TORV
Sustainable Agronomics

August 8, 2021

Kaleb Anderson
Director of Agronomy
Maroon Creek Club
10 Club Circle
Aspen, CO 81611

Kaleb,

Attached is a summary report of the water test and summer soil tests.

All nutrient levels are in line with MLSN guidelines. All deficiencies from spring testing have been corrected. Nitrogen applications for winter preparation are the focus for the rest of the season including:

- Consider additional nitrogen on known weaker tees such as 12 black
- Additional inputs into 5 green have brought it into line. Keep up on the nitrogen inputs going into winter

Water EC_w was .27. The next application of gypsum can be applied at 10 lbs. per 1000 sq.ft.

As I mentioned before the format of this report is the same as previous reports, but I am working with a new coding company to develop a new format for forthcoming reports.

I should be out on August 26th to do a final water test and then at the end of September to do the final soil testing and organic matter test for the year.

Best Regards,

Eric Foerster, CGCS, MG
TORV, LLC

Executive Summary of Nutrient Recommendations Based on Findings using MLSN Guidelines

The following are a total summary of recommendations by area using MLSN nutrient guidelines in conjunction with the provided nitrogen application rates and growth modeling, and water analysis.

Greens

- Apply ferrous sulphate as needed based on visual observation and goals
- Maintain current cultural practices to keep OM% at desirable levels for playability and surface health
- Apply N as needed for winter preparation. Acidifying N sources are recommended
- No other nutrient applications as fertilizer are recommended. All nutrient levels surpass what is needed based on estimated nitrogen applications to conclude the season

Tees

- Apply ferrous sulphate as needed based on visual observation and goals
- Subjective observation is that all tee surfaces that were tested felt firmer
- Apply N as needed for winter preparation. Acidifying N sources are recommended
- Consider increasing fertility on known tee surfaces with weak root structure. 12 black tee is an example
- No other nutrient applications as fertilizer are recommended. All nutrient levels surpass what is needed based on estimated nitrogen applications to conclude the season
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Fairways

- Apply ferrous sulphate as needed based on visual observation and goals
- Apply N as needed for winter preparation. Acidifying N sources are recommended
- No other amendments as fertilizer are recommended at this time
- No other nutrient applications as fertilizer are recommended. All nutrient levels surpass what is needed based on estimated nitrogen applications to conclude the season
- As described in the spring recommendations:
    - Verti-drain when possible

- Consider using an Aerway with the sports tine on a regular schedule. Drive the existing OM into the soil profile. As the OM breaks down, it will provide beneficial organic acids within the soil
- Consider topdressing with a LOW nitrogen organic compost prior to verti-draining and/or Aerway. Introduce organic compost into the soil profile when possible. Given time, the physical characteristics of the soil will change.

Rough

The rough exhibits consistency issues with overall quality to include density, thatch, playability, color, and general appearance. Again, there was nothing found within the current soil test sample results to suggest any major deficiencies that would contribute to consistency issues.

Approximately 2 lbs. of nitrogen per 1000 sq.ft. was planned for this year. As discussed, consider increasing the annual nitrogen rate especially in areas that are struggling.

If possible, hold off on spring cultivation practices until there is more microbial activity to increase recovery rate.

As discussed:

- Similar to fairway cultivation, perform the following in identified "spot treatment" areas:
  - Apply acidifying fertilizers when possible
  - Verti-drain when possible
  - Consider using an Aerway with the sports tine on a regular schedule. Drive the existing OM into the soil profile. As the OM breaks down, it will provide beneficial organic acids within the soil
  - Consider topdressing with a LOW nitrogen organic compost prior to verti-draining and/or Aerway. Introduce organic compost into the soil profile when possible. Given time, the physical characteristics of the soil will change.
- Treat all rough with gypsum applications related to ultra-pure water at same rate as fairway applications
- Treat all rough areas with acidifying fertilizers when possible

Water

- There are no new recommendations to be made based on current water test sample results. The water continues to exhibit ultra-pure characteristics.
- Apply gypsum at 10 lbs. per 1000 sq. ft. per acre foot of water applied. 1 acre foot is 325,800 gallons. This will offset the current EC_w of .27 with an EC_w effect of .5.
- Monitor monthly for gypsum amendments

Greens

This is a summary and recommendations for green samples 1, 2, 17, 4, 6, 8, 10, 12, 16, and 5. Recommendations are based on the **average results for samples** unless otherwise noted and a nitrogen input of 1 lb. per 1000 sq. ft. to conclude the year.

pH (H_2O 1:1) The average pH is 7.31. This is within the optimum range for soil microbial activity and soil nutrient availability. With the pH in this range, there is a chance of seeing some iron chlorosis. If this does occur, you can fix it by making foliar applications of ferrous sulfate.

Organic matter The average organic matter percentage is 1.87%. This is normal and indicates that your current maintenance practices are keeping the organic matter percentage in an ideal range.

Available Nitrogen (NO_4-N) The average total available nitrogen is 1.71 ppm. This is O.K. Adjust nitrogen inputs to match recovery and playability goals.

Potassium The average potassium is 103 ppm. This is above the minimum MLSN guideline of 54 ppm. None is required.

Phosphorus The average Mehlich III phosphorus is 56 ppm. This is above the minimum MLSN guideline of 25 ppm. None is required.

Calcium The average calcium is 732 ppm. This is above the minimum MLSN guideline of 334 ppm. None is required.

Magnesium The average magnesium is 81 ppm. This is above the minimum MLSN guideline of 49 ppm. None is required.

