Swan River Crossings Project

Sediment Sampling Report

Report ARUP-SED-January-2021-Rev 01

Innovative Corrosion Management Suite 7 - 3 Canning Rd Kalamunda WA 6076 – 6394 4362
www.corrosionmanagement.com.au – 0407 501 509

Contents

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1. Introduction & Background

At the request of Arup, Innovative Corrosion Management (ICM) was engaged to provide resources to undertake the sediment sampling associated with the Swan River Crossings Project for Main Roads.

The sampling and analysis was undertaken to the requirements of the Swan River Crossings – Consultancy Brief for Soil Sampling. The sample analysis has been provided to assist Main Roads with sediment migration modelling.

A total of Thirty Seven (37) samples were taken throughout the Swan River seabed extending from the Western side of the existing Fremantle Rail Bridge and through to the eastern side of the Stirling Hwy Traffic Bridge.

The 37 sample locations consisted of an initial twenty one (21) samples nominated as required predominantly around the existing Fremantle Traffic and Road Bridges extending east towards the Stirling Bridge. A further sixteen (16) samples were taken (nominated as optional) to cover the seabed locations closer to and surrounding the Stirling Bridge. Locations are as shown in Figure 1.

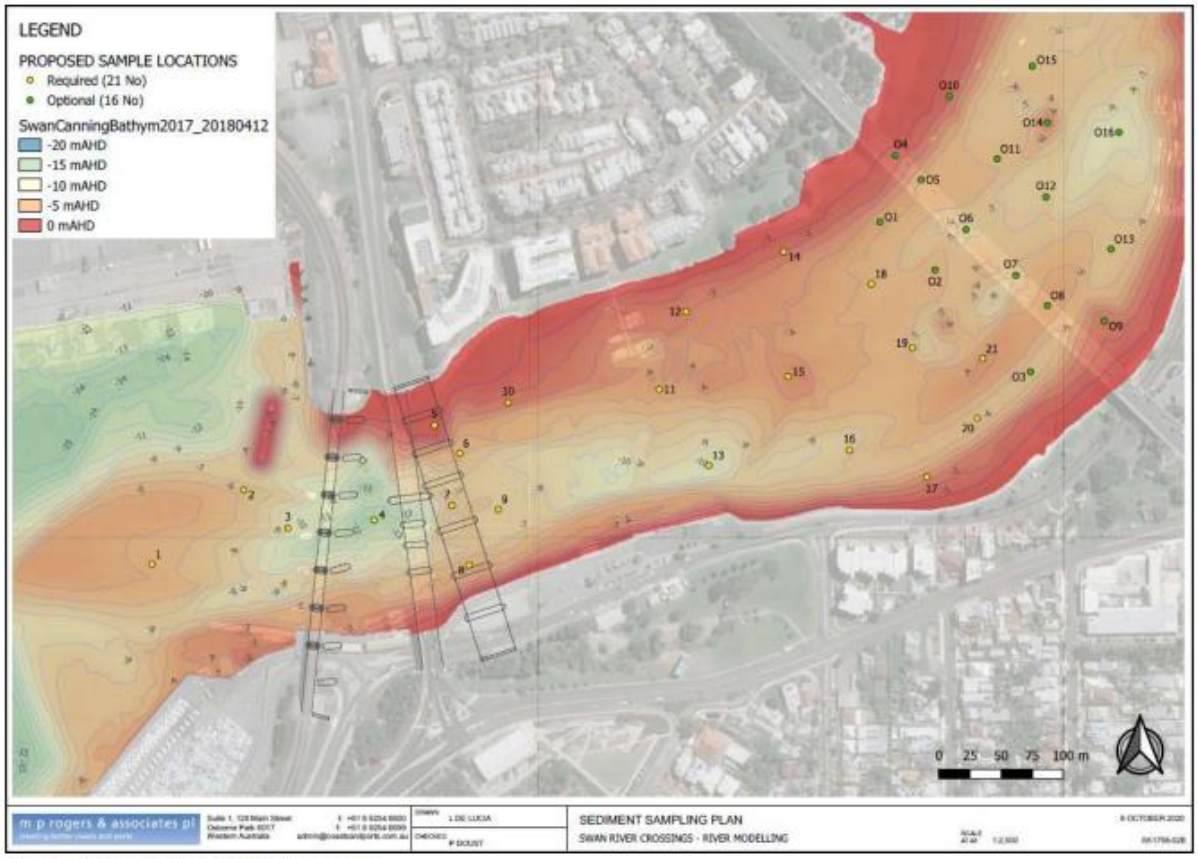

Figure 1: Sediment Sample Locations

1.1 Sediment Sampling

The scope of work for the removal of the sediment samples consisted of the following:

- Review of the nominated sample locations and confirm suitability for sample removal. This was achieved at all locations with minimal movement of the sample locations as provided by Main Roads. No sample was taken any further than +1m from the nominated sample location positions.
- All samples were taken and logged as per the sample locations provided with the initial required samples labelled samples 1 through to 21 inclusive (eg. SS1, SS2, SS3…..SS21). The Optional samples were then labelled 1 through to 16 inclusive as SS01, SS02, SS03….SS016).
- At all 37 locations samples were taken in 20L buckets as well as push tube cores. All samples removed and tested have been retained at the Laboratory in the event that any additional testing is required.
- At all locations the seabed was photographed and the divers commented on the seabed type.

The sample locations are as follows:

Table One: Sediment Sample Locations

SAMPLE No.	TYPE	LONGITUDE	LATITUDE
1	Required	115.7523117	-32.04158681
2	Required	115.753097	-32.04104784
3	Required	115.7534722	-32.04132579
4	Required	115.7542098	-32.04126802
5	Required	115.7547221	-32.04058034
6	Required	115.7549381	-32.04078391
7	Required	115.7548715	-32.04116338
8	Required	115.7550172	-32.04159623
9	Required	115.7552677	-32.04119263
10	Required	115.7553517	-32.04041431
11	Required	115.756639	-32.04031965
12	Required	115.7568669	-32.03975455
13	Required	115.7570633	-32.04087213
14	Required	115.7577032	-32.03932054
15	Required	115.7577387	-32.0402265
16	Required	115.7582616	-32.04076288
17	Required	115.7589212	-32.04095697
18	Required	115.758452	-32.03955505
19	Required	115.7588005	-32.04002029
20	Required	115.7593538	-32.04053084
21	Required	115.7593995	-32.04009807
O1	Optional	115.7585224	-32.03910453
O2	Optional	115.7589923	-32.03945356
O3	Optional	115.7598071	-32.04019353
O4	Optional	115.7586554	-32.03862336
O5	Optional	115.7588752	-32.03879787
O6	Optional	115.7592579	-32.03915977
O7	Optional	115.7596824	-32.03949263
O8	Optional	115.7599515	-32.03971237

Cont'd…….

SAMPLE No.	TYPE	LONGITUDE	LATITUDE
O9	Optional	115.7604367	-32.03982562
O10	Optional	115.7591145	-32.03819402
O11	Optional	115.7595237	-32.03864636
O12	Optional	115.7599406	-32.03892431
O13	Optional	115.7604939	-32.03930243
O14	Optional	115.7599523	-32.03838333
O15	Optional	115.7598236	-32.0379731
O16	Optional	115.7605627	-32.03845466

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Table Two: Sediment Sample Locations and surface layer description

SITE	SAMPLE TYPE	DESCRIPTION SURFACE LAYERS	REVISED CO-ORDINATES
EXAMPLE	Bucket/Push Tube	Sand/Rocks - obstructions	As Original
1	Bucket & Core	Sand / Shell	As Original
2	Bucket & Core	Sand / Shell	As Original
2	Bucket & Core	Sand / Shell	As Original
3	Bucket & Core	Sand / Shell	As Original
4	Bucket & Core	Sand / Shell	As Original
5	Bucket & Core	Rocky / Hard	As Original
6	Bucket & Core	Rocky / Hard	As Original
7	Bucket & Core	Sand / Shell	As Original
8	Bucket & Core	Sand / Shell	As Original
9	Bucket & Core	Rocky	As Original
10	Bucket & Core	Sandy Seabed	As Original
11	Bucket & Core	Sandy Seabed	As Original
12	Bucket & Core	Sandy Seabed	As Original
13	Bucket & Core	Sand / Rock	As Original
14	Bucket & Core	Sandy Seabed	As Original
15	Bucket & Core	Sandy Seabed	As Original
16	Bucket & Core	Sandy Seabed	As Original
17	Bucket & Core	Sandy Seabed	As Original
18	Bucket & Core	Sand / Shell	As Original
19	Bucket & Core	Sand / Shell	As Original
20	Bucket & Core	Sandy Seabed	As Original
21	Bucket & Core	Sand / Shell	As Original
O1	Bucket & Core	Sand / Rock	As Original
O2	Bucket & Core	Sand/ Silt	As Original
O3	Bucket & Core	Sandy Seabed	As Original
O4	Bucket & Core	Sandy Seabed	As Original
O5	Bucket & Core	Sandy Seabed	As Original
O6	Bucket & Core	Sand / Shell	As Original
O7	Bucket & Core	Sand / Shell	As Original
O8	Bucket & Core	Sandy Seabed	As Original

Cont'd…….

SITE	SAMPLE TYPE	DESCRIPTION SURFACE LAYERS	REVISED CO-ORDINATES
O9	Bucket & Core	Sandy Seabed	As Original
O10	Bucket & Core	Sandy Seabed	As Original
O11	Bucket & Core	Sand / Shell	As Original
O12	Bucket & Core	Sand / Shell	As Original
O13	Bucket & Core	Silt	As Original
O14	Bucket & Core	Sandy Seabed	As Original
O15	Bucket & Core	Silt	As Original
O16	Bucket & Core	Sand / Shell	As Original

1.2 Laboratory Testing

The laboratory testing was undertaken by Western Geotechnical with the following testing provided:

- Particle Size Distribution to AS 1289.3.6.1
- Hydrometer Analysis to AS1289.3.6.3
- Calcium Carbonate Content to WA 615.1
- Solid Partial Density to AS 1289.3.5.1
- Insitu Density from Push Tubes

As part of the sample removal works, a representative from Western Geotechnical was on board the diver vessel for the initial sample removal to confirm sampling technique and quantity of material removed was adequate for the testing required.

The reports for all Laboratory testing can be found in full for each individual sample in the attached Appendices.

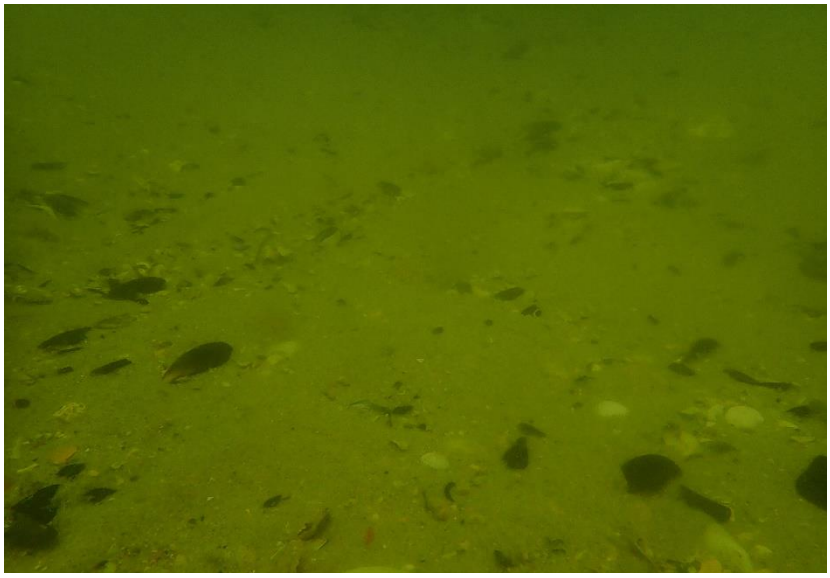
2. Diver sample locations

As part of the sediment removal, the divers were asked to take a photographic representation from where the samples were removed and note the seabed typical makeup. The following photographs refer directly with the sample location as identified in *Figure 1: Sediment sample locations*.

2.1 Required Samples numbered One (1) – Twenty One (21)

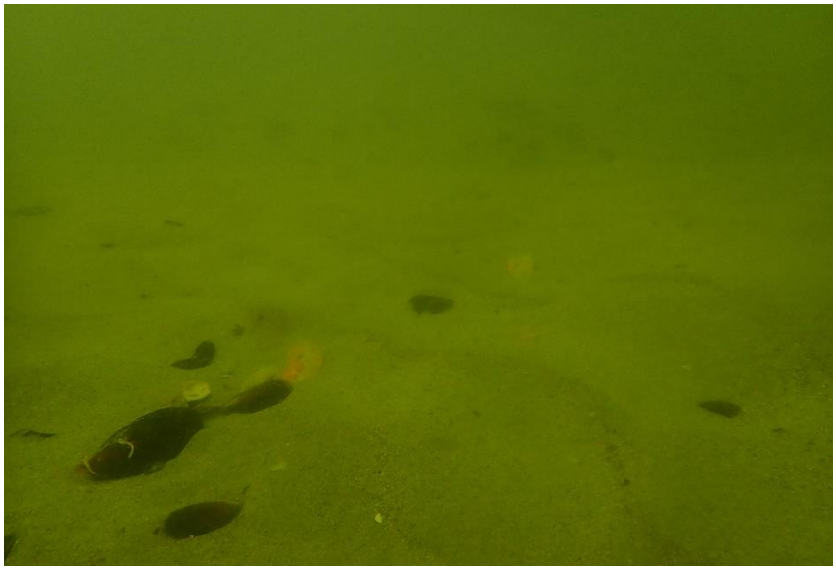
Sample Location One (1)

Surface Layers description: Sandy with shells



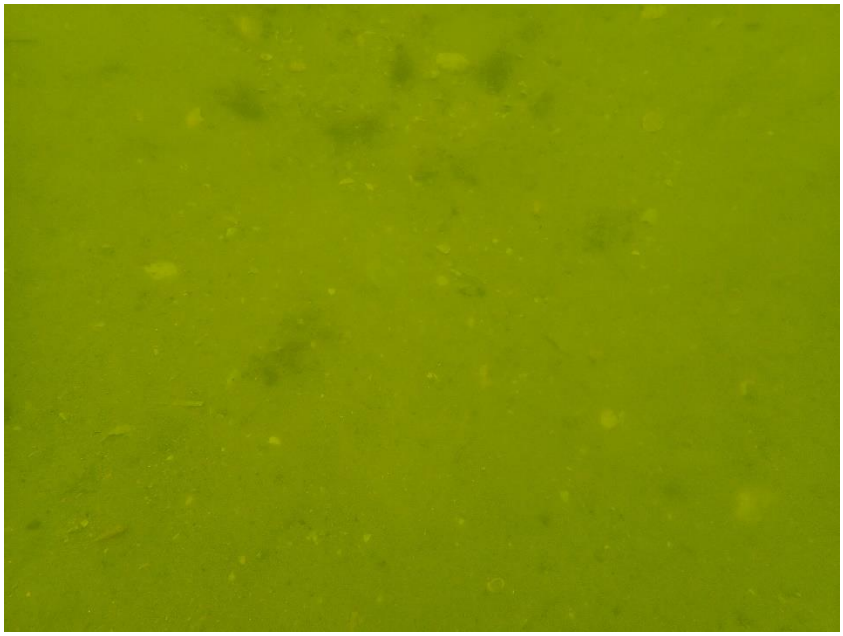
Sample Location Two (2)

Surface Layers description: Sandy with shells



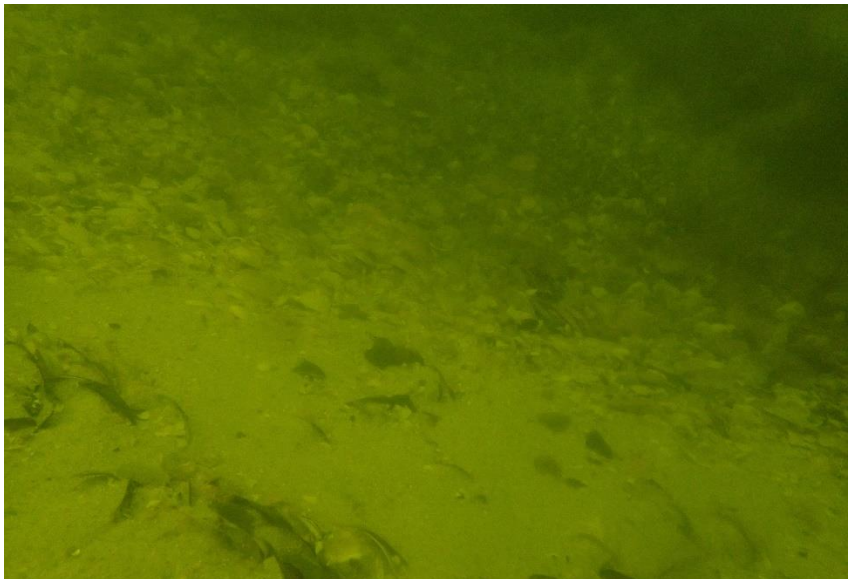
Sample Location Three (3)

Surface Layers description: Sandy with shells



Sample Location Four (4)

Surface Layers description: Sandy with shells slight rock

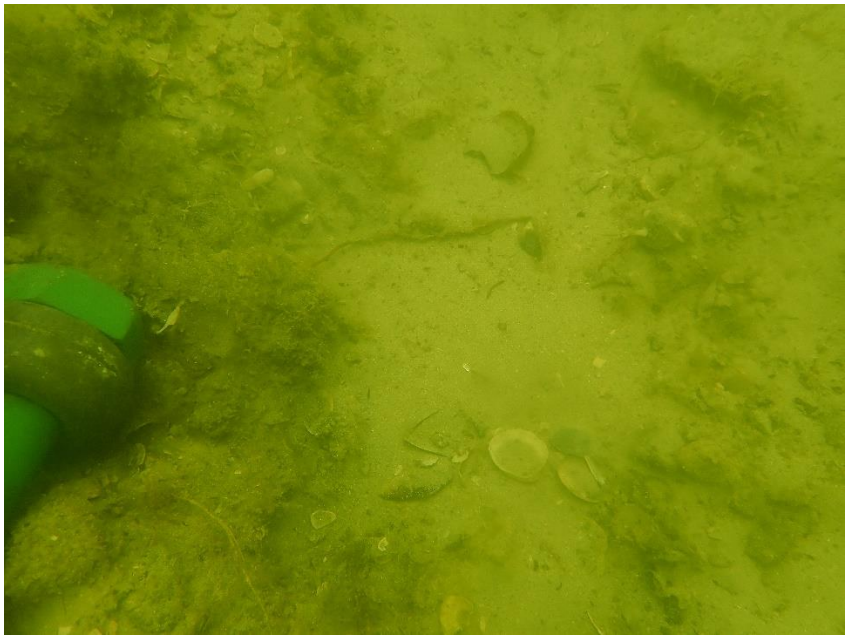


Sample Location Five (5)

Surface Layers description: Rocky and hard surface

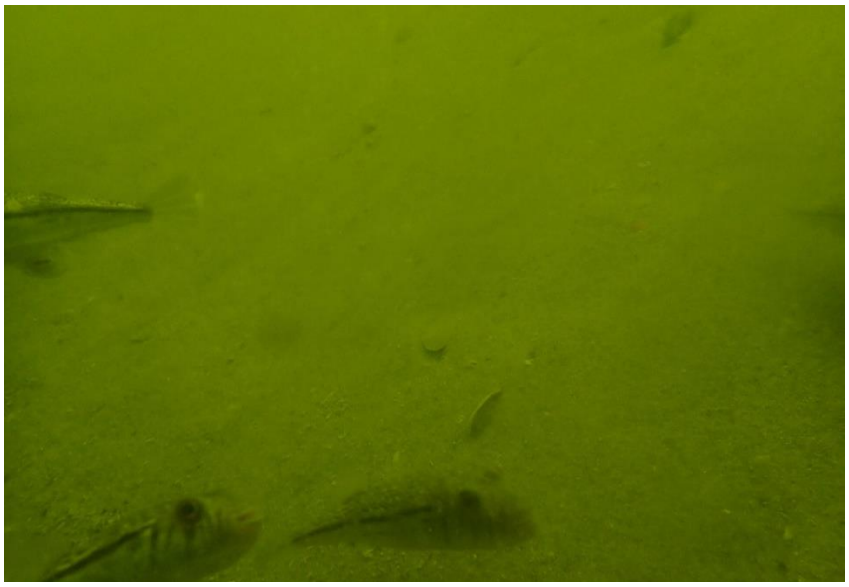
Sample Location Six (6)

Surface Layers description: Rocky and hard surface



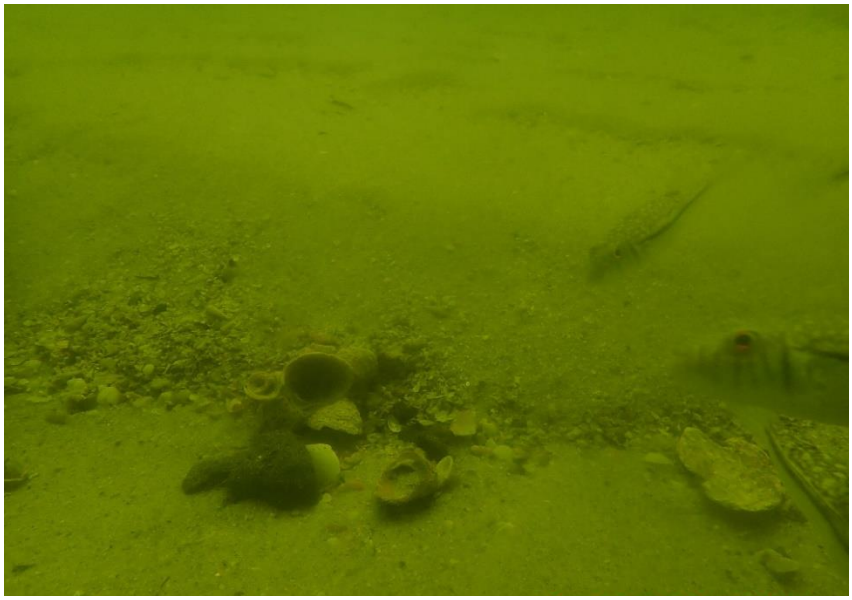
Sample Location Seven (7)

Surface Layers description: Sandy with shells



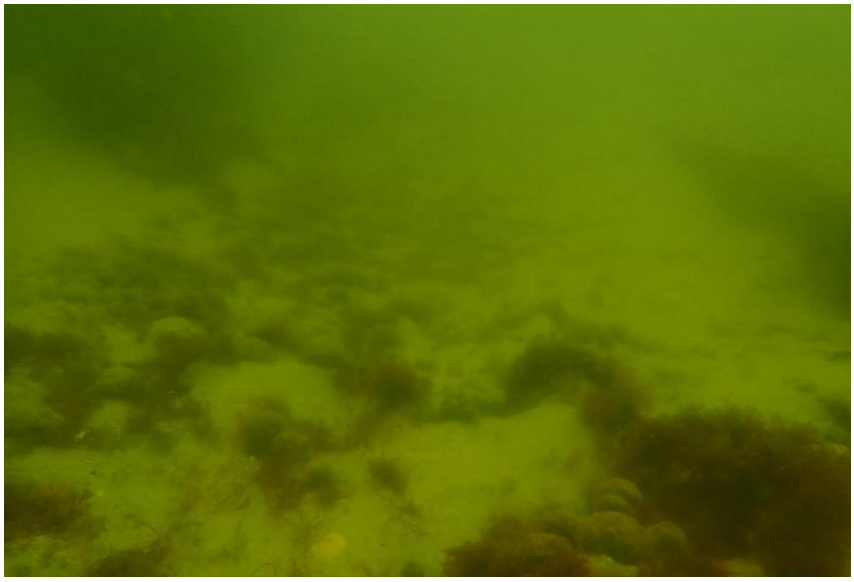
Sample Location Eight (8)

Surface Layers description: Sandy with shells



Sample Location Nine (9)

Surface Layers description: Rocky

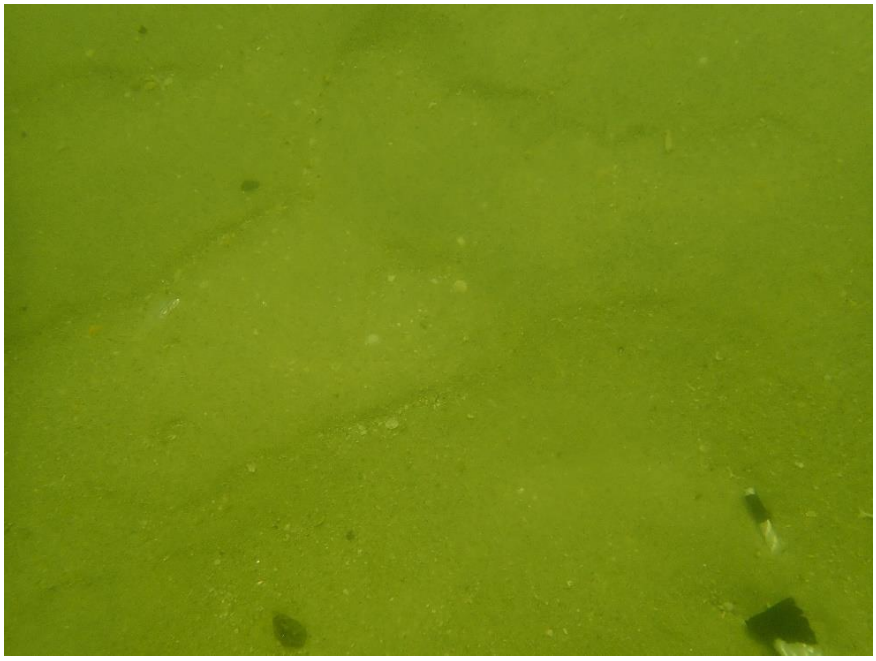


Sample Location Ten (10)

Surface Layers description: Sandy seabed

Sample Location Eleven (11)

Surface Layers description: Sandy seabed

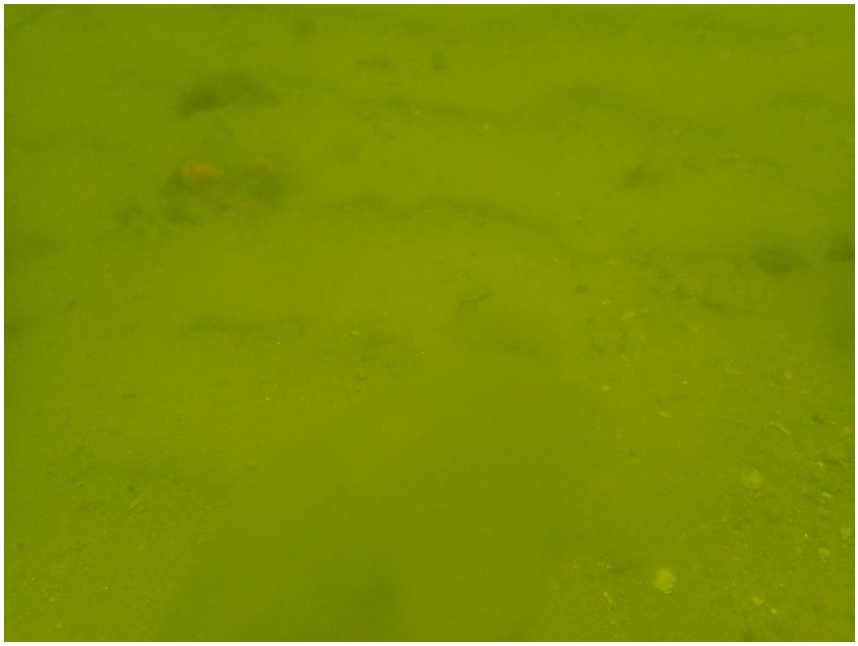


Sample Location Twelve (12)

