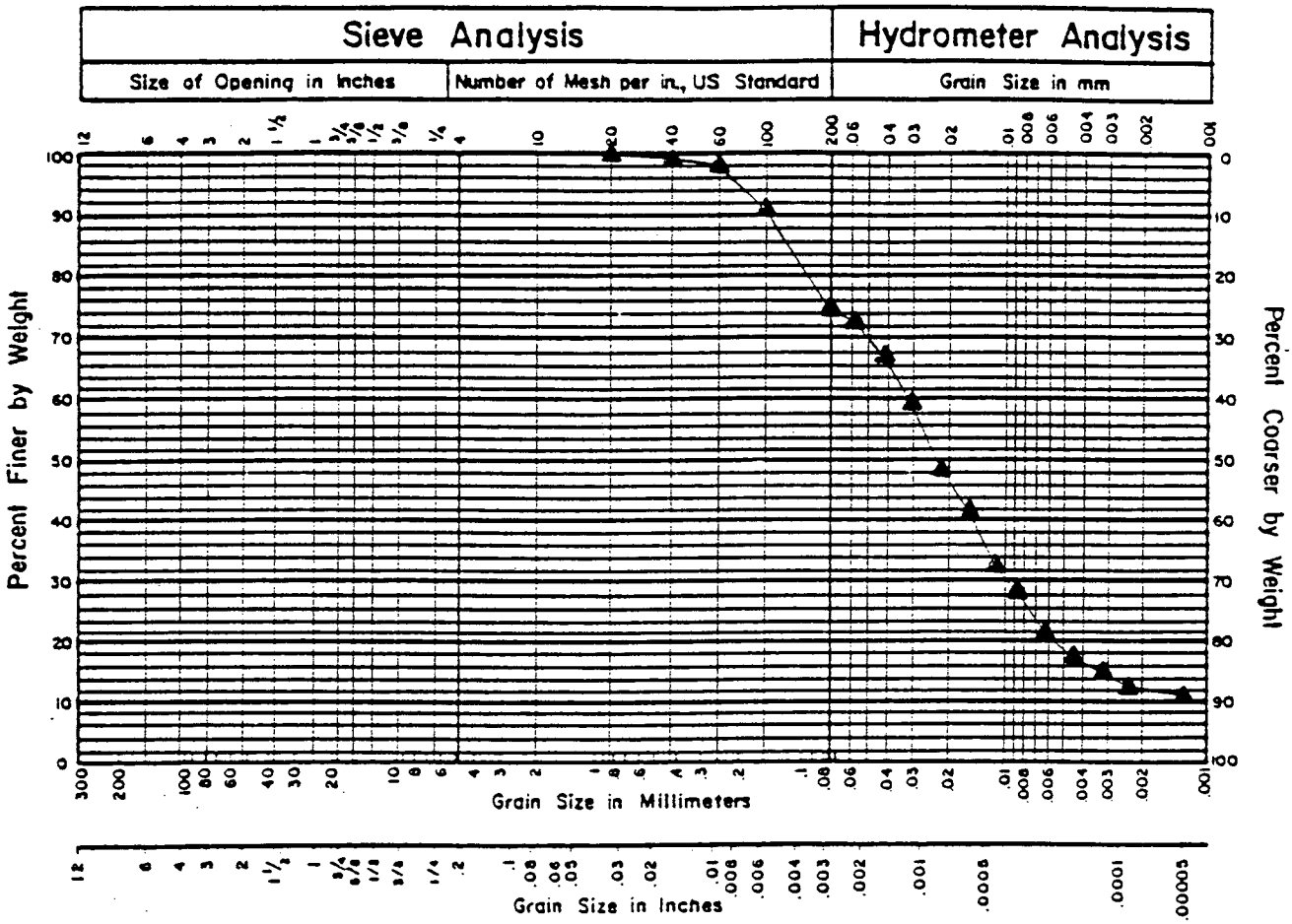
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bayhead
Job No. 2291
Exploration No. SKMS
Sample No. 6A
Sample Depth

Date 2-7-77
Tested By JPB / TLM
Plotted By TLM
Checked By



COBBLES	COARSE	FINE	C	M	F	FINES
	GRAVEL		SAND			

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	6A		58			* ML	* Slightly clayey sandy silt

* Based on Grain Size

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm D60=	mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cz = $(D30)^2/(D10 \times D60)$ =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	$1 \leq Cz \leq 3$
SAND (SW): Cu > 6	and	$1 \leq Cz \leq 3$

NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

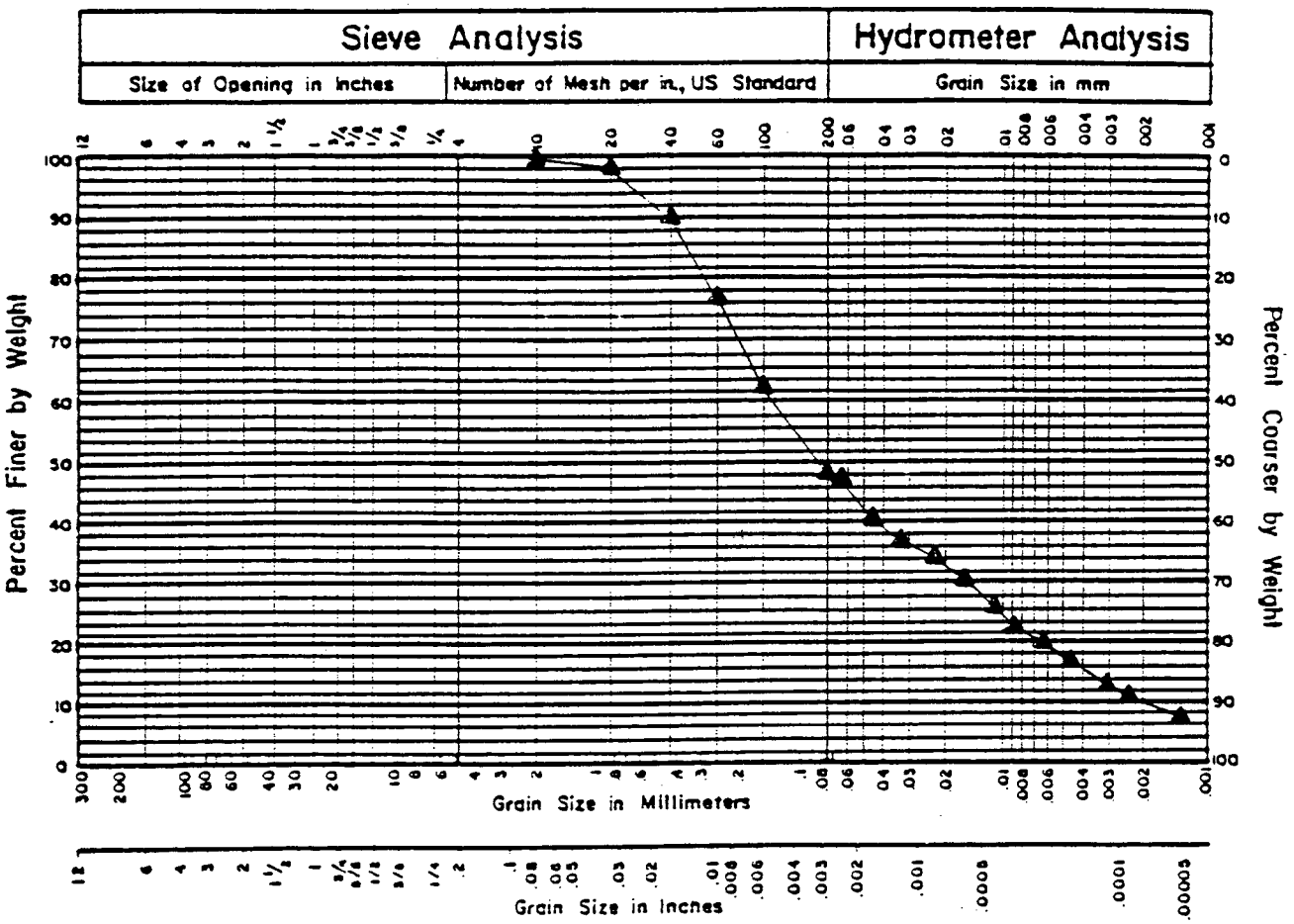
HART-CROWSER & associates inc.

Form 1126-26

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. EKME
Sample No. 5a
Sample Depth

Date 12-7-88
Tested By JPB / JLM
Plotted By JLM
Checked By JPB



COBBLES	GRAVEL: COARSE / FINE	SAND: C / M / F	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
EKME	5a		40			*SM	*Slightly clayey very silty Fine to Medium Sand

* Based on Grain Size.

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm D60=	mm
UNIFORMITY COEFFICIENT: $C_u = D60/D10$ =	
COEF OF CURVATURE: $C_z = (D30)^2/(D10 \times D60)$ =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): $C_u > 4$	and	$1 \leq C_z \leq 3$
SAND (SW): $C_u > 6$	and	$1 \leq C_z \leq 3$

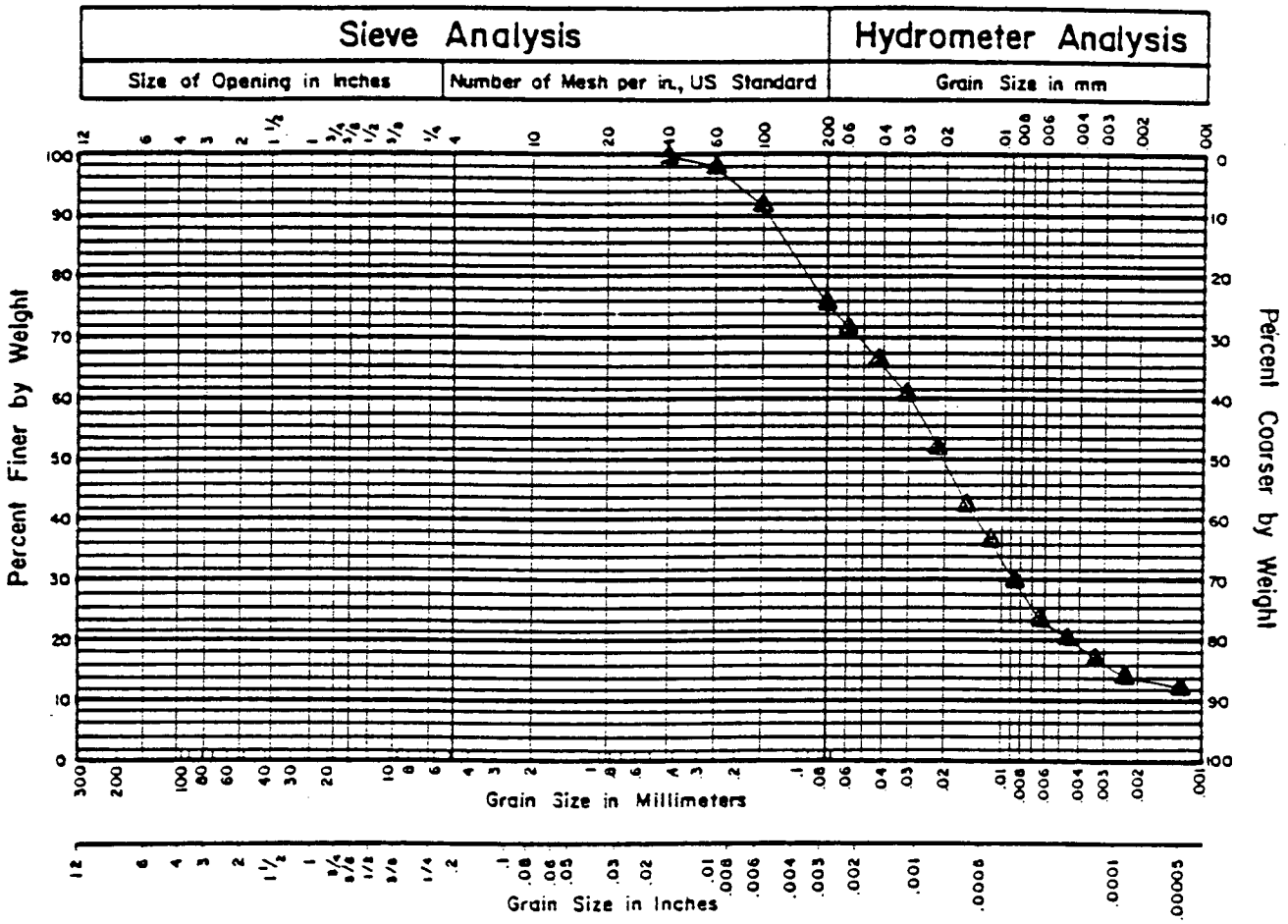
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 2391
Exploration No. Skms
Sample No. 6E
Sample Depth

Date 12-7-92
Tested By JPB/JLM
Plotted By JLM
Checked By JPB



COBBLES	GRAVEL: COARSE / FINE	SAND: C / M / F	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
Skms	6E		40			ML	Clayey sandy Silt

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm	D60= mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cz = $(D30)^2/(D10 \times D60)$ =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	$1 \leq Cz \leq 3$
SAND (SW): Cu > 6	and	$1 \leq Cz \leq 3$

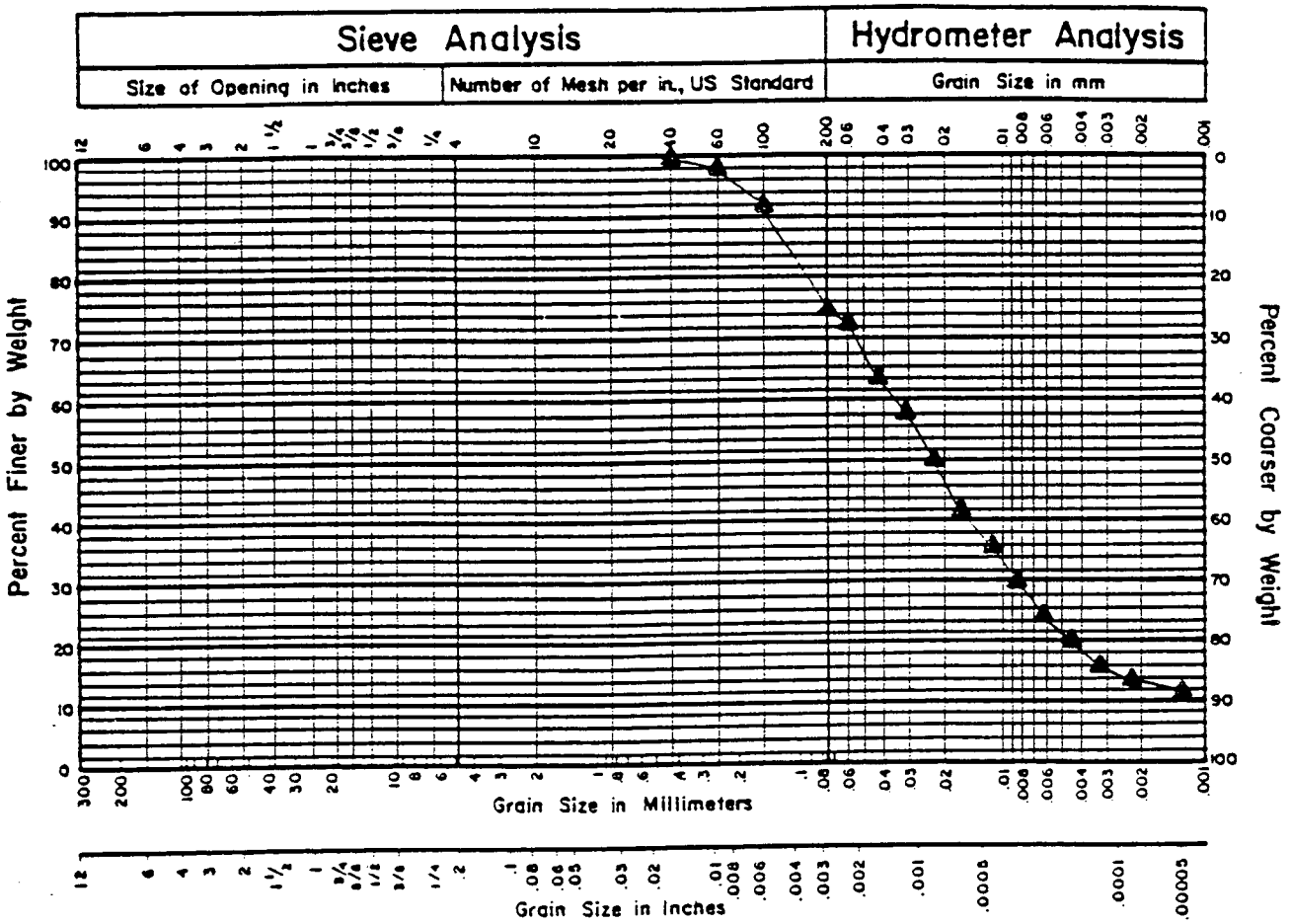
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowrens
Job No. 229
Exploration No. SKMS
Sample No. 67
Sample Depth

Date 12-7-88
Tested By JPB / JLM
Plotted By JLM
Checked By JPB



COBBLES	GRAVEL: COARSE / FINE	SAND: C / M / F	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	67		49			*ML	*clayey, sandy silt

*Based on Field Sieve

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm D60=	mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cz = $(D30)^2/(D10 \times D60)$ =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	$1 \leq Cz \leq 3$
SAND (SW): Cu > 6	and	$1 \leq Cz \leq 3$

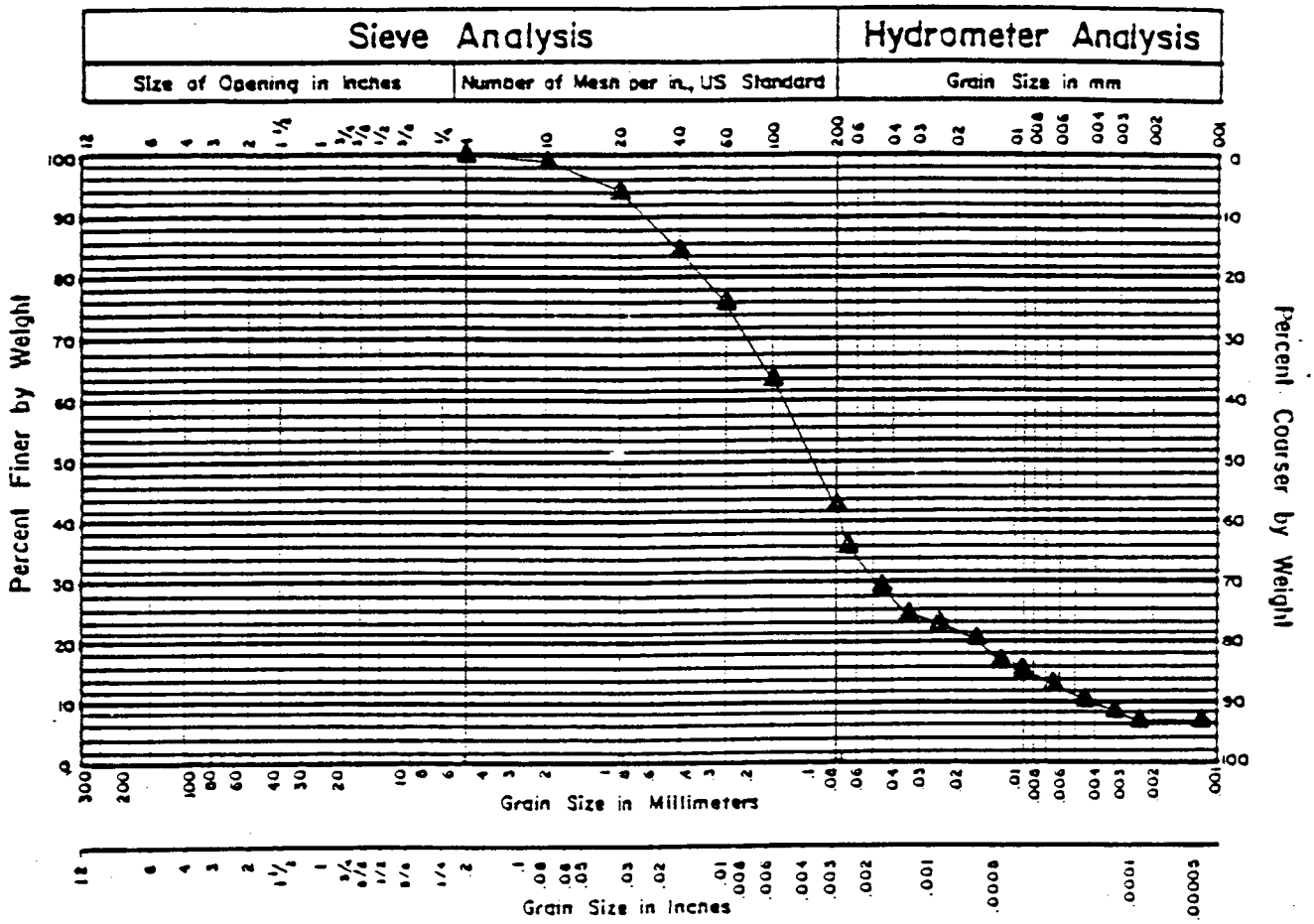
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 40
Sample Depth

Date 12-14-88
Tested By JPB/JLM
Plotted By JLM
Checked By JPB



EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	40		24			*SM	*Slightly clayey, very silty fine SAND

*Based on Field Sieve.

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%. SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%. VERY

NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm D60=	mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cz = $(D30)^2/(D10 \times D60)$ =	

Well Graded Soil (ASTM D 2487)

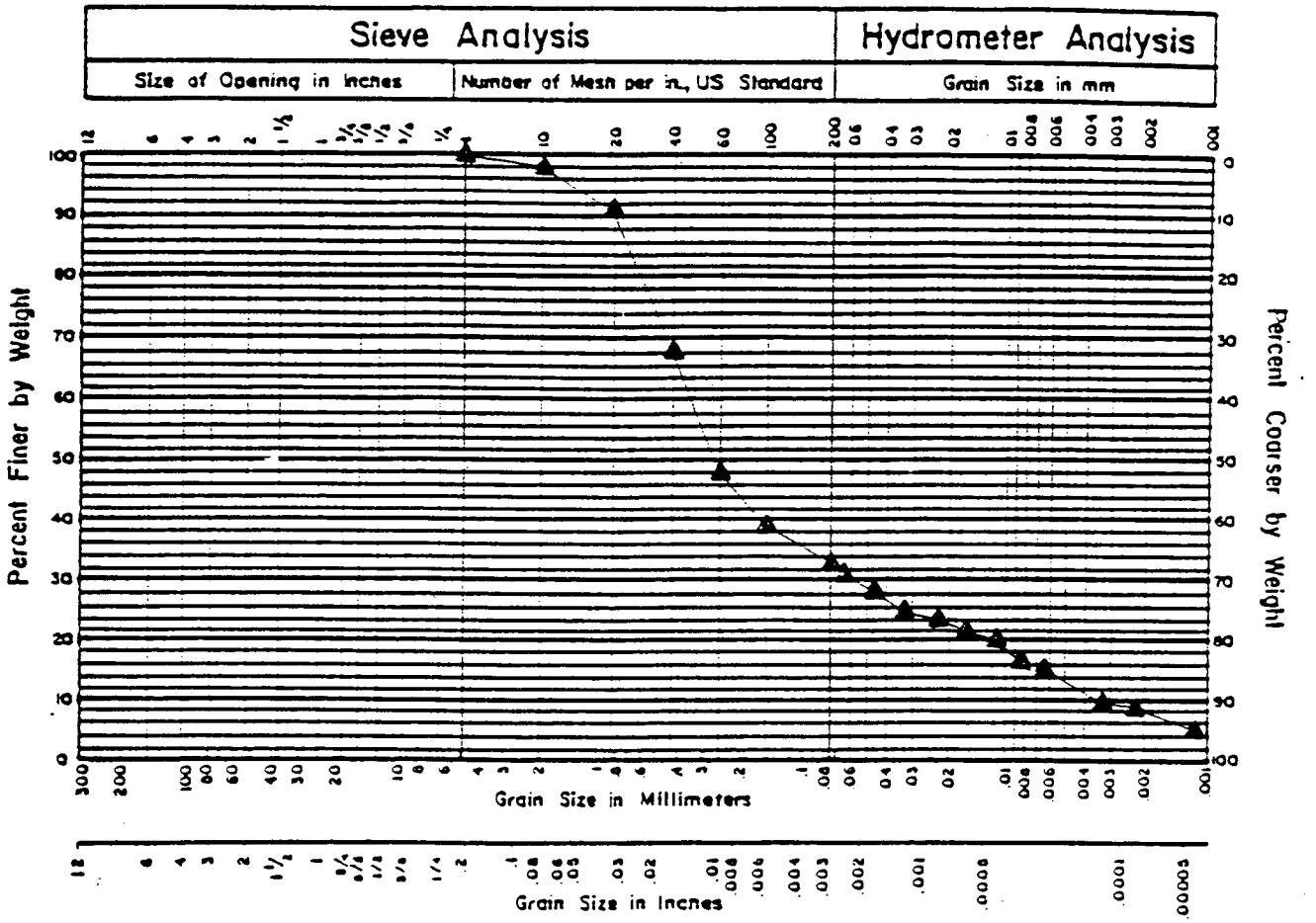
GRAVEL (GW): Cu > 4	and	1 ≤ Cz ≤ 3
SAND (SW): Cu > 6	and	1 ≤ Cz ≤ 3

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 26
Sample Depth

Date 12-12-88
Tested By LM
Plotted By JLM
Checked By JPB



EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	26		20			*SM	*Slightly Clayey, Silty, Med - Fine Sand.

*Based on Sieve Size.

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%. SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%. VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE. D10=	mm
D30= mm	D60= mm
UNIFORMITY COEFFICIENT: $C_u = D60/D10$ =	
COEF OF CURVATURE: $C_z = (D30)^2/(D10 \times D60)$ =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): $C_u > 4$	and	$1 \leq C_z \leq 3$
SAND (SW): $C_u > 6$	and	$1 \leq C_z \leq 3$

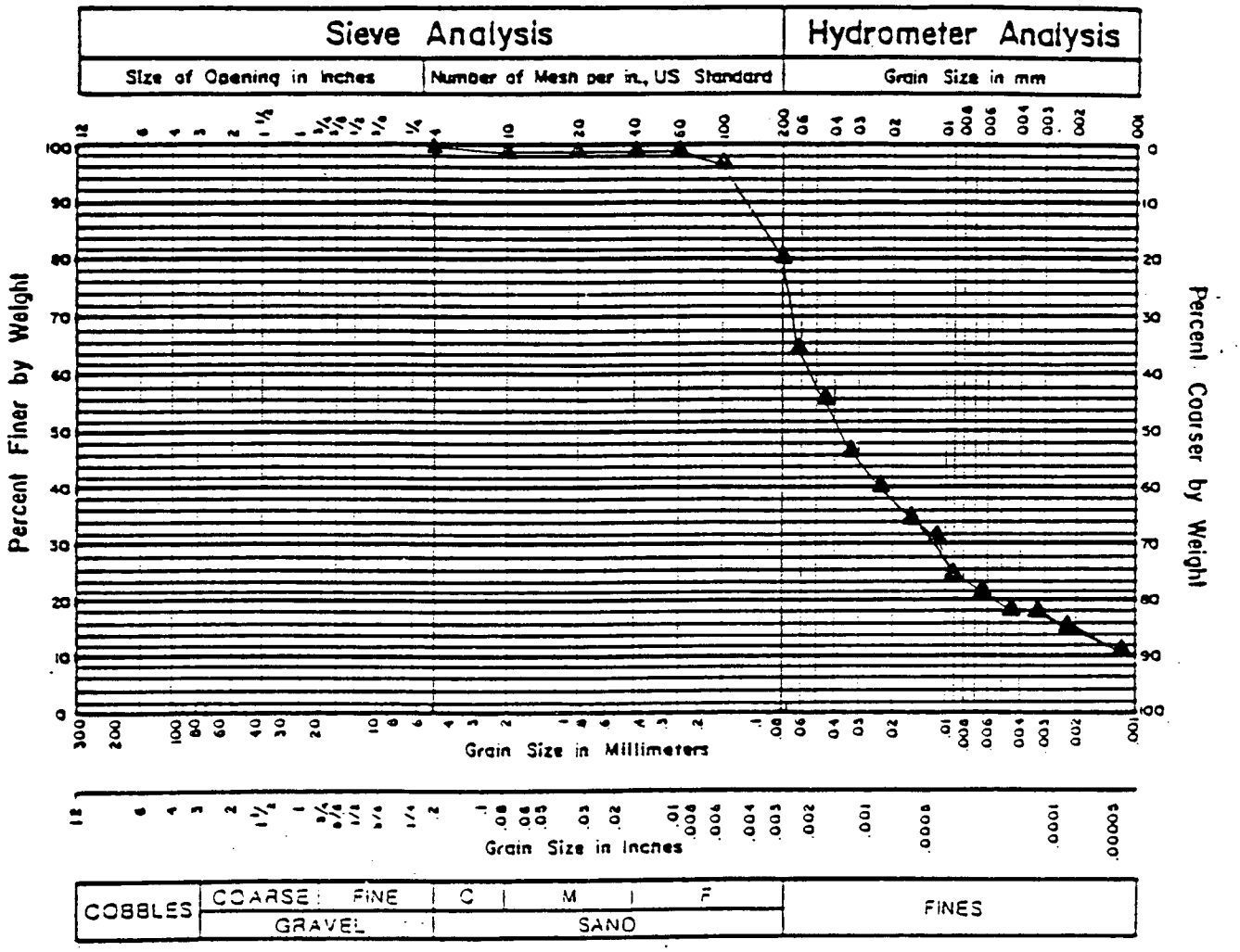
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Boulevard
Job No. 2201
Exploration No. SKMS
Sample No. 25
Sample Depth

Date 12-14-88
Tested By JPB / JLM
Plotted By JLM
Checked By JPB



EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
CAMS	25		37			*ML	*Clayey, Sandy, Silt

*Based on Grain Size

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%. SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%. VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE. D10=	mm
D30= mm D60=	mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cz = $(D30)^2/(D10 \times D60)$ =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	$1 \leq Cz \leq 3$
SAND (SW): Cu > 6	and	$1 \leq Cz \leq 3$

