

LAB CHRONICLE

OrderID:	Q1673	OrderDate:	3/28/2025 10:57:58 AM
Client:	APTIM	Project:	Project 502347 - Selenium
Contact:	Rachael Rezes	Location:	I31

LabID	ClientID	Matrix	Test	Method	Sample Date	Prep Date	Anal Date	Received
Q1673-01	GW-CONTROL	Water	Metals Group3	200.7	03/27/25	03/31/25	04/01/25	03/28/25
Q1673-02	SDC9	Water	Metals Group3	200.7	03/27/25	03/31/25	04/01/25	03/28/25
Q1673-03	FBR4	Water	Metals Group3	200.7	03/27/25	03/31/25	04/01/25	03/28/25



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Hit Summary Sheet
SW-846

SDG No.:	Q1673	Order ID:	Q1673
Client:	APTIM	Project ID:	Project 502347 - Selenium

Sample ID	Client ID	Matrix	Parameter	Concentration	C	MDL	RDL	Units
Client ID : Q1673-01	GW-CONTROL GW-CONTROL	Water	Selenium	173		3.07	10.0	ug/L
Client ID : Q1673-02	SDC9 SDC9	Water	Selenium	301		3.07	10.0	ug/L
Client ID : Q1673-03	FBR4 FBR4	Water	Selenium	39.2		3.07	10.0	ug/L



SAMPLE DATA

Report of Analysis

Client:	APTIM	Date Collected:	03/27/25
Project:	Project 502347 - Selenium	Date Received:	03/28/25
Client Sample ID:	GW-CONTROL	SDG No.:	Q1673
Lab Sample ID:	Q1673-01	Matrix:	Water
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.	Prep Met.
7782-49-2	Selenium	173		1	3.07	10.0	ug/L	03/31/25 10:05	04/01/25 12:16	EPA 200.7	

Color Before:	Colorless	Clarity Before:	Clear	Texture:
Color After:	Colorless	Clarity After:	Clear	Artifacts:
Comments:	Metals Group3			

U = Not Detected
 LOQ = Limit of Quantitation
 MDL = Method Detection Limit
 LOD = Limit of Detection
 D = Dilution
 Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
 B = Analyte Found in Associated Method Blank
 * = indicates the duplicate analysis is not within control limits.
 E = Indicates the reported value is estimated because of the presence of interference.
 OR = Over Range
 N =Spiked sample recovery not within control limits

Report of Analysis

Client:	APTIM	Date Collected:	03/27/25
Project:	Project 502347 - Selenium	Date Received:	03/28/25
Client Sample ID:	SDC9	SDG No.:	Q1673
Lab Sample ID:	Q1673-02	Matrix:	Water
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.	Prep Met.
7782-49-2	Selenium	301		1	3.07	10.0	ug/L	03/31/25 10:05	04/01/25 12:53	EPA 200.7	

Color Before:	Colorless	Clarity Before:	Clear	Texture:
Color After:	Colorless	Clarity After:	Clear	Artifacts:
Comments:	Metals Group3			

U = Not Detected
 LOQ = Limit of Quantitation
 MDL = Method Detection Limit
 LOD = Limit of Detection
 D = Dilution
 Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
 B = Analyte Found in Associated Method Blank
 * = indicates the duplicate analysis is not within control limits.
 E = Indicates the reported value is estimated because of the presence of interference.
 OR = Over Range
 N =Spiked sample recovery not within control limits

Report of Analysis

Client:	APTIM	Date Collected:	03/27/25
Project:	Project 502347 - Selenium	Date Received:	03/28/25
Client Sample ID:	FBR4	SDG No.:	Q1673
Lab Sample ID:	Q1673-03	Matrix:	Water
Level (low/med):	low	% Solid:	0

Cas	Parameter	Conc.	Qua.	DF	MDL	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.	Prep Met.
7782-49-2	Selenium	39.2		1	3.07	10.0	ug/L	03/31/25 10:05	04/01/25 12:57	EPA 200.7	

Color Before:	Colorless	Clarity Before:	Clear	Texture:
Color After:	Colorless	Clarity After:	Clear	Artifacts:
Comments:	Metals Group3			