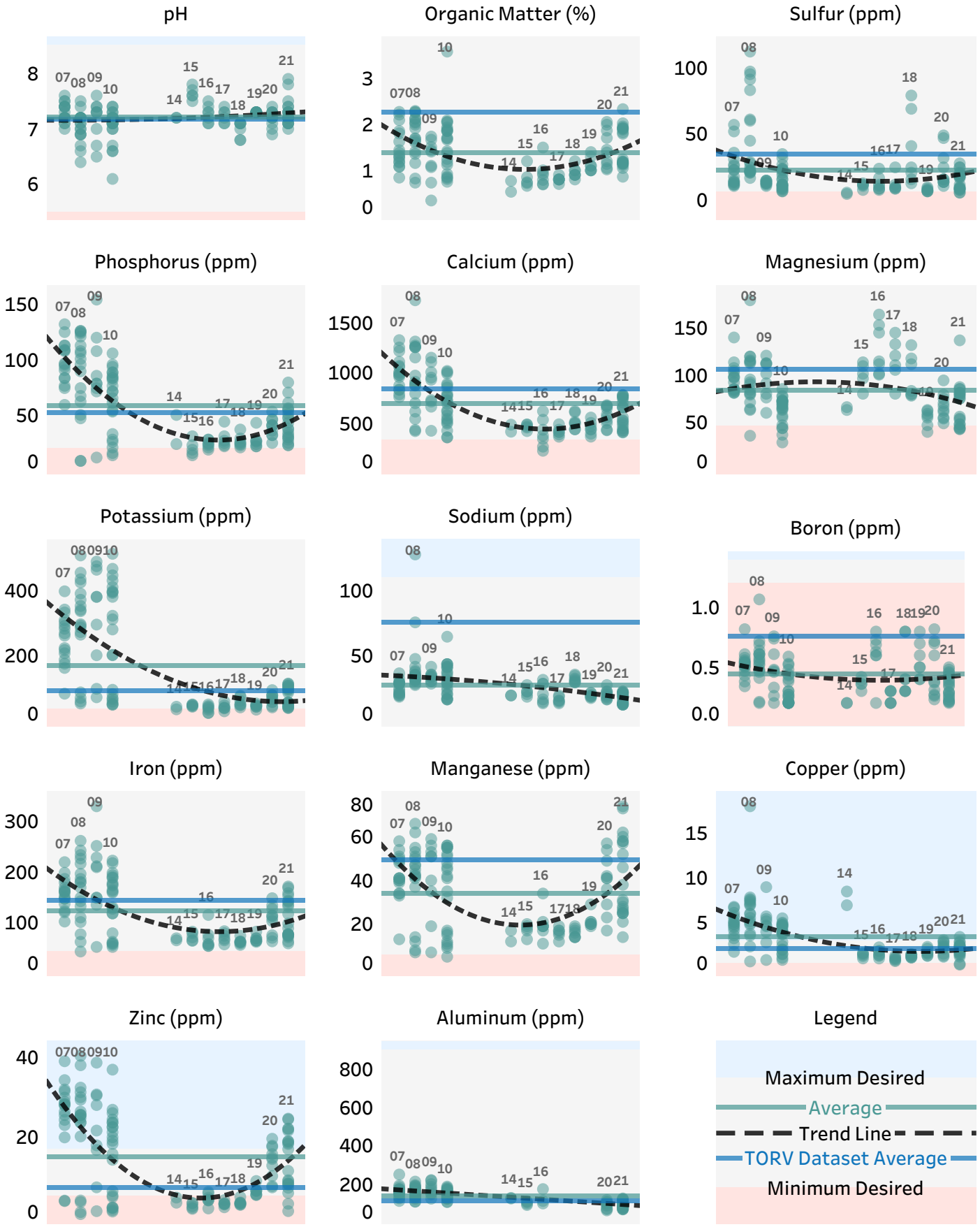
Sodium The average sodium is 21 ppm. This is well below 110 ppm and will not have a negative effect on turfgrass performance.

Sulfur The average sulfur is 20 ppm. This is above the minimum MLSN guideline of 9 ppm. None is required.

Micro-nutrients While boron continues to be low like the other areas of the course, all micronutrients are present, and none are required as fertilizer.

As described in the pH section, foliar applications of iron may have a good effect if you see iron chlorosis.

Soil Testing | Greens



Tees

This is a summary and recommendations for tee samples 1, 2, 17, 4, 6, 8, 10, 12, and 16. Recommendations are based on the **average results for samples** unless otherwise noted and a nitrogen input of 1.5 lbs. per 1000 sq. ft. to conclude the year.

pH (H_2O 1:1) The average pH is 7.40. This is within the optimum range for soil microbial activity and soil nutrient availability. With the pH in this range, there is a chance of seeing some iron chlorosis. If this does occur, you can fix it by making foliar applications of ferrous sulfate.

Organic matter The average organic matter percentage is 2.35%. This is normal and indicates that your current maintenance practices are keeping the organic matter percentage in an ideal range. Subjectively, all tee surfaces felt firm. As noted in previous reports, 12 black tee lacked substantial rooting. Competition with nearby tree roots and a lack of adequate sunlight probably contribute to a weakened plant.

Available Nitrogen (NO_4-N) The average total available nitrogen is 1.71 ppm. This is O.K. Adjust nitrogen inputs to match recovery goals.

Potassium The average potassium is 95 ppm. This is above the minimum MLSN guideline of 61 ppm. None is required.

Phosphorous The average Mehlich III phosphorus is 107 ppm. This is above the minimum MLSN guideline of 27 ppm. None is required.

Calcium The average calcium is 721 ppm. This is above the minimum MLSN guideline of 336 ppm. None is required

Magnesium The average magnesium is 97 ppm. This is above the minimum MLSN guideline of 50 ppm. None is required.

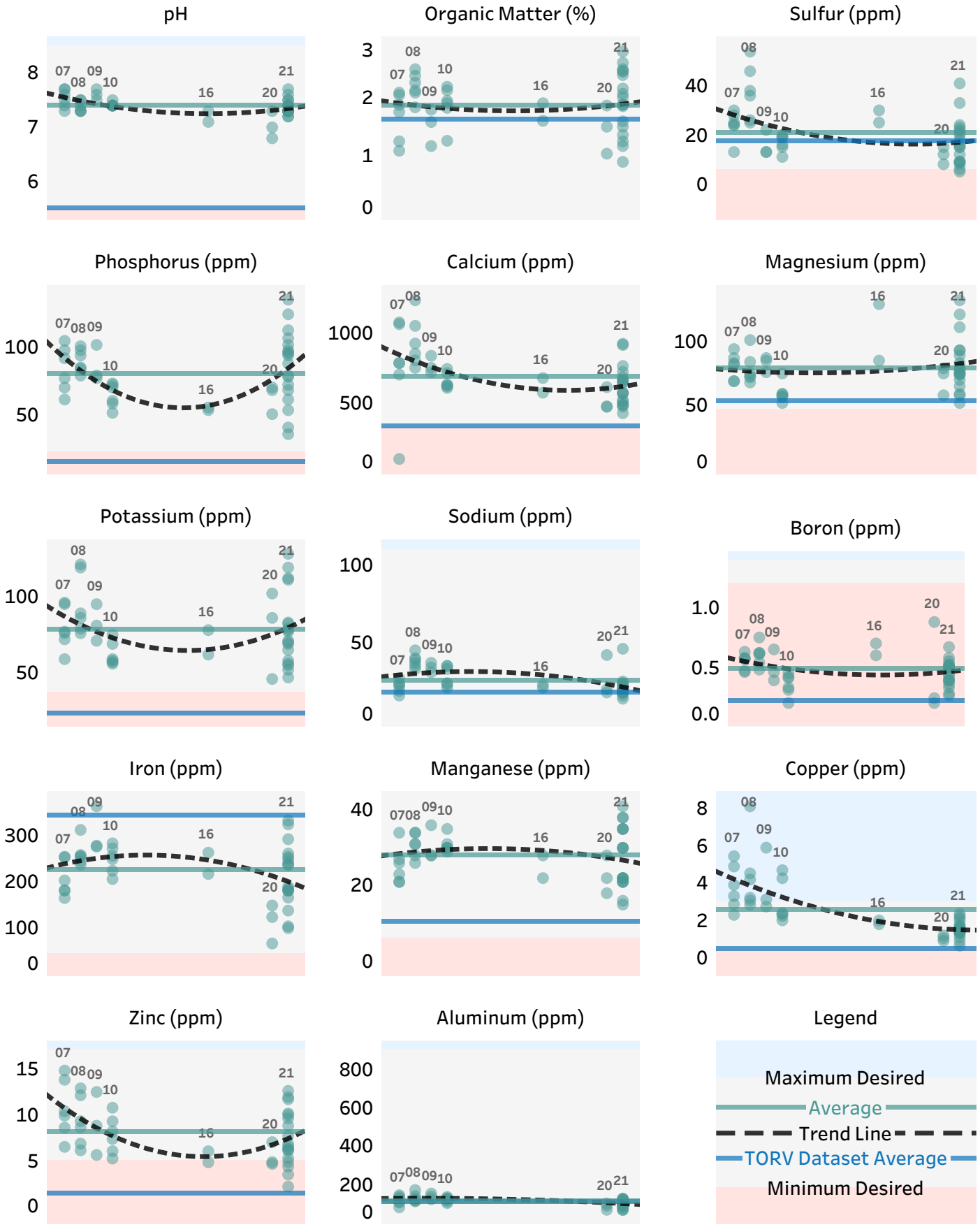
Sodium The average sodium is 24 ppm. This is well below 110 ppm and will not have a negative effect on turfgrass performance.

