



Data Collection Report Spring 2017

Ron Jaworski's Signature Courses





SOIL and WATER CONSULTING



Data Collection Report ~ Spring 2017



SOIL and WATER CONSULTING

Course Name: Blue Heron Pines Golf Club
Date of Visit: April 24, 2017

	<u>4/24/15</u>	<u>4/20/16</u>	<u>4/24/17</u>
Humidity/Air Temperature	48°	38%/55°	71%/55°
Fairway Temperature	47.4°	51.1°	60°
Greens Temperature	41°	46.6°	59°

Notes from the visit

- Greens Mowing height - 0.125"
- Fairways height - 0.600"
- Aerified the first week of March.
- Did Proxy and Primo on greens.
- very little Nitrogen applied thus far.
- Plan for new tees and irrigation on holes 32 and #9.
- No fertilizer on tees or fairways in 2017 as of visit.
- Upgrade to #10 tee/#18 green area and new fencing.
- New waste bunker area on #1





SOIL and WATER CONSULTING

TEE	Acceptable Range For Standard Soil Sample	5,8,13 (avg) 4/24/15	7,14 (avg) 4/20/16	1,10 (avg) 4/24/17
Organic Matter (Humus)	2 - 3%	2.02	1.71	1.75
Sulfur	50 - 100 ppm	9.67	11.00	14.00
Mehlich III - Phosphorus	350 lbs/acre	169.33	329.50	321.00
Calcium	68%	74.27	73.54	75.74
Magnesium	15%	14.28	16.26	12.23
Potassium	5%	1.25	1.15	1.16
Sodium	<2%	2.05	2.29	2.39
Boron	1 - 1.5 ppm	0.28	0.44	0.71
Iron	120 ppm	196.67	228.50	268.50
Manganese	50 ppm	5.33	9.00	9.00

TEE	Acceptable Range For Saturated Paste Sample	5,13 (avg) 4/25/15	7,14 (avg) 4/20/16	1,10 (avg) 4/24/17
Nitrate - Bentgrass	5 - 10 ppm	<0.5	<0.5	<0.5
Phosphorus	2 - 10 ppm	0.21	0.36	0.71
Potassium	40 - 100 ppm	1.11	15.28	31.92
Calcium	60 - 200 ppm	18.96	17.69	28.19
Magnesium	20 - 70 ppm	5.60	3.34	8.12
Sodium	0 - 30 ppm	8.77	4.26	6.23
Soluble Salts	<1,920 ppm	95.50	62.50	201.50
Bicarbonate	<60 ppm	57.35	65.89	91.52
Chloride	<1,000 ppm	7.00	16.50	37.50
SAR	<4%	0.45	0.17	0.26

FAIRWAY	Acceptable Range For Standard Soil Sample	5,8,13 (avg) 4/24/15	7,14 (avg) 4/20/16	1,10 (avg) 4/24/17
Organic Matter (Humus)	2 - 3%	3.69	3.33	2.24
Sulfur	50 - 100 ppm	15.33	22.00	14.50
Mehlich III - Phosphorus	350 lbs/acre	354.00	391.50	522.00
Calcium	68%	70.04	64.87	65.20
Magnesium	15%	16.49	19.71	13.17
Potassium	5%	2.05	2.86	3.04
Sodium	<2%	1.71	1.75	2.25
Boron	1 - 1.5 ppm	0.44	0.63	0.67
Iron	120 ppm	205.33	338.00	275.50
Manganese	50 ppm	8.33	14.00	9.50

FAIRWAY	Acceptable Range For Saturated Paste Sample	5,13 (avg) 4/25/15	7,14 (avg) 4/20/16	1,10 (avg) 4/24/17
Nitrate - Bentgrass	5 - 10 ppm	<0.5	<0.5	<0.5
Phosphorus	2 - 10 ppm	0.50	0.38	0.82
Potassium	40 - 100 ppm	9.31	9.25	23.91
Calcium	60 - 200 ppm	23.06	12.69	20.77
Magnesium	20 - 70 ppm	9.11	2.65	7.66
Sodium	0 - 30 ppm	9.07	3.95	7.55
Soluble Salts	<1,920 ppm	124.50	66.50	171.50
Bicarbonate	<60 ppm	81.76	53.69	79.32
Chloride	<1,000 ppm	8.50	13.00	27.50
SAR	<4%	0.41	0.17	0.37

GREENS	Acceptable Range For Standard Soil Sample	5,8,13 (avg) 4/24/15	7,14 (avg) 4/20/16	1,10 (avg) 4/24/17
Organic Matter (Humus)	2 - 3%	0.70	0.76	0.85
Sulfur	50 - 100 ppm	16.33	9.00	7.00
Mehlich III - Phosphorus	350 lbs/acre	172.67	222.00	192.50
Calcium	68%	67.05	64.09	67.79
Magnesium	15%	9.16	15.81	18.79
Potassium	5%	2.49	2.41	2.15
Sodium	<2%	3.63	3.60	4.49
Boron	1 - 1.5 ppm	<0.20	<0.22	0.46
Iron	120 ppm	82.67	122.50	92.00
Manganese	50 ppm	21.00	30.00	24.50