Surface Layers description: Sandy seabed

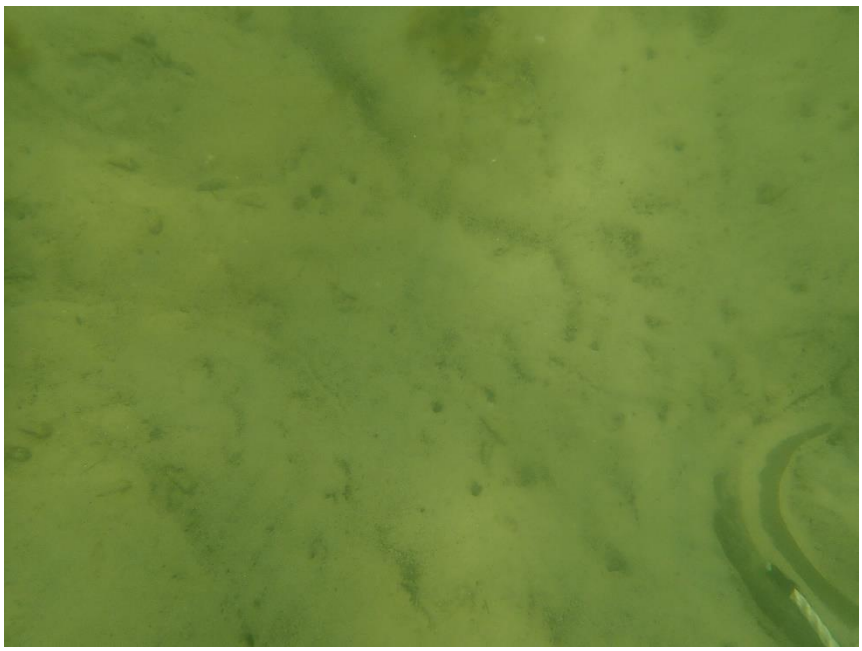
Sample Location Thirteen (13)

Surface Layers description: Sandy with rocks



Sample Location Fourteen (14)

Surface Layers description: Sandy seabed



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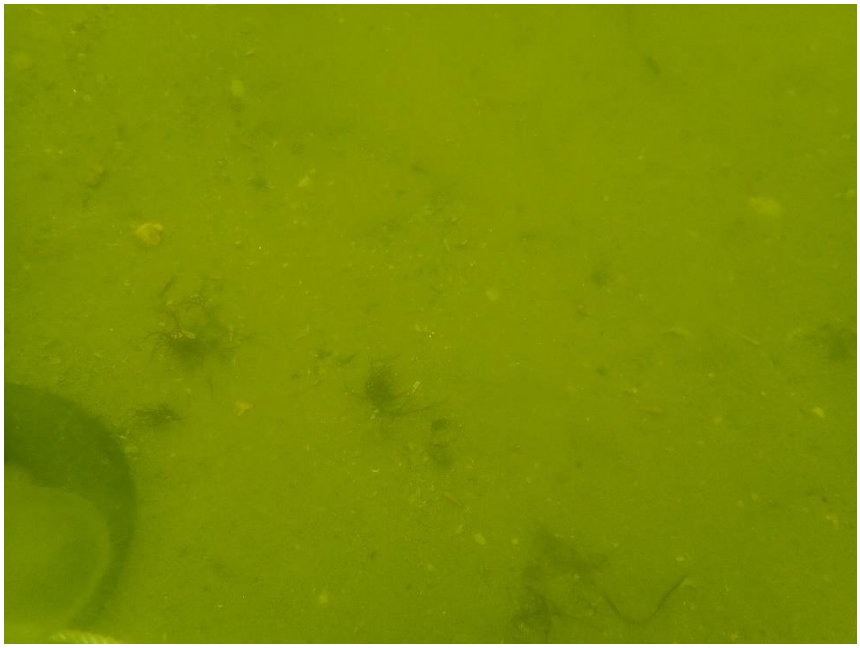
Sample Location Fifteen (15)

Surface Layers description: Sandy seabed

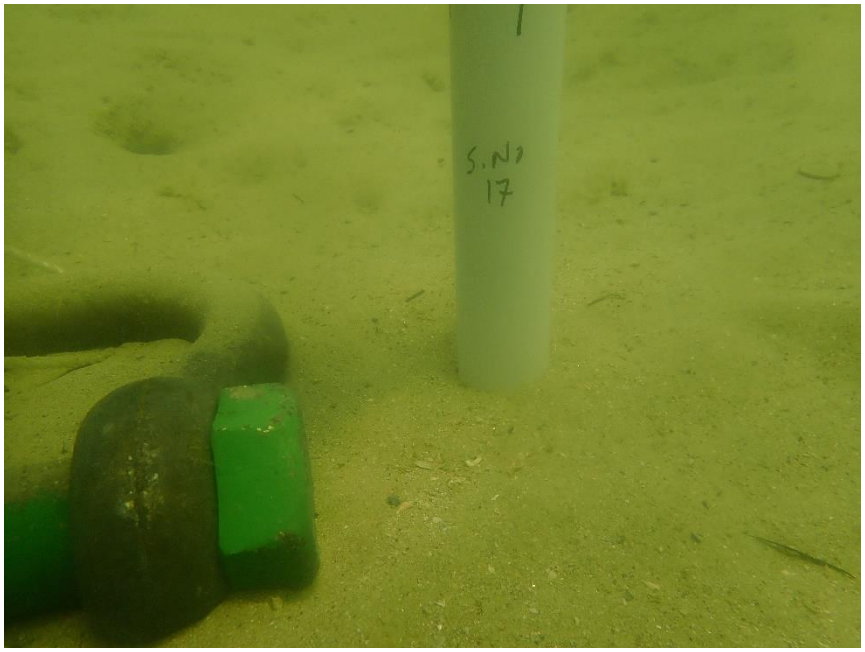
Sample Location Sixteen (16)

Surface Layers description: Sandy seabed



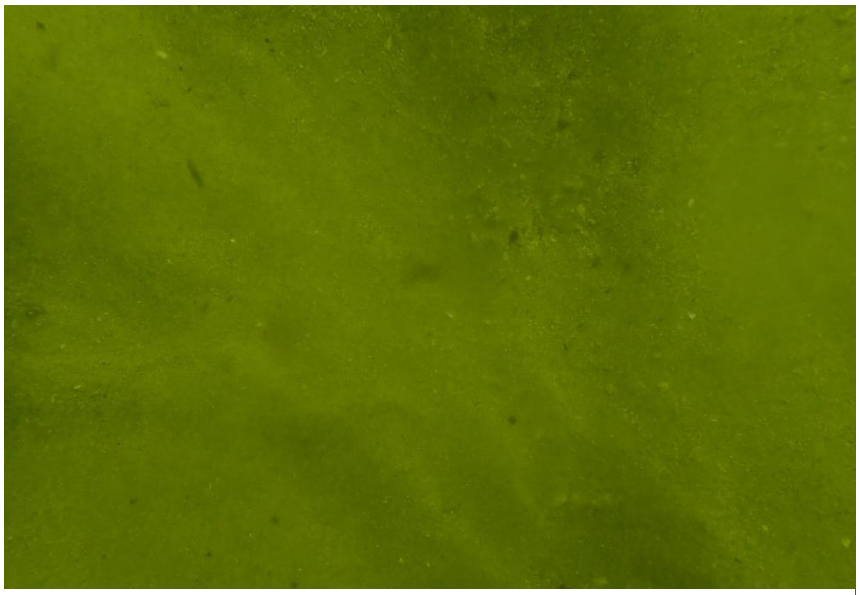
Sample Location Seventeen (17)

Surface Layers description: Sandy seabed



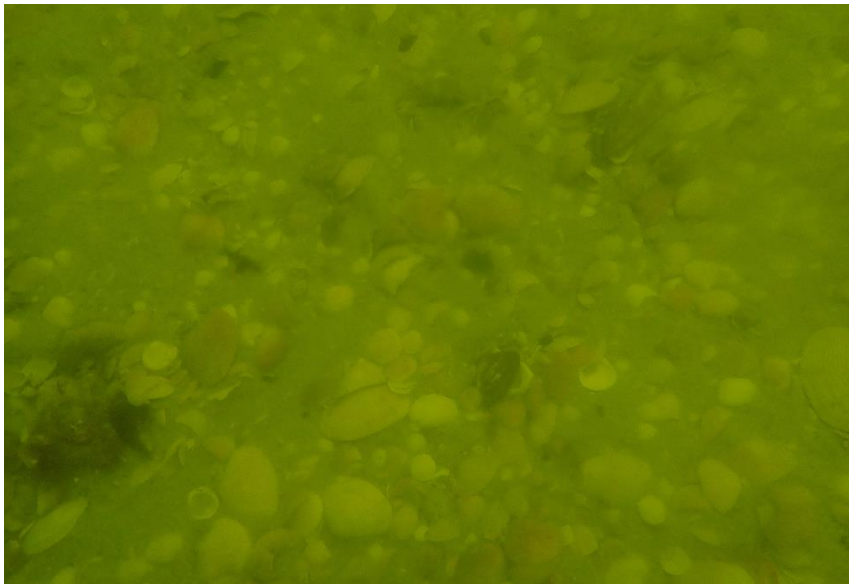
Sample Location Eighteen (18)

Surface Layers description: Sandy with small shells



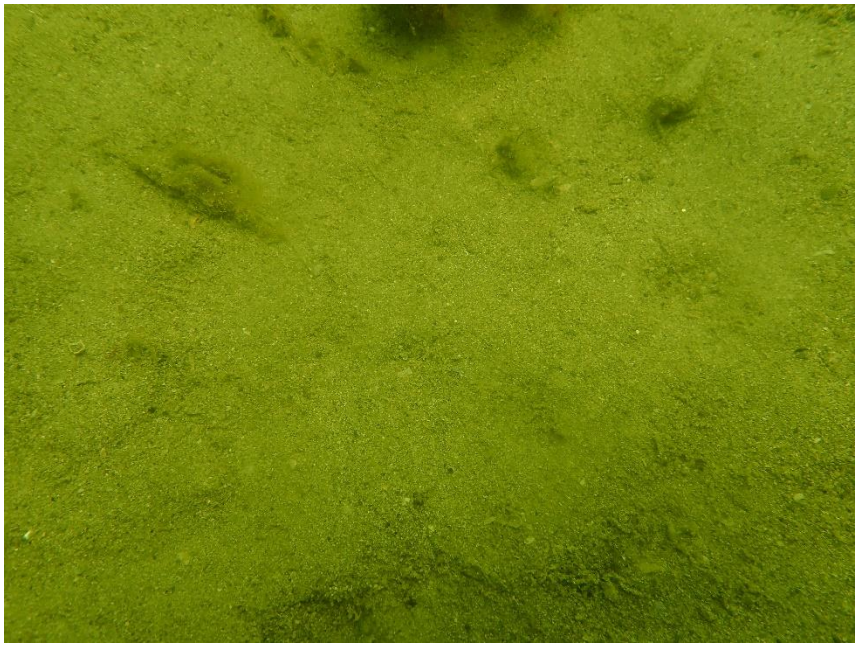
Sample Location Nineteen (19)

Surface Layers description: Sandy with shells



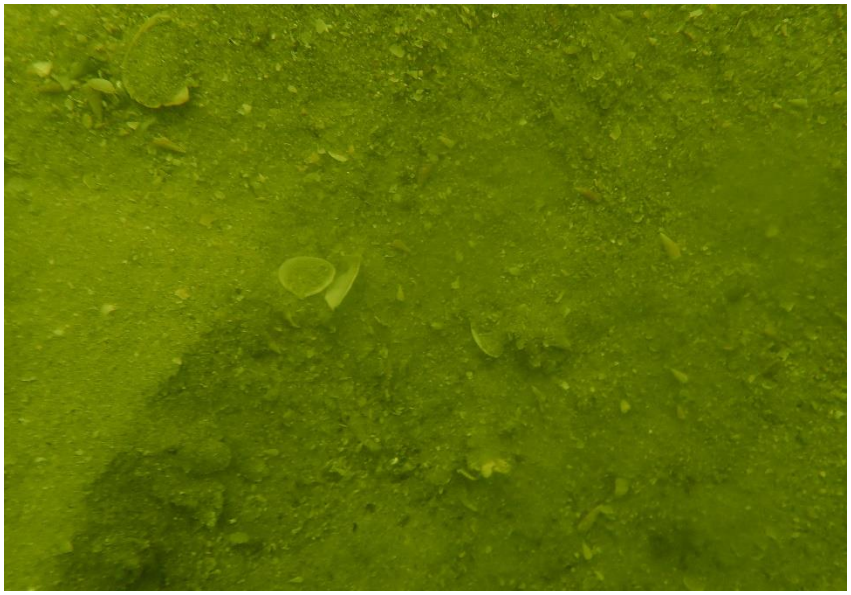
Sample Location Twenty (20)

Surface Layers description: Sandy seabed



Sample Location Twenty One (21)

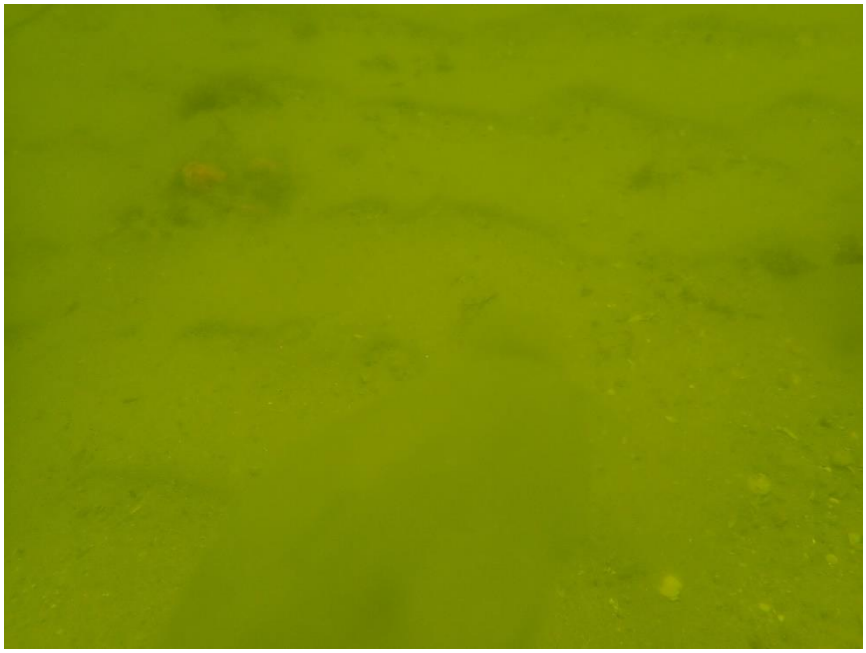
Surface Layers description: Sandy with shells



2.2 Optional Samples numbered One (01) – Twenty One (021)

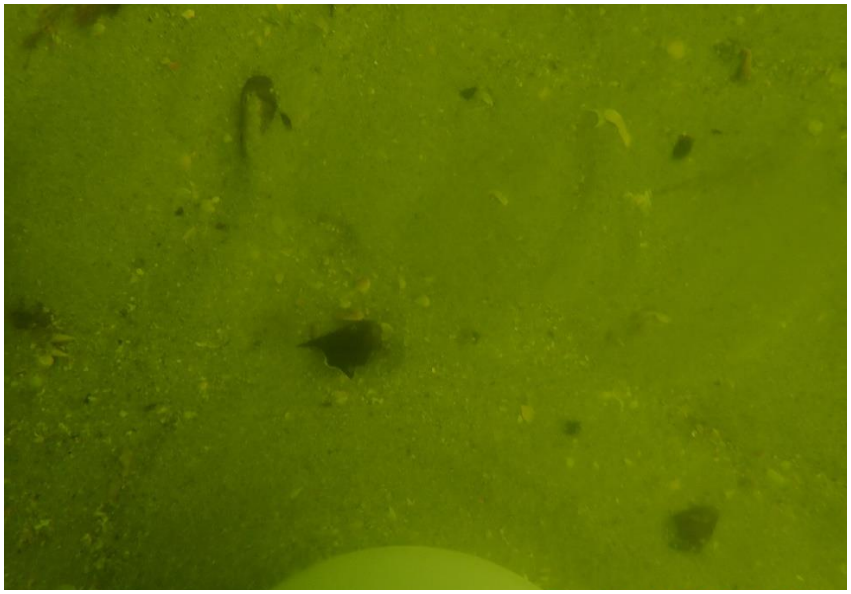
Sample Location Optional One (01)

Surface Layers description: Sandy with rocks



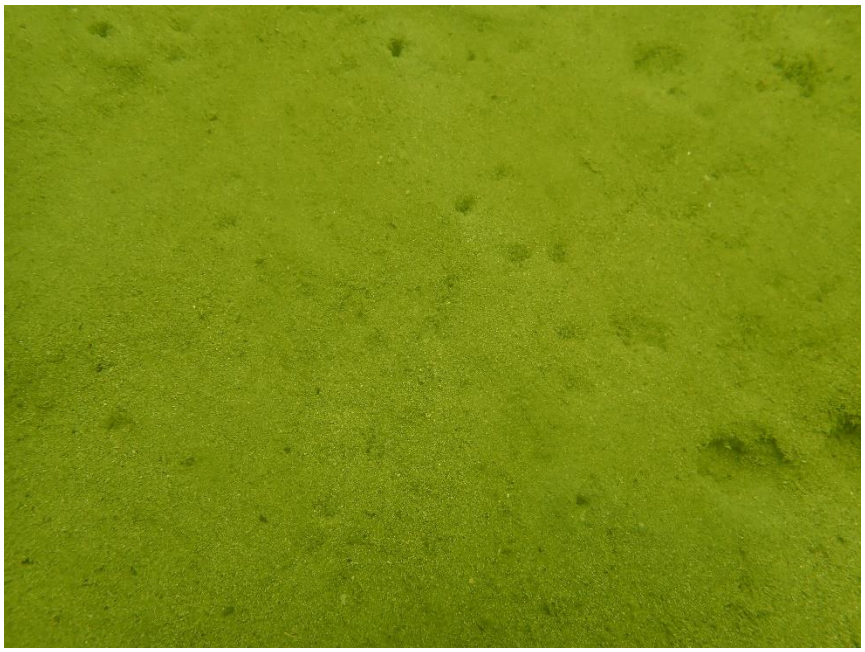
Sample Location Optional Two (02)

Surface Layers description: Sandy with silt



Sample Location Optional Three (03)

Surface Layers description: Sandy seabed



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Sample Location Optional Four (04)

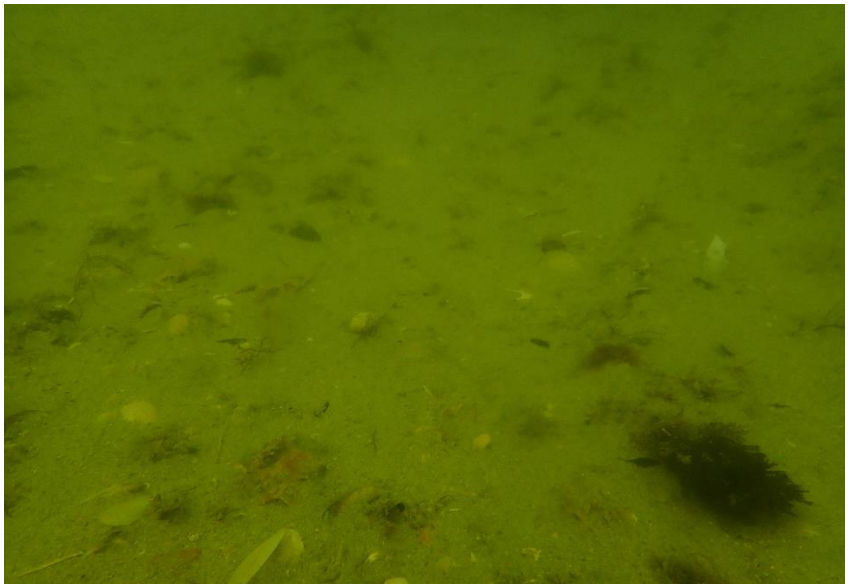
Surface Layers description: Sandy seabed

Sample Location Optional Five (05)

Surface Layers description: Sandy seabed

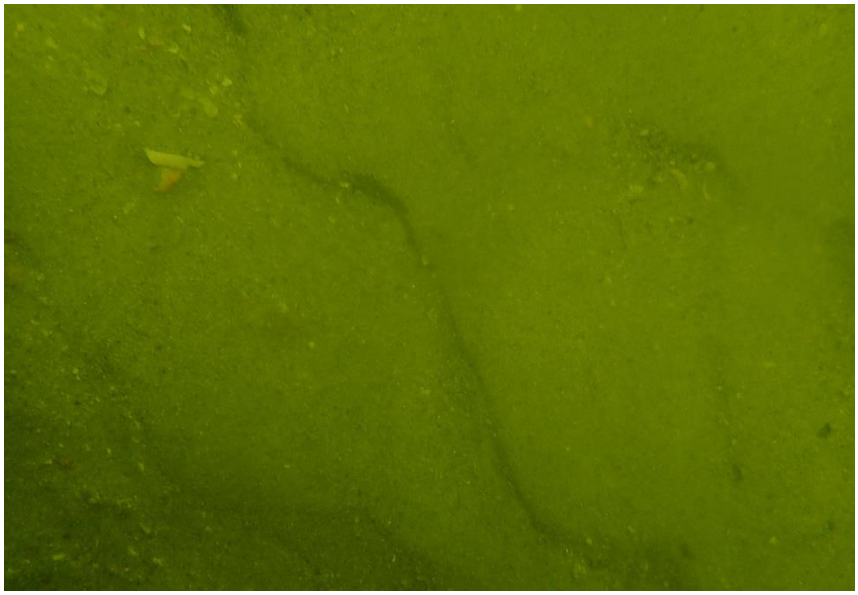
Sample Location Optional Six (06)

Surface Layers description: Sandy with shells



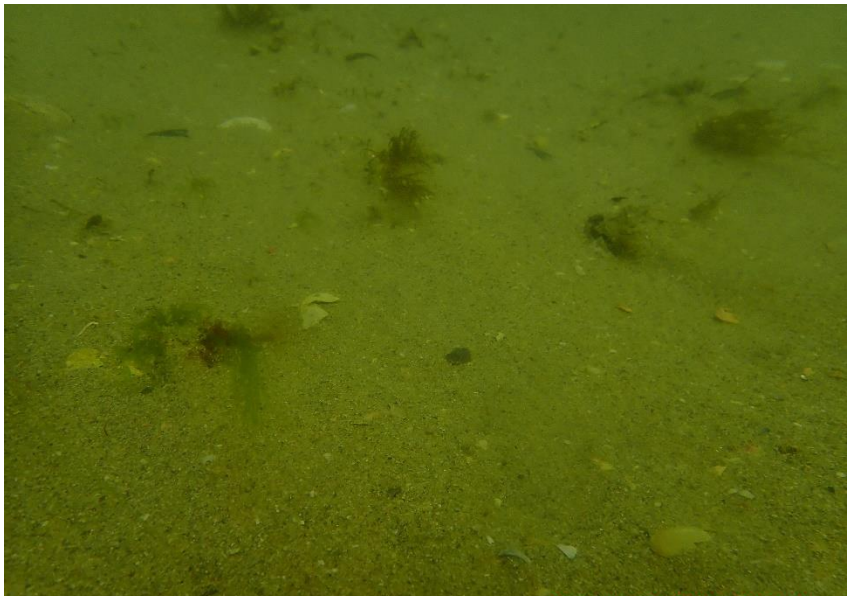
Sample Location Optional Seven (07)

Surface Layers description: Sandy with shells



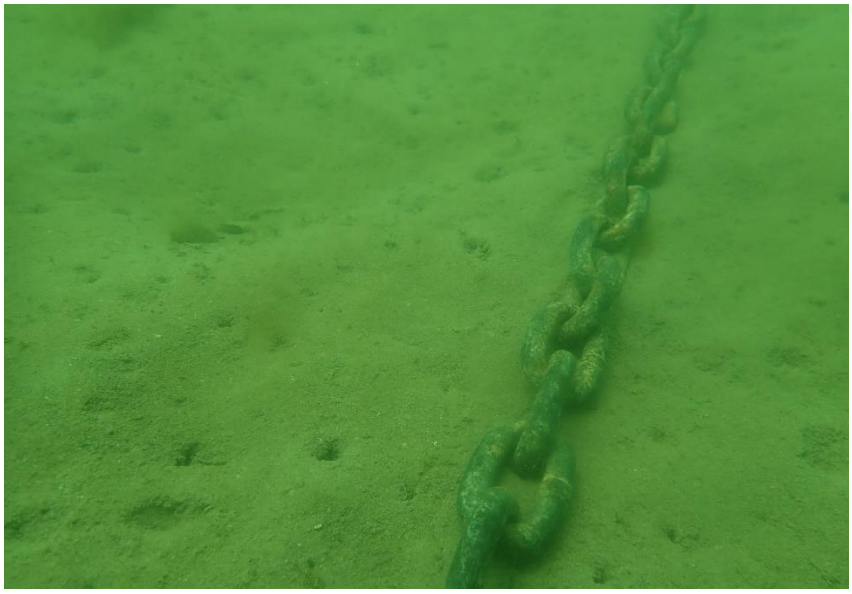
Sample Location Optional Eight (08)

Surface Layers description: Sandy seabed



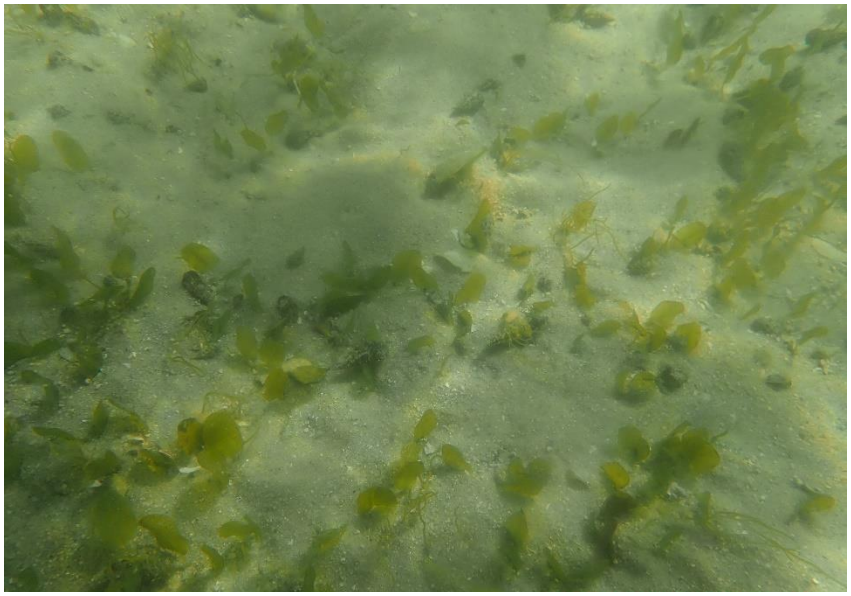
Sample Location Optional Nine (09)

Surface Layers description: Sandy seabed



Sample Location Optional Ten (010)

Surface Layers description: Sandy seabed



Sample Location Optional Eleven (011)