Sulfur The average sulfur is 24 ppm. This is above the minimum MLSN guideline of 10 ppm. None is required.

Micronutrients While boron continues to be low like the other areas of the course, all micronutrients are present, and none are required as fertilizer.

As described in the pH section, foliar applications of iron may have a good effect if you see iron chlorosis.

Soil Testing | Tees



Fairways

This is a summary and recommendations for fairway samples 1, 2, 17, 4, 6, 8, 10, 12, and 16. Recommendations are based on the **average results for samples** unless otherwise noted and a nitrogen input of 1.3 lbs. per 1000 sq. ft. to conclude the year.

pH (H_2O 1:1) The average pH is 7.31. This is within the optimum range for soil microbial activity and soil nutrient availability. With the pH in this range, there is a chance of seeing some iron chlorosis. If this does occur, you can fix it by making foliar applications of ferrous sulfate.

Organic matter The average organic matter percentage is 4.95%. This is normal for fairways. This is a slight increase (.6%) from the spring testing but is expected with the warmer months and fertility.

Available Nitrogen (NO_4-N) The average total available nitrogen is 4.28 ppm. This is ideal.

Potassium The average potassium is 163 ppm. This is above the minimum MLSN guideline of 59 ppm. None is required.

Phosphorous The average Mehlich III phosphorus is 86 ppm. This is above the minimum MLSN guideline of 26 ppm. None is required.

Calcium The average calcium is 1758 ppm. This is above the minimum MLSN guideline of 335 ppm. None is required.

Magnesium The average magnesium is 127ppm. This is above the minimum MLSN guideline of 50 ppm. None is required.

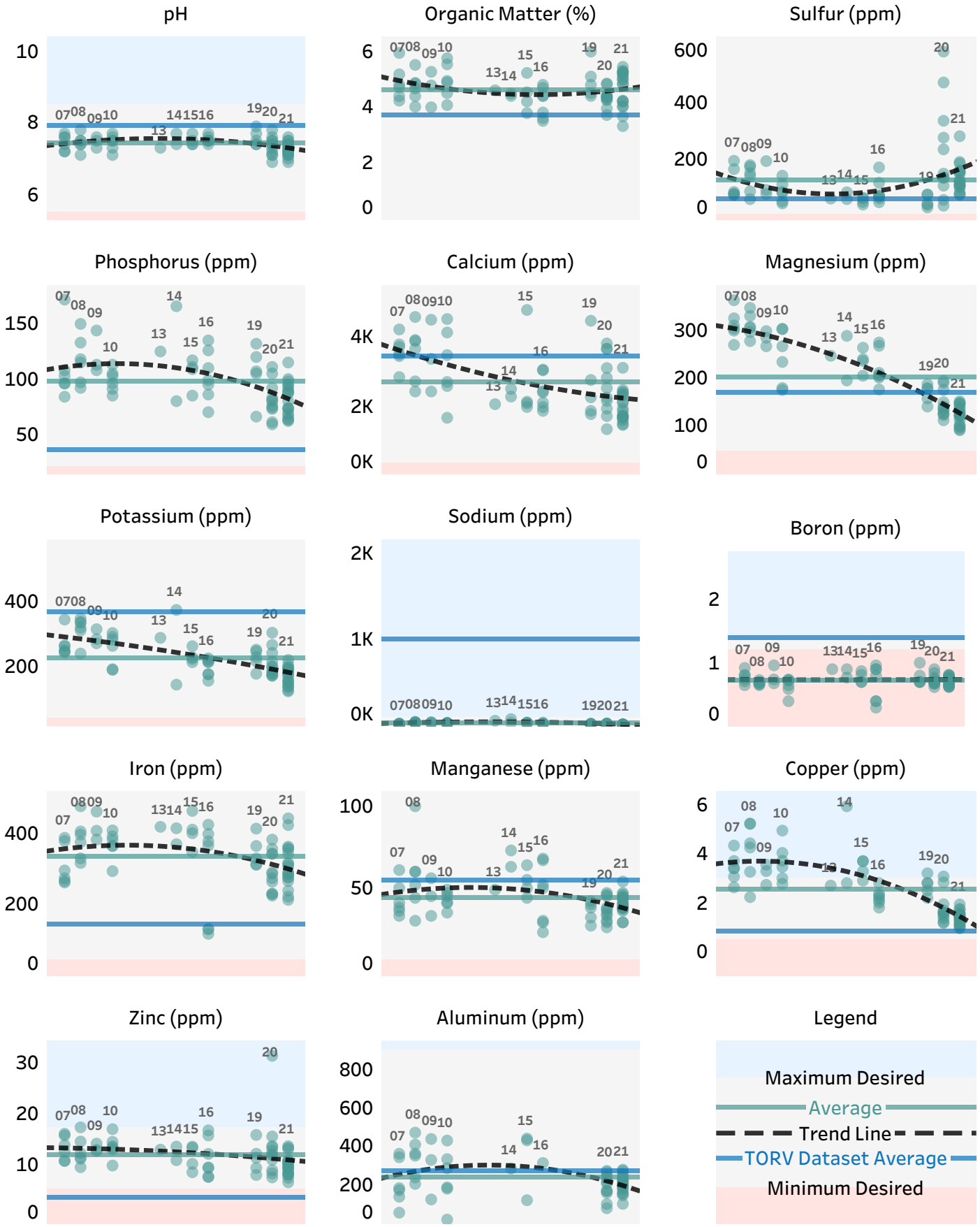
Sodium The average sodium is 22 ppm. This is well below 110 ppm and will not have a negative effect on turfgrass performance.

