Blackberry Farm Golf Course – Analysis of Minimal Repairs and Conversion of Irrigation to Well Water

Prepared For:

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Introduction & Project Background

National Golf Foundation Consulting, Inc. ("NGF Consulting" or "NGF") was retained by the City of Cupertino ("City") in late 2021 to formulate new probable cost estimates for the "minimal repairs" improvement scenario for Blackberry Farm Golf Course (alternately, "Blackberry Farm GC"). The consulting engagement was managed by Ed Getherall, NGF's Senior Director of Operations, with golf course architecture firm Richardson-Danner, ASGCA, and Russell D. Mitchell & Associates, Inc., irrigation consultant, acting as subcontractors to NGF.

National Golf Foundation Consulting, Inc. was previously retained by the City in 2014 to present potentially viable options regarding the future of Blackberry Farm GC. That consulting engagement was done as part of the overall due diligence related to the Stevens Creek Corridor Master Plan.

Cost estimation for the current study applies to the following elements of "Minimal Repair", as defined by the City:

- Replacing the irrigation system. The two scenarios of Potable vs Well Water are addressed here, requiring a discussion of the logistics of re-activating the well (connection to potable water should be made regardless, as a back-up).
- Replacing the empty ponds with lowland native areas.
- Replacing tees and greens as needed (e.g., #3 tee - removing mat & replacing w/grass). Tees and greens are replaced approximately every 6 years as needed. (NGF has recommended replacing all greens with the irrigation system replacement, and included this in the cost estimates).
- Installing netting to protect the #6 tee box from errant shots on the Hole #4.
- Shortening the 9th hole to eliminate the number of errant shots to the parking lot, trail, and Hole #1. Flipping the driving net, and making it longer and with additional bays. Adding a short game practice area (chipping/sand bunker), with protective netting.
- Identifying locations where installation of steps or terracing would be beneficial.

The NGF team was also tasked with evaluating and analyzing the logistics and cost feasibility of reactivating the on-site well. The analysis includes professional opinion on what is needed structurally to restore and revitalize the existing well for use as the golf course irrigation source. This scope includes a preliminary cost estimate to reactivate the well, as well as a comparison of annual operating costs for use of Potable water vs Well water as the irrigation source at Blackberry Farm GC.

CURRENT SCOPE OF SERVICES

In late 2021, the NGF was retained to review a "Minimal Repair Scope" for Blackberry Farm Golf Course. While some of these items represent those from the NGF's 2014 report, the City asked the NGF to review only the stated items in isolation from other potentially interrelated repairs. Therefore, the current NGF reporting cannot not fully consider the contextual influence each item has on the overall needs of the golf course.

The key areas the NGF Consulting team was asked to focus on – in addition to the aforementioned issues around potential reactivation of the on-site well – included, but were not limited to:

(1) Playability as it relates to watering needs and turf conditions, conversion of the pond to native lowland, character and condition of tees and greens.

(2) Safety as it relates to hole nos. 4 and 6, hole nos. 1 and 9 and accessibility for tee complexes.

(3) Water Source as it relates to potable versus well water use.

(4) Trail Protection as it relates to netting on hole nos. 8 and 9 (this item was later removed from the scope due to the City already assuming responsibility for this item.

Methodology

The method for updating relevant aspects of the 2014 report involved site visits on two separate occasions in November 2021 and January 2022. Interviews with key staff charged with caring for and operating the properties were conducted. Additional data, both provided by the City and secured independently, was used to ascertain the general maintenance needs and necessary improvements.

In late 2021 and early 2022, Golf Course Architect, Jeff Danner, ASGCA, MEIGCA conducted the noted site visits. The focus of Mr. Danner's reviews was to verify previous assumptions and account for any new or additional issues needing to be addressed. The consultants met with representatives from the City of Cupertino both in-person and via video call to obtain information to support our observations. Updated findings are referenced throughout this report.

Limitations

This report is intended to provide a basis for further study and potential action by the City, as well as potential integration to the Stevens Creek Corridor Master planning effort. The report is limited to the scope of services contracted to NGF Consulting. Accordingly, information such as probable cost estimates and conceptual planning must be viewed in their context and limitations. The City is advised that further study, detailed analysis, specific planning and cost analysis should be undertaken before final actions are determined. This report should be used to form decisions on "next steps" as improvements and/or changes are considered and shifted from planning to formal project.

The physical evaluation of the golf course is limited in that the items outlined in the Minimal Repairs scope of work do not consider the interconnectivity of various golf course components. Because the NGF is studying only items defined as "Minimal Repairs" by the City of Cupertino, exclusive of their contextual influence, the NGF cannot assume liability for issues that may arise in the future related to these recommendations.

For example, the NGF cannot thoroughly study safety without considering the spatial configuration of golf holes. The safety guidelines for setbacks to adjacent property, the separation between golf holes, and general "best practices" for golf course design have changed since Blackberry Farm GC was constructed about 60 years ago. Accordingly, NGF cannot make recommendations that conform to modern best practices for such setbacks to adjacent property or separation between golf

holes. Therefore, the City should make every effort to improve conditions relative to safety and minimize the occurrence of errant ball conflicts to adjacent property and areas and uses within the Owner's property. The NGF shall not be held liable for any claim, actual damage, or injury arising from errant ball issue or condition at the Owner's property or relative to this updated study.

As it relates to costs, Probable Construction Cost prepared by the Richardson | Danner under the auspices of NGF represents the Golf Course Architect's best judgment as design professionals of the potential construction cost for the golf course work. However, neither the consulting team nor the City has control over the cost of labor, materials, equipment, or course accessories, over any contractor's methods of determining bid prices, or over competitive bidding, market, or negotiating conditions. Accordingly, the NGF team does not warrant or represent that bids or negotiated prices will not vary from any project budget which may have been proposed, established or approved by the City or from any Statement of Probable Construction Cost or other cost estimate or evaluation prepared by the Golf Course Architect.

Blackberry Farm Golf Course

In this section NGF presents a summary narrative for Blackberry Farm Golf Course, comprising a brief synopsis of its history, golf course and facility overview, and our assessment of current golf course conditions.

HISTORY

The Blackberry Farm Golf Course occupies a portion of an old farm (160 acres) settled by Captain Elisha Stephens in 1848. Blackberry Farm, until 1991, was operated as a family-owned (Nelson Family) picnic facility for 37 years and over three generations. In 1991 Cupertino residents passed a 25-year bond measure to purchase the property. Today, this 33-acre recreational facility offers a creek-side park setting for family and group picnics, swimming pools, the 9-hole golf course and City offices.

The course was constructed in 1962 and was designed by Robert Muir Graves, a prominent California-based golf course architect. It was among the first designs in Graves' career and is listed as a "Par-3 Course" in early accounts by Graves and other resources. It may be that holes were lengthened over the years in an attempt to achieve longer yardages and an increased par value.

