Contact Filer Regarding Image Clarity

STATE OF NEVADA

PUBLIC UTILITIES COMMISSION OF NEVADA

1150 E. William Street
Carson City, Nevada 89701-3109

No. 43289

RECEIPT

Received from

Date 7/11/2014

LIONEL SAWYER & COLLINS
50 W LIBERTY STREET
RENO, NV 89501

AMOUNT $ 200.00

TWO HUNDRED ---------- and 00/100 Dollars

	Cash	Check	Money Order	Draft
How Paid	☐	506130		

Type of Receipt	Filing Fee	TDD	Copy Service	UEC	Mill or CMRS	Other
	☑	☐	☐	☐	☐	☐
GL	3717		3818	3% to 3305 97% to LIHEA cc: Welfare	3920-3315 1038-3315	

Invoice#:

Memo

New Filing

Received by SC

Business Process Copy

VALENTINE
Environmental Engineers

advanced innovation. pure water.

July 10, 2014

Ms. Breanne Potter
Assistant Commission Secretary
Public Utilities Commission of Nevada
1150 E. William Street
Carson City, Nevada 89701

RECEIVED-PUBLIC UTILITIES COMMISSION OF NEVADA-CARSON CITY
2014 JUL 11 PM 1:56

Re: Utilities, Inc. of Central Nevada - UEPA Application

Dear Ms. Potter:

Accompanying this letter, for filing with the Public Utilities Commission of Nevada, is Utilities, Inc. of Central Nevada's Application for a permit under the Utility Environmental Protection Act. UICN is requesting this permit in connection with the rehabilitation and remediation of certain facilities used to accept and store treated effluent, and which are located on the Willow Creek property in Pahrump, Nevada. UICN is filing this application with the understanding that the Commission does want to review this project in a UEPA docket (and UICN agrees that certain aspects of the project, such as the receiving ponds, could be construed as non-potable water storage facilities).

If you have any questions regarding this filing, please contact me at 480.283.8991 or tvalentine@valentineengineers.com.

Sincerely,

Teresa Valentine

Teresa Valentine, PhD, PE, BCEE
Managing Principal, Valentine Environmental Engineers

cc: Nevada Department of Environmental Protection

PUBLIC UTILITIES COMMISSION OF NEVADA
DRAFT NOTICE
(Applications, Tariff Filings, Complaints, and Petitions)

Pursuant to Nevada Administrative Code ("NAC") 703.162, the Commission requires that a draft notice be included with all applications, tariff filings, complaints and petitions. Please complete and include **ONE COPY** of this form with your filing. (Completion of this form may require the use of more than one page.)

A title that generally describes the relief requested (see NAC 703.160(5)(a)):

Application of Utilities, Inc. of Central Nevada for approval under the Utility Environmental Protection Act in connection with the rehabilitation and remediation of certain facilities used to accept and store treated effluent.

The name of the applicant, complainant, petitioner or the name of the agent for the applicant, complainant or petitioner (see NAC 703.160(5)(b)):

Utilities, Inc. of Central Nevada ("UICN")

A brief description of the purpose of the filing or proceeding, including, without limitation, a clear and concise introductory statement that summarizes the relief requested or the type of proceeding scheduled **AND** the effect of the relief or proceeding upon consumers (see NAC 703.160(5)(c)):

UICN files this Application for approval of its approval under the Utility Environmental Protection Act in connection with the rehabilitation and remediation of certain facilities used to accept and store treated effluent, and for relief properly related thereto.

A statement indicating whether a consumer session is required to be held pursuant to Nevada Revised Statute ("NRS") 704.069(1)[1]:

No consumer session is required.

If the draft notice pertains to a tariff filing, please include the tariff number **AND** the section number(s) or schedule number(s) being revised.

N/A

---

[1] NRS 704.069 states in pertinent part:

1. The Commission shall conduct a consumer session to solicit comments from the public in any matter pending before the Commission pursuant to NRS 704.061 to 704.110 inclusive, in which:
(a) A public utility has filed a general rate application, an application to recover the increased cost of purchased fuel, purchased power, or natural gas purchased for resale or an application to clear its deferred accounts; and
(b) The changes proposed in the application will result in an increase in annual gross operating revenue, as certified by the applicant, in an amount that will exceed $50,000 or 10 percent of the applicant's annual gross operating revenue, whichever is less.