Sulfur The average sulfur is 129 ppm. This above the minimum MLSN guideline of 9 ppm. None is required.

Micronutrients While boron continues to be low like the other areas of the course, all micronutrients are present, and none are required as fertilizer.

As described in the pH section, foliar applications of iron may have a good effect if you see iron chlorosis.

Soil Testing | Fairways



Roughs

This is a summary and recommendations for fairway samples 2, 8, and 12. Recommendations are based on the **average results for samples** unless otherwise noted and a nitrogen input of 1.5 lbs. per 1000 sq. ft. to conclude the year.

pH (H_2O 1:1) The average pH is 7.23. This is within the optimum range for soil microbial activity and soil nutrient availability. With the pH in this range, there is a slight chance of seeing some iron chlorosis. If this does occur, you can fix it by making foliar applications of ferrous sulfate. However, this may or may not be practical because it is the rough. Fertigation with an iron source may benefit.

Organic matter The average organic matter percentage is 7.48%. This is OK. This also represents a substantial amount of potential for mineralized nitrogen. This is a slight increase but is expected with the warmer months and fertility.

Available Nitrogen (NO_4-N) The average total available nitrogen is 5.7 ppm. This is ideal.

Potassium The average potassium is 200 ppm. This is above the minimum MLSN guideline of 61 ppm. None is required.

Phosphorous The average Mehlich III phosphorus is 96 ppm. This is above the minimum MLSN guideline of 27 ppm. None is required.

Calcium The average calcium is 2802 ppm. This is above the minimum MLSN guideline of 336 ppm. None is required.

Magnesium The average magnesium is 144 ppm. This is above the minimum MLSN guideline of 50 ppm. None is required.

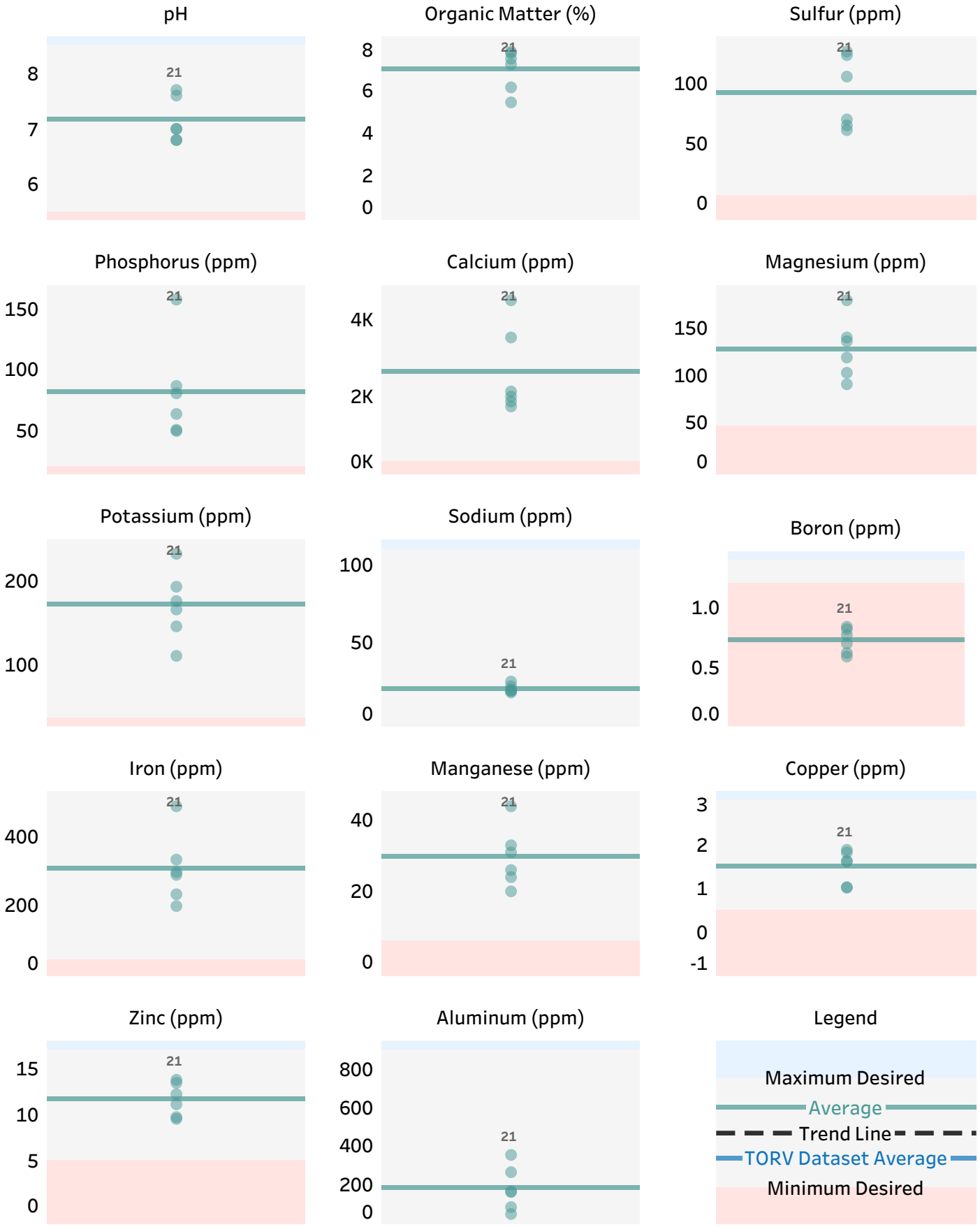
Sodium The average sodium is 21 ppm. This is well below 110 ppm and will not have a negative effect on turfgrass performance.

Sulfur The average sulfur is 119 ppm. This above the minimum MLSN guideline of 10 ppm. None is required.

Micronutrients While boron continues to be low like the other areas of the course, all micronutrients are present, and none are required as fertilizer.

As described in the pH section, foliar applications of iron may have a good effect if you see iron chlorosis.

Soil Testing | Rough



Water

FAO Handbook 29 is the Food and Agricultural Organization of the United Nations and widely is recognized as the leading source for irrigation water quality guidelines. Below are your water sample results as shown in comparison to the FAO guidelines.