Very little is reported to have been done to the course since the City acquired it. According to staff, only minor work has been done to repair and replace aging features and irrigation components. In recent years, work to Stevens Creek resulted in erection of barrier netting and small filtration basins along the western edges of the course. Additionally, a new maintenance facility was built by the City to replace an aging "garage" structure that had been used for maintenance operations dating to original farm and golf uses.

GOLF COURSE OVERVIEW AND SUMMARY OF FACILITIES

Course Overview

The 9-hole course has a back tee yardage of 1,544 yards and a par of 29. The two par-4 holes are quite short and barely meet USGA guidelines for the length of a par-4 golf hole. The course, with its two short par-4s, meets the technical definition of an "Executive length" course (e.g., one made up of at least one par-4 in addition to par-3 holes) but offers a very short total yardage (1,544 yards) from the back tees.

The course plays in a clockwise routing, with most holes oriented north/south. Hole corridors are tight with mature trees lining fairways. In terms of overall land use, the small footprint of the course - approximately 13.5 acres - equates to less than 1.3 acres per golf hole. This is extremely low as common acreage for even a par-3, 9-hole course is typically greater than 15 acres, or roughly 1.7 acres per golf hole.

Practice Facilities

Aside from a small practice putting green by the Hole No. 1, there are only "hitting cages" that may be used for instruction and warm-up. These structures are loosely configured and immediately adjacent to the green area for the Hole No. 9. The lack of quality practice areas and amenities that could attract new players and those interested in learning golf are all but absent.

Maintenance Facility

The maintenance building and yard are relatively new replacements for an old garage that had stored equipment. The new building is metal constructed and well-screened from view of golfers. There are sanitary facilities, wash stations and typical appointments for a modern facility. The yard, while small, is adequate for the limited equipment and materials necessary to care for the course. Storage bins for sand and landscape materials are undersized, which required double handling after loads of material are delivered.

On-course Restrooms

No restrooms are located on the course itself. The restrooms located in the maintenance building were configured to serve the public while playing golf. Due to the small footprint of the course and the short time it takes to play, new on-course restrooms are not considered mission critical.

Pro Shop and Grounds

The pro shop, staff office, storage, and restrooms are located on the lower level of a City-owned building near the first tee. The upper level houses the Blue Pheasant Restaurant, which has no affiliation with the golf course. Of important note is that the lower level lies within a designated floodplain. The parking lot was resurfaced and configured just prior to the issuance of the original NGF report in 2014. Today, the condition is fair and functional for its purpose. It still appears well lit and adequately serves the restaurant and golf uses. The pro shop building and parking lot are not part of the current study scope.

ASSESSMENT OF CURRENT GOLF COURSE CONDITIONS

The intent of this section is to provide a baseline of the current conditions and general deficiencies of Blackberry Farm Golf Course in order to provide context to the need for facility improvements. For a more detailed assessment of current conditions, organized by golf course component, please refer to Appendix A.

The existing golf facility (course only) has baseline deficiencies in the six areas discussed below. In evaluating the golf course, the criteria applied was to identify the minimum “baseline” remediation measures to render the facility (i) safe for public use; (ii) acceptable in terms of common “best practices” for municipal (public sector) golf facilities; (iii) compliant with ADA guidelines for public golf facilities; and (iv) partially restored in areas where ponds were abandoned and trees removed and/or lost to disease.

Current Conditions and General Deficiencies

1. Irrigation:

The entirety of the irrigation system was deemed to be in need of full replacement. This is consistent with previous findings. We note that no work, except nominal emergency repairs and replacements, have been made to the facility since NGF Consulting first consulted with the City in 2014. Our findings now are updated to reflect newer golf irrigation technologies, including better control systems and sprinkler nozzle technology. These newer technologies save water use and provide more efficient coverage and delivery of water to irrigated turf. In determining the baseline improvements for irrigation, we used similar specification assumptions to other public sector golf courses in the market.

2. Features (Tees and Greens):

Tees (surfaces and alignment) are past their useful life. All tees need to be leveled and aligned. As part of this work, nominal enlargement is anticipated as tees can, in many locations, be lowered slightly and therefore expanded in terms of their square footage.

Greens are all in need of re-construction as they are past their useful life. Rootzones are now approaching their 56th year of use and show decline, including an inability to drain properly and fully, and all surface areas have shrunk markedly to the point where the square footage is not conducive to the wear and tear through daily use. All greens are to be reconstructed to an adapted USGA standard of 12-inches of sand greensmix over 4-inches of washed gravel with 25-foot drain tile spacing. All outfall drainage at the newly constructed greens will be handled per best practices where water is dispersed back onto the course areas in appropriate out-of-play zones. Nominal enlargement is a part of the baseline work to restore green sizes closer to their original sizes and shapes.

3. Drainage:

Current areas of the course do not drain adequately. Some areas sheet-drain directly off turf areas and, instead, should be intercepted with appropriately located outfall points. Work performed along Stevens Creek has established catchment basins where surface drainage should ideally be collected and filtered before allowing to pass to the Stevens Creek watershed.

> **Note**: While not part of the defined minimal repair scope, we recommend that baseline course renovation work include budget allowances for minimal drainage improvements to (i) collect water to prevent ponding; (ii) positive gravity drain lines to appropriate low points; and (iii) the aforementioned collection at existing low points where proper filtration can be achieved.

4. Safety (refer to Appendix B Exhibit, "Minimum Safety Set-Backs"):

The existing course layout includes golf hole lengths and orientations that are too close to one another. In some areas golf holes are too close to adjoining property, including both park (City-owned) areas and neighboring private property. **We note that the suggested remediation measures are *not* costed into the Minimal Repairs improvement plan**.

Forrest Richardson, ASGCA is a noted authority on golf course safety and minimum standards applied to the layout and configuration of golf holes with regard to on-course uses and adjoining property uses. He is the author of five books on golf course architecture, including *Routing the Golf Course* (John Wiley & Sons, 2001) which contains a full chapter on safety issues and considerations. For Blackberry Farm GC, Mr. Richardson has provided remediation recommendations to only the most pressing areas as shown on the accompanying Appendix B exhibit. The criteria applied in this case is described below in each area where Mr. Richardson determined an absolute mitigation must be made. Other areas of concern remain apart from those listed and may be reviewed in the NGF consulting report dated December, 2014.

Area A: The tee shot at Hole No. 1 is ±186 yards. A typical required minimum safety set-back to both sides the nominal center line is calculated at .8 x the yardage, expressed in feet (186 x .8 = 148.8 feet). This dimension is shown on the exhibit. "A" references the primary area of concern, which is the tee of Hole No. 9. To the left of Hole No. 1 is private property where errant balls regularly fall. Because this area is a steep hillside and generally unused, it is assumed to be an existing condition without high priority to be mitigated.