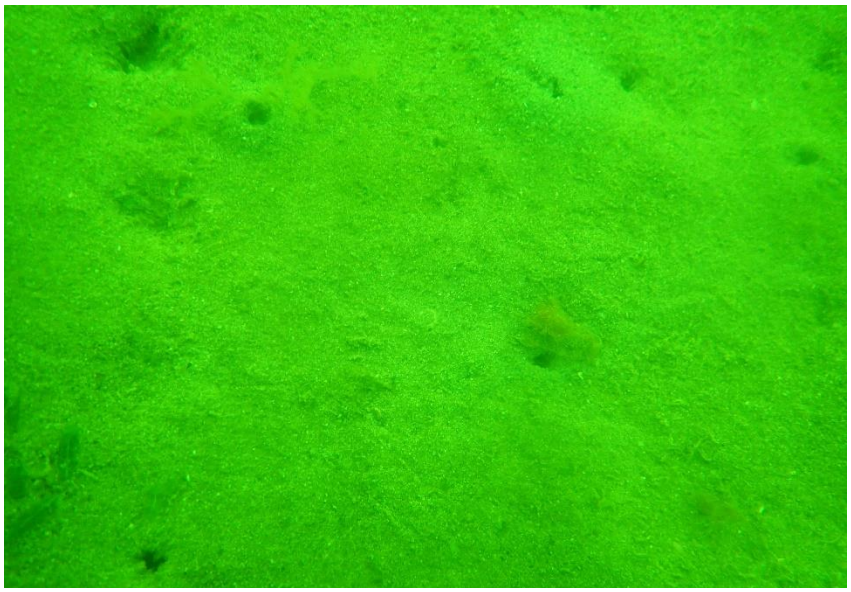
Surface Layers description: Sandy with shells

Sample Location Optional Twelve (012)

Surface Layers description: Sandy with shells

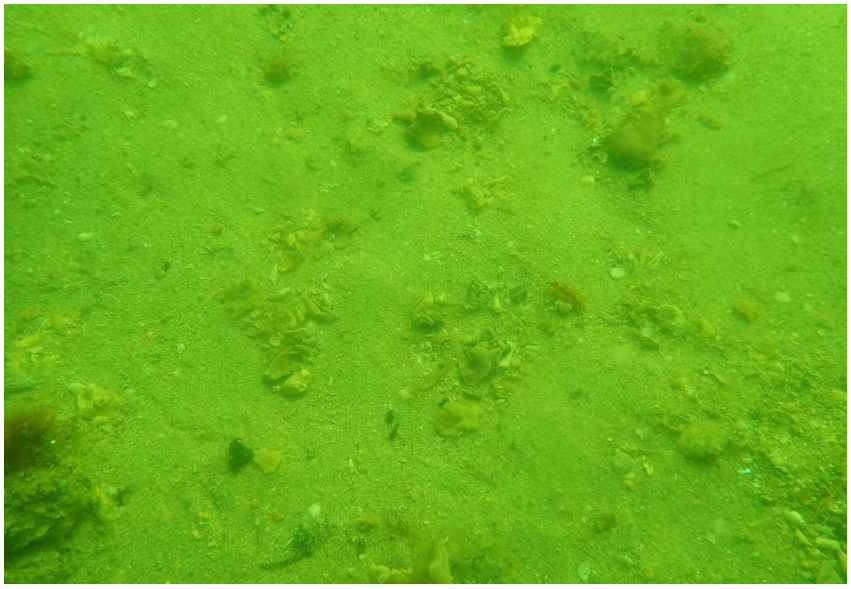
Sample Location Optional Thirteen (013)

Surface Layers description: Silt



Sample Location Optional Fourteen (014)

Surface Layers description: Sandy seabed

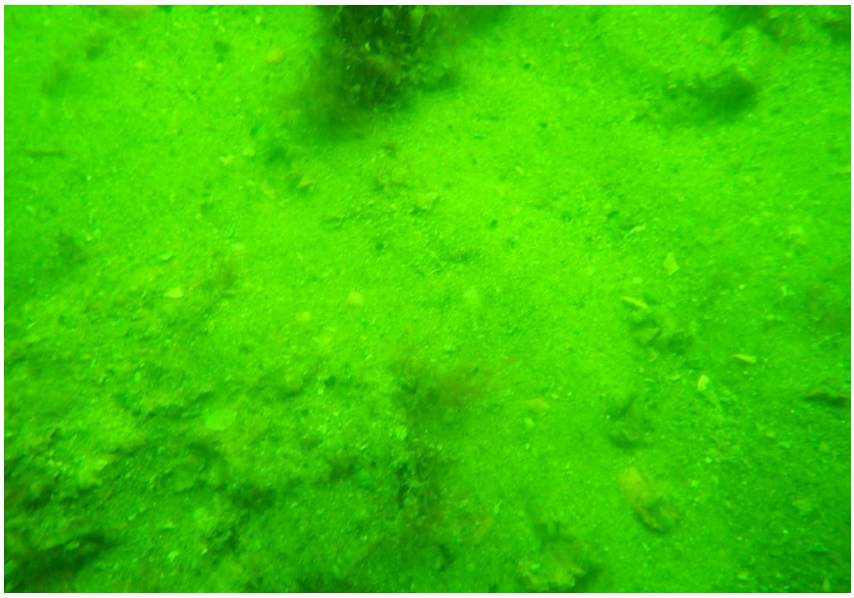


Sample Location Optional Fifteen (015)

Surface Layers description: Silt

Sample Location Optional Sixteen (016)

Surface Layers description: Sandy with shells



Appendix A: Particle Size Distribution of Soil & Hydrometer Analysis

WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.6.1 & ψ AS 1289. 3.6.3

Client:	ICM	*Ticket No.*	S2266
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/12009_1_PSDHY
Project:	Riverbed Material Assessment	*Sample No.*	WG20/12009
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	SS1	*Date Tested:*	3/01/2021

TEST RESULTS - Particle Size Distribution of Soil & Hyrdrometer Analysis

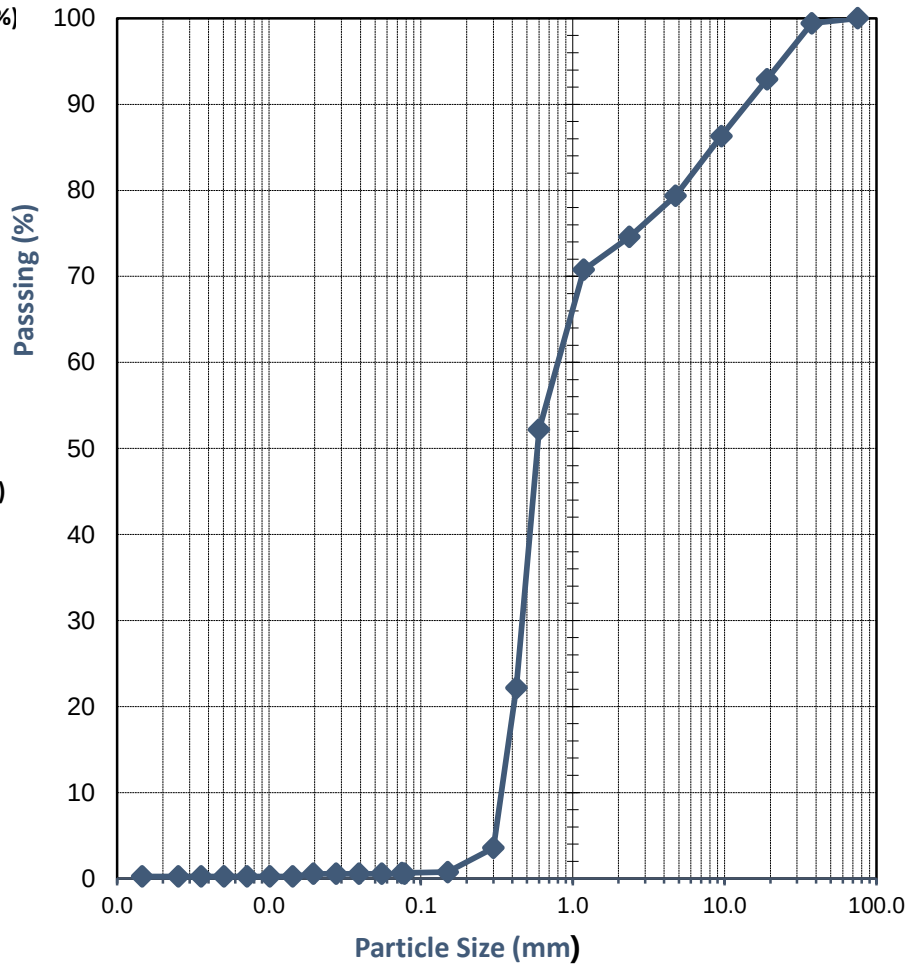
Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing (%)
75.0	100
37.5	99
19.0	93
9.5	86
4.75	79
2.36	75
1.18	71
0.600	52
0.425	22
0.300	4
0.150	1
0.075	1

Particle Diameter (mm ψ	Percent Finer (%)
0.0781	1
0.0552	1
0.0391	1
0.0276	1
0.0143	0
0.0101	0
0.0072	0
0.0051	0
0.0036	0
0.0025	0
0.0015	0

ψ AS 1289.3.5.1 -2.36mm Particle Density

2.65 g/cm3



Comments: ψ- AS 1289.3.5.1 & ψ AS 1289.3.6.3 - NATA Accreditation does not cover the performance of this service.

Approved Signatory:

Name: Matt van Herk

Date: 06/January/2021

NATA WORLD RECOGNISED ACCREDITATION

Accreditation No. 20599

Accredited for compliance with ISO/IEC 17025 - Testing

WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.6.1 & ψ AS 1289. 3.6.3

Client:	ICM	*Ticket No.*	S2266
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/12010_1_PSDHY
Project:	Riverbed Material Assessment	*Sample No.*	WG20/12010
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	SS2	*Date Tested:*	3/01/2021

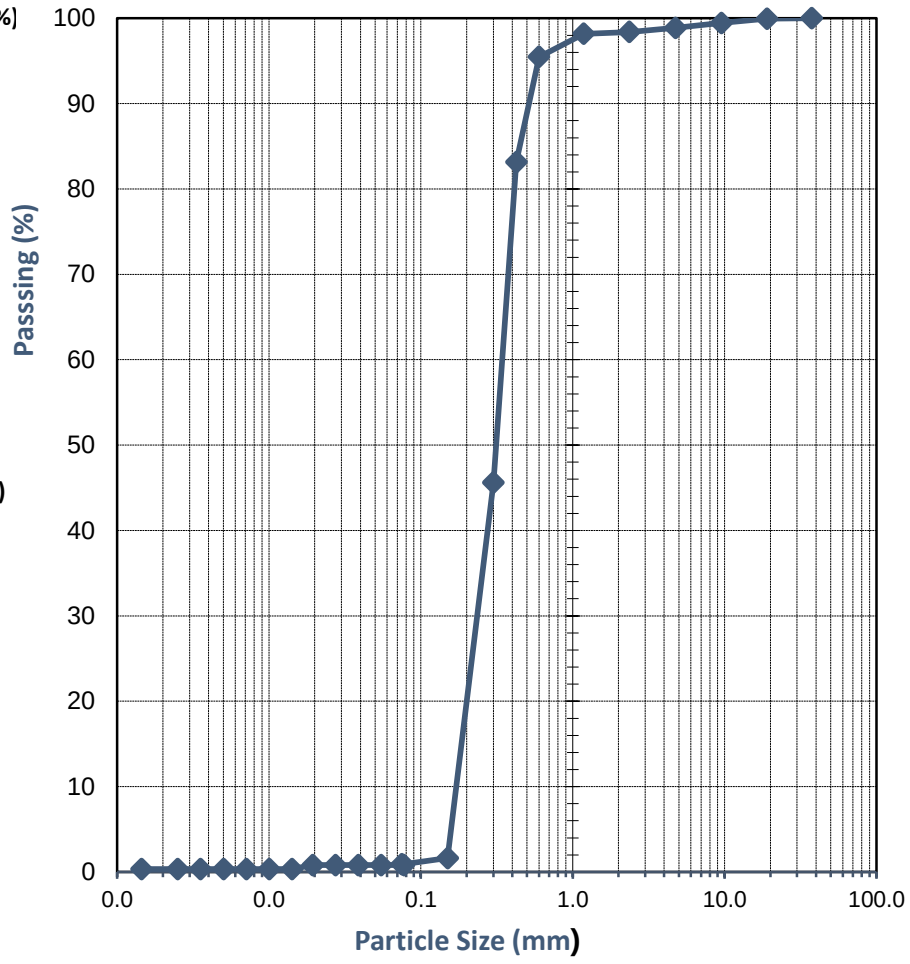
TEST RESULTS - Particle Size Distribution of Soil & Hyrdrometer Analysis

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing (%)
75.0	
37.5	100
19.0	100
9.5	99
4.75	99
2.36	98
1.18	98
0.600	95
0.425	83
0.300	46
0.150	2
0.075	1

Particle Diameter (mm ψ	Percent Finer (%)
0.0774	1
0.0547	1
0.0387	1
0.0274	1
0.0142	0
0.0100	0
0.0071	0
0.0050	0
0.0035	0
0.0025	0
0.0014	0

ψ AS 1289.3.5.1 -2.36mm Particle Density
2.68 g/cm3



Comments: ψ- AS 1289.3.5.1 & ψ AS 1289.3.6.3 - NATA Accreditation does not cover the performance of this service.

Approved Signatory:

Name: Matt van Herk
Date: 06/January/2021

NATA WORLD RECOGNISED ACCREDITATION

Accreditation No. 20599
Accredited for compliance with ISO/IEC 17025 - Testing

WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.6.1 & ψ AS 1289. 3.6.3

Client:	ICM	*Ticket No.*	S2266
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/12011_1_PSDHY
Project:	Riverbed Material Assessment	*Sample No.*	WG20/12011
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	SS3	*Date Tested:*	3/01/2021

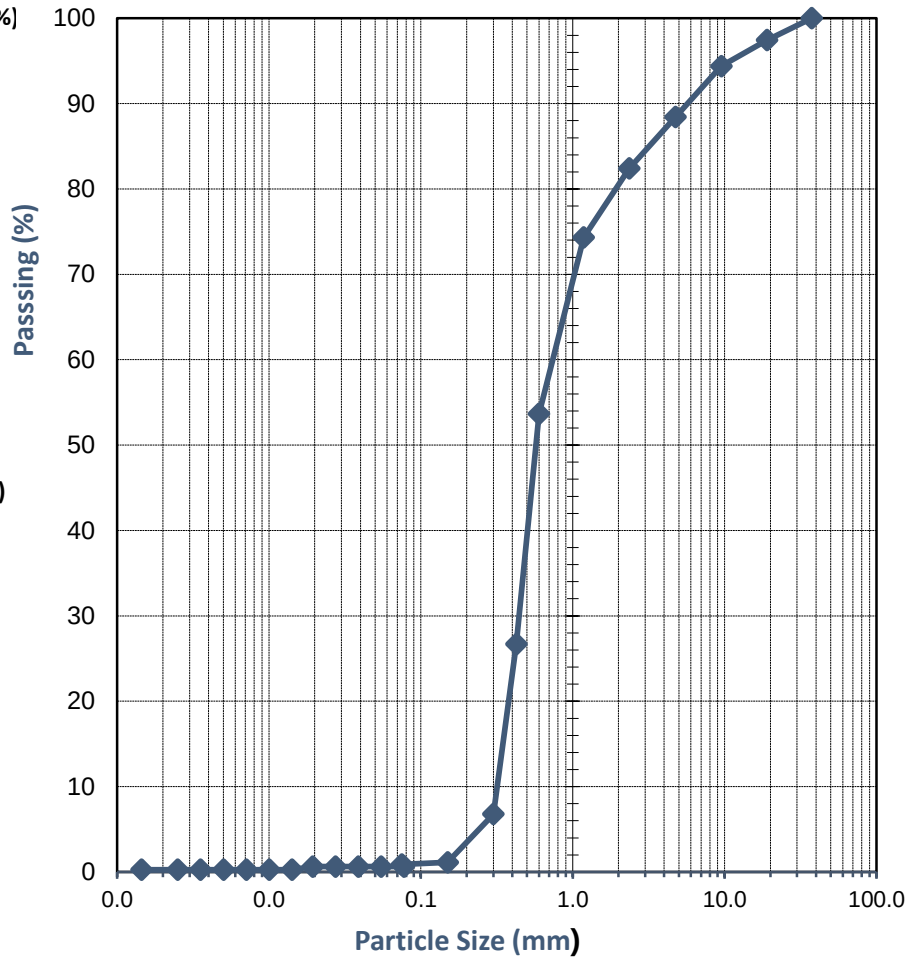
TEST RESULTS - Particle Size Distribution of Soil & Hyrdrometer Analysis

Sampling Method: **Sampled by Client, Tested as Received**

Sieve Size (mm)	Percent Passing (%)
75.0	
37.5	100
19.0	97
9.5	94
4.75	88
2.36	82
1.18	74
0.600	54
0.425	27
0.300	7
0.150	1
0.075	1

Particle Diameter (mm ψ	Percent Finer (%)
0.0774	1
0.0547	1
0.0387	1
0.0274	1
0.0142	0
0.0100	0
0.0071	0
0.0050	0
0.0035	0
0.0025	0
0.0014	0

ψ AS 1289.3.5.1 -2.36mm Particle Density
2.68 g/cm3



Comments: ψ- AS 1289.3.5.1 & ψ AS 1289.3.6.3 - NATA Accreditation does not cover the performance of this service.

Approved Signatory:

Name: Matt van Herk
Date: 06/January/2021

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WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.6.1 & ψ AS 1289. 3.6.3

Client:	ICM	*Ticket No.*	S2266
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/12012_1_PSDHY
Project:	Riverbed Material Assessment	*Sample No.*	WG20/12012
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	SS4	*Date Tested:*	3/01/2021

TEST RESULTS - Particle Size Distribution of Soil & Hyrdrometer Analysis

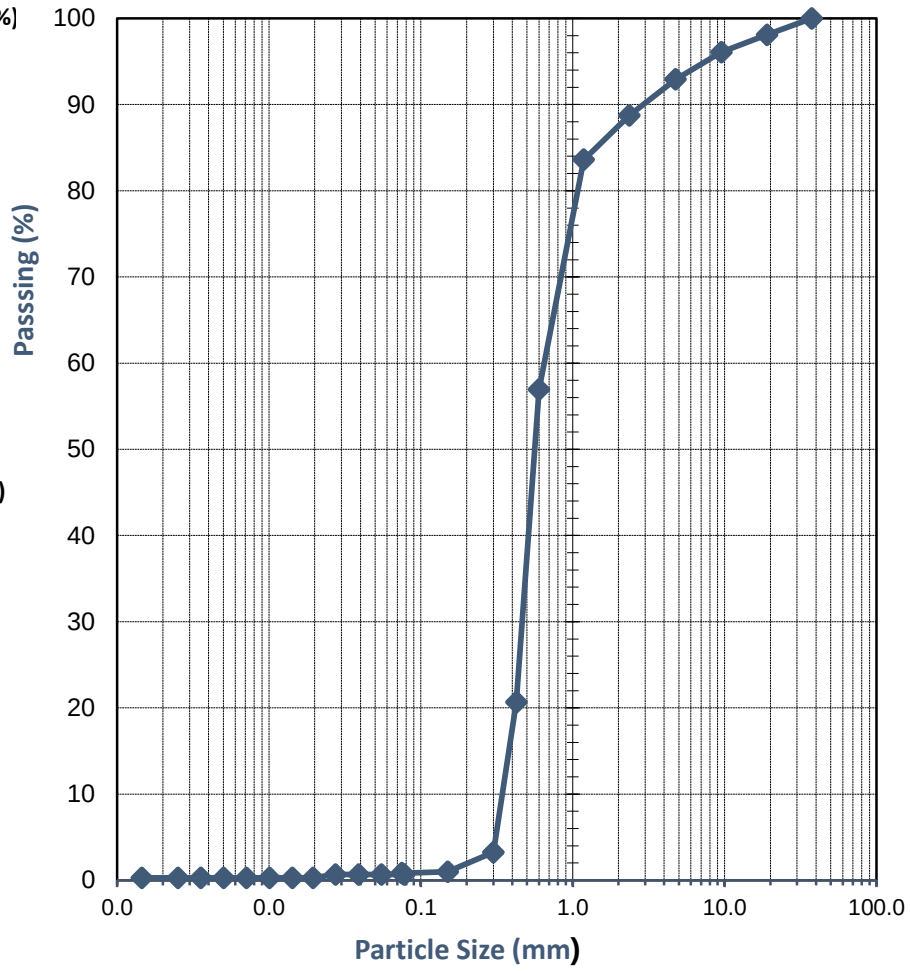
Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing (%)
75.0	
37.5	100
19.0	98
9.5	96
4.75	93
2.36	89
1.18	84
0.600	57
0.425	21
0.300	3
0.150	1
0.075	1

Particle Diameter (mm ψ	Percent Finer (%)
0.0777	1
0.0549	1
0.0388	1
0.0275	1
0.0142	0
0.0101	0
0.0071	0
0.0050	0
0.0036	0
0.0025	0
0.0015	0

ψ AS 1289.3.5.1 -2.36mm Particle Density

2.67 g/cm3



Comments: ψ- AS 1289.3.5.1 & ψ AS 1289.3.6.3 - NATA Accreditation does not cover the performance of this service.

Approved Signatory:

Name: Matt van Herk

Date: 06/January/2021

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TEST REPORT - AS 1289.3.6.1 & ψ AS 1289. 3.6.3

Client:	ICM	*Ticket No.*	S2265
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/11999_1_PSDHY
Project:	Riverbed Material Assessment	*Sample No.*	WG20/11999
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	S No. 5	*Date Tested:*	5/01/2021

TEST RESULTS - Particle Size Distribution of Soil & Hyrdrometer Analysis

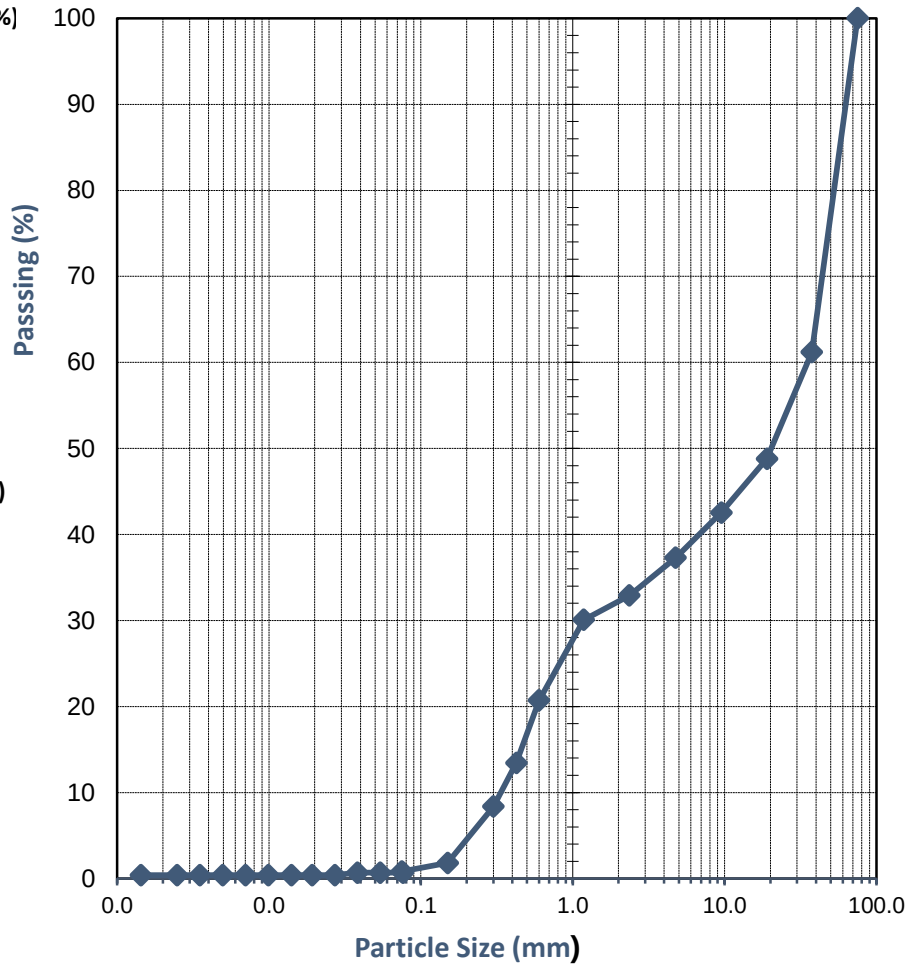
Sampling Method: **Sampled by Client, Tested as Received**

Sieve Size (mm)	Percent Passing (%)
75.0	100
37.5	61
19.0	49
9.5	43
4.75	37
2.36	33
1.18	30
0.600	21
0.425	13
0.300	8
0.150	2
0.075	1

Particle Diameter (mm ψ	Percent Finer (%)
0.0763	1
0.0540	1
0.0382	1
0.0271	0
0.0140	0
0.0099	0
0.0070	0
0.0050	0
0.0035	0
0.0025	0
0.0014	0

ψ AS 1289.3.5.1 -2.36mm Particle Density

2.7 g/cm3



Comments: ψ- AS 1289.3.5.1 & ψ AS 1289.3.6.3 - NATA Accreditation does not cover the performance of this service.

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Date: 06/January/2021

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TEST REPORT - AS 1289.3.6.1 & ψ AS 1289. 3.6.3

Client:	ICM	*Ticket No.*	S2265
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/12000_1_PSDHY
Project:	Riverbed Material Assessment	*Sample No.*	WG20/12000
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	S No. 6	*Date Tested:*	5/01/2021

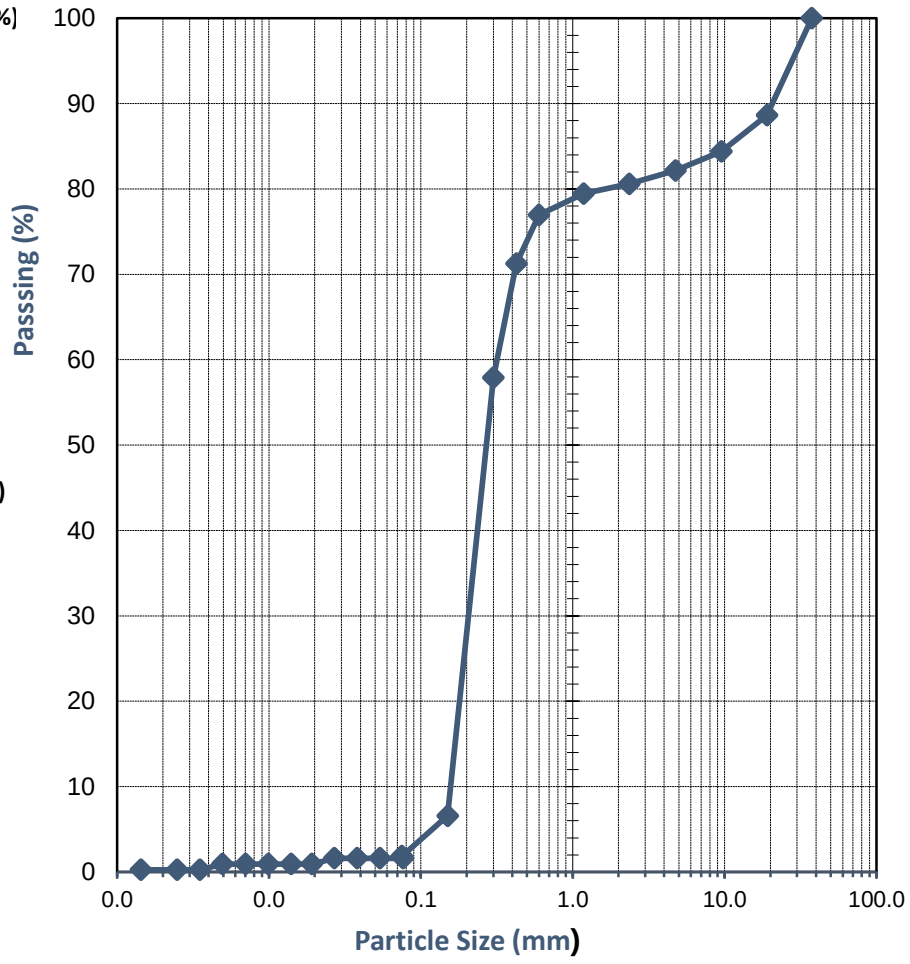
TEST RESULTS - Particle Size Distribution of Soil & Hyrdrometer Analysis

Sampling Method: **Sampled by Client, Tested as Received**

Sieve Size (mm)	Percent Passing (%)
75.0	
37.5	100
19.0	89
9.5	84
4.75	82
2.36	81
1.18	79
0.600	77
0.425	71
0.300	58
0.150	7
0.075	2

Particle Diameter (mm ψ	Percent Finer (%)
0.0761	2
0.0538	2
0.0380	2
0.0269	2
0.0140	1
0.0099	1
0.0070	1
0.0049	1
0.0035	0
0.0025	0
0.0014	0

ψ AS 1289.3.5.1 -2.36mm Particle Density
2.71 g/cm3



Comments: ψ- AS 1289.3.5.1 & ψ AS 1289.3.6.3 - NATA Accreditation does not cover the performance of this service.