Irrigation 18 QC

		Likelihood of Soil Problems		
	Lab Value	**Low**	**Medium**	**High**
ECw (Conductivity) (mmhos/cm)	0.27	< 0.7	0.7 - 3.0	> 3.0
TDS (mg/l, ppm)	170.3	< 450	450 - 2000	> 2000
SAR 0 -3		ECw > 0.7	ECw 0.7 - 0.2	ECw < 0.2
SAR 3 - 6		ECw > 1.2	ECw 1.2 - 0.3	ECw < 0.3
SAR 6 - 12		ECw > 1.9	ECw 1.9 - 0.5	ECw < 0.5
SAR 12 - 20		ECw > 2.9	ECw 2.9 - 1.3	ECw < 1.3
Sodium Na (me/l)	0.04	< 3	3 - 9	> 9
RSC (me/l)	-1.07	< 1.25	> 1.25	
Boron B (mg/l, ppm)	<0.05	< 0.5	0.5 - 3.0	> 3.0
Bicarbonate HCO3 (mg/l, ppm)	98.63	92	92 - 520	> 520
Chloride Cl (mg/l, ppm)	<2.00	< 105	> 105	

BROOKSIDE LABORATORIES, INC.

** WATER ANALYSIS

Maroon Creek Golf Club
10 Club Circle
Aspen, CO 81611

File Number: 35873
Date Received:08/02/2021
Date Reported:08/03/2021

Submitted By:TORV, LLC

Lab Number	1908
Sample Location	MAROON CREEK CLUB
Sample Description	IRRIGATION

pH		7.33
Hardness	(ppm)	136.75
Hardness	(grains/gal)	8.00
Conductivity	(mmhos/cm)	0.27
Sodium Adsorp. Ratio		0.04
Adjusted SAR		0.05
Adjusted RNa		0.03
pHc		7.92
Residual Sodium Carbonate (RSC)		-1.07

		(ppm)	meq/l	lbs/ac in
Calcium	(Ca)	45.34	2.26	10.28
Magnesium	(Mg)	5.13	0.42	1.16
Potassium	(K)	3.48	0.09	0.79
Sodium	(Na)	0.98	0.04	0.22
Iron	(Fe)	1.35		0.31
Total Alkalinity	(CaCO3)	80.83		18.33
Carbonate	(CO3)	0.00		
Bicarbonate	(HCO3)	98.63	1.62	22.37
Hydroxide	(OH)	0.00		
Chloride	(Cl)	< 2.00		
Sulfur as	(S04)	70.95	1.48	16.09
Salt Concentration	(TDS)	170.30		38.62
Boron	(B)	< 0.05		

Cation/Anion Ratio	0.91

Reviewed by:

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BROOKSIDE LABORATORIES, INC.

35873-72

SOIL AUDIT AND INVENTORY REPORT

Name Maroon Creek Golf Club City Aspen State CO

Independent Consultant TORV, LLC Date 08/04/2021

Sample Location GREEN				1		2		17
Sample Identification				4 in		4 in		4 in
Lab Number				0504-1		0505-1		0506-1
Total Exchange Capacity (ME/100 g)				5.17		4.46		4.48
pH (H_2O 1:1)				7.3		7.3		7.2
Organic Matter (360°C LOI) %				1.83		1.80		2.03
Estimated Nitrogen Release			#/1000	1		1		1
ANIONS	SOLUBLE SULFUR*		ppm	25		18		19
	PHOSPHORUS MEHLICH III	#/1000	P as P_2O_5	4		4		3
			ppm of P	57		52		49
	BRAY II	#/1000	P as P_2O_5	5		5		5
			ppm of P	72		76		78
	OLSEN	#/1000	P as P_2O_5					
			ppm of P					
EXCHANGABLE CATIONS	CALCIUM*		#/1000	24		20		20
			ppm	775		668		664
	MAGNESIUM*		#/1000	3		2		2
			ppm	86		76		76
	POTASSIUM*		#/1000	3		3		3
			ppm	107		87		98
	SODIUM*		#/1000	1		1		1
			ppm	22		19		19
BASE SATURATION PERCENT								
Calcium		%		74.95		74.89		74.11
Magnesium		%		13.86		14.20		14.14
Potassium		%		5.31		5.00		5.61
Sodium		%		1.85		1.85		1.84
Other Bases		%		4.10		4.10		4.20
Hydrogen		%		0.00		0.00		0.00
EXTRACTABLE MINORS								
Boron* (ppm)				0.43		0.38		0.35
Iron* (ppm)				160		134		119
Manganese* (ppm)				60		52		46
Copper* (ppm)				2.44		2.41		2.06
Zinc* (ppm)				21.65		18.97		18.61
Aluminum* (ppm)				124		101		100
OTHER TESTS	Soluble Salts (mmhos/cm)							
	Chlorides (ppm)							
	NO_3-N (ppm)			0.7		0.5		< 0.5
	NH_4-N (ppm)			2.0		0.7		1.2

d - specific

* Mehlich III Extractable

#/1000

BROOKSIDE LABORATORIES, INC.

35873-72

SOIL AUDIT AND INVENTORY REPORT

Name Maroon Creek Golf Club City Aspen State CO

Independent Consultant TORV, LLC Date 08/04/2021

Sample Location GREEN				4		6		8
Sample Identification				4 in		4 in		4 in
Lab Number				0507-1		0508-1		0509-1
Total Exchange Capacity (ME/100 g)				5.24		5.27		4.78
pH (H_2O 1:1)				7.1		7.3		7.1
Organic Matter (360°C LOI) %				1.92		1.93		1.89
Estimated Nitrogen Release			#/1000	1		1		1
ANIONS	SOLUBLE SULFUR*		ppm	20		25		21
	PHOSPHORUS MEHLICH III	#/1000	P as P_2O_5	4		6		3
			ppm of P	62		80		48
	PHOSPHORUS BRAY II	#/1000	P as P_2O_5	5		7		4
			ppm of P	75		102		61
	PHOSPHORUS OLSEN	#/1000	P as P_2O_5					
			ppm of P					
EXCHANGABLE CATIONS	CALCIUM*		#/1000	24		24		22
			ppm	784		786		711
	MAGNESIUM*		#/1000	3		3		3
			ppm	86		88		82
	POTASSIUM*		#/1000	3		3		3
			ppm	110		114		93
	SODIUM*		#/1000	1		1		1
			ppm	22		22		23
BASE SATURATION PERCENT								
Calcium		%		74.81		74.57		74.37
Magnesium		%		13.68		13.92		14.30
Potassium		%		5.38		5.55		4.99
Sodium		%		1.83		1.82		2.09
Other Bases		%		4.30		4.10		4.30
Hydrogen		%		0.00		0.00		0.00
EXTRACTABLE MINORS								
Boron* (ppm)				0.48		0.46		0.34
Iron* (ppm)				155		173		145
Manganese* (ppm)				73		74		57
Copper* (ppm)				2.91		2.77		2.29
Zinc* (ppm)				24.67		24.48		18.98
Aluminum* (ppm)				127		90		109
OTHER TESTS	Soluble Salts (mmhos/cm)							
	Chlorides (ppm)							
	NO_3-N (ppm)			0.8		0.6		< 0.5
	NH_4-N (ppm)			3.7		1.1		1.6

d - specific

* Mehlich III Extractable

#/1000

BROOKSIDE LABORATORIES, INC.

