Les Lacs Pond Liner Replacement & Water Quality Update

June 11, 2019

ADDISON

WESTRA CONSULTANTS

TBG

HALFF

Presentation Overview

This is a follow up to the project update staff and the consultant made to Council on April 6, 2019 in regards to the replacement of the pond liner at Les Lacs Pond. During this update Council requested additional information from staff regarding:

- **Question 1:** What liner materials were considered? What is the life cycle information and warranty of the proposed liner?
- **Question 2:** What is the break down of items included in the landscape enhancements?
- **Question 3:** What Grants are available and how do the landscape enhancements improve grant funding potential?
- **Question 4:** When will the water quality report be complete? Please, provide the results of the water quality sampling report when completed.

Staff will provide a project background and additional information related to the questions listed above.

Background Information - Existing Conditions

LEGEND

PEDESTRIAN AMENITIES
- 01 FOUNTAINS
- 02 PET STATIONS
- 03 TRASH RECEPTACLES
- 04 OVERLOOK AND WATERFALL

VEGETATION
- 01 TURF
- 02 CANOPY TREES TYPE 1
- 03 ORNAMENTAL TREES
- 04 CANOPY TREES TYPE 2

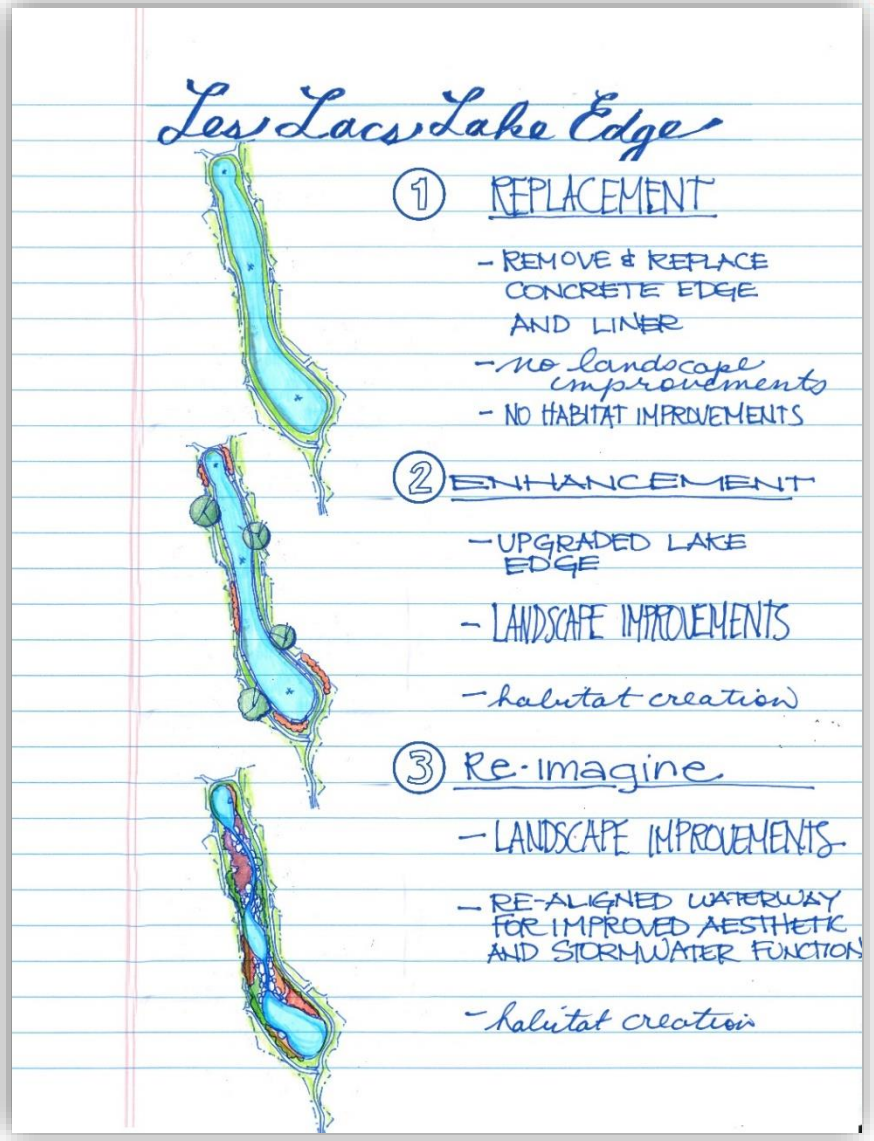
UTILITIES
- 01 STORMWATER OUTFALL
- 02 POND OVERFLOW
- 03 ELECTRICAL ENCLOSURE

SITEWORK
- 01 PROPERTY BOUNDARY
- 02 CONCRETE FLUMES
- 03 LIMESTONE SUB-LAYER
- 04 AGING IRREGULAR POND EDGE
- 05 STEEP SLOPES
- 06 WALK NOT ADA ACCESSIBLE

- Upland Pond, 2.2 Acres.
- Residents report concerns with water quality.
- Manages stormwater for surrounding neighborhood.
- Irregular concrete edge, deteriorated.
- Steep slopes in some areas.
- Liner is nearing or has exceeded its life expectancy of 15-20 years.
