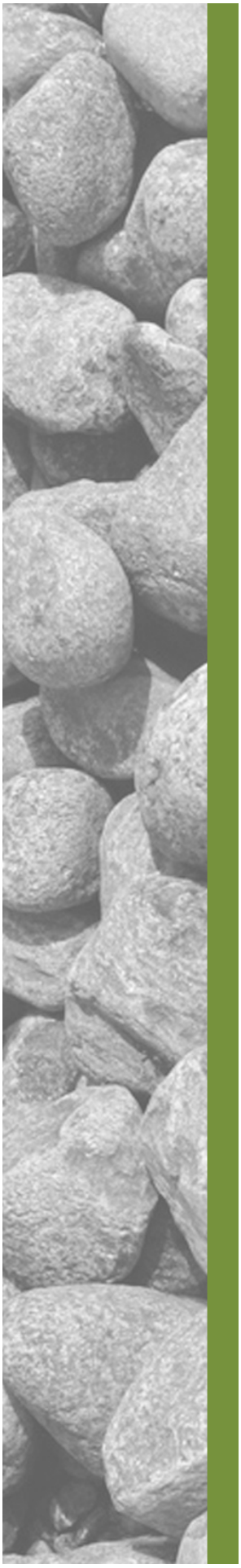
Appendix E

Resource Assessment

Applicant



HAROLD E. STAFFORD, Q.C.
Barrister and Solicitor
P.O. Box 575
458 Talbot Street
St. Thomas Ontario
N5P 3V8

Report On
GEOTECHNICAL INVESTIGATION
to
ASSESS COMMERCIAL AGGREGATE SUPPLY,
DONALD FERGUSON ESTATE,
North Half of Lot 6, Concession 12,
Township of Yarmouth

Ref.: 1-2044

September 16, 1994

September 16, 1994

Ref.: 1-2044

Harold E. Stafford, Q.C.
Barrister and Solicitor
P.O. Box 575
458 Talbot Street
St. Thomas, Ontario
N5P 3V8

Dear Sirs:

Re: Geotechnical Investigation to Assess Commercial Aggregate Supply, Donald Ferguson Estate, North Half of Lot 6, Concession 12, Township of Yarmouth, Ontario

We have completed this project in accordance with instructions from Mr. Donald Cosens and a letter of authorization from Harold E. Stafford, Q.C., dated August 27, 1994. This report contains a record of our findings and presents our conclusions with respect to the possible use of aggregate from the subject property.

FIELD WORK

The field work, consisting of an initial program of 8 boreholes along the east and south boundaries of the existing gravel pit was carried out during the period August 31 to September 7, 1994, and following discussion with Mr. Donald Cosens, a second series of

boreholes Numbered 9 to 13, were put down to the east of Boreholes 2 and 3 and to the south of Boreholes 6, 7 and 8, to confirm the presence of potential gravel supplies which were identified in Boreholes 2, 3, 6, 7 and 8. The boreholes were advanced to the sampling depths by a power auger machine, which was equipped with hollow-stem augers and conventional soil sampling equipment.

Standard penetration tests were performed at 5 foot intervals of depth to obtain representative samples for classification purposes, and the samples were transferred to our laboratory for grain size analyses. The field work was supervised by a geologist, who also referred the strata changes to the prevailing ground surface at each borehole location.

SUBSURFACE CONDITIONS

Detailed descriptions of the strata, which were encountered in each borehole, are given on the borehole logs comprising Enclosures 3 to 15. The following notes are intended only to amplify this data.

All the boreholes encountered a surface layer of topsoil which ranges in thickness from 8 to 10 inches. The predominant soil type below the topsoil consists of fine sand, however a silty clay stratum was encountered between depths of 11.5 and 20 feet at Borehole 1 location and Borehole 5 encountered glacial clayey silt, silt and sandy silt till materials from immediately below the topsoil layer to a depth of 24 feet. Gravel layers were also encountered in Boreholes 3, 6, 7, 8, 9, 10 and 11.

Sieve analyses were performed on 17 composite samples of the soil strata to obtain an indication of the grading that would be obtained from an excavation face with a height of 10 to 20 feet, and the results are plotted on the grain size distribution curves comprising Enclosures 17 to 29.

GROUNDWATER CONDITIONS

The groundwater table was encountered at a depth of approximately 51 feet in the area of Boreholes 1, 2, 3, 12 and 13, and the depth to the groundwater table ranges from 41 to 45 feet in the area of Boreholes 4, 5, 6, 7, 8, 9, 10, and 11.

DISCUSSION AND RECOMMENDATIONS

The investigation has revealed that the predominant soil type along the eastern and southern boundaries of the existing gravel pit consist of fine sand, however a layer of silty clay, approximately 9 feet thick, was encountered in Borehole 1, and at Borehole 5 location glacial clayey silt, silt and sandy silt till formed the entire soil profile to a depth of 24 feet. Sand and gravel was encountered within the fine sand matrix at Borehole 2, 6, 7, 8, 9 and 11 locations, where the average thickness of sand and gravel is estimated to be 16 feet. The predominant use for the sand and gravel would be for Granular 'B', which is a classification of the Provincial Ministries for road sub-base material, and the fine sand which is the predominant soil type in the area tested, could be used for a variety of purposes, commonly categorized as sand fill.

Sieve analyses were performed on 17 composite samples of the soil strata to obtain an indication of the grading that would be obtained from an excavation face with a height of 10 to 20 feet, and the results are plotted on the grain size distribution curves comprising Enclosures 17 to 29.

GROUNDWATER CONDITIONS

The groundwater table was encountered at a depth of approximately 51 feet in the area of Boreholes 1, 2, 3, 12 and 13, and the depth to the groundwater table ranges from 41 to 45 feet in the area of Boreholes 4, 5, 6, 7, 8, 9, 10, and 11.

DISCUSSION AND RECOMMENDATIONS

The investigation has revealed that the predominant soil type along the eastern and southern boundaries of the existing gravel pit consist of fine sand, however a layer of silty clay, approximately 9 feet thick, was encountered in Borehole 1, and at Borehole 5 location glacial clayey silt, silt and sandy silt till formed the entire soil profile to a depth of 24 feet. Sand and gravel was encountered within the fine sand matrix at Borehole 2, 6, 7, 8, 9 and 11 locations, where the average thickness of sand and gravel is estimated to be 16 feet. The predominant use for the sand and gravel would be for Granular 'B', which is a classification of the Provincial Ministries for road sub-base material, and the fine sand which is the predominant soil type in the area tested, could be used for a variety of purposes, commonly categorized as sand fill.

Granular 'B'

Composite samples of the subsoil were subjected to sieve analyses, and the results are plotted on Enclosures 19, 21, 22, 24, 25 and 27, which also indicate the limits for Granular 'B' material. The gravel layer encountered in Borehole 3 is considered to be a local anomaly, and it is therefore being disregarded in the estimation for Granular 'B' quantity. Assuming that the sand and gravel is extracted from an area 900 feet long in the east - west direction and 400 feet in the north - south direction, the average thickness of 16 feet would produce in excess of 200,000 cubic yards of Granular 'B' type material which would translate to approximately 360,000 tons by weight. The price of Granular 'B' gravel varies considerably, and the prospective buyers should therefore form their own opinion with regard to the profit to be made after extraction and trucking costs.

Sand Fill

Sand fill could be extracted in the area of Boreholes 6, 7, 8, 9, 10 and 11 to the south of the existing gravel pit, and also in the area of Boreholes 2, 3, 4, 12 and 13 to the east of the gravel pit. Assuming that a 40 foot face of sand is excavated over an area 600 by 900 on the east side of the existing gravel pit and a further 15 feet outside the Granular 'B' zone is excavated from an area 900 by 400 on the south side of the existing gravel pit, the total volume of sand fill is estimated to be 800,000 cubic yards along the east side and 200,000 cubic yards along the south side of the existing pit. The total of 1,000,000 cubic yards equates to a total weight of approximately 1,485,000 tons. It should be remembered that the silt content of the fine sand varies from less than 10% to as high as 31.1% in the samples tested, and it may therefore be assumed to be a frost susceptible material. Frost susceptible sand fill may be used for various purposes such as:-

(a) Engineered fill to raise the grade inside an existing building.

(b) Engineered fill to replace weak subsoil subexcavated below building areas.

(c) Backfill for interior footing excavations in areas where buildings are constructed on glacial silty clay or silt subsoil, which cannot be re-used for backfill purposes.

Silty Clay

The silty clay subsoil which was encountered in Borehole 1 is considered to have a natural moisture content lower than the Plastic Limit of the soil, which makes it easily compactable. This type of impermeable soil is often required for embankment construction, impermeable dyke construction, and backfill around buildings for methane protection, and it may therefore be considered to have a minimal commercial value.

CONCLUSIONS

The investigation has shown that the predominant soil type consists of fine sand, which is generally a low quality fill material, however this type of material is frequently required in the building industry. It is understood that that sand fill from the existing pit operation was used in the construciton of the Talbotville Ford plant. Smaller amounts of Granular 'B' type (non-frost susceptible) material were encountered, particularly along the southern boundary of the existing gravel pit, and this material may be considered to be of fairly high quality for use in pavement construction.

The estimated quantities in the report are based on the results of the boreholes, and proposed buyers of the property should form their own opinions with regard to the potential net value of subsoil excavated for commercial purposes, taking into account set-backs for site boundaries.

We trust that the foregoing report contains sufficient information for your present requirements, however if further discussion is required, please do not hesitate to contact us.

Yours very truly,

ATKINSON, DAVIES INC.

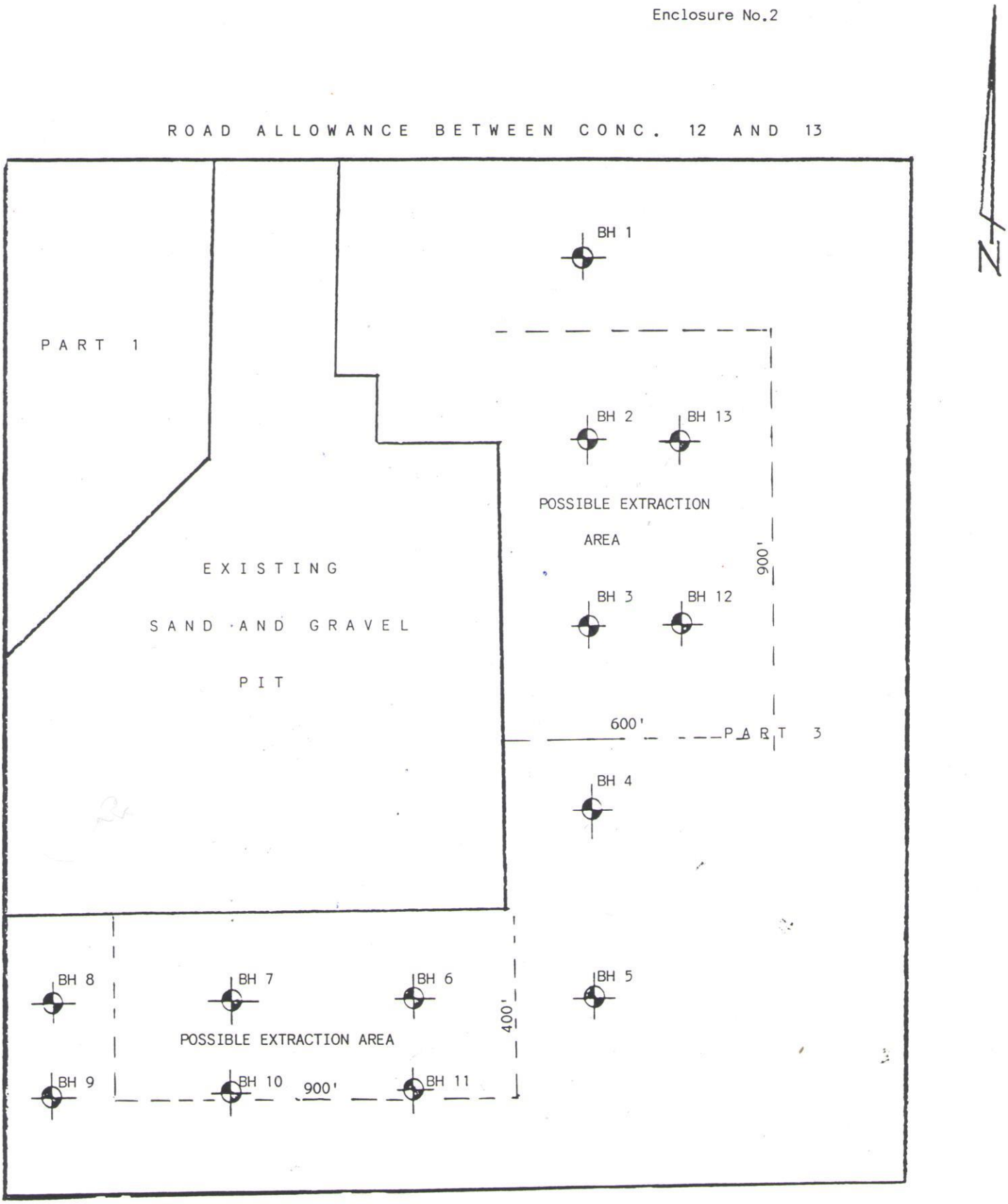
C.J.W. Atkinson, M.Sc., P.Eng.