GREENS	Acceptable Range For Saturated Paste Sample	5,13 (avg) 4/25/15	7,14 (avg) 4/20/16	1,10 (avg) 4/24/17
Nitrate - Bentgrass	1-3 ppm	<0.5	<0.5	<0.5
Phosphorus	2 - 7 ppm	0.56	0.32	0.72
Potassium	25-40 ppm	13.07	6.87	15.29
Calcium	50- 75 ppm	18.32	12.41	23.07
Magnesium	15-30 ppm	3.53	5.77	12.06
Sodium	0 - 30 ppm	10.67	2.58	8.64
Soluble Salts	<1,000 ppm	137.00	89.50	179.50
Bicarbonate	<60 ppm	15.86	61.01	125.68
Chloride	<200 ppm	3.50	9.50	20.50
SAR	<4%	0.60	0.11	0.37

WATER	Acceptable Range For Water Sample	Irrigation Water 4/24/15	Irrigation Water 4/20/16	Irrigation Water 4/24/17
pH		7.94	6.76	7.01
EC	<2.25 mmhos/cm	0.17	0.18	0.13
Sodium		23.12	25.60	17.90
Calcium	20 - 60 ppm	6.84	5.95	5.27
Magnesium	10 - 25 ppm	1.93	1.63	1.41
Potassium	5 - 20 ppm	2.61	2.46	2.12
Sulfur	30 - 90 ppm	5.49	6.20	3.31
Bicarbonate	<120 ppm	35.57	35.28	30.96
Boron	<0.67 ppm	<0.05	<0.05	<0.05
Chloride	<177 ppm	29.11	31.49	17.02



Data Collection Report ~ Spring 2017



SOIL and WATER CONSULTING

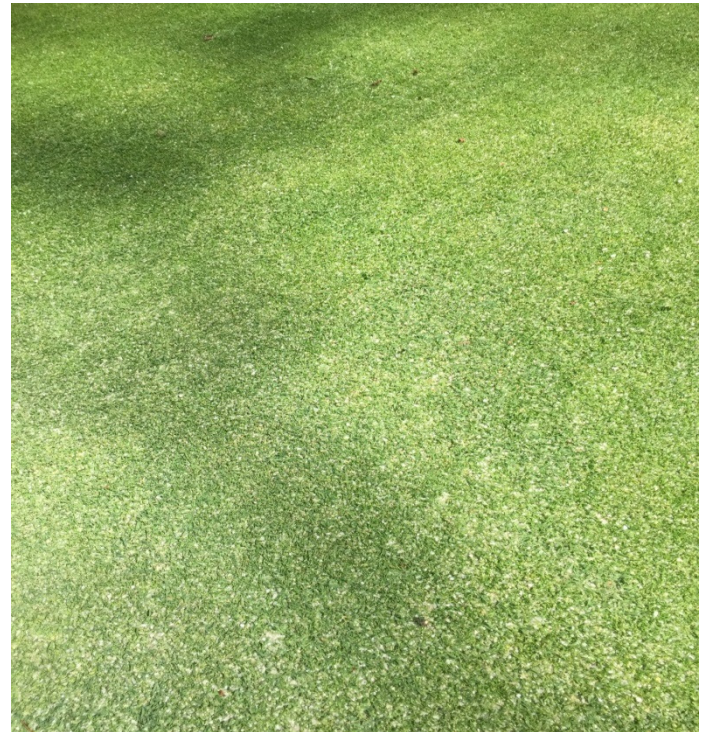
Course Name: Downingtown Country Club

Date of Visit: May 3, 2017

	<u>5/22/15</u>	<u>4/29/16</u>	<u>5/3/17</u>
Humidity/Air Temperature	33%/75°	75%/50°	27%/63°
Fairway Temperature	62.4°	51.7°	70°
Greens Temperature	60.1°	50.3°	68°

Notes from the visit

- Greens Mowing height - 0.145"
- Tees and Fairways height - 0.600"
- Aerified Greens April 17th
- Proxy and primo applied once per month.
- 21-0-0, Potash and gypsum applied to greens at aerification.
- Urea applied on tees and fairways
- Pre-emergence herbicide (Dimension) applied.
- Noticed a little Yellow Patch on some greens during the visit.





SOIL and WATER CONSULTING

TEE	Acceptable Range For Standard Soil Sample	6,16,18 (avg) 5/22/15	1,10 (avg) 4/29/16	9,18 (avg) 5/3/17
Organic Matter (Humus)	2 - 3%	3.04	1.79	3.93
Sulfur	50 - 100 ppm	14.00	16.50	21.00
Mehlich III - Phosphorus	350 lbs/acre	670.33	824.50	820.00
Calcium	68%	66.05	76.23	75.88
Magnesium	15%	16.10	13.41	12.69
Potassium	5%	3.32	1.67	3.42
Sodium	<2%	2.64	1.99	1.18
Boron	1 - 1.5 ppm	0.47	36.00	0.61
Iron	120 ppm	241.33	241.00	313.50
Manganese	50 ppm	58.00	23.50	51.00

TEE	Acceptable Range For Saturated Paste Sample	6,18 (avg) 5/22/15	1,10 (avg) 4/29/16	9,18 (avg) 5/3/17
Nitrate - Poa/Bentgrass	5 - 10 ppm	19.40	<0.5	<0.5
Phosphorus	2 - 10 ppm	0.43	1.05	0.62
Potassium	40 - 100 ppm	14.29	10.38	17.60
Calcium	60 - 200 ppm	50.09	42.48	28.06
Magnesium	20 - 70 ppm	15.97	10.47	9.09
Sodium	0 - 30 ppm	35.43	17.83	8.20
Soluble Salts	<1,920 ppm	393.50	236.00	191.00
Bicarbonate	<60 ppm	34.17	135.45	119.58
Chloride	<1,000 ppm	97.50	23.00	13.00
SAR	<4%	1.13	0.00	0.35