U = Not Detected
 LOQ = Limit of Quantitation
 MDL = Method Detection Limit
 LOD = Limit of Detection
 D = Dilution
 Q = indicates LCS control criteria did not meet requirements

J = Estimated Value
 B = Analyte Found in Associated Method Blank
 * = indicates the duplicate analysis is not within control limits.
 E = Indicates the reported value is estimated because of the presence of interference.
 OR = Over Range
 N =Spiked sample recovery not within control limits



METAL CALIBRATION DATA

Metals

- 2a -

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: APTIM **SDG No.:** Q1673
Contract: SHAW18 **Lab Code:** CHEM **Case No.:** Q1673 **SAS No.:** Q1673
Initial Calibration Source: EPA
Continuing Calibration Source: Inorganic Ventures

Sample ID	Analyte	Result ug/L	True Value	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
ICV01	Selenium	1030	1000	103	95 - 105	P	04/01/2025	10:57	LB135255

Metals

- 2a -

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: APTIM **SDG No.:** Q1673
Contract: SHAW18 **Lab Code:** CHEM **Case No.:** Q1673 **SAS No.:** Q1673
Initial Calibration Source: EPA
Continuing Calibration Source: Inorganic Ventures

Sample ID	Analyte	Result ug/L	True Value	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
LLICV01	Selenium	21.8	20.0	109	80 - 120	P	04/01/2025	11:15	LB135255

Metals

- 2a -

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: APTIM **SDG No.:** Q1673
Contract: SHAW18 **Lab Code:** CHEM **Case No.:** Q1673 **SAS No.:** Q1673
Initial Calibration Source: EPA
Continuing Calibration Source: Inorganic Ventures

Sample ID	Analyte	Result ug/L	True Value	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
CCV01	Selenium	5090	5000	102	90 - 110	P	04/01/2025	11:50	LB135255
CCV02	Selenium	5180	5000	104	90 - 110	P	04/01/2025	12:43	LB135255
CCV03	Selenium	5390	5000	108	90 - 110	P	04/01/2025	13:35	LB135255
CCV04	Selenium	5300	5000	106	90 - 110	P	04/01/2025	14:31	LB135255
CCV05	Selenium	5210	5000	104	90 - 110	P	04/01/2025	15:23	LB135255
CCV06	Selenium	5180	5000	104	90 - 110	P	04/01/2025	15:52	LB135255
CCV07	Selenium	5160	5000	103	90 - 110	P	04/01/2025	16:56	LB135255
CCV08	Selenium	5280	5000	106	90 - 110	P	04/01/2025	17:41	LB135255



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Metals

- 2b -

CRDL STANDARD FOR AA & ICP

Client: APTIM **SDG No.:** Q1673
Contract: SHAW18 **Lab Code:** CHEM **Case No.:** Q1673 **SAS No.:** Q1673
Initial Calibration Source: _____
Continuing Calibration Source: _____

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Acceptance Window (%R)	M	Analysis Date	Analysis Time	Run Number
CRI01	Selenium	19.7	20.0	98	40 - 160	P	04/01/2025	11:28	LB135255



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Metals

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client:	APTIM				SDG No.:	Q1673			
Contract:	SHAW18	Lab Code:	CHEM	Case No.:	Q1673	SAS No.:	Q1673		
Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	CRQL	M	Analysis Date	Analysis Time	Run Number
ICB01	Selenium	20.0	+/-20.0	U	20.0	P	04/01/2025	11:19	LB135255

Metals

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: APTIM SDG No.: Q1673
Contract: SHAW18 Lab Code: CHEM Case No.: Q1673 SAS No.: Q1673