CJWA/wrs
Enclosures

ATKINSON, DAVIES INC.

Ref: 1-2044

Enclosure No.2



SITE PLAN

Scale 1 inch = 300 feet

REF. NO.: 1-2044
CLIENT: Harold E. Stafford Q.C.
PROJECT: Gravel Exploration
LOCATION: Donald Ferguson Estate, N½ Lot 6, Conc. 12, Yarmouth
DATUM ELEVATION: Ground Surface

LOG OF BOREHOLE NO. 1

Encl. No. 3
DRILLING DATA:
METHOD: Auger
DIAMETER: hollow stem
DATE: Aug. 31 to Sept. 9, 1994

Elev. feet	Depth feet	DESCRIPTION	SYMBOL	GROUND WATER	SAMPLES NUMBER	TYPE	'N' Blow/Ft	Penetration Resistance Blows/Ft. 20 40 60 80 100 / Undrained Shear Strength p.s.f. + Field Vane Test • Compression Test	PLASTIC LIMIT %	NATURAL WATER %	LIQUID LIMIT %
	0.0	Ground Surface									
		10" Topsoil.									
		Loose dark brown silt and fine sand.			1	SS	7				
	5.0	Dense fine sand, trace of gravelly silt.			2	SS	40				
	11.5	Hard grey/brown silty clay.			3	SS	82				
					4	SS	97				
	20.0	Very dense sand, trace to some gravel, trace of silt.			5	SS	89				
					6	SS	55/6"				
	30.0	Very dense fine sand, trace to some silt.			7	SS	95				
					8	SS	83				
					9	SS	86				
					10	SS	67				

ATKINSON DAVIES INC.

REF. NO.: 1-2044
CLIENT: Harold E. Stafford Q.C.
PROJECT: Gravel Exploration
LOCATION: Donald Ferguson Estate, N½ Lot 6, Conc. 12, Yarmouth
DATUM ELEVATION: Ground Surface

LOG OF BOREHOLE NO. 2

Encl. No. 4
DRILLING DATA:
METHOD: Auger
DIAMETER: hollow stem
DATE: Aug. 31 to Sept. 9, 1994

Elev. feet	Depth feet	DESCRIPTION	SYMBOL	GROUND WATER	NUMBER	TYPE	'N' Blow/Ft	Penetration Resistance Blows/Ft. 20 40 60 80 100 / Undrained Shear Strength p.s.f. + Field Vane Test • Compression Test	PLASTIC LIMIT %	NATURAL WATER %	LIQUID LIMIT %
	0.0	Ground Surface									
		10" Topsoil.									
		Compact			1	SS	21				
		to			2	SS	32				
		dense			3	SS	18				
		brown			4	SS	33				
		fine			5	SS	83				
		sand,									
		some			6	SS	66				
		silt.			7	SS	52				
		Sieve Analyses see Enclosure No. 17			8	SS	63				
	40.0	Very dense									
		fine to			9	SS	50/6"				
		coarse									
		sand,			10	SS	66				
		some silt,									
		trace of gravel.									
		Sieve- Enclosure No. 18			11	SS	64				

ATKINSON DAVIES INC.

REF. NO.: 1-2044
CLIENT: Harold E. Stafford Q.C.
PROJECT: Gravel Exploration
LOCATION: Donald Ferguson Estate, N½ Lot 6, Conc. 12, Yarmouth
DATUM ELEVATION: Ground Surface

LOG OF BOREHOLE NO. 3

Encl. No. 5
DRILLING DATA:
METHOD: Auger
DIAMETER: hollow stem
DATE: Aug. 31 to Sept. 9, 1994

Elev. feet	Depth feet	DESCRIPTION	SYMBOL	GROUND WATER	SAMPLES NUMBER	TYPE	'N' Blow/Ft	Penetration Resistance Blows/Ft. 20 40 60 80 100 / Undrained Shear Strength p.s.f. + Field Vane Test • Compression Test	PLASTIC LIMIT %	NATURAL WATER %	LIQUID LIMIT %
	0.0	Ground Surface									
		10" Topsoil.									
		Compact brown sandy silt.			1	SS	16				
	6.0	Loose brown fine sand, trace of silt.			2	SS	3				
	12.0	Compact to very dense sand and gravel, trace of silt. Sieve- Enclosure No. 19			3	SS	17				
					4	SS	62				
	21.0	Very dense brown fine sand, some silt. Sieve- Enclosure No. 20			5	SS	54				
					6	SS	93				
					7	SS	96				
					8	SS	58				
					9	SS	73				
	48.5	Very dense coarse sand, traces of gravel and silt.		▽	10	SS	69				
					11	SS	101				

ATKINSON DAVIES INC.

REF. NO.: 1-2044
CLIENT: Harold E. Stafford Q.C.
PROJECT: Gravel Exploration
LOCATION: Donald Ferguson Estate, N½ Lot 6, Conc. 12, Yarmouth
DATUM ELEVATION: Ground Surface

LOG OF BOREHOLE NO. 4

Encl. No. 6
DRILLING DATA:
METHOD: Auger
DIAMETER: hollow stem
DATE: Aug. 31 to Sept. 9, 1994

Elev. feet	Depth feet	DESCRIPTION	SYMBOL	GROUND WATER	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES 'N' Blow/Ft	Penetration Resistance Blows/Ft. 20 40 60 80 100 / Undrained Shear Strength p.s.f. + Field Vane Test • Compression Test	PLASTIC LIMIT %	NATURAL WATER %	LIQUID LIMIT %
	0.0	Ground Surface									
		9" Topsoil.									
		Loose rusty brown fine sand, some silt.			1	SS	3				
	5.0	Compact silt and fine sand.			2	SS	18				
	11.0	Dense to very dense fine sand, trace to some silt, silt layers.			3	SS	37				
					4	SS	55				
					5	SS	38				
					6	SS	51				
					7	SS	69				
					8	SS	74				
					9	SS	72				
					10	SS	41				
	47.5	End of Borehole									

REF. NO.: 1-2044

CLIENT: Harold E. Stafford Q.C.

PROJECT: Gravel Exploration

LOCATION: Donald Ferguson Estate, N½ Lot 6, Conc. 12, Yarmouth

DATUM ELEVATION: Ground Surface

LOG OF BOREHOLE NO. 5

Encl. No. 7

DRILLING DATA:

METHOD: Auger

DIAMETER: hollow stem

DATE: Aug. 31 to Sept. 9, 1994

Elev. feet	Depth feet	DESCRIPTION	SYMBOL	GROUND WATER	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES 'N' Blow/Ft	Penetration Resistance Blows/Ft. 20 40 60 80 100 / Undrained Shear Strength p.s.f. + Field Vane Test • Compression Test	PLASTIC LIMIT %	NATURAL WATER %	LIQUID LIMIT %
	0.0	Ground Surface									
		10" Topsoil.									
		Very stiff brown clayey silt.			1	SS	15	⊕			
	6.0	Very dense brown silt.			2	SS	56	⊕			
	11.0	Very dense brown sandy silt, embedded gravel.		Hole dry at completion	3	SS	76	⊕			
					4	SS	50/5"	→			
					5	SS	105	⊕			
	24.0	End of Borehole									

ATKINSON DAVIES INC.

REF. NO.: 1-2044
CLIENT: Harold E. Stafford Q.C.
PROJECT: Gravel Exploration
LOCATION: Donald Ferguson Estate, N½ Lot 6, Conc. 12, Yarmouth
DATUM ELEVATION: Ground Surface

LOG OF BOREHOLE NO. 6

Encl. No. 8
DRILLING DATA:
METHOD: Auger
DIAMETER: hollow stem
DATE: Aug. 31 to Sept. 9, 1994

SUBSURFACE PROFILE					SAMPLES			Penetration Resistance Blows/Ft. 20 40 60 80 100	PLASTIC LIMIT %	NATURAL WATER %	LIQUID LIMIT %
Elev. feet	Depth feet	DESCRIPTION	SYMBOL	GROUND WATER	NUMBER	TYPE	'N' Blow/Ft	Undrained Shear Strength p.s.f. + Field Vane Test • Compression Test			
	0.0	Ground Surface									
		10" Topsoil.									
		Sandy silt.									
	2.0	Compact to very dense brown fine sand, some silt, seams and layers of silt.			1	SS	16				
					2	SS	47				
					3	SS	45				
					4	SS	66				
					5	SS	63				
	25.0	Very dense fine sand, trace of silt.			6	SS	51				
	31.0	Very dense fine to coarse sand, some gravel, trace of silt. Sieve- Enclosure No. 21			7	SS	66				
					8	SS	62				
	41.0	Grey fine sand, trace of silt.			9	SS	58				
	46.0	Sand and gravel, trace of silt.			10	SS	52				
	49.0	End of Borehole									

REF. NO.: 1-2044
CLIENT: Harold E. Stafford Q.C.
PROJECT: Gravel Exploration
LOCATION: Donald Ferguson Estate, N½ Lot 6, Conc. 12, Yarmouth
DATUM ELEVATION: Ground Surface

LOG OF BOREHOLE NO. 7

Encl. No. 9
DRILLING DATA:
METHOD: Auger
DIAMETER: hollow stem
DATE: Aug. 31 to Sept. 9, 1994

Elev. feet	Depth feet	DESCRIPTION	SYMBOL	GROUND WATER	SAMPLES NUMBER	TYPE	'N' Blow/Ft	Penetration Resistance Blows/Ft. 20 40 60 80 100 / Undrained Shear Strength p.s.f. + Field Vane Test • Compression Test	PLASTIC LIMIT %	NATURAL WATER %	LIQUID LIMIT %
	0.0	Ground Surface									
		9" Topsoil.									
		Sandy silt.									
	3.3	Sand and gravel, trace of silt.			1	SS	22				
	6.0	Very dense brown fine sand, trace of silt.			2	SS	65				
					3	SS	62				
	15.0	Very dense sand and gravel, trace of silt.			4	SS	66/6"				
					5	SS	74/4"				
		Sieve- Enclosure No. 22									
	27.0	Very dense fine to coarse sand, some gravel, trace of silt.			6	SS	98				
					7	SS	68				
					8	SS	91				
		Sieve- Enclosure No. 22									
	41.0	Very dense fine sand, trace of silt.			9	SS	82				
	46.0	Very dense fine to coarse sand, trace of silt.			10	SS	105				
	49.0	End of Borehole									

ATKINSON DAVIES INC.