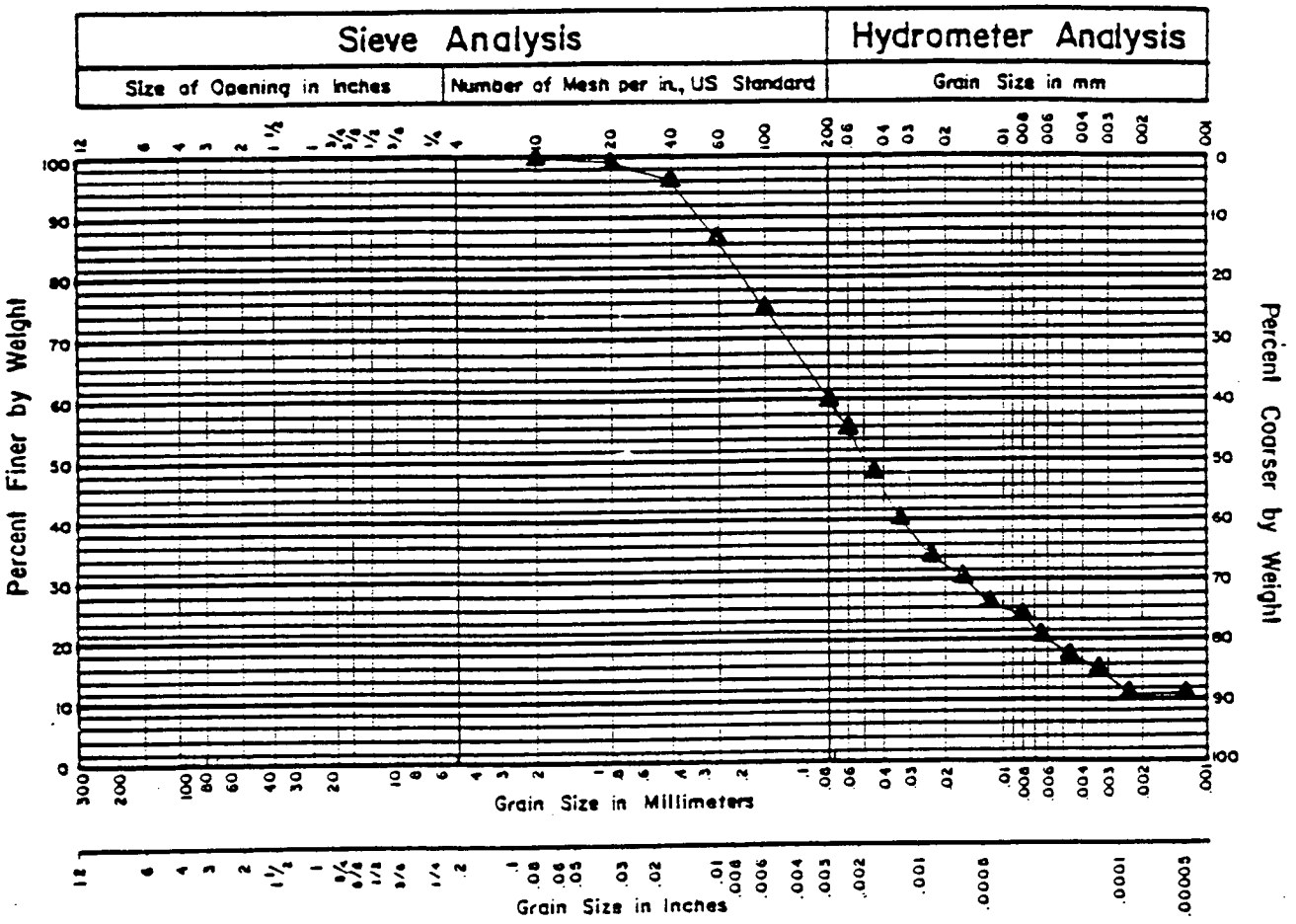
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 31
Sample Depth

Date 12-7-88
Tested By TDR / SLPI
Plotted By JLM
Checked By JPB



COBBLES	GRAVEL: COARSE | FINE	SAND: C | M | F	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	31		63			*ML	*Slightly clayey, very sandy silt

*Based on Grain Size

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm D60=	mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cz = $(D30)^2/(D10 \times D60)$ =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	$1 \leq Cz \leq 3$
SAND (SW): Cu > 6	and	$1 \leq Cz \leq 3$

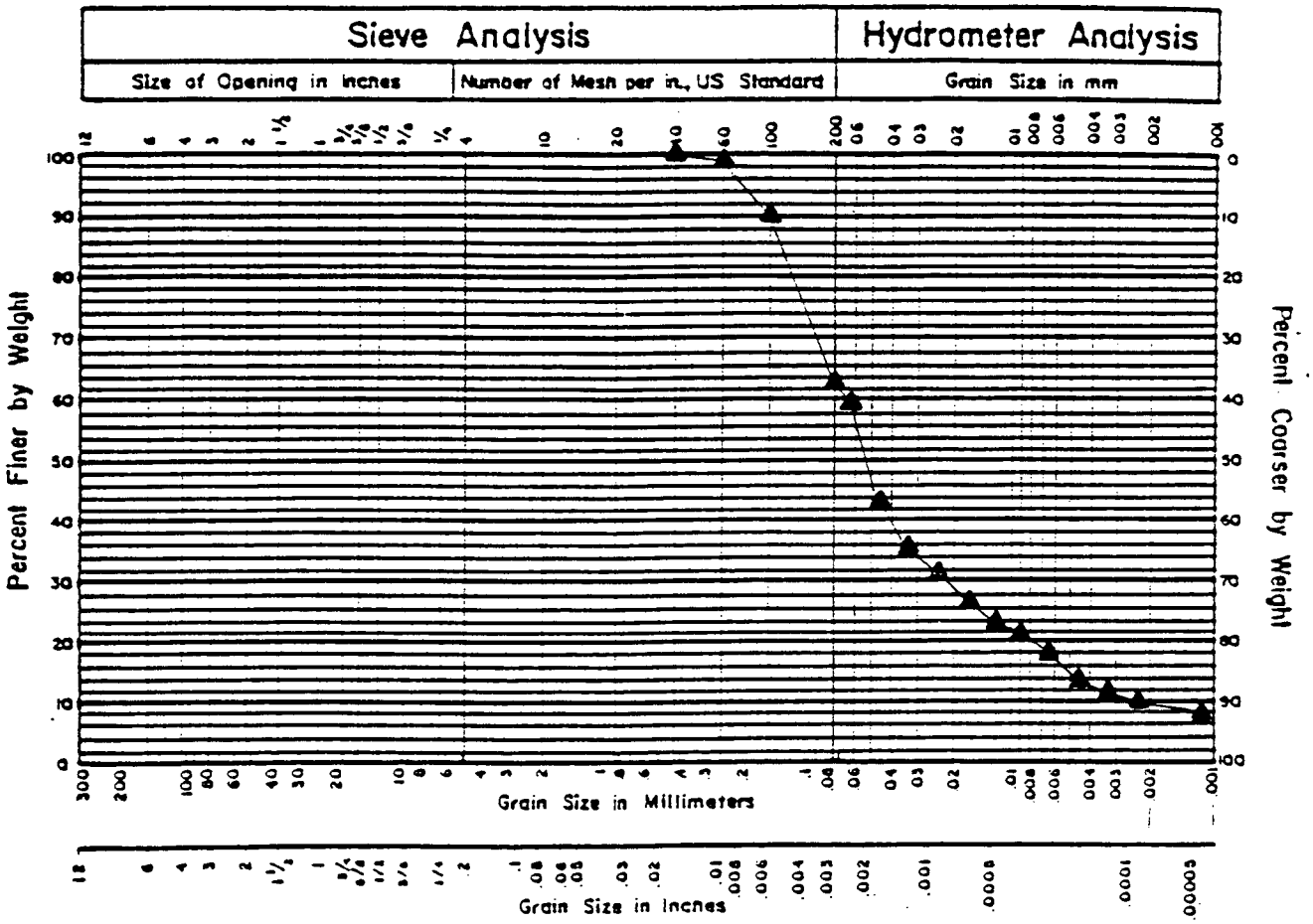
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 23
Sample Depth

Date 12-14-88
Tested By JPB/JLM
Plotted By JLM
Checked By



COBBLES	COARSE GRAVEL	FINE GRAVEL	C SAND	M SAND	F SAND	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	23		32			* ML	Slightly clayey, very sandy silt

* Based on Grain Size

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm	D60= mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cc = (D30)^2/(D10 x D60) =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	1 ≤ Cc ≤ 3
SAND (SW): Cu > 6	and	1 ≤ Cc ≤ 3

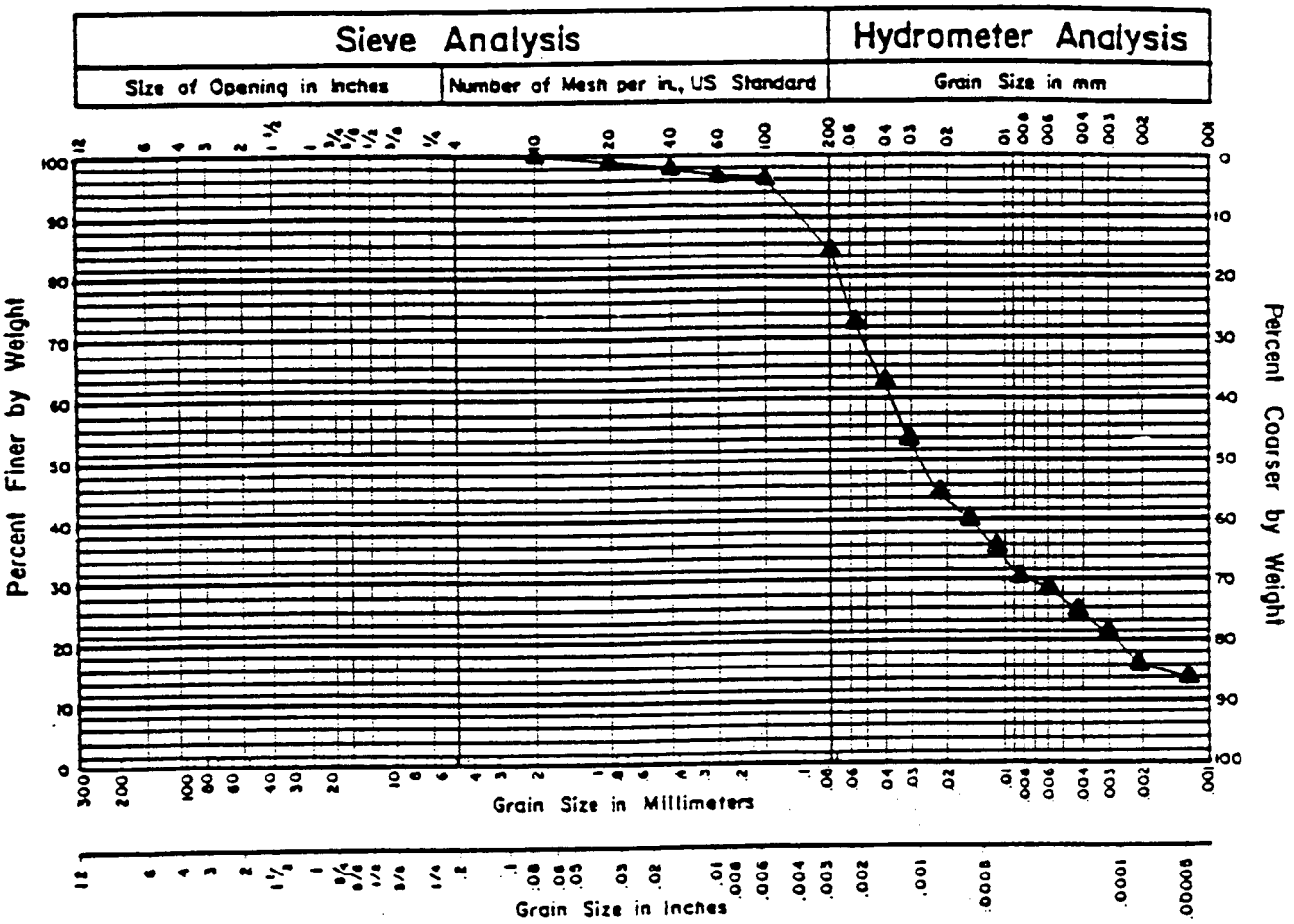
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 85
Sample Depth

Date 12-22-88
Tested By JPB
Plotted By JLM
Checked By JPB



COBBLES	COARSE | FINE (GRAVEL)	C | M | F (SAND)	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	85		65			*ML	*Sandy, clayey silt

*Based on Grain Size.

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm D60=	mm
UNIFORMITY COEFFICIENT: Cu=D60/D10=	
COEF OF CURVATURE: Cz=$(D30)^2/(D10 \times D60)$=	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	$1 \leq Cz \leq 3$
SAND (SW): Cu > 6	and	$1 \leq Cz \leq 3$

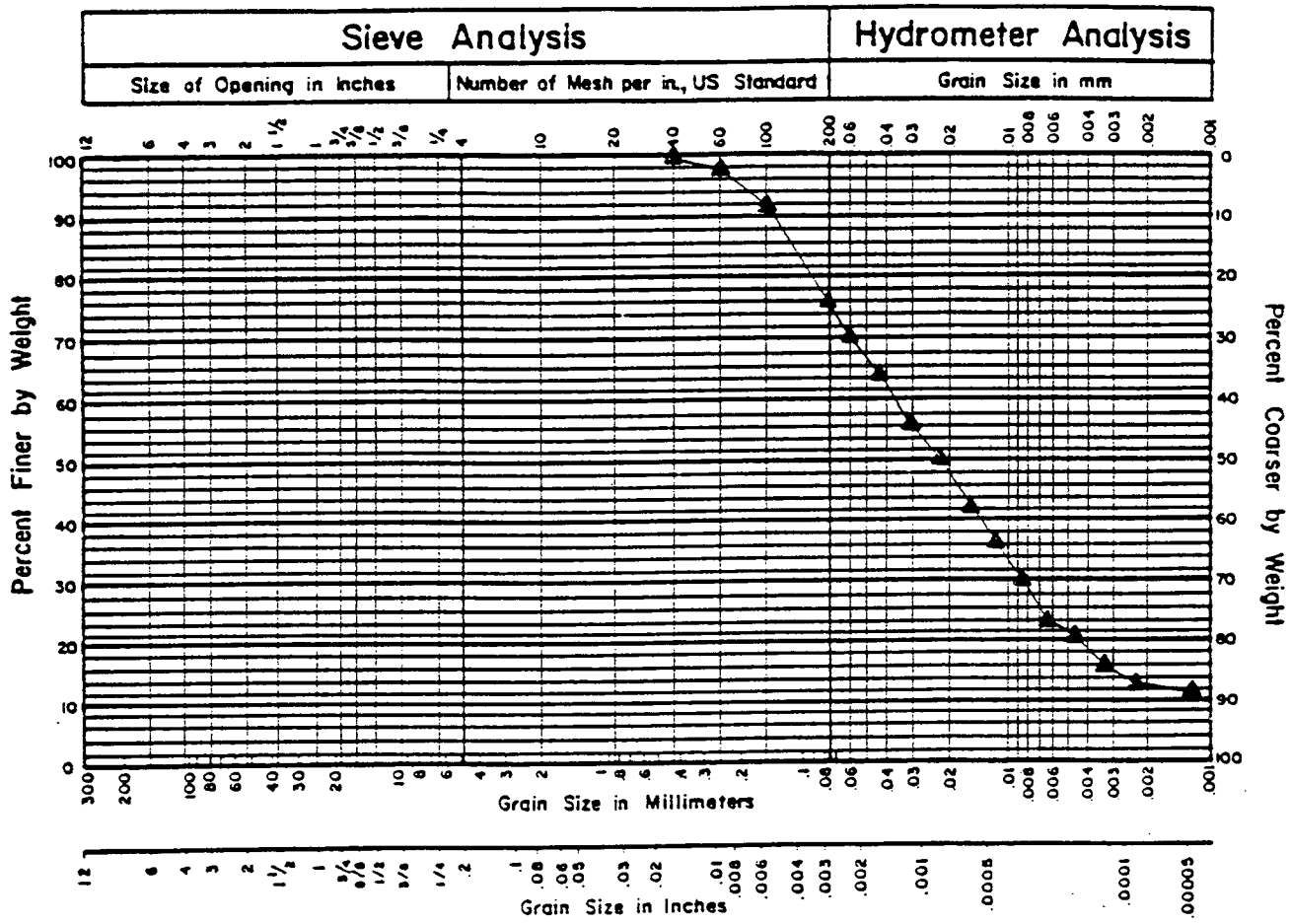
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Brushead
Job No. 2291
Exploration No. SKMS
Sample No. 69
Sample Depth

Date 12-7-88
Tested By JPR / JLM
Plotted By JLM
Checked By



COBBLES	GRAVEL: COARSE	GRAVEL: FINE	SAND: C	SAND: M	SAND: F	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	69		42			*ML	*clayey, sandy silt

*Based on Grain Size.

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=			mm
D30=	mm	D60=	mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =			
COEF OF CURVATURE: Cz = $(D30)^2/(D10 \times D60)$ =			

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	$1 \leq Cz \leq 3$
SAND (SW): Cu > 6	and	$1 \leq Cz \leq 3$

NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

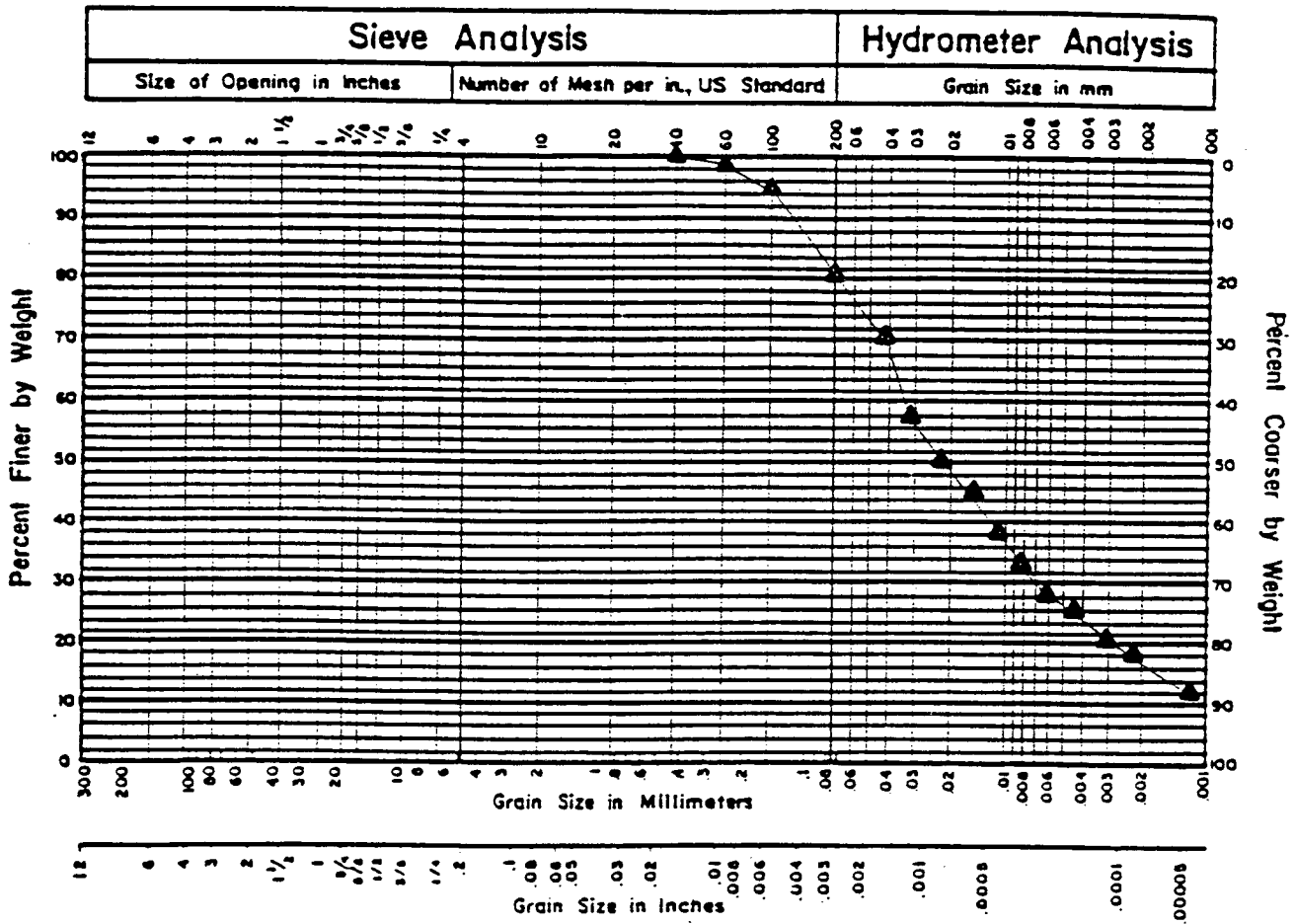
HART-CROWSER & associates inc.

Form 1126-86

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 3
Sample Depth

Date 12-23-88
Tested By JPB/SAS
Plotted By JLM
Checked By JPB



COBBLES	COARSE | FINE (GRAVEL)	C | M | F (SAND)	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	3		57			*ML	*Clayey, sandy silt

*Based on grain size.

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10= mm
D30= mm D60= mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =
COEF OF CURVATURE: Cz = $(D30)^2/(D10 \times D60)$ =

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	$1 \leq Cz \leq 3$
SAND (SW): Cu > 6	and	$1 \leq Cz \leq 3$

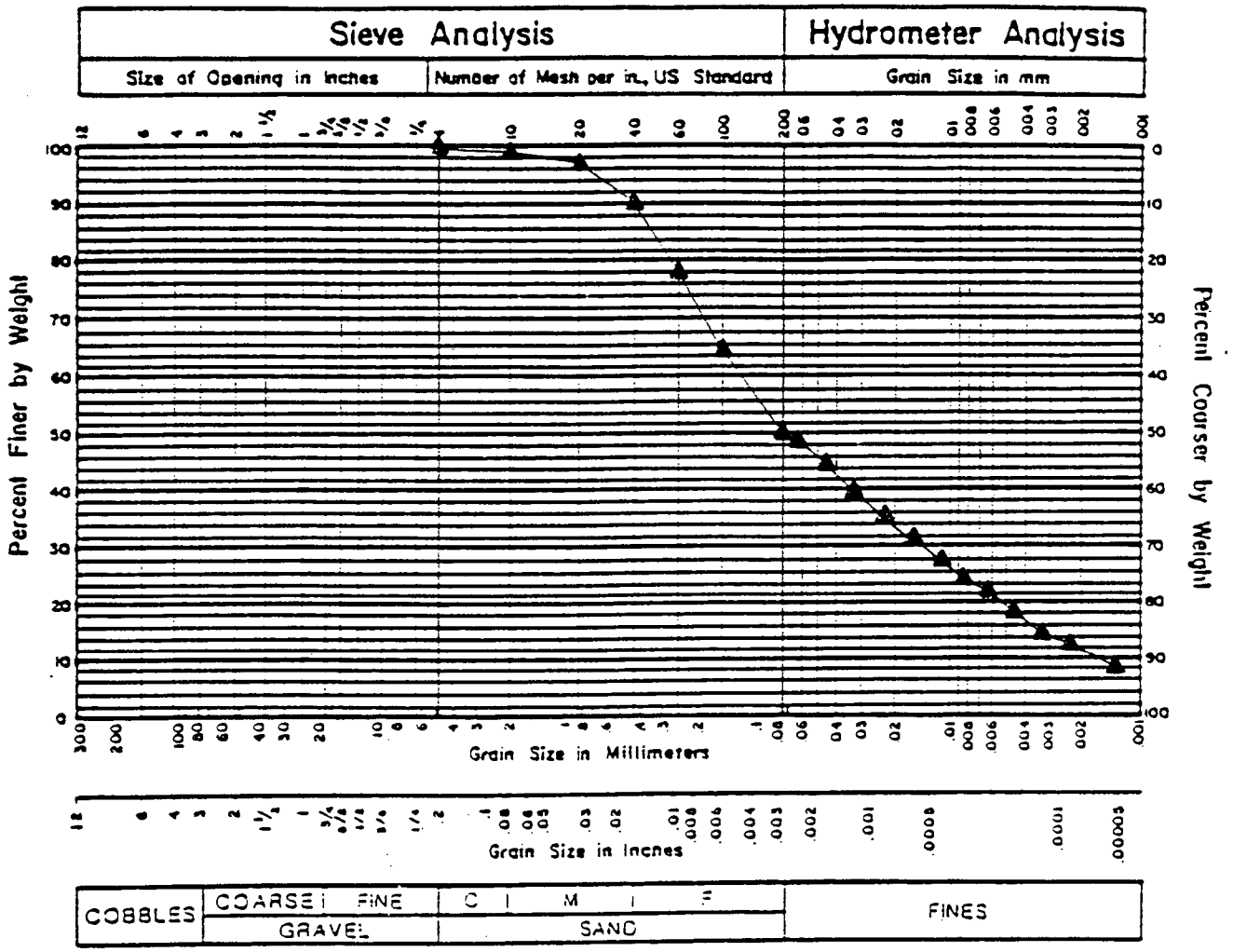
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST 0.5 %

HART-CROWSER & associates inc.

Grain Size Classification

Job Bayhead
Job No. 2291
Exploration No. SKMS
Sample No. 50
Sample Depth

Date 12-7-98
Tested By THE/JLM
Plotted By JLM
Checked By JRB



EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	50		39			ML	Slightly clayey, very sandy Silt

Classification

ORDER OF SOIL DESCRIPTION:
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm	D60= mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cz = (D30)^2/(D10 × D60) =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	1 ≤ Cz ≤ 3
SAND (SW): Cu > 6	and	1 ≤ Cz ≤ 3

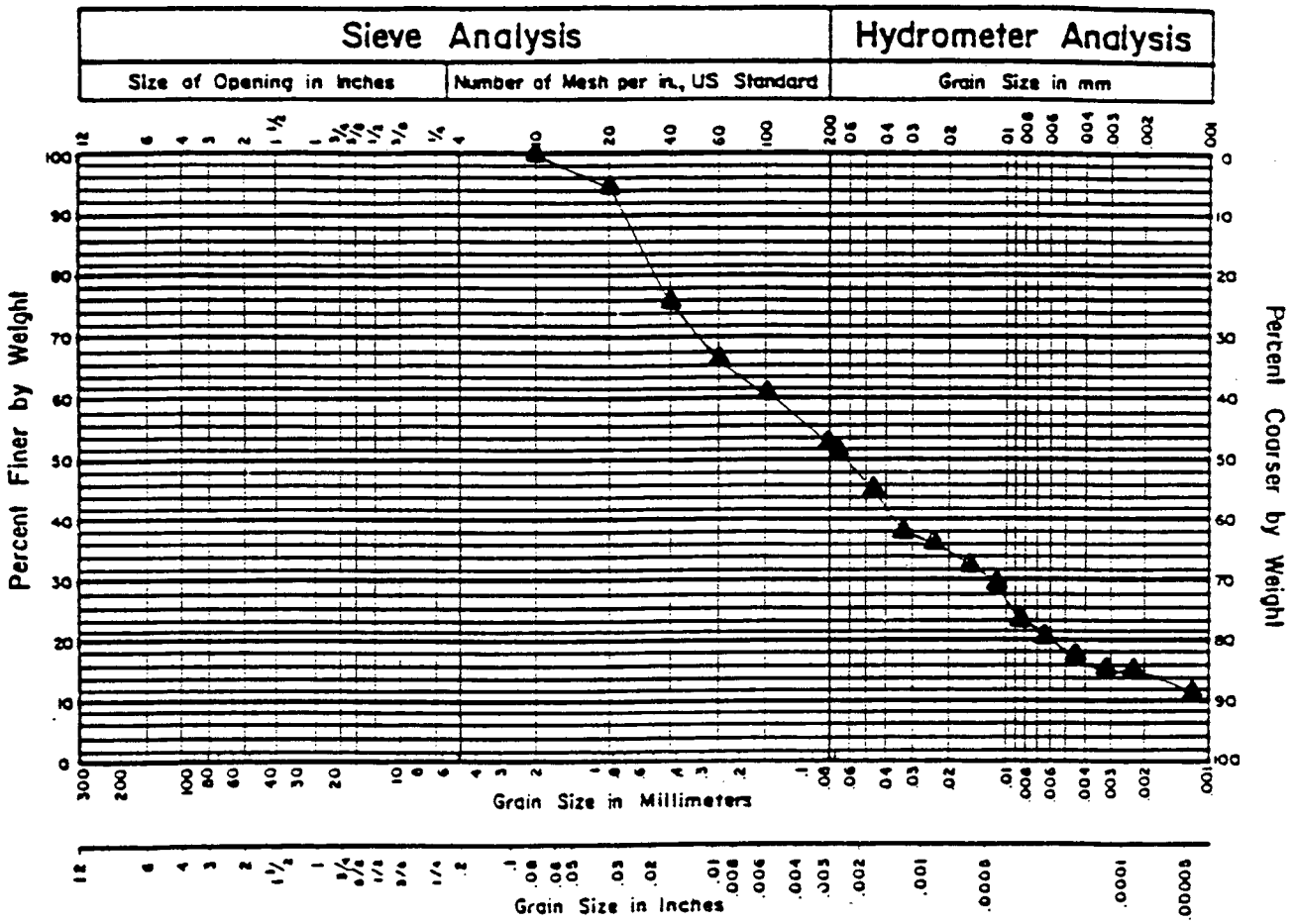
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. 4BT (2259M)
Sample No.
Sample Depth

Date 12-23-88
Tested By JPB/SAS
Plotted By JLM
Checked By RLS



COBBLES	GRAVEL: COARSE / FINE	SAND: C / M / F	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
4BT	/	/	62	/	/	*ML	*Clayey, very sandy silt

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= / mm D60=	mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cz = $(D30)^2/(D10 \times D60)$ =	

*BASED on GRAIN SIZE only.