Approved Signatory:

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TEST REPORT - AS 1289.3.6.1 & ψ AS 1289. 3.6.3

Client:	ICM	*Ticket No.*	S2266
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/12013_1_PSDHY
Project:	Riverbed Material Assessment	*Sample No.*	WG20/12013
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	SS7	*Date Tested:*	3/01/2021

TEST RESULTS - Particle Size Distribution of Soil & Hyrdrometer Analysis

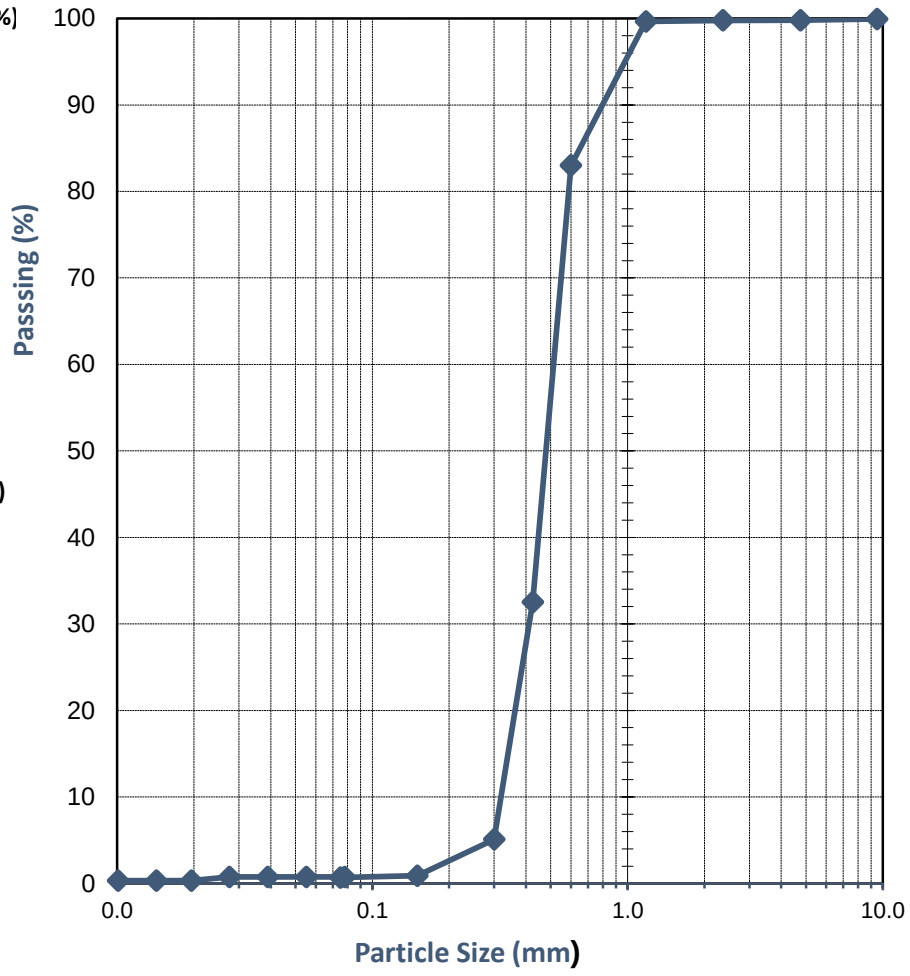
Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing (%)
75.0	
37.5	
19.0	100
9.5	100
4.75	100
2.36	100
1.18	100
0.600	83
0.425	33
0.300	5
0.150	1
0.075	1

Particle Diameter (mm ψ	Percent Finer (%)
0.0779	1
0.0551	1
0.0389	1
0.0275	1
0.0143	0
0.0101	0
0.0071	0
0.0050	0
0.0036	0
0.0025	0
0.0015	0

ψ AS 1289.3.5.1 -2.36mm Particle Density

2.66 g/cm3



Comments: ψ- AS 1289.3.5.1 & ψ AS 1289.3.6.3 - NATA Accreditation does not cover the performance of this service.

Approved Signatory:

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TEST REPORT - AS 1289.3.6.1 & ψ AS 1289. 3.6.3

Client:	ICM	*Ticket No.*	S2266
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/12014_1_PSDHY
Project:	Riverbed Material Assessment	*Sample No.*	WG20/12014
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	SS8	*Date Tested:*	3/01/2021

TEST RESULTS - Particle Size Distribution of Soil & Hyrdrometer Analysis

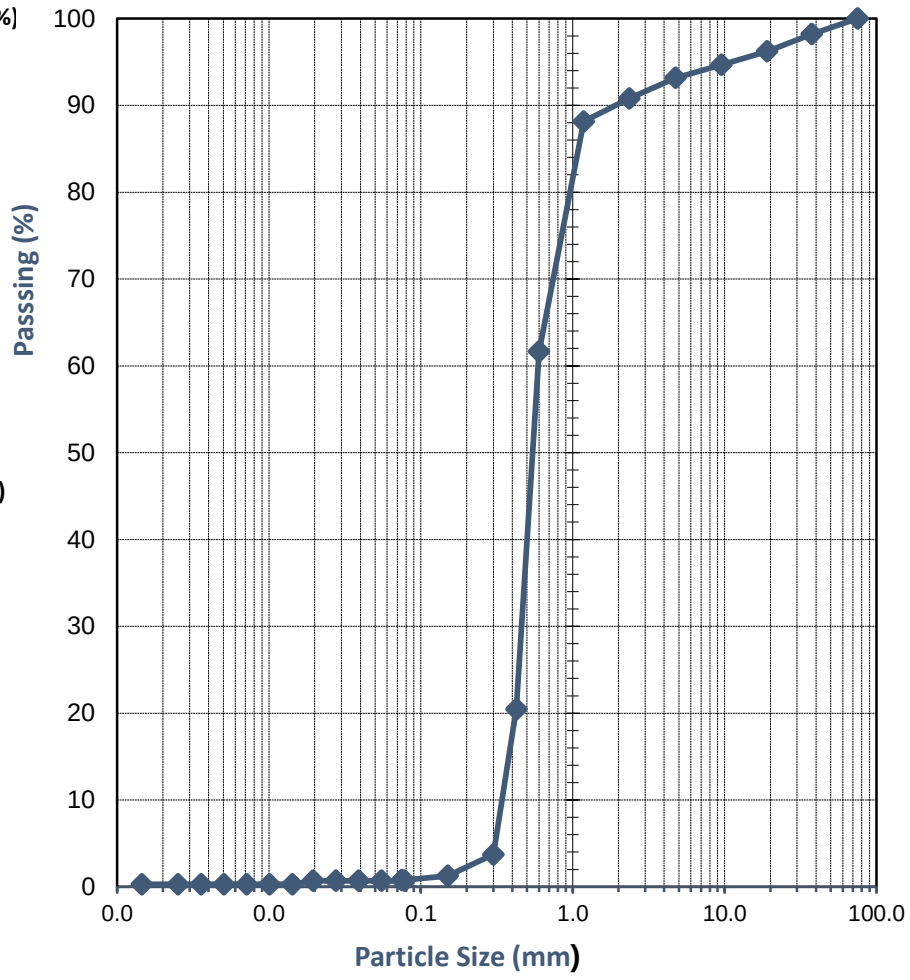
Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing (%)
75.0	100
37.5	98
19.0	96
9.5	95
4.75	93
2.36	91
1.18	88
0.600	62
0.425	20
0.300	4
0.150	1
0.075	1

Particle Diameter (mm ψ	Percent Finer (%)
0.0779	1
0.0551	1
0.0389	1
0.0275	1
0.0143	0
0.0101	0
0.0071	0
0.0050	0
0.0036	0
0.0025	0
0.0015	0

ψ AS 1289.3.5.1 -2.36mm Particle Density

2.66 g/cm3



Comments: ψ- AS 1289.3.5.1 & ψ AS 1289.3.6.3 - NATA Accreditation does not cover the performance of this service.

Approved Signatory:

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Date: 06/January/2021

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TEST REPORT - AS 1289.3.6.1 & ψ AS 1289. 3.6.3

Client:	ICM	*Ticket No.*	S2266
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/12015_1_PSDHY
Project:	Riverbed Material Assessment	*Sample No.*	WG20/12015
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	SS9	*Date Tested:*	3/01/2021

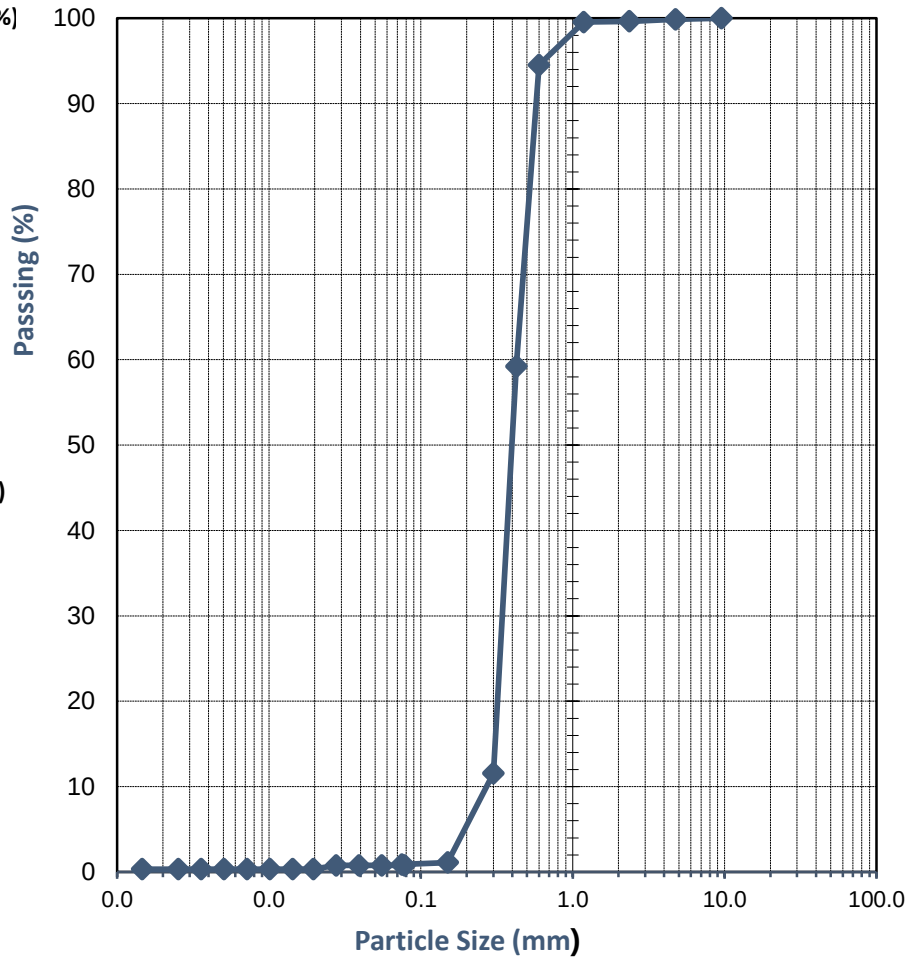
TEST RESULTS - Particle Size Distribution of Soil & Hyrdrometer Analysis

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing (%)
75.0	
37.5	
19.0	
9.5	100
4.75	100
2.36	100
1.18	100
0.600	95
0.425	59
0.300	12
0.150	1
0.075	1

Particle Diameter (mm ψ	Percent Finer (%)
0.0781	1
0.0552	1
0.0391	1
0.0276	1
0.0143	0
0.0101	0
0.0072	0
0.0051	0
0.0036	0
0.0025	0
0.0015	0

ψ AS 1289.3.5.1 -2.36mm Particle Density
2.65 g/cm3



Comments: ψ- AS 1289.3.5.1 & ψ AS 1289.3.6.3 - NATA Accreditation does not cover the performance of this service.

Approved Signatory:

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Date: 06/January/2021

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TEST REPORT - AS 1289.3.6.1 & ψ AS 1289. 3.6.3

Client:	ICM	*Ticket No.*	S2265
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/12001_1_PSDHY
Project:	Riverbed Material Assessment	*Sample No.*	WG20/12001
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	S No. 10	*Date Tested:*	5/01/2021

TEST RESULTS - Particle Size Distribution of Soil & Hyrdrometer Analysis

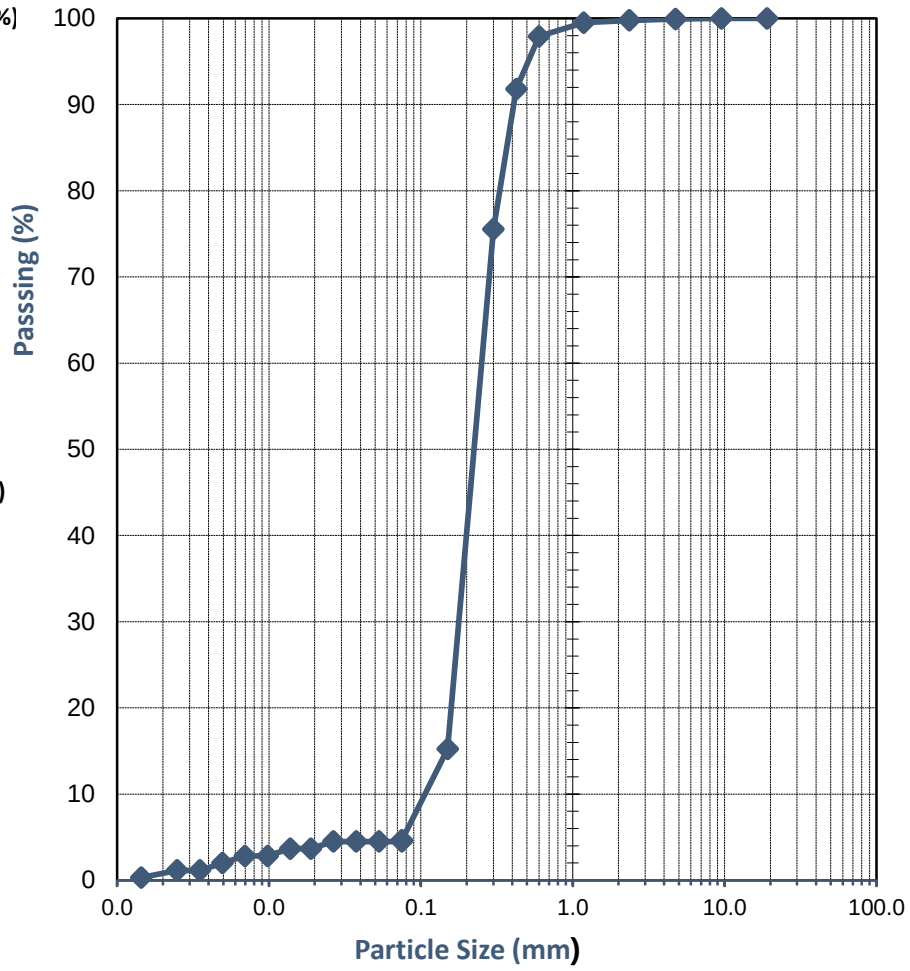
Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing (%)
75.0	
37.5	
19.0	100
9.5	100
4.75	100
2.36	100
1.18	100
0.600	98
0.425	92
0.300	76
0.150	15
0.075	5

Particle Diameter (mm ψ	Percent Finer (%)
0.0750	4
0.0530	4
0.0375	4
0.0265	4
0.0138	4
0.0098	3
0.0069	3
0.0049	2
0.0035	1
0.0025	1
0.0014	0

ψ AS 1289.3.5.1 -2.36mm Particle Density

2.7 g/cm3



Comments: ψ- AS 1289.3.5.1 & ψ AS 1289.3.6.3 - NATA Accreditation does not cover the performance of this service.

Approved Signatory:

Name: Matt van Herk

Date: 06/January/2021

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TEST REPORT - AS 1289.3.6.1 & ψ AS 1289. 3.6.3

Client:	ICM	*Ticket No.*	S2265
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/12002_1_PSDHY
Project:	Riverbed Material Assessment	*Sample No.*	WG20/12002
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	S No. 11	*Date Tested:*	4/01/2021

TEST RESULTS - Particle Size Distribution of Soil & Hyrdrometer Analysis

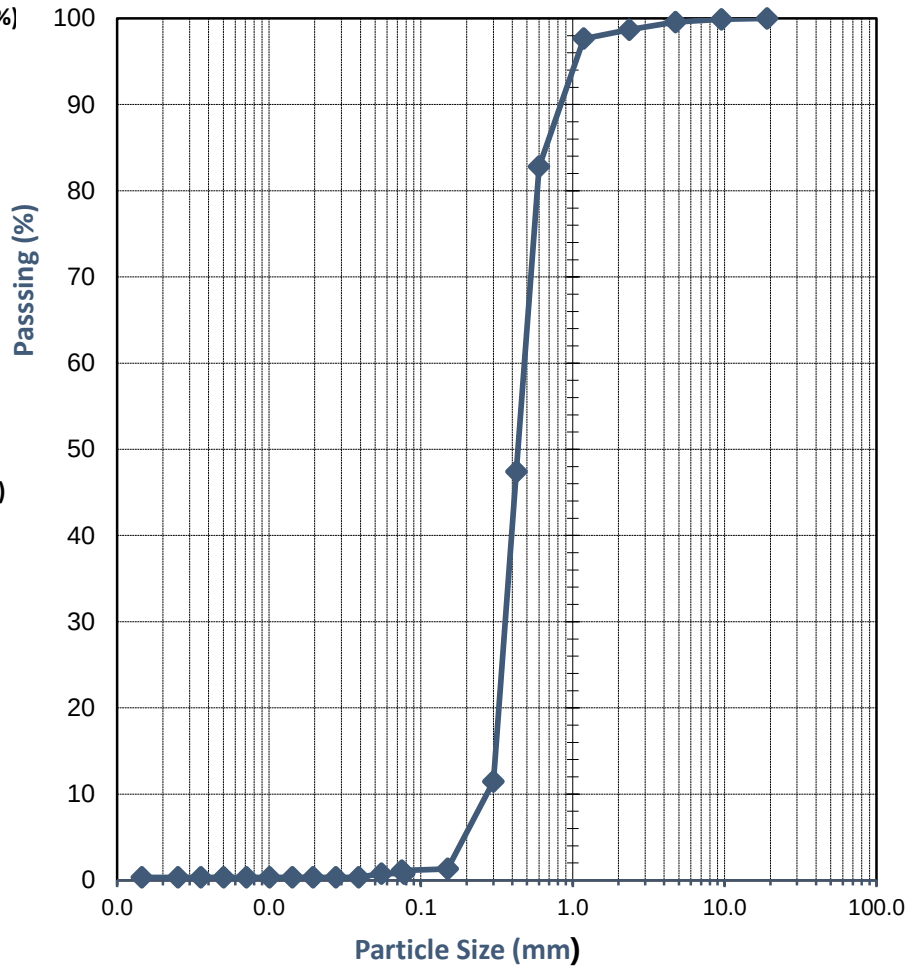
Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing (%)
75.0	
37.5	
19.0	100
9.5	100
4.75	100
2.36	99
1.18	98
0.600	83
0.425	47
0.300	11
0.150	1
0.075	1

Particle Diameter (mm ψ	Percent Finer (%)
0.0777	1
0.0549	1
0.0389	0
0.0275	0
0.0142	0
0.0101	0
0.0071	0
0.0050	0
0.0036	0
0.0025	0
0.0015	0

ψ AS 1289.3.5.1 -2.36mm Particle Density

2.67 g/cm3



Comments: ψ- AS 1289.3.5.1 & ψ AS 1289.3.6.3 - NATA Accreditation does not cover the performance of this service.

Approved Signatory:

Name: Matt van Herk

Date: 06/January/2021

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TEST REPORT - AS 1289.3.6.1 & ψ AS 1289. 3.6.3

Client:	ICM	*Ticket No.*	S2265
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/12003_1_PSDHY
Project:	Riverbed Material Assessment	*Sample No.*	WG20/12003
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	S No. 12	*Date Tested:*	4/01/2021

TEST RESULTS - Particle Size Distribution of Soil & Hyrdrometer Analysis

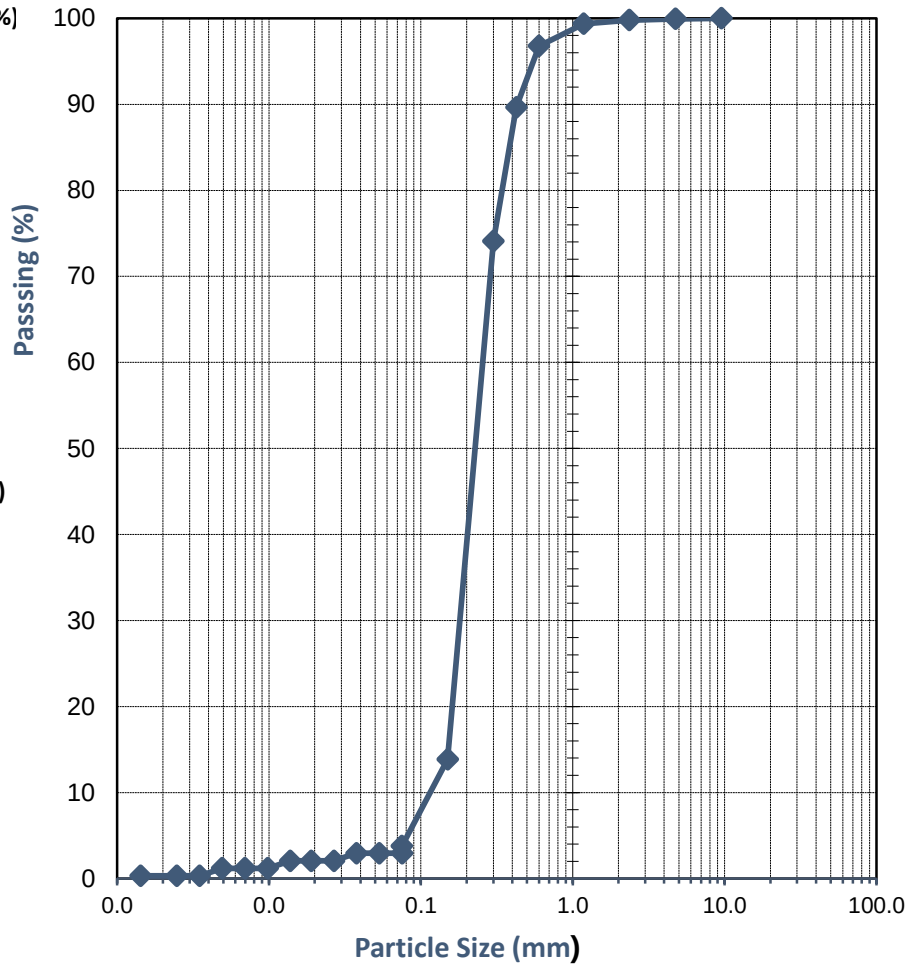
Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing (%)
75.0	
37.5	
19.0	
9.5	100
4.75	100
2.36	100
1.18	99
0.600	97
0.425	90
0.300	74
0.150	14
0.075	4

Particle Diameter (mm ψ	Percent Finer (%)
0.0752	3
0.0532	3
0.0376	3
0.0267	2
0.0138	2
0.0098	1
0.0069	1
0.0049	1
0.0035	0
0.0025	0
0.0014	0

ψ AS 1289.3.5.1 -2.36mm Particle Density

2.73 g/cm3



Comments: ψ- AS 1289.3.5.1 & ψ AS 1289.3.6.3 - NATA Accreditation does not cover the performance of this service.

Approved Signatory:

Name: Matt van Herk

Date: 06/January/2021

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TEST REPORT - AS 1289.3.6.1 & ψ AS 1289. 3.6.3

Client:	ICM	*Ticket No.*	S2266
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/12016_1_PSDHY
Project:	Riverbed Material Assessment	*Sample No.*	WG20/12016
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	SS13	*Date Tested:*	3/01/2021

TEST RESULTS - Particle Size Distribution of Soil & Hyrdrometer Analysis

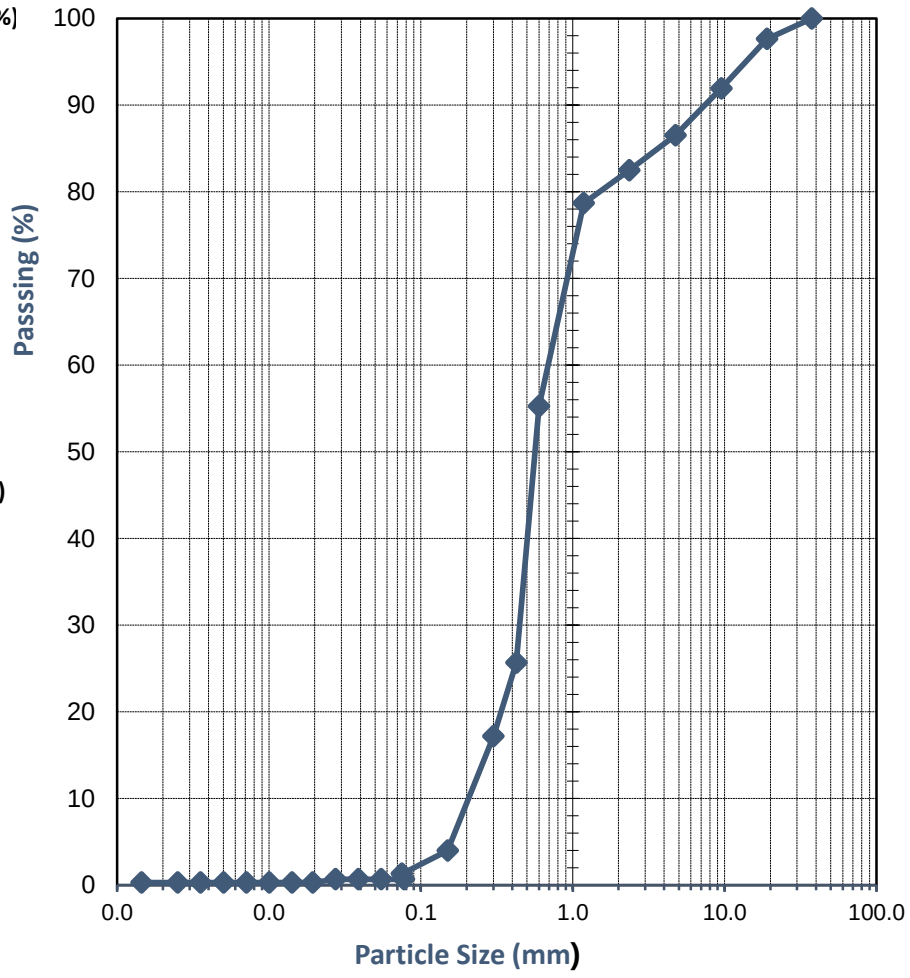
Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing (%)
75.0	
37.5	100
19.0	98
9.5	92
4.75	87
2.36	83
1.18	79
0.600	55
0.425	26
0.300	17
0.150	4
0.075	1

Particle Diameter (mm ψ	Percent Finer (%)
0.0774	1
0.0547	1
0.0387	1
0.0274	1
0.0142	0
0.0100	0
0.0071	0
0.0050	0
0.0035	0
0.0025	0
0.0014	0

ψ AS 1289.3.5.1 -2.36mm Particle Density

2.68 g/cm3



Comments: ψ- AS 1289.3.5.1 & ψ AS 1289.3.6.3 - NATA Accreditation does not cover the performance of this service.