- Two constructed overlooks with water recirculation.

Background Information - Options

- Initially a Base, Medium and High Option were to be developed.
- Due to the structure of the public input process the consultant designed a Base and High Option.
- The Medium Option was discussed with Council during the April 9, 2019 Council Meeting Work Session.



Background Information - Base Option

LEGEND

- 01 PROPERTY BOUNDARY
- 02 EXISTING FOUNTAINS
- 03 EXISTING DECK AND WATERFALL
- 04 EXISTING TREES TO REMAIN
- 05 EXISTING CONCRETE FLUME
- 06 PROPOSED RETAINING WALLS
- 07 MAKE WALK ADA ACCESSIBLE
- 08 PROPOSED POND OVERFLOW TRASH RACK
- 09 PROPOSED SMOOTHING OF ENTIRE PERIMETER POND EDGE
- 10 APPLY STONE VENEER TO OUTFALL STRUCTURE

DESIGN TIMELINE: 4 - 6 MONTHS
CONSTRUCTION TIMELINE: 6 - 8 MONTHS
BASE COST - POND DEMOLITION, NEW LINER AND NATURAL EDGE: $790,000
CONCEPT OPTION 1 - POND LANDSCAPE, AMENITY AND SITE IMPROVEMENTS: $297,000
MATERIALS TESTING, CONSTRUCTION ADMINISTRATION, PERMITTING, LANDSCAPE ARCHITECTURE AND ENGINEERING, & SURVEYING SERVICES: $271,750
TOTAL PROBABLE COST: $1,358,750.00

NOTES:

OPTION 1 INCLUDES THE MINIMUM WORK REQUIRED TO REPLACE THE LINER, MEET ADA REQUIREMENTS AND SMOOTH OUT THE POND EDGE TO IMPROVE MAINTENANCE.

WESTRA TBG ADDISON LES LACS POND / **ILLUSTRATIVE SITE PLAN - OPTION 1 "BASE CONSTRUCTION ITEM"**

Base Option Includes the Minimum Work Required to Replace the Liner, Meet ADA Requirements, Smooth Out the Pond Edge to Improve Maintenance and Revegetate the Site to Existing Conditions

Design Schedule:	4-6 Months
Construction Schedule:	6-8 Months
Cost:	$1,358,750*

* Includes Engineering Services, Materials Testing and Construction Administration and is based on 2019 Construction