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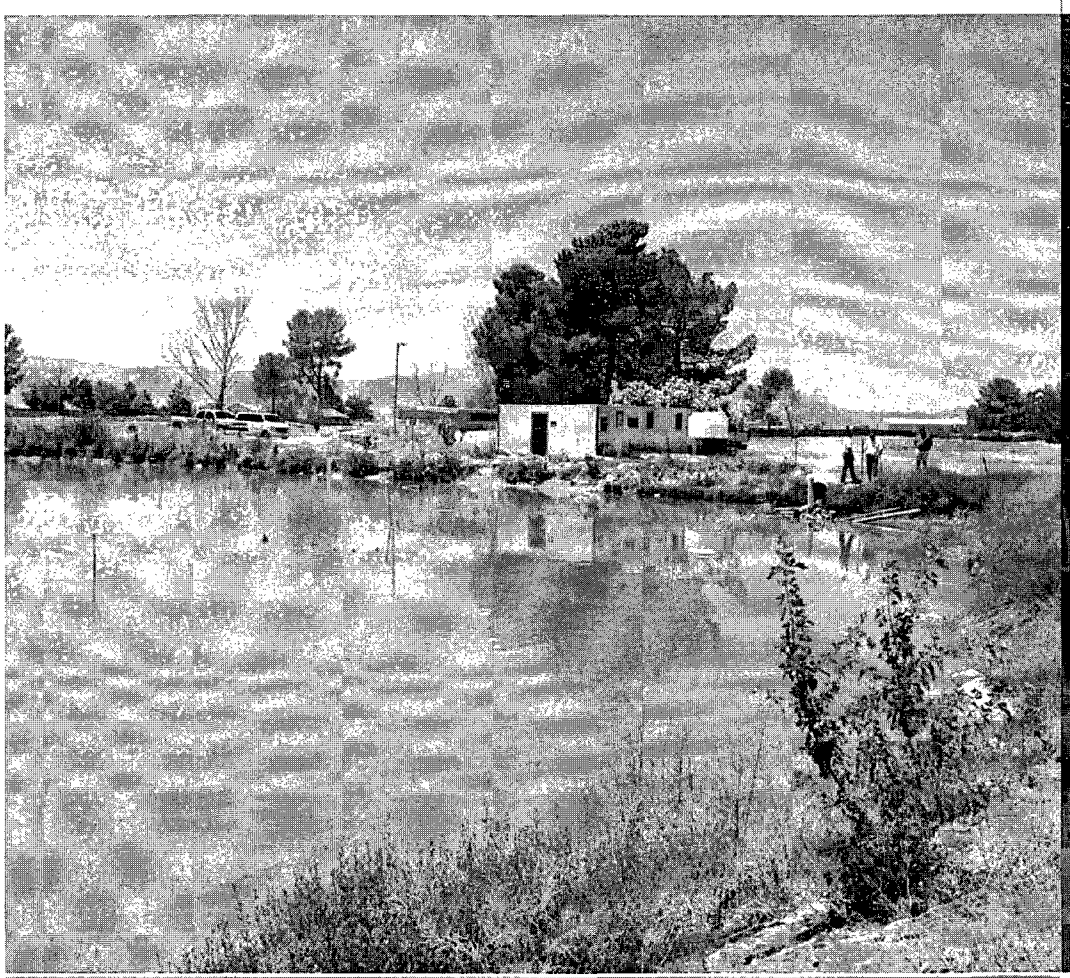
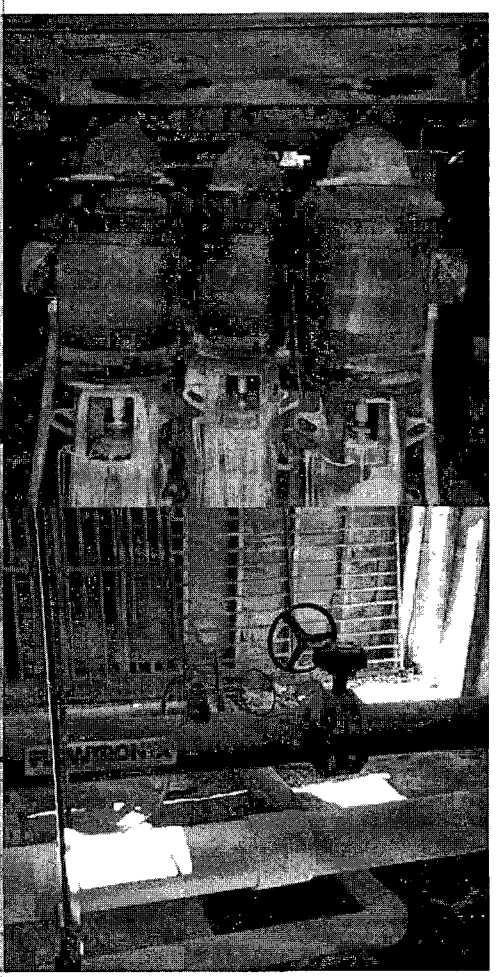
Willow Creek Remediation Project

July 2014





Utilities, Inc of Central Nevada
UEPA Permit Application

Utilities, Inc.

UEPA Permit Application
Willow Creek Remediation Project

TABLE OF CONTENTS

APPENDICES

Attachment A - Maps and Drawings
Attachment B - Legal Description of the Site
Attachment C - Geotechnical Report
Attachment D – Preliminary Engineering Report
Attachment E – Public Notice and Proof of Publication

1.0 INTRODUCTION

1.1 Background

Utilities Incorporated of Central Nevada (UICN) owns and operates Wastewater Treatment Plant (WWTP) No. 3. The only method of effluent disposal from WWTP No. 3 is to the Lakeview Golf Course and the former Willow Creek Golf Course (now referred to as the Willow Creek Property). UICN is obligated under the Tri-Partite Agreement (TPA) to send it treated reclaimed water from Plant 3 to the Willow Creek Property. WWTP No. 3 is permitted for Class B reuse and currently discharges approximately 600,000 gpd.

The WWTP discharges its effluent into a lined receiving pond located on the Willow Creek Property. From there, two pump stations convey the effluent for irrigation of the Lakeview Golf Course and for effluent disposal on the Willow Creek Property. These pump stations are termed the Willow Creek Pump Station and the Lakeview Golf Course Pump Station. Overflow from the receiving pond is collected into two lined overflow ponds just north of the receiving pond. There are several other unlined ponds and another pump station located on the property.

The Willow Creek Property Owner closed the golf course in October 2008 and later declared bankruptcy in November 2012. To date, the receiving pond and the overflow ponds have not been maintained and the liners and pump stations have fallen into disrepair. The Owner of the property failed to do the required maintenance to ensure the health and safety of the community and the reliable operation of their own Effluent Management Plan and NDEP Discharge Permit. In addition, this lack of operations and maintenance poses a significant risk to the reliable discharge of WWTP No. 3 effluent.

On August 21, 2013, the United States Bankruptcy Court of the District of Nevada approved the Trustee's plan to grant UICN ownership of the property. Anticipating this plausible outcome, UICN sought an amendment to the 2011 Integrated Resource Plan to remediate the receiving pond, overflow ponds, Willow Creek Pump House and Lakeview Pump House. In addition, UICN was approved to commence certain projects to begin remediation of the existing effluent storage and irrigation system. Approval of this First Amendment to the UICN Water and Sewer System 2001 Integrated Resource Plan was received on November 21, 2013.

In December 2013, Valentine Environmental Engineers was awarded the design and permitting for the Willow Creek Property Remediation and associated assessments. The irrigation assessment was completed in April 2014. This assessment indicated that the condition of the Willow Creek Property irrigation system was worse than originally anticipated and would be costly to UICN to rehabilitate and repair the system to a reliable operating condition. At the same time, percolation tests were

performed at three locations on the Willow Creek Property and the results indicate that rapid infiltration basins are a viable option.

1.2 Proposed Project

The proposed project includes:

- Installation of a new lined effluent receiving pond and equip with aeration
- Rehabilitation and enlargement of the existing receiving pond and equip with aeration
- Installation of necessary interconnecting piping between ponds and existing pump station forebays
- Demolition of the liner from the existing overflow ponds, enlargement and deepening of the overflow ponds and convert to use as rapid infiltration basins
- Rehabilitation of the existing pump stations through removal of the damaged buildings, overgrown vegetation, unused equipment and perform electrical and installation modifications. Installation of shade canopy for equipment protection.
- Replacement and relocation of approximately 810 lineal feet of new 12-inch discharge piping from the Willow Creek Pump House to the rapid infiltration basins and for connection into the existing irrigation system main piping on the property.
- Replacement and relocation of approximately 190 lineal feet of new 10-inch discharge piping from the Lakeview Pump House.
- Relocation of Lakeview Pump House discharge line and electrical services lines.