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	$1 \leq Cz \leq 3$
SAND (SW): Cu > 6	and	$1 \leq Cz \leq 3$

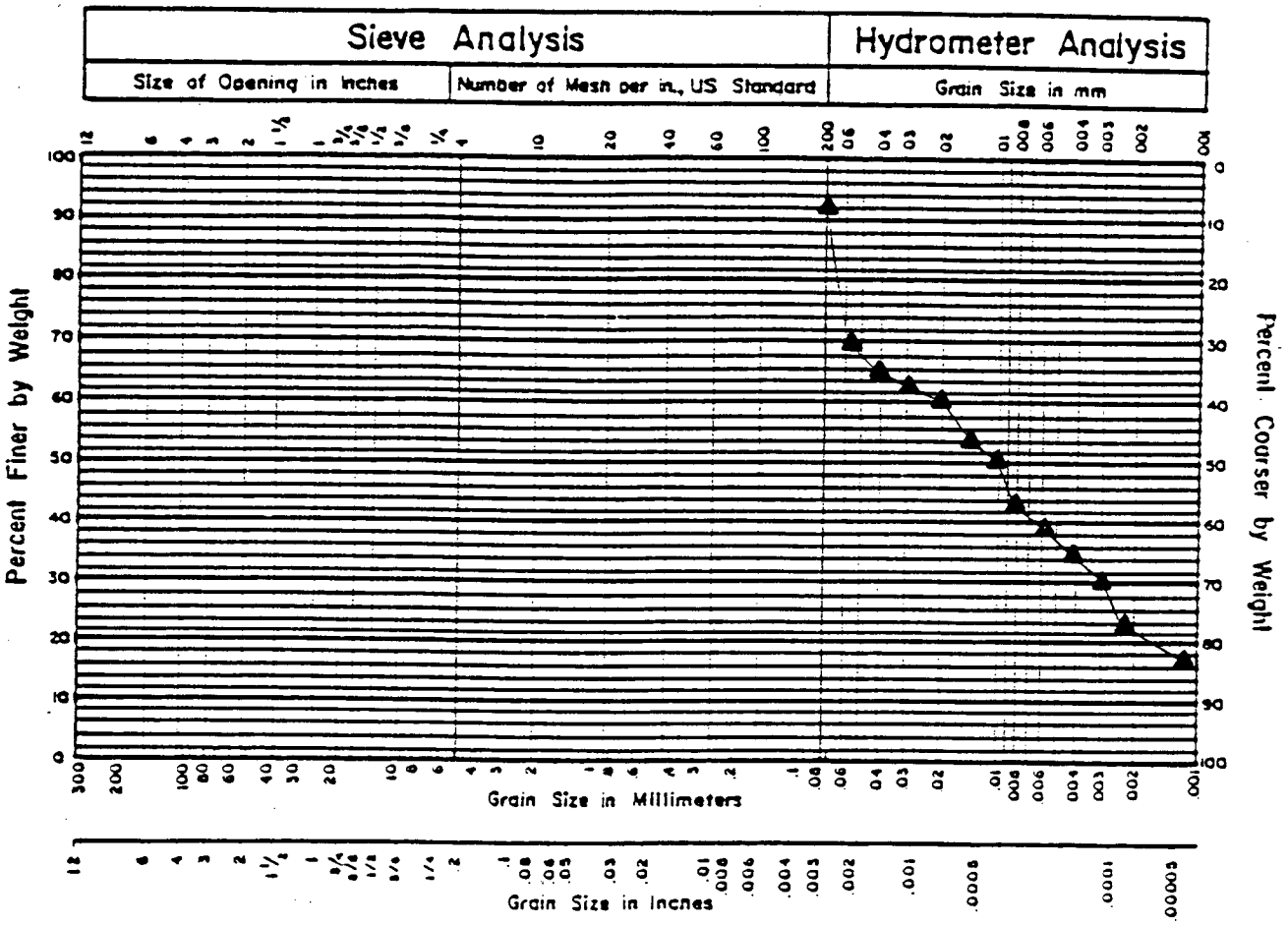
NOTE: REPORT WATER CONTENTS AND ATTERBERG

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 37
Sample Depth

Date 12-14-88
Tested By JPB
Plotted By JLM
Checked By JPB



COBBLES	COARSE | FINE	C | M | F	FINES
	GRAVEL	SAND	

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	37		74			*ML	*Slightly sandy, clayey silt

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%. SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%. VERY

NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

Grain Size Coefficients *Based on Smooth Curve (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm	D60= mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cc = (D30)^2/(D10 x D60) =	

Well Graded Soil (ASTM D 2487)

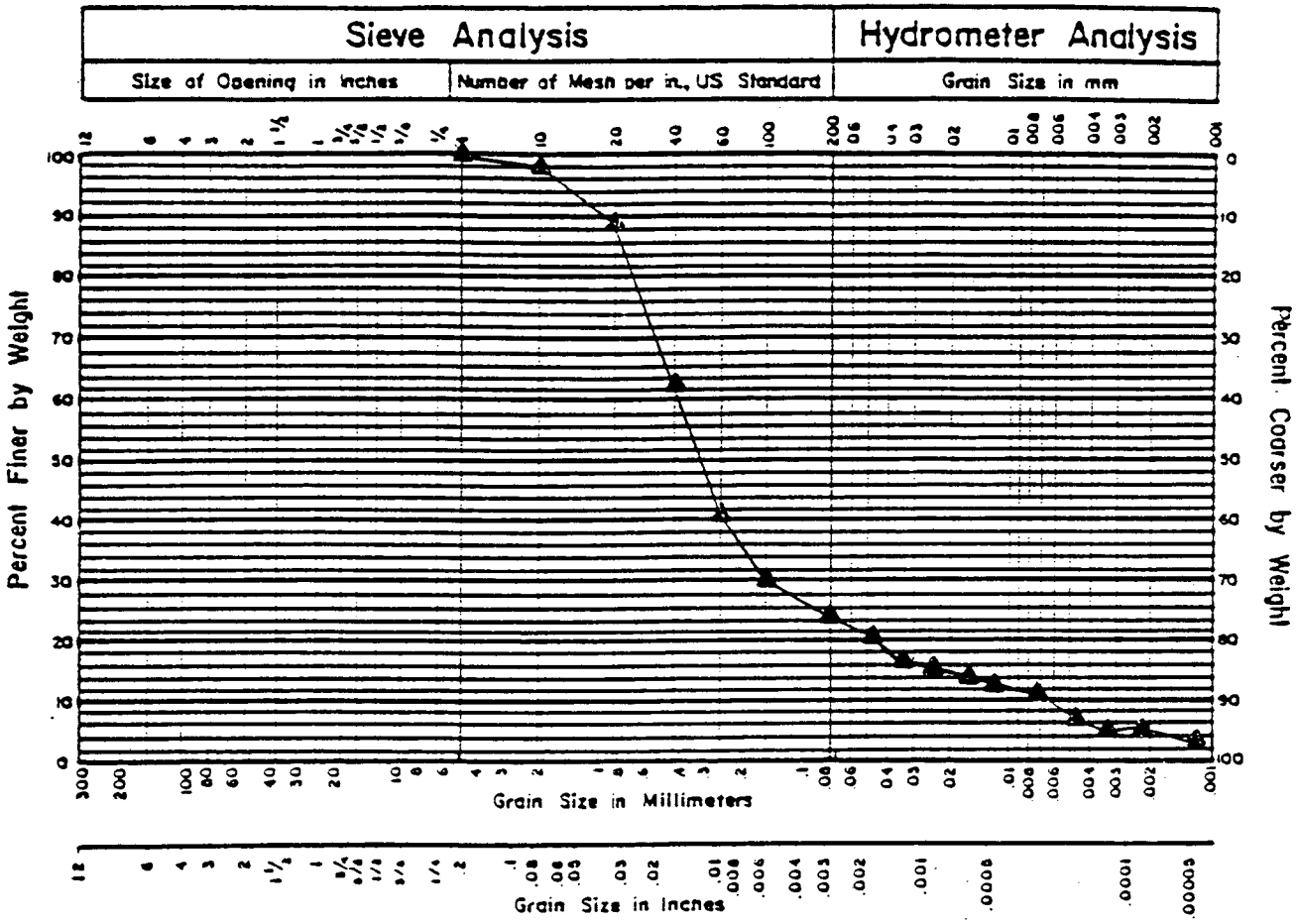
GRAVEL (GW): Cu > 4	and	1 ≤ Cc ≤ 3
SAND (SW): Cu > 6	and	1 ≤ Cc ≤ 3

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 27
Sample Depth

Date 12-14-88
Tested By JPB / JLM
Plotted By JLM
Checked By JPB



EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	27		21			*SM	*Slightly clayey, silty, med-fine sand

*Based on Grain Size

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE, D10=	mm
D30= mm	D60= mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cz = (D30)^2/(D10 x D60) =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	1 ≤ Cz ≤ 3
SAND (SW): Cu > 6	and	1 ≤ Cz ≤ 3

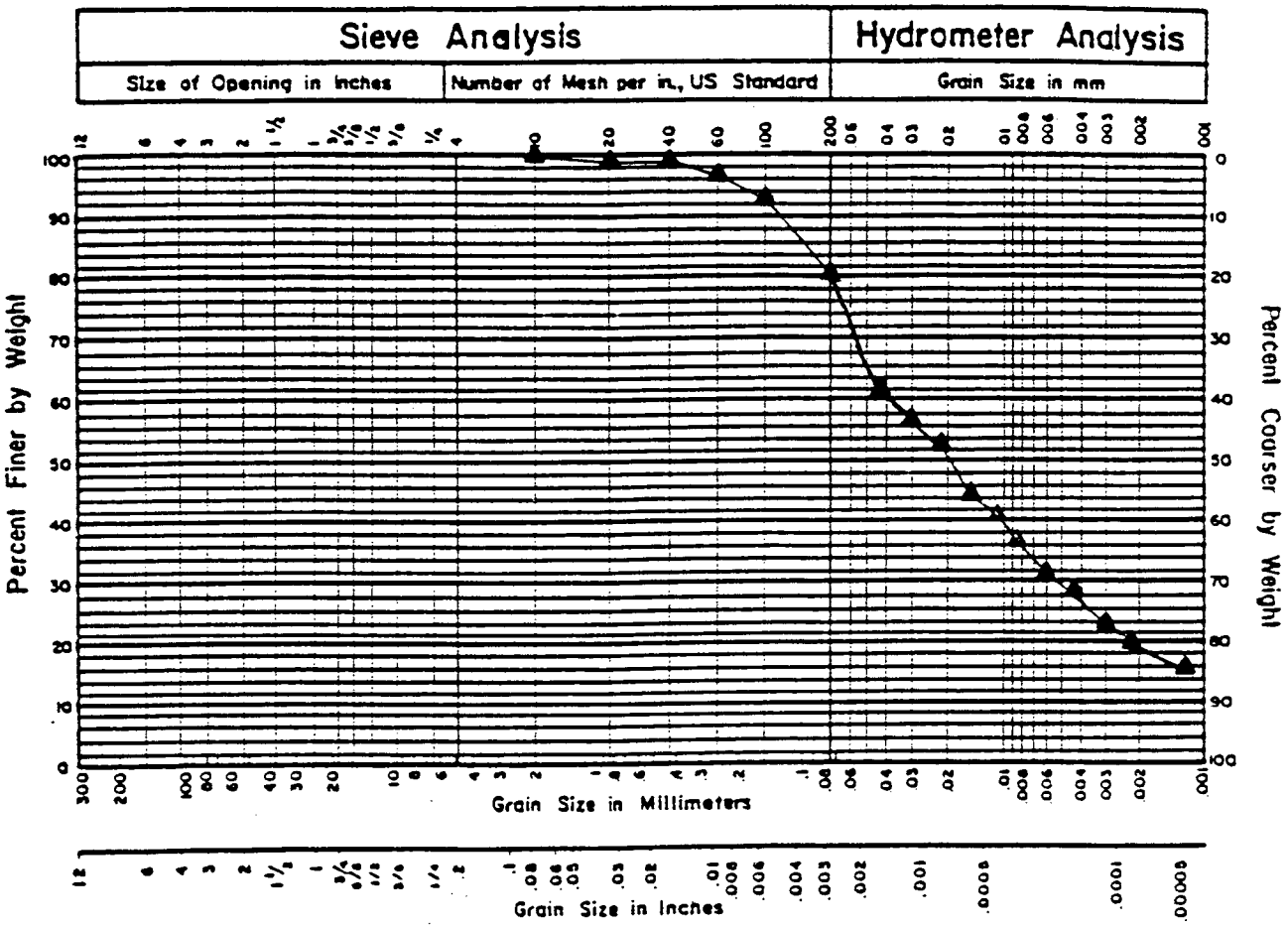
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 47
Sample Depth

Date 12-23-88
Tested By SAS/JPB
Plotted By JLM
Checked By



COBBLES	GRAVEL: COARSE / FINE	SAND: C / M / F	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	47		68			ML	Clayey, Sandy Silt

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10= mm
D30= mm D60= mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =
COEF OF CURVATURE: Cz = $(D30)^2/(D10 \times D60)$ =

* BASED ON GRAIN SIZE ONLY

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	1 ≤ Cz ≤ 3
SAND (SW): Cu > 6	and	1 ≤ Cz ≤ 3

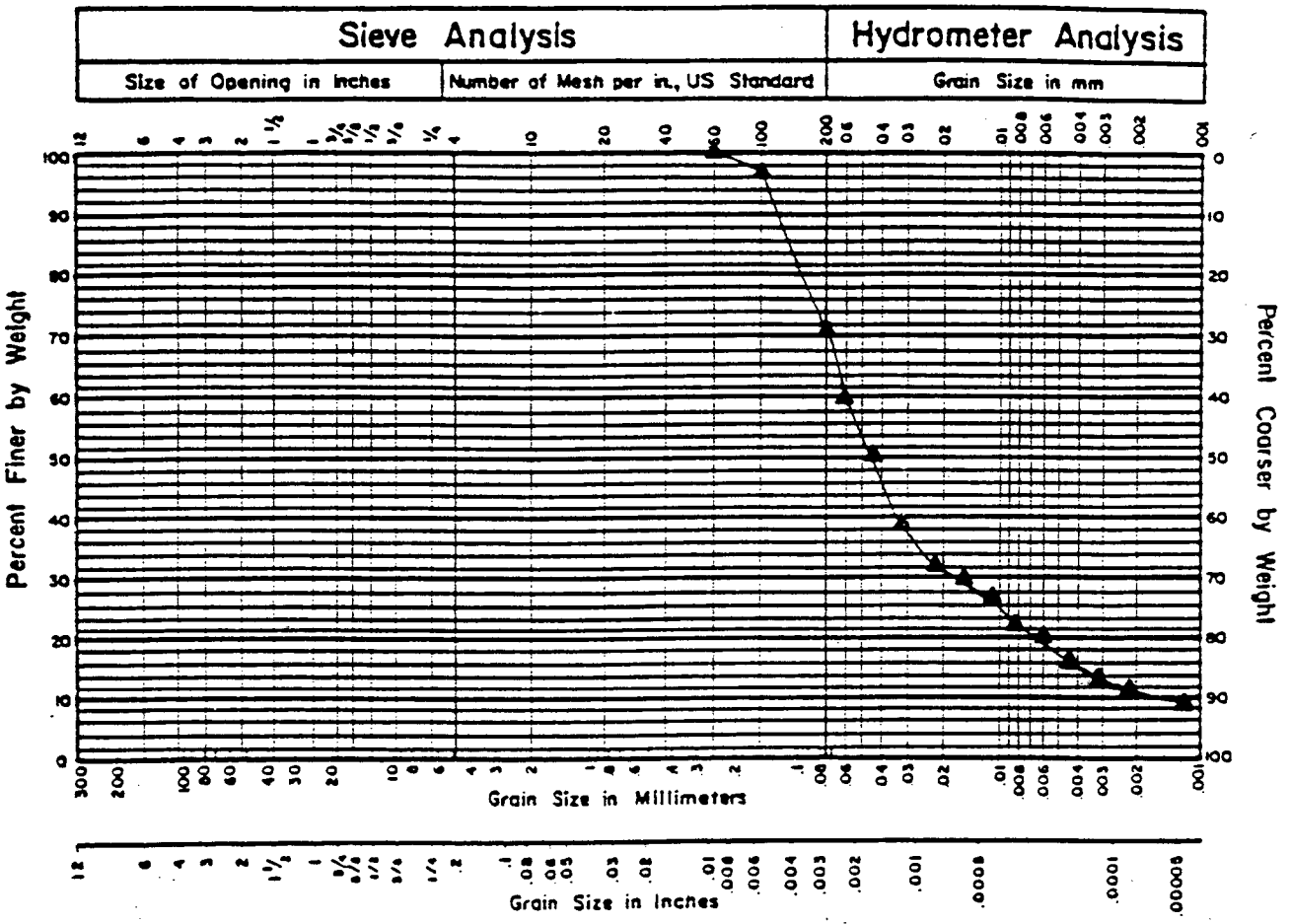
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 24
Sample Depth

Date 12-23-88
Tested By SAS/JPB
Plotted By JLM
Checked By



COBBLES	GRAVEL: COARSE / FINE	SAND: C / M / F	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	24	/	35	/	/	* ML	slightly clayey, sandy SILT

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= / mm D60=	mm
UNIFORMITY COEFFICIENT: Cu=D60/D10=	
COEF OF CURVATURE: Cz=(D30)^2/(D10 x D60) =	

* Based on Grain Size only

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	1≤Cz≤3
SAND (SW): Cu > 6	and	1≤Cz≤3

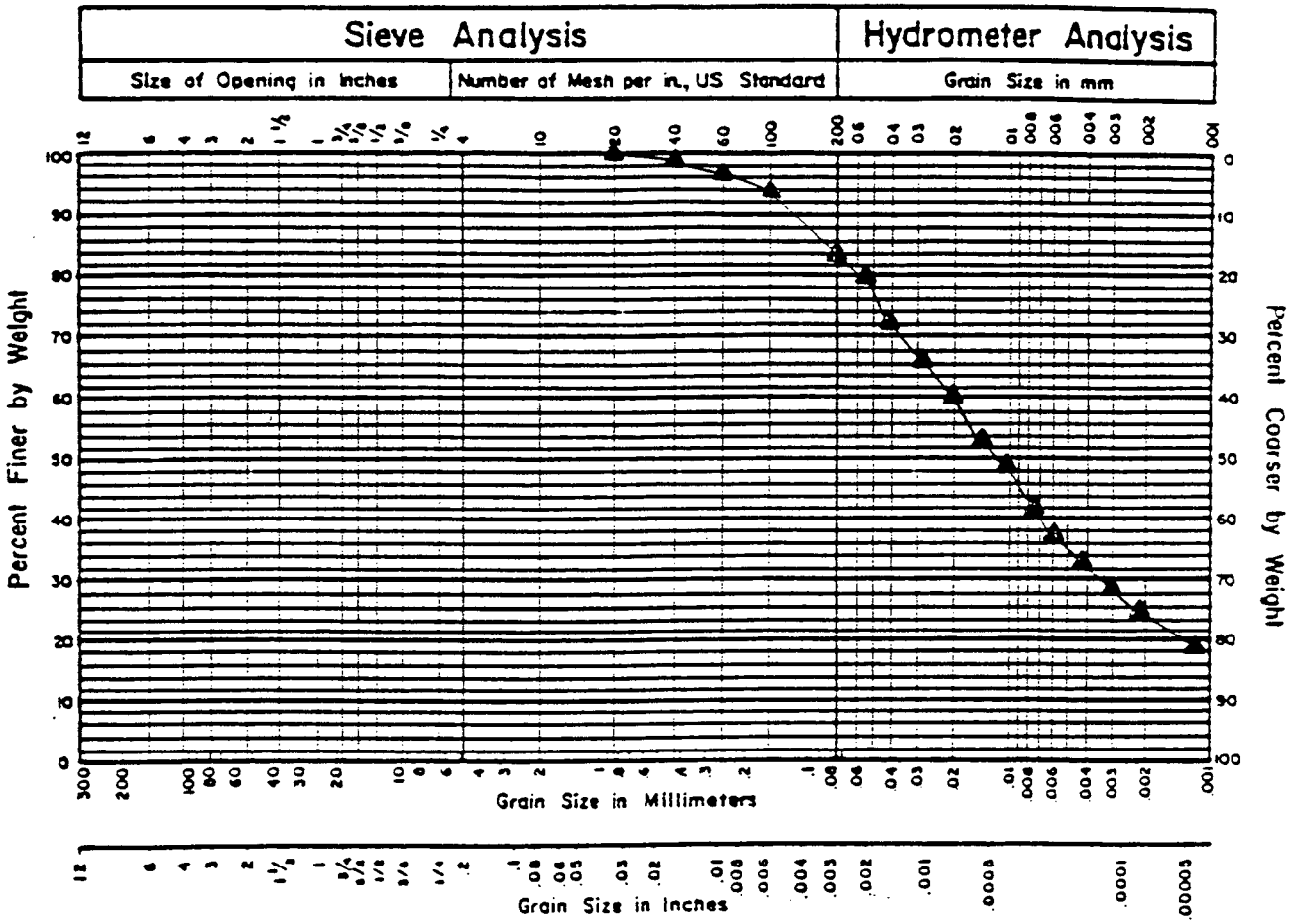
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 4
Sample Depth

Date 12-23-88
Tested By JLM/RGS
Plotted By JLM
Checked By



COBBLES	COARSE GRAVEL	FINE GRAVEL	C SAND	M SAND	F SAND	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	4	/	71	/	/	* ML	*Sandy, clayey silt

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%. SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30% VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm	D60= mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cc = $(D30)^2/(D10 \times D60)$ =	

* BASED on Grain Size only.

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	$1 \leq Cc \leq 3$
SAND (SW): Cu > 6	and	$1 \leq Cc \leq 3$

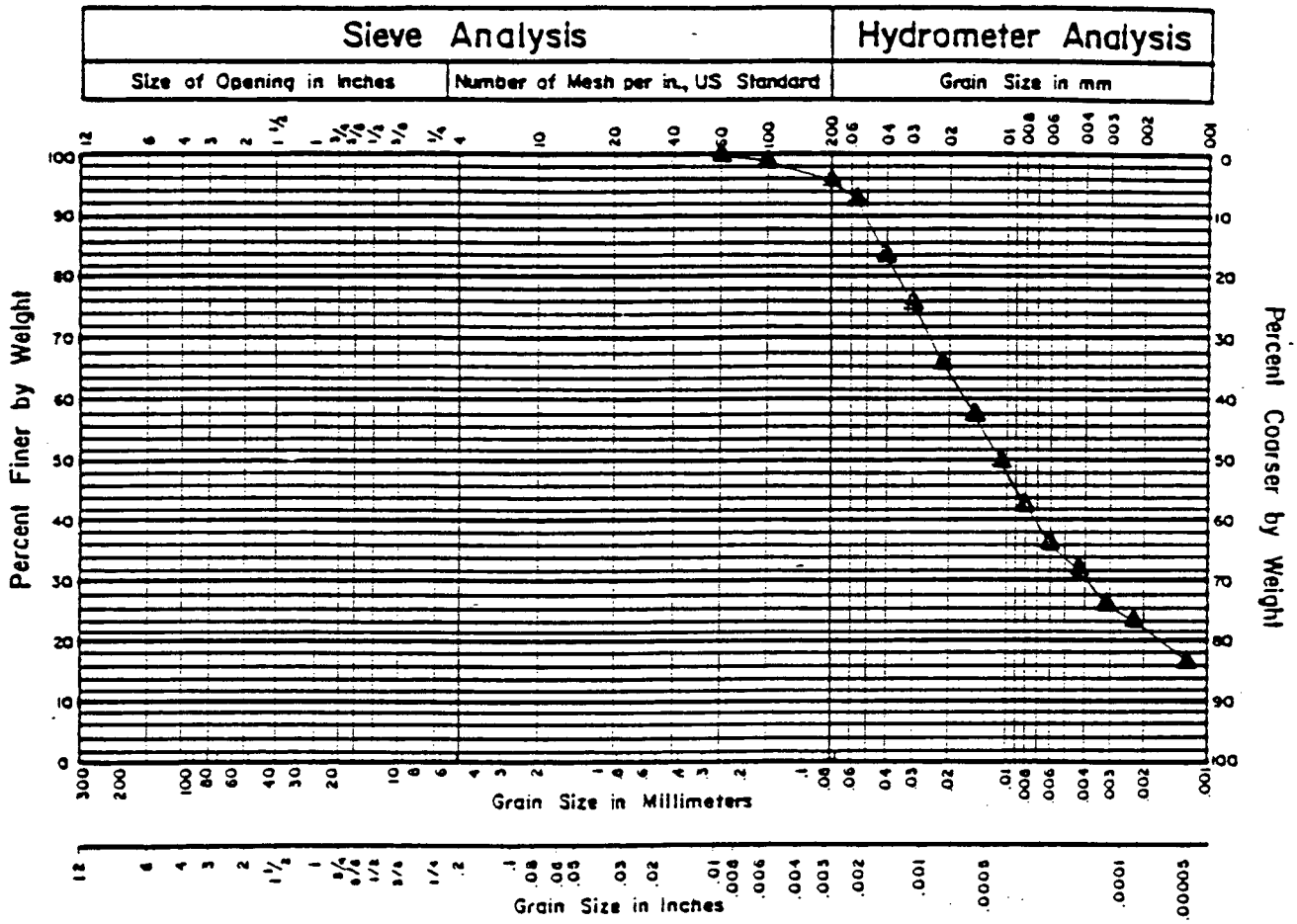
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 62
Sample Depth

Date 12-7-88
Tested By JPB/JLM
Plotted By JLM
Checked By JPB



COBBLES	GRAVEL: COARSE / FINE	SAND: C / M / F	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	62		62			*ML	*Clayey silt

* Based on Grain Size.

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm	D60= mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cz = (D30)^2/(D10 × D60) =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	1 ≤ Cz ≤ 3
SAND (SW): Cu > 6	and	1 ≤ Cz ≤ 3

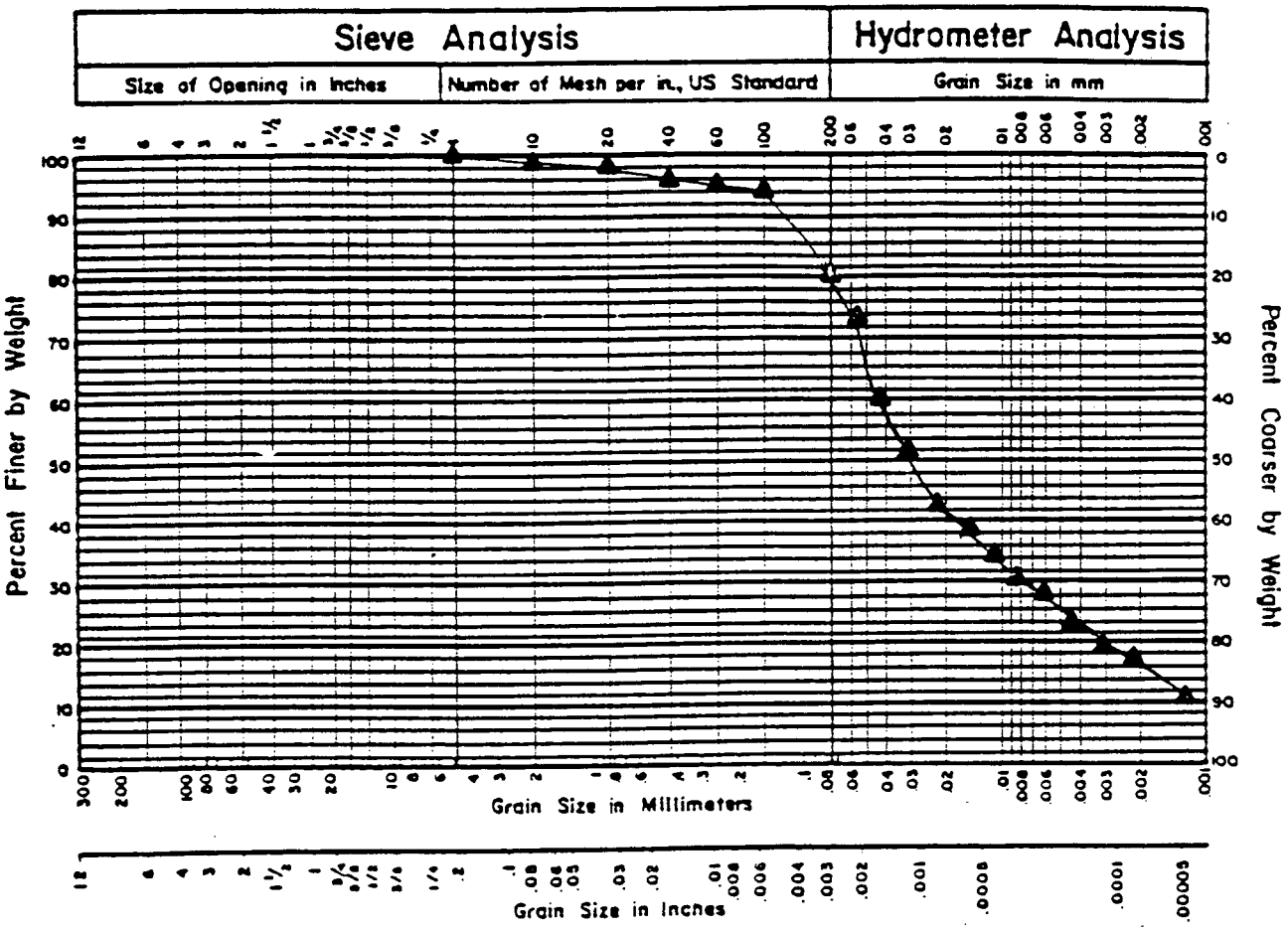
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 41
Sample Depth /

Date 12-23-88
Tested By JPB/SAS
Plotted By JLM
Checked By



COBBLES	GRAVEL: COARSE / FINE	SAND: C / M / F	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	41	/	84	/	/	ML	Clayey, sandy silt

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= / mm D60=	mm
UNIFORMITY COEFFICIENT: Cu=D60/D10=	
COEF OF CURVATURE: Cz=(D30)^2/(D10 x D60) =	

* BASED ON GRAIN SIZE ONLY

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	1 ≤ Cz ≤ 3
SAND (SW): Cu > 6	and	1 ≤ Cz ≤ 3

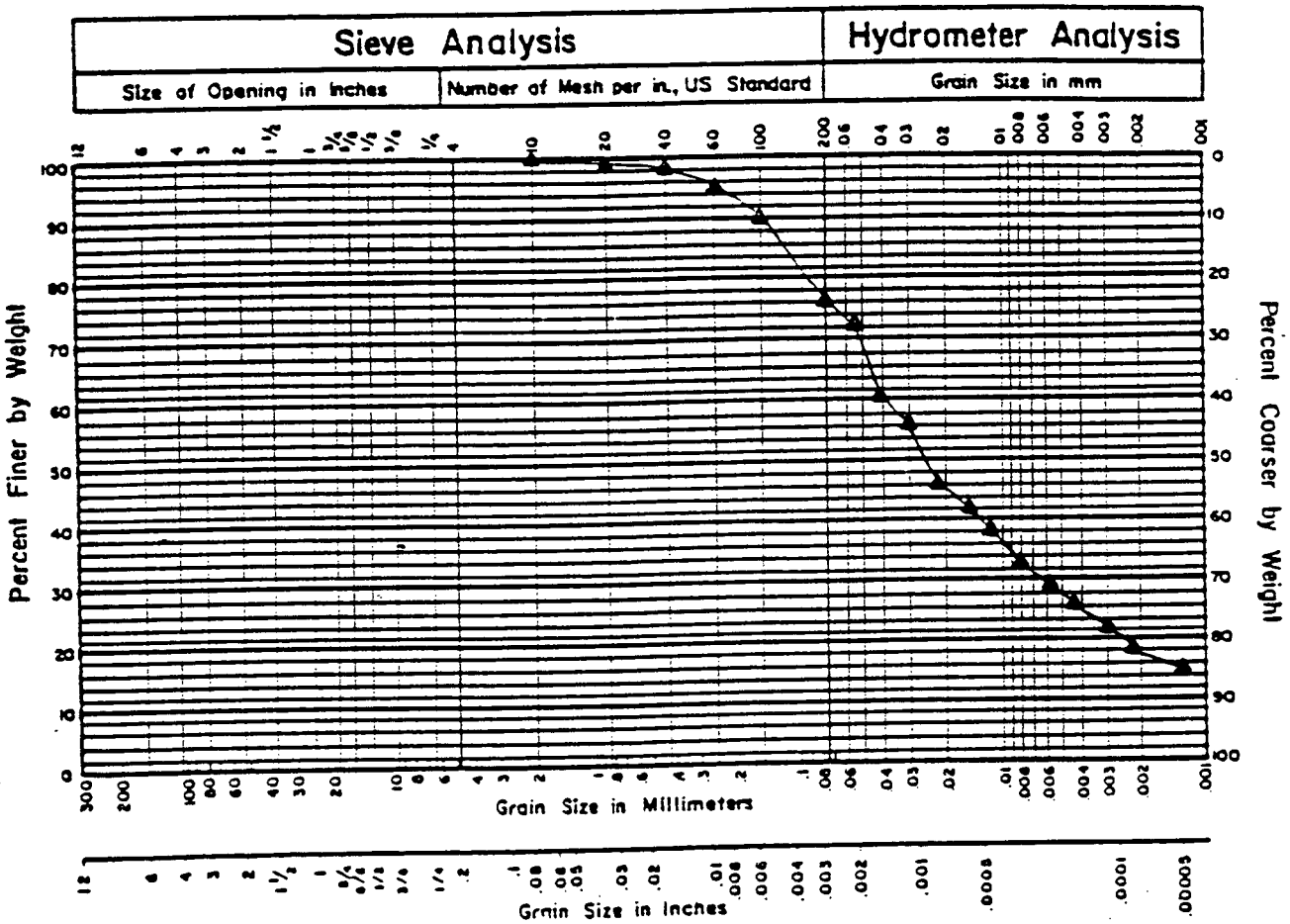
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS ON THE LOWEST RECOVERY

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS.
Sample No. 5
Sample Depth

Date 12/23/88
Tested By JPB
Plotted By CEB.
Checked By



COBBLES	COARSE | FINE	C | M | F	FINES
	GRAVEL	SAND	

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	5	/	46	/	/	*ML	CLAYEY, SANDY SILT

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= / mm D60=	mm
UNIFORMITY COEFFICIENT: Cu=D60/D10=	
COEF OF CURVATURE: Cz=(D30)^2/(D10 x D60) =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	1≤Cz≤3
SAND (SW): Cu > 6	and	1≤Cz≤3

* BASED on GRAIN-SIZE only.