Background Information - High Option

LEGEND

01 PROPERTY BOUNDARY
02 NEW FOUNTAINS WITH LED LIGHTING
03 EXISTING WATERFALL WITH PROPOSED LED LIGHTING AND CLEANING OF ROCKS
04 PRESERVE EXISTING TREES AND ADD UPLIGHTING (✳)
05 EXISTING CONCRETE FLUME WITH PROPOSED RAIN GARDEN AND STONE BOULDERS
06 PROPOSED RETAINING WALLS
07 WIDEN WALKS TO 8' AND CREATE CURVILINEAR ALIGNMENT
08 PROPOSED POND OVERFLOW TRASH RACK
09 PROPOSED SMOOTH POND FORM AND CONCRETE EDGE
10 PROPOSED SMOOTH POND FORM AND NATURAL LANDSCAPE EDGE
11 PROPOSED SMOOTH POND FORM AND STONE EDGE
12 PROPOSED ART
13 EXISTING DECKING WITH PROPOSED MOVABLE SEATING AND GAME AREA
14 PROPOSED FITNESS STATIONS ALONG WALK
15 PROPOSED BOARDWALK
16 PROPOSED BRIDGE
17 PROPOSED MEANDERING WALK
18 PROPOSED AQUATIC PLANTING
19 PROPOSED EDUCATIONAL SIGNAGE
20 PROPOSED ROOT BARRIER TO PROTECT SIDEWALKS AND POND LINER
21 NUTRIENT/DEBRIS COLLECTION CHAMBER

DESIGN TIMELINE: 6 - 8 MONTHS
CONSTRUCTION TIMELINE: 9 - 12 MONTHS
BASE COST - POND DEMOLITION AND RECONSTRUCTION OF POND LINER: $790,000
CONCEPT OPTION 2 - POND LANDSCAPE, AMENITY AND SITE IMPROVEMENTS: $2,637,000
MATERIALS TESTING, CONSTRUCTION ADMINISTRATION, PERMITTING, LANDSCAPE ARCHITECTURE AND ENGINEERING, & SURVEYING SERVICES: $856,750
TOTAL PROBABLE COST: $4,283,750.00

NOTES:
OPTION 2 INCLUDES ITEMS SHOWN IN OPTION 1 AND RECOMMENDED ENHANCEMENTS. THE ENHANCEMENTS WILL BE PRIORITIZED BY COMMUNITY INPUT.

WESTRA TBG ADDISON LES LACS POND / **ILLUSTRATIVE SITE PLAN - OPTION 2 "BASE CONSTRUCTION ITEMS + RECOMMENDED ENHANCEMENTS"**

High Option Builds on the Base Option and Includes the Stone Edge Option, Additional Plantings, Interactive Amenities, Site Improvements, Environmental Amenities and Aesthetic Amenities.

Design Schedule:	6-8 Months
Construction Schedule:	9-12 Months
Cost:	$4,283,750*

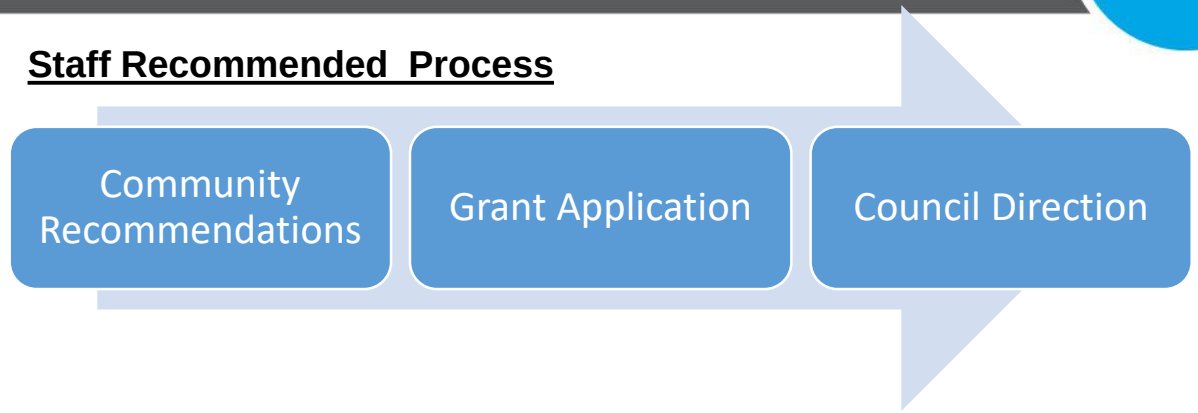
* Includes Engineering Services, Materials Testing and Construction Administration and is based on 2019 Construction