Sample ID	Analyte	Result ug/L	Acceptance Limit	Conc Qual	CRQL	M	Analysis Date	Analysis Time	Run Number
CCB01	Selenium	20.0	+/-20.0	U	20.0	P	04/01/2025	11:54	LB135255
CCB02	Selenium	20.0	+/-20.0	U	20.0	P	04/01/2025	12:48	LB135255
CCB03	Selenium	20.0	+/-20.0	U	20.0	P	04/01/2025	13:39	LB135255
CCB04	Selenium	20.0	+/-20.0	U	20.0	P	04/01/2025	14:36	LB135255
CCB05	Selenium	20.0	+/-20.0	U	20.0	P	04/01/2025	15:28	LB135255
CCB06	Selenium	20.0	+/-20.0	U	20.0	P	04/01/2025	15:56	LB135255
CCB07	Selenium	20.0	+/-20.0	U	20.0	P	04/01/2025	17:00	LB135255
CCB08	Selenium	20.0	+/-20.0	U	20.0	P	04/01/2025	17:50	LB135255

Metals
- 3b -
PREPARATION BLANK SUMMARY

Client: APTIM

SDG No.: Q1673

Instrument: P4

Sample ID	Analyte	Result (ug/L)	Acceptance Limit	Conc Qual	CRQL ug/L	M	Analysis Date	Analysis Time	Run
PB167385BL		WATER		Batch Number:	PB167385		Prep Date:	03/31/2025	
	Selenium	10.0	<10.0	U	10.0	P	04/01/2025	13:02	LB135255

Metals
- 4 -
INTERFERENCE CHECK SAMPLE

Client: <u>APTIM</u>	SDG No.: <u>Q1673</u>
Contract: <u>SHAW18</u>	Lab Code: <u>CHEM</u>
ICS Source: <u>EPA</u>	Case No.: <u>Q1673</u>
	SAS No.: <u>Q1673</u>
	Instrument ID: <u>P4</u>

Sample ID	Analyte	Result ug/L	True Value ug/L	% Recovery	Low Limit (ug/L)	High Limit (ug/L)	Analysis Date	Analysis Time	Run Number
ICSA01	Selenium	-13.6			-20	20	04/01/2025	11:33	LB135255
ICSAB01	Selenium	39.8	46.0	86	26	66	04/01/2025	11:37	LB135255
ICSA	Selenium	22.0			-20	20	04/01/2025	11:41	LB135255
ICSAB	Selenium	60.6	46.0	132	26	66	04/01/2025	11:46	LB135255



METAL QC DATA

metals
- 5a -
MATRIX SPIKE SUMMARY

client: <u>APTIM</u>	level: <u>low</u>	sdg no.: <u>Q1673</u>
contract: <u>SHAW18</u>	lab code: <u>CHEM</u>	case no.: <u>Q1673</u> sas no.: <u>Q1673</u>
matrix: <u>Water</u>	sample id: <u>Q1673-01</u>	client id: <u>GW-CONTROLMS</u>
Percent Solids for Sample: <u>NA</u>	Spiked ID: <u>Q1673-01MS</u>	Percent Solids for Spike Sample: <u>NA</u>

Analyte	Units	Acceptance Limit %R	Spiked Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Selenium	ug/L	75 - 125	1140		173		1000	97		P

metals
- 5a -
MATRIX SPIKE DUPLICATE SUMMARY

client: APTIM **level:** low **sdg no.:** Q1673
contract: SHAW18 **lab code:** CHEM **case no.:** Q1673 **sas no.:** Q1673
matrix: Water **sample id:** Q1673-01 **client id:** GW-CONTROLMSD
Percent Solids for Sample: NA **Spiked ID:** Q1673-01MSD **Percent Solids for Spike Sample:** NA

Analyte	Units	Acceptance Limit %R	MSD Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Selenium	ug/L	75 - 125	1140		173		1000	96		P

Metals
- 5b -

Client: APTIM **SDG No.:** Q1673
Contract: SHAW18 **Lab Code:** CHEM **Case No.:** Q1673 **SAS No.:** Q1673
Matrix: **Level:** LOW **Client ID:**
Sample ID: **Spiked ID:**

Analyte	Units	Acceptance Limit %R	C	Sample Result	C	Spike Added	% Recovery	Qual	M
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A
B
C
D
E
F
G
H