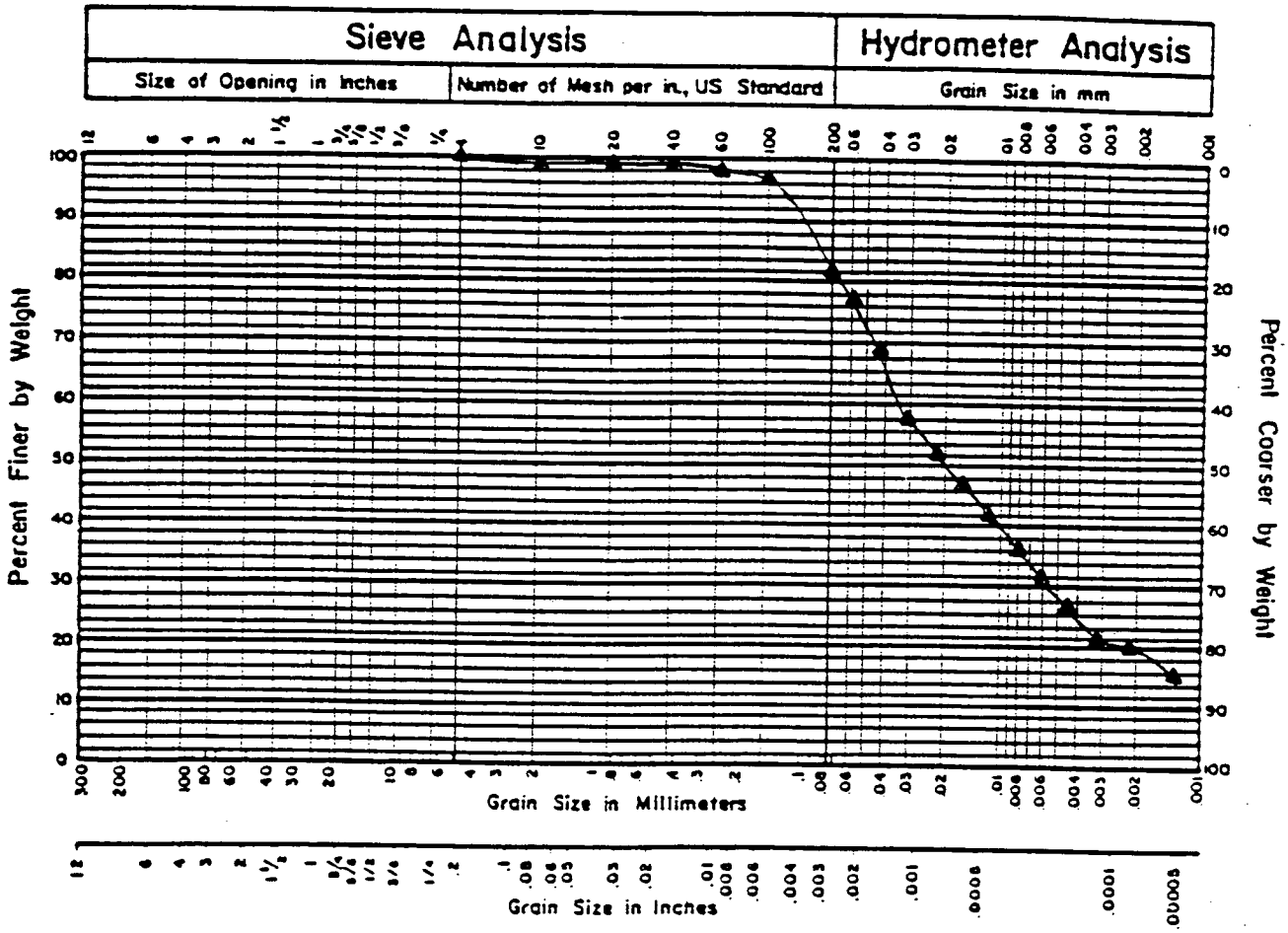
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. J-2291
Exploration No. SKMS-34
Sample No.
Sample Depth

Date 12/23/88
Tested By JFB
Plotted By
Checked By



COBBLES	COARSE GRAVEL	FINE GRAVEL	C SAND	M SAND	F SAND	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	34	/	47	/	/	*ML	*SANDY, CLAYEY SILT

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30% VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm	D60= mm
UNIFORMITY COEFFICIENT: Cu=D60/D10=	
COEF OF CURVATURE: Cz=(D30)^2/(D10×D60)=	

* BASED ON GRAIN SIZE ONLY.

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	1≤Cz≤3
SAND (SW): Cu > 6	and	1≤Cz≤3

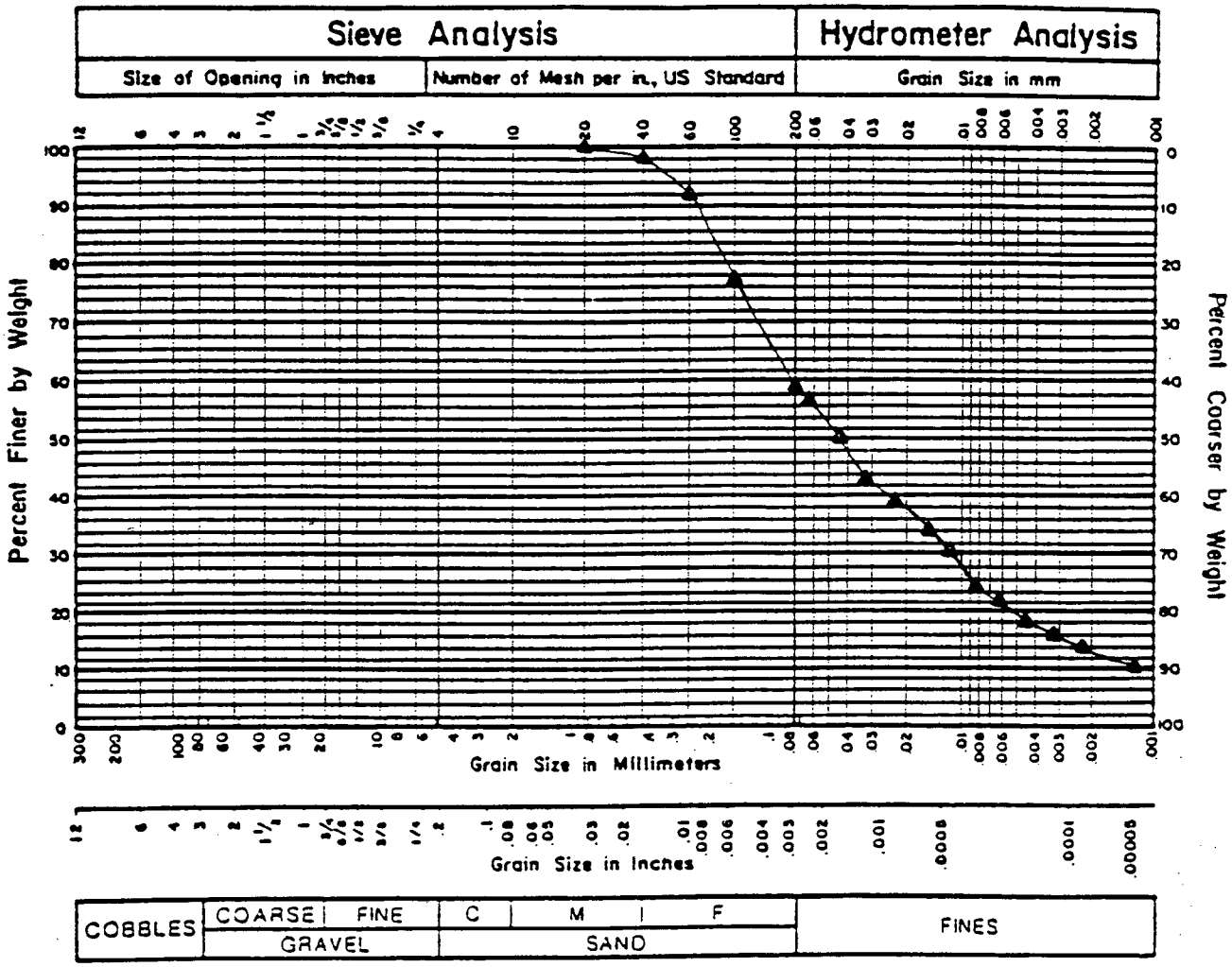
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 55
Sample Depth

Date 12/23/88
Tested By JPB
Plotted By A.K.
Checked By



COBBLES	COARSE GRAVEL	FINE GRAVEL	C SAND	M SAND	F SAND	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	55	/	33	/	/	*ML	*LAYEY, VERY SANDY SILT

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%. SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30% VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm	D60= mm
UNIFORMITY COEFFICIENT: Cu=D60/D10=	
COEF OF CURVATURE: Cz=(D30)^2/(D10 x D60)=	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	1≤Cz≤3
SAND (SW): Cu > 6	and	1≤Cz≤3

* Based on Grain Size only

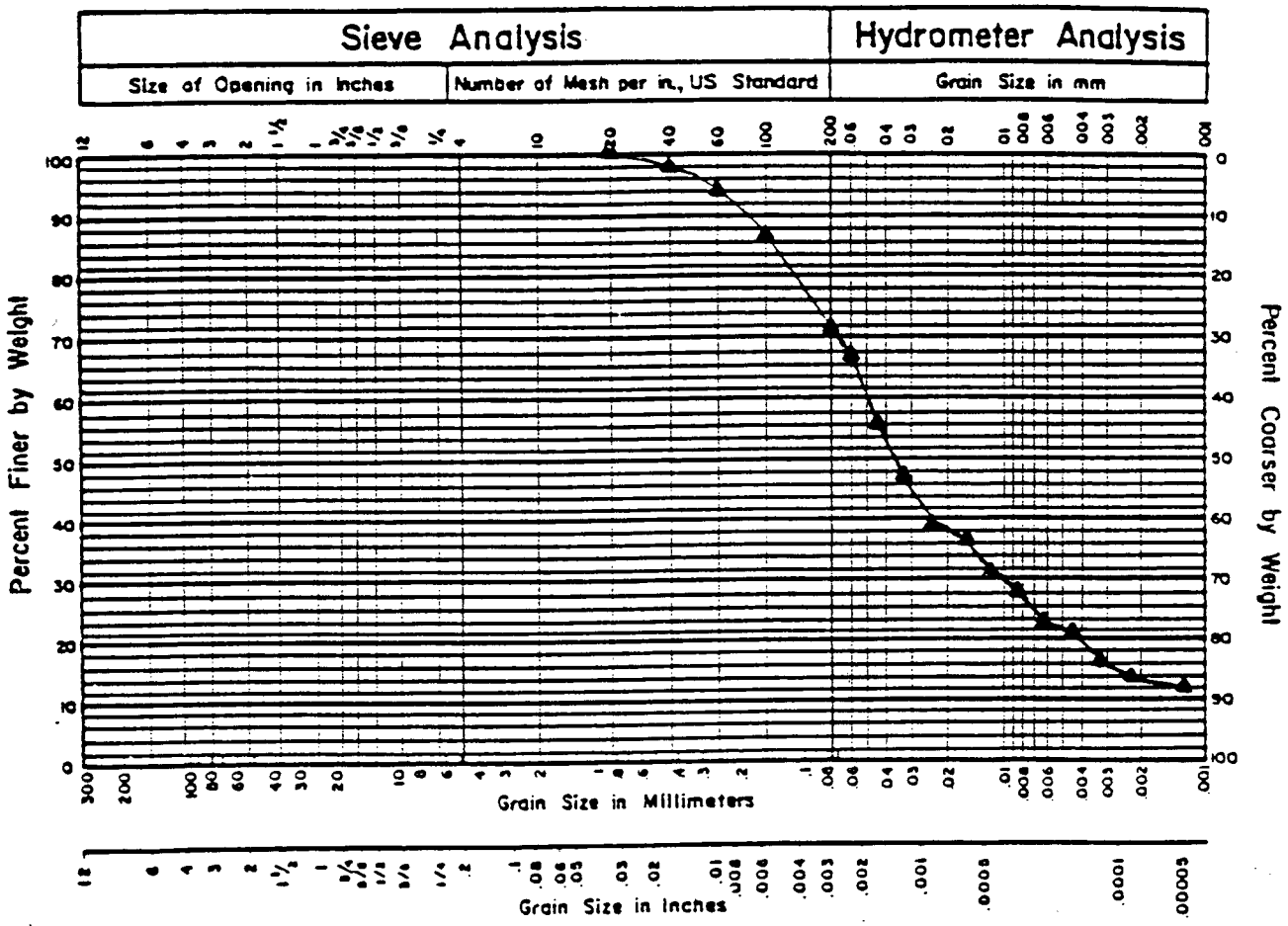
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job BOWHEAD
Job No. J-2291
Exploration No. SKMS
Sample No. 21
Sample Depth

Date 12/23/88
Tested By SAS
Plotted By
Checked By



COBBLES	COARSE GRAVEL	FINE GRAVEL	C SAND	M SAND	F SAND	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	21	/	37	/	/	* ML	* CLAYEY, SANDY SILT

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm D60=	mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cz = $(D30)^2/(D10 \times D60)$ =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	$1 \leq Cz \leq 3$
SAND (SW): Cu > 6	and	$1 \leq Cz \leq 3$

* BASED ON GRAIN SIZE ONLY

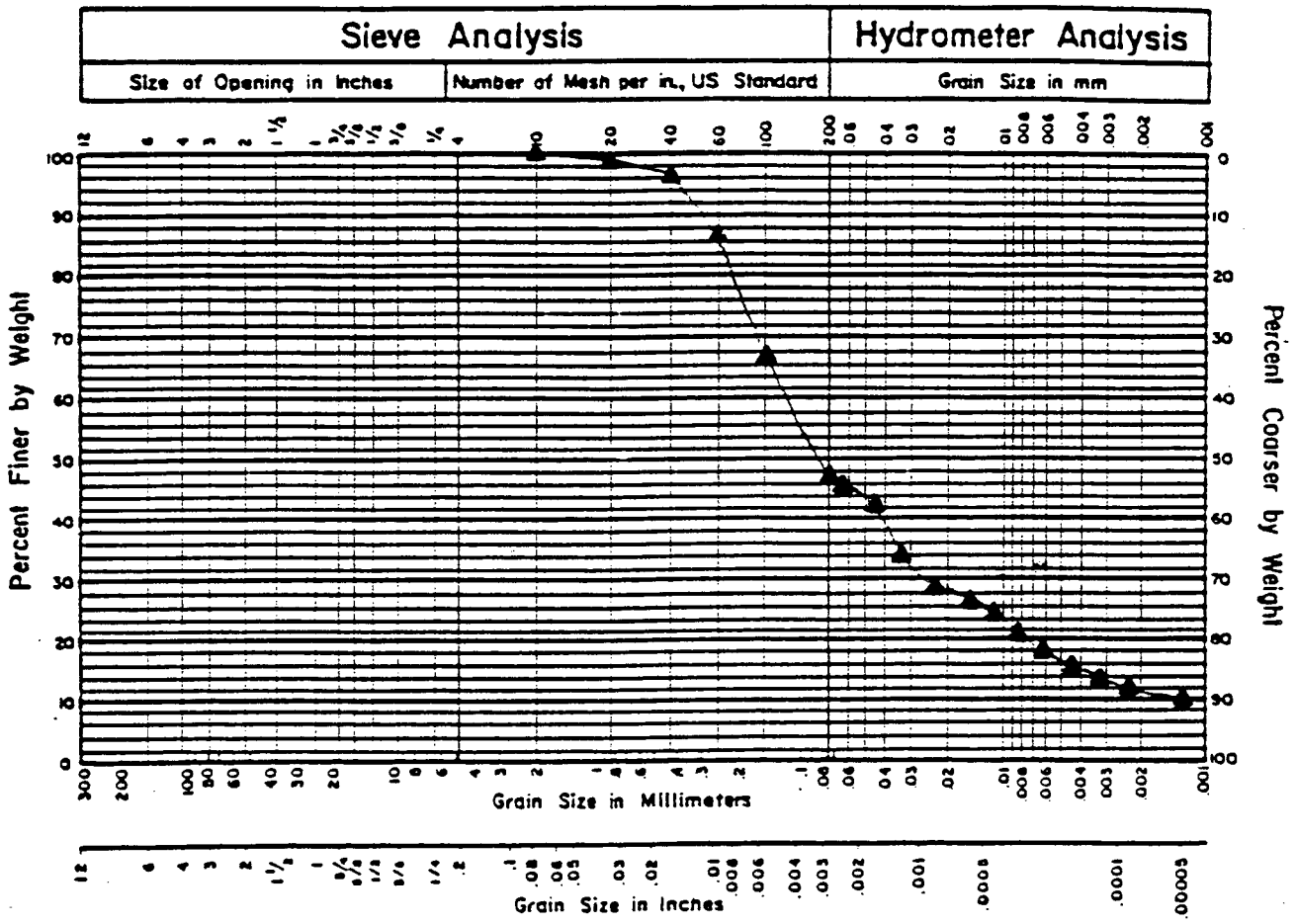
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 58
Sample Depth

Date 12/23/88
Tested By SAS / JPB
Plotted By JPB
Checked By



COBBLES	GRAVEL: COARSE / FINE	SAND: C / M / F	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	58	/	31	/	/	*SM	SLIGHTLY CLAYEY, VERY SILTY FINE SAND

* Based on Fines Size.

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%. SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30% VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= / mm D60=	mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cz = $(D30)^2/(D10 \times D60)$ =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	$1 \leq Cz \leq 3$
SAND (SW): Cu > 6	and	$1 \leq Cz \leq 3$

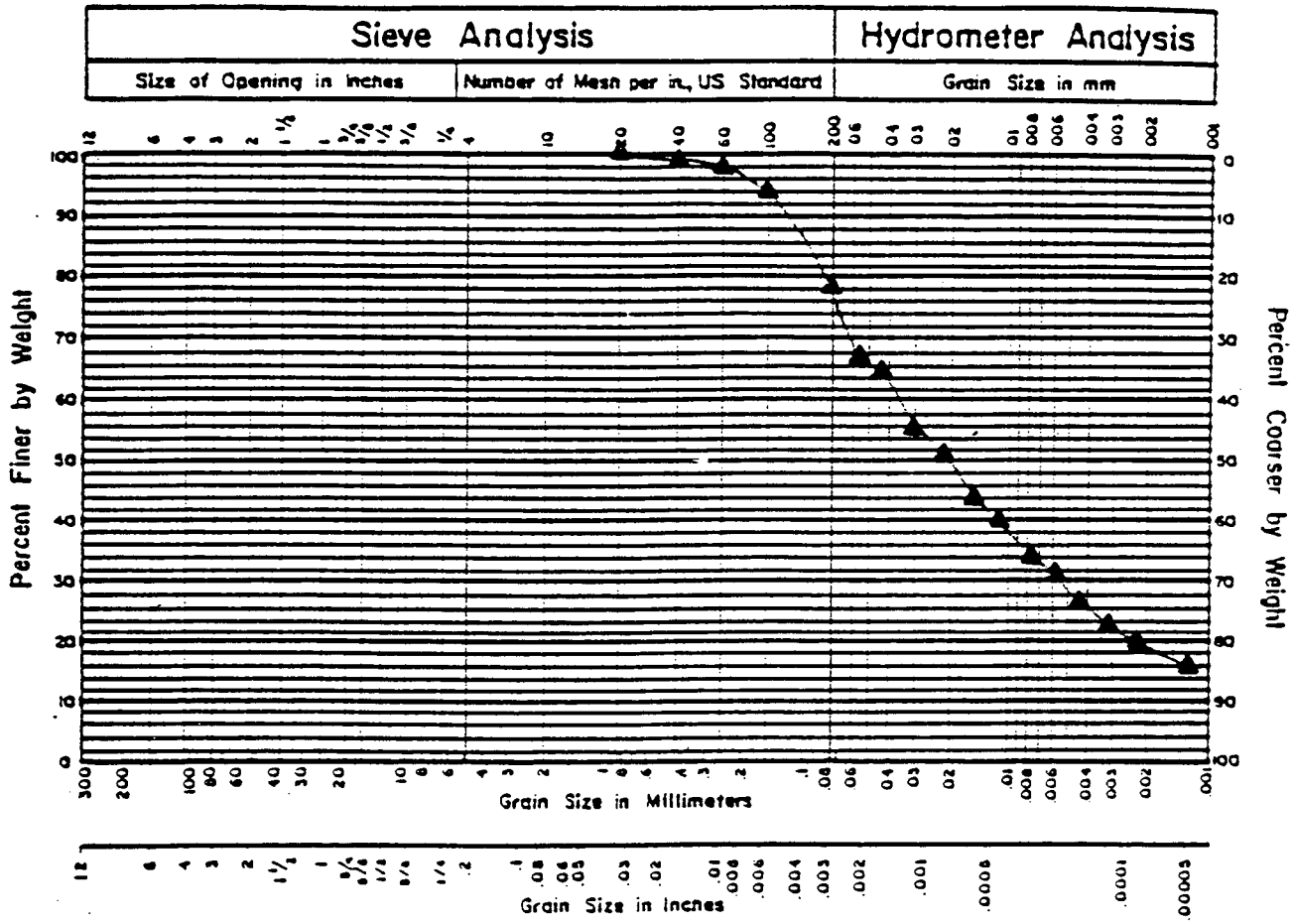
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Rowhead
Job No. 2291
Exploration No. SKMS
Sample No. 48
Sample Depth

Date 12/23/88
Tested By SAS/JPB
Plotted By JPB
Checked By



EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	48	/	/	—	—	*ML	*Clayey, Sandy, Silt.

*Based on Grain Size.

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%. SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%. VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= / mm D60=	mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cc = (D30)^2/(D10 x D60) =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	1 ≤ Cc ≤ 3
SAND (SW): Cu > 6	and	1 ≤ Cc ≤ 3

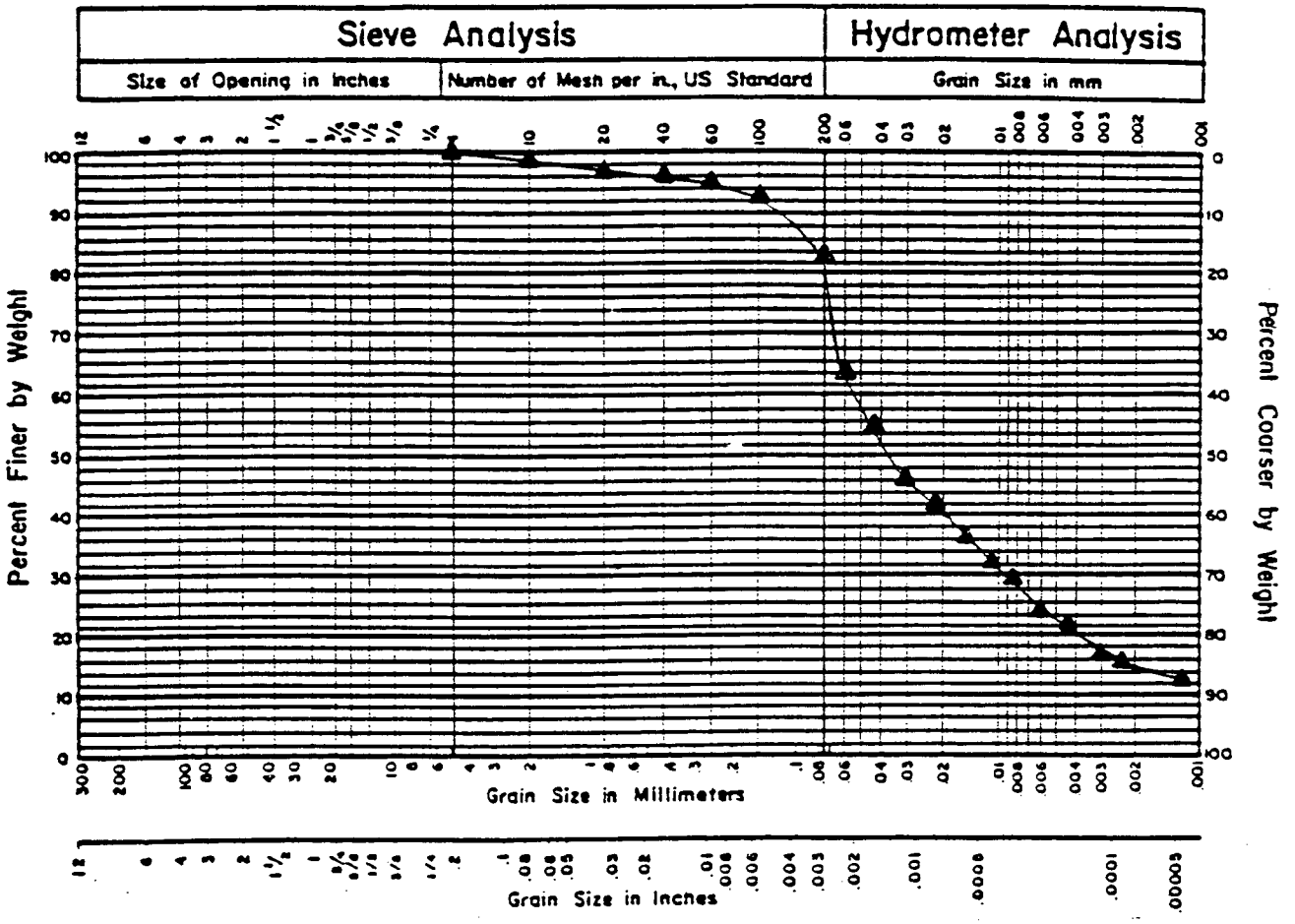
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 84
Sample Depth

Date 12/23/88
Tested By JTB
Plotted By JLM
Checked By



COBBLES	COARSE GRAVEL	FINE GRAVEL	C SAND	M SAND	F SAND	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	84	—	95	—	—	*ML	*Clayey, sandy silt

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm	D60= mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cz = $(D30)^2/(D10 \times D60)$ =	

* Based on grain size only

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	1 ≤ Cz ≤ 3
SAND (SW): Cu > 6	and	1 ≤ Cz ≤ 3

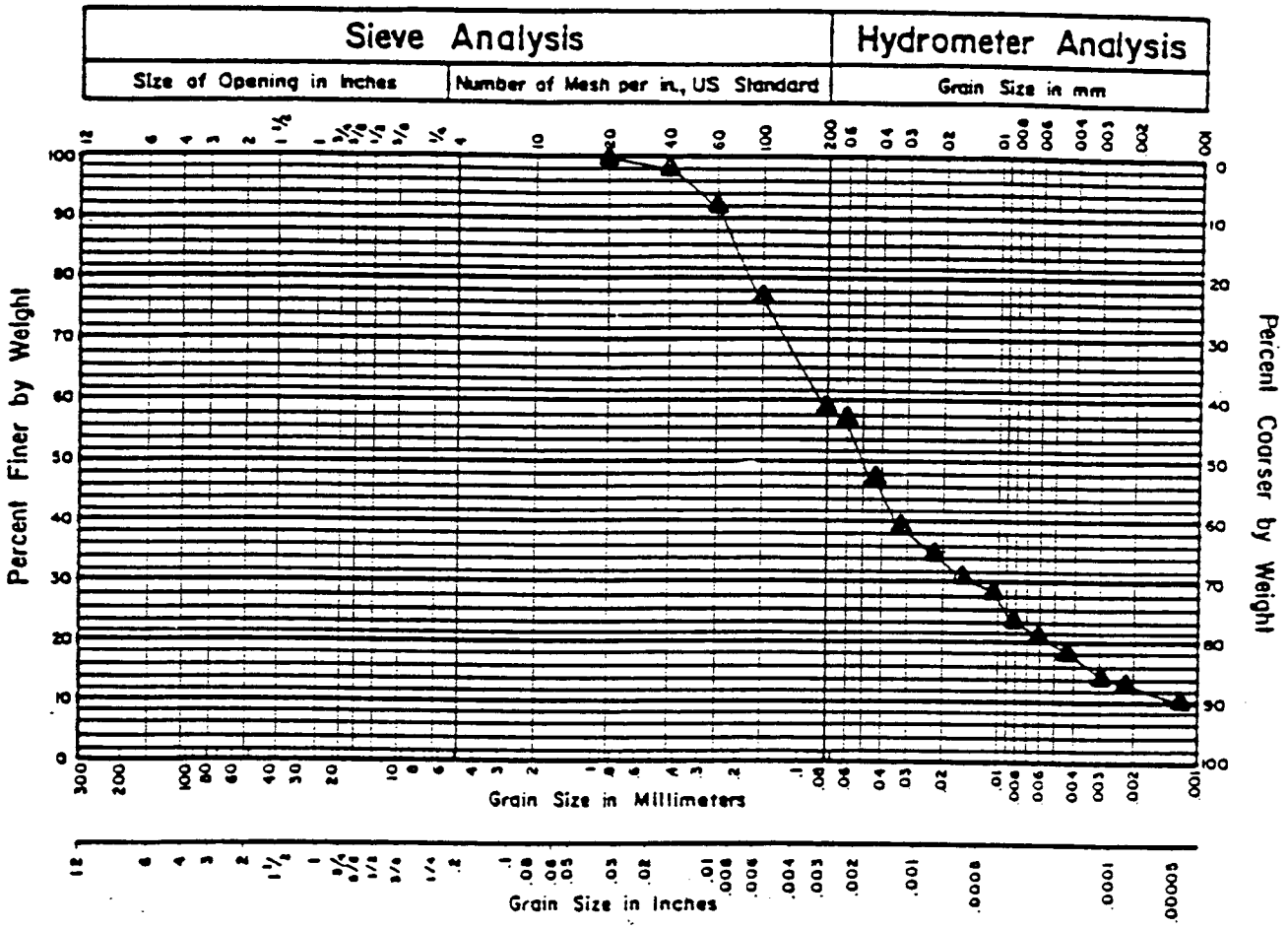
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 54
Sample Depth

Date 12-23-88
Tested By JPB/SAS
Plotted By JLM
Checked By



COBBLES	COARSE | FINE (GRAVEL)	C | M | F (SAND)	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	54	/	39	/	/	* ML	*Clayey, very sandy silt

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= / mm D60=	mm
UNIFORMITY COEFFICIENT: Cu=D60/D10=	
COEF OF CURVATURE: Cz=(D30)^2/(D10 x D60)=	

* BASED ON GRAIN SIZE ONLY.