REF. NO.: 1-2044
CLIENT: Harold E. Stafford Q.C.
PROJECT: Gravel Exploration
LOCATION: Donald Ferguson Estate, N½ Lot 6, Conc. 12, Yarmouth
DATUM ELEVATION: Ground Surface

LOG OF BOREHOLE NO. 8

Encl. No. 10

DRILLING DATA:
METHOD: Auger
DIAMETER: hollow stem
DATE: Aug. 31 to Sept. 9, 1994

Elev. feet	Depth feet	DESCRIPTION	SYMBOL	GROUND WATER	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES 'N' Blow/Ft	Penetration Resistance Blows/Ft. (20 40 60 80 100) Undrained Shear Strength p.s.f. + Field Vane Test • Compression Test	PLASTIC LIMIT %	NATURAL WATER %	LIQUID LIMIT %
	0.0	Ground Surface									
		9" Topsoil.									
		Compact brown sandy silt.			1	SS	12				
	5.0	Loose fine to medium sand, traces of gravel and silt.			2	SS	6				
	10.0	Very dense silty fine sand.			3	SS	76				
					4	SS	62				
					5	SS	53				
					6	SS	55				
		Sieve- Enclosure No. 23									
	31.0	Very dense sand and gravel, trace of silt.			7	SS	87				
					8	SS	61				
		Sieve- Enclosure No. 24									
	42.0	Fine sand.			9	SS	102				
	44.0	End of Borehole									

REF. NO.: 1-2044
CLIENT: Harold E. Stafford Q.C.
PROJECT: Gravel Exploration
LOCATION: Donald Ferguson Estate, N½ Lot 6, Conc. 12, Yarmouth
DATUM ELEVATION: Ground Surface

LOG OF BOREHOLE NO. 9

Encl. No. 11
DRILLING DATA:
METHOD: Auger
DIAMETER: hollow stem
DATE: Aug. 31 to Sept. 9, 1994

Elev. feet	Depth feet	DESCRIPTION	SYMBOL	GROUND WATER	SAMPLES NUMBER	TYPE	'N' Blow/Ft	Penetration Resistance Blows/Ft. 20 40 60 80 100 / Undrained Shear Strength p.s.f. + Field Vane Test • Compression Test	PLASTIC LIMIT %	NATURAL WATER %	LIQUID LIMIT %
	0.0	Ground Surface									
		8" Topsoil.									
	2.8	Clayey sandy silt.									
		Loose to dense fine sand, some silt, trace of gravel.			1	SS	6				
					2	SS	19				
					3	SS	3				
					4	SS	51				
					5	SS	41				
		Sieve- Enclosure No. 25									
	26.0	Very dense gravelly sand, trace of silt.			6	SS	70				
					7	SS	86				
		Sieve- Enclosure No. 25			8	SS	58				
	40.0	Compact grey silty fine sand.			9	SS	24				
	44.0	End of Borehole									

ATKINSON DAVIES INC.

REF. NO.: 1-2044
CLIENT: Harold E. Stafford Q.C.
PROJECT: Gravel Exploration
LOCATION: Donald Ferguson Estate, N½ Lot 6, Conc. 12, Yarmouth
DATUM ELEVATION: Ground Surface

LOG OF BOREHOLE NO. 10

Encl. No. 12
DRILLING DATA:
METHOD: Auger
DIAMETER: hollow stem
DATE: Aug. 31 to Sept. 9, 1994

Elev. feet	Depth feet	DESCRIPTION	SYMBOL	GROUND WATER	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES 'N' Blow/Ft	Penetration Resistance Blows/Ft. 20 40 60 80 100 / Undrained Shear Strength p.s.f. + Field Vane Test • Compression Test	PLASTIC LIMIT %	NATURAL WATER %	LIQUID LIMIT %
	0.0	Ground Surface									
		10" Topsoil.									
		Dark brown clayey silt.			1	SS	9				
	5.0	Very dense silty fine to coarse sand and gravel.			2	SS	52				
					3	SS	79				
					4	SS	60				
		Sieve- Enclosure No. 26			5	SS	100				
	25.0	Very dese brown fine sand, trace to some silt.			6	SS	107				
					7	SS	56				
					8	SS	80				
					9	SS	73				
	44.0	End of Borehole									

REF. NO.: 1-2044
CLIENT: Harold E. Stafford Q.C.
PROJECT: Gravel Exploration
LOCATION: Donald Ferguson Estate, N½ Lot 6, Conc. 12, Yarmouth
DATUM ELEVATION: Ground Surface

LOG OF BOREHOLE NO. 11

Encl. No. 13
DRILLING DATA:
METHOD: Auger
DIAMETER: hollow stem
DATE: Aug. 31 to Sept. 9, 1994

Elev. feet	Depth feet	DESCRIPTION	SYMBOL	GROUND WATER	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES 'N' Blow/Ft	Penetration Resistance Blows/Ft. 20 40 60 80 100 / Undrained Shear Strength p.s.f. + Field Vane Test • Compression Test	PLASTIC LIMIT %	NATURAL WATER %	LIQUID LIMIT %
	0.0	Ground Surface									
		8" Topsoil.									
		Dark brown sandy silt.			1	SS	7				
	5.0	Dense brown fine sand, trace of silt.			2	SS	47				
	11.0	Dense to very dense sand and gravel, trace of silt.			3	SS	49				
					4	SS	82				
		Sieve- Enclosure No. 27			5	SS	60				
	25.0	Very dense brown fine sand, some silt.			6	SS	45				
					7	SS	81				
					8	SS	101				
					9	SS	82				
	44.0	End of Borehole									

ATKINSON, DAVIES INC.

REF. NO.: 1-2044
CLIENT: Harold E. Stafford Q.C.
PROJECT: Gravel Exploration
LOCATION: Donald Ferguson Estate, N½ Lot 6, Conc. 12, Yarmouth
DATUM ELEVATION: Ground Surface

LOG OF BOREHOLE NO. 12

Encl. No. 14

DRILLING DATA:
METHOD: Auger
DIAMETER: hollow stem
DATE: Aug. 31 to Sept. 9, 1994

Elev. feet	Depth feet	DESCRIPTION	SYMBOL	GROUND WATER	SAMPLES NUMBER	TYPE	'N' Blow/Ft	Penetration Resistance Blows/Ft. 20 40 60 80 100 / Undrained Shear Strength p.s.f. + Field Vane Test • Compression Test	PLASTIC LIMIT %	NATURAL WATER %	LIQUID LIMIT %
	0.0	Ground Surface									
		10" Topsoil.									
		Sandy clayey silt.									
	3.0	Loose brown fine sand, some silt.			1	SS	9				
	6.0	Dense to very dense silty fine sand.			2	SS	30				
					3	SS	40				
					4	SS	56				
		Sieve- Enclosure No. 28			5	SS	60				
	26.0	Very dense silty fine to coarse sand, trace of gravel. Sieve- Enclosure No. 28			6	SS	68				
					7	SS	85				
					8	SS	58				
	41.0	Very dense fine sand, trace of silt.			9	SS	71				
	47.0	Very dense gravelly fine to coarse sand, trace of silt.			10	SS	82				

ATKINSON DAVIES INC.

REF. NO.: 1-2044
CLIENT: Harold E. Stafford Q.C.
PROJECT: Gravel Exploration
LOCATION: Donald Ferguson Estate, N½ Lot 6, Conc. 12, Yarmouth
DATUM ELEVATION: Ground Surface

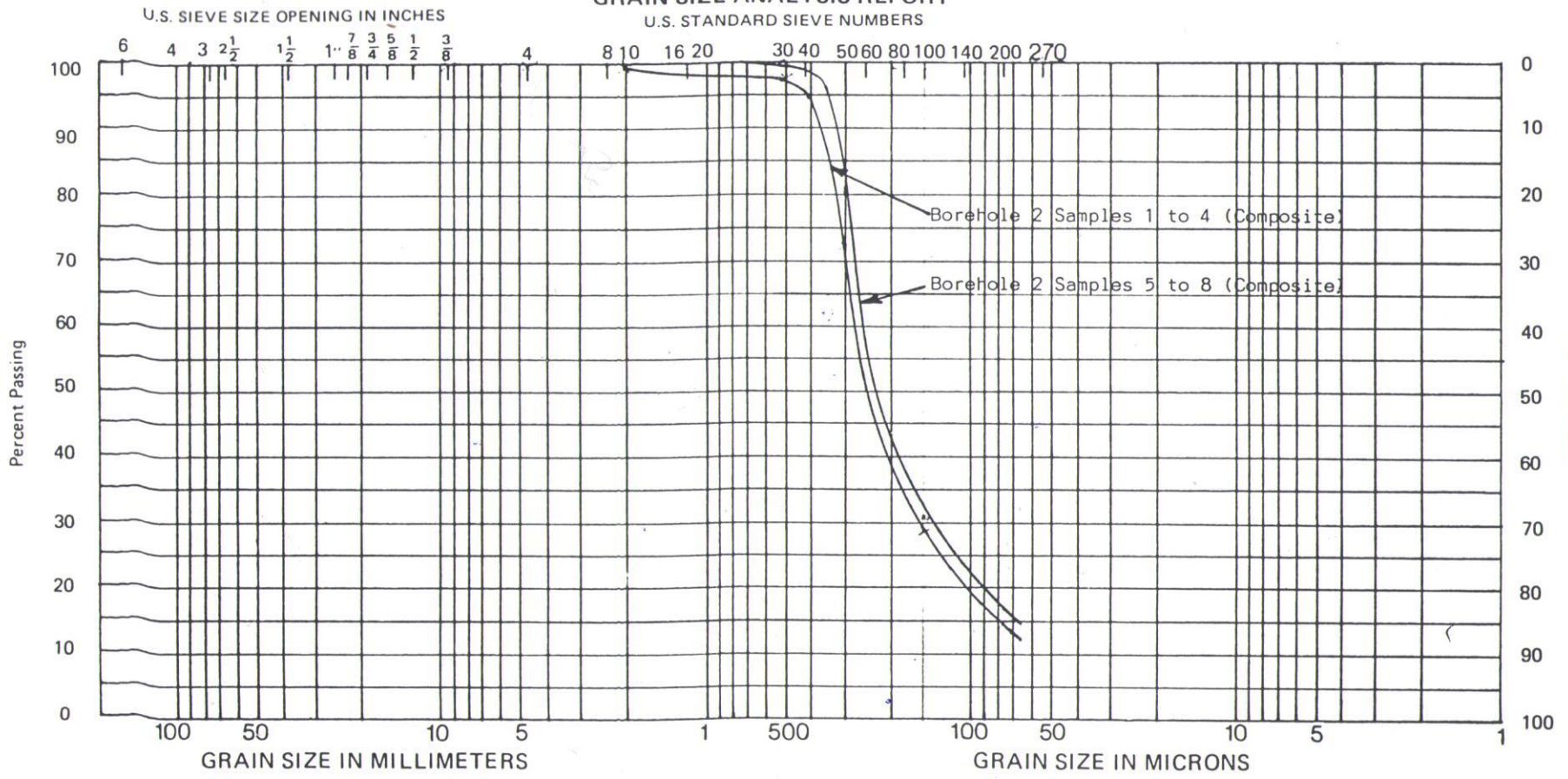
LOG OF BOREHOLE NO. 13

Encl. No. 15
DRILLING DATA:
METHOD: Auger
DIAMETER: hollow stem
DATE: Aug. 31 to Sept. 9, 1994

Elev. feet	Depth feet	DESCRIPTION	SYMBOL	GROUND WATER	SAMPLES NUMBER	TYPE	'N' Blow/Ft	Penetration Resistance Blows/Ft. 20 40 60 80 100 / Undrained Shear Strength p.s.f. + Field Vane Test • Compression Test	PLASTIC LIMIT %	NATURAL WATER %	LIQUID LIMIT %
	0.0	Ground Surface									
		10" Topsoil.									
	2.0	Silty sand.									
		Loose to very dense wet silt layer fine sand, trace of silt.			1	SS	9				
					2	SS	22				
					3	SS	28				
					4	SS	70				
					5	SS	70				
					6	SS	77				
		Sieve- Enclosure No. 29			7	SS	59				
	36.0	Very dense silty fine sand.			8	SS	91				
					9	SS	77				
					10	SS	72				
	54.0				11	SS	72				

ATKINSON, DAVIES INC.