Approved Signatory:

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Date: 06/January/2021

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TEST REPORT - AS 1289.3.6.1 & ψ AS 1289. 3.6.3

Client:	ICM	*Ticket No.*	S2265
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/12004_1_PSDHY
Project:	Riverbed Material Assessment	*Sample No.*	WG20/12004
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	S No. 14	*Date Tested:*	4/01/2021

TEST RESULTS - Particle Size Distribution of Soil & Hyrdrometer Analysis

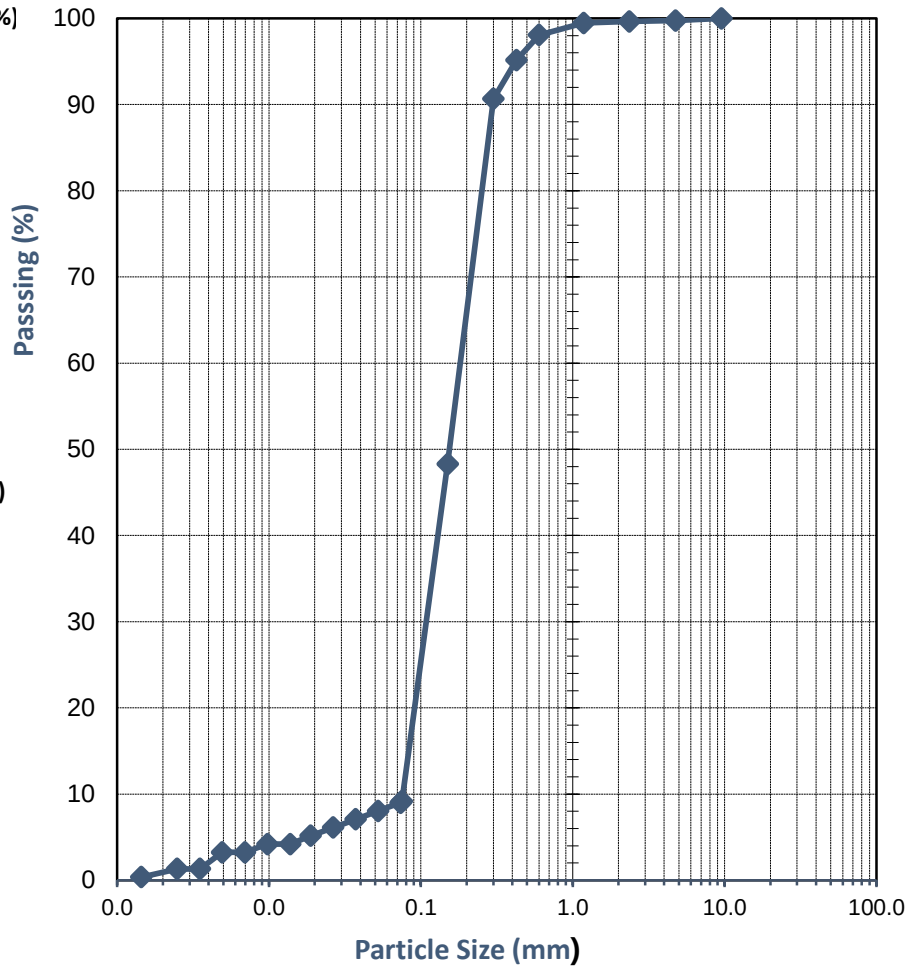
Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing (%)
75.0	
37.5	
19.0	
9.5	100
4.75	100
2.36	100
1.18	99
0.600	98
0.425	95
0.300	91
0.150	48
0.075	9

Particle Diameter (mm ψ	Percent Finer (%)
0.0735	9
0.0523	8
0.0372	7
0.0264	6
0.0138	4
0.0098	4
0.0069	3
0.0049	3
0.0035	1
0.0025	1
0.0014	0

ψ AS 1289.3.5.1 -2.36mm Particle Density

2.69 g/cm3



Comments: ψ- AS 1289.3.5.1 & ψ AS 1289.3.6.3 - NATA Accreditation does not cover the performance of this service.

Approved Signatory:

Name: Matt van Herk

Date: 06/January/2021

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SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.6.1 & ψ AS 1289. 3.6.3

Client:	ICM	*Ticket No.*	S2265
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/12005_1_PSDHY
Project:	Riverbed Material Assessment	*Sample No.*	WG20/12005
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	S No. 15	*Date Tested:*	4/01/2021

TEST RESULTS - Particle Size Distribution of Soil & Hyrdrometer Analysis

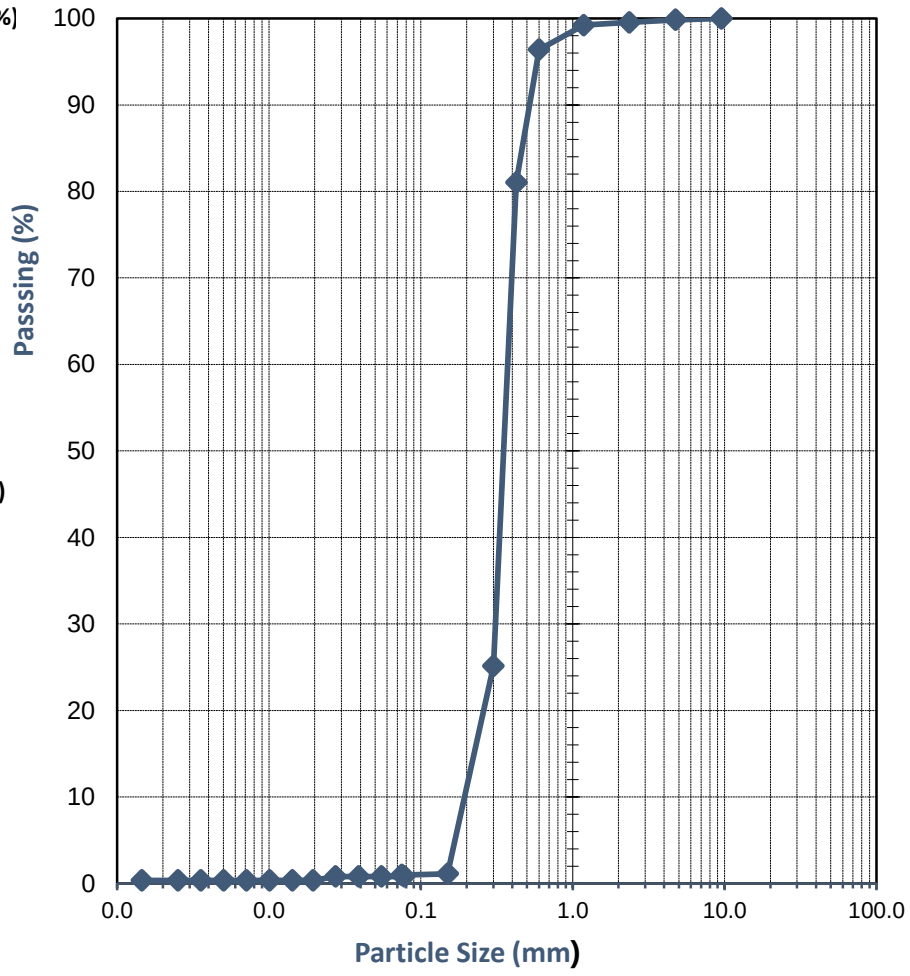
Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing (%)
75.0	
37.5	
19.0	
9.5	100
4.75	100
2.36	100
1.18	99
0.600	96
0.425	81
0.300	25
0.150	1
0.075	1

Particle Diameter (mm ψ	Percent Finer (%)
0.0777	1
0.0549	1
0.0388	1
0.0275	1
0.0142	0
0.0101	0
0.0071	0
0.0050	0
0.0036	0
0.0025	0
0.0015	0

ψ AS 1289.3.5.1 -2.36mm Particle Density

2.67 g/cm3



Comments: ψ- AS 1289.3.5.1 & ψ AS 1289.3.6.3 - NATA Accreditation does not cover the performance of this service.

Approved Signatory:

Name: Matt van Herk

Date: 06/January/2021

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Accreditation No. 20599
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WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.6.1 & ψ AS 1289. 3.6.3

Client:	ICM	*Ticket No.*	S2265
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/12006_1_PSDHY
Project:	Riverbed Material Assessment	*Sample No.*	WG20/12006
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	S No. 16	*Date Tested:*	4/01/2021

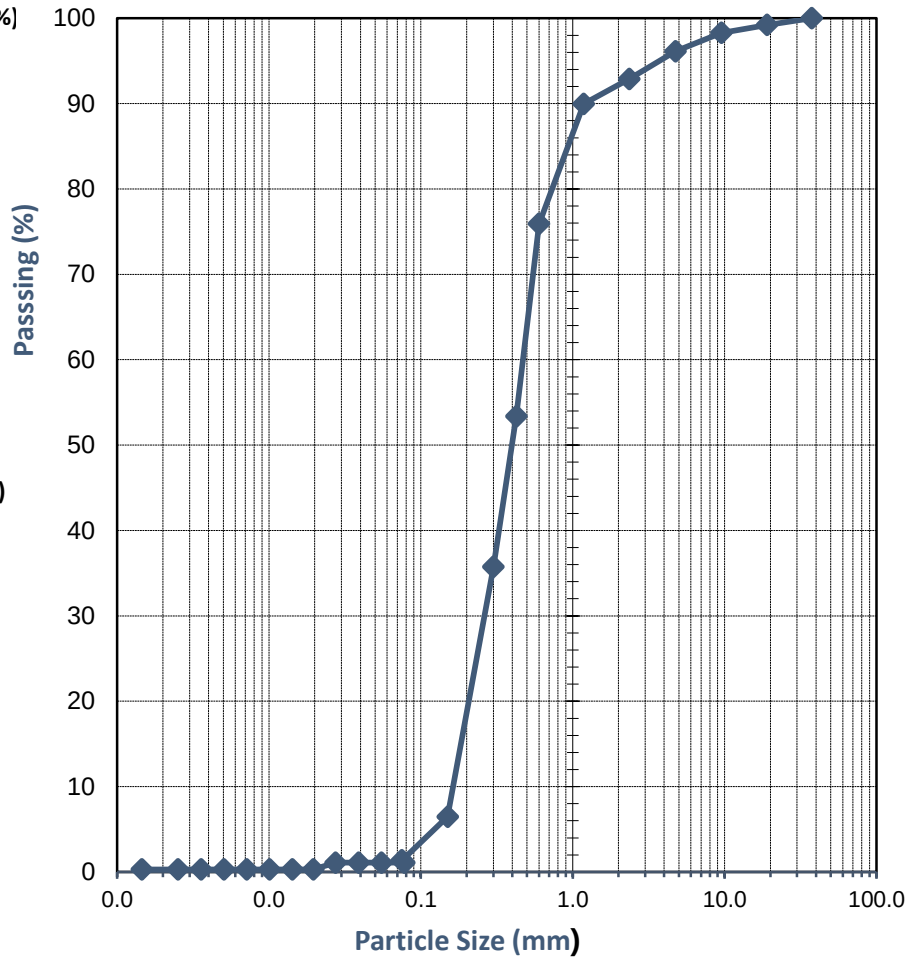
TEST RESULTS - Particle Size Distribution of Soil & Hyrdrometer Analysis

Sampling Method: **Sampled by Client, Tested as Received**

Sieve Size (mm)	Percent Passing (%)
75.0	
37.5	100
19.0	99
9.5	98
4.75	96
2.36	93
1.18	90
0.600	76
0.425	53
0.300	36
0.150	6
0.075	1

Particle Diameter (mm ψ	Percent Finer (%)
0.0777	1
0.0549	1
0.0388	1
0.0275	1
0.0143	0
0.0101	0
0.0071	0
0.0050	0
0.0036	0
0.0025	0
0.0015	0

ψ AS 1289.3.5.1 -2.36mm Particle Density
2.66 g/cm3



Comments: ψ- AS 1289.3.5.1 & ψ AS 1289.3.6.3 - NATA Accreditation does not cover the performance of this service.

Approved Signatory:

Name: Matt van Herk
Date: 06/January/2021

Accreditation No. 20599
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WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.6.1 & ψ AS 1289. 3.6.3

Client:	ICM	*Ticket No.*	S2265
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/12007_1_PSDHY
Project:	Riverbed Material Assessment	*Sample No.*	WG20/12007
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	S No. 17	*Date Tested:*	3/01/2021

TEST RESULTS - Particle Size Distribution of Soil & Hyrdrometer Analysis

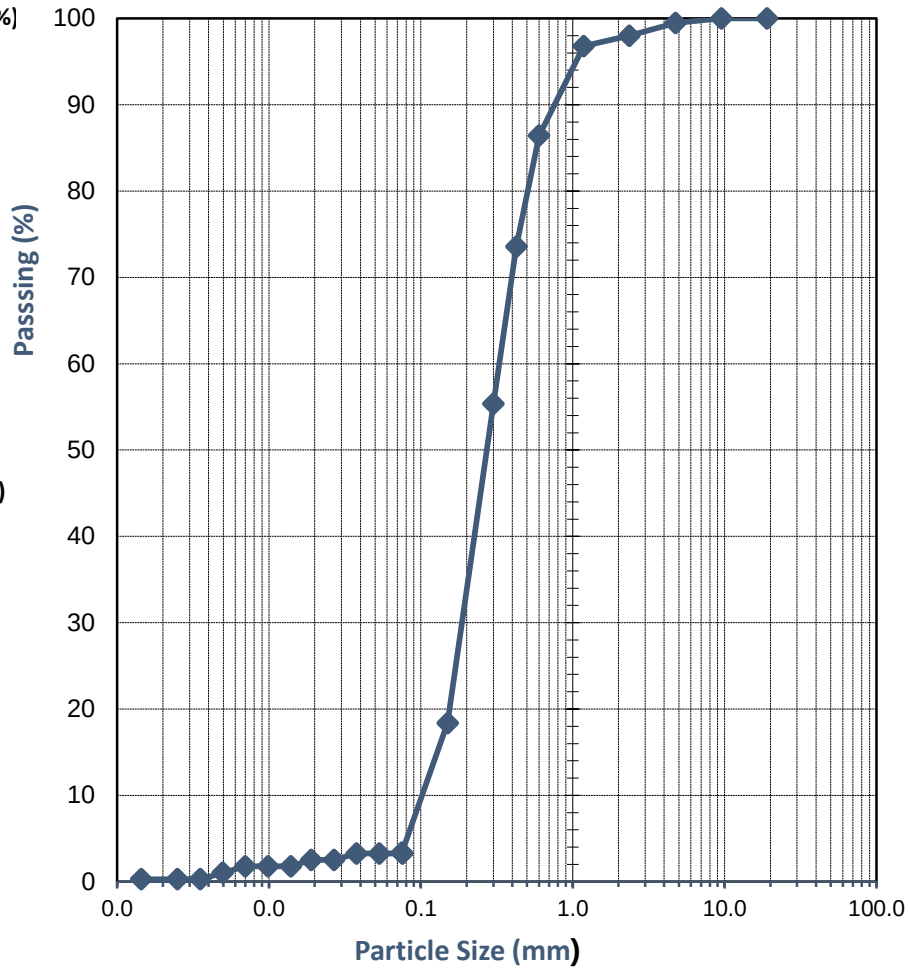
Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing (%)
75.0	
37.5	
19.0	100
9.5	100
4.75	99
2.36	98
1.18	97
0.600	86
0.425	74
0.300	55
0.150	18
0.075	3

Particle Diameter (mm ψ	Percent Finer (%)
0.0754	3
0.0533	3
0.0377	3
0.0268	3
0.0139	2
0.0099	2
0.0070	2
0.0050	1
0.0035	0
0.0025	0
0.0014	0

ψ AS 1289.3.5.1 -2.36mm Particle Density

2.7 g/cm3



Comments: ψ- AS 1289.3.5.1 & ψ AS 1289.3.6.3 - NATA Accreditation does not cover the performance of this service.

Approved Signatory:

Name: Matt van Herk

Date: 06/January/2021

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SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.6.1 & ψ AS 1289. 3.6.3

Client:	ICM	*Ticket No.*	S2266
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/12017_1_PSDHY
Project:	Riverbed Material Assessment	*Sample No.*	WG20/12017
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	SS18	*Date Tested:*	4/01/2021

TEST RESULTS - Particle Size Distribution of Soil & Hyrdrometer Analysis

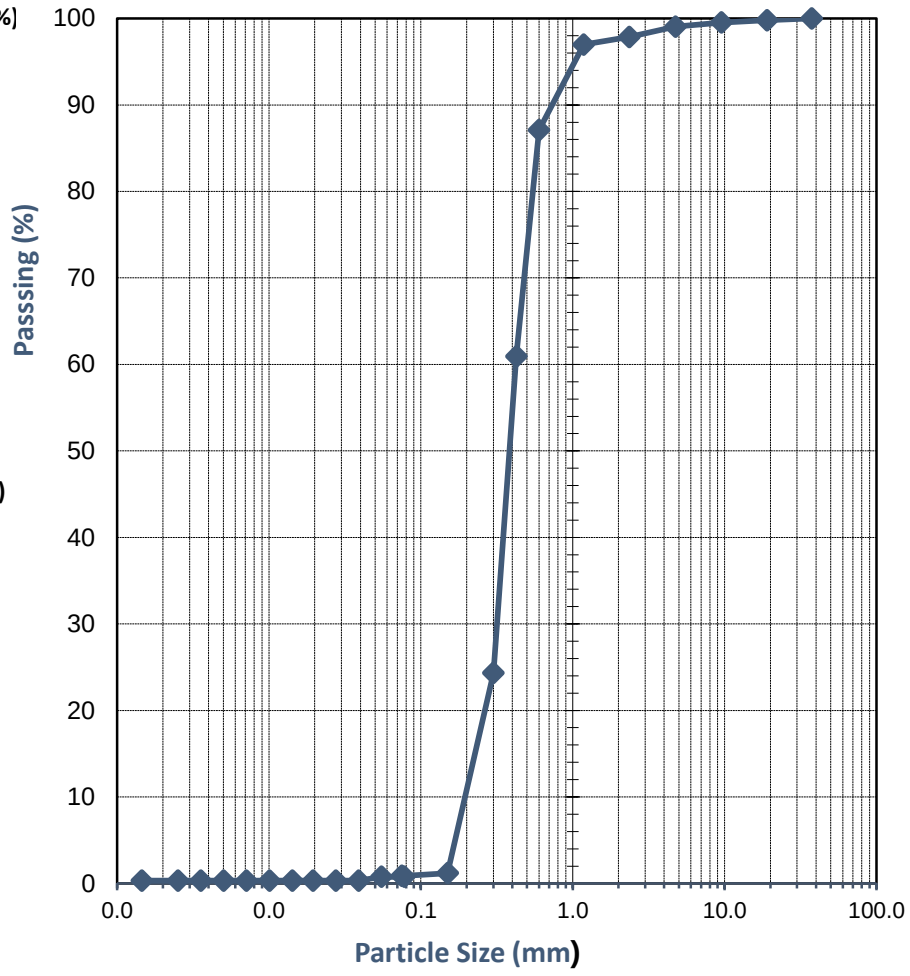
Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing (%)
75.0	
37.5	100
19.0	100
9.5	100
4.75	99
2.36	98
1.18	97
0.600	87
0.425	61
0.300	24
0.150	1
0.075	1

Particle Diameter (mm ψ	Percent Finer (%)
0.0777	1
0.0549	1
0.0389	0
0.0275	0
0.0142	0
0.0101	0
0.0071	0
0.0050	0
0.0036	0
0.0025	0
0.0015	0

ψ AS 1289.3.5.1 -2.36mm Particle Density

2.67 g/cm3



Comments: ψ- AS 1289.3.5.1 & ψ AS 1289.3.6.3 - NATA Accreditation does not cover the performance of this service.

Approved Signatory:

Name: Matt van Herk

Date: 06/January/2021

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WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.6.1 & ψ AS 1289. 3.6.3

Client:	ICM	*Ticket No.*	S2266
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/12018_1_PSDHY
Project:	Riverbed Material Assessment	*Sample No.*	WG20/12018
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	SS19	*Date Tested:*	4/01/2020

TEST RESULTS - Particle Size Distribution of Soil & Hyrdrometer Analysis

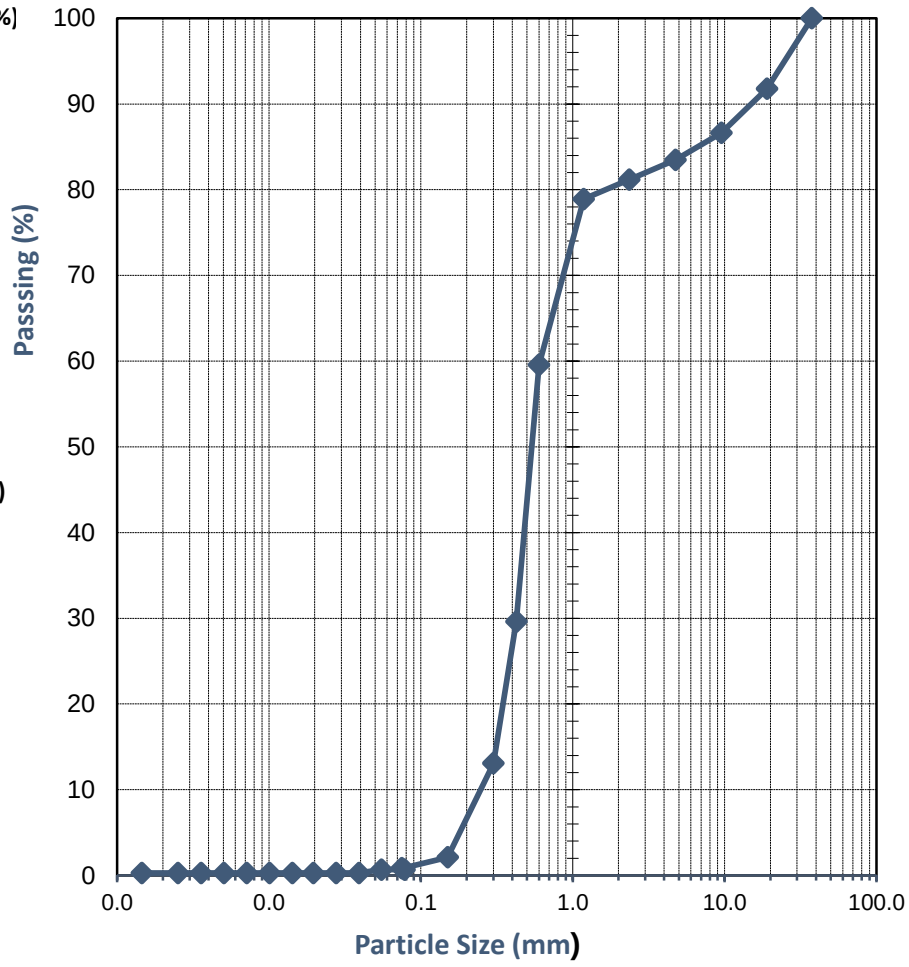
Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing (%)
75.0	
37.5	100
19.0	92
9.5	87
4.75	83
2.36	81
1.18	79
0.600	60
0.425	30
0.300	13
0.150	2
0.075	1

Particle Diameter (mm ψ	Percent Finer (%)
0.0779	1
0.0551	1
0.0391	0
0.0276	0
0.0143	0
0.0101	0
0.0071	0
0.0050	0
0.0036	0
0.0025	0
0.0015	0

ψ AS 1289.3.5.1 -2.36mm Particle Density

2.66 g/cm3



Comments: ψ- AS 1289.3.5.1 & ψ AS 1289.3.6.3 - NATA Accreditation does not cover the performance of this service.

Approved Signatory:

Name: Matt van Herk

Date: 06/January/2021

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SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.6.1 & ψ AS 1289. 3.6.3

Client:	ICM	*Ticket No.*	S2265
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/12008_1_PSDHY
Project:	Riverbed Material Assessment	*Sample No.*	WG20/12008
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	S No. 20	*Date Tested:*	3/01/2021

TEST RESULTS - Particle Size Distribution of Soil & Hyrdrometer Analysis

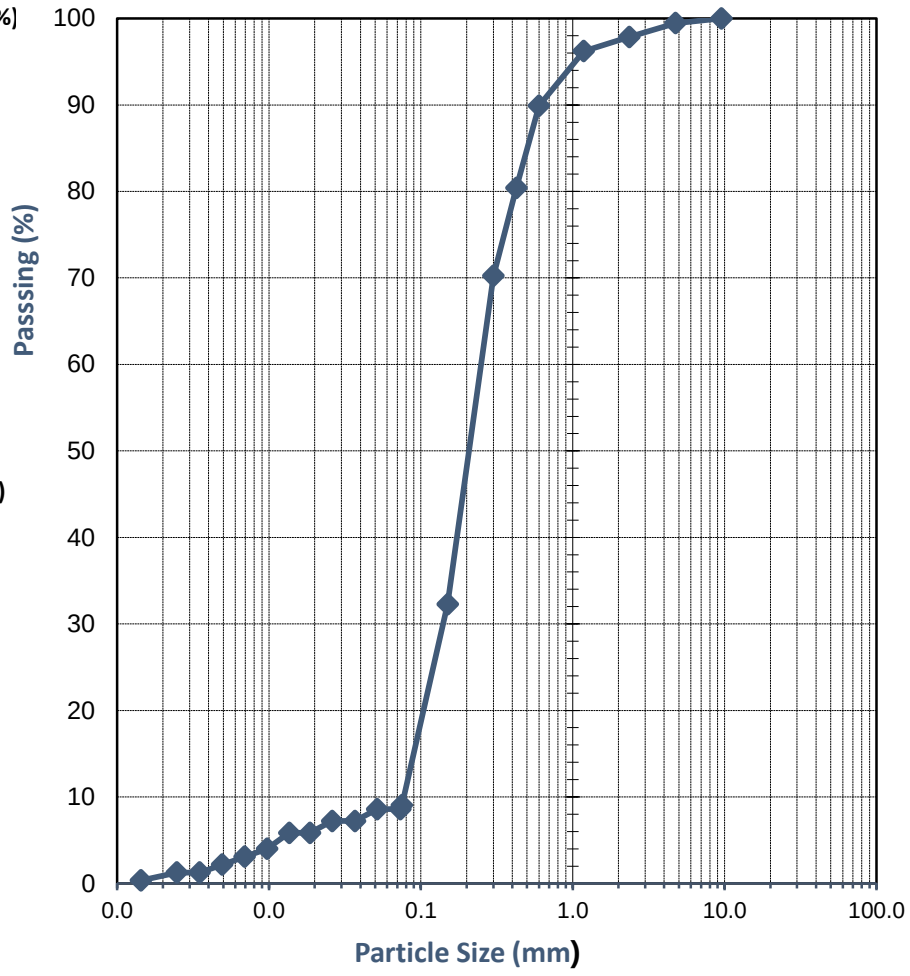
Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing (%)
75.0	
37.5	
19.0	
9.5	100
4.75	99
2.36	98
1.18	96
0.600	90
0.425	80
0.300	70
0.150	32
0.075	9

Particle Diameter (mm ψ	Percent Finer (%)
0.0730	9
0.0516	9
0.0368	7
0.0261	7
0.0136	6
0.0097	4
0.0069	3
0.0049	2
0.0035	1
0.0025	1
0.0014	0

ψ AS 1289.3.5.1 -2.36mm Particle Density

2.71 g/cm3



Comments: ψ- AS 1289.3.5.1 & ψ AS 1289.3.6.3 - NATA Accreditation does not cover the performance of this service.