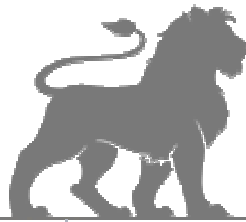
FAIRWAY	Acceptable Range For Standard Soil Sample	6,16,18 (avg) 5/22/15	1,10 (avg) 4/29/16	9,18 (avg) 5/3/17
Organic Matter (Humus)	2 - 3%	4.19	3.89	4.47
Sulfur	50 - 100 ppm	14.67	41.00	27.50
Mehlich III - Phosphorus	350 lbs/acre	238.00	261.00	251.50
Calcium	68%	55.74	65.43	69.50
Magnesium	15%	18.45	15.62	16.51
Potassium	5%	4.75	4.65	4.93
Sodium	<2%	3.37	1.89	2.26
Boron	1 - 1.5 ppm	0.46	0.43	0.54
Iron	120 ppm	129.00	99.00	144.50
Manganese	50 ppm	57.67	84.00	63.00

FAIRWAY	Acceptable Range For Saturated Paste Sample	6,18 (avg) 5/22/15	1,10 (avg) 4/29/16	9,18 (avg) 5/3/17
Nitrate - Poa/Bentgrass	5 - 10 ppm	21.80	<0.5	<0.5
Phosphorus	2 - 10 ppm	0.17	0.14	0.42
Potassium	40 - 100 ppm	18.82	16.07	13.25
Calcium	60 - 200 ppm	48.62	49.85	31.46
Magnesium	20 - 70 ppm	17.92	13.58	10.74
Sodium	0 - 30 ppm	47.49	19.46	19.41
Soluble Salts	<1,920 ppm	433.00	289.00	238.50
Bicarbonate	<60 ppm	18.30	59.79	112.26
Chloride	<1,000 ppm	119.50	20.50	27.00
SAR	<4%	1.48	0.65	0.78

GREENS	Acceptable Range For Standard Soil Sample	3,6,15,16,18 (avg) 5/22/15	1,10 (avg) 4/29/16	9,18 (avg) 5/3/17
Organic Matter (Humus)	2 - 3%	2.66	2.69	2.64
Sulfur	50 - 100 ppm	22.60	13.00	50.50
Mehlich III - Phosphorus	350 lbs/acre	534.00	481.00	536.00
Calcium	68%	65.33	67.07	74.90
Magnesium	15%	20.35	19.90	13.58
Potassium	5%	6.16	6.21	4.29
Sodium	<2%	4.03	2.69	2.09
Boron	1 - 1.5 ppm	0.61	0.52	0.41
Iron	120 ppm	240.60	169.50	282.50
Manganese	50 ppm	44.00	48.50	33.00

GREENS	Acceptable Range For Saturated Paste Sample	1,18 (avg) 5/22/15	1,10 (avg) 4/29/16	9,18 (avg) 5/3/17
Nitrate - Bentgrass	1-3 ppm	7.30	<0.5	<0.5
Phosphorus	2 - 7 ppm	0.47	0.60	0.79
Potassium	25-40 ppm	31.80	16.70	37.71
Calcium	50- 75 ppm	52.44	22.35	61.82
Magnesium	15-30 ppm	18.56	7.52	18.93
Sodium	0 - 30 ppm	56.64	18.10	19.23
Soluble Salts	<1,000 ppm	480.00	167.50	396.50
Bicarbonate	<60 ppm	34.17	97.62	126.90
Chloride	<200 ppm	122.50	12.50	43.00
SAR	<4%	1.71	0.85	0.55

WATER	Acceptable Range For Water Sample	Hole #15 5/22/15	Hole #10 4/29/16	Hole #18 5/3/17
pH		7.54	7.85	7.65
EC	<2.25 mmhos/cm	1.31	1.15	0.83
Sodium		160.70	138.50	103.30
Calcium	20 - 60 ppm	40.54	64.65	34.10
Magnesium	10 - 25 ppm	34.35	14.89	12.08
Potassium	5 - 20 ppm	3.53	3.45	2.06
Sulfur	30 - 90 ppm	25.37	39.54	10.34
Bicarbonate	<120 ppm	212.00	182.14	155.50
Boron	<0.67 ppm	<0.05	<0.05	<0.05
Chloride	<177 ppm	301.61	247.14	157.44



RON JAWORSKI'S
RAMBLEWOOD
COUNTRY CLUB

Data Collection Report ~ Spring 2017



SOIL and WATER CONSULTING

Course Name: Ramblewood Country Club

Date of Visit: April 26, 2017

	<u>4/29/16</u>	<u>4/26/17</u>
Humidity/Air Temperature	50%/75°	77%/64°
Fairway Temperature	53°	60°
Greens Temperature	54°	61°

Notes from the visit

- Greens Mowing height - 0.145"
- Tees and Fairways height - 0.600"
- Aerfied Greens on 4/3(white), 4/5 (blue), 4/10 (red)
- Applied Gypsum and Potash to greens at aerification.
- Applied 0.25 pounds of N per 1,000 sq. ft. rate to fairways.
- Apply double the amendments to Greens like Red Course #1.