Background Information - Recommendations

Community Recommended Enhancements

Base Project	**1,358,750**
Pond Edge Condition	
Combined Edge	493,200
Planting Condition	
Formal Plantings	792,600
Interactive Amenities	
None Preferred	0
Site Improvement Amenities	
Retaining Walls	96,300
Environmental Amenities	
Rain Garden	43,500
Aquatic Plants	229,000
Aesthetic Improvement Amenities	
Fountain & LED Uplighting	61,625
Tree Uplighting	68,150
Addison Arbor Foundation	0
Total Community Recommended Enhancements	**$3,143,125**

Staff Recommended Process



Staff Recommended Grant Application - $2,186,075*

- Staff recommends submitting the Base Project, Pond Edge Conditions, Environmental Amenities, Fountain & LED Lighting for a TCEQ Grant.

- Staff recommends finalizing project scope once the Town has been notified of the grant application status.

Bond Committee Recommendation -$3,282,110**

The bond committee's recommendation to Council includes the base project and the Community Recommended Enhancements.

* Includes Engineering Services, Materials Testing and Construction Administration.

** Amount requested by Parks Department for consideration in 2019 Bond Program. Includes inflation rate increase for 2020 Construction.

Question 1: Liner Information

Liner Material	Estimated Cost	Installation Warranty	Liner Warranty	Notes
HDPE 40 Mil Smooth	$41,940*	1-year	5-Years Standard**	Over / Underlayment can extend life 10 Years
HDPE 40 Mil Textured	$45,235	1-year	5-Years Standard**	Over / Underlayment can extend life 10 Years
HDPE 60 Mil Textured (Included in the Base Bid) **Staff recommends this product**	$57,298	1-year	5-Years Standard**	Over / Underlayment can extend life 10 Years
Geosynthetic Clay Liner	$57,692	None	5-Years Standard	
Natural Clay	$157,000	None	None Required	24” Thick Profile
Bentonite Clay	$66,800	None	None Required	1-4” Thick Profile

* Costs are for materials only and do not include labor and installation.
**Additional years can be purchased and added onto the warranty.

Question 2 - Landscape Breakdown

Additional Landscape Includes:

Soft Costs

Design Fees
Testing
Project Contingency

Hard Costs

Fine Grading
Bed Preparation
Shrub and Groundcover
Additional Sod Replacement
Canopy Trees
Ornamental Trees
Root Barrier
Steel Edging
Spray Irrigation
Drip Irrigation
Irrigation Meter
1-Year Maintenance

Question 3 – Grant Opportunities

Grant Opportunity	Agency	Maximum Amount	Deadline	Notes
TCEQ Nonpoint Source Program*	TCEQ	$500,000	July 31, 2019	Strategic selection of management measures to assure the water bodies meet water quality standards. Addison applied for, but was not awarded, this grant in 2016. Staff believes that water quality information and schematic design plans will strengthen the application in 2019.
Blue-Grey-Green	NCTCOG	$50,000	Date Not Set	Anticipates a call within the next year.

* Similarities Amongst Grant Awarded Projects

- The selected projects often reach a large scope of people. It is either a regional issue or an issue that affects a large city.
- Most of the approved watershed projects include measures to address issues with elevated bacteria levels.
- There is a large public element of the project. Some projects include using media to educate citizens and others encourage the public to participate in watershed partnerships.
- The project addresses source water protection or restoration.