Approved Signatory:

Name: Matt van Herk

Date: 06/January/2021

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TEST REPORT - AS 1289.3.6.1 & ψ AS 1289. 3.6.3

Client:	ICM	*Ticket No.*	S2266
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/12019_1_PSDHY
Project:	Riverbed Material Assessment	*Sample No.*	WG20/12019
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	SS21	*Date Tested:*	4/01/2021

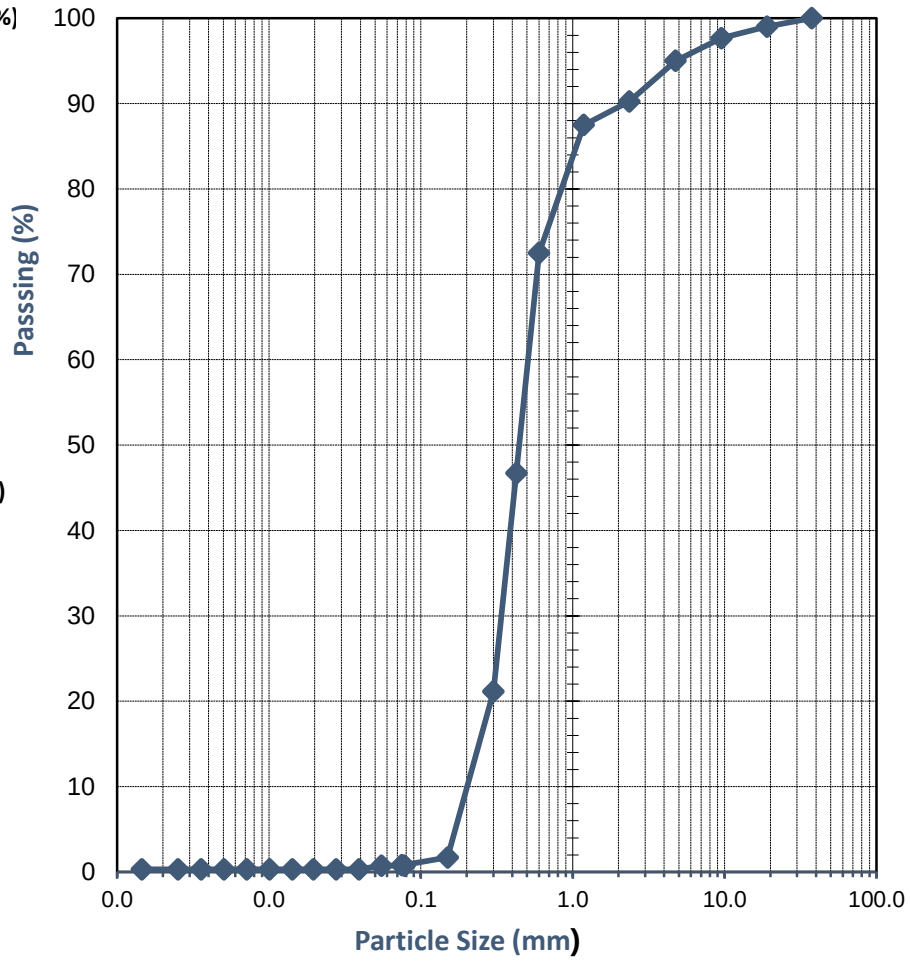
TEST RESULTS - Particle Size Distribution of Soil & Hyrdrometer Analysis

Sampling Method: **Sampled by Client, Tested as Received**

Sieve Size (mm)	Percent Passing (%)
75.0	
37.5	100
19.0	99
9.5	98
4.75	95
2.36	90
1.18	87
0.600	72
0.425	47
0.300	21
0.150	2
0.075	1

Particle Diameter (mm ψ	Percent Finer (%)
0.0779	1
0.0551	1
0.0391	0
0.0276	0
0.0143	0
0.0101	0
0.0071	0
0.0050	0
0.0036	0
0.0025	0
0.0015	0

ψ AS 1289.3.5.1 -2.36mm Particle Density
2.66 g/cm3



Comments: ψ- AS 1289.3.5.1 & ψ AS 1289.3.6.3 - NATA Accreditation does not cover the performance of this service.

Approved Signatory:

Name: Matt van Herk
Date: 06/January/2021

Accreditation No. 20599
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Appendix A: Particle Size Distribution of Soil & Hydrometer Analysis

SEDIMENT SAMPLES OPTIONAL ONE (01) TO OPTIONAL SIXTEEN (016)

WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.6.1 & ψ AS 1289. 3.6.3

Client:	ICM	*Ticket No.*	S2264
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/11984_1_PSDHY
Project:	Riverbed Material Assessment	*Sample No.*	WG20/11984
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	SS01	*Date Tested:*	31/12/2020

TEST RESULTS - Particle Size Distribution of Soil & Hyrdrometer Analysis

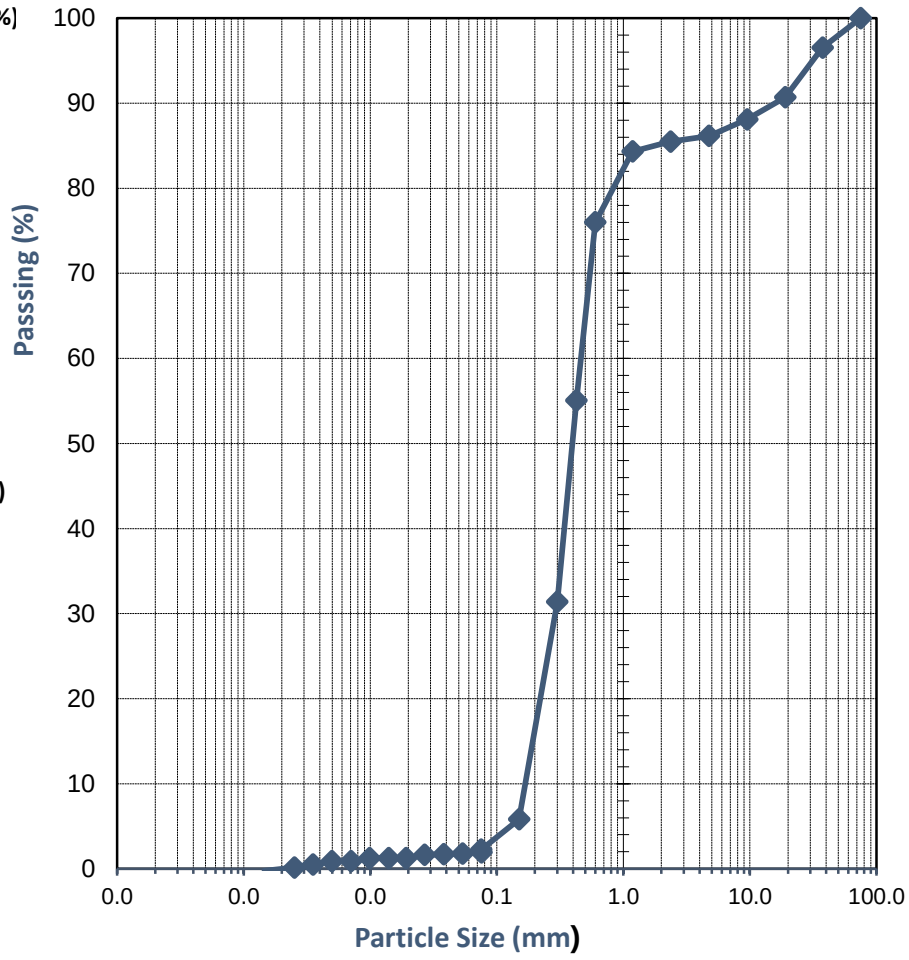
Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing (%)
75.0	100
37.5	97
19.0	91
9.5	88
4.75	86
2.36	85
1.18	84
0.600	76
0.425	55
0.300	31
0.150	6
0.075	2

Particle Diameter (mm ψ	Percent Finer (%)
0.0758	2
0.0537	2
0.0380	2
0.0269	2
0.0140	1
0.0099	1
0.0070	1
0.0050	1
0.0035	1
0.0025	0
0.0015	0

AS 1289.3.5.1 -2.36mm Particle Density

2.67 g/cm3



Comments: ψ- AS 1289.3.5.1 & ψ AS 1289.3.6.3 - NATA Accreditation does not cover the performance of this service.

Approved Signatory:

Name: Matt van Herk

Date: 04/January/2021

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WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.6.1 & ψ AS 1289. 3.6.3

Client:	ICM	*Ticket No.*	S2264
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/11985_1_PSDHY
Project:	Riverbed Material Assessment	*Sample No.*	WG20/11985
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	SS02	*Date Tested:*	31/12/2020

TEST RESULTS - Particle Size Distribution of Soil & Hyrdrometer Analysis

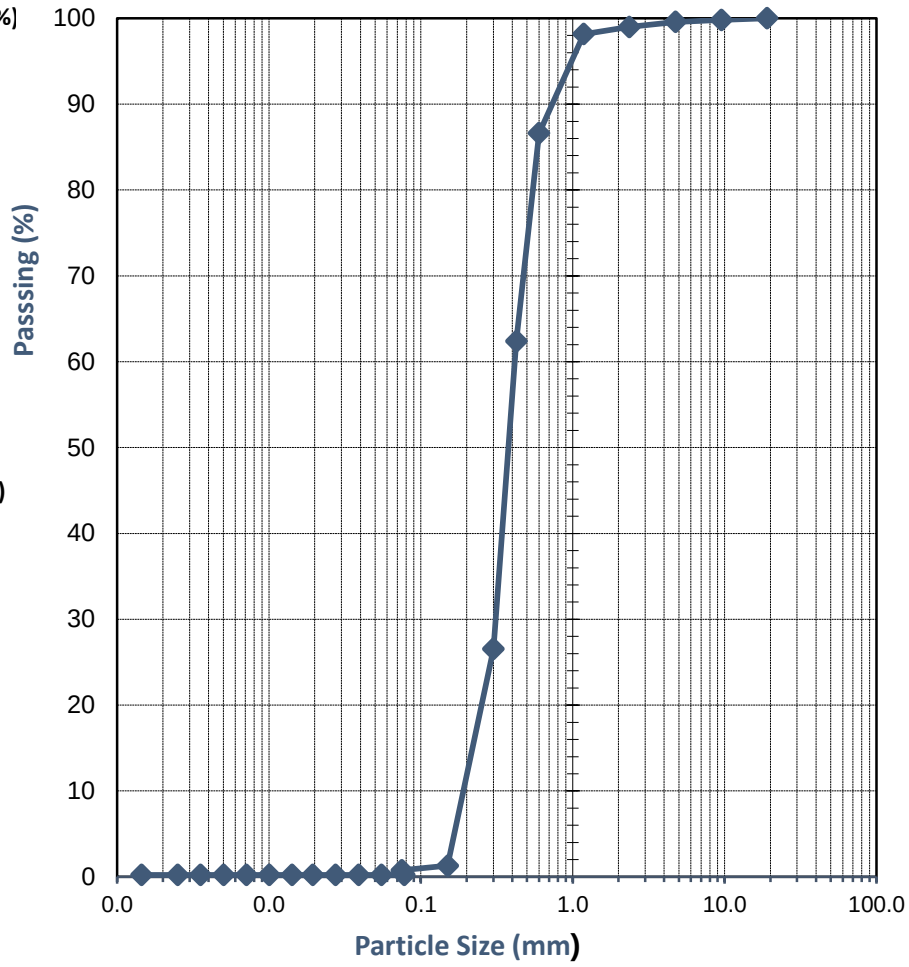
Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing (%)
75.0	
37.5	
19.0	100
9.5	100
4.75	100
2.36	99
1.18	98
0.600	87
0.425	62
0.300	27
0.150	1
0.075	1

Particle Diameter (mm ψ	Percent Finer (%)
0.0776	0
0.0549	0
0.0388	0
0.0274	0
0.0142	0
0.0100	0
0.0071	0
0.0050	0
0.0035	0
0.0025	0
0.0014	0

ψ AS 1289.3.5.1 -2.36mm Particle Density

2.68 g/cm3



Comments: ψ- AS 1289.3.5.1 & ψ AS 1289.3.6.3 - NATA Accreditation does not cover the performance of this service.

Approved Signatory:

Name: Matt van Herk

Date: 04/January/2021

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SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.6.1 & ψ AS 1289. 3.6.3

Client:	ICM	*Ticket No.*	S2266
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/12020_1_PSDHY
Project:	Riverbed Material Assessment	*Sample No.*	WG20/12020
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	OPT.03	*Date Tested:*	5/01/2021

TEST RESULTS - Particle Size Distribution of Soil & Hyrdrometer Analysis

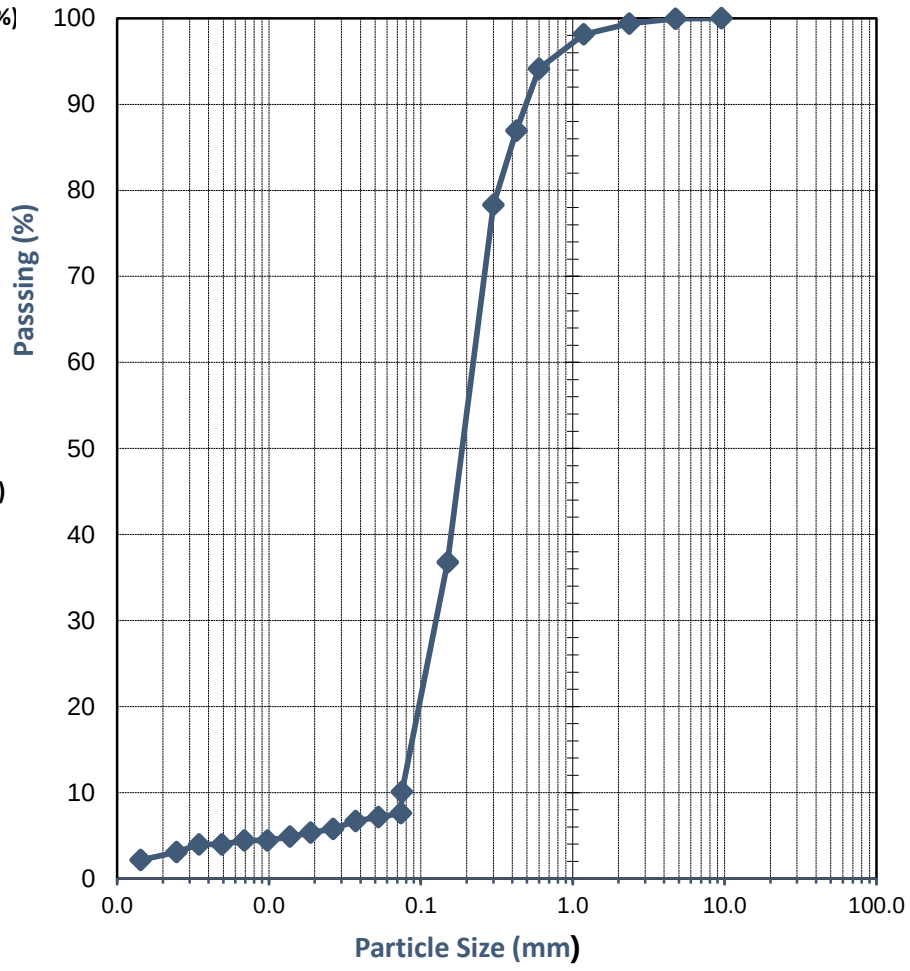
Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing (%)
75.0	
37.5	
19.0	
9.5	100
4.75	100
2.36	99
1.18	98
0.600	94
0.425	87
0.300	78
0.150	37
0.075	10

Particle Diameter (mm ψ	Percent Finer (%)
0.0739	8
0.0524	7
0.0372	7
0.0264	6
0.0137	5
0.0097	4
0.0069	4
0.0049	4
0.0035	4
0.0025	3
0.0014	2

ψ AS 1289.3.5.1 -2.36mm Particle Density

2.69 g/cm3



Comments: ψ- AS 1289.3.5.1 & ψ AS 1289.3.6.3 - NATA Accreditation does not cover the performance of this service.

Approved Signatory:

Name: Matt van Herk

Date: 06/January/2021

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WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.6.1 & ψ AS 1289. 3.6.3

Client:	ICM	*Ticket No.*	S2264
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/11986_1_PSDHY
Project:	Riverbed Material Assessment	*Sample No.*	WG20/11986
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	SS04	*Date Tested:*	31/12/2020

TEST RESULTS - Particle Size Distribution of Soil & Hyrdrometer Analysis

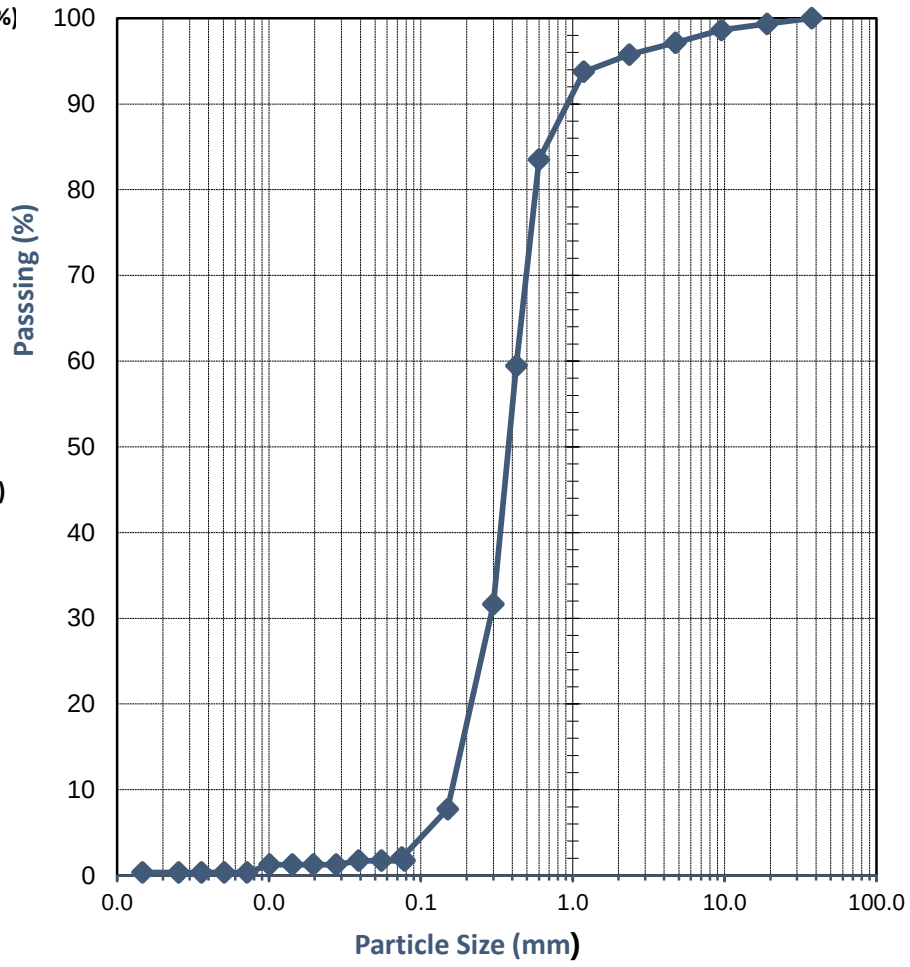
Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing (%)
75.0	
37.5	100
19.0	99
9.5	99
4.75	97
2.36	96
1.18	94
0.600	84
0.425	59
0.300	32
0.150	8
0.075	2

Particle Diameter (mm ψ	Percent Finer (%)
0.0779	2
0.0551	2
0.0390	2
0.0276	1
0.0143	1
0.0101	1
0.0072	0
0.0051	0
0.0036	0
0.0025	0
0.0015	0

ψ AS 1289.3.5.1 -2.36mm Particle Density

2.64 g/cm3



Comments: ψ- AS 1289.3.5.1 & ψ AS 1289.3.6.3 - NATA Accreditation does not cover the performance of this service.

Approved Signatory:

Name: Matt van Herk

Date: 04/January/2021

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SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.6.1 & ψ AS 1289. 3.6.3

Client:	ICM	*Ticket No.*	S2264
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/11987_1_PSDHY
Project:	Riverbed Material Assessment	*Sample No.*	WG20/11987
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	SS05	*Date Tested:*	31/12/2020

TEST RESULTS - Particle Size Distribution of Soil & Hyrdrometer Analysis

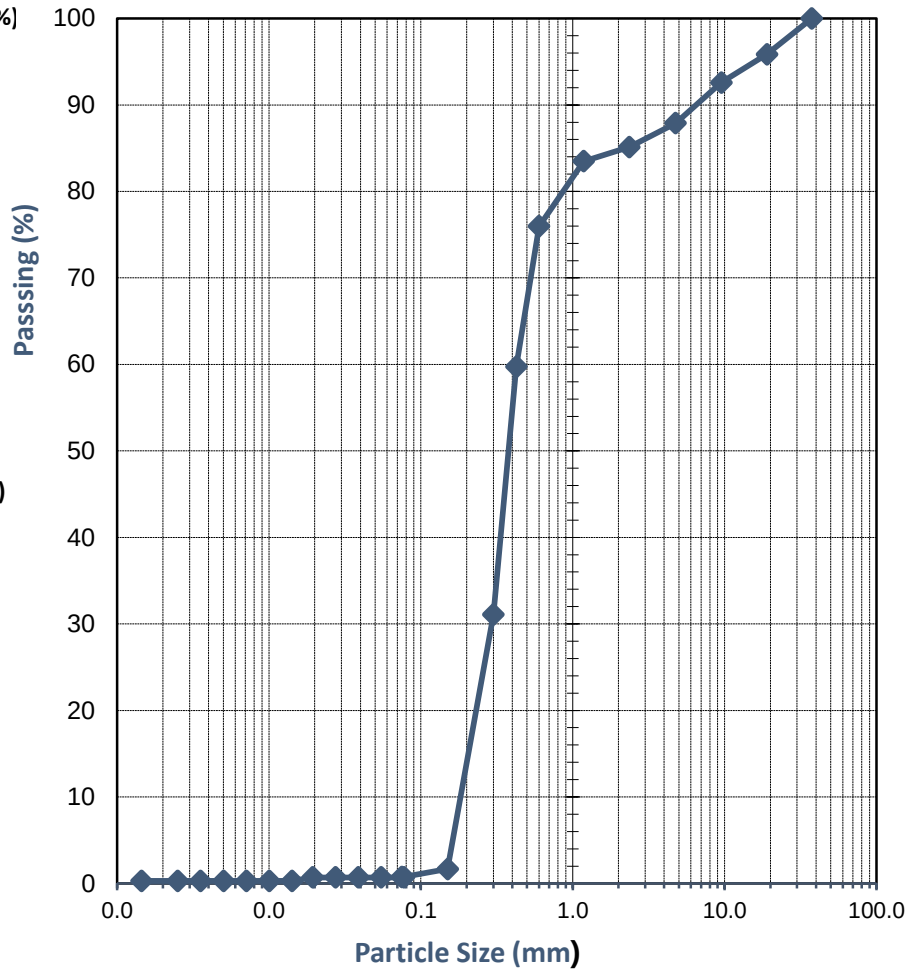
Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing (%)
75.0	
37.5	100
19.0	96
9.5	93
4.75	88
2.36	85
1.18	83
0.600	76
0.425	60
0.300	31
0.150	2
0.075	1

Particle Diameter (mm ψ	Percent Finer (%)
0.0774	1
0.0547	1
0.0387	1
0.0274	1
0.0142	0
0.0100	0
0.0071	0
0.0050	0
0.0035	0
0.0025	0
0.0014	0

ψ AS 1289.3.5.1 -2.36mm Particle Density

2.68 g/cm3



Comments: ψ- AS 1289.3.5.1 & ψ AS 1289.3.6.3 - NATA Accreditation does not cover the performance of this service.

Approved Signatory:

Name: Matt van Herk

Date: 04/January/2021

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SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.6.1 & ψ AS 1289. 3.6.3

Client:	ICM	*Ticket No.*	S2264
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/11988_1_PSDHY
Project:	Riverbed Material Assessment	*Sample No.*	WG20/11988
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	SS06	*Date Tested:*	31/12/2020

TEST RESULTS - Particle Size Distribution of Soil & Hyrdrometer Analysis

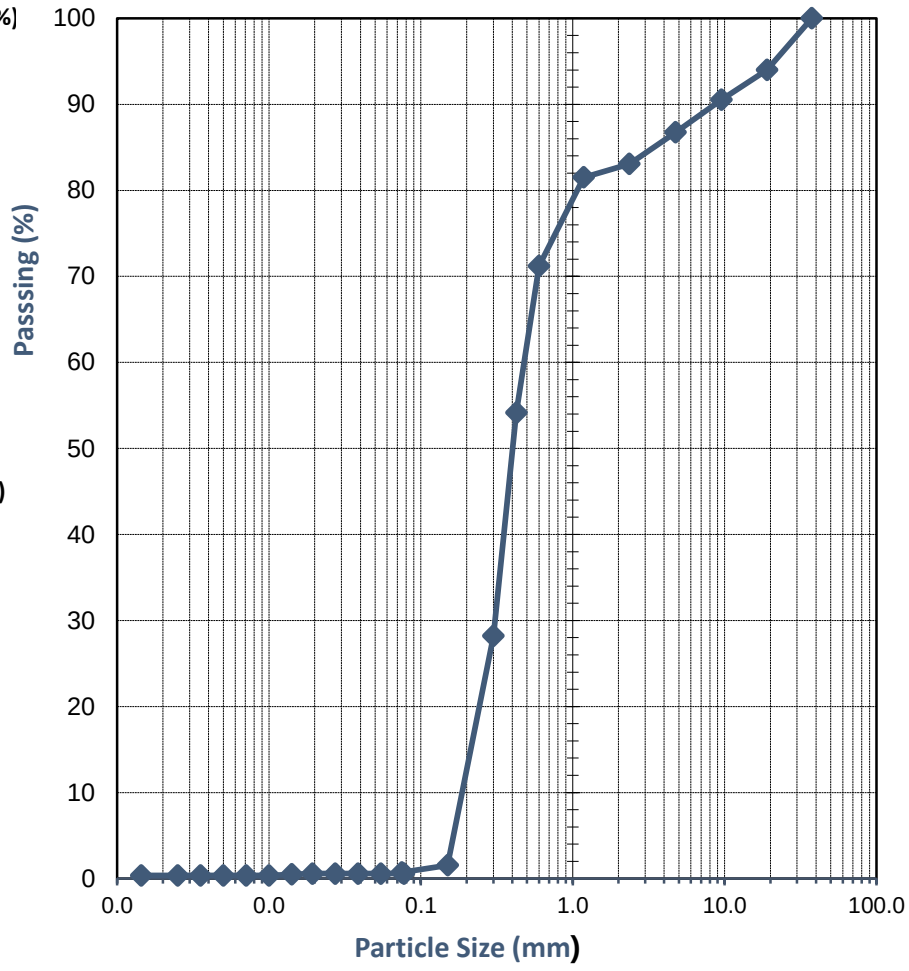
Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing (%)
75.0	
37.5	100
19.0	94
9.5	91
4.75	87
2.36	83
1.18	82
0.600	71
0.425	54
0.300	28
0.150	2
0.075	1

Particle Diameter (mm ψ	Percent Finer (%)
0.0772	1
0.0546	1
0.0386	1
0.0273	1
0.0141	0
0.0100	0
0.0071	0
0.0050	0
0.0035	0
0.0025	0
0.0014	0

ψ AS 1289.3.5.1 -2.36mm Particle Density

2.68 g/cm3



Comments: ψ- AS 1289.3.5.1 & ψ AS 1289.3.6.3 - NATA Accreditation does not cover the performance of this service.