SOIL and WATER CONSULTING

TEE	Acceptable Range For Standard Soil Sample	Red 1, White 1, Blue 7 (avg) 4/29/16	Red 2, White 2, Blue 2 (avg) 4/26/17
Organic Matter (Humus)	2 - 3%	3.42	4.26
Sulfur	50 - 100 ppm	14.33	20.66
Mehlich III - Phosphorus	350 lbs/acre	816.66	1210.66
Calcium	68%	64.03	66.74
Magnesium	15%	13.87	15.67
Potassium	5%	3.62	3.37
Sodium	<2%	1.83	1.78
Boron	1 - 1.5 ppm	0.55	1.00
Iron	120 ppm	545.33	599.66
Manganese	50 ppm	5.00	11.00

TEE	Acceptable Range For Saturated Paste Sample	Red 1, White 1, Blue 7 (avg) 4/29/16	Red 2, White 2, Blue 2 (avg) 4/26/17
Nitrate - Ryegrass	5 - 10 ppm	<0.5	<0.5
Phosphorus	2 - 10 ppm	0.62	0.96
Potassium	40 - 100 ppm	9.33	12.80
Calcium	60 - 200 ppm	13.40	25.62
Magnesium	20 - 70 ppm	4.09	8.44
Sodium	0 - 30 ppm	9.10	11.07
Soluble Salts	<1,920 ppm	95.67	173.33
Bicarbonate	<60 ppm	30.10	75.65
Chloride	<1,000 ppm	10.33	19.67
SAR	<4%	0.56	0.48

FAIRWAY	Acceptable Range For Standard Soil Sample	Red 1, White 1, Blue 7 (avg) 4/29/16	Red 2, White 2, Blue 2 (avg) 4/26/17
Organic Matter (Humus)	2 - 3%	3.78	3.79
Sulfur	50 - 100 ppm	23.00	27.00
Mehlich III - Phosphorus	350 lbs/acre	757.00	1,221.33
Calcium	68%	74.10	68.69
Magnesium	15%	13.07	13.16
Potassium	5%	3.38	5.12
Sodium	<2%	1.37	1.69
Boron	1 - 1.5 ppm	0.65	0.97
Iron	120 ppm	555.33	494.33
Manganese	50 ppm	4.33	8.33

FAIRWAY	Acceptable Range For Saturated Paste Sample	Red 1, White 1, Blue 7 (avg) 4/29/16	Red 2, White 2, Blue 2 (avg) 4/26/17
Nitrate - Ryegrass	5 - 10 ppm	<0.5	<0.5
Phosphorus	2 - 10 ppm	0.39	0.88
Potassium	40 - 100 ppm	11.21	18.15
Calcium	60 - 200 ppm	33.77	35.45
Magnesium	20 - 70 ppm	8.66	8.81
Sodium	0 - 30 ppm	11.62	10.38
Soluble Salts	<1,920 ppm	185.00	207.67
Bicarbonate	<60 ppm	69.96	74.84
Chloride	<1,000 ppm	14.67	16.67
SAR	<4%	0.45	0.41

GREENS	Acceptable Range For Standard Soil Sample	Red 1, White 1, Blue 7 (avg) 4/29/16	Red 2, White 2, Blue 2 (avg) 4/26/17
Organic Matter (Humus)	2 - 3%	2.14	2.66
Sulfur	50 - 100 ppm	42.66	61.66
Mehlich III - Phosphorus	350 lbs/acre	832.00	1,244.33
Calcium	68%	58.69	63.37
Magnesium	15%	11.03	11.88
Potassium	5%	2.48	3.05
Sodium	<2%	2.09	1.94
Boron	1 - 1.5 ppm	0.56	1.02
Iron	120 ppm	494.00	672.33
Manganese	50 ppm	17.33	11.00

GREENS	Acceptable Range For Saturated Paste Sample	Red 1, White 1, Blue 7 (avg) 4/29/16	Red 2, White 2, Blue 2 (avg) 4/26/17
Nitrate - Bentgrass	1-3 ppm	<0.5	<0.5
Phosphorus	2 - 7 ppm	0.46	0.52
Potassium	25-40 ppm	17.53	28.74
Calcium	50- 75 ppm	39.54	61.12
Magnesium	15-30 ppm	10.88	16.43
Sodium	0 - 30 ppm	11.82	11.15
Soluble Salts	<1,000 ppm	249.33	349.67
Bicarbonate	<60 ppm	15.45	52.88
Chloride	<200 ppm	9.33	10.67
SAR	<4%	0.43	0.32

WATER	Acceptable Range For Water Sample	Pond 4/29/16	Pond 4/26/17
pH		6.07	6.14
EC	<2.25 mmhos/cm	0.41	0.35
Sodium		24.36	20.90
Calcium	20 - 60 ppm	37.84	30.23
Magnesium	10 - 25 ppm	5.42	4.67
Potassium	5 - 20 ppm	5.76	4.67
Phosphorus	0.1 - 0.4 ppm	<0.20	n/t
Nitrate	5 - 50 ppm	0.17	n/t
Sulfur	30 - 90 ppm	59.82	45.09
Bicarbonate	<120 ppm	58.31	46.07
Boron	<0.67 ppm	<0.05	>0.05
Chloride	<177 ppm	46.98	36.25



Data Collection Report ~ Spring 2017



SOIL and WATER CONSULTING

Course Name: Riverwinds Golf and Tennis Club

Date of Visit: May 10, 2017

	<u>5/23/15</u>	<u>4/28/16</u>	<u>5/10/17</u>
Humidity/Air Temperature	39%/74°	65%/50°	46%/70°
Fairway Temperature	63.7°	51.5°	62°
Greens Temperature	63.9°	50.8°	59°

Notes from the visit

- Greens Mowing height - 0.140"
- Tees and Fairways height - 0.500"
- Aerified Greens on April 11th.
- Applied 5 pounds of Gypsum, $\frac{3}{4}$ # rate of N and Potash to greens at aerification.
- Topdressing on greens every two weeks.
- 23-0-12 being applied to fairways at a $\frac{3}{4}$ # rate of N. (had not done the holes I sampled)
- A little dollar spot on poa in fairways.
- Applied Gypsum and Potash on tees and fairways in the Fall.
- Cleared some areas on the course.
- Geese chasing service on course.