GRAIN SIZE ANALYSIS REPORT



GRAVEL			SAND			SILT	CLAY
COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE		

PROJECT: Gravel Exploration
CLIENT: Harold E. Stafford Q.C.
SOURCE OF MATERIAL: Donald File No.:
SAMPLE TAKEN FROM: Ferguson Est. Specification:
SAMPLE TAKEN BY: OF:
DATE SAMPLED:
" RECEIVED:
" TESTED:
DISTRIBUTION:

% PASSING NO. 200 SIEVE (WASH): Sa. 1-4, 14.6%
CRUSHED PARTICLE COUNT: Sa. 5-8, 17.1%

REMARKS AND RECOMMENDATIONS:

Fine sand, some silt.

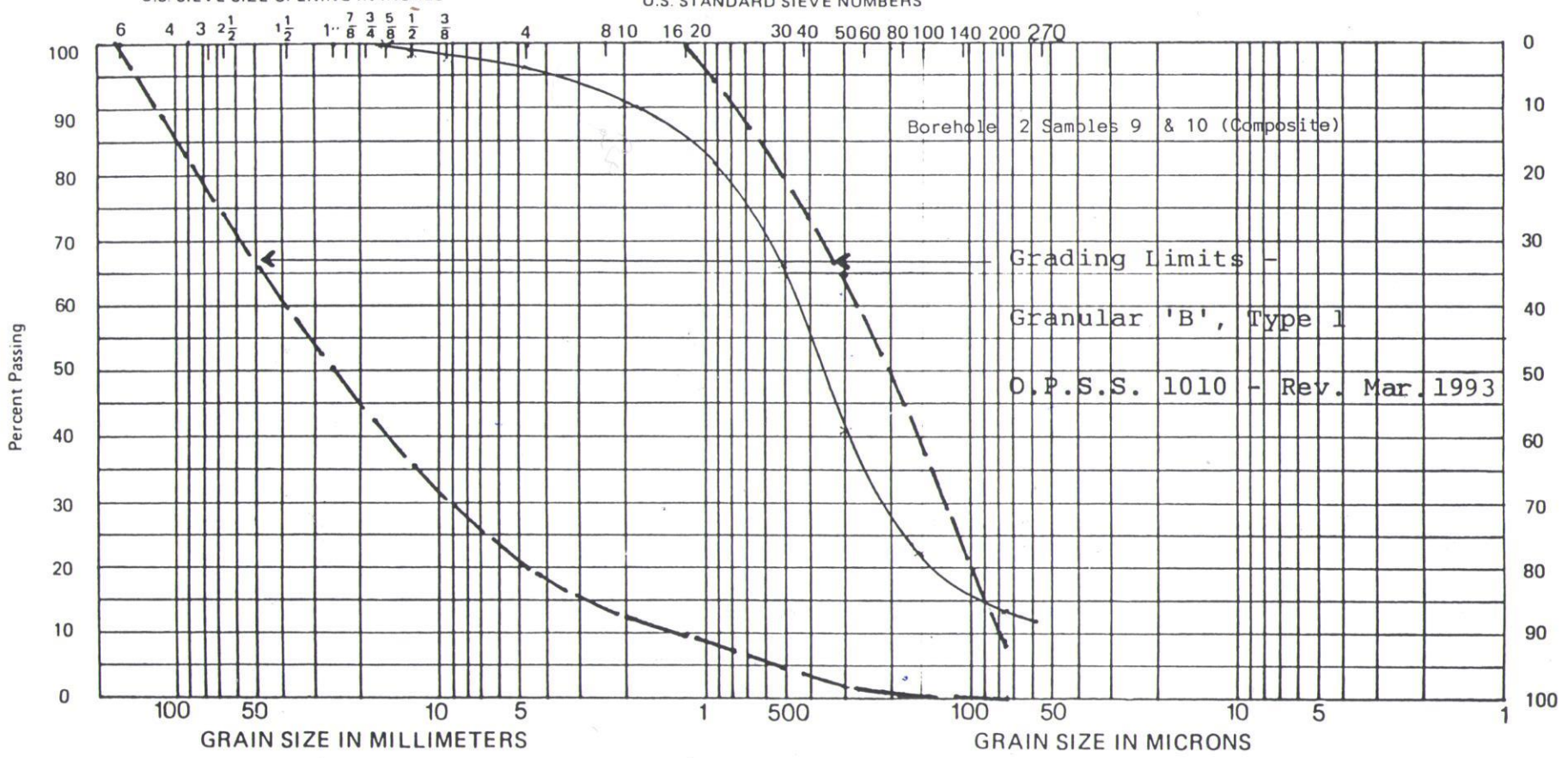
by: _____

This report is the result of testing of a sample of material taken from the location listed. The result may not be representative of all material from this source. Acceptance of one sample does not necessarily mean that all material from the same source will be acceptable for the project. We accept no responsibility whatever for information given to us by others nor for procedures done by other than our own forces. Information obtained from other than our own forces is reported for convenience only.

ATKINSON, DAVIES INC.

Enclosure No. 17

GRAIN SIZE ANALYSIS REPORT



GRAVEL			SAND			SILT	CLAY
COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE		

PROJECT: Gravel Exploration
CLIENT: Harold E. Stafford Q.C.
SOURCE OF MATERIAL: Donald
SAMPLE TAKEN FROM: Ferguson Est.
SAMPLE TAKEN BY:
DATE SAMPLED:
" RECEIVED:
" TESTED:
DISTRIBUTION:

File No.:
Specification:
OF:

% PASSING NO. 200 SIEVE (WASH): 13.7%
CRUSHED PARTICLE COUNT:

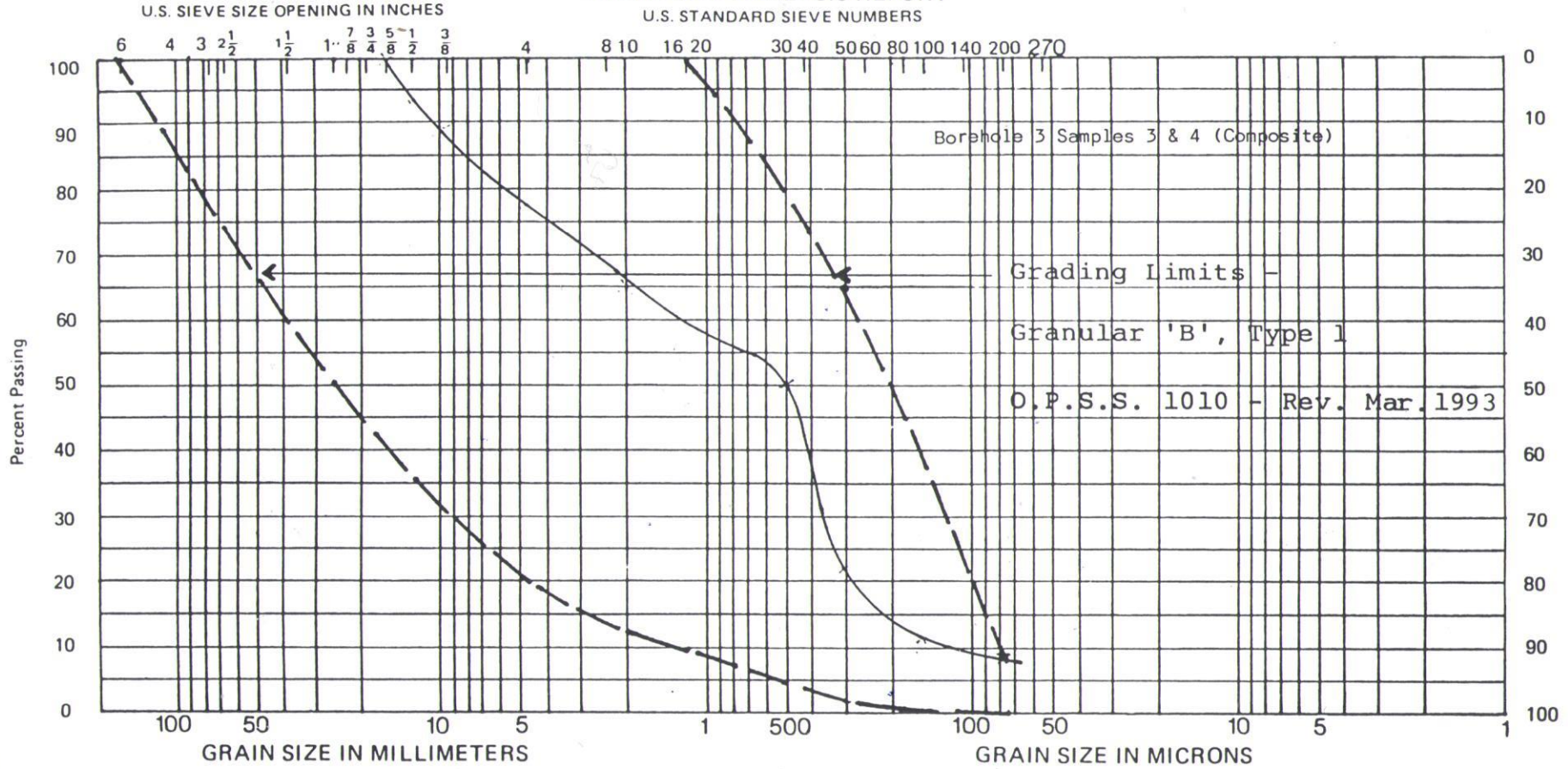
REMARKS AND RECOMMENDATIONS:

FINE TO COARSE SAND, SOME SILT, TRACE OF GRAVEL.

by: _____

ATKINSON, DAVIES INC.

GRAIN SIZE ANALYSIS REPORT



GRAVEL			SAND			SILT	CLAY
COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE		

PROJECT: Gravel Exploration
CLIENT: Harold E. Stafford Q.C.
SOURCE OF MATERIAL: Donald
SAMPLE TAKEN FROM: Ferguson Est.
SAMPLE TAKEN BY:
DATE SAMPLED:
" **RECEIVED:**
" **TESTED:**

File No.:
Specification:
OF:

% PASSING NO. 200 SIEVE (WASH): 8.4
CRUSHED PARTICLE COUNT:

DISTRIBUTION:

REMARKS AND RECOMMENDATIONS:

SAND AND GRAVEL, TRACE OF SILT.