35873-72

SOIL AUDIT AND INVENTORY REPORT

Name Maroon Creek Golf Club City Aspen State CO

Independent Consultant TORV, LLC Date 08/04/2021

Sample Location			GREEN	10		12		16
Sample Identification				4 in		4 in		4 in
Lab Number				0510-1		0511-1		0512-1
Total Exchange Capacity (ME/100 g)				5.05		4.51		4.97
pH (H_2O 1:1)				7.2		7.4		7.3
Organic Matter (360°C LOI) %				2.34		1.91		1.96
Estimated Nitrogen Release			#/1000	1		1		1
ANIONS	SOLUBLE SULFUR*		ppm	28		18		18
	PHOSPHORUS	MEHLICH III	#/1000	5		4		4
			P as P_2O_5	71		55		56
			ppm of P					
		BRAY II	#/1000	7		6		7
			P as P_2O_5	98		86		94
			ppm of P					
		OLSEN	#/1000					
			P as P_2O_5					
			ppm of P					
EXCHANGABLE CATIONS	CALCIUM*		#/1000	23		20		23
			ppm	755		661		754
	MAGNESIUM*		#/1000	3		2		2
			ppm	82		81		79
	POTASSIUM*		#/1000	3		3		3
			ppm	108		102		98
	SODIUM*		#/1000	1		1		1
			ppm	23		20		20
BASE SATURATION PERCENT								
Calcium			%	74.75		73.28		75.86
Magnesium			%	13.53		14.97		13.25
Potassium			%	5.48		5.80		5.06
Sodium			%	1.98		1.93		1.75
Other Bases			%	4.20		4.00		4.10
Hydrogen			%	0.00		0.00		0.00
EXTRACTABLE MINORS								
Boron* (ppm)				0.37		0.45		0.40
Iron* (ppm)				170		143		138
Manganese* (ppm)				58		62		58
Copper* (ppm)				2.51		3.41		2.13
Zinc* (ppm)				22.18		22.05		18.30
Aluminum* (ppm)				113		109		122
OTHER TESTS	Soluble Salts (mmhos/cm)							
	Chlorides (ppm)							
	NO_3-N (ppm)			0.7		0.7		0.6
	NH_4-N (ppm)			1.4		1.7		1.4

d - specific a - alkaline

* Mehlich III Extractable

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BROOKSIDE LABORATORIES, INC.

35873-72

SOIL AUDIT AND INVENTORY REPORT

Name Maroon Creek Golf Club City Aspen State CO

Independent Consultant TORV, LLC Date 08/04/2021

Sample Location TEE				1		2		17
Sample Identification				4 in		4 in		4 in
Lab Number				0513-1		0514-1		0515-1
Total Exchange Capacity (ME/100 g)				4.67		4.57		6.28
pH (H_2O 1:1)				7.7		7.3		7.3
Organic Matter (360°C LOI) %				2.44		2.48		2.15
Estimated Nitrogen Release			#/1000	1		1		1
ANIONS	SOLUBLE SULFUR*		ppm	22		20		33
	PHOSPHORUS MEHLICH III	#/1000	P as P_2O_5	8		7		9
			ppm of P	107		94		125
	BRAY II	#/1000	P as P_2O_5	9		11		11
			ppm of P	132		152		153
	OLSEN	#/1000	P as P_2O_5					
			ppm of P					
EXCHANGABLE CATIONS	CALCIUM*		#/1000	20		21		28
			ppm	667		684		915
	MAGNESIUM*		#/1000	3		3		4
			ppm	93		83		121
	POTASSIUM*		#/1000	3		2		4
			ppm	112		71		128
	SODIUM*		#/1000	1		1		1
			ppm	23		20		25
BASE SATURATION PERCENT								
Calcium		%		71.41		74.84		72.85
Magnesium		%		16.60		15.13		16.06
Potassium		%		6.15		3.98		5.23
Sodium		%		2.14		1.90		1.73
Other Bases		%		3.70		4.10		4.10
Hydrogen		%		0.00		0.00		0.00
EXTRACTABLE MINORS								
Boron* (ppm)				0.55		0.39		0.50
Iron* (ppm)				324		236		261
Manganese* (ppm)				38		30		35
Copper* (ppm)				2.37		1.98		2.23
Zinc* (ppm)				9.57		8.80		11.66
Aluminum* (ppm)				119		110		112
OTHER TESTS	Soluble Salts (mmhos/cm)							
	Chlorides (ppm)							
	NO_3-N (ppm)			0.7		0.9		0.6
	NH_4-N (ppm)			1.9		2.2		1.1

d - specific a - alkaline

* Mehlich III Extractable

#/1000

BROOKSIDE LABORATORIES, INC.

35873-72

SOIL AUDIT AND INVENTORY REPORT

Name Maroon Creek Golf Club City Aspen State CO

Independent Consultant TORV, LLC Date 08/04/2021

Sample Location TEE				4		6		8
Sample Identification				4 in		4 in		4 in
Lab Number				0516-1		0517-1		0518-1
Total Exchange Capacity (ME/100 g)				6.47		4.90		5.35
pH (H_2O 1:1)				7.6		7.3		7.4
Organic Matter (360°C LOI) %				2.59		2.38		2.78
Estimated Nitrogen Release			#/1000	1		1		1
ANIONS	SOLUBLE SULFUR*		ppm	41		21		23
	PHOSPHORUS MEHLICH III	#/1000	P as P_2O_5	10		7		8
			ppm of P	136		96		113
	BRAY II	#/1000	P as P_2O_5	12		8		11
			ppm of P	173		119		152
	OLSEN	#/1000	P as P_2O_5					
			ppm of P					
EXCHANGABLE CATIONS	CALCIUM*		#/1000	28		22		23
			ppm	923		723		765
	MAGNESIUM*		#/1000	4		3		3
			ppm	132		93		111
	POTASSIUM*		#/1000	4		3		3
			ppm	119		82		111
	SODIUM*		#/1000	1		1		1
			ppm	46		23		24
BASE SATURATION PERCENT								
Calcium		%		71.33		73.78		71.50
Magnesium		%		17.00		15.82		17.29
Potassium		%		4.72		4.29		5.32
Sodium		%		3.09		2.04		1.95
Other Bases		%		3.80		4.10		4.00
Hydrogen		%		0.00		0.00		0.00
EXTRACTABLE MINORS								
Boron* (ppm)				0.67		0.44		0.42
Iron* (ppm)				332		250		166
Manganese* (ppm)				38		30		41
Copper* (ppm)				2.14		1.47		1.75
Zinc* (ppm)				12.57		9.96		11.90
Aluminum* (ppm)				68		126		123
OTHER TESTS	Soluble Salts (mmhos/cm)							
	Chlorides (ppm)							
	NO_3-N (ppm)			0.6		0.6		0.6
	NH_4-N (ppm)			1.4		1.8		2.2

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BROOKSIDE LABORATORIES, INC.