After construction of the proposed project is completed, the ground surface will be restored to the original surface contour as much as practically possible.

The proposed project will not involve any federal action: no federal land will be needed; no federal funding is involved, and federal approval is required. Therefore, this permit application document is prepared in accordance with Nevada Administrative Code (NAC) 703.423.

2.0 REQUIREMENT OF NAC 703.423

2.1 Description of Location

1. A description of the location of the proposed utility facility, as required by subsection 1 of NRS 704.870 including:

   a) A general description of the location of the proposed utility facility, including a regional map that identifies the location of the proposed utility facility (NAC 703.423(1)(a):

   The rehabilitation and remediation of the components and systems outlined in Section 1.1 are located in the exact location or adjacent to the existing receiving and overflow ponds currently on the Willow Creek Property. The project is located in the Southeast Quarter of the Southwest Quarter of Section 22, Township 20 South, Range 53 East in Nye County, Nevada (see Maps and Drawings in Attachment A).

   b) A legal description of the site of the proposed utility facility, with the exception of electric lines, gas transmission lines and water and wastewater lines, for which only a detailed description of the site is required (NAC 703.423(1)(b)):

   The project site overlaps two parcels. A legal description and parcel map is included in Attachment B and is summarized below:

   "Parcel 2 of boundary line adjustment map 659137, recorded 6/02/2006 being a portion of Calvada Valley Unit 7, File No. 36023 located in Section 22, T20S, R53E, MDM, Nye County, Nevada"

   "Being lot 128, block 35 of Calvada Valley Unit 7 in Section 22, T20S, R53E, MDM, Nye County, Nevada"

   c) Appropriately scaled site plan drawings of the proposed utility facility, vicinity maps and routing maps (NAC 703.423(1)(c)).

   See Attachment A (Maps and Drawings).

2.2 General Description of Facility

A description of the proposed utility facility including:

   a) The size and nature of the proposed utility facility (NAC 703.423.(2)(a)):

The existing overflow pond will be increased in size to have an approximate surface area of 43,164 square feet and the new overflow pond will have an approximate surface area of 67,914 square feet. The pump houses will remain in their respective locations; the Lakeview Pump House area is approximately 250 square feet and the Willow Creek Pump House area is approximately 250 square feet. Approximately 810 lineal feet of new 12-inch discharge piping will be installed and approximately 190 lineal feet of

Lakeview Pump House 10-inch discharge piping will be relocated to accommodate the work. Security fencing will be provided around the receiving ponds and the pump houses. The pump houses will also be equipped with shade canopy structures to protect the equipment from the elements.

The rapid infiltration basins (RIBs) will be installed in the same location as the existing overflow ponds. Two basins will be installed of equal area. The total bottom surface area of the RIBs is 20,400 square feet.

b) The natural resources that will be used during the construction and operation of the proposed utility facility (NAC 703.423.(2)(b)):

- Fuel for vehicles to transport materials to the site and to operate equipment
- Concrete for splash pads
- PVC pipe to connect overflow ponds to the existing pump house forebays, to interconnect the overflow ponds and as discharge piping from the pump houses
- Geotextile membrane liner for receiving ponds
- River rock at RIB inlet structures
- Gravel, road base and structural fill
- Gravel for vadose zone trench in RIBs
- Steel for shade canopy structures

The proposed project will not have any significant adverse impact on natural resources.

c) Layout diagrams of the proposed utility facility and its associated equipment (NAC 703.423(2)(c):

See Attachment A (Maps and Drawings)

d) Scaled diagrams of the structures at the proposed utility facility (NAC 703.423(2)(d):

See Attachment A (Maps and Drawings)

2.3 Environmental Studies

3. A copy and summary of any studies which have been made of the environmental impact of the proposed utility facility as required by subsection 1 of NRS 704.870 (NAC 703.423(3)).

Attachment C is a Geotechnical Report prepared based on a geotechnical investigation conducted at the project site. The report indicates that the site is suitable for the proposed project construction.

Attachment D is an Engineering Design Report. The report provides the basis of design for the overflow ponds, RIBs and other system appurtenances. The report also reviews the results of the recharge testing and irrigation system assessment and discusses the use of RIBs as the most optimum solution for effluent disposal in lieu of spray irrigation at Willow Creek Property.

UICN completed an environmental impact assessment in July 2014. The findings regarding the environmental impact to the proposed utility facility are outlined in Section 2.7.

2.4 Reasonable Alternative Locations

4. A description of any reasonable alternatives locations for the proposed utility facility, a description of the comparative merits or detriments of each location submitted and a statement of the reasons why the location is best suited for the proposed utility facility as required by subsection 1 of NRS 704.870 (NAC 703.423(4)).

The utility facility proposed in this application is at the same location as the existing facilities to be rehabilitated. The existing facilities are directly adjacent to WWTP No. 3 which is an optimal location for operations and maintenance of the facilities. There are no other reasonable alternate locations.

2.5 Public Notice

5. A copy of the public notice of the application or amended application and proof of the publication of the public notice as required by subsection 4 of NRS 704.870 (NAC 703.423(5)).

A copy of the public notice and proof of publication is attached in Attachment E.

2.6 State Clearinghouse

6. Proof that a copy of the application or amended application has been submitted to the Nevada State Clearinghouse within the Department of Administration to enable agency review and comment (NAC 703.423.(6)).

A copy of the certificate of service will be provided in a subsequent submittal.

2.7 Probable Effect on Environment

7. An explanation of the nature of the probable effect on the environment, including:

1) A reference to any studies, if applicable (NAC 703.423(7)(a):

This project will be constructed on disturbed land and remediates/upgrades existing facilities in place. At this time, environmental studies have not been performed.

2) An environmental statement that includes (NAC 703.123(7)(b):

1) The name, qualifications, professions and contact information of each person with primary responsibility for the preparation of the environmental statement (NAC 703.423(7)(b)(1):

Greg Dozer, PE
Environmental Consultant
Four Corners Environmental, Inc.
10030 N. 49th Lane, Glendale, Arizona 85302

2) The name, qualifications, professions and contact information of each person who has provided comments or input in the preparation of the environmental statement (NAC 703.423(7)(b)(2)):

Greg Dozer, PE
Environmental Consultant
Four Corners Environmental, Inc.
10030 N. 49th Lane, Glendale, Arizona 85302

Teresa Valentine, PhD, PE, BCEE
Project Manager
Valentine Environmental Engineers, LLC
15845 S. 46th Street, Suite 144
Phoenix, Arizona 85048

3) A bibliography of materials used in the preparation of the environmental statement (NAC 704.423(7)(b)(3):

See Attachments C and D.