Metals

- 6 -

DUPLICATE SAMPLE SUMMARY

Client: <u>APTIM</u>	Level: <u>LOW</u>	SDG No.: <u>Q1673</u>
Contract: <u>SHAW18</u>	Lab Code: <u>CHEM</u>	Case No.: <u>Q1673</u> SAS No.: <u>Q1673</u>
Matrix: <u>Water</u>	Sample ID: <u>Q1673-01</u>	Client ID: <u>GW-CONTROLDUP</u>
Percent Solids for Sample: <u>NA</u>	Duplicate ID <u>Q1673-01DUP</u>	Percent Solids for Spike Sample: <u>NA</u>

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M
Selenium	ug/L	20	173		173		0		P

Metals

- 6 -

DUPLICATE SAMPLE SUMMARY

Client: <u>APTIM</u>	Level: <u>LOW</u>	SDG No.: <u>Q1673</u>
Contract: <u>SHAW18</u>	Lab Code: <u>CHEM</u>	Case No.: <u>Q1673</u> SAS No.: <u>Q1673</u>
Matrix: <u>Water</u>	Sample ID: <u>Q1673-01MS</u>	Client ID: <u>GW-CONTROLMSD</u>
Percent Solids for Sample: <u>NA</u>	Duplicate ID <u>Q1673-01MSD</u>	Percent Solids for Spike Sample: <u>NA</u>

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M
Selenium	ug/L	20	1140		1140		0		P

Metals

- 7 -

LABORATORY CONTROL SAMPLE SUMMARY

Client: APTIM **SDG No.:** Q1673
Contract: SHAW18 **Lab Code:** CHEM **Case No.:** Q1673 **SAS No.:** Q1673

Analyte	Units	True Value	Result	C	% Recovery	Acceptance Limits	M
PB167385BS Selenium	ug/L	1000	1000		100	85 - 115	P

Metals
-9 -
ICP SERIAL DILUTIONS

SAMPLE NO.

GW-CONTROLL

Lab Name: Chemtech Consulting Group

Contract: SHAW18

Lab Code: CHEM

Lb No.: lb135255

Lab Sample ID : Q1673-01L

SDG No.: Q1673

Matrix (soil/water): Water

Level (low/med): LOW

Concentration Units: ug/L

Analyte	Initial Sample Result (I) C	Serial Dilution Result (S) C	% Differ- ence	Q	M
Selenium	173	182	5		P



METAL PREPARATION & INSTRUMENT DATA

Metals

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: APTIM

SDG No.: Q1673

Contract: SHAW18

Lab Code: CHEM

Case No.: Q1673

SAS No.: Q1673

Instrument ID: _____

Date: _____

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave- Length (nm)	ICP Interelement Correction Factors For:				
		Al	Ca	Fe	Mg	Ag
Selenium	196.090	0.0000000	0.0000000	-0.0001440	0.0000000	0.0000000

Metals

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: APTIM

SDG No.: Q1673

Contract: SHAW18

Lab Code: CHEM

Case No.: Q1673

SAS No.: Q1673

Instrument ID: _____

Date: _____

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave- Length (nm)	ICP Interelement Correction Factors For:				
		As	Ba	Be	Cd	Co
Selenium	196.090	0.0000000	0.0000000	0.0000000	0.0000000	-0.0003570

Metals

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: APTIM

SDG No.: Q1673

Contract: SHAW18

Lab Code: CHEM

Case No.: Q1673

SAS No.: Q1673

Instrument ID: _____

Date: _____

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave- Length (nm)	ICP Interelement Correction Factors For:				
		Cr	Cu	K	Mn	Mo
Selenium	196.090	0.0000000	0.0000000	0.0000000	0.0007460	0.0000000

Metals

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: APTIM

SDG No.: Q1673

Contract: SHAW18

Lab Code: CHEM

Case No.: Q1673

SAS No.: Q1673

Instrument ID: _____

Date: _____

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave- Length (nm)	ICP Interelement Correction Factors For:				
		Na	Ni	Pb	Sb	Se
Selenium	196.090	0.0000000	0.0000000	0.0003330	0.0000000	0.0000000