The Minimum Improvement Exhibit proposes a new tee surface for the tee realignment and renovation work. This minor adjustment will shift a percentage of play forward to reduce set-back requirements. Hole No. 9 tee should also be relocated out of Hole No. 1 required set-back zone and align with the new location of Hole No. 9 green described in (E) and (F).

Area B: This area represents conflicts with the tee shot from Hole No. 1 to the tee at Hole No. 2. The area "**B**" is within the anticipated shot zone of Hole No. 1.

Area C: The tee shot at Hole No. 2 involves a full "driver" shot for a predominance of players. At ±220-yards there should be no less than 160-feet to both sides of the nominal center line of play. "**C**" represents an area on private property where balls fall. This area, despite being a steep hillside and elevated above the golf course, does contain some degree of residential improvements that fall within the range of the minimum set-back. The set-back zone is very close to single family homes.

The Minimum Improvement Exhibit proposes relocating the Hole No. 2 tee away from the Hole No. 1 set-back zone. Shifting the tee also angles play away from the property line to improve the conditions described in (B) and (C) above.

Area D: The tee shot at Hole No. 4 involves a full "driver" shot for a predominance of players. At ±220-yards there should be no less than 160 feet to both sides of the nominal center line of play. "**D**" represents a conflict area to the left with the existing tees at Hole No. 5.

The Minimum Improvement Exhibit proposes relocating the Hole No. 4 tee away from the Hole No. 2 set-back zone. Shifting the tee also angles play away from Hole Nos. 5 and 6 to lessen the impact on their respective set-back zones. The tee on Hole No. 5 should also be relocated away from Hole No. 4 set-back zone and can become part of the lowland habitat restoration of the abandoned pond. Finally, small-scale, localized cut and fill practices are required and reflected in the cost assumptions.

New poles and netting also need consideration between Hole Nos. 4, 5, and 6. Placement of nets will require further study based on ball trajectory and tee location adjustments. Implementing new or retaining existing netting and poles should occur left of Hole Nos. 7, 8, and 9.

Area E: The tee shot at Hole No. 9 is ±188 yards. A typical required minimum safety set-back to both sides the nominal center line is calculated at .8 x the yardage, expressed in feet. (188 x .8 = 150.4 feet). This dimension is shown on the exhibit. "**E**" references the primary area of concern which is the tee of Hole No. 1 and golfers staging before beginning their rounds.

Area F: Represents the parking and public areas north of Hole Nos. 1 and 9 that are impacted by the set-back behind Hole No. 9's tee shot.

The Minimum Improvement Exhibit proposes shifting and reconstructing the Hole No. 9 green to relocate further South to mitigate safety set-backs to Hole No. 1 tees and the parking lot. In addition, the City can convert the old Hole No. 9 green to become a short game practice area with adjacent netting hitting bays.

Area X: Represents golf holes that are too close to neighboring park uses and trails, yet have been mitigated with screening, fences and/or netting. "J-fence" has been used successfully along the trail spans to protect trail users. Netting on higher poles has been used in other locations, but with limited success. In many areas netting has deteriorated. In other instances, it is not high enough to fully contain shots. These areas ("**X**") are specifically removed from study as the City indicates that replacement screening will be handled under separate contracts and work.

The minimum remediation measures outlined above and shown on the exhibit are only representative of the absolute measures identified by Mr. Richardson that the City should undertake to make the facility safer than it is presently. We recommend that a more comprehensive trajectory and errant ball study be performed prior to the City renovating the facility, and prior to investing in new, replacement screening. Such study will yield whether additional absolute measures are appropriate.

Additional Safety Note: Installing Netting to Protect the Hole No. 6 Tee Box from Errant Shots on Hole No. 4

The installation of nets between Hole Nos. 4 and 6, as proposed by the City under the Minimal Repairs improvement plan, does **not** adequately address existing set-back conflicts between Hole Nos. 4, 5 and 6. As shown on the safety exhibit, Hole No. 5 tees are in conflict with the tee shot at Hole No. 4. This is in addition to conflicts with the Hole No. 6 tees.

Poles and netting will **not** mitigate the overall safety issue between these three golf holes, as the elevated tees at Hole No. 4 in relationship to the other holes (and tees) is such that ball trajectory from Hole No. 4 would require poles ≥130-feet in height at the most northern area. This height is impractical and cost-prohibitive. The $172,000 probable cost estimate amount (Line Item 4.0) represents only poles and netting to address protection of Hole No. 6 tees from Hole No. 4, and does not address the full safety issue.

The best practices recommendation is to try and avoid any use of poles and netting and, in lieu of these vertical structures, to shift tees at Hole Nos. 4 and 5, nominally shortening both holes. This approach is anticipated to cost less than the investment of pole and netting, but will require further study and cost estimating to confirm. NGF Consulting does not recommend the mitigation measure as shown in the Probable Cost Estimate. The $172,000 should be retained and applied toward the recommended best practices mitigation as described.

5. ADA Compliance (Golf Course Only):

The golf course must have accessible tees and greens that are able to be accessed by a standard golf cart. In many locations there is (i) no path near to tees or greens; (ii) too steep of a grade for access; and/or (iii) impediments between a logical parking area and the tee or green. Additionally, all practice greens and any warm-up area must be fully accessible via a path from the clubhouse area.

Our area of focus is on the golf course itself. To mitigate these conditions as noted, the approach assumed in the renovation/re-construction scope will be to create logical parking areas for a standard golf car (cart) at each tee and green with removal of any existing curbing, edge material, hedge or steps. Exceptions at tees may include steeper areas where steps or paths need to remain, but only in the event that an alternate tee is provided.

For the purposes of this report, we have generally included ADA mitigation measures within the probable cost estimate. It should be assumed that some mitigation measures are facilitated by the rebuilding of tees and greens, and that the new warm-up practice area would be constructed with ADA compliance in mind.

6. Habitat Restoration (Trees, Old Pond Areas):

Minimal work is proposed under the minimal repair approach, with only certain areas to be considered. These include removal of tree stumps and roots - primarily for safety and efficient maintenance access and practices - and restoration of the abandoned pond areas with appropriate hydroseeding/planting, slope stabilization and drainage.

Changes to Hole No. 9 and Practice Area

The proposal for minimal improvements included changes to the areas of the property occupying Hole No. 9 and the practice facility. The need for expanded practice facilities and efficient use of space can be realized through aligning the practice area hitting bays with proximity to the parking lot. Shortening Hole No. 9 frees up space to provide a short game development area between the 9th green and eight (8) hitting bays. The spatial arrangement also has the potential to reduce the probability of golf balls leaving the course and entering the parking lot, thus improving one of the most bothersome safety concerns on the property.



Blackberry Farm Golf Course "Minimal Repairs" Improvement Costs

Based on our analyses of the Blackberry Farm Golf Course and irrigation options, the NGF team has developed construction cost estimates for the golf course assuming the "Minimal Repairs" scope, as defined by the City in 2021. We have also analyzed the potential efficacy and feasibility of reactivating BFGC's on-site well and converting the irrigation source from potable to well water. Summary findings follow.