SOIL and WATER CONSULTING

TEE	Acceptable Range For Standard Soil Sample	10,18 (avg) 5/23/15	9,16 (avg) 4/28/16	1,10 (avg) 5/10/17
Organic Matter (Humus)	2 - 3%	2.37	2.20	1.55
Sulfur	50 - 100 ppm	27.00	19.50	17.00
Mehlich III - Phosphorus	350 lbs/acre	629.50	673.00	570.00
Calcium	68%	66.29	69.95	64.74
Magnesium	15%	11.79	13.40	16.98
Potassium	5%	3.35	2.75	3.96
Sodium	<2%	2.22	2.30	3.49
Boron	1 - 1.5 ppm	0.53	0.47	0.57
Iron	120 ppm	589.00	583.00	702.50
Manganese	50 ppm	10.00	12.00	13.00

TEE	Acceptable Range For Saturated Paste Sample	10,18 (avg) 5/23/2015	9,16 (avg) 4/28/16	1,10 (avg) 5/10/17
Nitrate - Bentgrass	5 - 10 ppm	<0.5	<0.5	<0.5
Phosphorus	2 - 10 ppm	0.51	0.43	1.04
Potassium	40 - 100 ppm	21.11	11.14	17.11
Calcium	60 - 200 ppm	53.95	39.00	38.92
Magnesium	20 - 70 ppm	12.38	8.67	12.12
Sodium	0 - 30 ppm	20.46	21.75	20.02
Soluble Salts	<1,920 ppm	342.00	238.50	267.00
Bicarbonate	<60 ppm	89.08	59.79	126.90
Chloride	<1,000 ppm	39.00	24.50	36.00
SAR	<4%	0.65	0.82	0.72

FAIRWAY	Acceptable Range For Standard Soil Sample	5,10,18 (avg) 5/23/15	9,16 (avg) 4/28/16	1,10 (avg) 5/10/17
Organic Matter (Humus)	2 - 3%	1.95	1.90	2.55
Sulfur	50 - 100 ppm	64.67	29.00	117.50
Mehlich III - Phosphorus	350 lbs/acre	612.00	568.00	602.50
Calcium	68%	53.20	63.12	65.35
Magnesium	15%	12.00	14.58	14.62
Potassium	5%	3.14	3.26	3.02
Sodium	<2%	2.72	3.42	3.05
Boron	1 - 1.5 ppm	0.55	0.65	0.76
Iron	120 ppm	617.67	661.50	570.00
Manganese	50 ppm	10.33	9.50	12.00

FAIRWAY	Acceptable Range For Saturated Paste Sample	5,10,18 (avg) 5/23/15	9,16 (avg) 4/28/16	1,10 (avg) 5/10/17
Nitrate - Bentgrass	5 - 10 ppm	<0.5	<0.5	<0.5
Phosphorus	2 - 10 ppm	0.29	0.26	0.27
Potassium	40 - 100 ppm	21.45	11.35	19.97
Calcium	60 - 200 ppm	71.93	45.66	136.23
Magnesium	20 - 70 ppm	18.20	11.56	32.95
Sodium	0 - 30 ppm	35.33	32.86	46.97
Soluble Salts	<1,920 ppm	463.33	288.50	701.00
Bicarbonate	<60 ppm	54.50	52.47	95.18
Chloride	<1,000 ppm	50.00	32.50	54.50
SAR	<4%	0.95	1.13	0.95

GREENS	Acceptable Range For Standard Soil Sample	5,10,18 (avg) 5/23/15	9,16 (avg) 4/28/16	1,10 (avg) 5/10/17
Organic Matter (Humus)	2 - 3%	0.42	0.34	0.47
Sulfur	50 - 100 ppm	7.67	57.00	21.00
Mehlich III - Phosphorus	350 lbs/acre	156.00	188.00	190.00
Calcium	68%	66.23	60.52	66.33
Magnesium	15%	13.25	14.77	16.30
Potassium	5%	3.92	8.23	5.53
Sodium	<2%	3.67	4.93	5.00
Boron	1 - 1.5 ppm	<0.20	<0.20	0.25
Iron	120 ppm	69.33	94.00	74.00
Manganese	50 ppm	10.33	10.00	9.00

GREENS	Acceptable Range For Saturated Paste Sample	5,10,18 (avg) 5/23/15	9,16 (avg) 4/28/16	1,10 (avg) 5/10/17
Nitrate - Bentgrass	1-3 ppm	<0.5	<0.5	<0.5
Phosphorus	2 - 7 ppm	2.51	0.85	2.49
Potassium	25-40 ppm	12.78	81.18	44.77
Calcium	50- 75 ppm	11.57	62.04	37.41
Magnesium	15-30 ppm	3.84	14.83	13.56
Sodium	0 - 30 ppm	6.37	13.24	10.89
Soluble Salts	<1,000 ppm	106.33	442.50	292.50
Bicarbonate	<60 ppm	46.37	42.71	120.80
Chloride	<200 ppm	4.67	4.00	23.00
SAR	<4%	0.42	0.39	0.39