Question 4 - Water Quality Sampling Report

Testing	Results	Notes
Total Phosphorous	Frequently Over .036	> .036 indicates: • High Nutrients • Low Clarity • Algae Blooms
Nitrogen	Exceeded 6 mg/l on two occasions	> 6 mg/l indicates pollution from: • Fertilizers • Nutrient Rich Waste • Manure
Total Organic Carbon	Slightly exceeded 10 mg/l in June, July and August	< 10 mg/l = pristine rivers and lakes > 10 mg/l can indicate: • Foam • Pollution from pesticides and herbicides and agricultural chemicals
Chlorophyll-a	Almost always exceed 13 ug/l	• < 10 ug/l – Indicates good water quality • > 13 ug/l – Indicates eutrophic conditions which is typically dominated by algae and results in darker and murkier water

mg/l = milligrams per liter
ug/l = micrograms per liter

Question 4 – Water Quality Sampling Report

Testing	Results	• Notes
Fecal Coliform	Exceeded 10,000 cfu/100 ml on four occasions Consistently over 2,000 cfu/100 ml	• > 200 cfu/100 ml - potential concern for primary recreation activities • > 2000 cfu/100 ml - potential concern for secondary contact recreation activities • Concentrations > than 10,000 cfu/100 ml - immensely high Can cause diarrhea in dogs who may drink from the pond
Biochemical Oxygen Demand (BOD) the amount of oxygen consumed by bacteria in the decomposition of organic material	BOD levels are typically 8 mg/L or lower but have ranged between 20-25 mg/l on three occasions	• < 2mg/l pristine water bodies. • 2 mg/l – 8 mg/l moderately polluted water bodies • 20 mg/l – 30 mg/l efficiently treated sewage • 30 mg/l or > is considered high
Total Suspended Solids (TSS)	TSS levels are below 45 mg/l except for early and late summer seasons	> 45 mg/l high level Can Indicate: • Light being blocked • High levels of bacteria, nutrients, pesticides and other metals present in the water

mg/l = milligrams per liter
cfu/100 ml = colony forming units per 100 milliliters

Primary Recreation Activities - swimming
Secondary Recreation Activities – fishing, boating, and limited body contact

Question 4 – Water Quality Sampling Report

The Water Quality Sampling Report recommends the implementation of the following Best Management Practices (BMP's) to improve water quality:

1. Implement a consistent program to document and record complaints from citizens and staff of the pond water quality.
2. Enforce mandatory use of phosphorus-free fertilizers by Town in public areas.
3. Increase public education of residential use of phosphorous free fertilizers in lawn care and of where runoff water goes.
4. Begin a regimented chemical testing program and be proactive to water quality irregularities. Trigger corrective actions such as stricter enforcement of polluted runoff, chemical treatments or water body controls.
5. Use chemical treatment to help precipitate phosphorous and decrease its levels.
6. Plant and maintain vegetation buffers around pond to help filter pollutants carried in runoff and to absorb excess nutrients.
7. Post signs during high levels of nutrients in water to increase public awareness and input on reducing fertilizing and yard waste disposal in storm sewers.
8. Flush pond during hazardous periods with supplemental water supply.
9. Increase frequency of basket cleaning of the recirculation system to remove waste and nutrients from system.
10. Monitor chemical properties of silt in bottom as well as depth on 5-year program to determine rate of increase of nutrient concentrations and volume. Develop plan for future removal if need develops.

Next Steps

- Finalize and submit TCEQ non-point source grant application.
- Monitor NCTCOG for submission deadlines for Blue-Grey-Green grant.
- A recommended scope for a medium project will be brought to Council for adoption, once staff receives the status of the TCEQ grant applications.
- Develop a proposal for professional services based on the scope defined by Council.
- Develop and finalize construction documents for the project.
- Bid project.
- Begin construction.