COST ESTIMATES – MINIMAL REPAIRS SCENARIO

The method for evaluating the golf course and developing the improvement plan cost estimates involved multiple site visits as well as interviews with key staff charged with caring for and operating the property. Additional data, both provided by the City and secured independently, was used to ascertain the general maintenance needs and necessary improvements. Additionally, the consultant team referenced the goals outlined in Cupertino Parks and Recreation System Master Plan, February 2020 to ascertain whether the minimal improvements to Blackberry Farm aligned well with the same goals.

Pricing Methodology

The NGF team consulted with leading golf course and utilities contractors, suppliers, and golf course owners who have recently executed projects to arrive at updated pricing for the various line items included herein. Consulting team member Richardson | Danner combined the above with their own recent experience bidding projects throughout the Bay Area and West Coast to arrive at sampling of reasonable costs appropriate for the scope of work at Blackberry Farm GC.

Rising inflation rates, combined with increased material demands, shortages of qualified labor, complicated shipping and logistics, and the overall demand for golf course construction services are all significant factors that have contributed to a significant rise in pricing in recent years. In 2022, contractors are very busy, and some are completely booked through 2023.

Cost Estimates

The NGF shows cost estimates for the "Minimal Repairs" improvement scope for Blackberry Farm Golf Course on the following pages. The total cost for the minimal repairs as defined by the City of Cupertino ranges from approximately $1.8 million dollars to $2.7 million dollars, depending on whether the City pursues reactivation of the well.

BLACKBERRY FARM GOLF COURSE - Probable Cost Estimate - Minimal Repair Scope

		Quantity	*Unit*	*Cost*
1.0	**REPLACING THE IRRIGATION SYSTEM (Potable Option)**			
1.1	Mobilization	LS	25,000.00	$ 25,000
1.2	Valve-in-head sprinkler with swing joint	340 EA	475.00	161,500
1.3	Non-valve-in-head 3/4" rotor sprinkler with swing joint	60 EA	125.00	7,500
1.4	2" Isolation Valve with saddle and Valve box	64 EA	350.00	22,400
1.5	1" Quick Coupling Valve	26 EA	150.00	3,900
1.6	Central Computer and Communication Interface	1 EA	25,000.00	25,000
1.7	Solar Weather Station	1 EA	10,000.00	10,000
1.8	1-1/2" Remote Control Valve with box	16 EA	350.00	5,600
1.9	1" Remote Control Valve (DRIP) with box	45 EA	500.00	22,500
1.10	Square head Gate Valve with box	15 EA	650.00	9,750
1.11	4-6" PVC Main line with fittings	5,600 LF	40.00	224,000
1.12	3" PVC Lateral (sub-main) with fittings	1,100 LF	8.00	8,800
1.13	2" PVC Lateral (sub-main) with fittings	13,500 LF	6.00	81,000
1.14	Air Vent/vacuum relief	0 EA	1,000.00	-
1.15	#12 TWO WIRE CABLE	20,000 LF	1.50	30,000
1.16	6" Backflow	LS	7,500.00	7,500
1.17	Salvage sprinklers, QCV's and Controllers	LS	10,000.00	10,000
1.18	Performance Bond	LS	4,604.50	4,605
1.19	Contingency (5%)	LS	23,252.73	23,253
				$ 682,308
1.20	**ADDITIONAL ITEMS FOR WELL WATER OPTION**			
1.21	Existing Well Activation (Assumes new pump, drop pipe and controls) (Further Study Required)	LS		$ 35,000
1.22	Rework Existing Delivery Line(s)	LS		37,000
1.23	Water Tank (30,000 gal.) & 20-ft Wood Structure	LS		750,000
1.24	Utility Allowance	LS		20,000
1.25	Booster Pump	LS		90,000
1.26	Water Tank Engineering	LS		20,000
				$ 952,000
2.0	**REPLACING THE EMPTY PONDS WITH LOWLAND NATIVE AREAS**			
2.1	Grubbing / Turf Eradication	1.05 AC	2,000.00	$ 2,100
2.2	Native Area Hydroseeding & Tackifier	1.05 AC	10,890.00	11,435
				$ 13,535
3.0	**REPLACING TEES AND GREENS AS NEEDED**			
3.1	Grubbing / Turf Eradication (Green and Tee Sites All 9 Holes Plus Practice Green)	1.32 AC	2,000.00	$ 2,640
3.2	Rough Grading (Green and Tee Sites All 9-Holes Plus Practice Green)	7,000 CY	5.25	36,750
3.3	Topsoil Management	LS		5,000
3.4	Feature Shaping (Tees & Greens)	LS		40,050
3.5	Tee Construction (New Const. / Finish Work)	24,775 SF	3.00	74,325
3.6	Green Construction (New Const. / Modified USGA & Finish Work)	32,700 SF	8.42	275,334
3.8	Soil Amendments & Fertilizers	1.32 AC	1,000.00	1,320
3.9	Hydro-sprigging (Tees)	0.57 AC	10,890.00	6,207
3.10	Sod Allowance	5,000 SF	0.55	2,750
3.11	Seed Greens Surfaces	32,700 SF	0.60	19,620
3.12	Grow-In	LS		20,000
				$ 483,996

4.0	**INSTALLING NETTING TO PROTECT HOLE #6 TEE BOX FROM ERRANT SHOTS ON HOLE #4**				
4.1	New Netting Between Hole Nos. 4 and 6	LS	1.00	$	172,000
				$	**172,000**
5.0	**SHORTENING THE 9TH HOLE**				
5.1	Green and Tee Construction for this item included in 3.0 above	NA	NA	$	-
5.2	Grubbing / Turf Eradication for Green Relocation	0.30 AC	2,000.00		600
5.3	Rough Grading for Non-Green Area	500 CY	5.25		2,625
5.4	Topsoil Management for Non-Green Area	LS			1,500
5.5	Soil Amendments & Fertilizers	0.30 AC	1,000.00		300
5.6	Hydro-sprigging (Fairways & Roughs)	0.30 AC	10,890.00		3,267
5.7	Grow-In	LS			1,500
5.8	Practice Hitting Bays Flipped (Steel Poles w/Netting & Artificial Matts)	8 bays	10,000.00		80,000
				$	**89,792**
6.0	**STEPS OR TERRACING TO ADDRESS ADA (Golf Course Only)**				
6.1	Tee Construction related to this item included above in 3.0	NA	NA	$	-
	Grubbing / Turf Eradication for Grading	0.2 AC	2,000.00		400
	Rough Grading to Create Walkable Slope to Tees	350 CY	5.25		1,838
	Topsoil Management for Non-Tee Area	LS			550
	Soil Amendments & Fertilizers	0.20 AC	1,000.00		200
	Hydro-sprigging (Roughs)	0.2 AC	10,890.00		2,178
	Grow-In	LS			1,000
				$	**6,166**
7.0	**TREE MANAGEMENT**				
7.1	Stump Removal	17	500.00	$	8,500
				$	**8,500**
8.0	**PROFESSIONAL FEES**				
8.1	Golf Course Architectural/Civil Engineering (Allowance)	LS		$	250,000
8.2	Project Management	LS			75,000
8.3	Permits	LS			10,000
8.4	Well Permit Fees	NIC			n/a
				$	**335,000**
	GOLF COURSE CONSTRUCTION SUBTOTAL (Potable Option)				**$1,791,297**
	CONTINGENCY (10%)			$	179,130
	GOLF COURSE CONSTRUCTION SUBTOTAL (Well Water Option)				**$2,743,297**
	CONTINGENCY (10%)			$	274,330
9.0	**Alternate - Bunkers**				
9.1	Bunker Construction (New Const. / Drainage & Finish Work)	14,400 SF	7.4	**$**	**106,560**