Metals

- 11 -

ICP INTERELEMENT CORRECTION FACTORS

Client: APTIM

SDG No.: Q1673

Contract: SHAW18

Lab Code: CHEM

Case No.: Q1673

SAS No.: Q1673

Instrument ID: _____

Date: _____

Interelement Correction Factors (apparent ppb analyte/ppm interferent)

Analyte	Wave- Length (nm)	ICP Interelement Correction Factors For:				
		Sn	Ti	Tl	V	Zn
Selenium	196.090	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

METAL PREPARATION & ANALYICAL SUMMARY

Metals

- 13 -

SAMPLE PREPARATION SUMMARY

Client:	<u>APTIM</u>	SDG No.:	<u>Q1673</u>
Contract:	<u>SHAW18</u>	Lab Code:	<u>CHEM</u>
		Method:	<u></u>
		Case No.:	<u>Q1673</u>
		SAS No.:	<u>Q1673</u>

Sample ID	Client ID	Sample Type	Matrix	Prep Date	Initial Sample Size(mL)	Final Sample Volume (mL)	Percent Solids
Batch Number: PB167385							
PB167385BL	PB167385BL	MB	WATER	03/31/2025	50.0	25.0	
PB167385BS	PB167385BS	LCS	WATER	03/31/2025	50.0	25.0	
Q1673-01	GW-CONTROL	SAM	WATER	03/31/2025	50.0	25.0	
Q1673-01DUP	GW-CONTROLDUP	DUP	WATER	03/31/2025	50.0	25.0	
Q1673-01MS	GW-CONTROLMS	MS	WATER	03/31/2025	50.0	25.0	
Q1673-01MSD	GW-CONTROLMSD	MSD	WATER	03/31/2025	50.0	25.0	
Q1673-02	SDC9	SAM	WATER	03/31/2025	50.0	25.0	
Q1673-03	FBR4	SAM	WATER	03/31/2025	50.0	25.0	

metals
- 14 -
ANALYSIS RUN LOG

Client: APTIM **Contract:** SHAW18

Lab code: CHEM **Case no.:** Q1673 **Sas no.:** Q1673 **Sdg no.:** Q1673

Instrument id number: **Method:** **Run number:** LB135255

Start date: 04/01/2025 **End date:** 04/01/2025

Lab sample id.	Client Sample Id	d/f	Time	Parameter list
S0	S0	1	1031	Se
S1	S1	1	1035	Se
S2	S2	1	1040	Se
S3	S3	1	1044	Se
S4	S4	1	1048	Se
S5	S5	1	1052	Se
ICV01	ICV01	1	1057	Se
LLICV01	LLICV01	1	1115	Se
ICB01	ICB01	1	1119	Se
CRI01	CRI01	1	1128	Se
ICSA01	ICSA01	1	1133	Se
ICSAB01	ICSAB01	1	1137	Se
ICSA	ICSA	20	1141	Se
ICSAB	ICSAB	20	1146	Se
CCV01	CCV01	1	1150	Se
CCB01	CCB01	1	1154	Se
Q1673-01	GW-CONTROL	1	1216	Se
Q1673-01DUP	GW-CONTROLDUP	1	1221	Se
Q1673-01L	GW-CONTROL	5	1225	Se
Q1673-01MS	GW-CONTROLMS	1	1230	Se
Q1673-01MSD	GW-CONTROLMSD	1	1234	Se
CCV02	CCV02	1	1243	Se
CCB02	CCB02	1	1248	Se
Q1673-02	SDC9	1	1253	Se
Q1673-03	FBR4	1	1257	Se
PB167385BL	PB167385BL	1	1302	Se
PB167385BS	PB167385BS	1	1307	Se
CCV03	CCV03	1	1335	Se
CCB03	CCB03	1	1339	Se
CCV04	CCV04	1	1431	Se
CCB04	CCB04	1	1436	Se
CCV05	CCV05	1	1523	Se
CCB05	CCB05	1	1528	Se
CCV06	CCV06	1	1552	Se
CCB06	CCB06	1	1556	Se
CCV07	CCV07	1	1656	Se
CCB07	CCB07	1	1700	Se
CCV08	CCV08	1	1741	Se
CCB08	CCB08	1	1750	Se