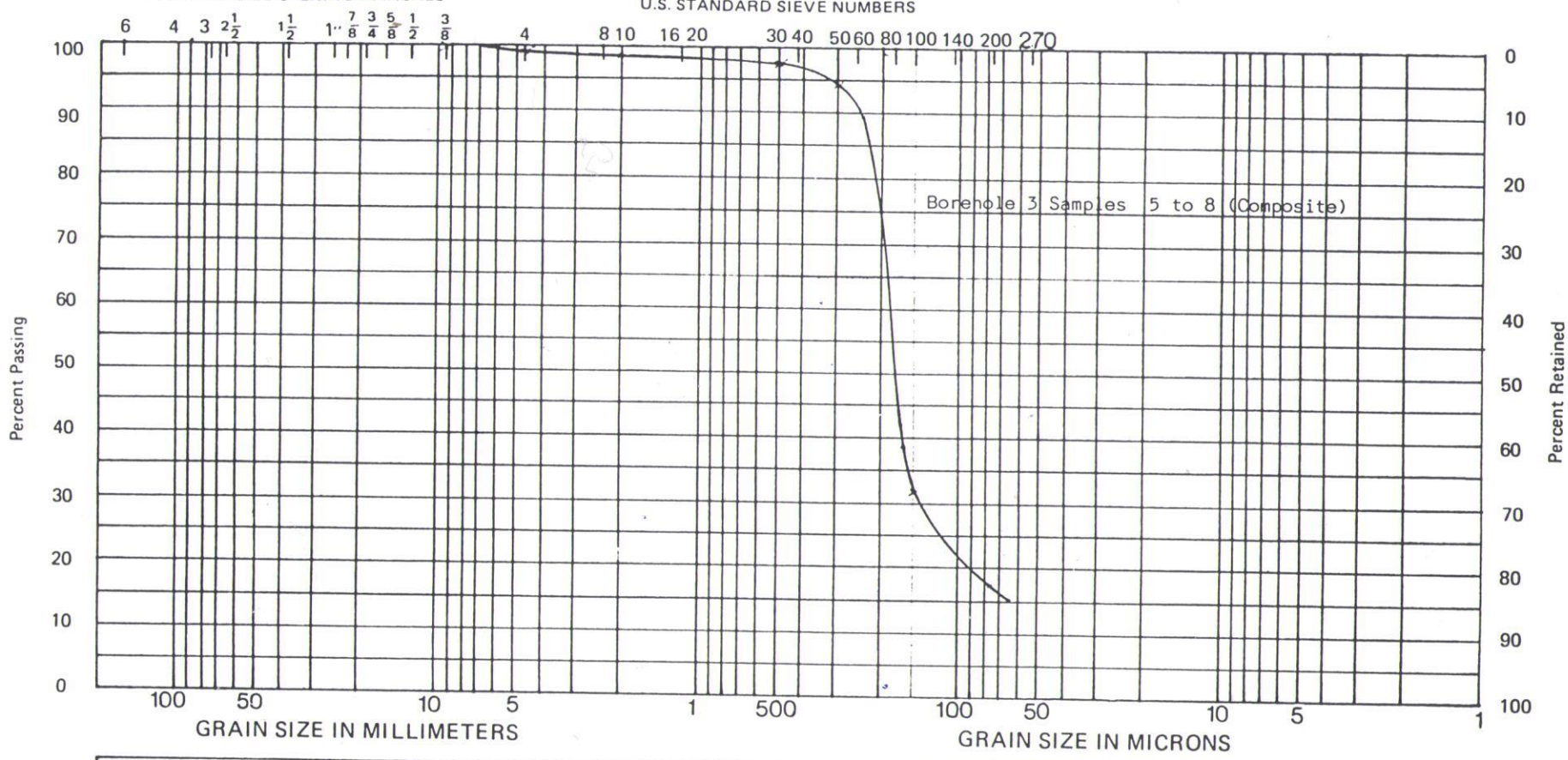
by: _____

This report is the result of testing of a sample of material taken from the location listed. The result may not be representative of all material from this source. Acceptance of one sample does not necessarily mean that all material from the same source will be acceptable for the project. We accept no responsibility whatever for information given to us by others nor for procedures done by other than our own forces. Information obtained from other than our own forces is reported for convenience only.

ATKINSON, DAVIES INC.

Enclosure No. 19

GRAIN SIZE ANALYSIS REPORT



GRAVEL			SAND			SILT	CLAY
COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE		

PROJECT: Gravel Exploration
CLIENT: Harold E. Stafford Q.C.
SOURCE OF MATERIAL: Donald
SAMPLE TAKEN FROM: Ferguson Est.
SAMPLE TAKEN BY:
DATE SAMPLED:
" RECEIVED:
" TESTED:
DISTRIBUTION:

File No.:
Specification:
OF:

% PASSING NO. 200 SIEVE (WASH): 17.5
CRUSHED PARTICLE COUNT:

REMARKS AND RECOMMENDATIONS:

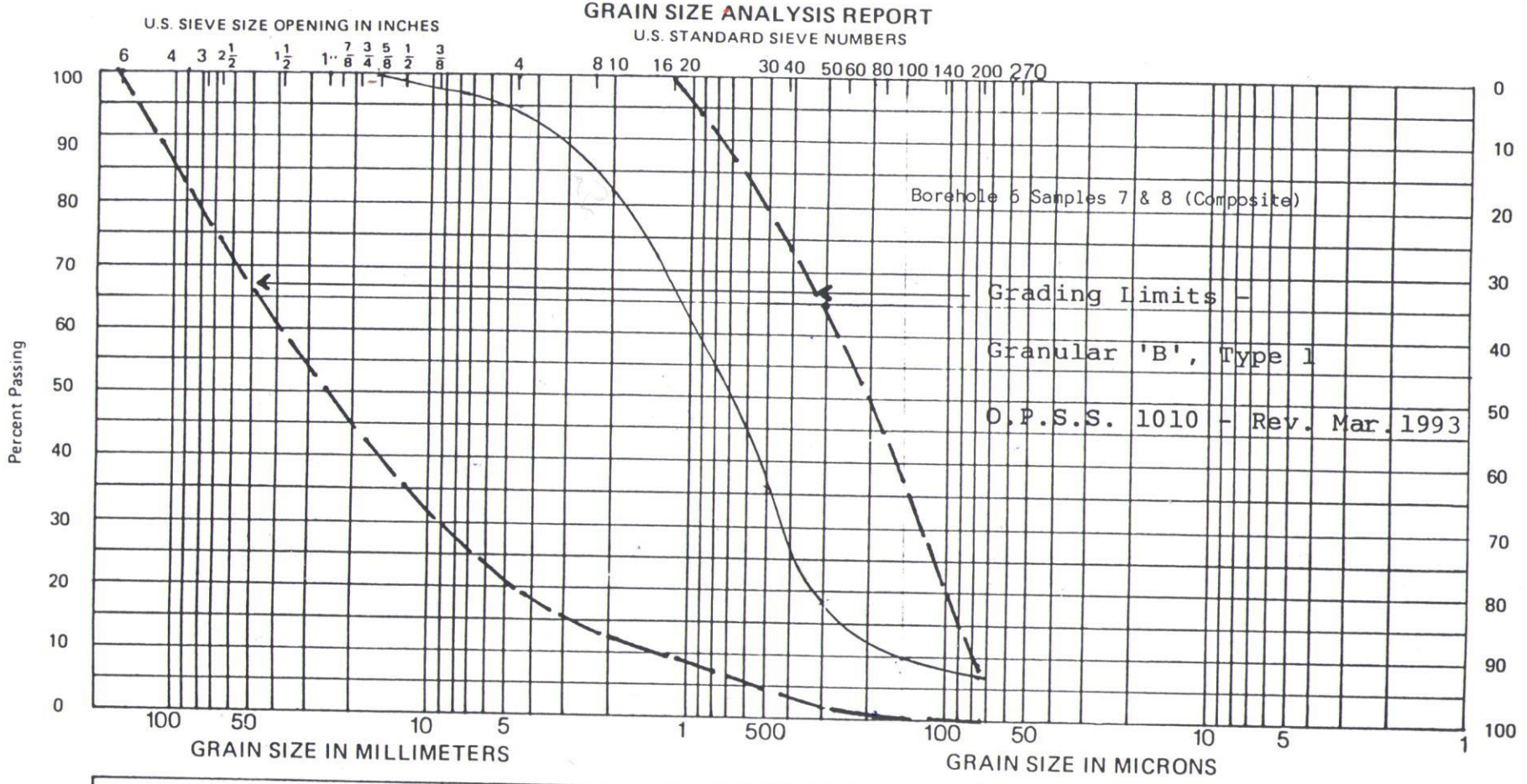
FINE SAND, SOME SILT.

by: _____

ATKINSON, DAVIES INC.

Enclosure No. 20

GRAIN SIZE ANALYSIS REPORT



GRAVEL			SAND			SILT	CLAY
COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE		

PROJECT: Gravel Exploration
CLIENT: Harold E. Stafford Q.C.
SOURCE OF MATERIAL: Donald
SAMPLE TAKEN FROM: Ferguson Est.
SAMPLE TAKEN BY:
DATE SAMPLED:
" **RECEIVED:**
" **TESTED:**
DISTRIBUTION:

File No.:
Specification:
OF:

% PASSING NO. 200 SIEVE (WASH): 6.6
CRUSHED PARTICLE COUNT:

REMARKS AND RECOMMENDATIONS:

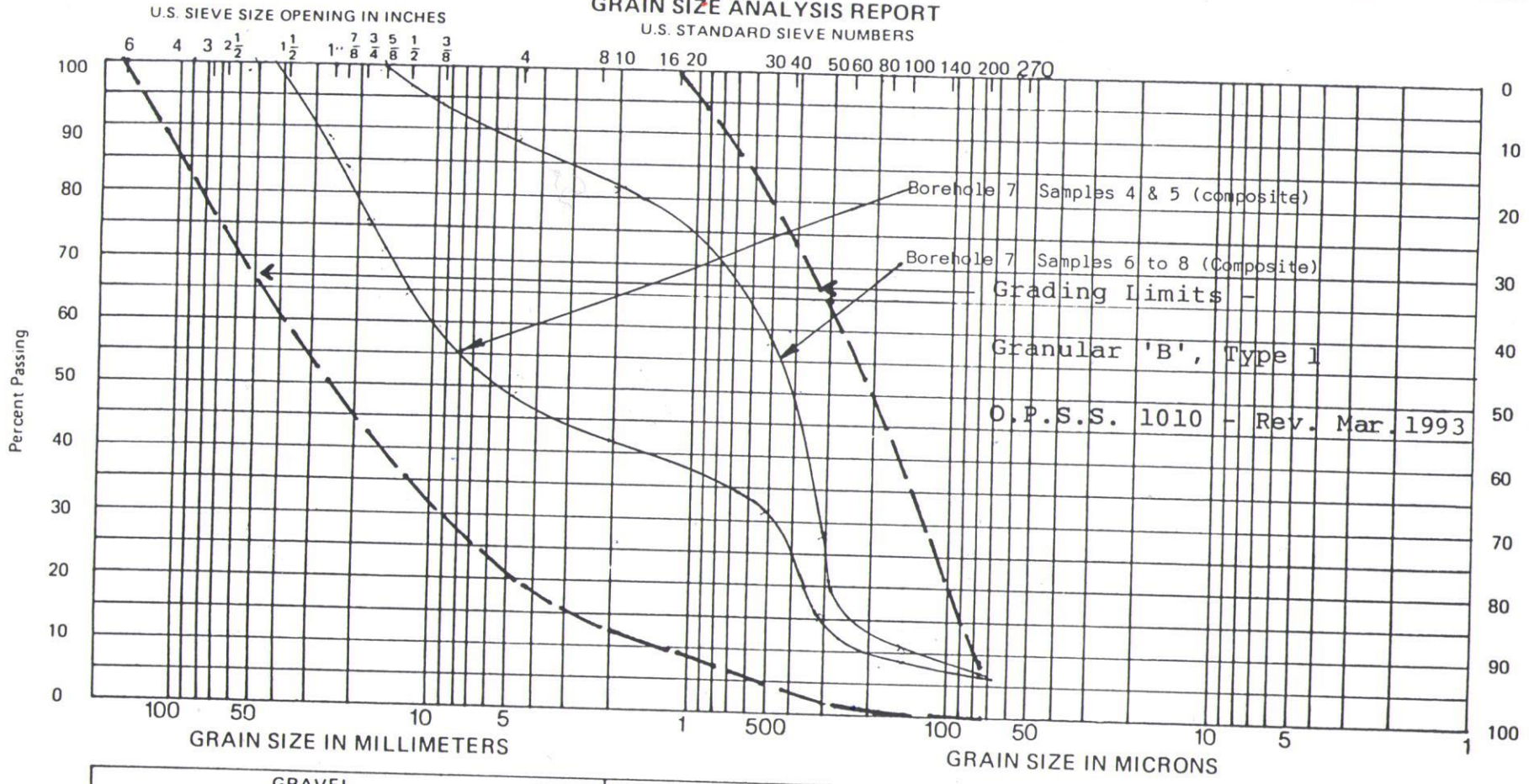
FINE TO COARSE SAND, SOME GRAVEL, TRACE OF SILT.

by: _____

ATKINSON, DAVIES INC.