Probable cost estimate is based on conceptual planning prepared as of this date. Environmental mitigation and/or consulting is not calculated in the above estimates. Unforeseen conditions, additional utility work, prolonged work due to seasonal conditions and revenue losses during closure are not a part of the probable cost estimate. Prepared 02-03-22, 16:11

LS – Lump Sum; EA – Each; LF – Linear Feet; AC – Acreage; CY – Cubic Yard; NA – Not Appliable; SF - Square Feet

Irrigation and Water Source Conversion

Irrigation of the Golf Course is a critical and costly element of the ongoing operation of the golf course. In order to provide forecasts for water use and cost, NGF Consulting worked with Russell D. Mitchell & Associates ("RDMA"), who previously completed a redesign of the irrigation system for Blackberry Farm Golf Course.

CURRENT IRRIGATION SYSTEM

Irrigation of the Golf Course is a critical and costly element of the ongoing operation of the golf course. Blackberry Farm Golf Course has approximately 12.5 acres of irrigatable land. When constructed in 1962 the golf course was irrigated with use of a nearby shallow well and a storage tank with gravity-fed pipes. This kept cost for irrigation relatively low. In the early 2000's, due to failure of the storage tank, the City converted the system to potable water use. In the original construction the use of a hydraulic system for control of individual sprinkles made the system relatively inefficient by today's standards.

In 2011 the City hired Russell D Mitchell & Associates (RDMA) to provide a preliminary design for replacement of the existing irrigation system to improve efficiency and effectiveness of use irrigation. The new design was intended to irrigate the entire 12.5 acres while reducing water use by 20%-25%. That project was put on hold due to the ongoing studies associated with the overall Steven Creek Corridor Master Plan and potential renovations of the Golf Course. Regardless, in 2014 the City decided to replace the hydraulic control system with a battery-operated control system. The battery-operated system installed improved irrigation efficiency considerably.

Over the past several years the state of California has experienced statewide drought conditions and has required municipalities to restrict water use. San Jose Water (SJW) utilizes *Rule 14.1 - Water Shortage Contingency Plan* to regulate water use at the municipal level. Generally, golf courses are exempt from these restrictions until Drought Stage 4 is reached. However, the City has included Blackberry Farm Golf Course in ongoing implementation of water use limitations. In 2014 the City started placing water use limitations for the golf course. **Table 1 - Irrigation Water Use Pre-2014 and Post-2014** below indicates average water use for the years just prior to 2014 and from 2014 through 2021.

Table 1 – Irrigation Water Use Pre-2014 and Post-2014

Year Range	Average Annual Water Use
2008 through 2013	**15.9 million gallons**
2014 through 2021	**8.5 million gallons**

Utilizing the combination of the improvement to the irrigation control system and drought water-use limitations, on average, the City reduced water use to 53% of pre-2014 levels. These reductions were achieved with an irrigation system that is well past its useful life. One primary method used to reduce water use has been to reduce the total acreage of turf being watered. During some operational periods nearly 1/3 of all irrigation heads were turned off. This tends to lead to browning of large areas of the golf course turf. Yet, more can be done to decrease water use for the golf course.

The irrigation system is 60 years old and has outlived its useful life. There are multiple mainline pipe breaks per year and lateral pipes break on a weekly basis. The infrastructure is outdated and deteriorating. Irrigation system replacement parts are not available and repairs require creative solutions to keep the system operational.

CURRENT WATER USE AND FUTURE PROJECTIONS

The average annual water use between 2014 and 2021 was 8.5 million gallons versus of 15.9 million gallons prior to 2014. Currently, that level of water reduction is primarily being met by reducing turf irrigated. The irrigation regime varies annually based on weather, drought restrictions, and system limitations. As the City explores water saving options updating and improving the irrigation system is critical. The City anticipates the need to reduce irrigated acreage during designated drought periods. A new irrigation system will give the City opportunity to more efficiently use allotted water to provide a better golfing experience.

Table 2 – Water Use Projections with New Irrigation System - summarizes water use projections if a new irrigation system is installed. Total water use will vary based on operational decisions made by the City. In periods when no drought conditions exist the entire 12.5 acres may be irrigated. In periods of water-use restrictions irrigated acreage may be reduced. Currently, the City anticipates removing up to 3.0 acres from the irrigation regime in times of drought restrictions.

RDMA used the Estimated Total Water Use (ETWU) method to calculate future water use projects using different amounts of irrigated acreage.

Table 2 – Water Use Projections with New Irrigation System

Projected Irrigated Acres	Total Reduction in Irrigated Acres	Projected Annual Water Use (ETWU) (gallons)	Percentage Reduction in Water Use Vs Irrigating Full 12.5 Acres	Percentage Change from Post-2014 Average of 8.5M Gallons
12.5	0.0	8,825,050	0%	4% More
11.5	1.0	8,119,046	8%	4% Less
10.5	2.0	7,413,042	16%	13% Less
9.5	3.0	6,707,038	24%	21% Less

Note: ETWU = (Acres*Acre-In *Eto*PF)/IE. To calculate ETWU RDMA assumed an average Annual Evapotranspiration Rate (ETo) of 30 inches, a Plant Factor (PF) of 0.65%, and an Irrigation Efficiency (IE) of 75%.

WATER SOURCE CONVERSION TO WELL

The NGF team also analyzed the logistics and cost feasibility of reactivating the on-site well at BFGC. A well located nearby the golf course is the original source of irrigation. The analysis includes professional opinion on what is needed structurally to restore and revitalize the existing well for use as the golf course irrigation source. This scope includes a preliminary cost estimate to reactivate the well, as well as a comparison of annual operating costs for use of potable water vs well water as the irrigation source at Blackberry Farm GC.