Approved Signatory:

Name: Matt van Herk

Date: 04/January/2021

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Accreditation No. 20599

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WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.6.1 & ψ AS 1289. 3.6.3

Client:	ICM	*Ticket No.*	S2264
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/11989_1_PSDHY
Project:	Riverbed Material Assessment	*Sample No.*	WG20/11989
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	SS07	*Date Tested:*	31/12/2020

TEST RESULTS - Particle Size Distribution of Soil & Hyrdrometer Analysis

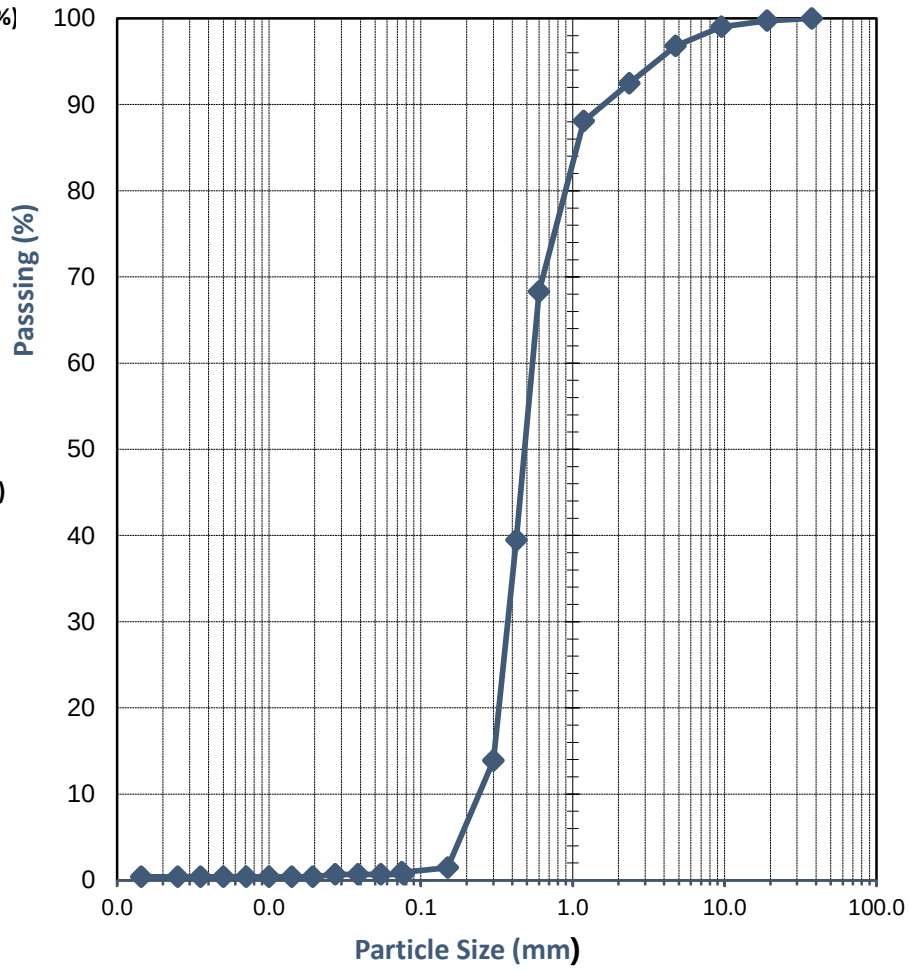
Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing (%)
75.0	
37.5	100
19.0	100
9.5	99
4.75	97
2.36	92
1.18	88
0.600	68
0.425	39
0.300	14
0.150	1
0.075	1

Particle Diameter (mm ψ	Percent Finer (%)
0.0770	1
0.0544	1
0.0385	1
0.0272	1
0.0141	0
0.0100	0
0.0071	0
0.0050	0
0.0035	0
0.0025	0
0.0014	0

ψ AS 1289.3.5.1 -2.36mm Particle Density

2.67 g/cm3



Comments: ψ- AS 1289.3.5.1 & ψ AS 1289.3.6.3 - NATA Accreditation does not cover the performance of this service.

Approved Signatory:

Name: Matt van Herk

Date: 04/January/2021

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TEST REPORT - AS 1289.3.6.1 & ψ AS 1289. 3.6.3

Client:	ICM	*Ticket No.*	S2264
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/11990_1_PSDHY
Project:	Riverbed Material Assessment	*Sample No.*	WG20/11990
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	SS08	*Date Tested:*	31/12/2020

TEST RESULTS - Particle Size Distribution of Soil & Hyrdrometer Analysis

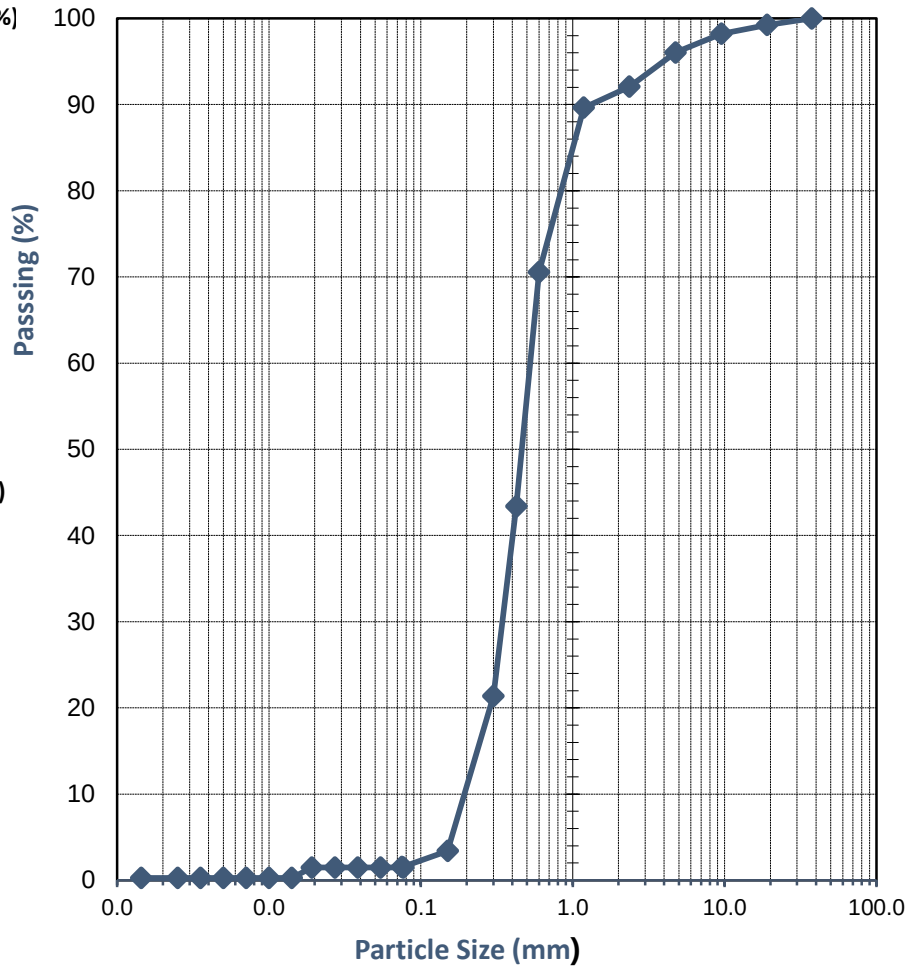
Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing (%)
75.0	
37.5	100
19.0	99
9.5	98
4.75	96
2.36	92
1.18	90
0.600	71
0.425	43
0.300	21
0.150	3
0.075	2

Particle Diameter (mm ψ	Percent Finer (%)
0.0767	1
0.0542	1
0.0383	1
0.0271	1
0.0141	0
0.0100	0
0.0071	0
0.0050	0
0.0035	0
0.0025	0
0.0014	0

ψ AS 1289.3.5.1 -2.36mm Particle Density

2.69 g/cm3



Comments: ψ- AS 1289.3.5.1 & ψ AS 1289.3.6.3 - NATA Accreditation does not cover the performance of this service.

Approved Signatory:

Name: Matt van Herk

Date: 04/January/2021

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TEST REPORT - AS 1289.3.6.1 & ψ AS 1289. 3.6.3

Client:	ICM	*Ticket No.*	S2264
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/11991_1_PSDHY
Project:	Riverbed Material Assessment	*Sample No.*	WG20/11991
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	SS09	*Date Tested:*	2/1/2021-5/1/2021

TEST RESULTS - Particle Size Distribution of Soil & Hyrdrometer Analysis

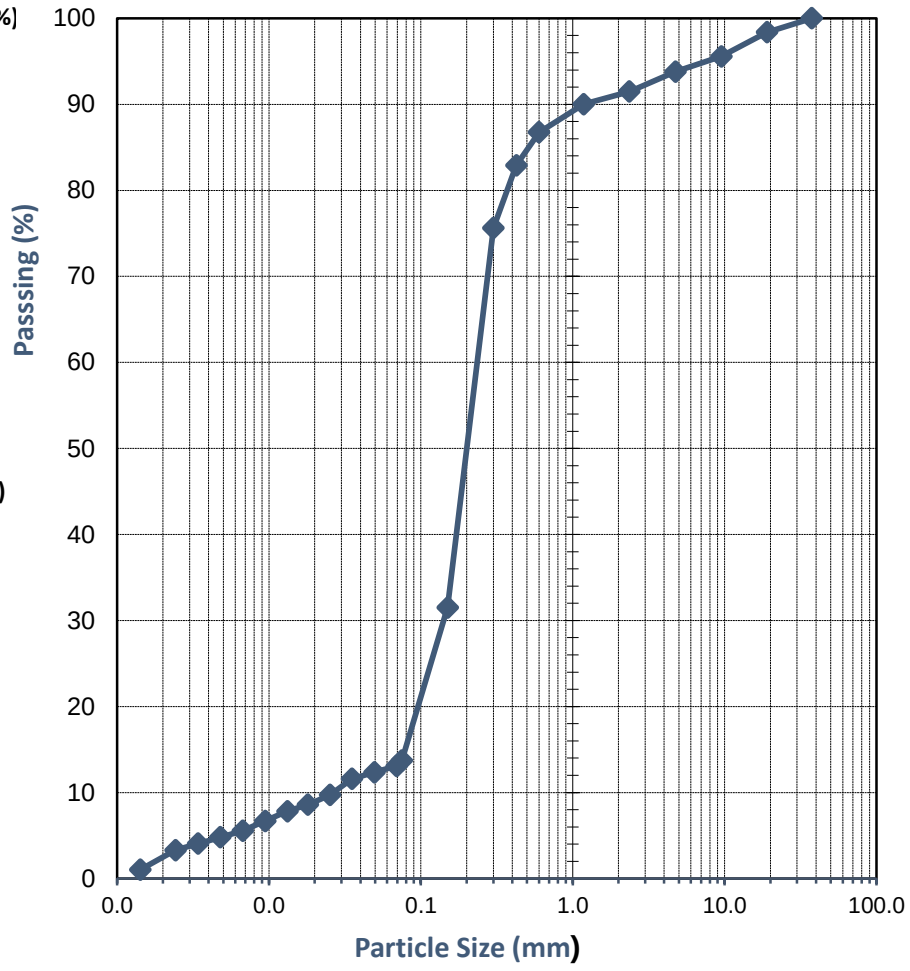
Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing (%)
75.0	
37.5	100
19.0	98
9.5	96
4.75	94
2.36	91
1.18	90
0.600	87
0.425	83
0.300	76
0.150	32
0.075	14

Particle Diameter (mm ψ	Percent Finer (%)
0.0694	13
0.0494	12
0.0351	12
0.0252	10
0.0132	8
0.0094	7
0.0067	6
0.0048	5
0.0034	4
0.0024	3
0.0014	1

ψ AS 1289.3.5.1 -2.36mm Particle Density

2.72 g/cm3



Comments: ψ- AS 1289.3.5.1 & ψ AS 1289.3.6.3 - NATA Accreditation does not cover the performance of this service.

Approved Signatory:

Name: Matt van Herk

Date: 06/January/2021

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TEST REPORT - AS 1289.3.6.1 & ψ AS 1289. 3.6.3

Client:	ICM	*Ticket No.*	S2264
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/11992_1_PSDHY
Project:	Riverbed Material Assessment	*Sample No.*	WG20/11992
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	SS010	*Date Tested:*	31/12/2020

TEST RESULTS - Particle Size Distribution of Soil & Hyrdrometer Analysis

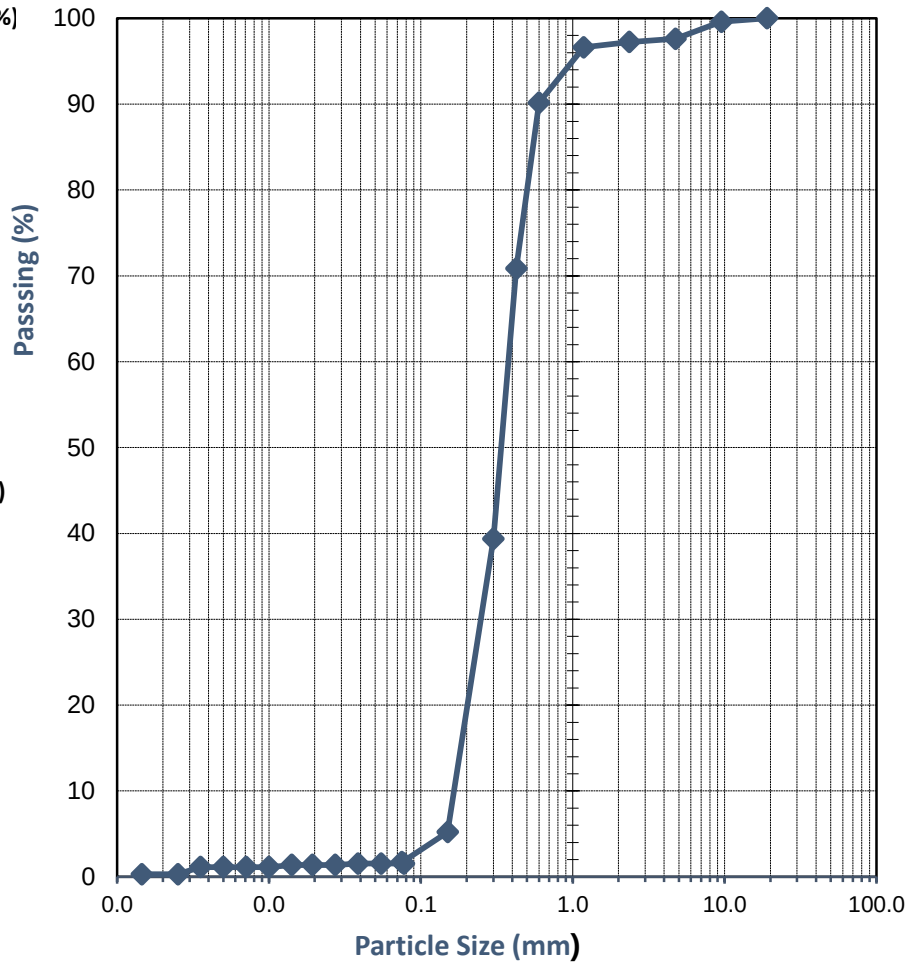
Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing (%)
75.0	
37.5	
19.0	100
9.5	100
4.75	98
2.36	97
1.18	97
0.600	90
0.425	71
0.300	39
0.150	5
0.075	2

Particle Diameter (mm ψ	Percent Finer (%)
0.0772	2
0.0546	2
0.0386	2
0.0273	1
0.0141	1
0.0100	1
0.0071	1
0.0050	1
0.0035	1
0.0025	0
0.0015	0

ψ AS 1289.3.5.1 -2.36mm Particle Density

2.67 g/cm3



Comments: ψ- AS 1289.3.5.1 & ψ AS 1289.3.6.3 - NATA Accreditation does not cover the performance of this service.

Approved Signatory:

Name: Matt van Herk

Date: 04/January/2021

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SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.6.1 & ψ AS 1289. 3.6.3

Client:	ICM	*Ticket No.*	S2264
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/11993_1_PSDHY
Project:	Riverbed Material Assessment	*Sample No.*	WG20/11993
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	SS011	*Date Tested:*	4/01/2020

TEST RESULTS - Particle Size Distribution of Soil & Hyrdrometer Analysis

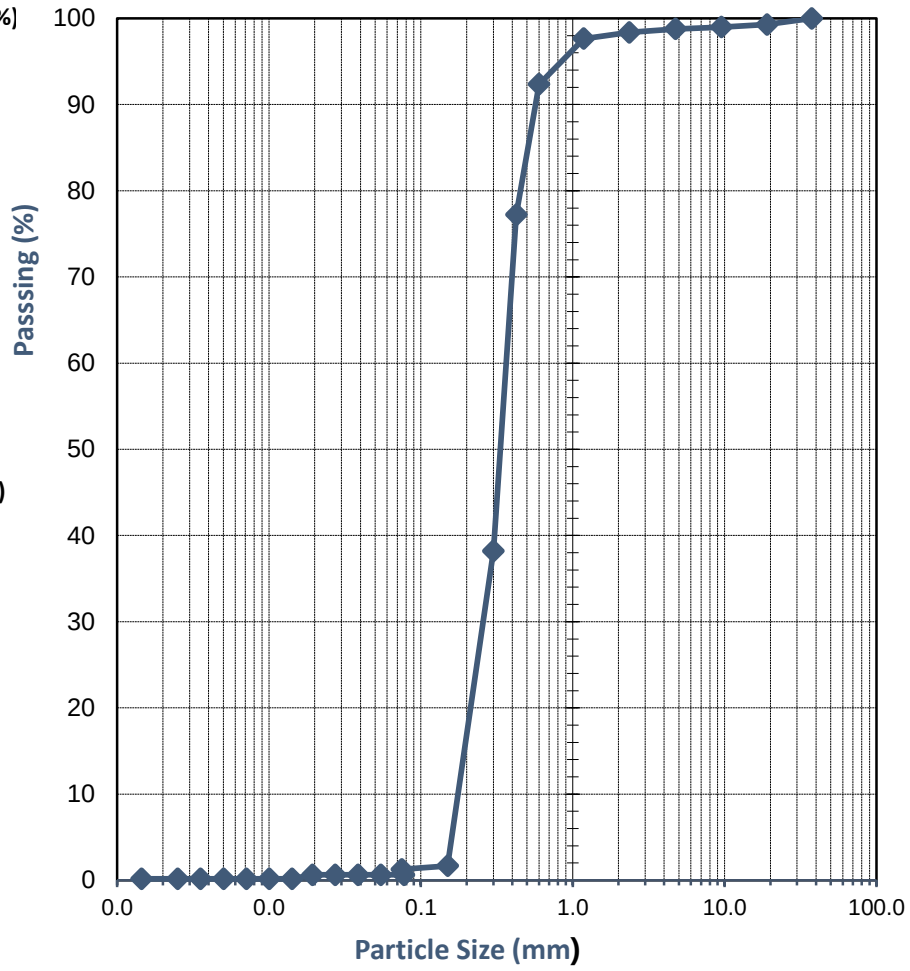
Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing (%)
75.0	
37.5	100
19.0	99
9.5	99
4.75	99
2.36	98
1.18	98
0.600	92
0.425	77
0.300	38
0.150	2
0.075	1

Particle Diameter (mm ψ	Percent Finer (%)
0.0772	1
0.0546	1
0.0386	1
0.0273	1
0.0142	0
0.0100	0
0.0071	0
0.0050	0
0.0035	0
0.0025	0
0.0014	0

ψ AS 1289.3.5.1 -2.36mm Particle Density

2.68 g/cm3



Comments: ψ- AS 1289.3.5.1 & ψ AS 1289.3.6.3 - NATA Accreditation does not cover the performance of this service.

Approved Signatory:

Name: Matt van Herk

Date: 04/January/2021

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TEST REPORT - AS 1289.3.6.1 & ψ AS 1289. 3.6.3

Client:	ICM	*Ticket No.*	S2264
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/11994_1_PSDHY
Project:	Riverbed Material Assessment	*Sample No.*	WG20/11994
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	SS012	*Date Tested:*	4/01/2021

TEST RESULTS - Particle Size Distribution of Soil & Hyrdrometer Analysis

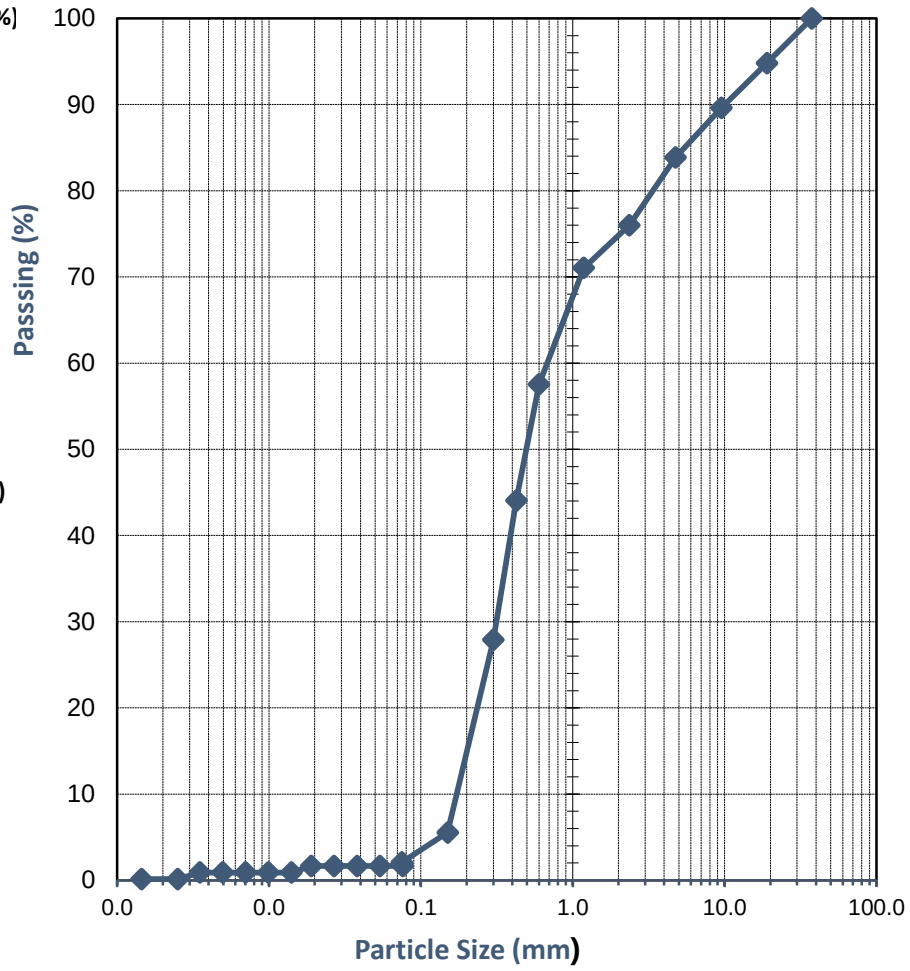
Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing (%)
75.0	
37.5	100
19.0	95
9.5	90
4.75	84
2.36	76
1.18	71
0.600	58
0.425	44
0.300	28
0.150	6
0.075	2

Particle Diameter (mm ψ	Percent Finer (%)
0.0759	2
0.0537	2
0.0379	2
0.0268	2
0.0140	1
0.0099	1
0.0070	1
0.0050	1
0.0035	1
0.0025	0
0.0014	0

ψ AS 1289.3.5.1 -2.36mm Particle Density

2.68 g/cm3



Comments: ψ- AS 1289.3.5.1 & ψ AS 1289.3.6.3 - NATA Accreditation does not cover the performance of this service.

Approved Signatory:

Name: Matt van Herk

Date: 04/January/2021

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SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.6.1 & ψ AS 1289. 3.6.3

Client:	ICM	*Ticket No.*	S2264
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/11995_1_PSDHY
Project:	Riverbed Material Assessment	*Sample No.*	WG20/11995
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	SS013	*Date Tested:*	2/1/2021-5/1/2021

TEST RESULTS - Particle Size Distribution of Soil & Hyrdrometer Analysis

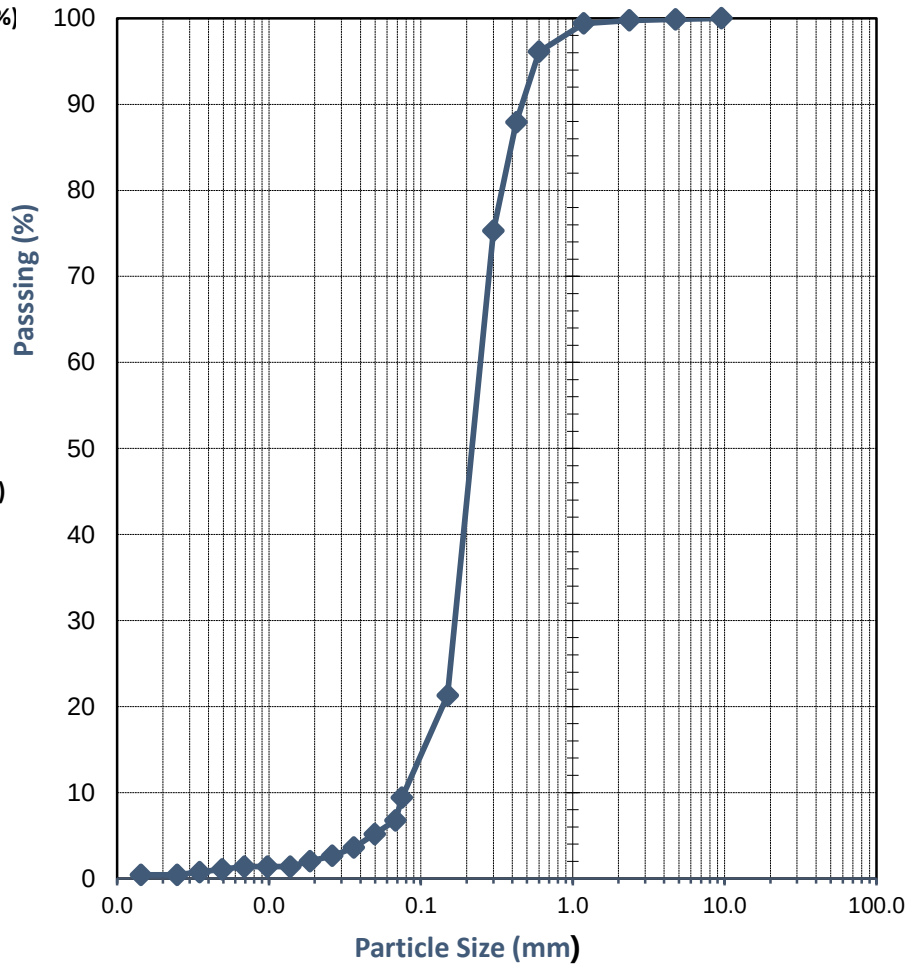
Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing (%)
75.0	
37.5	
19.0	
9.5	100
4.75	100
2.36	100
1.18	99
0.600	96
0.425	88
0.300	75
0.150	21
0.075	9

Particle Diameter (mm ψ	Percent Finer (%)
0.0680	7
0.0496	5
0.0362	4
0.0261	3
0.0138	1
0.0097	1
0.0069	1
0.0049	1
0.0035	1
0.0025	0
0.0014	0

ψ AS 1289.3.5.1 -2.36mm Particle Density

2.7 g/cm3



Comments: ψ- AS 1289.3.5.1 & ψ AS 1289.3.6.3 - NATA Accreditation does not cover the performance of this service.