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SOIL AUDIT AND INVENTORY REPORT

Name Maroon Creek Golf Club City Aspen State CO

Independent Consultant TORV, LLC Date 08/04/2021

Sample Location				TEE	10		12		16
Sample Identification					4 in		4 in		4 in
Lab Number					0519-1		0520-1		0521-1
Total Exchange Capacity (ME/100 g)					3.65		4.31		4.53
pH (H_2O 1:1)					7.4		7.3		7.3
Organic Matter (360°C LOI) %					2.06		1.87		2.45
Estimated Nitrogen Release			#/1000		1		1		1
ANIONS	SOLUBLE SULFUR*		ppm		18		15		24
	PHOSPHORUS	MEHLICH III	#/1000	P as P_2O_5	7		7		7
				ppm of P	96		102		98
		BRAY II	#/1000	P as P_2O_5	9		10		8
				ppm of P	132		140		110
		OLSEN	#/1000	P as P_2O_5					
				ppm of P					
EXCHANGABLE CATIONS	CALCIUM*		#/1000		16		20		20
			ppm		511		644		661
	MAGNESIUM*		#/1000		2		2		3
			ppm		79		76		89
	POTASSIUM*		#/1000		2		2		3
			ppm		79		77		83
	SODIUM*		#/1000		1		1		1
			ppm		21		20		20
BASE SATURATION PERCENT									
Calcium			%		70.00		74.71		72.96
Magnesium			%		18.04		14.69		16.37
Potassium			%		5.55		4.58		4.70
Sodium			%		2.50		2.02		1.92
Other Bases			%		4.00		4.10		4.10
Hydrogen			%		0.00		0.00		0.00
EXTRACTABLE MINORS									
Boron* (ppm)					0.28		0.39		0.50
Iron* (ppm)					181		237		292
Manganese* (ppm)					30		35		35
Copper* (ppm)					1.30		1.33		1.68
Zinc* (ppm)					7.69		6.79		10.11
Aluminum* (ppm)					96		126		67
OTHER TESTS	Soluble Salts (mmhos/cm)								
	Chlorides (ppm)								
	NO_3-N (ppm)				0.5		2.4		0.5
	NH_4-N (ppm)				1.2		1.6		2.0

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SOIL AUDIT AND INVENTORY REPORT

Name Maroon Creek Golf Club City Aspen State CO

Independent Consultant TORV, LLC Date 08/04/2021

Sample Location FWY				1		2		17
Sample Identification				4 in		4 in		4 in
Lab Number				0522-1		0523-1		0524-1
Total Exchange Capacity (ME/100 g)				10.24		10.93		11.73
pH (H_2O 1:1)				7.2		7.2		7.6
Organic Matter (360°C LOI) %				5.24		5.00		5.45
Estimated Nitrogen Release			#/1000	2		2		2
ANIONS	SOLUBLE SULFUR*		ppm	124		156		111
	PHOSPHORUS MEHLICH III	#/1000	P as P_2O_5	6		8		4
			ppm of P	88		115		63
	BRAY II	#/1000	P as P_2O_5	10		13		10
			ppm of P	143		182		137
	OLSEN	#/1000	P as P_2O_5					
			ppm of P					
EXCHANGABLE CATIONS	CALCIUM*		#/1000	51		53		59
			ppm	1647		1721		1912
	MAGNESIUM*		#/1000	4		4		4
			ppm	130		145		146
	POTASSIUM*		#/1000	5		7		5
			ppm	152		219		156
	SODIUM*		#/1000	1		1		1
			ppm	23		23		24
BASE SATURATION PERCENT								
Calcium		%		80.42		78.73		81.50
Magnesium		%		10.58		11.06		10.37
Potassium		%		3.81		5.14		3.41
Sodium		%		0.98		0.91		0.89
Other Bases		%		4.20		4.20		3.80
Hydrogen		%		0.00		0.00		0.00
EXTRACTABLE MINORS								
Boron* (ppm)				0.62		0.77		0.80
Iron* (ppm)				289		358		314
Manganese* (ppm)				43		44		44
Copper* (ppm)				1.28		1.40		1.45
Zinc* (ppm)				13.17		10.45		9.12
Aluminum* (ppm)				210		277		173
OTHER TESTS	Soluble Salts (mmhos/cm)							
	Chlorides (ppm)							
	NO_3-N (ppm)			8.3		6.2		3.7
	NH_4-N (ppm)			3.8		4.6		4.2

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SOIL AUDIT AND INVENTORY REPORT

Name Maroon Creek Golf Club City Aspen State CO

Independent Consultant TORV, LLC Date 08/04/2021

Sample Location FWY				4		6		8
Sample Identification				4 in		4 in		4 in
Lab Number				0525-1		0526-1		0527-1
Total Exchange Capacity (ME/100 g)				8.97		10.33		12.74
pH (H_2O 1:1)				7.5		7.0		7.2
Organic Matter (360°C LOI) %				5.10		5.31		4.23
Estimated Nitrogen Release			#/1000	2		2		1
ANIONS	SOLUBLE SULFUR*		ppm	108		154		125
	PHOSPHORUS MEHLICH III	#/1000	P as P_2O_5	5		6		7
			ppm of P	67		89		98
	BRAY II	#/1000	P as P_2O_5	8		8		11
			ppm of P	110		119		150
	OLSEN	#/1000	P as P_2O_5					
			ppm of P					
EXCHANGABLE CATIONS	CALCIUM*		#/1000	45		52		65
			ppm	1467		1683		2126
	MAGNESIUM*		#/1000	3		3		4
			ppm	101		112		121
	POTASSIUM*		#/1000	4		5		6
			ppm	135		167		188
	SODIUM*		#/1000	1		1		1
			ppm	23		22		20
BASE SATURATION PERCENT								
Calcium			%	81.77		81.46		83.44
Magnesium			%	9.38		9.04		7.91
Potassium			%	3.86		4.15		3.78
Sodium			%	1.11		0.93		0.68
Other Bases			%	3.90		4.40		4.20
Hydrogen			%	0.00		0.00		0.00
EXTRACTABLE MINORS								
Boron* (ppm)				0.63		0.69		0.64
Iron* (ppm)				275		355		306
Manganese* (ppm)				40		47		40
Copper* (ppm)				1.20		1.10		1.15
Zinc* (ppm)				8.42		7.94		9.34
Aluminum* (ppm)				156		271		236
OTHER TESTS	Soluble Salts (mmhos/cm)							
	Chlorides (ppm)							
	NO_3-N (ppm)			6.1		7.3		9.1
	NH_4-N (ppm)			3.3		4.0		3.5