Current water use has averaged 26 acre-feet per year since 2014 (1 a.f. = 326,000 gal. x 26 = 8,476,000 gal./yr.). This estimated is based on actual water usage data from the water department. Roughly 8.5 million gallons are now a baseline in terms of water use at the current facility. According to the Balance Hydrologics well report (test performed November 2012) provided by the City, the existing and available well is likely to produce up to160 GPM or 67,200 gallons during a 7-hour watering window. The well will produce more if the watering window is expanded.

Daily Water Use Estimate – Average Summer Day

To utilize the existing well and provide adequate water for the 12.5 acres of turf on a hot summer day, we estimate it will require approximately 91,000 gals. per day. Therefore, to irrigate the course with well water a reservoir capable of holding the difference between the ETWU and what the well can produce during the irrigation watering window (91,000 – 67,200 = 23,800 gals.) will be required. If the watering window were extended to 8 hours from the 7 hours, the storage reservoir could be smaller. If the course continues to be irrigated by City potable water, no reservoir is required.

Conclusion: A 30,000-gallon storage reservoir is required to accommodate this turf footprint with well water. A potable connection with level controls will be required as a backup for makeup water or if the well is not operational for maintenance. We estimate 10% of the total water usage during the summer months will be potable water.

***Note**: Fall is a good time to have a well consultant perform a new pump test, but only to determine what maximum GPM could be obtained. With dry years experienced recently, this would be a prudent course of action for the City. We point out that the 160 GPM was not actually pumped but was calculated from a test at 50 GPM. NGF Consulting recommends the City undertake this updated testing in concert with other due diligence of well fees, groundwater use fees, verification of well reactivation requirements and costs, etc*.

To properly irrigate by applying the appropriate percentage of ETo (i.e., greatly reduce or eliminate browning of the turf) at a higher efficiency over the 12.5 acres of turf, RDMA estimates the water use with a new system to be 8,825,000 gal./yr., as illustrated in **Table 2**. This is a 4% increase in total water usage per year but the uniformity of the distribution of water over the entire site will be greatly increased and more efficient.

Additional Discussion on Benefits/Efficiency of New System

We preface this discussion by reiterating that the primary reason to replace the current irrigation system is that the system is past its useful life. The current system will only continue to deteriorate. Installation of a new system will also increase the efficiency of the system on a per-acre-irrigated basis. The existing irrigation system requires frequent repairs that redirect resources from other maintenance needs and provides inadequate coverage and playing conditions, likely resulting in lost revenues. (See Appendix A discussion relative to current condition). Even the current golf course turf condition is acceptable to the City, the point at which the irrigation system becomes unusable is approaching. (Think of replacing components /

appliances of a home or car). If the City is committed to continuing to offer affordable golf as a recreation activity to its residents, the irrigation system will soon need to be replaced.

Numerous factors contribute to the potential efficiency of a new irrigation system in comparison to the existing system being replaced. However, without understanding precisely how much water (plus labor and material resources) is being wasted from breakages, pipe and head leaks, equipment failures, and ongoing repairs under the existing system, it becomes difficult to quantify the potential savings from a new system. At Blackberry Farm GC, we are confident that using the same amount of water that has been used historically or less will result in better conditions.

In addition to less waste from maintenance problems and costs associated with older parts, the benefits of a new irrigation system include:

- Better coverage
- More uniform distribution
- More efficient head layout with better distribution
- Increased precision and control for the operator (more targeted watering):
    - Easier to single out and address problem areas rather than having to switch on/off an entire zone
    - Automatic runtimes and water scheduling allows less wasted water

The existing turf at Blackberry Farm GC is a relatively high consumer of water in the context of maintaining an acceptable playing surface. Our data and calculations tell us that not enough water is currently being distributed based on the ETo and Plant Factor to achieve a specific result. Our expert opinion is that with the same amount of water (~8.5 million gallons) currently being used, BFGC will achieve improved conditions with a new system due to the factors discussed above. Still, the cost does not change because the quantity of water is approximately the same when irrigating the full 12.5 acres. Decreased water usage and potential cost savings relative to post-2015 levels can be seen when irrigating less than 12 acres of turf.

WELL REACTIVATION ESTIMATED COSTS

To reactivate the on-site well for conversion from potable water to well water as an irrigation source, new infrastructure and additional testing will be required to confirm the costs and assumptions.

Estimated Well Reactivation Costs

The new infrastructure required to reactivate the well will include but not be limited to the following items:

- Well upgrades
- New electrical meter
- Storage tank
- Booster pump
- New piping from well to storage tank
- New piping from potable source to storage tank with controls

Well Upgrades: Depending on the condition of the well but assuming the well casing is usable, we estimate the cost to install a new pump, drop pipe and controls will be **$35,000**.

Electric Meter: We are assuming the electrical service to the well is sufficient, but a new electrical service/meter will be required to service the booster pump located at the storage tank. We estimate the new meter to be **$20,000**.

Storage Tank: Depending on which improvement plan is ultimately chosen for the golf course, the size of the tank and required footprint will vary. We have included a place holder cost due to the tank being installed on a tower. Based on a 30,000-gallon tank and 20' wood structure, the estimated cost is **$750,000**.

Booster Pump: A booster pump will be required at the tank locations to provide sufficient pressure to operate the irrigation system. We estimate this booster pump will cost **$90,000**.

New Piping (from existing well to tank): If the existing pipe from the well is deemed unusable, a new fill line with controls will be required from the well to the tank location. Due to the location of the existing well, it will be difficult to get the fill line around all existing buildings and hardscape. The length of this fill line could be 300-600 linear ft depending on the tank location. We estimate the cost to install this pipe will cost between **$15,000 and $27,000**.

Potable backup source and controls to tank: The storage tank will require a potable backup with an air gap and level controls for makeup water or if the well is down for maintenance. A new line from the backflow to the tank with controls will cost **$10,000**.

Preliminary Estimated Hard Costs to Reactivate BFGC Well			
6.0	**Irrigation**		
6.1	Existing Well Activation*	LS	$35,000
6.2	Rework Existing Delivery Line(s)	LS	$37,000
6.3	Water Tank (30,000 gal.) & 20-ft Wood Structure	LS	$750,000
6.5	Utility Allowance	LS	$20,000
6.6	Booster Pump	LS	$90,000
	Total		**$932,000**

*Assumes new pump, drop pipe and controls (further study required)

Irrigation Cost Comparison – Potable vs. Well

Based on water usage data provided by the city, we analyzed the cost of potable water from 2015 through 2020. The average yearly cost of potable water was $62,176. The same usage with well water would cost the City $39,489, resulting in **annual savings of ±$22,700**. Since the potable water meter will still be in service as a backup the monthly cost of the water meter will still be incurred. We estimate this cost to be $400 to $500 per month for a yearly cost of at least $4,800.