4) A description of (NAC 703.423(7)(b)(4):

(I) The environmental characteristics of the project area existing at the time of the application or amended application is filed with the Commission:

The existing receiving (1) and overflow ponds (2) are each surrounded by temporary chain link fencing with warning signage for security. The receiving pond was used to distribute water for irrigation of the golf course while the overflow ponds were used for excess water generated but not used for irrigation. The ponds were originally installed with impermeable liners but the liners are currently torn and in disrepair allowing tertiary treated effluent discharges to percolate into the underlying soil. A small area of green vegetation surrounds the perimeter of each pond and consists of various shrubs, weeds and grasses. Adjacent to the existing receiving pond are two pump houses for the distribution of tertiary treated effluent to and off-site Golf Course and to other areas and distribution ponds on the Willow Creek property. The abandoned golf course property (primarily fairways) that generally surrounds the receiving and overflow ponds planned for remediation consists of either bare earth or is covered with weeds and dead vegetation. Limited dead or distressed trees and shrubs are sporadically present in the vicinity of the ponds. The plan of remediation includes general cleanup and a small expansion and re-lining of the receiving pond as well and cleanup and renovation of the overflow ponds to be Rapid Infiltration Basins. Although remediation of the ponds will square out the edges of each pond and convert the existing receiving pond to two adjacent and lined receiving ponds, the renovation activities will be in the same location as existing ponds. Significant impacts to surrounding environments outside of the general existing pond area is not anticipated

(II) The environmental impacts of the construction and operation of the proposed utility facility will have on the project area before mitigation:

The proposed construction will include access to the ponds for remedial activities. Existing access dirt roadways to the receiving pond pump facilities as well as golf cart trails will be used for transportation routes. Dust may be generated during construction activities but will be limited using Best Management Practices for dust suppression by the Contractor. Vehicle emissions from emission controlled vehicles will be expected during excavation and remedial efforts but not anticipated to be more than normal vehicular traffic in the general area.

The environmental impacts that the construction and operation of the proposed utility facility will have on the project area after mitigation:

No significant adverse environmental impacts are expected on the following important environmental elements:

- Land use
- Floodplain
- Wetlands
- Biological resources
- Cultural resources
- Water quality
- Socio-economic/environmental justice
- Air quality
- Transportation
- Noise

2.8 Reliable Utility Service

8. An explanation of the extent to which the proposed utility facility is needed to ensure the reliable utility service to customers in this State, including:

(a) If the proposed utility facility was approved in a resource plan or an amendment to a resource plan, a reference to the previous approval by the Commission (NAC 703.423(8)(a):

UICN received approval for the receiving pond construction and pump house remediation in an amendment to its 2011 Integrated Resource Plan, Docket No. 13-09015. UICN is requesting approval for the RIBs in an amendment to its 2014 Integrated Resource Plan, Docket No. 14-02043.

(b) If the proposed utility facility was not approved in a resource plan or an amendment to a resource plan, a description of the extent to which the proposed utility facility will (NAC 703.423(8)(b)):

(1) Provide utility service to customers in this State (NAC 703.423(8)(b)(1):

With implementation of the RIBs, a safe, reliable and cost effective means of effluent discharge will be accomplished. The existing irrigation system on site requires significant upgrades and maintenance to make it a reliable system.

(2) Enhance the reliability of utility service in this State (NAC 703.423(8)(b)(2)):

See response to item (1) above.

(3) Achieve interstate benefits by the proposed construction or modification of transmission facilities in this State, if applicable (NAC703.423(8)(b)(3)):

Not applicable.

2.9 Discussion of Need Versus Effect on Environment

9. An explanation of how the need for the proposed facility as described in subsection eight balances any adverse effects on the environment as described in subsection seven (NAC 703.423(9)):

The proposed project will not cause any significant adverse environmental impacts. The proposed project is needed to replace existing facilities that were not maintained and as a result pose health and safety issues for operations staff and residents.

2.10 Minimum Adverse Impact on Environment

10. An explanation of how the proposed utility facility represents the minimum adverse effect on the environment, including:

(a) The state of available technology (NAC 703.423(10)(b)):

The options for effluent disposal from WWTP No. 3 are golf course irrigation or some other off site irrigation use and on site disposal methods such as surface infiltration, vadose zone injection and spray irrigation. The existing Lakeview Golf Course will continue to take a portion of the effluent as long as the golf course is in operation.

(b) The nature of various alternatives (NAC 703.423(10)(b)):

Other than irrigation of Lakeview Golf Course, there is no other high capacity off site effluent use option. Smaller capacity users, such as the local high school could be connected in the future. All of the onsite methods could be implemented on the Willow Creek property, but vadose zone injection would be more costly to install, operate and maintain. As previously mentioned, the existing irrigation system has fallen into disrepair and would require a significant capital investment to upgrade it for spray irrigation. Surface infiltration, or rapid infiltration basins, provide a cost effective means for effluent disposal through repurposing the

existing overflow ponds. Additional analysis is contained in the Engineering Report in Attachment D.

2.11 Facility Conforms to Local Laws

11. An explanation of how the location of the proposed utility facility conforms to the applicable state and local laws and regulations, including a list of all permits, licenses and approvals required by federal, state and local statutes, regulations and ordinances. The explanation must include a list that indicates:

(a) All permits licenses and approvals the applicant has obtained, including copies thereof (NAC 703.423(11)(a)):

See table part 11(b).