WATER	Acceptable Range For Water Sample	Pond 5/23/15	Pond 4/28/16	Pond 5/3/17
pH		9.23	6.40	8.98
EC	<2.25 mmhos/cm	0.28	0.31	0.37
Sodium		19.28	17.01	22.03
Calcium	20 - 60 ppm	22.57	29.19	31.91
Magnesium	10 - 25 ppm	5.53	7.66	9.26
Potassium	5 - 20 ppm	3.38	3.90	4.13
Sulfur	30 - 90 ppm	26.62	43.08	46.65
Bicarbonate	<120 ppm	31.22	82.79	63.35
Boron	<0.67 ppm	0.06	0.06	0.07
Chloride	<177 ppm	24.51	21.79	29.96



Data Collection Report - Spring 2017



SOIL and WATER CONSULTING

Course Name: Running Deer Golf Club

Date & Time of Visit: May 3, 2017

	<u>5/1/15</u>	<u>4/20/16</u>	<u>5/3/17</u>
Humidity/Air Temperature	50%/60°	20%/68°	45%/63°
Fairway Temperature	59.8°	61.3°	66°
Greens Temperature	61.3°	67°	65°

Notes from the visit

- Greens Mowing height - 0.135"
- Tees and Fairways height - 0.500" (first mowing at that height the day of my visit)
- Aerifying greens in June after USGA Qualifier and Memorial Day.
- Greens sprayed multiple times with Brexel Multi and Proxy and Primo mix. (good seed head control)
- Gypsum and Potash applied to tees and fairways in Mid-April.





SOIL and WATER CONSULTING

TEE	Acceptable Range For Standard Soil Sample	5,7,13 (avg) 5/1/15	9,15 (avg) 4/20/16	1,10 (avg) 5/3/17
Organic Matter (Humus)	2 - 3%	0.95	0.95	0.90
Sulfur	50 - 100 ppm	19.00	8.00	49.50
Mehlich III - Phosphorus	350 lbs/acre	270.33	460.00	309.00
Calcium	68%	66.29	75.24	65.90
Magnesium	15%	12.84	15.10	12.28
Potassium	5%	2.18	1.75	5.32
Sodium	<2%	4.10	2.76	3.32
Boron	1 - 1.5 ppm	0.28	0.30	0.35
Iron	120 ppm	213.67	215.00	380.00
Manganese	50 ppm	2.33	9.00	2.50

TEE	Acceptable Range For Saturated Paste Sample	5,13 (avg) 5/1/15	9,15 (avg) 4/20/16	1,10 (avg) 5/3/17
Nitrate - Bentgrass	5 - 10 ppm	<0.5	<0.5	<0.5
Phosphorus	2 - 10 ppm	0.51	0.79	0.74
Potassium	40 - 100 ppm	11.80	10.06	64.54
Calcium	60 - 200 ppm	25.54	25.14	58.34
Magnesium	20 - 70 ppm	7.12	8.07	18.58
Sodium	0 - 30 ppm	7.59	5.65	5.51
Soluble Salts	<1,920 ppm	163.50	131.00	417.50
Bicarbonate	<60 ppm	46.37	73.21	63.45
Chloride	<1,000 ppm	3.00	10.00	12.00
SAR	<4%	0.38	0.26	0.16

FAIRWAY	Acceptable Range For Standard Soil Sample	13 5/1/15	9,15 (avg) 4/20/16	1,10 (avg) 5/3/17
Organic Matter (Humus)	2 - 3%	4.93	3.49	4.75
Sulfur	50 - 100 ppm	17.00	17.00	65.50
Mehlich III - Phosphorus	350 lbs/acre	119.00	167.00	162.50
Calcium	68%	64.19	66.72	67.38
Magnesium	15%	13.24	17.55	14.51
Potassium	5%	3.37	3.62	5.17
Sodium	<2%	1.93	1.33	1.34
Boron	1 - 1.5 ppm	0.44	0.32	0.48
Iron	120 ppm	375.00	304.00	392.50
Manganese	50 ppm	8.00	6.50	8.00

FAIRWAY	Acceptable Range For Saturated Paste Sample	13 5/1/15	9,15 (avg) 4/20/16	1,10 (avg) 5/3/17
Nitrate - Bentgrass	5 - 10 ppm	<0.5	<0.5	<0.5
Phosphorus	2 - 10 ppm	0.20	0.35	0.24
Potassium	40 - 100 ppm	8.52	22.16	38.85
Calcium	60 - 200 ppm	15.69	42.40	63.69
Magnesium	20 - 70 ppm	4.50	15.08	20.68
Sodium	0 - 30 ppm	6.04	6.13	7.75
Soluble Salts	<1,920 ppm	110.00	223.00	381.00
Bicarbonate	<60 ppm	43.93	107.38	70.77
Chloride	<1,000 ppm	4.00	23.50	15.50
SAR	<4%	0.35	0.21	0.22

GREENS	Acceptable Range For Standard Soil Sample	5,7,13 (avg) 5/1/15	9,15 (avg) 4/20/16	1,10 (avg) 5/3/17
Organic Matter (Humus)	2 - 3%	0.75	0.75	0.72
Sulfur	50 - 100 ppm	13.00	7.00	8.50
Mehlich III - Phosphorus	350 lbs/acre	273.33	325.50	309.00
Calcium	68%	66.20	65.53	58.37
Magnesium	15%	9.29	16.29	19.37
Potassium	5%	2.05	1.80	3.38
Sodium	<2%	4.61	3.29	3.95
Boron	1 - 1.5 ppm	0.23	0.21	0.44
Iron	120 ppm	156.00	166.50	200.50
Manganese	50 ppm	12.00	22.50	19.00