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SOIL AUDIT AND INVENTORY REPORT

Name Maroon Creek Golf Club City Aspen State CO

Independent Consultant TORV, LLC Date 08/04/2021

Sample Location			FWY	10		12		16
Sample Identification				4 in		4 in		4 in
Lab Number				0528-1		0529-1		0530-1
Total Exchange Capacity (ME/100 g)				14.48		17.67		13.62
pH (H_2O 1:1)				7.3		7.5		7.3
Organic Matter (360°C LOI) %				4.03		4.99		5.25
Estimated Nitrogen Release			#/1000	1		2		2
ANIONS	SOLUBLE SULFUR*		ppm	185		160		280
	PHOSPHORUS	MEHLICH III	#/1000	6		5		7
			P as P_2O_5	91		69		95
			ppm of P					
		BRAY II	#/1000	14		11		13
			P as P_2O_5	198		159		183
			ppm of P					
		OLSEN	#/1000					
			P as P_2O_5					
			ppm of P					
EXCHANGABLE CATIONS	CALCIUM*		#/1000	74		95		70
			ppm	2400		3103		2298
	MAGNESIUM*		#/1000	5		4		4
			ppm	151		119		124
	POTASSIUM*		#/1000	6		5		5
			ppm	204		151		177
	SODIUM*		#/1000	1		1		1
			ppm	24		21		20
BASE SATURATION PERCENT								
	Calcium		%	82.87		87.80		84.36
	Magnesium		%	8.69		5.61		7.59
	Potassium		%	3.61		2.19		3.33
	Sodium		%	0.72		0.52		0.64
	Other Bases		%	4.10		3.90		4.10
	Hydrogen		%	0.00		0.00		0.00
EXTRACTABLE MINORS								
	Boron* (ppm)			0.78		0.74		0.75
	Iron* (ppm)			442		362		423
	Manganese* (ppm)			54		38		46
	Copper* (ppm)			1.57		1.93		1.36
	Zinc* (ppm)			8.15		10.51		10.20
	Aluminum* (ppm)			257		99		143
OTHER TESTS	Soluble Salts (mmhos/cm)							
	Chlorides (ppm)							
	NO_3-N (ppm)			3.7		5.8		4.8
	NH_4-N (ppm)			4.0		5.4		5.8

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SOIL AUDIT AND INVENTORY REPORT

Name Maroon Creek Golf Club City Aspen State CO

Independent Consultant TORV, LLC Date 08/04/2021

Sample Location ROUGH				2		8		12
Sample Identification				4 in		4 in		4 in
Lab Number				0531-1		0532-1		0533-1
Total Exchange Capacity (ME/100 g)				12.83		11.47		25.17
pH (H_2O 1:1)				7.0		7.0		7.7
Organic Matter (360°C LOI) %				7.79		7.19		7.46
Estimated Nitrogen Release			#/1000	2		2		2
ANIONS	SOLUBLE SULFUR*		ppm	127		106		124
	PHOSPHORUS MEHLICH III	#/1000	P as P_2O_5	11		6		4
			ppm of P	158		81		51
	BRAY II	#/1000	P as P_2O_5	18		8		8
			ppm of P	253		116		119
	OLSEN	#/1000	P as P_2O_5					
			ppm of P					
EXCHANGABLE CATIONS	CALCIUM*		#/1000	62		58		138
			ppm	2015		1887		4505
	MAGNESIUM*		#/1000	5		4		4
			ppm	179		119		136
	POTASSIUM*		#/1000	7		5		6
			ppm	232		176		193
	SODIUM*		#/1000	1		1		1
			ppm	25		20		19
BASE SATURATION PERCENT								
	Calcium	%		78.53		82.26		89.49
	Magnesium	%		11.63		8.65		4.50
	Potassium	%		4.64		3.93		1.97
	Sodium	%		0.85		0.76		0.33
	Other Bases	%		4.40		4.40		3.70
	Hydrogen	%		0.00		0.00		0.00
EXTRACTABLE MINORS								
	Boron* (ppm)			0.82		0.59		0.77
	Iron* (ppm)			487		289		297
	Manganese* (ppm)			44		31		24
	Copper* (ppm)			1.82		1.03		1.88
	Zinc* (ppm)			13.77		12.21		13.44
	Aluminum* (ppm)			354		161		46
OTHER TESTS	Soluble Salts (mmhos/cm)							
	Chlorides (ppm)							
	NO_3-N (ppm)			7.6		12.6		8.2
	NH_4-N (ppm)			8.4		4.4		4.5

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BROOKSIDE LABORATORIES, INC.

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SOIL AUDIT AND INVENTORY REPORT

Name Maroon Creek Golf Club City Aspen State CO

Independent Consultant TORV, LLC Date 08/04/2021

Sample Location	GREEN		5					
Sample Identification			4 in					
Lab Number			0534-1					
Total Exchange Capacity (ME/100 g)			5.58					
pH (H_2O 1:1)			7.9					
Organic Matter (360°C LOI) %			1.18					
Estimated Nitrogen Release		#/1000	1					
ANIONS	SOLUBLE SULFUR*	ppm	17					
ANIONS / PHOSPHORUS	MEHLICH III	#/1000	2					
		P as P_2O_5	35					
		ppm of P						
	BRAY II	#/1000	5					
		P as P_2O_5	74					
		ppm of P						
	OLSEN	#/1000						
		P as P_2O_5						
		ppm of P						
EXCHANGABLE CATIONS	CALCIUM*	#/1000	24					
		ppm	770					
	MAGNESIUM*	#/1000	4					
		ppm	137					
	POTASSIUM*	#/1000	4					
		ppm	115					
	SODIUM*	#/1000	1					
		ppm	22					
BASE SATURATION PERCENT								
	Calcium	%	69.00					
	Magnesium	%	20.46					
	Potassium	%	5.28					
	Sodium	%	1.71					
	Other Bases	%	3.50					
	Hydrogen	%	0.00					
EXTRACTABLE MINORS								
	Boron* (ppm)		0.50					
	Iron* (ppm)		100					
	Manganese* (ppm)		28					
	Copper* (ppm)		0.39					
	Zinc* (ppm)		3.28					
	Aluminum* (ppm)		120					
OTHER TESTS	Soluble Salts (mmhos/cm)							
	Chlorides (ppm)							
	NO_3-N (ppm)		0.7					
	NH_4-N (ppm)		2.3					

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