(b) All permits, licenses and approvals the applicant is in the process of obtained to commence construction of the proposed utility facility. The applicant must provide an estimated timeline for obtaining these permits, licenses and approvals (NAC 703.423(11)(b)):

Permit/Approval Required	Approving Agency and Contact Information	Application Submittal Date	Date of Issuance
UEPA Permit to Construct	Nevada Public Utilities Commission Carson City, NV 89701-3109	To be filed	
Environmental Clearance	State Clearinghouse Nevada Department of Administration Division of Budget and Planning 209 East Musser Street, Room 200 Carson City, NV 89701-5249 Tel:775-687-0222	To be filed	
Design Approval	Nevada Division of Environmental	Filed	June 30, 2014

Permit/Approval Required	Approving Agency and Contact Information	Application Submittal Date	Date of Issuance
	Protection 901 South Stewart Street, Suite 4001 Carson City, NV 89701-5249 Tel: 775-687-4670		
WWTP No. 3 Waste Discharge Permit Amendment	Nevada Division of Environmental Protection 901 South Stewart Street, Suite 4001 Carson City, NV 89701-5249 Tel: 775-687-4670	Filed July 2, 2014	
Willow Creek Property Waste Discharge Permit	Nevada Division of Environmental Protection 901 South Stewart Street, Suite 4001 Carson City, NV 89701-5249 Tel: 775-687-4670	To be filed	
Zoning Review	Nye County – Planning Department 250 North Highway 160, Suite 3 Pahrump, NV 89060	Filed July 3, 2014	
Building Permit	Nye County – Building Department 250 North Highway 160, Suite 3 Pahrump, NV 89060	To be filed	

2.12 Public Interest

12. An explanation of how the proposed utility facility will serve the public interest, including:

(a) The economic benefits that the proposed utility facility will bring to the applicant and this State (NAC 703.423 (12)(a)):

The proposed project will benefit applicant by providing a safe, reliable and cost effective method of effluent disposal. In addition, the construction of the facility will result in a financial benefit to the community.

(b) The nature of the probable effect on the environment in this State if the proposed utility facility is constructed (NAC 703.423(12)(b)):

The proposed project will have no significant impact on the environment. The proposed project will assist in improving environmental conditions at the site through clean-up and restoration of damaged structures.

(c) The nature of the probably effect on the public health, safety, and welfare of the residents in this State if the proposed utility facility is constructed (NAC 703.423(12)(c)):

The proposed project will improve operations staff and public safety by remediating the ponds, pump houses and securing the site. By establishing a reliable method of effluent disposal, public safety will also be maintained.

(d) The interstate benefits expected to be achieved by the proposed electric transmission facility in this State, if applicable (NAC 703.423(12)(d)):

Not applicable.

Attachment A - Maps and Drawings

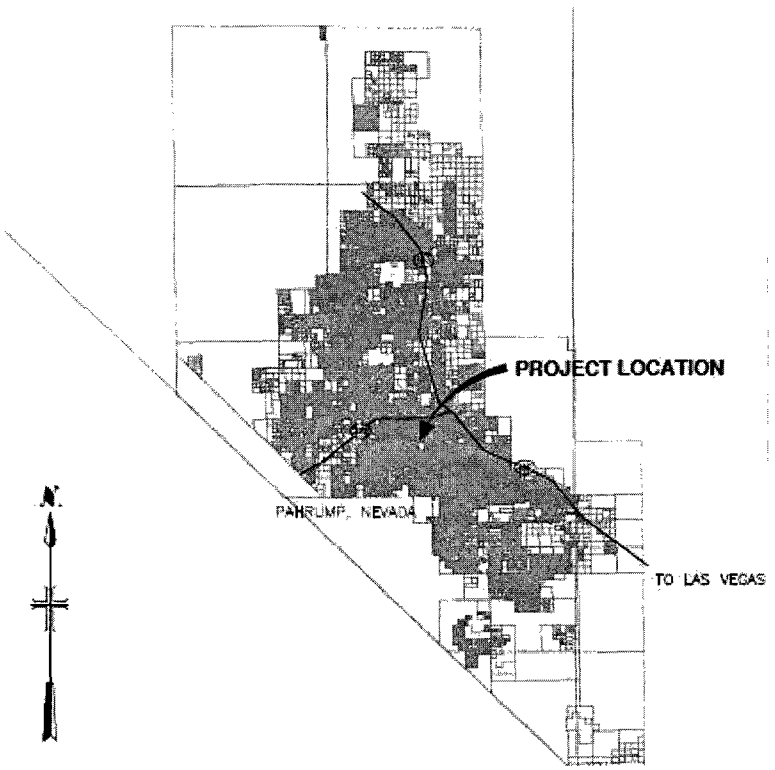
Attachment B - Legal Description of the Site

Attachment C - Geotechnical Report

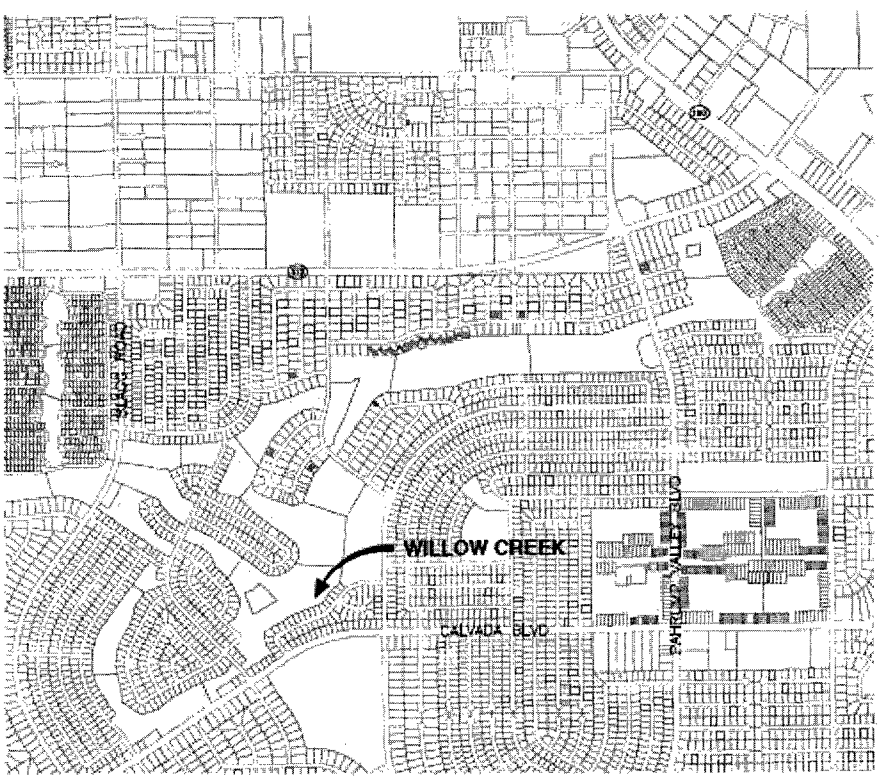
Attachment D – Preliminary Engineering Report