GREENS	Acceptable Range For Saturated Paste Sample	5,7,13 (avg) 5/1/15	9,15 (avg) 4/20/16	1,10 (avg) 5/3/17
Nitrate - Bentgrass	1-3 ppm	<0.5	<0.5	<0.5
Phosphorus	2 - 7 ppm	0.89	1.31	2.01
Potassium	25-40 ppm	12.92	4.61	10.09
Calcium	50- 75 ppm	22.19	6.58	8.20
Magnesium	15-30 ppm	4.33	2.49	4.88
Sodium	0 - 30 ppm	6.20	3.43	3.47
Soluble Salts	<1,000 ppm	139.33	46.50	88.50
Bicarbonate	<60 ppm	30.81	21.96	45.15
Chloride	<200 ppm	5.67	3.00	8.00
SAR	<4%	0.33	0.29	0.26

WATER	Acceptable Range For Water Sample	Pond 5/1/15	Pond 4/20/16	Sprinkler head 5/3/17
pH		6.57	6.14	6.51
EC	<2.25 mmhos/cm	0.06	0.06	0.07
Sodium		2.81	2.08	3.33
Calcium	20 - 60 ppm	3.59	5.08	5.67
Magnesium	10 - 25 ppm	2.41	1.64	1.43
Potassium	5 - 20 ppm	2.69	4.47	2.03
Sulfur	30 - 90 ppm	5.97	10.25	11.83
Bicarbonate	<120 ppm	30.49	22.32	21.60
Boron	<0.67 ppm	<0.05	<0.05	<0.05



Data Collection Report - Spring 2017



SOIL and WATER CONSULTING

Course Name: Valleybrook Country Club

Date & Time of Visit: April 26, 2017

	<u>5/2/15</u>	<u>4/20/16</u>	<u>4/26/17</u>
Humidity/Air Temperature	45%/70°	24%/70°	90%/59°
Fairway Temperature	53°	55.1°	59°
Greens Temperature	50.1°	55.3°	59°

Notes from the visit

- Greens Mowing height - 0.150"
- Tees and Fairways height - 0.650"
- Aerified Greens on May 8th.
- Only 1/8# of Nitrogen from 21-0-0 on greens as of my visit.
- Applied Proxy and Primo 2 times as of my visit.
- Topdressed greens 2 times as of my visit.
- Overnight rain of 0.9" prior to my visit.
- The course was the best that I have ever seen it.
- 46-0-0 and 21-0-0 sprayed on fairways the week prior to my visit.





SOIL and WATER CONSULTING

TEE	Acceptable Range For Standard Soil Sample	7,8,13 (avg) 5/2/15	1,18 (avg) 4/20/16	2,10(avg) 4/26/17
Organic Matter (Humus)	2 - 3%	2.50	1.63	1.99
Sulfur	50 - 100 ppm	18.67	14.00	16.00
Mehlich III - Phosphorus	350 lbs/acre	748.00	719.00	1053.50
Calcium	68%	63.26	63.97	63.57
Magnesium	15%	16.23	17.57	16.07
Potassium	5%	3.52	2.93	3.50
Sodium	<2%	1.92	2.33	2.89
Boron	1 - 1.5 ppm	0.54	0.53	0.83
Iron	120 ppm	436.33	443.00	556.50
Manganese	50 ppm	11.67	12.50	10.00

TEE	Acceptable Range For Saturated Paste Sample	7,13 (avg) 5/2/15	1,18 (avg) 4/20/16	2,10 (avg) 4/26/17
Nitrate - Ryegrass	5 - 10 ppm	< 0.5	<0.5	<0.5
Phosphorus	2 - 10 ppm	0.96	1.35	1.38
Potassium	40 - 100 ppm	42.13	20.32	20.87
Calcium	60 - 200 ppm	71.91	61.22	22.88
Magnesium	20 - 70 ppm	24.12	20.17	9.68
Sodium	0 - 30 ppm	12.58	11.09	8.03
Soluble Salts	<1,920 ppm	406.00	306.00	172.50
Bicarbonate	<60 ppm	183.03	192.80	84.19
Chloride	<1,000 ppm	33.50	21.50	30.50
SAR	<4%	0.34	0.34	0.36

FAIRWAY	Acceptable Range For Standard Soil Sample	7,8,13 (avg) 5/2/15	1,18 (avg) 4/20/16	2,10(avg) 4/26/17
Organic Matter (Humus)	2 - 3%	3.63	2.35	2.33
Sulfur	50 - 100 ppm	21.67	14.00	16.00
Mehlich III - Phosphorus	350 lbs/acre	560.00	1062.50	959.50
Calcium	68%	59.98	64.65	61.24
Magnesium	15%	14.46	17.48	15.33
Potassium	5%	3.17	3.33	4.00
Sodium	<2%	1.43	1.44	2.23
Boron	1 - 1.5 ppm	0.49	0.75	0.68
Iron	120 ppm	351.00	468.00	378.00
Manganese	50 ppm	7.00	10.00	7.00