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	1 ≤ Cz ≤ 3
SAND (SW): Cu > 6	and	1 ≤ Cz ≤ 3

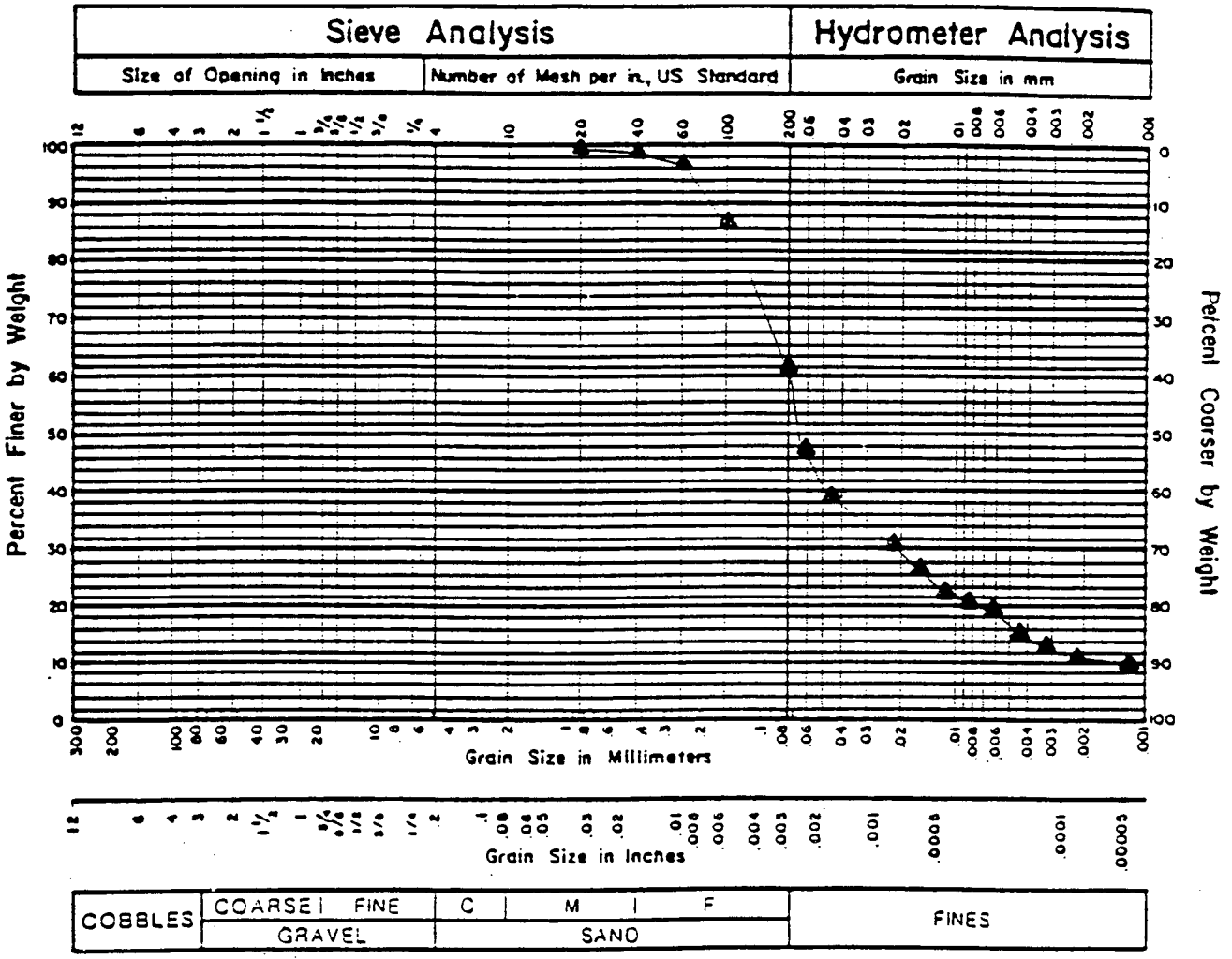
NOTE: REPORT WATER CONTENTS AND ATTERBERG

HART-CROWSER & associates inc.

Grain Size Classification

Job Bouneza
Job No. 2291
Exploration No. SKMS
Sample No. 46
Sample Depth

Date 2-23-88
Tested By SAS/KBS
Plotted By
Checked By



EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	46	/	/	/	/	* ML	* Slightly clayey, very sandy silt

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= / mm D60=	mm
UNIFORMITY COEFFICIENT: Cu=D60/D10=	
COEF OF CURVATURE: Cz=(D30)^2/(D10 x D60)=	

* Based on Grain Size only

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	1≤Cz≤3
SAND (SW): Cu > 6	and	1≤Cz≤3

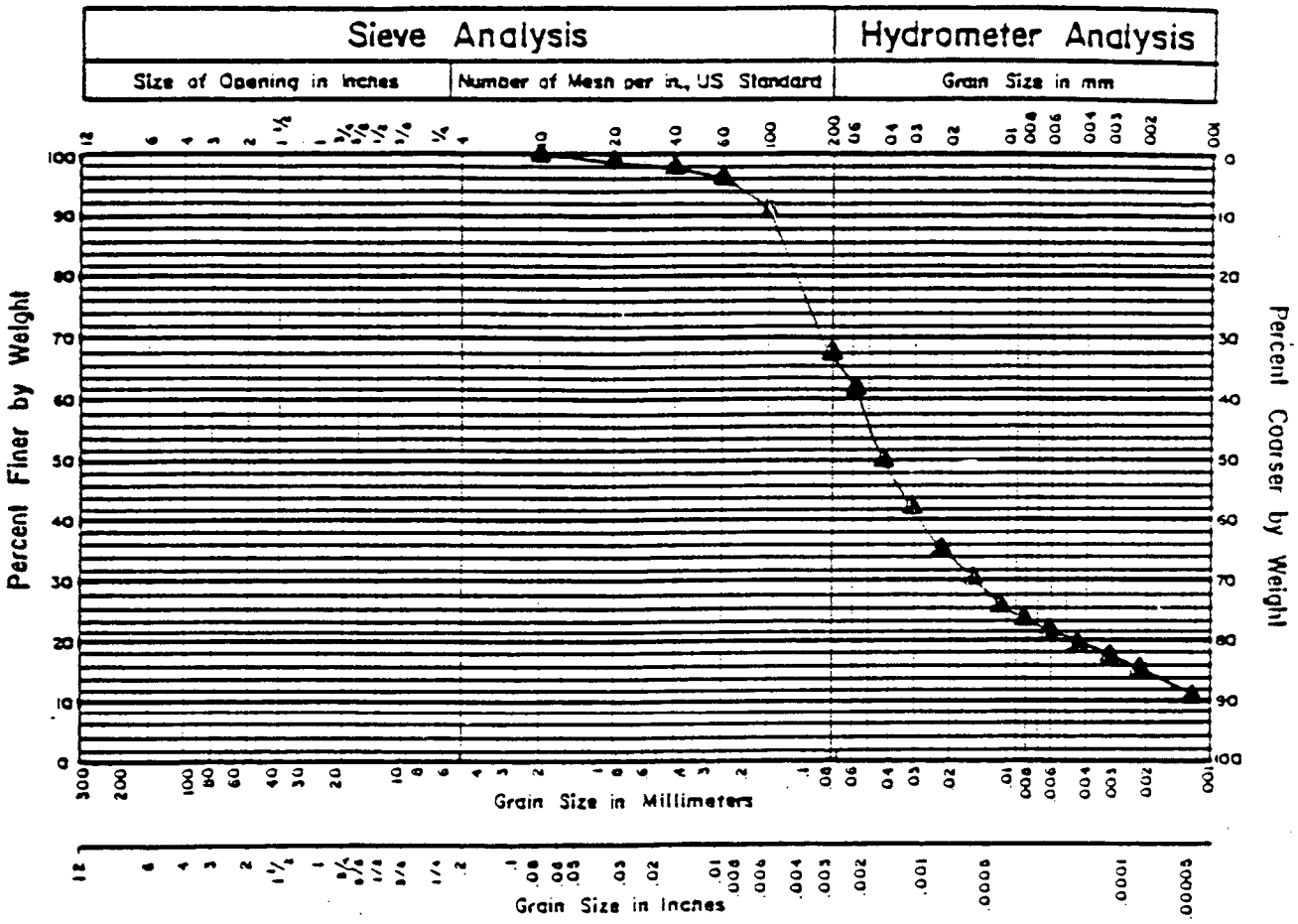
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 43
Sample Depth

Date 12-23-87
Tested By SHS / TPB
Plotted By TLH
Checked By



COBBLES	COARSE | FINE (GRAVEL)	C | M | F (SAND)	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	43	/	36	/	/	*ML	*Clayey, very sandy silt

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= / mm D60=	mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cz = (D30)² / (D10 x D60) =	

* Based on Grain Size only

Well Graded Soil (ASTM D 2487)

GRAVEL (GW) Cu > 4	and	1 ≤ Cz ≤ 3
SAND (SW) Cu > 6	and	1 ≤ Cz ≤ 3

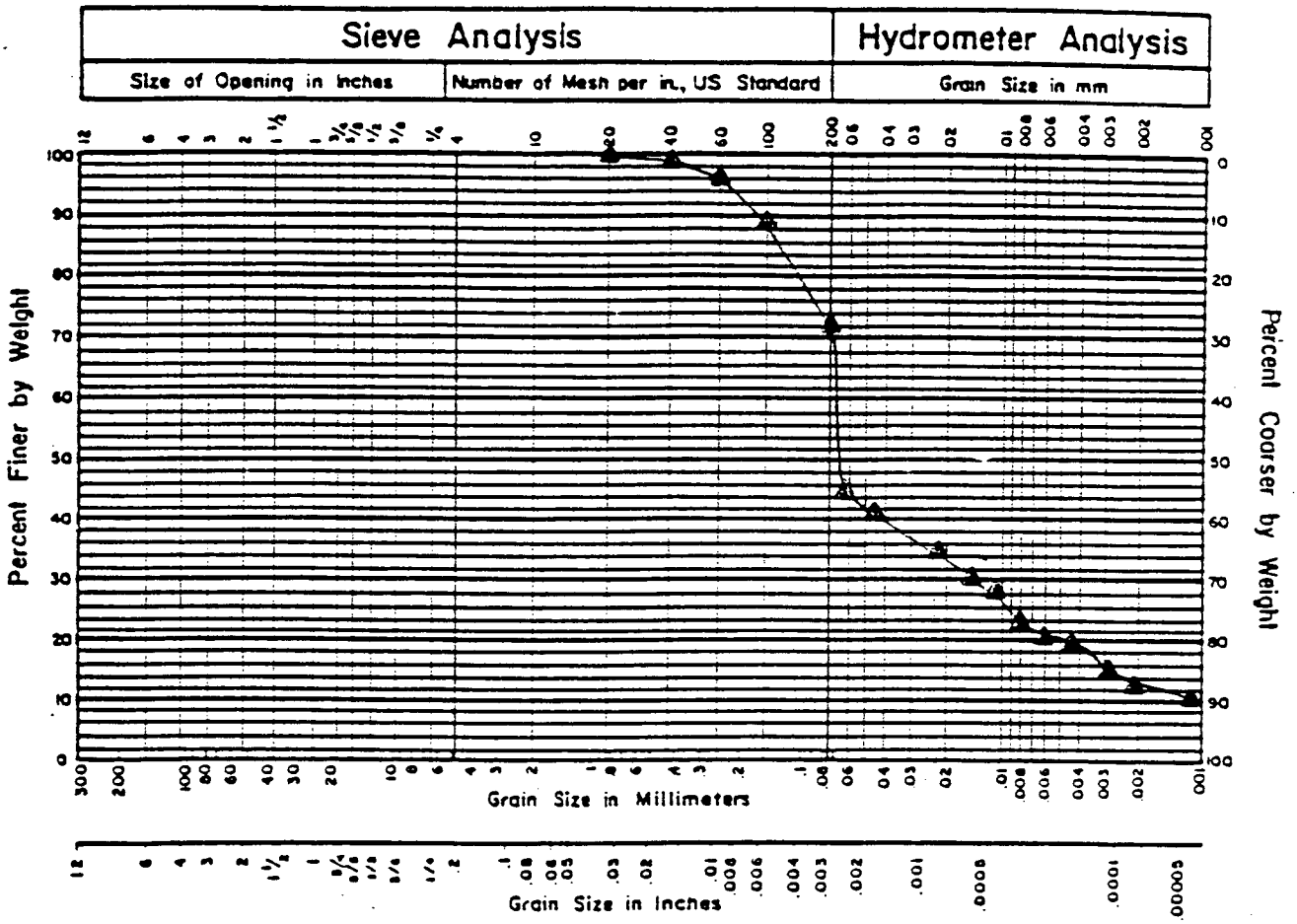
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Brunhead
Job No. 2291
Exploration No. SKMS
Sample No. 35
Sample Depth

Date 12-23-88
Tested By JPB / JLN
Plotted By JLN
Checked By



COBBLES	COARSE | FINE	C | M | F	FINES
	GRAVEL	SAND	

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	35		57			*ML	*Clayey, sandy SILT

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm	D60= mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cz = $(D30)^2/(D10 \times D60)$ =	

* Based on Grain Size only

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	$1 \leq Cz \leq 3$
SAND (SW): Cu > 6	and	$1 \leq Cz \leq 3$

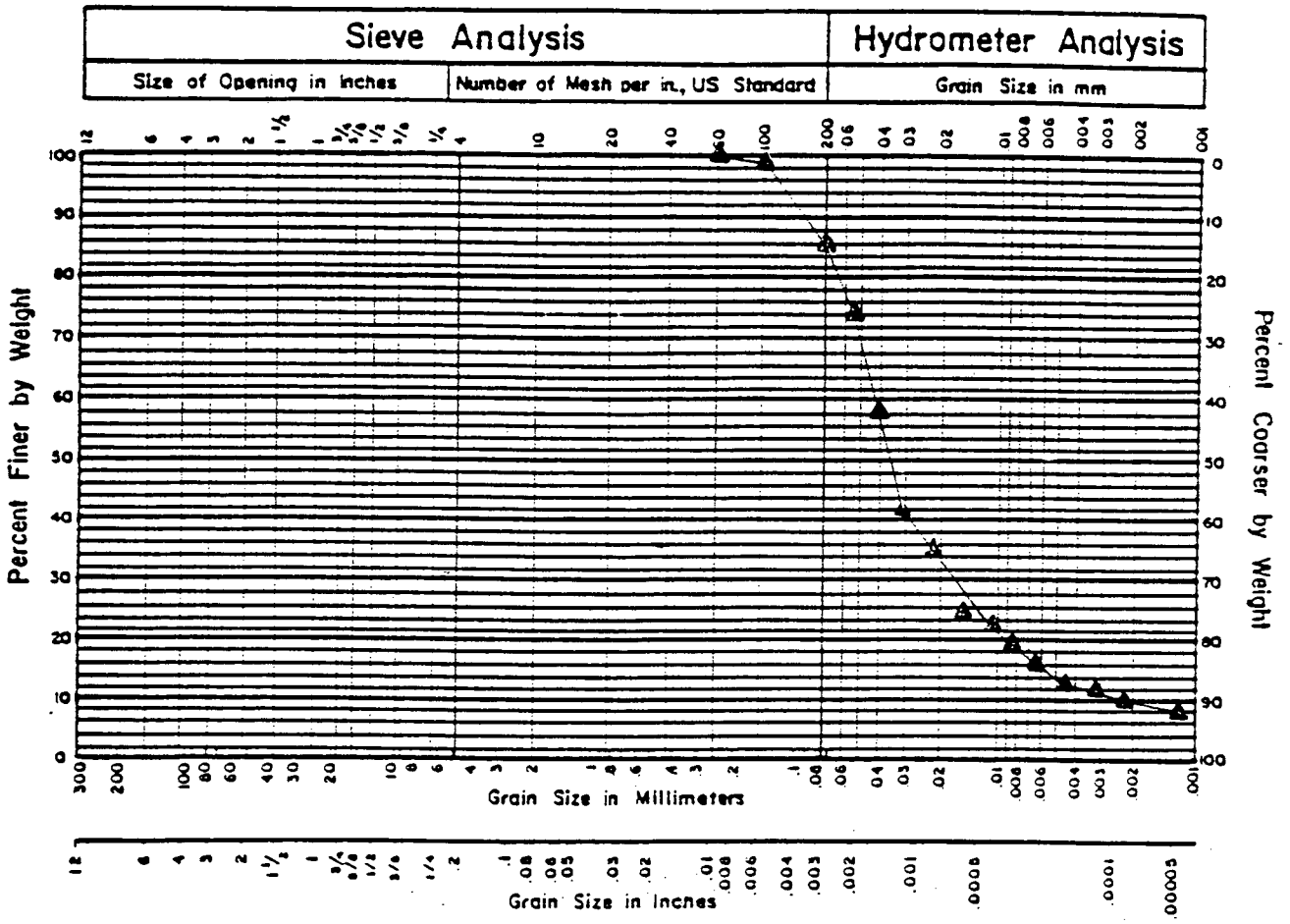
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bonnard
Job No. 320
Exploration No. SKMS
Sample No. 78
Sample Depth

Date 12-21-87
Tested By JPB/SAS
Plotted By JLM
Checked By JRB



COBBLES	GRAVEL: COARSE / FINE	SAND: C / M / F	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	78		33			* ML	*Slightly clayey, sandy silt

*Based on Grain Size

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm	D60= mm
UNIFORMITY COEFFICIENT: $C_u = D60/D10$ =	
COEF OF CURVATURE: $C_z = (D30)^2/(D10 \times D60)$ =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): $C_u > 4$	and	$1 \le C_z \le 3$
SAND (SW): $C_u > 6$	and	$1 \le C_z \le 3$

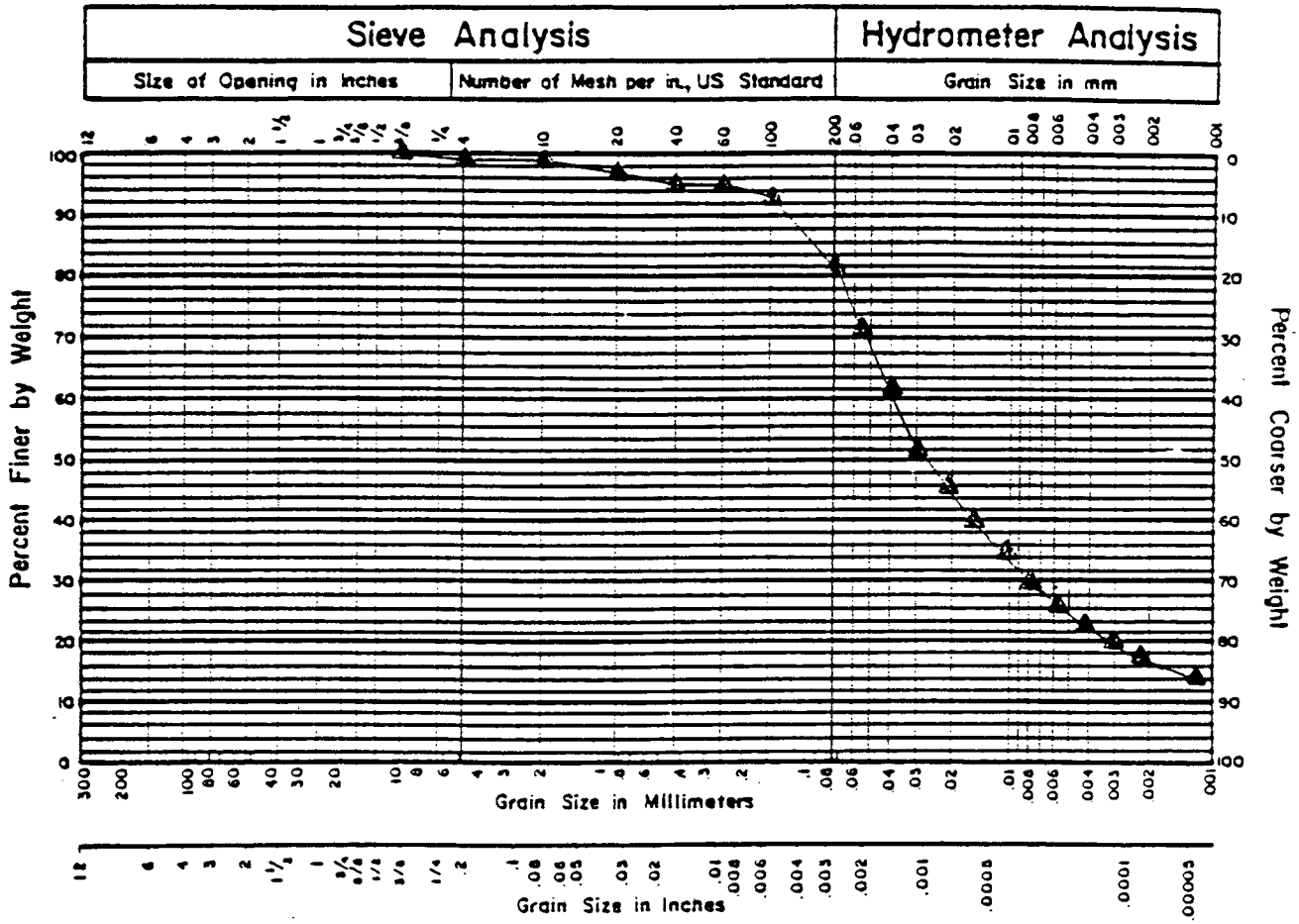
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bonhead
Job No. 2391
Exploration No. SKMS
Sample No. 83
Sample Depth

Date 12-21-87
Tested By JPB/SAS
Plotted By JLM
Checked By JPB



COBBLES	COARSE | FINE (GRAVEL)	C | M | F (SAND)	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	83		70			* ML	Clayey sandy silt

* Based on Grain Size.

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm	D60= mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cz = (D30)^2/(D10 × D60) =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	1 ≤ Cz ≤ 3
SAND (SW): Cu > 6	and	1 ≤ Cz ≤ 3

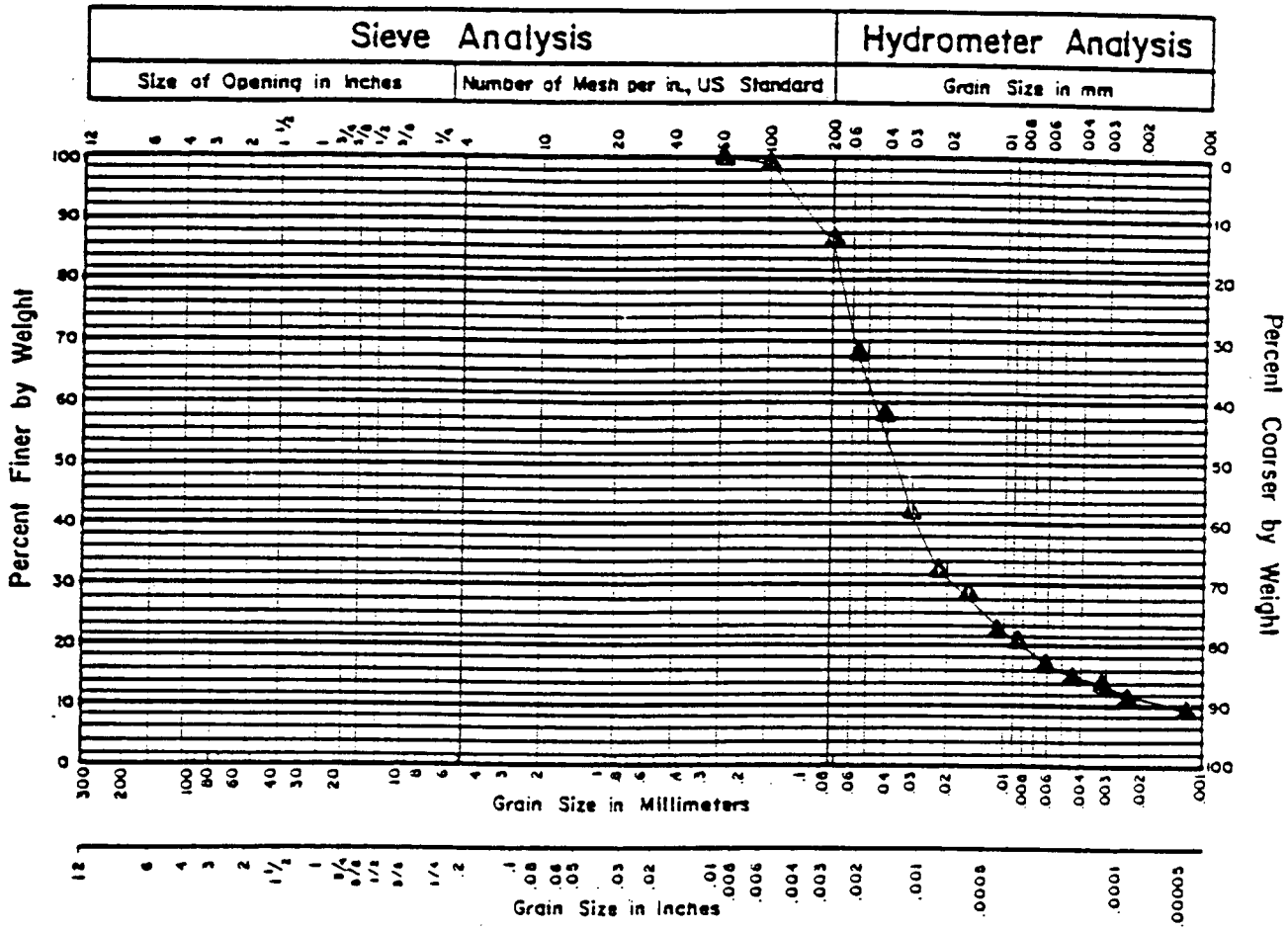
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 76
Sample Depth

Date 12-21-88
Tested By JPE/SAS
Plotted By JLM
Checked By JDR



COBBLES	GRAVEL: COARSE / FINE	SAND: C / M / F	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	76		37			* ML	Slightly clayey, sandy silt

*Based on Grain Size.