Enclosure No. 21

GRAIN SIZE ANALYSIS REPORT



GRAVEL			SAND			SILT	CLAY
COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE		

PROJECT: Gravel Exploration
CLIENT: Harold E. Stafford Q.C.
SOURCE OF MATERIAL: Donald File No.:
SAMPLE TAKEN FROM: Ferguson Est. Specification:
SAMPLE TAKEN BY: OF:
DATE SAMPLED:
" RECEIVED:
" TESTED:
DISTRIBUTION:

% PASSING NO. 200 SIEVE (WASH): Sa. 4-5, 6.7%
Sa. 6-8, 7.0%
CRUSHED PARTICLE COUNT:

REMARKS AND RECOMMENDATIONS:

Sa. 4-5, SAND AND GRAVEL, TRACE OF SILT.

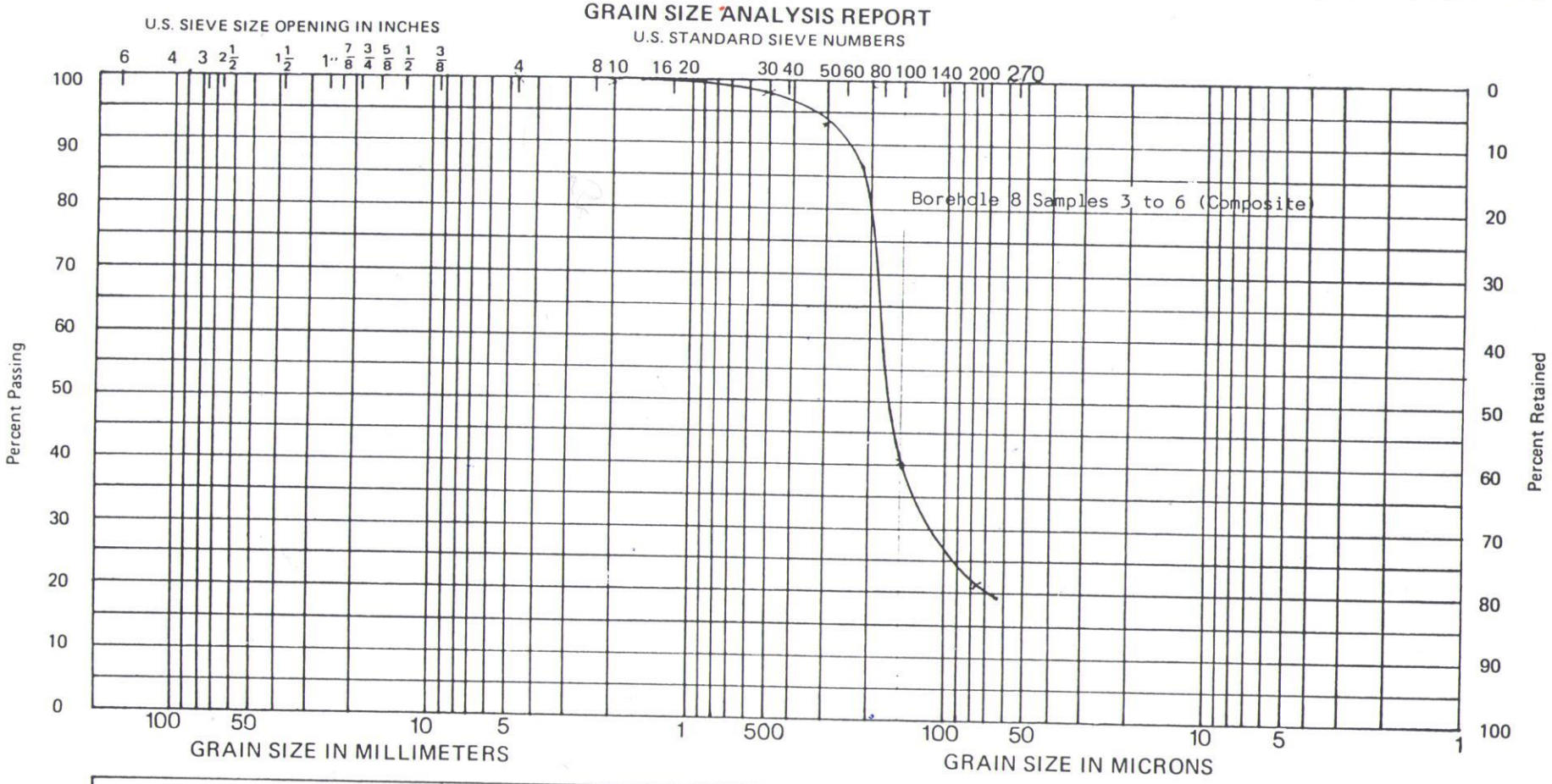
Sa. 6-8, FINE TO COARSE SAND, SOME GRAVEL, TRACE OF SILT.

by: _____

ATKINSON, DAVIES INC.

Enclosure No. 22

GRAIN SIZE ANALYSIS REPORT



GRAVEL			SAND			SILT	CLAY
COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE		

PROJECT: Gravel Exploration
CLIENT: Harold E. Stafford Q.C.
SOURCE OF MATERIAL: Donald
SAMPLE TAKEN FROM: Ferguson Est.
SAMPLE TAKEN BY:
DATE SAMPLED:
" RECEIVED:
" TESTED:
DISTRIBUTION:

File No.:
Specification:
OF:

% PASSING NO. 200 SIEVE (WASH): 21.0
CRUSHED PARTICLE COUNT:

REMARKS AND RECOMMENDATIONS:
SILTY FINE SAND.

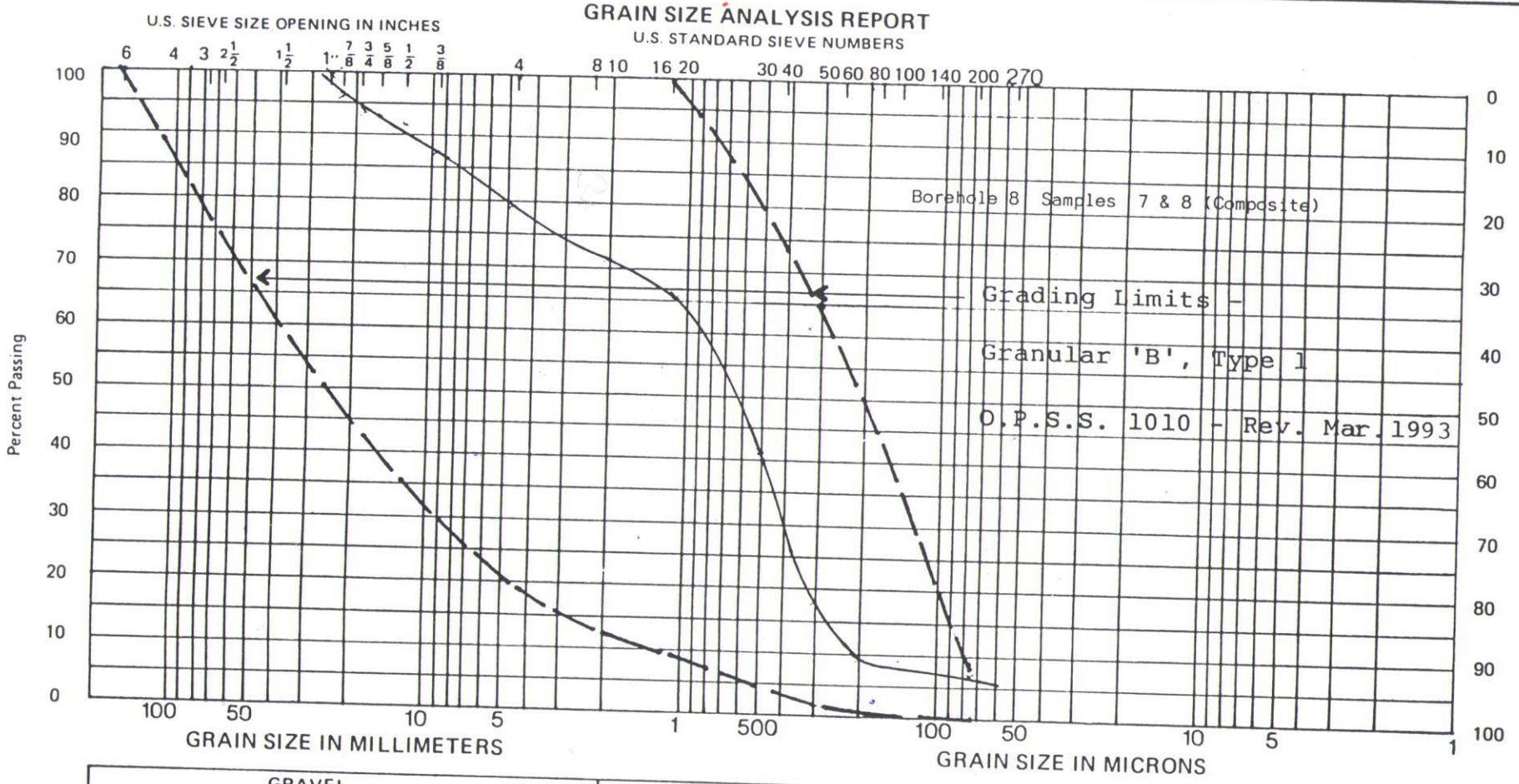
by: _____

This report is the result of testing of a sample of material taken from the location listed. The result may not be representative of all material from this source. Acceptance of one sample does not necessarily mean that all material from the same source will be acceptable for the project. We accept no responsibility whatever for information given to us by others nor for procedures done by other than our own forces. Information obtained from other than our own forces is reported for convenience only.

ATKINSON, DAVIES INC.