FAIRWAY	Acceptable Range For Saturated Paste Sample	7,13 (avg) 5/2/15	1,18 (avg) 4/20/16	2,10 (avg) 4/26/17
Nitrate - Ryegrass	5 - 10 ppm	<0.5	<0.5	<0.5
Phosphorus	2 - 10 ppm	0.53	1.28	0.94
Potassium	40 - 100 ppm	17.21	11.62	34.77
Calcium	60 - 200 ppm	71.16	22.22	18.70
Magnesium	20 - 70 ppm	17.05	8.35	8.05
Sodium	0 - 30 ppm	9.61	6.57	6.95
Soluble Salts	<1,920 ppm	316.50	129.50	153.50
Bicarbonate	<60 ppm	107.38	65.89	93.91
Chloride	<1,000 ppm	29.00	12.00	40.50
SAR	<4%	0.37	0.31	0.34

GREENS	Acceptable Range For Standard Soil Sample	7,8,13 (avg) 5/2/15	1,18 (avg) 4/20/16	2,10 (avg) 4/26/17
Organic Matter (Humus)	2 - 3%	1.63	2.10	1.85
Sulfur	50 - 100 ppm	21.67	14.50	13.50
Mehlich III - Phosphorus	350 lbs/acre	391.00	834.00	419.00
Calcium	68%	63.91	72.28	66.46
Magnesium	15%	9.23	11.52	10.09
Potassium	5%	4.52	2.30	2.70
Sodium	<2%	3.05	1.54	3.61
Boron	1 - 1.5 ppm	0.40	0.72	0.70
Iron	120 ppm	350.00	460.00	477.50
Manganese	50 ppm	12.67	15.00	18.00

GREENS	Acceptable Range For Saturated Paste Sample	7,13 (avg) 5/2/15	1,18 (avg) 4/20/16	2,10 (avg) 4/26/17
Nitrate - Bentgrass	1-3 ppm	<0.5	<0.5	<0.5
Phosphorus	2 - 7 ppm	0.31	0.62	1.50
Potassium	25-40 ppm	32.41	8.43	37.95
Calcium	50- 75 ppm	29.52	13.14	13.90
Magnesium	15-30 ppm	5.60	3.40	3.77
Sodium	0 - 30 ppm	8.54	4.94	11.51
Soluble Salts	<1,000 ppm	238.00	74.00	121.50
Bicarbonate	<60 ppm	24.40	34.17	24.40
Chloride	<200 ppm	2.50	6.50	28.00
SAR	<4%	0.38	0.32	0.71

WATER	Acceptable Range For Water Sample	Pond 5/2/15	Pond 4/20/16	Pond 4/26/17
pH		5.29	5.39	6.16
EC	<2.25 mmhos/cm	0.28	0.23	0.21
Sodium		28.29	19.66	27.69
Calcium	20 - 60 ppm	15.35	15.42	9.80
Magnesium	10 - 25 ppm	2.29	2.35	1.75
Potassium	5 - 20 ppm	5.53	6.50	3.10
Sulfur	30 - 90 ppm	33.18	32.19	13.44
Bicarbonate	<120 ppm	26.86	26.64	33.12
Boron	<0.67 ppm	<0.05	<0.05	<0.05
Chloride	<177 ppm	46.64	29.62	34.89



SOIL and WATER CONSULTING

GREENS		Tuckahoe Topdressing Sand (2016)	RDGC Topdressing Sand (2017)	BHPGC Topdressing Sand (2017)	<u>USGA Recommendations</u>
	Clay	0.70	0.70	0.50	<= 3.0%
	Silt	0.10	0.10	0.10	<= 5.0%
	Sand	98.60	99.10	99.20	94 - 100%
	Gravel	0.60	0.10	0.20	
	Organic Material	<0.1	<0.1	<0.1	
	<u>Sieve #:</u>				
	Fine Gravel 10	0.60	0.10	0.20	2.0mm <= 3.0%
	Very Coarse Sand 18	9.30	9.90	11.30	2.0mm + 1.0mm <= 10%
	Coarse Sand 35	27.40	42.50	43.60	
	Medium Sand 60	45.40	35.80	33.20	0.5mm + 0.25mm >= 60%
	Fine Sand 100	13.00	9.10	8.70	0.15mm <= 20%
	Very Fine Sand 140	2.90	1.40	2.00	0.106mm + 0.053mm <= 5.0%
	Very Fine Sand 270	0.60	0.40	0.40	



RECOMMENDATIONS



SOIL and WATER CONSULTING

Spring Application for Tees:	200 pounds of product/acre (0-0-50)	500 pounds of product/acre (Gypsum)
Blue Heron Pines GC	No	Yes
Downingtown CC	No	No
Ramblewood CC	Yes	Yes
Riverwinds Golf & Tennis Club	Yes	Yes
Running Deer GC	No	No
Valleybrook CC	Yes	Yes

Spring Application for Fairways:	200 pounds of product/acre (0-0-50)	500 pounds of product/acre (Gypsum)
Blue Heron Pines GC	Yes	Yes
Downingtown CC	No	No
Ramblewood CC	Yes	Yes
Riverwinds Golf & Tennis Club	No	No
Running Deer GC	No	Yes
Valleybrook CC	Yes	Yes

Monthly Applications for Greens:	2 pounds of product / 1,000 sq. ft. (0-0-50)	10 pounds of product / 1,000 sq. ft. (Gypsum)	3 pounds of product / 1,000 sq.ft. (Pro-Mag)	3 pounds of product / 1,000 sq.ft. (11-55-00)
Blue Heron Pines GC	Yes	Yes	No	Yes
Downingtown CC	Yes	Yes	No	No
Ramblewood CC	No	No	No	No
Riverwinds Golf & Tennis Club	Yes	Yes	Yes	No
Running Deer GC	Yes	Yes	Yes	No
Valleybrook CC	Yes	Yes	Yes	No