The well water will require electrical costs for the two pumps (well and booster) We estimate the two pumps will cost roughly $6,000 per year in electrical costs. The City should set aside an additional $2,000 per year in maintenance of these pumps. Other factors being equal, and using the low end of the estimated monthly cost for the water meter, the ***net*** annual savings on water costs for the well vs. potable (based on inputs above, valid as of late 2021) after these operational costs are factored in would be ±$9,900 per year (2022 dollars):

Annual Cost - Well Water vs. Potable Water	
Annual Savings - Well Water	± $22,700
Operational Costs:	
Potable Water Meter	$4,800
Electrical	$6,000
Maintenance	$2,000
Net Annual Savings	**±$9,900**

We note that at the time of this report, NGF has not received updated monthly water meter charge figures for the potable water meter to remain in service. Therefore, we have assumed the $400 to $500 as stated above. We do know that the potable water at the BFGC uses the same meter as the irrigation. As a result, the potable water rate is higher than the irrigation rate, meaning the City is paying more than necessary for golf course irrigation water.

NGF has a call into the water department to obtain general costs by meter size. At the time of this report, no further information has been received. San Jose Water Company has stated that a new separate meter could cost around $30,000 for 4-inch meter installed. Adding a new smaller potable water meter to separate the irrigation from potable water may be required. Additionally, the City may be paying sewer fees based on water usage on the current meter. Therefore, NGF recommends having two meters. As per the 2015 State Water Ordinance, all irrigation must be separately metered from the potable water if there is more than 5,000 square feet of planting.

Conclusion – Economics of Conversion from Potable to Well

Earlier, we estimated the total infrastructure costs to implement the well system will be about $930,000. Annual irrigation expense savings, based on current assumptions and inputs, were estimated to be ±$9,900. **Therefore, the 'payback' period for this investment is about 94 years even longer when considering present value of the future savings.**

Summary Benefits of Undertaking Minimal Improvements for BFGC

The City of Cupertino should realize operational benefits by pursuing a minimal repair improvement plan that addresses only the irrigation, empty ponds, tees, greens, netting on hole nos. 4 and 6, hole no. 9 and driving net, and tee accessibility. Updated and expanded practice areas will also attract golfers and facilitate new player development and other programming opportunities. Additionally, the rehabilitated golf course will be more efficient to maintain. And, these benefits do not consider the potential "cost of doing nothing" that could result from the further deferral of facility improvements.

COST EFFICIENCIES

Areas where NGF Consulting sees a potential to reduce or reprioritize costs associated with the golf facilities include:

- Reduce managed turf footprint (to save on water cost and focus maintenance effort)
- Replace aging irrigation infrastructure (to reduce annual costs on emergency repairs)
- Create more efficient circulation through addressing accessibility needs on the golf course itself
- Replace aging tees and greens for better performance to reduce downtime during wet or inclement weather
- Address safety issues where possible given the existing layout and configuration
- Update practice facilities to help attract customers and develop new golfers

ENVIRONMENTAL ORIENTATION

Improving the golf course as presented orients Blackberry Farm GC to a more naturalized landscape. The additional benefit is a more pleasing aesthetic, and one that corresponds better to the natural areas of the Stevens Creek Valley. Additionally, enhancements to upgrade the golf course will greatly reduce or eliminate regularly occurring, but unanticipated repairs that cost the city resources. Updating the infrastructure, especially drainage and irrigation related items creates a more sustainable asset with lower expense and resources required for upkeep.

CONGRUENCE WITH PARKS & RECREATION MASTER PLAN GOALS

Minimal repairs to the golf course will go a long way with aligning the facilities to the Cupertino Parks and Recreation System Master Plan environmental goals, especially as it relates to conservation and sustainability. Advances in technology throughout the golf world have provided better options for conserving our natural resources. The most important resource in this case is water. The current irrigation system is old and inefficient. But upgrading to a newer system with smart technology, on demand metrics, diagnostics and more environmentally friendly materials in general, will allow the City to have better control over their water use and the costs associated with irrigating turfgrass in California.

REPLACING EMPTY PONDS WITH NATIVE LOWLAND LANDSCAPE

As of early 2022, the former pond is serving the purpose of dry detention. The former pond has been overtaken by the establishment of a variety of grasses and weeds, and resembles more of

a dry basin. Further work needs to be done to specify a more appropriate mix of wildflowers and/or native plant material to realize full environmental benefit. By converting the old pond areas to biofiltration basins, less water is required and maintenance can be aimed at greens, tees and playable areas of turf. Converting this area into a native lowland landscape is considered in the updated probable cost estimates.





These images depict potential “before” and “after” comparisons from the original 2014 report, showing the conversion of the old pond area to a natural “meadow” lowland area. While this specific view shows the conceptual view of Hole No. 8, it is also indicative of the transformation in landscape that could also be facilitated through turf reduction and native area establishment under the Minimal Repairs improvement plan.

NGF CONCLUSION

The consultant team concludes that the scope of work outlined under a minimal repair scope aligns very well with the City’s Master Plan goals, specifically as it relates to:

- Conservation
- Tree management
- The creation of lowland plant communities
- A reduced turf footprint
- More efficient use of water

All of these outcomes support the functionality of Cupertino’s natural environment and in a recreational setting for people to enjoy. The way golf courses are designed, built, and managed has evolved over time to better consider habitat needs. More than ever, ecology and sustainability are built into the process of creating any golf facility.

Through the enhancement of access to tees and other golf features and addressing ADA issues throughout the facilities, Blackberry Farm Golf Course becomes much more equitable in its accessibility for the public.

The minimal repair scope is certainly one way to revitalize and improve the quality of a public asset that would become much more usable for everyone. Better conditioning, turf performance and visual appeal all contribute to polishing a long-standing community asset.

Appendices

Appendix A – Assessment of Golf Course Components

Appendix B – Minimum Safety Set-Backs Exhibit

Appendix C – Miscellaneous Exhibits

APPENDIX A – ASSESSMENT OF GOLF COURSE COMPONENTS

Tees: In general, tees are in poor condition and are crowned (i.e., are not level.) Turf suffers from over-shading due to proximity of trees, and tree density (i.e., overplanting). Drainage appears non-existent with native soils likely forming the tee subgrades. Even though tees have been rebuilt occasionally, the extremely small sizes create constant wear and they simply cannot keep up with the use. As of 2022, it appears that even more usable space has been lost, particularly, at the 8th hole where the entire right half of the tee has been abandoned. This is especially problematic because Hole No. 8 is a par-3, enduring short iron shots.

Tees also do not offer yardage flexibility to the degree necessary to serve golfers of varying abilities. The yardage difference between the back tees and the forward tees is just 134-yards, an average of 15 yards per hole. Developing new tees for shorter forward yardages encourages more new players, young players and senior players, and can have the effect of promoting more play from tee yardages appropriate to individual skill level.

During the site visits, we observed that a few tees, most notably on Holes #2 and #3, have ADA access issues. Some customers struggle to navigate the steeper embankment leading up to these tees. At minimum, accessibility should be reinstated through softening the embankments or providing steps up to tees. However, steps may also be problematic depending on the needs of the individual. The location of these areas is shown in Appendix C, Exhibit 2.