Enclosure No. 23

GRAIN SIZE ANALYSIS REPORT



GRAVEL			SAND			SILT	CLAY
COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE		

PROJECT: Gravel Exploration
CLIENT: Harold E. Stafford Q.C.
SOURCE OF MATERIAL: Donald File No.:
SAMPLE TAKEN FROM: Ferguson Est. Specification:
SAMPLE TAKEN BY: OF:
DATE SAMPLED:
" RECEIVED:
" TESTED:

% PASSING NO. 200 SIEVE (WASH): 7.0
CRUSHED PARTICLE COUNT:

DISTRIBUTION:

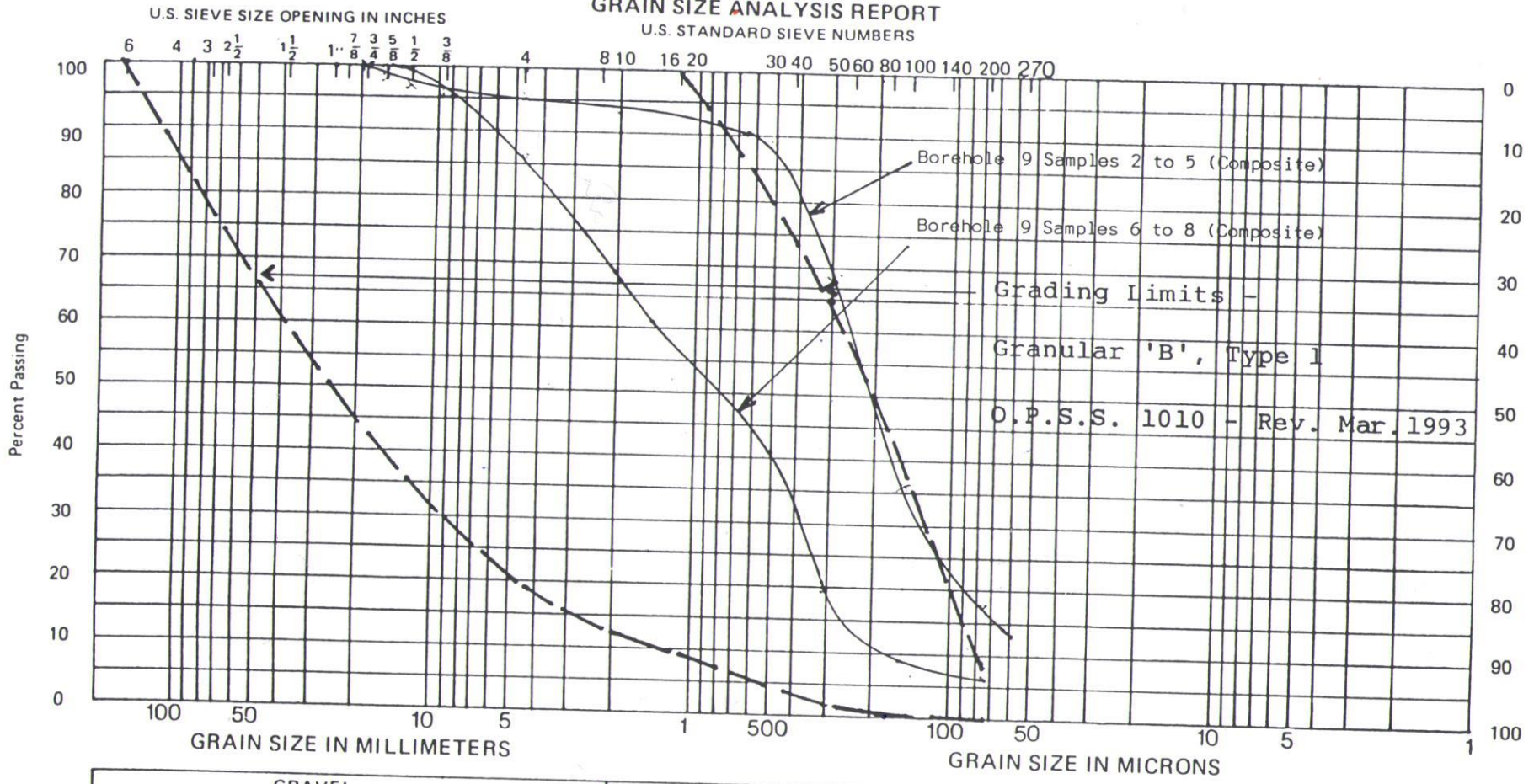
REMARKS AND RECOMMENDATIONS:
SAND AND GRAVEL, TRACE OF SILT.

by: _____

ATKINSON, DAVIES INC.

Enclosure No. 24

GRAIN SIZE ANALYSIS REPORT



GRAVEL			SAND			SILT	CLAY
COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE		

PROJECT: Gravel Exploration
CLIENT: Harold E. Stafford Q.C.
SOURCE OF MATERIAL: Donald File No.:
SAMPLE TAKEN FROM: Ferguson Est. Specification:
SAMPLE TAKEN BY: OF:
DATE SAMPLED:
" **RECEIVED:**
" **TESTED:**
DISTRIBUTION:

% PASSING NO. 200 SIEVE (WASH): Sa. 2-5, 17.5%
Sa. 6-8, 6.3%
CRUSHED PARTICLE COUNT:

REMARKS AND RECOMMENDATIONS:

Sa. 2-5, FINE SAND, SOME SILT, TRACE OF GRAVEL.

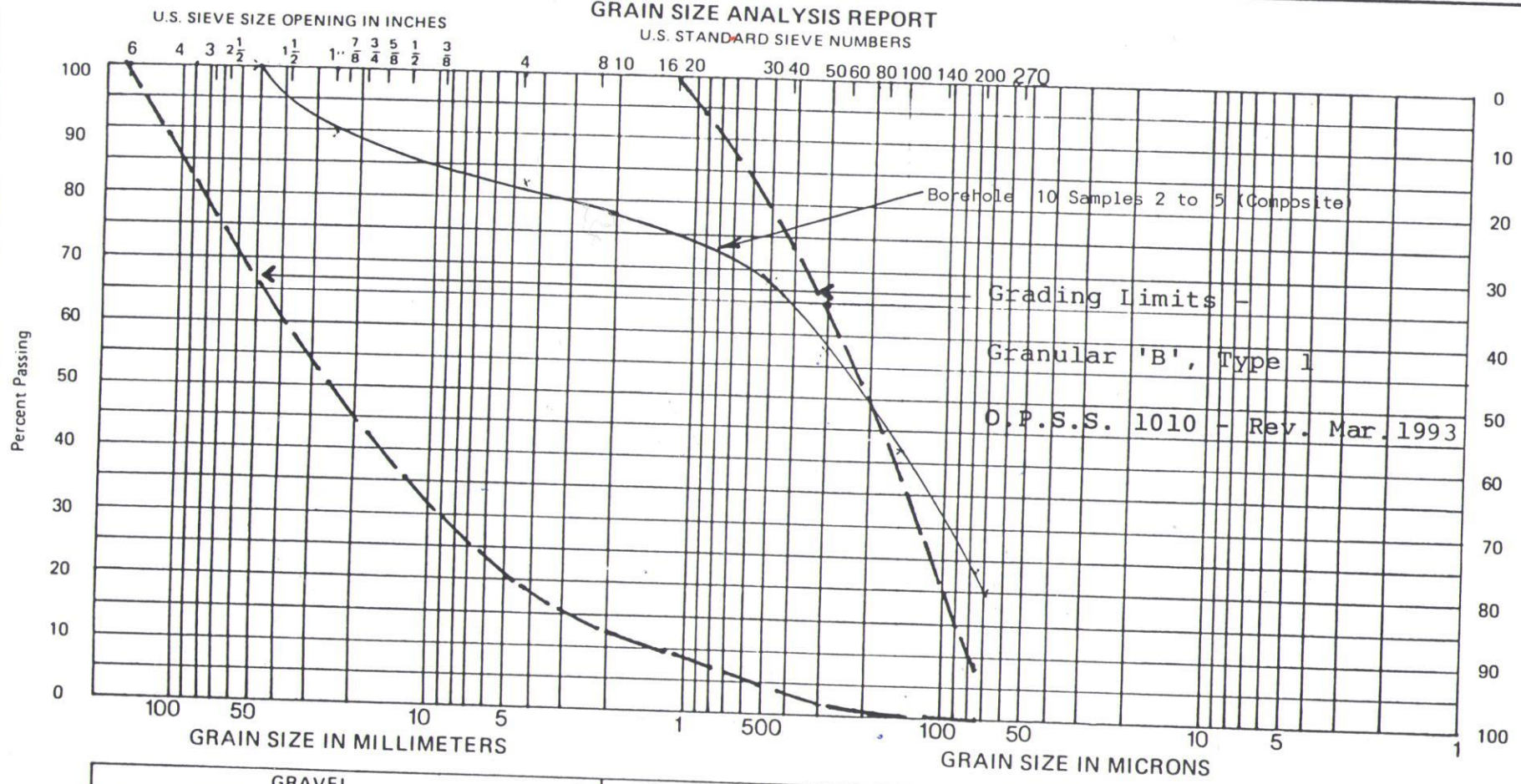
Sa. 6-8 GRAVELLY SAND, TRACE OF SILT.

by: _____

ATKINSON, DAVIES INC.

Enclosure No. 25

GRAIN SIZE ANALYSIS REPORT



GRAVEL			SAND			SILT	CLAY
COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE		

PROJECT: Gravel Exploration
CLIENT: Harold E. Stafford Q.C.
SOURCE OF MATERIAL: Donald File No.:
SAMPLE TAKEN FROM: Ferguson Est. Specification:
SAMPLE TAKEN BY: OF:
DATE SAMPLED: % PASSING NO. 200 SIEVE (WASH): 23.0%
" RECEIVED: CRUSHED PARTICLE COUNT:
" TESTED:

DISTRIBUTION:

REMARKS AND RECOMMENDATIONS:

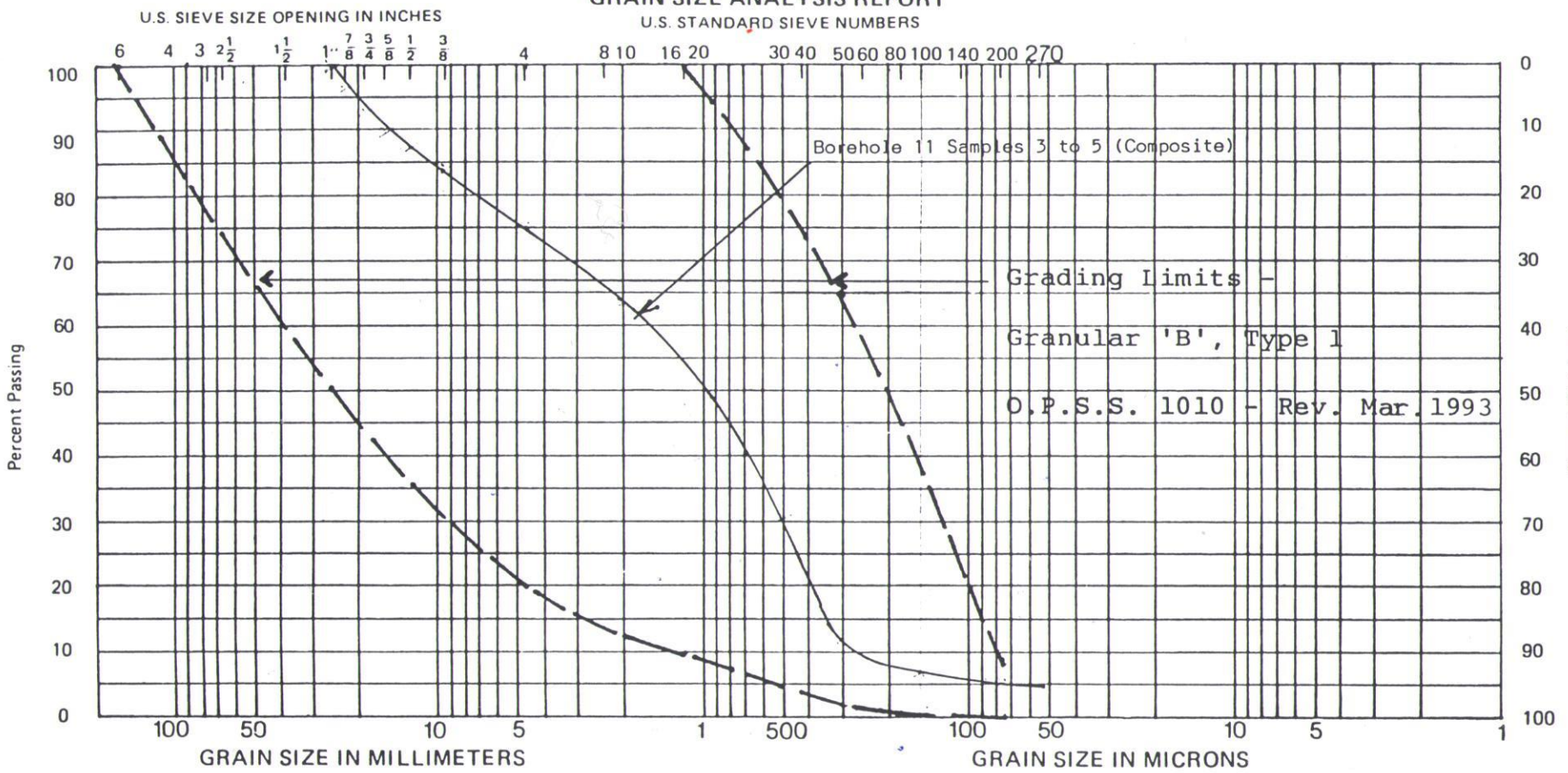
SILTY FINE TO COARSE SAND AND GRAVEL.

by: _____

ATKINSON, DAVIES INC.