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm	D60= mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cc = $(D30)^2/(D10 \times D60)$ =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	$1 \leq Cc \leq 3$
SAND (SW): Cu > 6	and	$1 \leq Cc \leq 3$

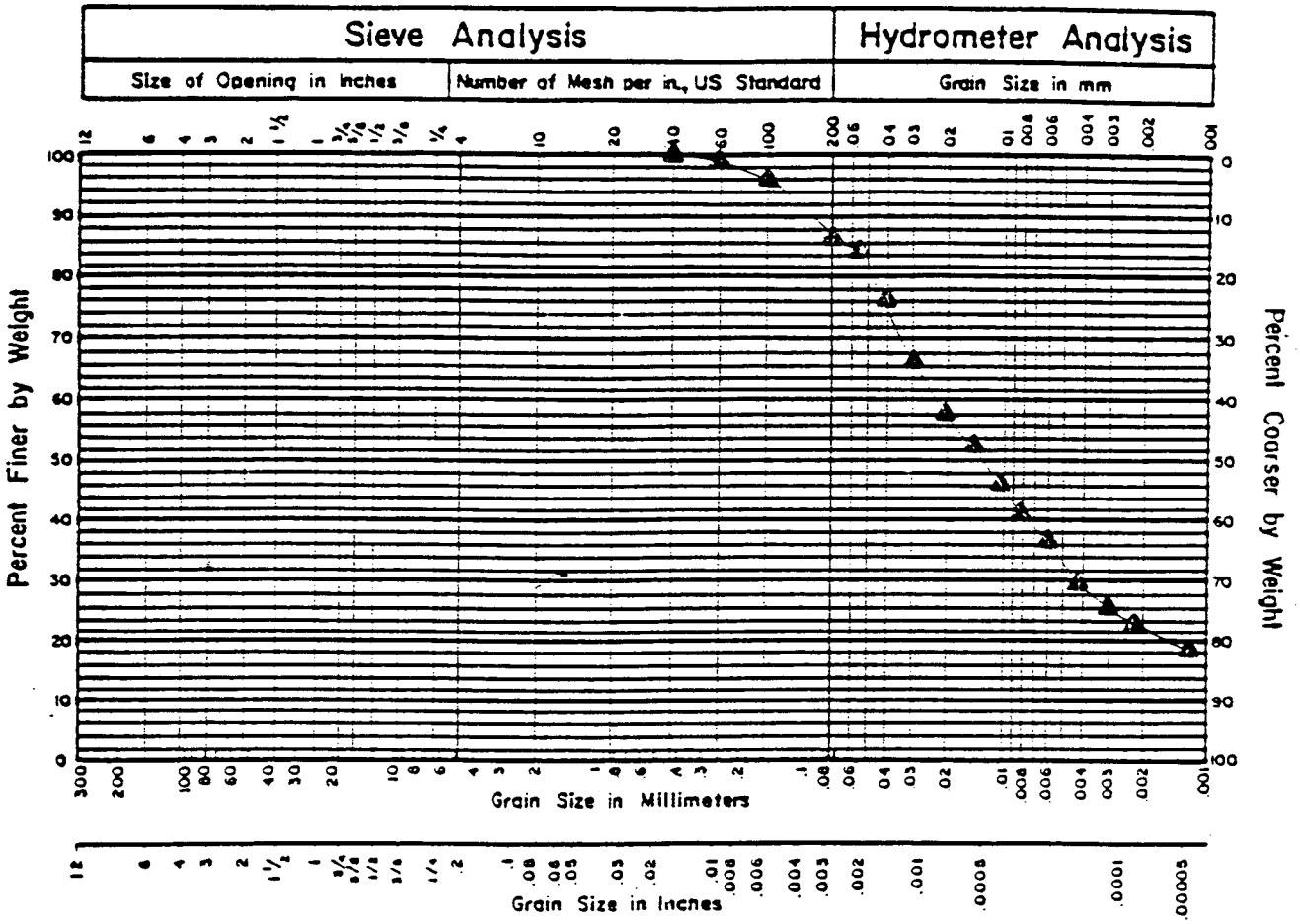
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 75
Sample Depth

Date 12-21-88
Tested By JPE / SPS
Plotted By JLM
Checked By JPR



EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	75		64			ML	clayey sandy silt

+ Based on grain size

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30% VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm	D60= mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cz = (D30)^2/(D10 × D60) =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	$1 \leq Cz \leq 3$
SAND (SW): Cu > 6	and	$1 \leq Cz \leq 3$

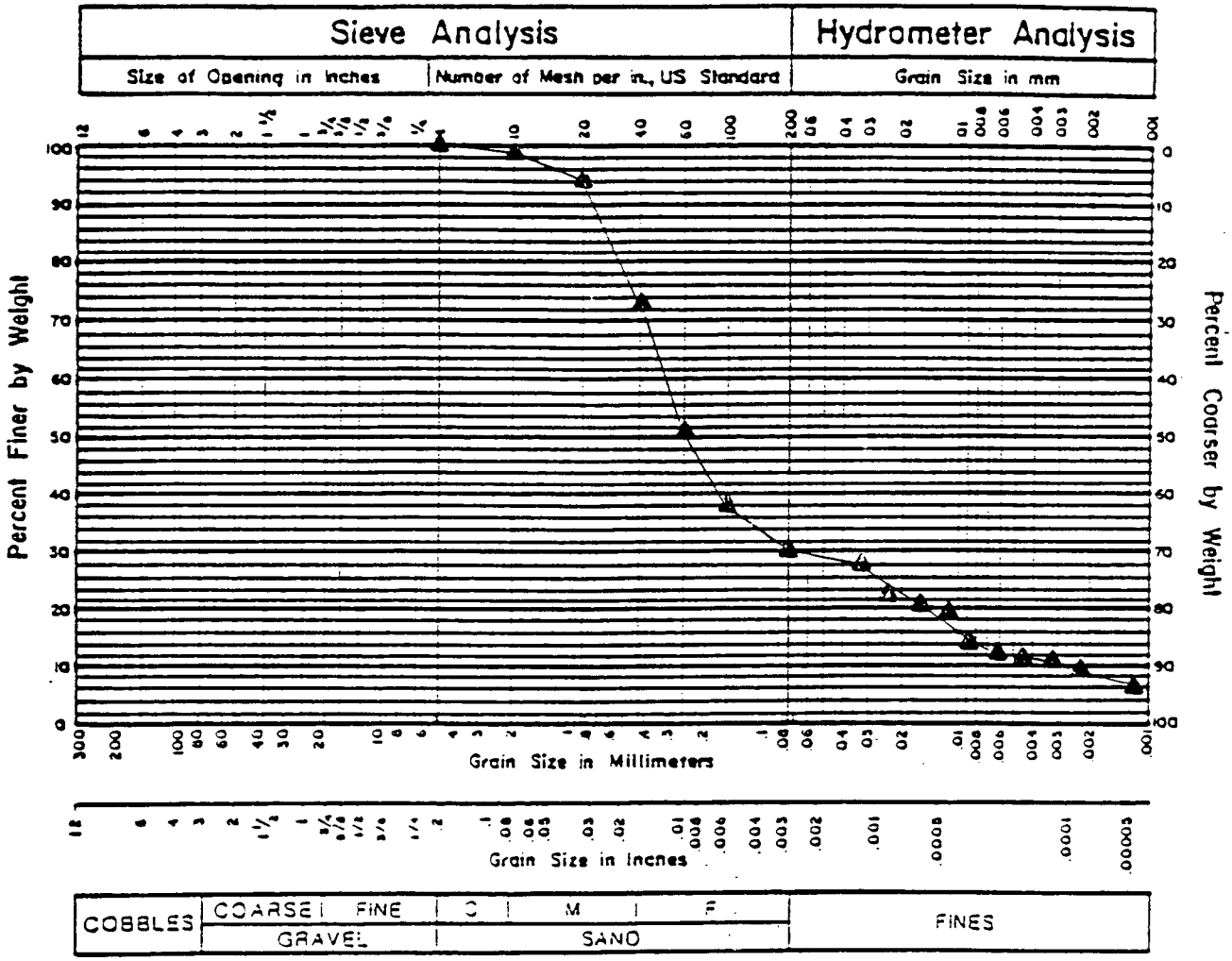
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 26
Sample Depth

Date 12-21-89
Tested By JPE/JLM
Plotted By JLM
Checked By JDR



COBBLES	COARSE | FINE (GRAVEL)	C | M | F (SAND)	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	26		18			*SM	*Slightly clayey, silty sand

* Based on Grain Size

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm	D60= mm
UNIFORMITY COEFFICIENT: $C_u = D60/D10$ =	
COEF OF CURVATURE: $C_z = (D30)^2/(D10 \times D60)$ =	

Well Graded Soil (ASTM D 2487)

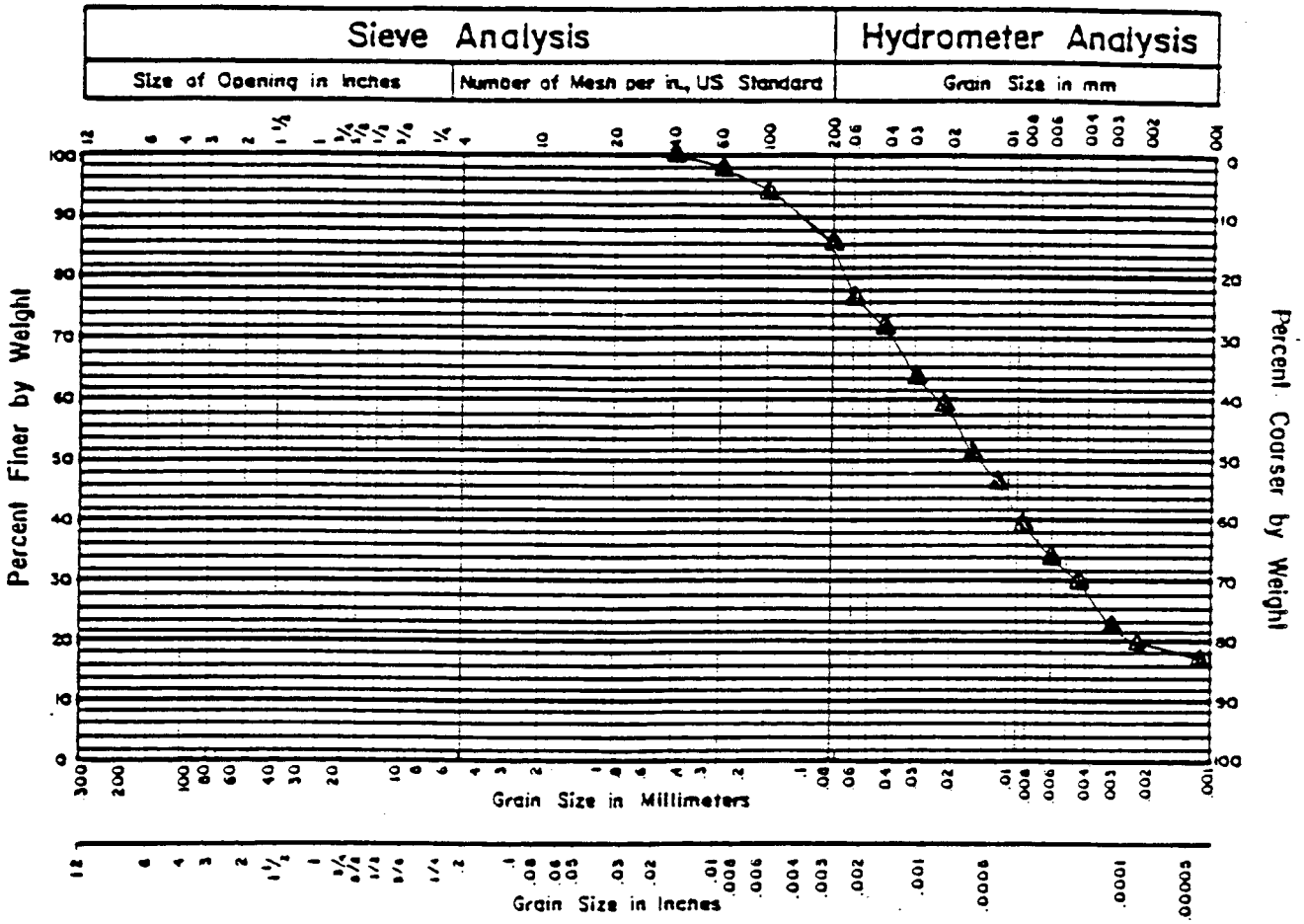
GRAVEL (GW): $C_u > 4$	and	$1 \leq C_z \leq 3$
SAND (SW): $C_u > 6$	and	$1 \leq C_z \leq 3$

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 73
Sample Depth

Date 12-21-88
Tested By JPB / JLM
Plotted By JLM
Checked By JPB



EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	73		64			*ML	*Sandy, clayey silt

*Based on Grain Size

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%. SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm	D60= mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cz = (D30)^2/(D10 x D60) =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	1 ≤ Cz ≤ 3
SAND (SW): Cu > 6	and	1 ≤ Cz ≤ 3

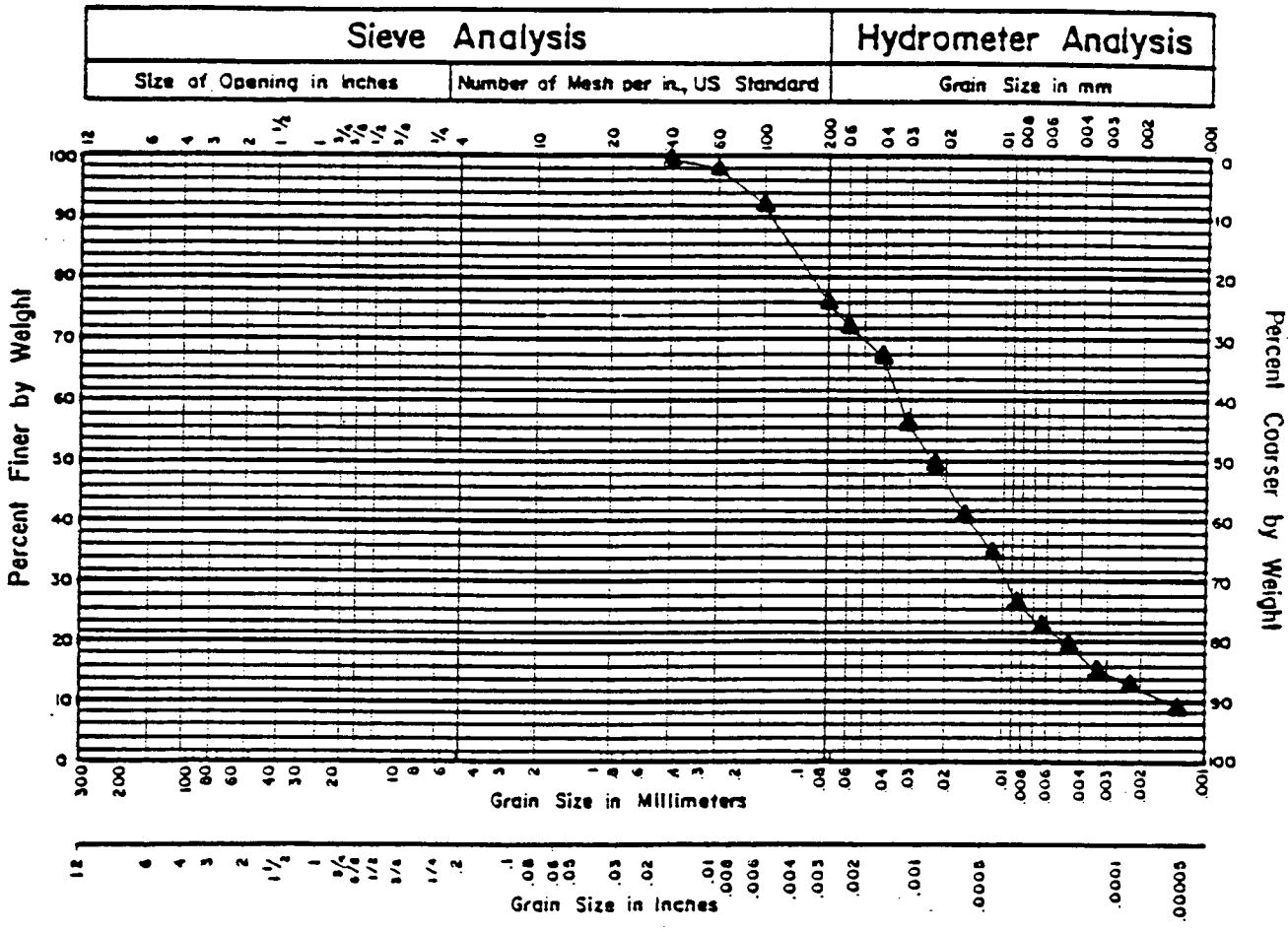
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 2201
Exploration No. SKMS
Sample No. 66
Sample Depth

Date 12-7-88
Tested By JPB/JLM
Plotted By JLM
Checked By JPB



COBBLES	COARSE | FINE (GRAVEL)	C | M | F (SAND)	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	66		40			* ML	*Slightly clayey, sandy silt

* Based on Grain Size

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm	D60= mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cz = $(D30)^2/(D10 \times D60)$ =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	$1 \leq Cz \leq 3$
SAND (SW): Cu > 6	and	$1 \leq Cz \leq 3$

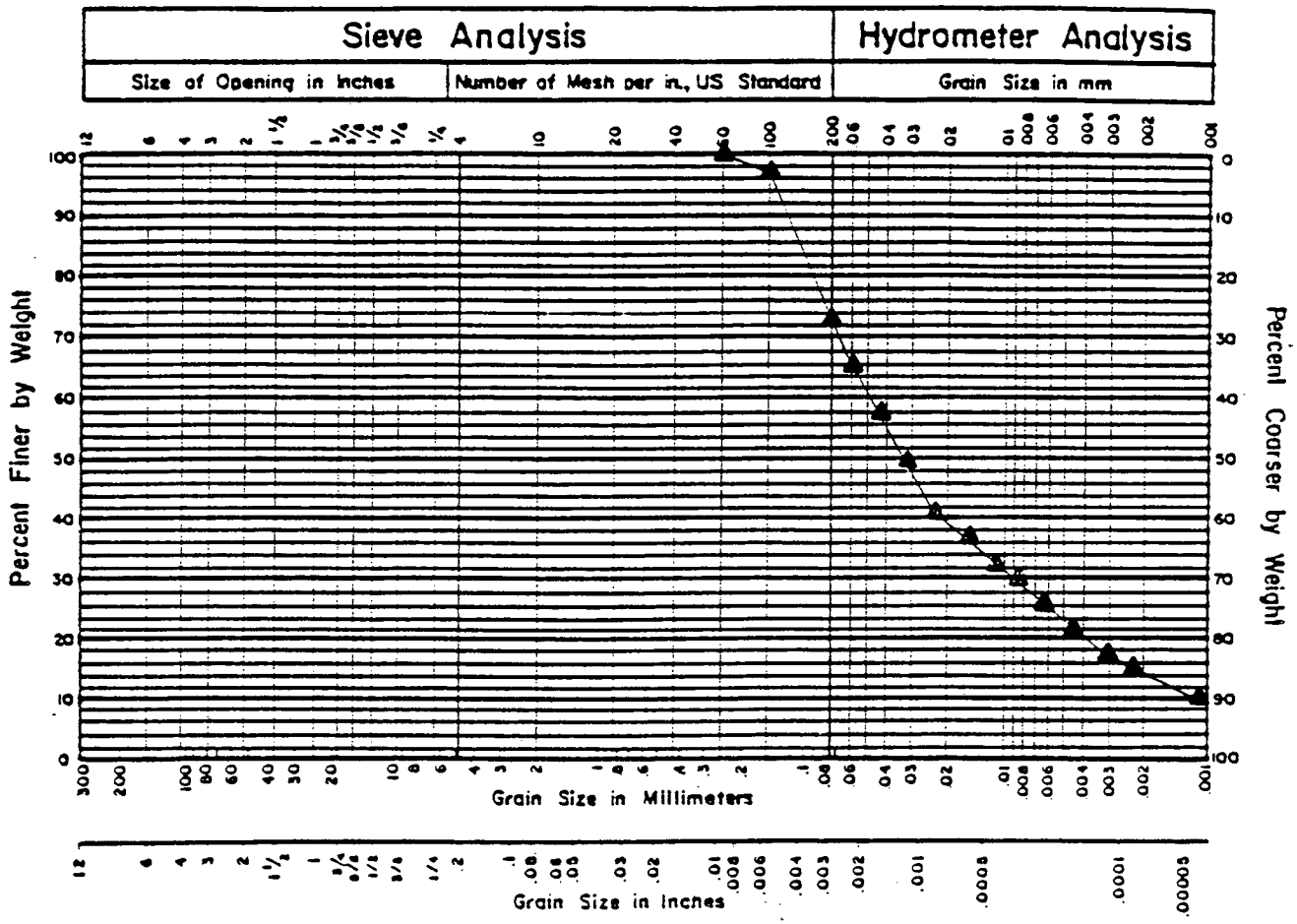
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 3291
Exploration No. SKMS
Sample No. 32
Sample Depth

Date 12-20-88
Tested By JPB / TLM
Plotted By TLM
Checked By JPB



COBBLES	GRAVEL: COARSE / FINE	SAND: C / M / F	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	32		45			*ML	*Clayey, sandy silt

* Based on Grain Size.

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%, VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm D60=	mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cz = $(D30)^2/(D10 \times D60)$ =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	$1 \leq Cz \leq 3$
SAND (SW): Cu > 6	and	$1 \leq Cz \leq 3$

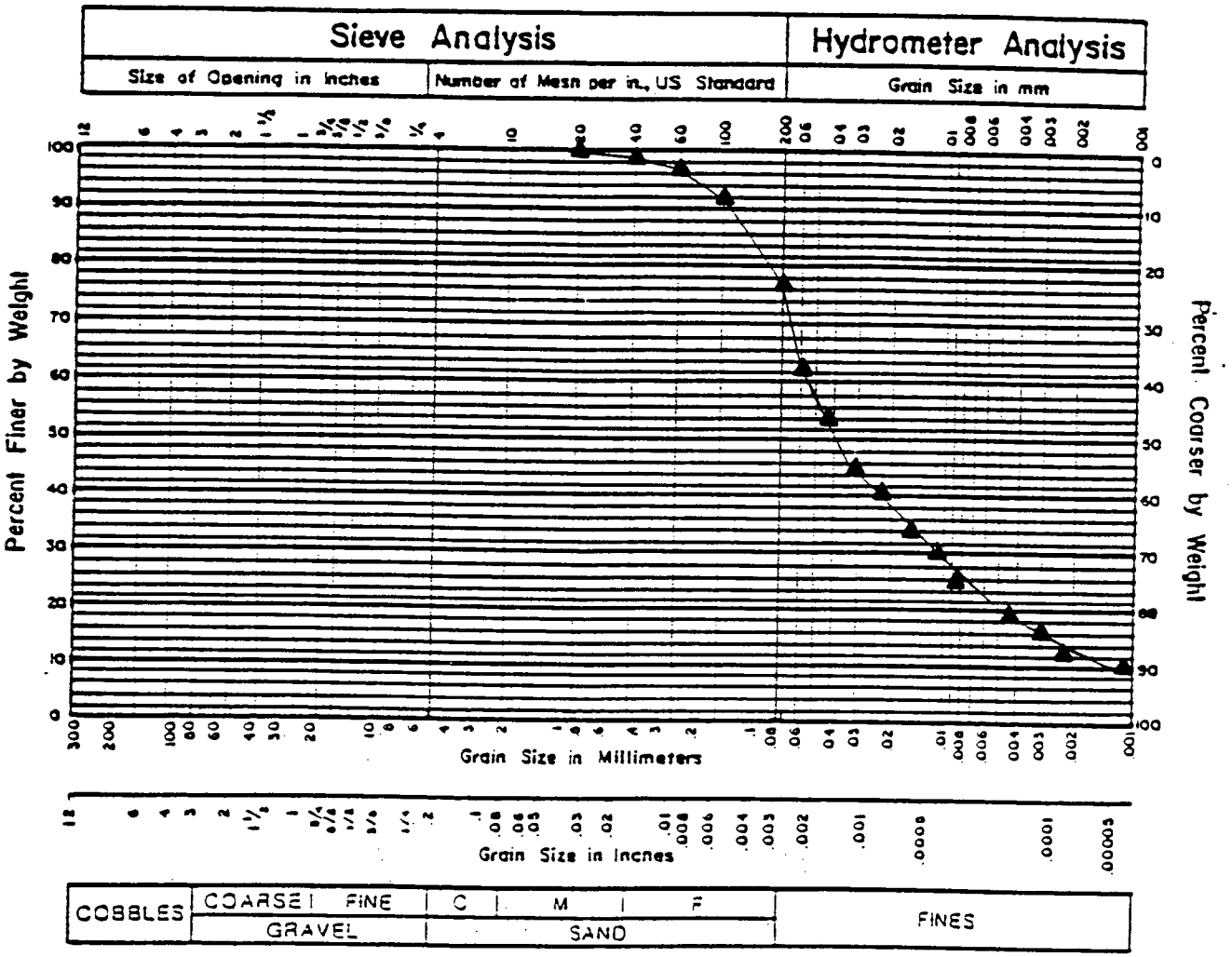
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Rainhead
Job No. 229
Exploration No. SKM S
Sample No. 38
Sample Depth

Date 12-20-87
Tested By JPB
Plotted By JM
Checked By JPB



COBBLES	COARSE | FINE (GRAVEL)	C | M | F (SAND)	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKM S	38		41			*ML	*clayey, sandy silt

*Based on Grain Size

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%. SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm	D60= mm
UNIFORMITY COEFFICIENT: $C_u = D60/D10 =$	
COEF OF CURVATURE: $C_z = (D30)^2/(D10 \times D60) =$	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): $C_u > 4$	and	$1 \leq C_z \leq 3$
SAND (SW): $C_u > 6$	and	$1 \leq C_z \leq 3$

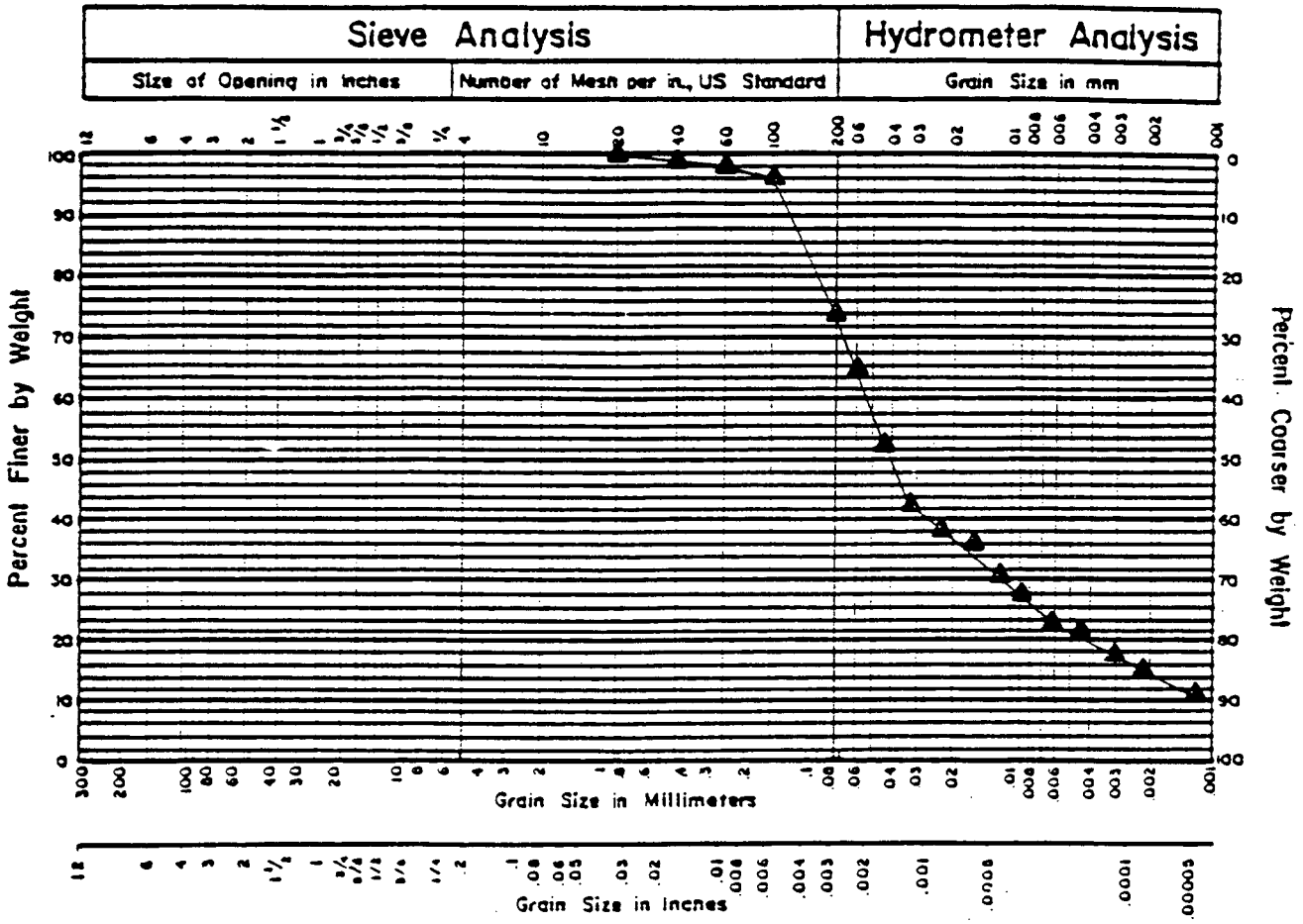
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 56
Sample Depth

Date 12-20-98
Tested By JPB / JLM
Plotted By JLM
Checked By JPB



COBBLES	GRAVEL: COARSE / FINE	SAND: C / M / F	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	56					*ML	*clayey, sandy silt

*Based on Fines Size

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%, VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm	D60= mm
UNIFORMITY COEFFICIENT: $C_u = D60/D10$ =	
COEF OF CURVATURE: $C_z = (D30)^2/(D10 \times D60)$ =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): $C_u > 4$	and	$1 \le C_z \le 3$
SAND (SW): $C_u > 6$	and	$1 \le C_z \le 3$