Approved Signatory:

Name: Matt van Herk

Date: 06/January/2021

NATA WORLD RECOGNISED ACCREDITATION

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TEST REPORT - AS 1289.3.6.1 & ψ AS 1289. 3.6.3

Client:	ICM	*Ticket No.*	S2264
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/11996_1_PSDHY
Project:	Riverbed Material Assessment	*Sample No.*	WG20/11996
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	SS014	*Date Tested:*	4/01/2021

TEST RESULTS - Particle Size Distribution of Soil & Hyrdrometer Analysis

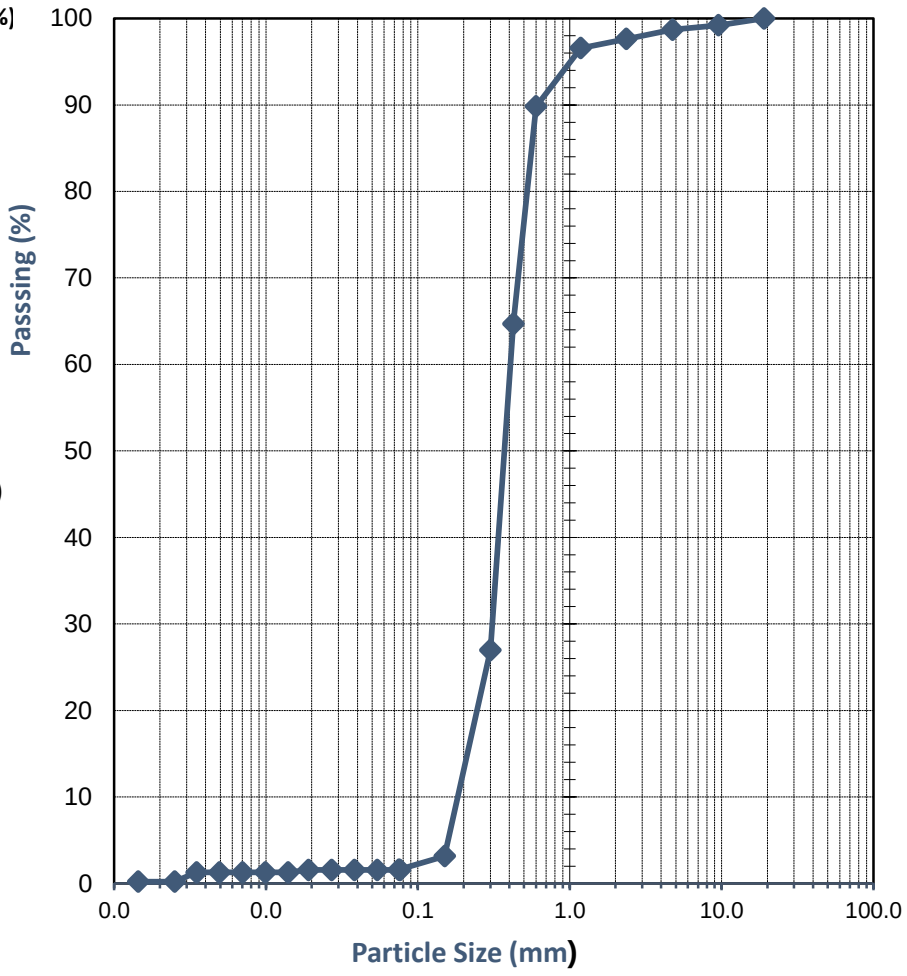
Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing (%)
75.0	
37.5	
19.0	100
9.5	99
4.75	99
2.36	98
1.18	97
0.600	90
0.425	65
0.300	27
0.150	3
0.075	2

Particle Diameter (mm ψ	Percent Finer (%)
0.0763	2
0.0540	2
0.0382	2
0.0270	2
0.0140	1
0.0099	1
0.0070	1
0.0049	1
0.0035	1
0.0025	0
0.0014	0

ψ AS 1289.3.5.1 -2.36mm Particle Density

2.69 g/cm3



Comments: ψ- AS 1289.3.5.1 & ψ AS 1289.3.6.3 - NATA Accreditation does not cover the performance of this service.

Approved Signatory:

Name: Matt van Herk

Date: 04/January/2021

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TEST REPORT - AS 1289.3.6.1 & ψ AS 1289. 3.6.3

Client:	ICM	*Ticket No.*	S2264
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/11997_1_PSDHY
Project:	Riverbed Material Assessment	*Sample No.*	WG20/11997
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	SS015	*Date Tested:*	4/01/2021

TEST RESULTS - Particle Size Distribution of Soil & Hyrdrometer Analysis

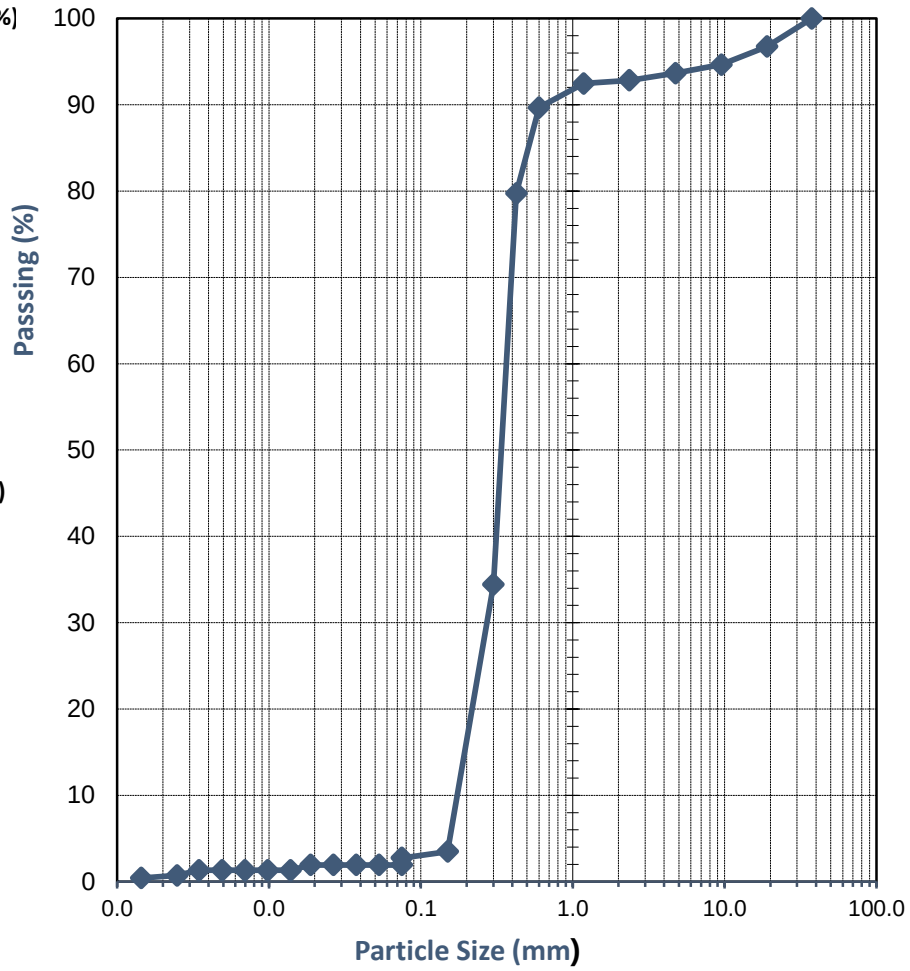
Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing (%)
75.0	
37.5	100
19.0	97
9.5	95
4.75	94
2.36	93
1.18	92
0.600	90
0.425	80
0.300	34
0.150	3
0.075	3

Particle Diameter (mm ψ	Percent Finer (%)
0.0750	2
0.0530	2
0.0375	2
0.0265	2
0.0139	1
0.0098	1
0.0069	1
0.0049	1
0.0035	1
0.0025	1
0.0014	0

ψ AS 1289.3.5.1 -2.36mm Particle Density

2.68 g/cm3



Comments: ψ- AS 1289.3.5.1 & ψ AS 1289.3.6.3 - NATA Accreditation does not cover the performance of this service.

Approved Signatory:

Name: Matt van Herk

Date: 04/January/2021

NATA WORLD RECOGNISED ACCREDITATION

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TEST REPORT - AS 1289.3.6.1 & ψ AS 1289. 3.6.3

Client:	ICM	*Ticket No.*	S2264
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/11998_1_PSDHY
Project:	Riverbed Material Assessment	*Sample No.*	WG20/11998
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	SS016	*Date Tested:*	4/01/2021

TEST RESULTS - Particle Size Distribution of Soil & Hyrdrometer Analysis

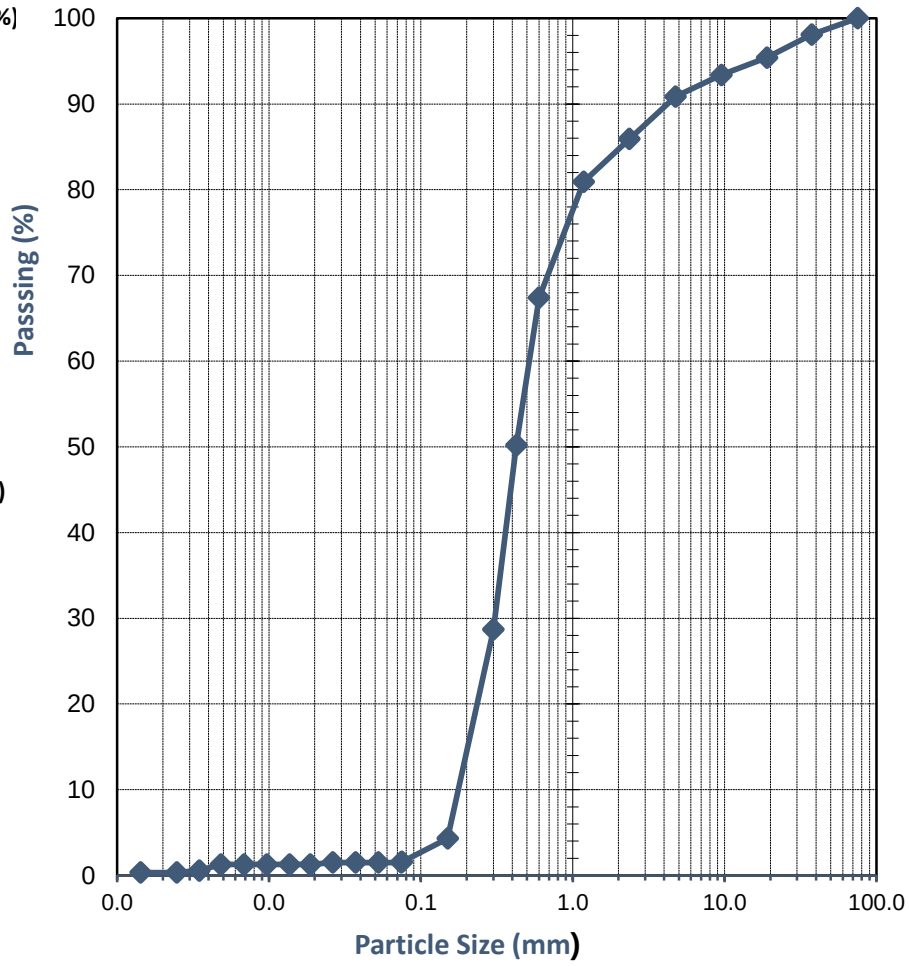
Sampling Method: **Sampled by Client, Tested as Received**

Sieve Size (mm)	Percent Passing (%)
75.0	100
37.5	98
19.0	95
9.5	93
4.75	91
2.36	86
1.18	81
0.600	67
0.425	50
0.300	29
0.150	4
0.075	2

Particle Diameter (mm ψ	Percent Finer (%)
0.0743	2
0.0526	2
0.0372	2
0.0263	2
0.0137	1
0.0097	1
0.0068	1
0.0048	1
0.0035	1
0.0025	0
0.0014	0

ψ AS 1289.3.5.1 -2.36mm Particle Density

2.71 g/cm3



Comments: ψ- AS 1289.3.5.1 & ψ AS 1289.3.6.3 - NATA Accreditation does not cover the performance of this service.

Approved Signatory:

Name: Matt van Herk

Date: 04/January/2021

NATA WORLD RECOGNISED ACCREDITATION

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Appendix B: Calcium Carbonate Content

TEST REPORT - WA 915.1

Client:	ICM	*Ticket No.*	S2266
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/12009-12012_1_Ca
Project:	Riverbed Material Assessment	*Sample No.*	WG20/12009-12012
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	Various, see below	*Date Tested:*	4/01/2021

TEST RESULTS - Calcium Carbonate Content

Sampling Method: **Sampled by Client, Tested as Received**

Sample Number	Sample Identification	Calcium Carbonate Content (%)
WG20/12009	SS1	31.7
WG20/12010	SS2	30.1
WG20/12011	SS3	29.3
WG20/12012	SS4	21.0

Comments:

Approved Signatory:

Name: Matt van Herk

Date: 05/January/2021

NATA WORLD RECOGNISED ACCREDITATION

Accreditation No. 20599
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WESTERN GEOTECHNICAL & Laboratory Services

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TEST REPORT - WA 915.1

Client:	ICM	*Ticket No.*	S2265
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/11999-12002_1_Ca
Project:	Riverbed Material Assessment	*Sample No.*	WG20/11999-12002
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	Various, see below	*Date Tested:*	2/01/2021

TEST RESULTS - Calcium Carbonate Content

Sampling Method: **Sampled by Client, Tested as Received**

Sample Number	Sample Identification	Calcium Carbonate Content (%)
WG20/11999	S No. 5	43.0
WG20/12000	S No. 6	50.1
WG20/12001	S No. 10	45.2
WG20/12002	S No. 11	18.1

Comments:

Approved Signatory:

Name: Matt van Herk

Date: 03/January/2021

NATA WORLD RECOGNISED ACCREDITATION

Accreditation No. 20599
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TEST REPORT - WA 915.1

Client:	ICM	*Ticket No.*	S2266
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/12013-12016_1_Ca
Project:	Riverbed Material Assessment	*Sample No.*	WG20/12013-12016
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	Various, see below	*Date Tested:*	4/01/2021

TEST RESULTS - Calcium Carbonate Content

Sampling Method: **Sampled by Client, Tested as Received**

Sample Number	Sample Identification	Calcium Carbonate Content (%)
WG20/12013	SS7	8.5
WG20/12014	SS8	12.8
WG20/12015	SS9	16.1
WG20/12016	SS13	28.9

Comments:

Approved Signatory:

Name: Matt van Herk

Date: 05/January/2021

NATA WORLD RECOGNISED ACCREDITATION

Accreditation No. 20599
Accredited for compliance with ISO/IEC 17025 - Testing

WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - WA 915.1

Client:	ICM	*Ticket No.*	S2265
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/12003-12006_1_Ca
Project:	Riverbed Material Assessment	*Sample No.*	WG20/12003-12006
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	Various, see below	*Date Tested:*	2/01/2021

TEST RESULTS - Calcium Carbonate Content

Sampling Method: **Sampled by Client, Tested as Received**

Sample Number	Sample Identification	Calcium Carbonate Content (%)
WG20/12003	S No. 12	45.4
WG20/12004	S No. 14	75.7
WG20/12005	S No. 15	23.8
WG20/12006	S No. 16	33.6

Comments:

Approved Signatory:

Name: Matt van Herk

Date: 03/January/2021

NATA WORLD RECOGNISED ACCREDITATION

Accreditation No. 20599
Accredited for compliance with ISO/IEC 17025 - Testing

WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - WA 915.1

Client:	ICM	*Ticket No.*	S2265
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/12007-12008_1_Ca
Project:	Riverbed Material Assessment	*Sample No.*	WG20/12007-12008
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	Various, see below	*Date Tested:*	2/01/2021

TEST RESULTS - Calcium Carbonate Content

Sampling Method: **Sampled by Client, Tested as Received**

Sample Number	Sample Identification	Calcium Carbonate Content (%)
WG20/12007	S No. 17	31.7
WG20/12008	S No. 20	55.0

Comments:

Approved Signatory:

Name: Matt van Herk

Date: 03/January/2021

Accreditation No. 20599
Accredited for compliance with ISO/IEC 17025 - Testing

TEST REPORT - WA 915.1

Client:	ICM	*Ticket No.*	S2266
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/12017-12020_1_Ca
Project:	Riverbed Material Assessment	*Sample No.*	WG20/12017-12020
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	Various, see below	*Date Tested:*	4/01/2021

TEST RESULTS - Calcium Carbonate Content

Sampling Method: **Sampled by Client, Tested as Received**

Sample Number	Sample Identification	Calcium Carbonate Content (%)
WG20/12017	SS18	20.6
WG20/12018	SS19	25.2
WG20/12019	SS21	26.0
WG20/12020	OPT.03	55.7

Comments:

Approved Signatory:

Name: Matt van Herk

Date: 05/January/2021

NATA WORLD RECOGNISED ACCREDITATION

Accreditation No. 20599
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WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - WA 915.1

Client:	ICM	*Ticket No.*	S2264
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/11984-11987_1_Ca
Project:	Riverbed Material Assessment	*Sample No.*	WG20/11984-11987
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	Various, see below	*Date Tested:*	30/12/2020

TEST RESULTS - Calcium Carbonate Content

Sampling Method: **Sampled by Client, Tested as Received**

Sample Number	Sample Identification	Calcium Carbonate Content (%)
WG20/11984	SS01	18.9
WG20/11985	SS02	22.1
WG20/11986	SS04	23.7
WG20/11987	SS05	32.2

Comments:

Approved Signatory:

Name: Matt van Herk

Date: 31/December/2020

NATA WORLD RECOGNISED ACCREDITATION

Accreditation No. 20599
Accredited for compliance with ISO/IEC 17025 - Testing

WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - WA 915.1

Client:	ICM	*Ticket No.*	S2264
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/11988-11991_1_Ca
Project:	Riverbed Material Assessment	*Sample No.*	WG20/11988-11991
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	Various, see below	*Date Tested:*	30/12/2020

TEST RESULTS - Calcium Carbonate Content

Sampling Method: **Sampled by Client, Tested as Received**

Sample Number	Sample Identification	Calcium Carbonate Content (%)
WG20/11988	SS06	32.8
WG20/11989	SS07	28.4
WG20/11990	SS08	27.8
WG20/11991	SS09	68.6

Comments:

Approved Signatory:

Name: Matt van Herk

Date: 31/December/2020

NATA WORLD RECOGNISED ACCREDITATION

Accreditation No. 20599
Accredited for compliance with ISO/IEC 17025 - Testing

WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - WA 915.1

Client:	ICM	*Ticket No.*	S2264
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/11992_1_CaC03
Project:	Riverbed Material Assessment	*Sample No.*	WG20/11992
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	Various, see below	*Date Tested:*	30/12/2020

TEST RESULTS - Calcium Carbonate Content

Sampling Method: **Sampled by Client, Tested as Received**

Sample Number	Sample Identification	Calcium Carbonate Content (%)
WG20/11992	SS010	15.2
WG20/11993	SS011	26.1
WG20/11994	SS012	34.9
WG20/11995	SS013	56.2

Comments:

Approved Signatory:

Name: Matt van Herk

Date: 31/December/2020

NATA WORLD RECOGNISED ACCREDITATION

Accreditation No. 20599
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WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - WA 915.1

Client:	ICM	*Ticket No.*	S2264
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/11996-11998_1_Ca
Project:	Riverbed Material Assessment	*Sample No.*	WG20/11996-11998
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	Various, see below	*Date Tested:*	30/12/2020

TEST RESULTS - Calcium Carbonate Content

Sampling Method: **Sampled by Client, Tested as Received**

Sample Number	Sample Identification	Calcium Carbonate Content (%)
WG20/11996	SS014	31.1
WG20/11997	SS015	28.0
WG20/11998	SS016	28.2

Comments:

Approved Signatory:

Name: Matt van Herk

Date: 31/December/2020

NATA WORLD RECOGNISED ACCREDITATION

Accreditation No. 20599

Accredited for compliance with ISO/IEC 17025 - Testing

Appendix C: Insitu Core Density

WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - INSITU CORE DENSITY - DIRECT MEASUREMENT

Client:	ICM	*Ticket No.*	S2266
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/12009-12014_1_ICD
Project:	Riverbed Material Assessment	*Sample No.*	WG20/12009-12014
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	Various see below	*Date Tested:*	4/01/2021

TEST RESULTS - INSITU CORE DENSITY - DIRECT MEASUREMENT

Sampling Method: **Sampled by Client, Tested as Received**

Sample Number:	Sample Identification:	Moisture Content (%)	Wet Density (t/m^3):	Dry Density (t/m^3):
WG20/12009	SS1	21.5	2.06	1.70
WG20/12010	SS2	31.7	2.16	1.64
WG20/12011	SS3	35.0	2.01	1.49
WG20/12012	SS4	24.4	2.01	1.61
WG20/12013	SS7	24.4	2.12	1.70
WG20/12014	SS8	22.1	2.03	1.66

Comments:

Approved Signatory:

Name: General Manager

Date: 05/January/2021

WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - INSITU CORE DENSITY - DIRECT MEASUREMENT

Client:	ICM	*Ticket No.*	S2265
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/11999-12003_1_ICD
Project:	Riverbed Material Assessment	*Sample No.*	WG20/11999-12003
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	Various see below	*Date Tested:*	4/01/2021

TEST RESULTS - INSITU CORE DENSITY - DIRECT MEASUREMENT

Sampling Method: **Sampled by Client, Tested as Received**

Sample Number:	Sample Identification:	Moisture Content (%)	Wet Density (t/m^3):	Dry Density (t/m^3):
WG20/11999	S No. 5	26.9	2.09	1.65
WG20/12000	S No. 6	46.5	1.69	1.16
WG20/12001	S No. 10	36.4	1.87	1.37
WG20/12002	S No.11	23.5	2.03	1.64
WG20/12003	S No. 12	28.5	1.81	1.41

Comments:

Approved Signatory:

Name: General Manager

Date: 05/January/2021

WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - INSITU CORE DENSITY - DIRECT MEASUREMENT

Client:	ICM	*Ticket No.*	S2266
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/12015-12020_1_ICD
Project:	Riverbed Material Assessment	*Sample No.*	WG20/12015-12020
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	Various see below	*Date Tested:*	4/01/2021

TEST RESULTS - INSITU CORE DENSITY - DIRECT MEASUREMENT

Sampling Method: **Sampled by Client, Tested as Received**

Sample Number:	Sample Identification:	Moisture Content (%)	Wet Density (t/m^3):	Dry Density (t/m^3):
WG20/12015	SS9	20.9	1.91	1.58
WG20/12016	SS13	21.8	1.99	1.64
WG20/12017	SS18	27.6	1.98	1.55
WG20/12018	SS19	42.7	1.75	1.22
WG20/12019	SS21	38.2	1.83	1.32
WG20/12020	OPT.03	44.1	1.77	1.23

Comments:

Approved Signatory:

Name: General Manager

Date: 05/January/2021

WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - INSITU CORE DENSITY - DIRECT MEASUREMENT

Client:	ICM	*Ticket No.*	S2265
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/12004-12008_1_ICD
Project:	Riverbed Material Assessment	*Sample No.*	WG20/12004-12008
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	Various see below	*Date Tested:*	4/01/2021

TEST RESULTS - INSITU CORE DENSITY - DIRECT MEASUREMENT

Sampling Method: **Sampled by Client, Tested as Received**

Sample Number:	Sample Identification:	Moisture Content (%)	Wet Density (t/m^3):	Dry Density (t/m^3):
WG20/12004	S No. 14	33.3	1.73	1.30
WG20/12005	S No. 15	27.9	1.90	1.49
WG20/12006	S No. 16	29.2	1.92	1.49
WG20/12007	S No. 17	28.3	2.03	1.58
WG20/12008	S No. 20	42.9	1.75	1.22

Comments:

Approved Signatory:

Name: General Manager

Date: 05/January/2021

WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - INSITU CORE DENSITY - DIRECT MEASUREMENT

Client:	ICM	*Ticket No.*	S2264
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/11984-11991_1_ICD
Project:	Riverbed Material Assessment	*Sample No.*	WG20/11984-11991
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	Various see below	*Date Tested:*	4/01/2021

TEST RESULTS - INSITU CORE DENSITY - DIRECT MEASUREMENT

Sampling Method: **Sampled by Client, Tested as Received**

Sample Number:	Sample Identification:	Moisture Content (%)	Wet Density (t/m^3):	Dry Density (t/m^3):
WG20/11984	SS01	31.0	1.89	1.44
WG20/11985	SS02	18.9	1.97	1.66
WG20/11986	SS04	25.4	2.01	1.60
WG20/11987	SS05	19.9	1.97	1.64
WG20/11988	SS06	26.7	1.98	1.56
WG20/11989	SS07	26.2	2.05	1.63
WG20/11990	SS08	22.2	2.07	1.69
WG20/11991	SS09	22.2	1.85	1.51

Comments:

Approved Signatory:

Name: General Manager

Date: 05/January/2021

WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - INSITU CORE DENSITY - DIRECT MEASUREMENT

Client:	ICM	*Ticket No.*	S2264
Client Address:	Suite 7, 3 Stirk House Canning Road, Kalamunda	*Report No.*	WG20/11992-11998_1_ICD
Project:	Riverbed Material Assessment	*Sample No.*	WG20/11992-11998
Location:	Swan River	*Date Sampled:*	1/12/2020
Sample Identification:	Various see below	*Date Tested:*	4/01/2021

TEST RESULTS - INSITU CORE DENSITY - DIRECT MEASUREMENT

Sampling Method: **Sampled by Client, Tested as Received**

Sample Number:	Sample Identification:	Moisture Content (%)	Wet Density (t/m^3):	Dry Density (t/m^3):
WG20/11992	SS010	28.8	1.62	1.26
WG20/11993	SS011	30.6	1.95	1.49
WG20/11994	SS012	26.5	2.01	1.59
WG20/11995	SS013	43.8	1.79	1.24
WG20/11996	SS014	40.4	1.79	1.28
WG20/11997	SS015	21.9	2.03	1.67
WG20/11998	SS016	34.9	1.92	1.42

Comments:

Approved Signatory:

Name: General Manager

Date: 05/January/2021