Enclosure No. 26

GRAIN SIZE ANALYSIS REPORT



GRAVEL			SAND			SILT	CLAY
COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE		

PROJECT: Gravel Exploration
CLIENT: Harold E. Stafford Q.C.
SOURCE OF MATERIAL: Donald
SAMPLE TAKEN FROM: Ferguson Est.
SAMPLE TAKEN BY:
DATE SAMPLED:
" **RECEIVED:**
" **TESTED:**
DISTRIBUTION:

File No.:
Specification:
OF:

% PASSING NO. 200 SIEVE (WASH): 5.0%
CRUSHED PARTICLE COUNT:

REMARKS AND RECOMMENDATIONS:
SAND AND GRAVEL, TRACE OF SILT.

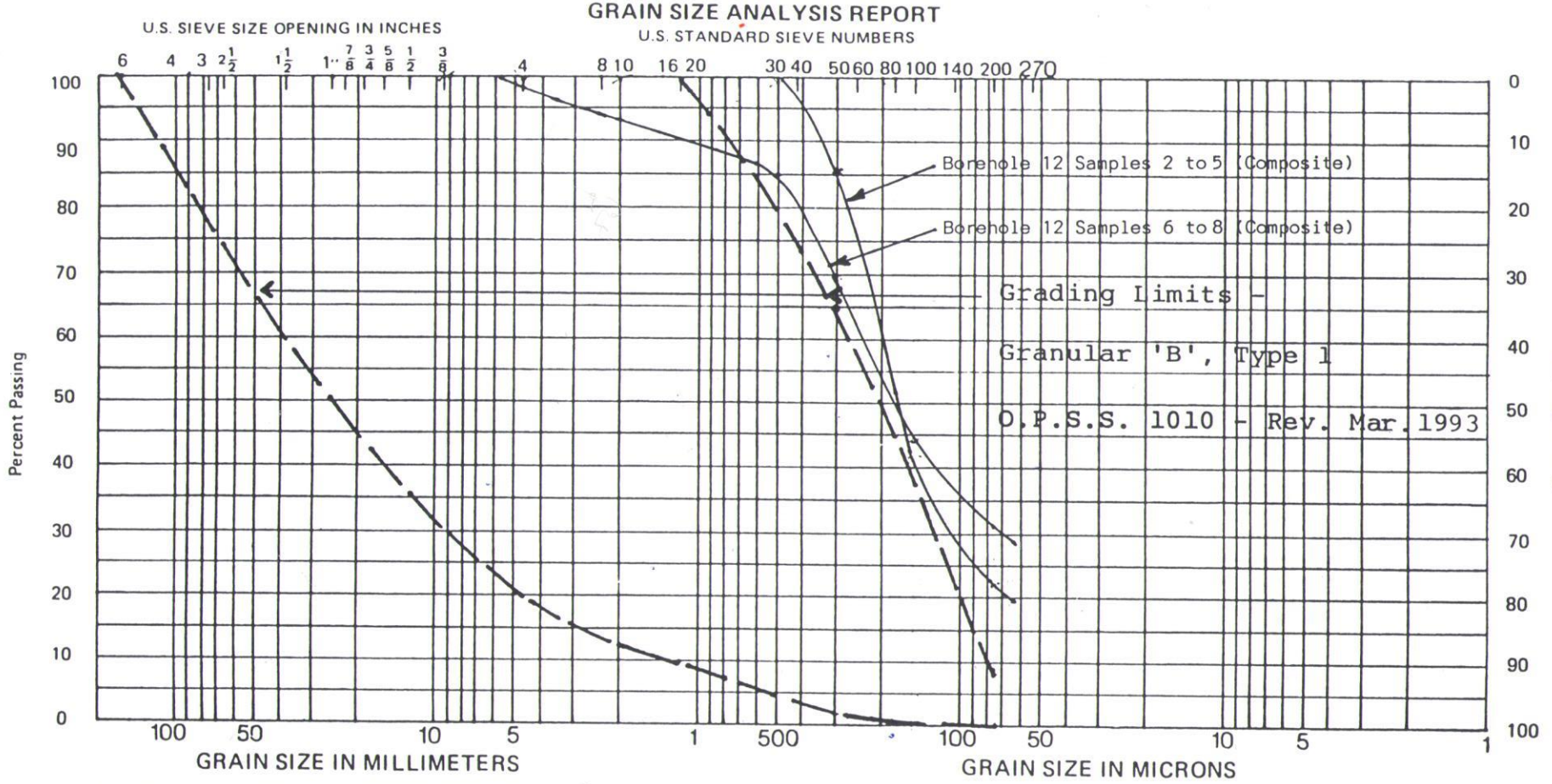
by: _____

This report is the result of testing of a sample of material taken from the location listed. The result may not be representative of all material from this source. Acceptance of one sample does not necessarily mean that all material from the same source will be acceptable for the project. We accept no responsibility whatever for information given to us by others nor for procedures done by other than our own forces. Information obtained from other than our own forces is reported for convenience only.

ATKINSON, DAVIES INC.

Enclosure No. 27

GRAIN SIZE ANALYSIS REPORT



GRAVEL			SAND			SILT	CLAY
COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE		

PROJECT: Gravel Exploration
CLIENT: Harold E. Stafford Q.C.
SOURCE OF MATERIAL: Donald
SAMPLE TAKEN FROM: Ferguson Est.
SAMPLE TAKEN BY:
DATE SAMPLED:
" RECEIVED:
" TESTED:
DISTRIBUTION:

File No.:
Specification:
OF:

% PASSING NO. 200 SIEVE (WASH): Sa. 2-5, 21.8%
Sa. 6-8, 31.1%
CRUSHED PARTICLE COUNT:

REMARKS AND RECOMMENDATIONS:
Sa. 2-5, SILTY FINE SAND.
Sa. 6-8, SILTY FINE TO COARSE SAND, TRACE OF GRAVEL.

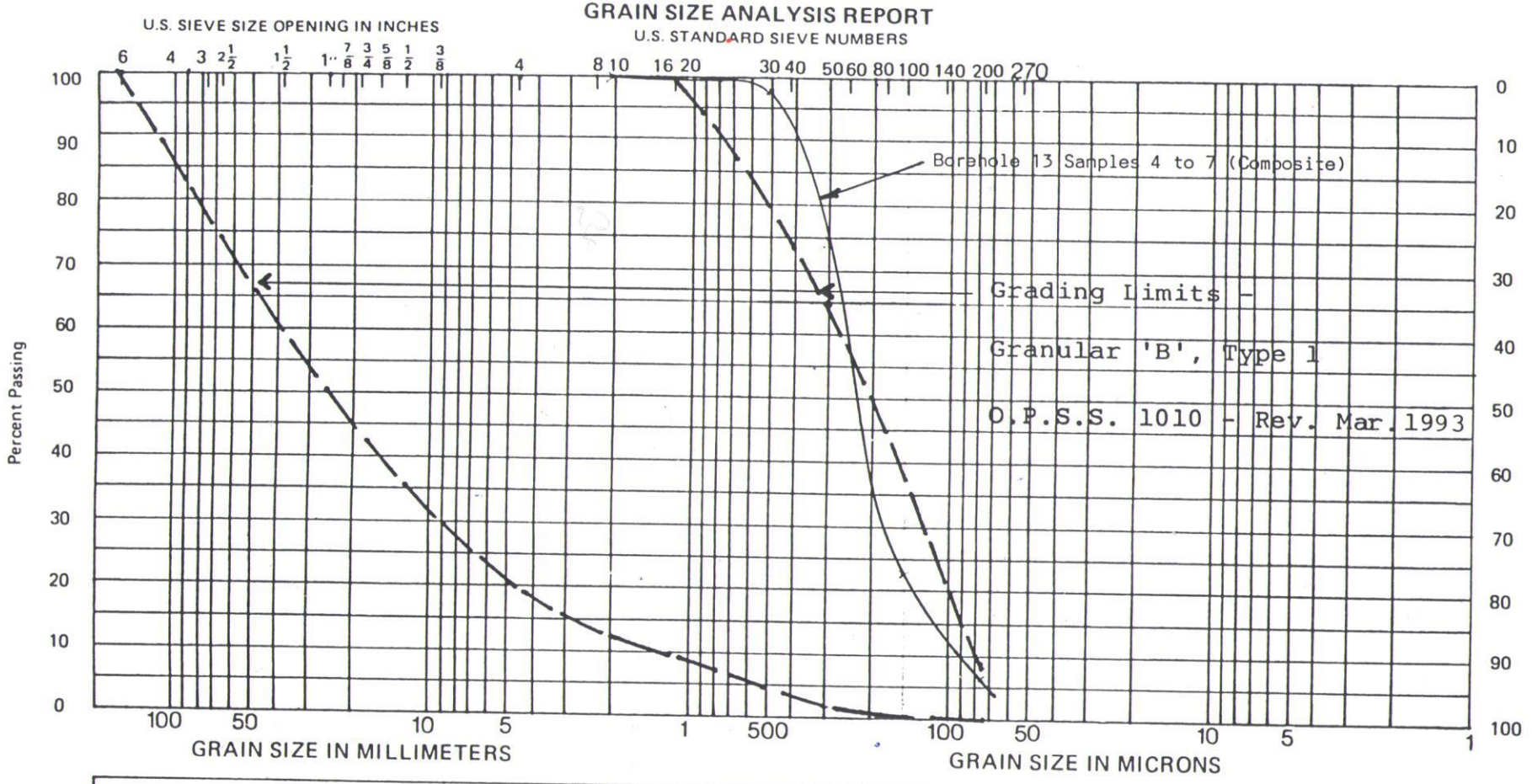
by: _____

This report is the result of testing of a sample of material taken from the location listed. The result may not be representative of all material from this source. Acceptance of one sample does not necessarily mean that all material from the same source will be acceptable for the project. We accept no responsibility whatever for information given to us by others nor for procedures done by other than our own forces. Information obtained from other than our own forces is reported for convenience only.

ATKINSON, DAVIES INC.

Enclosure No. 28

GRAIN SIZE ANALYSIS REPORT



GRAVEL			SAND			SILT	CLAY
COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE		

PROJECT: Gravel Exploration
CLIENT: Harold E. Stafford Q.C.
SOURCE OF MATERIAL: Donald
SAMPLE TAKEN FROM: Ferguson Est.
SAMPLE TAKEN BY:
DATE SAMPLED:
" **RECEIVED:**
" **TESTED:**
DISTRIBUTION:

File No.:
Specification:
OF:

% PASSING NO. 200 SIEVE (WASH): 5.8%
CRUSHED PARTICLE COUNT:

REMARKS AND RECOMMENDATIONS:
FINE SAND, TRACE OF SILT.

by: _____

ATKINSON, DAVIES INC.

Enclosure No. 29