Attachment E – Public Notice and Proof of Publication

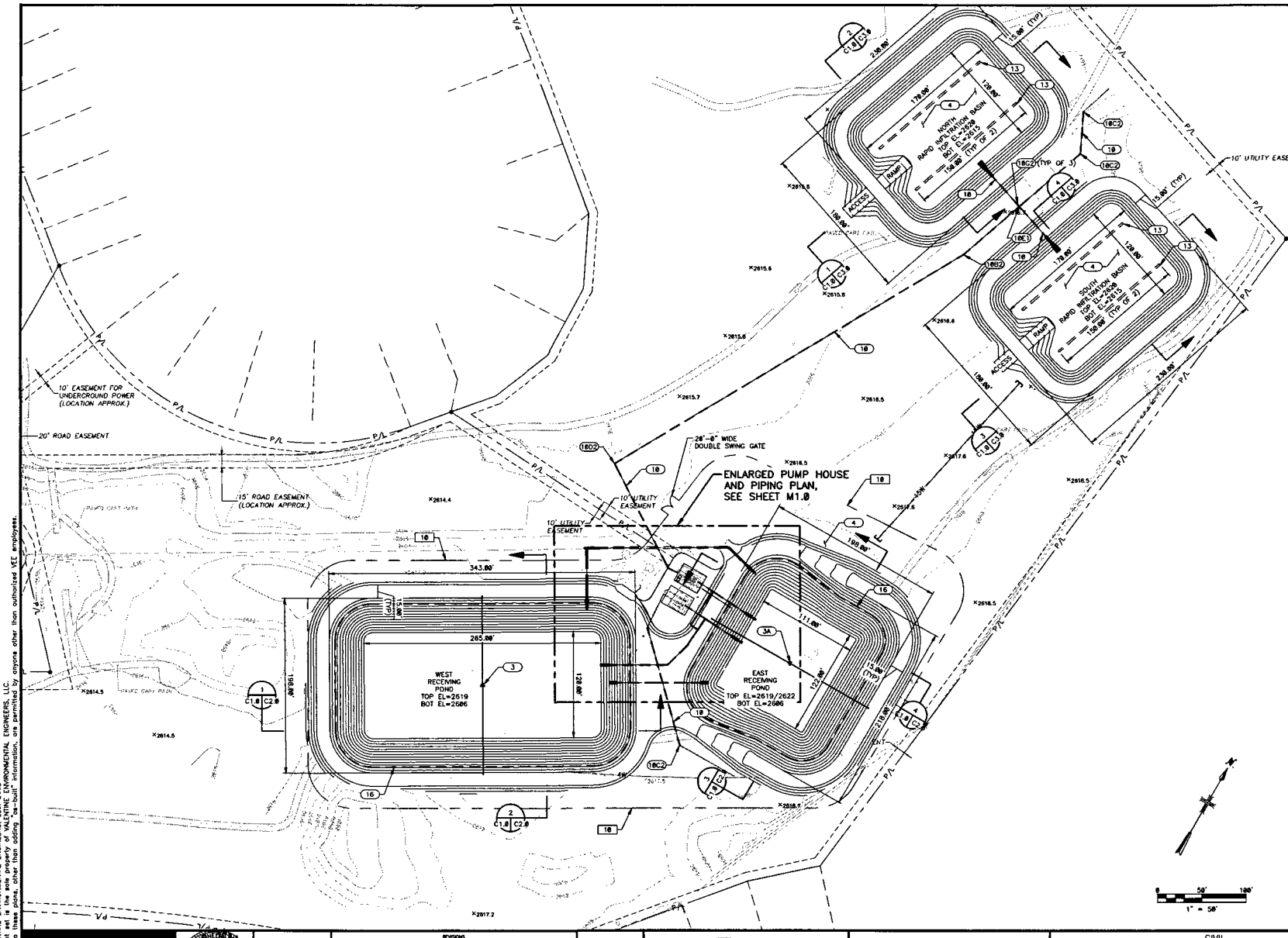
Attachment A - Maps and Drawings



PROJECT LOCATION



VICINITY MAP



CONSTRUCTION NOTES

16	PROVIDE PERMANENT CHAIN LINK FENCING TO EXTENTS SHOWN WITH WARNING SIGNS EVERY 300 FEET. SEE DETAIL 5, SHT M3.0.	LF	1955
3	PROVIDE AP4000 AERATOR/MIXER, SEE SPECIFICATION SECTION 11220.	EA	1
3A	PROVIDE AP2000 AERATOR/MIXER, SEE SPECIFICATION SECTION 11220.	EA	1
4	RE-GRADE AND SCARIFY TO ALLOW ADEQUATE DRAINAGE	LS	-
10	PROVIDE 10" WATERLINE IN ACCORDANCE WITH SPECIFICATION SECTION 15899.	LF	1069
10D2	PROVIDE 10" - 22.5° BEND (MJxMJ).	EA	1
10C2	PROVIDE 10" - 45° BEND (MJxMJ).	EA	3
10D2	PROVIDE 10" - 90° BEND (MJxMJ).	EA	1
10E1	PROVIDE 10"x10"x10"x10" CROSS (MJ).	EA	1
10C2	PROVIDE 10" GATE VALVE (MJ), VALVE BOX AND COVER.	EA	3
13	PROVIDE AND INSTALL TRENCH CHANNEL DRAIN IN ACCORDANCE WITH DETAIL 1, SHEET C3.0.	EA	4
15	PROVIDE AND INSTALL ANCHOR TRENCH IN ACCORDANCE WITH DETAIL 2, SHEET M3.0.	LF	1642

(*) INDICATES DIMENSIONS, DISTANCES, COORDINATES OR ELEVATIONS TO BE SURVEYED AND FIELD VERIFIED BY THE CONTRACTOR PRIOR TO INITIATING ANY OF THE WORK.
(**) INDICATES DIMENSIONS OR ELEVATIONS TO BE DETERMINED BASED UPON EQUIPMENT MANUFACTURER SELECTED.
(R) INDICATES RESTRAINED JOINT.
(#) INDICATES QUANTITY LOCATED ON A DIFFERENT SHEET.

GENERAL NOTES:

1. CONTRACTOR SHALL INSTALL SHEETING, SHORING, AND/OR PIPE SUPPORTS TO FACILITATE COMPLETE PROTECTION AND CONTINUAL OPERATION OF ALL UTILITIES (AS SHOWN OR EXPOSED DURING CONSTRUCTION) WITHIN THE WORK AREA. COORDINATE REPLACEMENT OF ALL DAMAGED OR DISTURBED UTILITIES BY CONTRACTOR CREW OR ACTIVITIES ASSOCIATED WITH THIS PROJECT AS REQUIRED. INCORPORATE THIS EFFORT WITHIN THE ORIGINAL PROJECT SCHEDULE AND COST(S).
2. ALL PIPING, JOINTS, FITTINGS, VALVES AND APPURTENANCES SHALL BE FULLY RESTRAINED.