Fairways and Roughs: Turf quality is average-to-poor, with shaded areas being in the worst condition. In recent years, the City has tried to address this through in-house tree removal. However, as of 2022, seventeen (17) stumps ranging from 18 inches to 36 inches remain in place. Turf conditions beyond the root structure seem to be improved, but not still cannot be considered up to high standard. Drainage is lacking at points where natural grades do not convey water to low areas and the few drains installed on the course. Turf is a variety of Bermudagrass, ryegrass and kikuyugrass. Some small patches of fescue-type turf and hearty bentgrass (likely left over from original greens planting) can also be found. Compounding turf conditions is the antiquated irrigation system that delivers poor coverage, inefficient irrigation pressure, and is a constant source of leaks and breaks.

Greens: Greens are very small with poa annua, an acceptable greens “turf” that overtakes bentgrass, especially in the Bay Area region. Where the greens are not in excess shade, the surfaces are acceptable. There are significant patches of poor quality, which is likely the result of multiple factors: poor irrigation, shade, age and size. In terms of size, the greens are extremely small and do not heal from day-to-day when the course is busy. Greens for a course of this length (with many short shots played from tees that are hit high and cause deeper ball marks) should be as much as three times (3x) the size of the greens presently managed. Greens are reported to be original and were likely built on native soils with only a nominal volume of sand mixed to available soils. Considering the age and other factors, the conditions are “good.” The overall quality is well below what can be attained with new, replaced rootzones and modern drainage systems. (Note: The No. 3 green was rebuilt in recent years and is, as a result, in better condition than others.)

Bunkers: Sand bunkers, of which there are nine (9) in total, are well past their expected lifecycle. Sand has been added to bunkers throughout the years, which amounts to the only significant care they have received. Adding sand causes the floors to rise up and eventually become elevated in relationship to green surfaces. This “volcano” effect is not only a poor aesthetic, but it sends a signal that the course has been neglected. In most climates sand bunkers get new sand replaced every 2-3 years with infrastructure (drainage and subgrades) renovated every 7-10 years. According to staff there has been no work to sand bunkers (except

sand being added with occasional edging work) since the course was originally built in the 1960s.

Ponds: Originally the course had a series of ponds and streams that formed a water feature through the course. These ponds were filled with a manual valve from the creek. The ponds were taken out of service due to failure of a diversion structure between the source and the ponds. Additionally, the upper pond does not hold water due to porous soils. The ponds never served as an irrigation reservoir for the golf course, at least not in the past several decades. While no detailed inspection of ponds was made by NGF Consulting, visual inspection shows soil cracking and conditions that tend to support potential leaks should they be refilled with water.

As of 2021, the former pond has been overtaken by the establishment of a variety of grasses and weeds and resembles more of a dry basin. While not currently serving any significant function, the landform presents an interesting feature on the golf course. Modern pond construction for soil types in this region would generally call for artificial liners such as HDPE plastic sheeting laid over a geotextile fabric. However, NGF is not recommending reconstruction of the ponds (i.e., lining) as we feel evaporation and resulting water cost would be counterproductive. Alternatively, we recommend conversion of the pond areas to a passive naturalized landscape that can serve the area with biofiltration *(see below).*

Irrigation System: No in-depth evaluation was made of the irrigation system. In general, the system is original to the c. 1960s course construction and has been held together with various patches, repairs and some newer equipment. A typical irrigation system in this region will last from 18 to 25 years. The Blackberry Farm GC system has now (tried) to outlive its intended lifecycle by nearly three-fold. The system is “hydraulic” controlled, a method of control that is now so old most turf suppliers no longer have personnel who have even heard of such technology. During our visits we observed hand-watering by the grounds crew in order to overcome this less-than-desirable system. The downside of such an older system is poor coverage (too much overlap or not enough), leaks, breaks and the constant vigilance by staff that takes their time and energy away from areas and maintenance that the public can see and appreciate more.

Cart Paths: The facility has 4 carts for patrons who are not able to walk the 9-hole course. Where paths are present (at just a few locations) they are narrow and not configured well. There is little compliance with ADA guidelines in terms of curbing or access. The cart paths, where present, are showing their age with declining functionality for their intended purpose. In addition, carts are expected to navigate the hill between Hole Nos. 3 and 4. This slope and informal path are difficult for people to navigate on foot, let alone by cart. Ground moisture and muddy conditions can make this a challenge, further adding to the wear and tear on the golf course, but more importantly presenting a potential accessibility and safety issue for golfers and patrons.



The absence of cart paths in general means guidelines for accessible ingress/egress from golf features, use of accessible routes, and accommodation for alternative cart usage is poor. (Guidelines for accessible golf courses can found in the separate attached report titled “Accessible Golf Courses” by the United States Access Board).

Trees/Stumps: Trees form the landscape theme for Blackberry Farm GC. As noted, trees line all golf holes except where poles and netting have existed along with other park uses. Overall, trees are too prevalent and cause too much shade for turf to thrive and be healthy for golf uses. Where shade is most pervasive, turf does not grow, and the ground is bare. Many trees are rootbound, with roots forming into a dense, tangled mass that occupies extensive playable turf area. Some exposed roots interfere with golfers, maintenance equipment, surface drainage, and irrigation. However, NGF notes that many trees are in decline. This condition is likely a result of aging trees, regional blight(s), and, in some areas, overcrowding where tree groupings are too close in proximity.

Where trees have been cut down, several stumps remain (see image below Appendix C, Exhibit 3). As of 2022, seventeen (17) sizable stumps remain, which has somewhat improved localized turf conditions. However, with stumps and root structure still intact, limiting the benefit to turf and golfer experience. If left in their current state some trees and/or the remaining stumps from removal may cause potential safety issues for golfers including but not limited to:

- If players hit their shot without being aware that persistent roots are just under the surface, they risk significant injury.
- Roots systems, if driven over, may cause loss of control with golf course or a tripping hazard for walkers.

- The remaining stumps present the possibility of ricocheting golf shots that may strike golfers on the same or adjacent holes.
- The presence of these root systems presents challenges to accessibility in general.



APPENDIX B – MINIMUM SAFETY SET-BACKS EXHIBIT



BLACKBERRY FARM GOLF COURSE
MINIMUM SAFETY SET-BACKS

North

0 50 100 150 200 250 feet

NGF CONSULTING
NATIONAL GOLF FOUNDATION

RICHARDSON DANNER
GOLF COURSE ARCHITECTS

2-18-22

APPENDIX C – MISCELLANEOUS EXHIBITS

Exhibit 1 - Minimum Improvement Exhibit



BLACKBERRY FARM GOLF COURSE
MINIMUM IMPROVEMENT EXHIBIT

2-18-22

Exhibit 2 – Tee Areas with Steep Embankments



Exhibit 3 – Areas Where Tree Stumps are Present