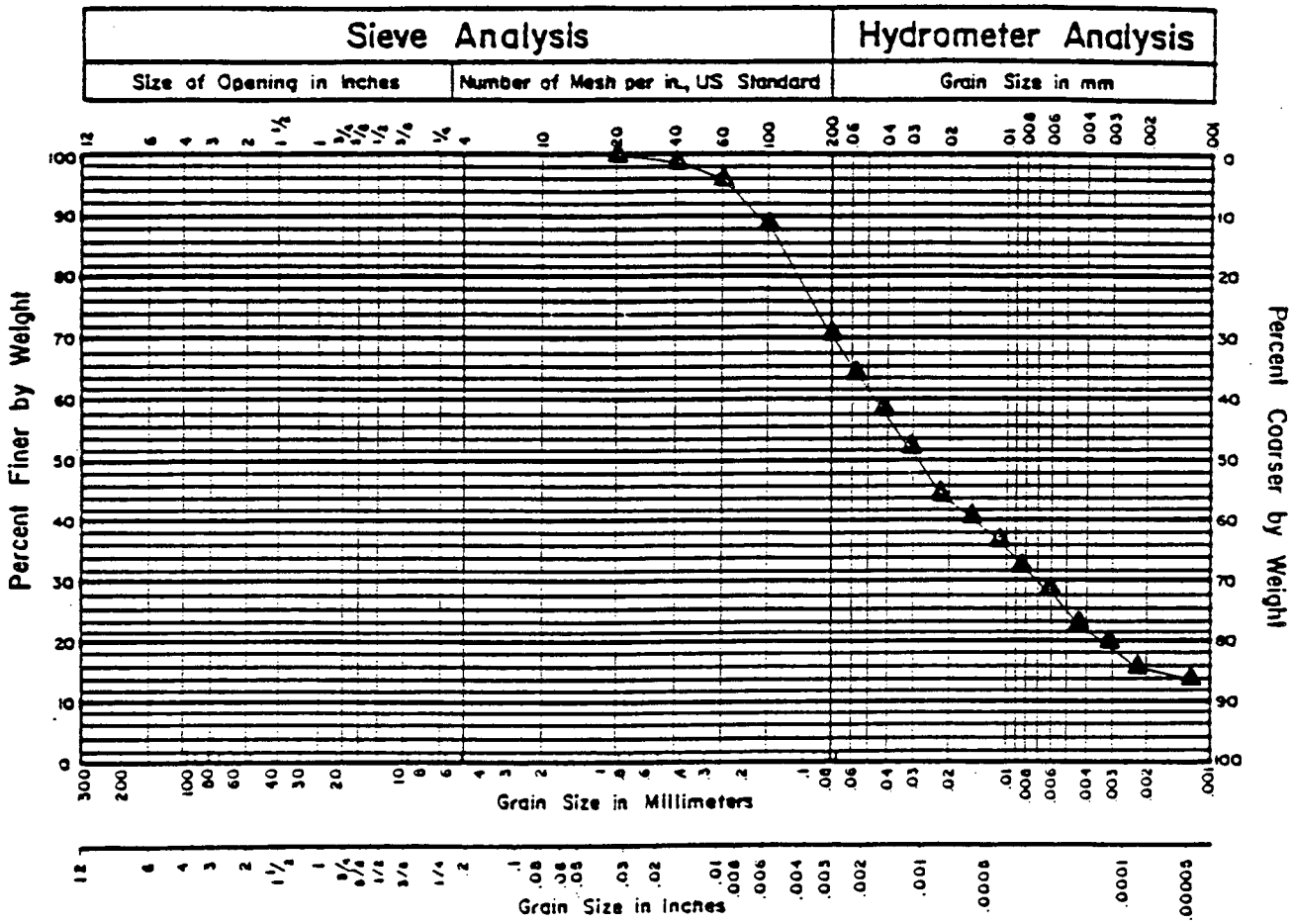
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 2
Sample Depth

Date 12-20-88
Tested By SAS/JPB
Plotted By JLM
Checked By JPB



COBBLES	COARSE | FINE (GRAVEL)	C | M | F (SAND)	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	2		44			* ML	*Clayey, sandy silt

*Based on Visual Size

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm D60=	mm
UNIFORMITY COEFFICIENT: $C_u = D60/D10 =$	
COEF OF CURVATURE: $C_z = (D30)^2/(D10 \times D60) =$	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): $C_u > 4$	and	$1 \leq C_z \leq 3$
SAND (SW): $C_u > 6$	and	$1 \leq C_z \leq 3$

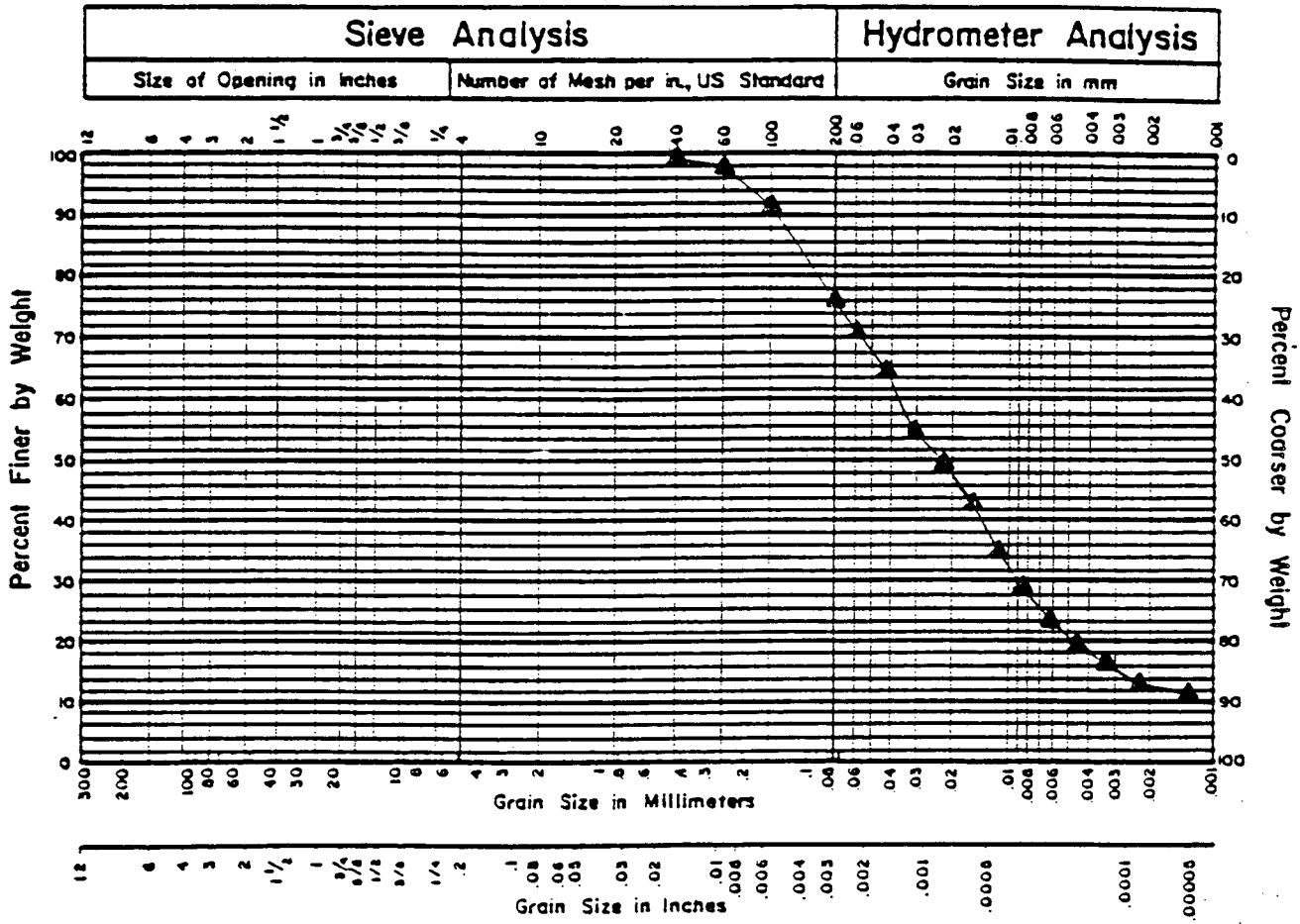
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 70
Sample Depth

Date 12-7-88
Tested By JPP/JLM
Plotted By JLM
Checked By JPR



COBBLES	GRAVEL: COARSE / FINE	SAND: C / M / F	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	70		40			*ML	*Slightly clayey, sandy silt

*Based on Grain Size

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm D60=	mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cz = $(D30)^2/(D10 \times D60)$ =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	$1 \leq Cz \leq 3$
SAND (SW): Cu > 6	and	$1 \leq Cz \leq 3$

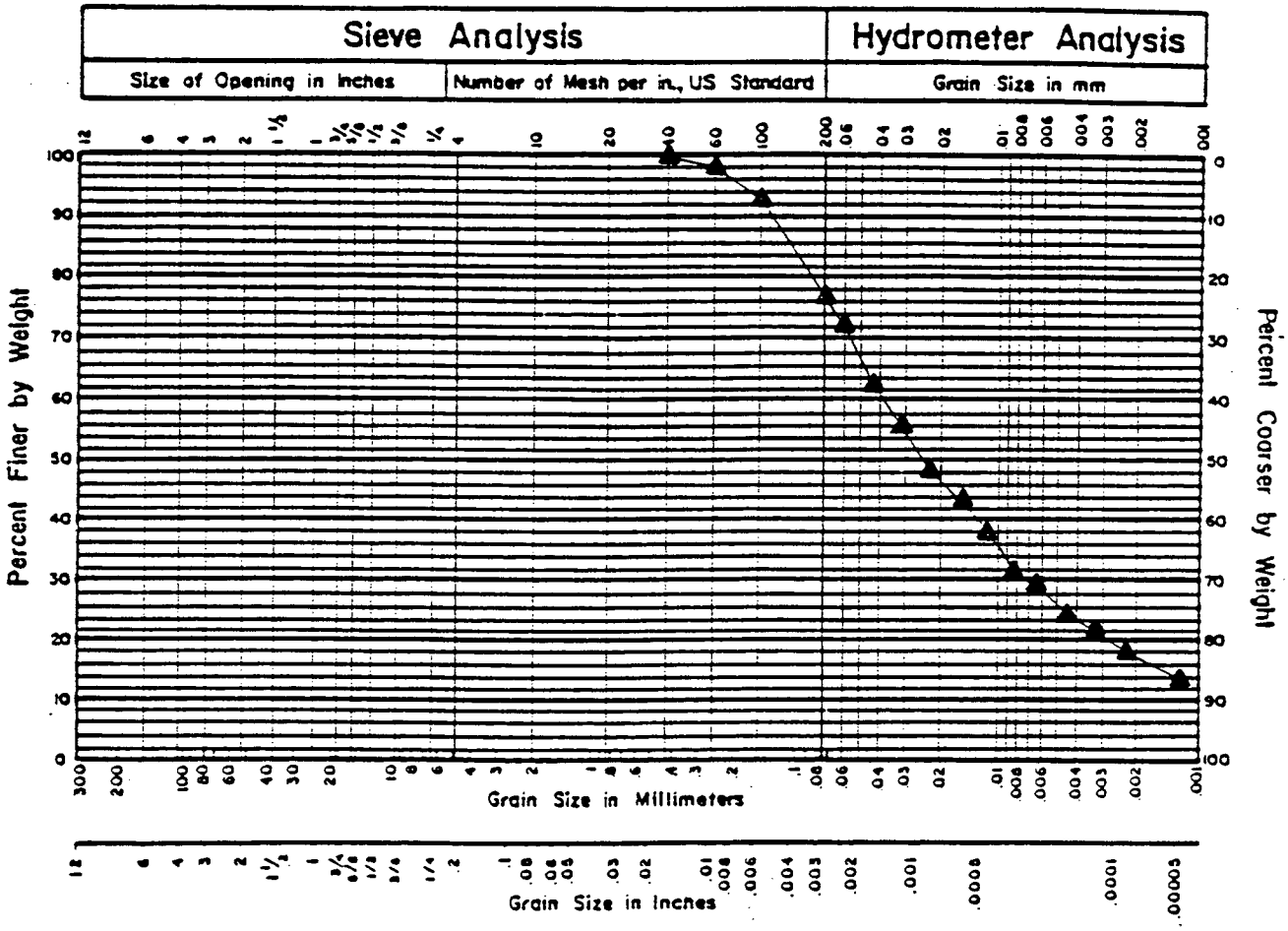
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT.

HART-CROWSER & associates inc.
Form 1126-86

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 18
Sample Depth

Date 12-20-88
Tested By JPB / JLM
Plotted By JLM
Checked By JPB



COBBLES	COARSE | FINE (GRAVEL)	C | M | F (SAND)	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	18		44			*ML	*clayey, sandy silt

*Based on Grain Size

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm	D60= mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cz = $(D30)^2/(D10 \times D60)$ =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	$1 \leq Cz \leq 3$
SAND (SW): Cu > 6	and	$1 \leq Cz \leq 3$

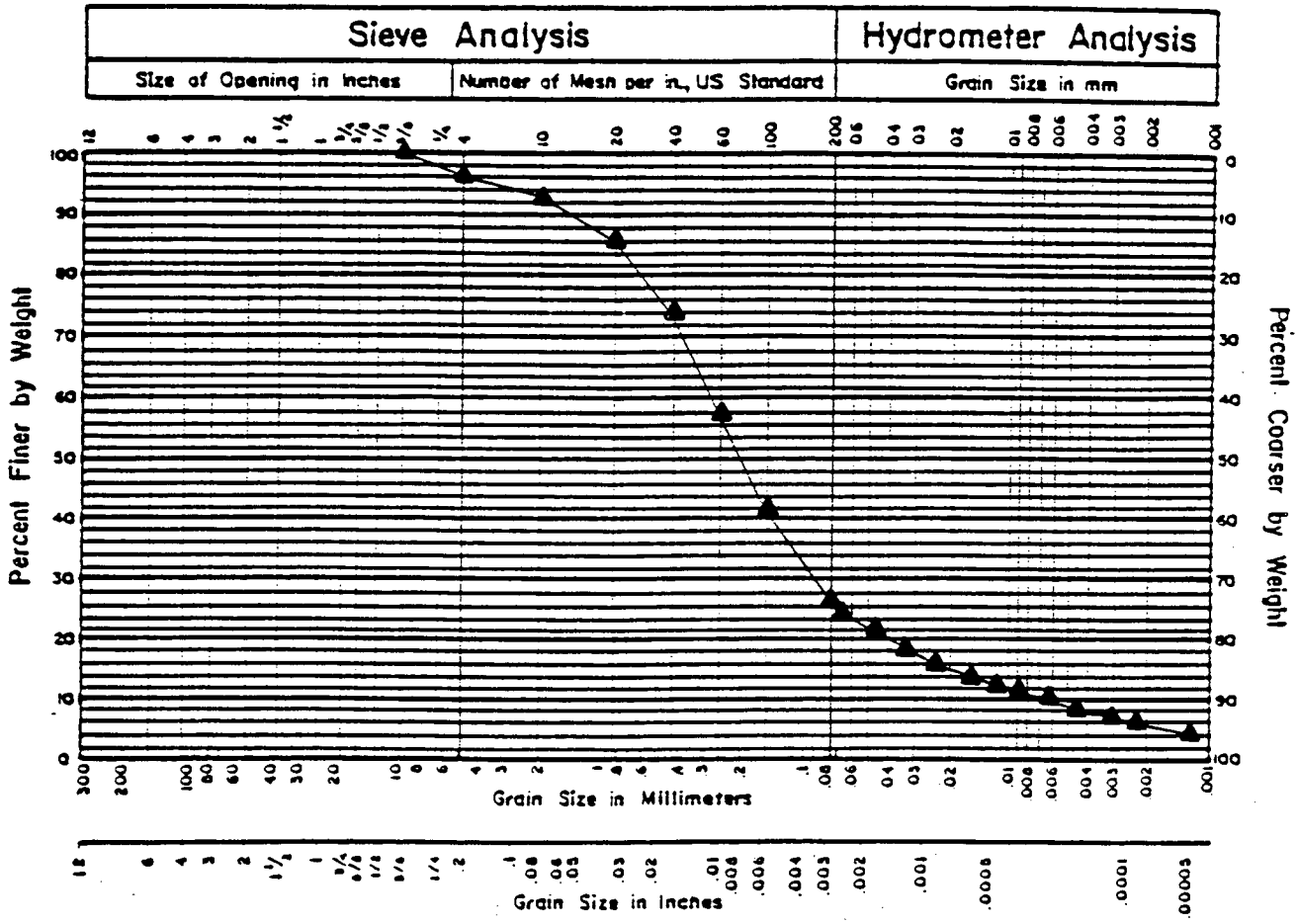
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 36
Sample Depth

Date 12-15-88
Tested By JPB / JLM
Plotted By JLM
Checked By JPB



COBBLES	GRAVEL: COARSE / FINE	SAND: C / M / F	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	36		23			*SM	*Slightly clayey, silty med-fine sand

*Based on Grain Size

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%. SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm	D60= mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cc = (D30)^2/(D10 x D60) =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	1 ≤ Cc ≤ 3
SAND (SW): Cu > 6	and	1 ≤ Cc ≤ 3

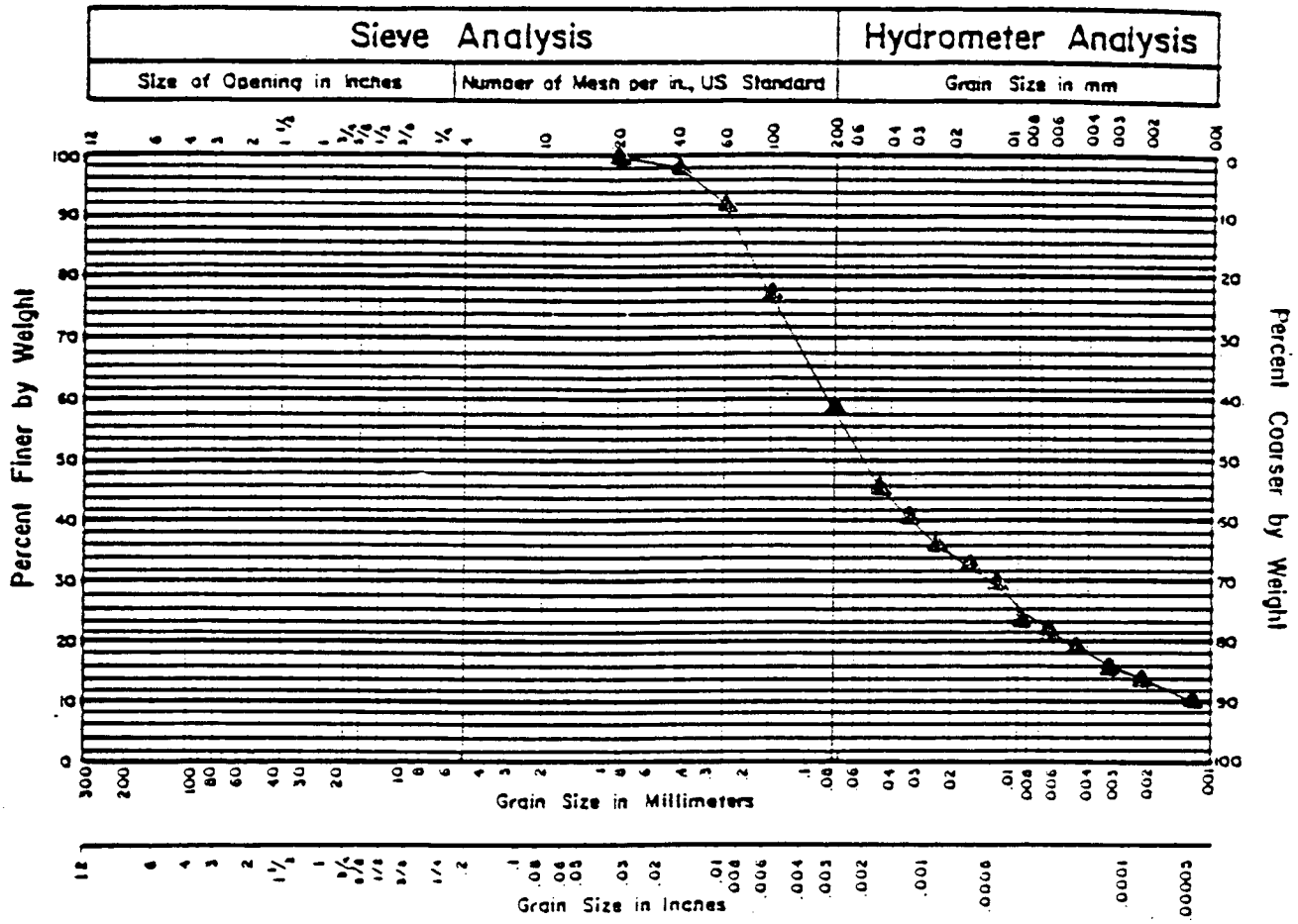
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bowhead
Job No. 2291
Exploration No. SKMS
Sample No. 57
Sample Depth

Date 12-21-87
Tested By JPB / JLM
Plotted By JM
Checked By JPR



COBBLES	GRAVEL: COARSE	GRAVEL: FINE	SAND: C	SAND: M	SAND: F	FINES
	GRAVEL		SAND			

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	57		36			* ML	*clayey, very sandy silt

*based on grain size

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm D60=	mm
UNIFORMITY COEFFICIENT: $C_u = D60/D10$ =	
COEF OF CURVATURE: $C_z = (D30)^2/(D10 \times D60)$ =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): $C_u > 4$	and	$1 \leq C_z \leq 3$
SAND (SW): $C_u > 6$	and	$1 \leq C_z \leq 3$

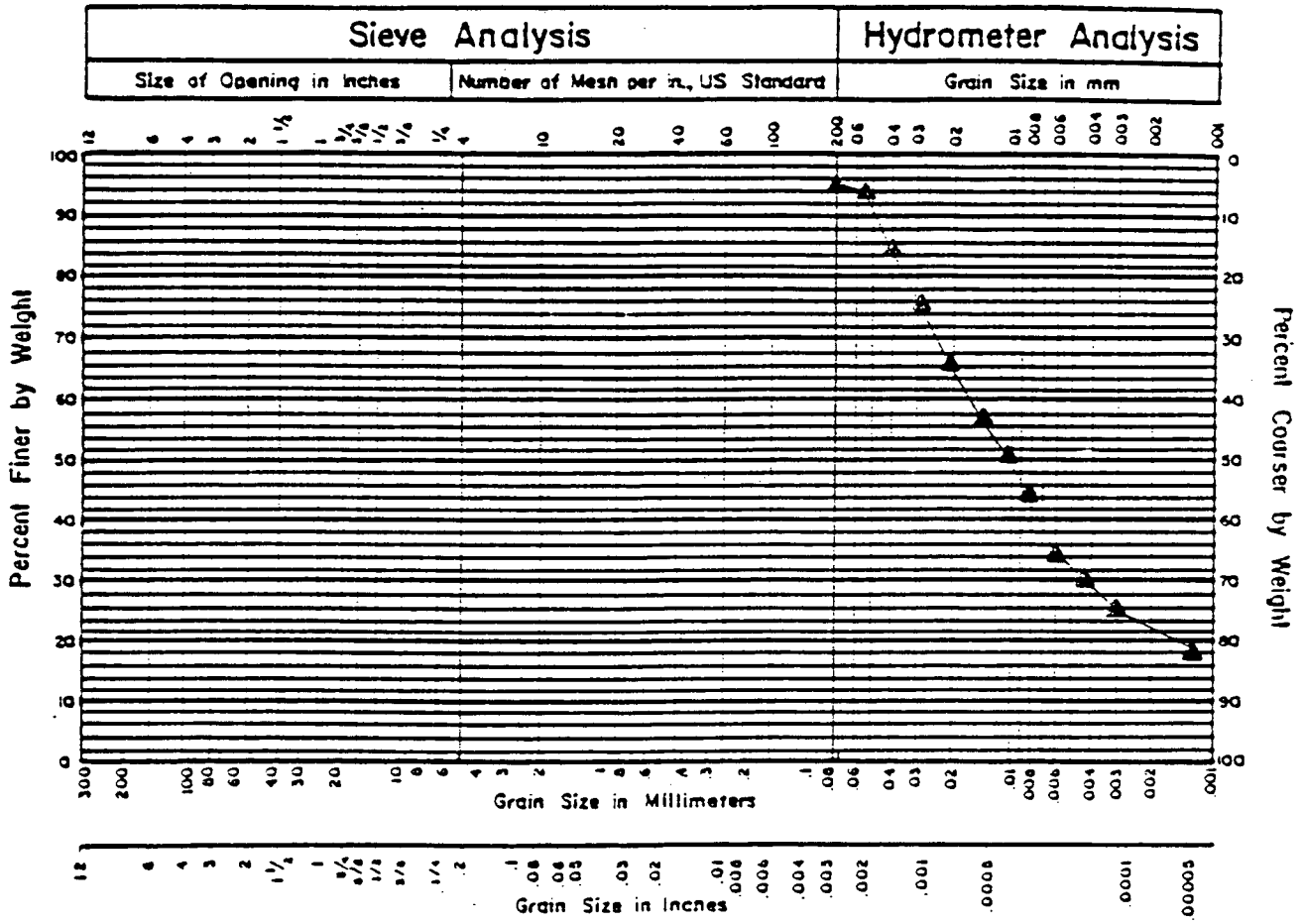
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bayhead
Job No. 2291
Exploration No. SKMS
Sample No. 59
Sample Depth

Date 12-14-92
Tested By JPR
Plotted By JCM
Checked By SMB



COBBLES	GRAVEL: COARSE	GRAVEL: FINE	SAND: C	SAND: M	SAND: F	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	59					* ML	Slightly Sandy Clayey Silt

* BASED ON GRAIN SIZE

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm D60=	mm
UNIFORMITY COEFFICIENT: $C_u = D60/D10$ =	
COEF OF CURVATURE: $C_z = (D30)^2/(D10 \times D60)$ =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): $C_u > 4$	and	$1 \leq C_z \leq 3$
SAND (SW): $C_u > 6$	and	$1 \leq C_z \leq 3$

NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

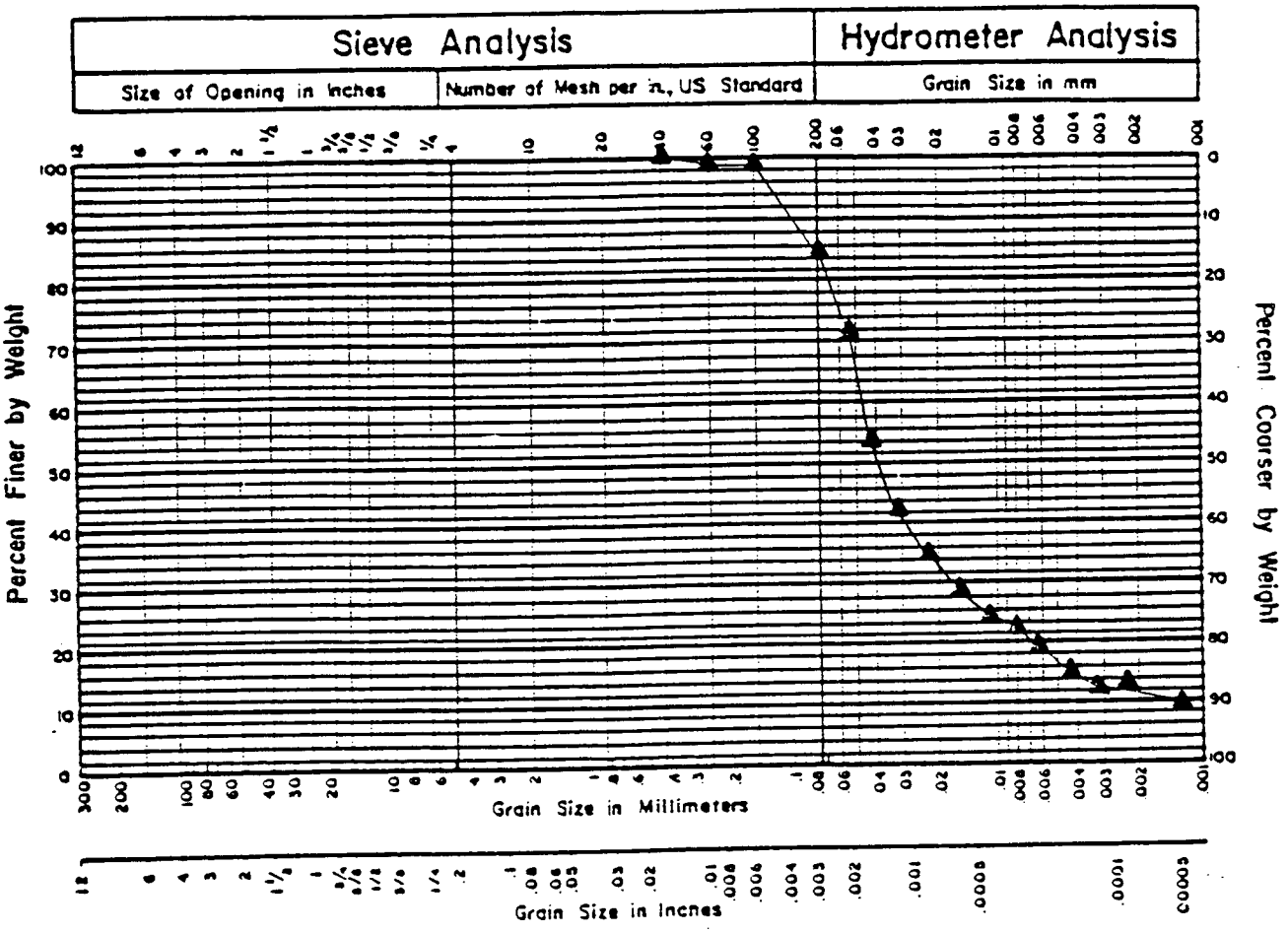
HART-CROWSER & associates inc.

Form 1.126.02

Grain Size Classification

Job [illegible]
Job No. 2091
Exploration No. SKMS
Sample No. 49
Sample Depth

Date 3-12-91
Tested By [illegible]
Plotted By JLH
Checked By JPD



COBBLES	GRAVEL: COARSE / FINE	SAND: C / M / F	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	49		83			* ML	*Slightly clayey sandy silt

*Based on Grain Size.