VALENTINE
Environmental Engineers, LLC
15845 South 46th Street, Suite 144 Phoenix, Arizona 85048
Phone: (480) 293 - 8851 Fax: (480) 293 - 0082

TERESA A. VALENTINE — No. 22511 — CIVIL — Date 6-30-14 — 6-30-16

REVISIONS			
NO.	BY	DATE	REMARKS

DES MB
DWN CBIA
CKD TAV

Utilities, Inc.

UTILITIES, INC. OF CENTRAL NEVADA
1240 E. STATE ST. #115
PAHRUMP, NV 89048
WILLOW CREEK PROPERTY REMEDIATION
PAHRUMP, NEVADA

CIVIL

GRADING, DRAINAGE AND YARD PIPING PLAN

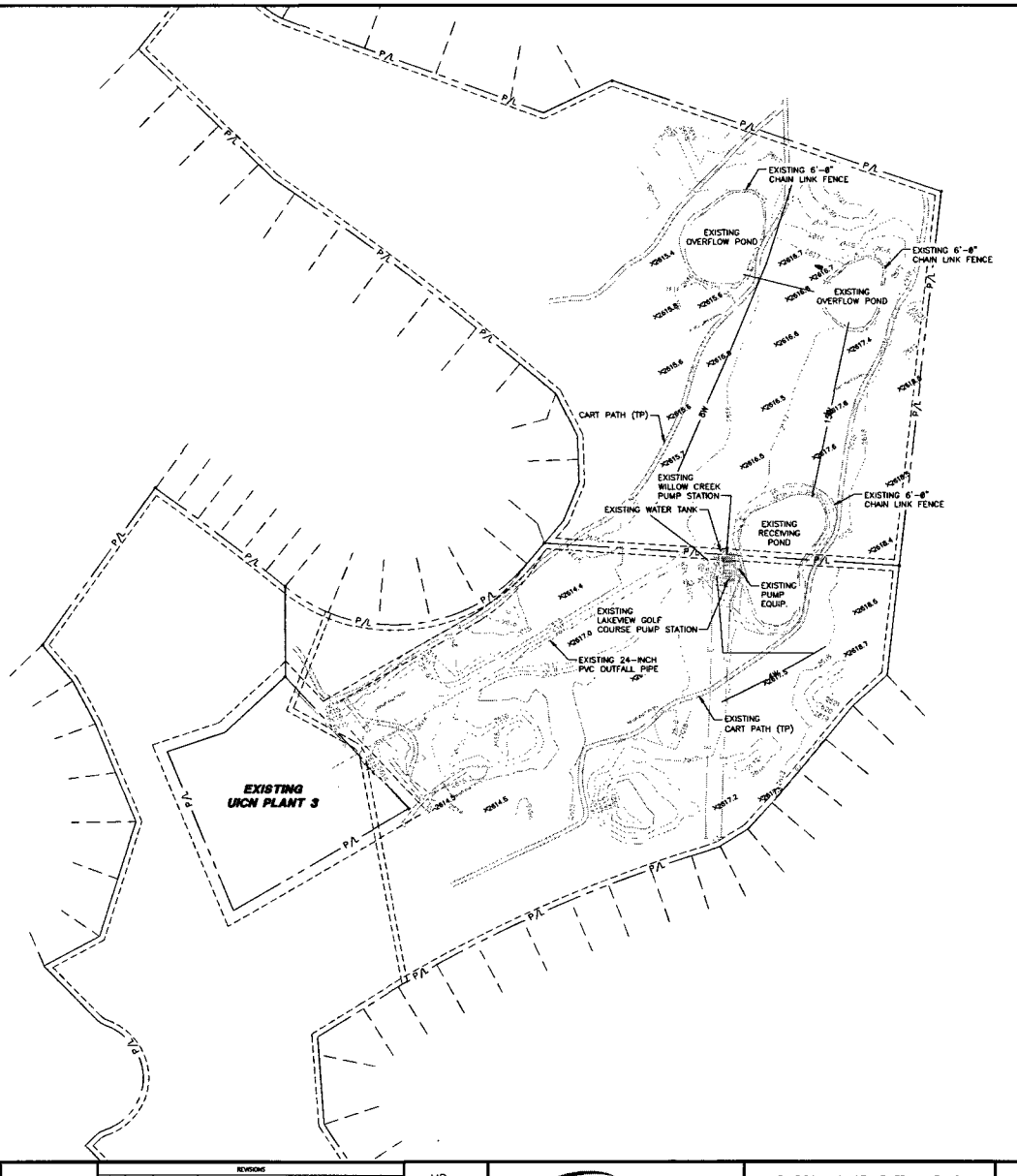
SCALE: 1" = 50'

DATE: JUNE 2014

C1.0
SHEET 9 OF 19
CAD FILE: C1.0.DWG

WILLOW CREEK PROPERTY REMEDIATION

FILE: P:\UICN_14UICNWC.0\2_CIVIL\C1.0.DWG 24X36 (06-24-14) CBIA



WILLOW CREEK PROPERTY REMEDIATION

CALL FOR THE BLUE STAKES
Inside Washoe County 263-1100
Outside Washoe County 1-800-782-5348

VALENTINE
Environmental Engineers, LLC
15845 South 45th Street, Suite 144 Phoenix, Arizona 85048
Phone: (480) 283 - 8991 Fax: (480) 283 - 8082

TERESA A. VALENTINE
Exp. 6-30-14
CIVIL

REVISIONS			
NO.	BY	DATE	REMARKS

DES MB
DWN CBIA
CKD TAV

Utilities, Inc.