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm D60=	mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cz = $(D30)^2/(D10 \times D60)$ =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	$1 \leq Cz \leq 3$
SAND (SW): Cu > 6	and	$1 \leq Cz \leq 3$

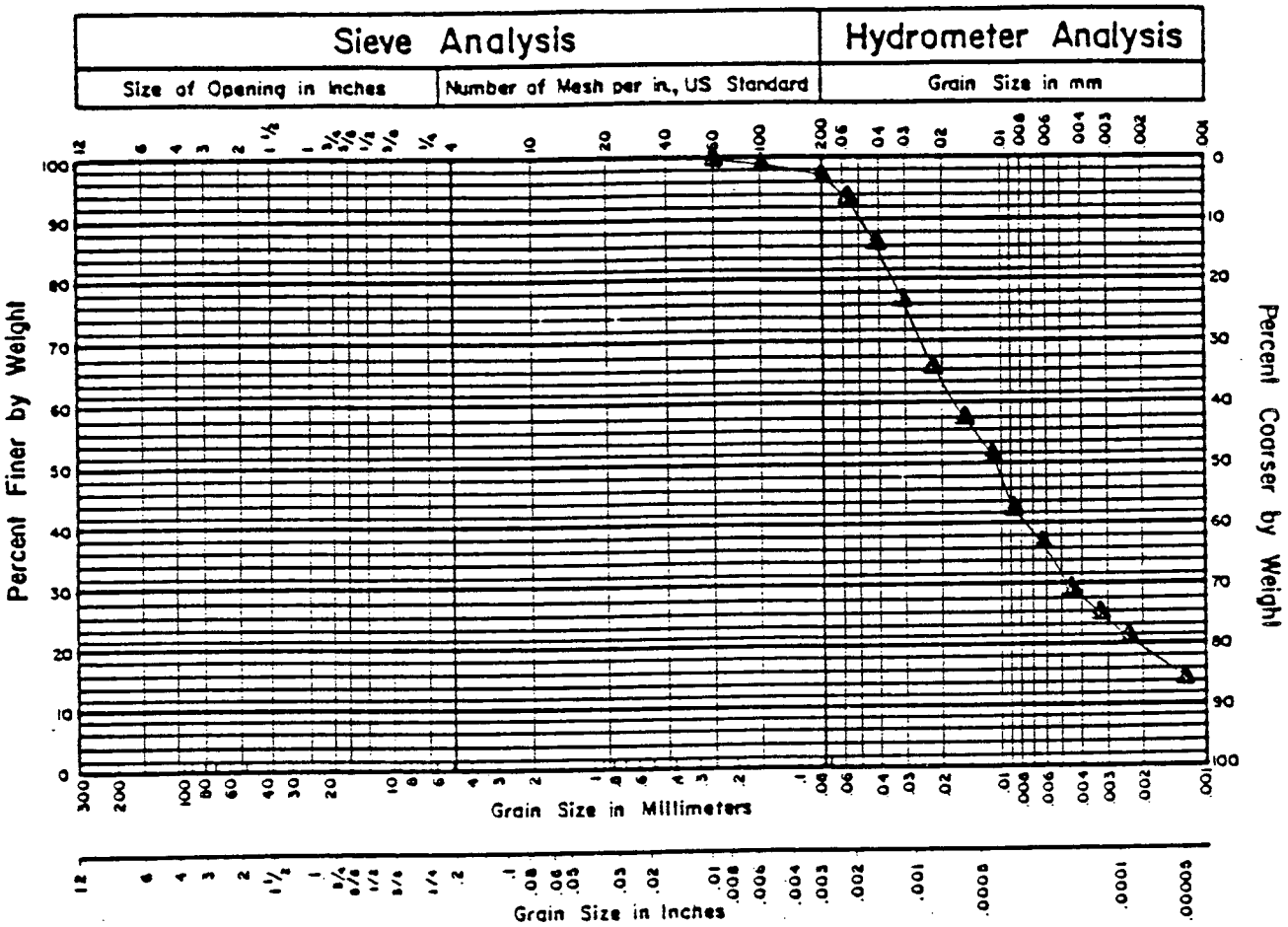
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job [illegible]
Job No. [illegible]
Exploration No. CMS
Sample No. 64
Sample Depth

Date [illegible]
Tested By [illegible]
Plotted By [illegible]
Checked By SPB



COBBLES	COARSE | FINE (GRAVEL)	C | M | F (SAND)	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
CMS	64		73			*ML	*clayey silt

*Based on Grain Size.

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON %FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm D60=	mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cz = $(D30)^2/(D10 \times D60)$ =	

Well Graded Soil (ASTM D 2487)

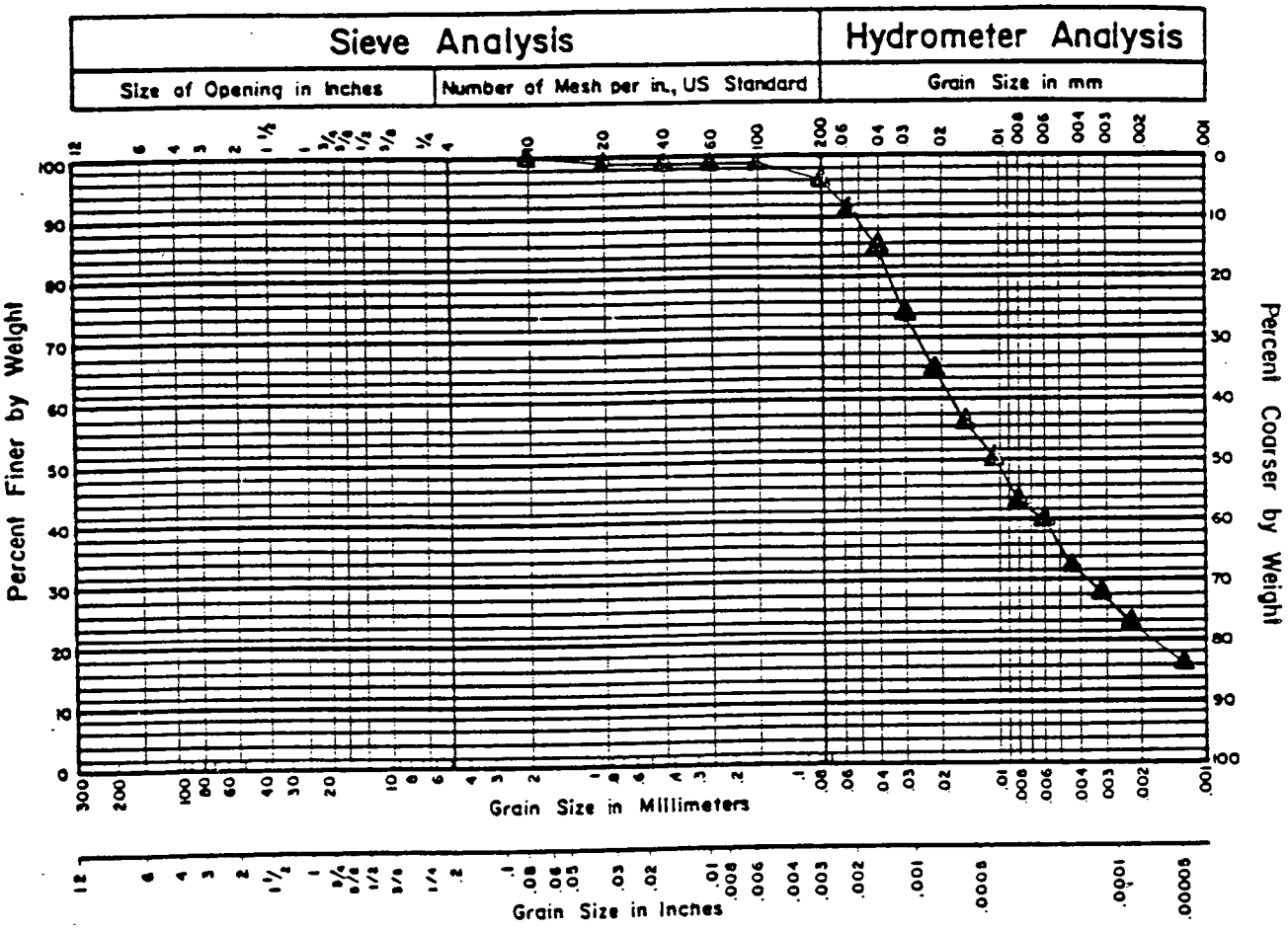
GRAVEL (GW): Cu > 4	and	$1 \leq Cz \leq 3$
SAND (SW): Cu > 6	and	$1 \leq Cz \leq 3$

NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT.

HART-CROWSER & associates inc.

Grain Size Classification

Job _____ Date _____
Job No. _____ Tested By _____
Exploration No. _____ Plotted By _____
Sample No. _____ Checked By JPR
Sample Depth _____



COBBLES	GRAVEL: COARSE	GRAVEL: FINE	SAND: C	SAND: M	SAND: F	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	63		64			*ML	*clayey silt

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm D60=	mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: $Cz = (D30)^2/(D10 \times D60)$ =	

Well Graded Soil (ASTM D 2487)

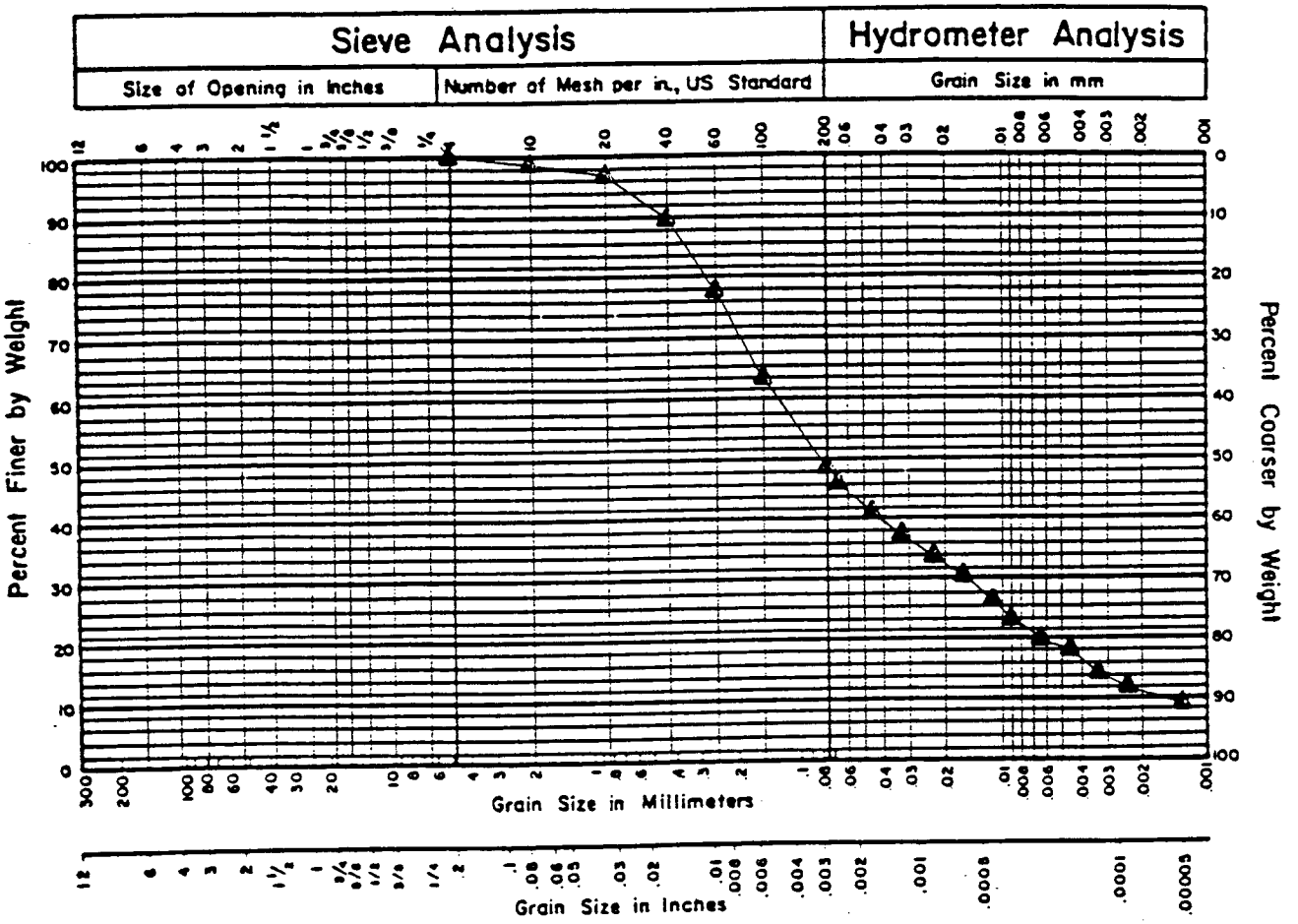
GRAVEL (GW): Cu > 4	and	$1 \le Cz \le 3$
SAND (SW): Cu > 6	and	$1 \le Cz \le 3$

NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job _____ Date _____
Job No. _____ Tested By _____
Exploration No. _____ Plotted By _____
Sample No. _____ Checked By _____
Sample Depth _____



COBBLES	GRAVEL: COARSE	GRAVEL: FINE	SAND: C	SAND: M	SAND: F	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	1		57			* SM	*Slightly clayey, very silty med-fine sand

*Based on fraction finer than 3"

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm D60=	mm
UNIFORMITY COEFFICIENT: $C_u = D60/D10$ =	
COEF OF CURVATURE: $C_z = (D30)^2/(D10 \times D60)$ =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): $C_u > 4$	and	$1 \leq C_z \leq 3$
SAND (SW): $C_u > 6$	and	$1 \leq C_z \leq 3$

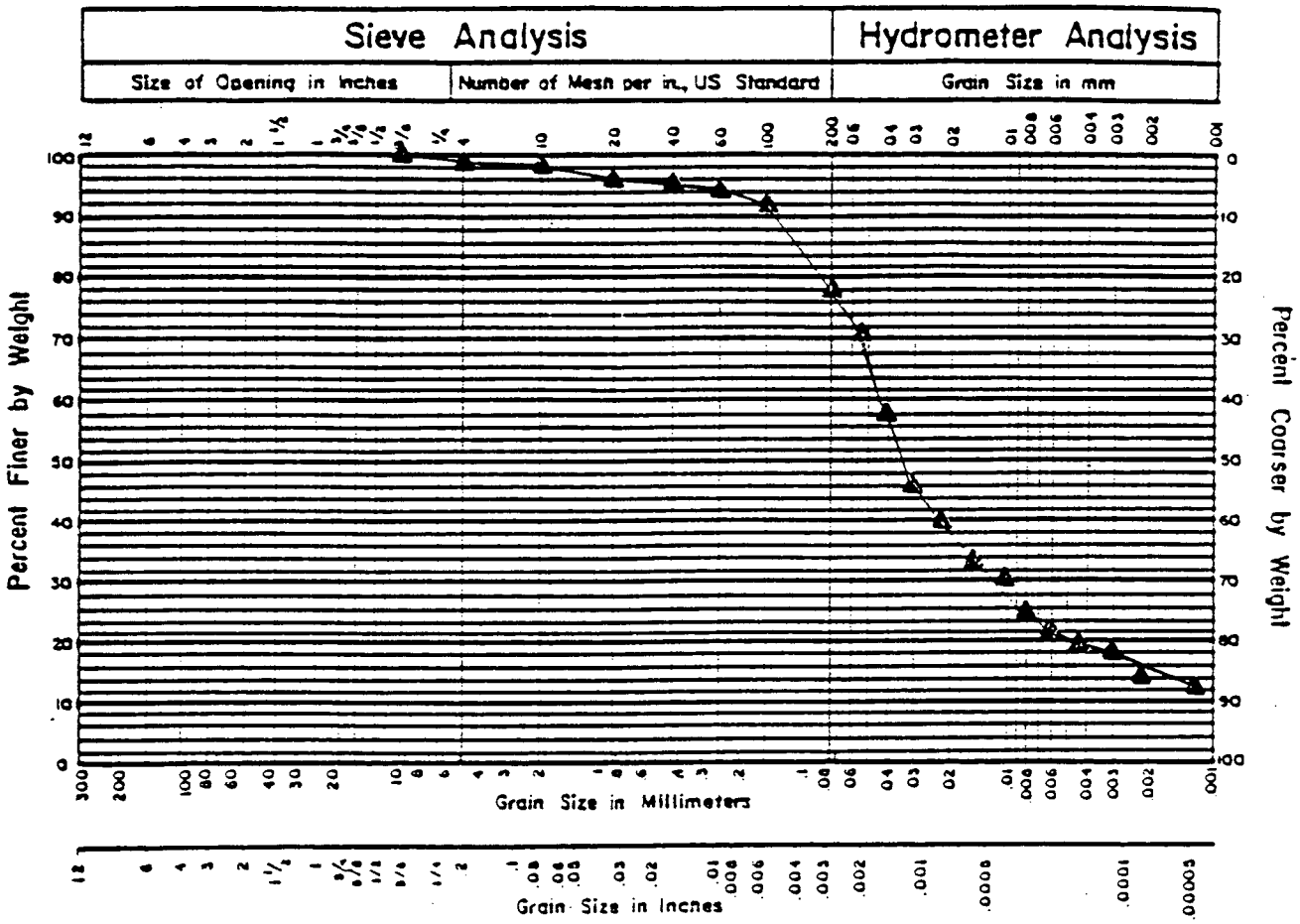
NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

Grain Size Classification

Job Bayhead
Job No. 2291
Exploration No. SKMS
Sample No. 81
Sample Depth

Date 12-21-88
Tested By JPB/SAS
Plotted By JLM
Checked By JPB



COBBLES	GRAVEL: COARSE / FINE	SAND: C / M / F	FINES

EXPL. NO.	SAMPLE NO.	DEPTH-FT.	NAT. W.C.%	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	U.S.C.	DESCRIPTION
SKMS	81		64			* ML	*Clayey, sandy silt

* Based on Grain Size.

Classification

ORDER OF SOIL DESCRIPTION
1) MINOR MODIFIER
2) MAJOR MODIFIER
3) MAJOR SOIL TYPE

DESCRIPTION OF DISTRIBUTION:
- LESS THAN 5%: (NOT CLASSIFIED)
- 5% TO 12%: SLIGHTLY
- 12% TO 30%: (NO MODIFIER)
- GREATER THAN 30%: VERY

Grain Size Coefficients (BASED ON % FINER)

EFFECTIVE GRAIN SIZE: D10=	mm
D30= mm D60=	mm
UNIFORMITY COEFFICIENT: Cu = D60/D10 =	
COEF OF CURVATURE: Cz = (D30)^2/(D10 x D60) =	

Well Graded Soil (ASTM D 2487)

GRAVEL (GW): Cu > 4	and	1 ≤ Cz ≤ 3
SAND (SW): Cu > 6	and	1 ≤ Cz ≤ 3

NOTE: REPORT WATER CONTENTS AND ATTERBERG LIMITS TO THE NEAREST PERCENT

HART-CROWSER & associates inc.

APPENDIX C-6

pace laboratories, inc
FORMERLY WESCO LABORATORIES

REPORT OF LABORATORY ANALYSIS

Offices:
Minneapolis, Minnesota
Tampa, Florida
Coralville, Iowa
Novato, California

Report date: December 29, 1988
Pace job #: SRK 0805 -L

Client: SRK
3232 S. Vance, Suite 210
Lakewood CO 80227
Attn.: Greg Knell

RECEIVED
JAN - 5 1989
Ans'd.....

Date sampled: November 15, 1988
Site: Skagway Harbor

Sampled by: Redman/ Titus

Date received: November 18, 1988
P.O.: 71401

Submitted by: DHL

Lab #	Client ID	Matrix	Analysis
8- 2074	SKMS-49	sludge	TOC (single) 415.1
8- 2073	SKMS-49	sludge	Lead 7420
8- 2073	SKMS-49	sludge	Mercury 7470
8- 2073	SKMS-49	sludge	Cadmium 7130/31
8- 2073	SKMS-49	sludge	Copper 7210
8- 2073	SKMS-49	sludge	Silver 7760
8- 2073	SKMS-49	sludge	Zinc 7950
8- 2074	SKMS-49	sludge	Particle size by sieve
8- 2074	SKMS-49	sludge	% Solids
8- 2076	SKMS-51	sludge	TOC (single) 415.1
8- 2075	SKMS-51	sludge	Lead 7420
8- 2075	SKMS-51	sludge	Mercury 7470
8- 2075	SKMS-51	sludge	Cadmium 7130/31
8- 2075	SKMS-51	sludge	Copper 7210
8- 2075	SKMS-51	sludge	Silver 7760
8- 2075	SKMS-51	sludge	Zinc 7950
8- 2076	SKMS-51	sludge	Particle size by sieve
8- 2076	SKMS-51	sludge	% Solids
8- 2078	SKMS-53	sludge	TOC (single) 415.1
8- 2077	SKMS-53	sludge	Lead 7420
8- 2077	SKMS-53	sludge	Mercury 7470
8- 2077	SKMS-53	sludge	Cadmium 7130/31
8- 2077	SKMS-53	sludge	Copper 7210
8- 2077	SKMS-53	sludge	Silver 7760
8- 2077	SKMS-53	sludge	Zinc 7950
8- 2078	SKMS-53	sludge	Particle size by sieve
8- 2078	SKMS-53	sludge	% Solids

pace laboratories, inc
FORMERLY WESCO LABORATORIES

REPORT OF LABORATORY ANALYSIS

Offices:
Minneapolis, Minnesot
Tampa, Florida
Coralville, Iowa
Novato, California

Report date: December 29, 1988
Client: SRK
3232 S. Vance, Suite 210
Lakewood CO 80227
Attn.: Greg Knell

Pace job #: SRK 0805 -L

Date sampled: November 15, 1988
Sampled by: Redman/ Titus

Site: Skagway Harbor

Date received: November 18, 1988
Submitted by: DHL

P.O.: 71401

Lab #	Client ID	Matrix	Analysis

Dear Client,

No problems were encountered with the analysis of your samples. We will store samples for 30 days after the report date. The samples will be returned to the client after the 30-day period, unless other arrangements are made.
If you have any questions, please feel free to call Lisa Petersen, our Client Services Coordinator at (415)883-6100.

C. Santiago
Sample Controller

pace laboratories, inc
FORMERLY WESCO LABORATORIES

REPORT OF LABORATORY ANALYSIS

Offices:
Minneapolis, Minnesota
Tampa, Florida
Coralville, Iowa
Novato, California

Report Date: 27-Dec-88
PACE JOB #: SRK 0805-L
MATRIX: SLUDGE

Completion Date: 12-DEC-88
Reported By: J.HARWOOD
Analyst: E.T.S.

LAB #	CLIENT'S ID:	SAND FRACTIONS (in %) DRY SIEVING GRAVEL	V.CRSE	CRSE	MED	FINE
8-2074	SKMS-49	0.00	0.70	5.85	16.51	23.81
8-2076	SKMS-51	0.10	1.97	10.78	15.64	24.76
8-2078	SKMS-53	0.43	1.38	11.10	16.77	25.87

LAB #	CLIENT'S ID:	V.FINE	CUMULATIVE % SAND	TEXTURE (by hydrometer) % SILT	% CLAY	% SOLIDS
8-2074	SKMS-49	17.53	64.4	21.4	14.2	70.82
8-2076	SKMS-51	14.03	67.2	19.4	13.4	70.95
8-2078	SKMS-53	15.14	70.3	17.7	12.0	70.66

NOTE: Soil analytical methodologies are developed or approved by USDA, USGS, ASTM, and/or various universities (eg. UC Davis, etc.). Textures: standard PSAs by hydrometer (Bouyoucos Method [two point method- modified ASTM D422]); Sieving with U.S. Standard sieve screens #10, #18, #35, #60, #120, #230 + pan following the USGS scale. Percent solids done on the basis of moisture loss.

Analytical Supervisor

pace laboratories, inc
FORMERLY WESCO LABORATORIES

REPORT OF LABORATORY ANALYSIS

Offices:
Minneapolis, Minnesota
Tampa, Florida
Coralville, Iowa
Novato, California

Report Date:	27-Dec-88	Completion Date:	27-Dec-88
PACE JOB #:	SRK 0805-L	Analyst:	NACKORD
Analytical Method:	EPA 7000 series	Reported by:	J.HARWOOD

MATRIX: SLUDGE

LAB #	CLIENT ID	Cadmium (Cd) (mg/kg)	Copper (Cu) (mg/kg)	Lead (Pb) (mg/kg)
8-2073	SKMS-49	2.6	39	593
8-2075	SKMS-51	2.1	36	644
8-2077	SKMS-53	N.D.	34	765
Detection limit		2.0	2.0	5.0
Method number		EPA 7130	EPA 7210	EPA 7420

LAB #	CLIENT ID	Mercury (Hg) (mg/kg)	Silver (Ag) (mg/kg)	Zinc (Zn) (mg/kg)
8-2073	SKMS-49	0.97	N.D.	1,100
8-2075	SKMS-51	0.71	N.D.	1,010
8-2077	SKMS-53	0.99	N.D.	935
Detection limit		0.02	5.0	2.0
Method number		EPA 7471	EPA 7760	EPA 7950

N.D.: Not Detected

Analytical Supervisor

pace laboratories, inc
FORMERLY WESCO LABORATORIES

REPORT OF LABORATORY ANALYSIS

Offices:
Minneapolis, Minnesota
Tampa, Florida
Coralville, Iowa
Novato, California

Report Date: 27-Dec-88
PACE JOB #: SRK 0805-L
MATRIX: SLUDGE

Completion Date: 06-DEC-88
Reported By: J.HARWOOD
Analyst: N.E.T.

LAB #	CLIENT'S ID:	TOTAL ORGANIC CARBON (mg/kg)
8-2074	SKMS-49	430
8-2076	SKMS-51	400
8-2078	SKMS-53	410

Analytical Supervisor

pace laboratories, inc
FORMERLY WESCO LABORATORIES

REPORT OF LABORATORY ANALYSIS

Offices:
Minneapolis, Minnesota
Tampa, Florida
Coralville, Iowa
Novato, California

Report date: December 29, 1988
Client: SRK
3232 S. Vance, Suite 210
Lakewood CO 80227
Attn.: Greg Knell

Pace job #: SRK 0806 -L

RECEIVED
JAN - 5 1989
Anch.

Date sampled: November 21, 1988
Sampled by: Titus/O'Donnell

Site: Skagway Harbor, Alaska

Date received: November 23, 1988
Submitted by: DHL

P.O.: 71401

Lab #	Client ID	Matrix	Analysis
8- 2200	SKMS-39	sludge	TOC (single) 415.1
8- 2203	SKMS-39	sludge	Metals as requested
8- 2200	SKMS-39	sludge	Particle size by sieve
8- 2200	SKMS-39	sludge	% Solids
8- 2201	SKMS-77	sludge	TOC (single) 415.1
8- 2204	SKMS-77	sludge	Metals as requested
8- 2201	SKMS-77	sludge	Particle size by sieve
8- 2201	SKMS-77	sludge	% Solids
8- 2202	SKMS-79	sludge	TOC (single) 415.1
8- 2205	SKMS-79	sludge	Metals as requested
8- 2202	SKMS-79	sludge	Particle size by sieve
8- 2202	SKMS-79	sludge	% Solids

Dear Client,

No problems were encountered with the analysis of your samples. We will store samples for 30 days after the report date. The samples will be returned to the client after the 30-day period, unless other arrangements are made.
If you have any questions, please feel free to call Lisa Petersen, our Client Services Coordinator at (415)883-6100.

C. Sontag
Sample Controller

11 Digital Drive c Novato, CA 94949 c Phone (415) 883-6100

pace laboratories, inc
FORMERLY WESCO LABORATORIES

REPORT OF LABORATORY ANALYSIS

Offices:
Minneapolis, Minnesota
Tampa, Florida
Coralville, Iowa
Novato, California

Report Date:	27-Dec-88	Completion Date:	12-DEC-88
PACE JOB #:	SRK 0806-L	Reported By:	J.HARWOOD
MATRIX:	SLUDGE	Analyst:	E.T.S.

LAB #	CLIENT'S ID:	SAND FRACTIONS (in %) DRY SIEVING GRAVEL	V.CRSE	CRSE	MED	FINE
8-2200	SKMS-39	0.00	0.00	0.00	0.47	4.07
8-2201	SKMS-77	0.00	0.00	0.27	2.07	5.94
8-2202	SKMS-79	0.00	0.00	0.24	3.04	11.45

LAB #	CLIENT'S ID:	V.FINE	CUMULATIVE % SAND	TEXTURE (by hydrometer) SILT	CLAY	% SOLIDS
8-2200	SKMS-39	23.16	27.7	53.7	18.6	72.51
8-2201	SKMS-77	26.96	35.2	48.1	16.7	73.30
8-2202	SKMS-79	34.43	49.2	36.0	14.8	72.31

NOTE: Soil analytical methodologies are developed or approved by USDA, USGS, ASTM, and/or various universities (eg. UC Davis, etc.). Textures: standard PSAs by hydrometer (Bouyoucos Method [two point method- modified ASTM D422]); Sieving with U.S. Standard sieve screens #10, #18, #35, #60, #120, #230 + pan following the USGS scale. Percent solids done on the basis of moisture loss.

Analytical Supervisor

pace laboratories, inc.
FORMERLY WESCO LABORATORIES

REPORT OF LABORATORY ANALYSIS

Offices:
Minneapolis, Minnesota
Tampa, Florida
Coralville, Iowa
Novato, California

Report Date:	27-Dec-88	Completion Date:	06-DEC-88
PACE JOB #:	SRK 0806-L	Reported By:	J.HARWOOD
MATRIX:	SLUDGE	Analyst:	N.E.T. Labs

LAB #	CLIENT'S ID:	TOTAL ORGANIC CARBON (mg/kg)
8-2200	SKMS-39	520
8-2201	SKMS-77	520
8-2202	SKMS-79	520

/Hatch

Analytical Supervisor

pace laboratories, inc
FORMERLY WESCO LABORATORIES

REPORT OF LABORATORY ANALYSIS

Offices:
Minneapolis, Minnesota
Tampa, Florida
Coralville, Iowa
Novato, California

Report Date: 27-Dec-88 Analyst: Nackord
PACE JOB #: SRK 0806-L Reported by: J.Harwood
Analytical Method: EPA 7000 series

MATRIX: SLUDGE

LAB #	CLIENT ID	Cadmium (Cd) (mg/kg)	Copper (Cu) (mg/kg)	Lead (Pb) (mg/kg)
8-2203	SKMS-39	N.D.	22	104
8-2204	SKMS-77	N.D.	21	104
8-2205	SKMS-79	N.D.	22	110
Detection limit		2.0	2.0	5.0
Method number		EPA 7130	EPA 7210	EPA 7420

LAB #	CLIENT ID	Mercury (Hg) (mg/kg)	Silver (Ag) (mg/kg)	Zinc (Zn) (mg/kg)
8-2203	SKMS-39	0.16	N.D.	513
8-2204	SKMS-77	0.19	N.D.	422
8-2205	SKMS-79	0.17	N.D.	475
Detection limit		0.02	5.0	2.0
Method number		EPA 7470	EPA 7760	EPA 7950

Analytical Supervisor