UTILITIES, INC. OF CENTRAL NEVADA
1240 E. STATE ST. #115
PAHRUMP, NV 89048
WILLOW CREEK PROPERTY REMEDIATION
PAHRUMP, NEVADA

GENERAL

OVERALL EXISTING PROJECT PLAN

SCALE: 1" = 100'

DATE: JUNE 2014

G4.0

SHEET 5 OF 19

CAD FILE: G4.0.DWG

FILE: P:\UICN_14UICNWC.0\1_GENERAL\G4.0.DWG 24X36 (06-24-14) CBIA

Attachment B - Legal Description of the Site

PARCEL MAP

PARCEL 2 OF BOUNDARY LINE ADJUSTMENT MAP 659137, RECORDED 06/02/06,
BEING A PORTION OF CALVADA UNIT 7
FILE No. 36023 LOCATED IN SECTION 22, T20S, R53E, MDM, NYE COUNTY NEVADA

OWNERS CERTIFICATE:

I, DEBBIE BARNETT, MANAGING MEMBER OF ASHLAND CAPITAL, LLC, A NEVADA LIMITED LIABILITY COMPANY, OWNER OF THE LAND SHOWN HEREON, DO HEREBY CERTIFY THAT I CONSENT TO THE PREPARATION AND RECORDATION OF THIS MAP. NO ADDITIONAL PUBLIC STREETS ARE BEING CREATED HEREON OR BEING OFFERED TO NYE COUNTY ITS SUCCESSORS AND ASSIGNS FOR PUBLIC USE. ALL PUBLIC UTILITY EASEMENTS SHOWN HEREON, TOGETHER WITH A RIGHT OF ACCESS HERETO ARE HEREBY GRANTED. THE DIVISION OF THIS PROPERTY IS NOT IN CONFLICT WITH ANY EXISTING MASTER PLAN, COVENANTS, CONDITIONS OR RESTRICTIONS OR OTHER DESIGNATED LAND USE.

Debbie Barnett 1-22-2009
DEBBIE BARNETT DATE:
MANAGING MEMBER
ASHLAND CAPITAL, LLC, A NEVADA LIMITED LIABILITY COMPANY

ACKNOWLEDGMENT:

STATE OF CALIFORNIA)
) S.S.
COUNTY OF SACRAMENTO)

THIS INSTRUMENT WAS ACKNOWLEDGED BEFORE ME ON JAN 23, 2009 BY
DEBBIE BARNETT

BY: [signature]
(MY COMMISSION EXPIRES: 12-17-2009)
ROBERT J. GUTHERTZ
NOTARY PUBLIC
SACRAMENTO COUNTY

ROBERT J. GUTHERTZ COMM. # 1622962 NOTARY PUBLIC - CALIFORNIA SACRAMENTO COUNTY COMM. EXPIRES DEC. 17, 2009

BENEFICIARY STATEMENT:

RATIFICATION STATEMENTS HAVE BEEN RECORDED WITH THIS MAP IN THE NYE COUNTY RECORDER'S OFFICE AS FOLLOWS:

DOCUMENT NO.:	DATE RECORDED:
722141	2-3-09
722142	
722143	

TAX CERTIFICATE:

TAXES ON ALL REAL PROPERTY FOR THE CURRENT FISCAL YEAR ARE PAID IN FULL.

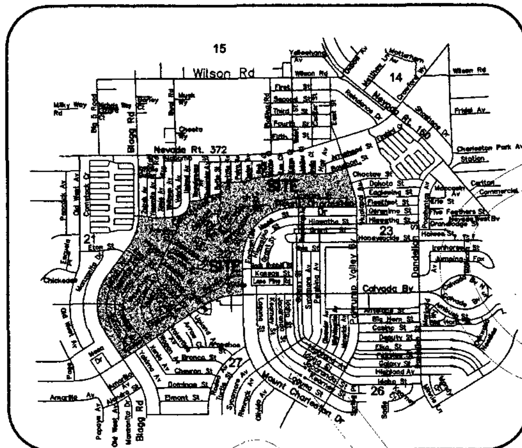
[signature] Deputy 2-3-09
GARY S. BUBAHL, NYE COUNTY TREASURER DATE:

WATER / SEWER NOTE:

THE SUBJECT PROPERTY WILL BE SERVICED BY PUBLIC WATER AND SEWER. THIS PROPERTY LIES WITHIN THE SERVICE AREA OF UTILITIES INC. OF NEVADA.

OWNER/DEVELOPER:

ASHLAND CAPITAL, LLC
8290 WEST SAHARA AVE, SUITE 186
LAS VEGAS, NV 89117



VICINITY MAP

PUBLIC UTILITY NOTE:

1. A PUBLIC UTILITY EASEMENT IS ALSO GRANTED WITHIN EACH LOT FOR EXCLUSIVE PURPOSE OF INSTALLING AND MAINTAINING UTILITY SERVICE FACILITIES TO THE LOTS AND THE RIGHT TO EXIT THE LOTS WITH SAID UTILITIES FACILITIES FOR THE PURPOSE OF SERVING ADJACENT PROPERTIES, LOTS OR PARCELS.

2. PUBLIC UTILITY EASEMENT ARE HEREBY GRANTED TEN (10) FEET IN WIDTH COINCIDENT WITH ALL STREET RIGHT-OF-WAY, AND FIVE (5) FEET IN WIDTH COINCIDENT WITH SIDE AND REAR LOT OR PARCEL LINES.

PUBLIC UTILITIES APPROVAL:

WE THE HEREIN NAMED UTILITY COMPANIES AND AGENCIES, APPROVE THE GRANT OF THE DESIGNATED EASEMENTS FOR UTILITY PURPOSES AS SHOWN ON THIS MAP.

[signature] 01-26-09
NEVADA BELL TELEPHONE COMPANY, ~~KIM WELLS~~ Steven R. Hempleal DATE:
dba AT&T-NEVADA

[signature] 1-26-9
VALLEY ELECTRIC ASSOCIATION, MARK DUVALL DATE:

[signature] 1-20-09
UTILITIES INC. OF CENTRAL NEVADA DATE:
JOSE NUNEZ, PROJECT MANAGER

[signature] 1/26/09
CABLE MANAGEMENT ASSOCIATES-CABLE COMPANY DATE:
GREG PETRAS

FLOOD ZONE STATEMENT:

THE PROPERTIES REPRESENTED ON THIS DOCUMENT ARE LOCATED IN FLOOD ZONES "X, SHADED AND UNSHADED" AND "AO, 1 FOOT IN DEPTH" AS SHOWN ON COMMUNITY PANEL #320018-4415, DATED SEPTEMBER 28, 1990. NO BASE FLOOD ELEVATION DETERMINED. ANY CONSTRUCTION OR IMPROVEMENTS WITHIN A SPECIAL FLOOD HAZARD AREA MUST BE IN ACCORDANCE WITH NYE COUNTY CODE TITLE 15.12, THE FLOOD DAMAGE PREVENTION ORDINANCE.

REFERENCES:

1. "CALVADA VALLEY UNIT 7" FILE No. 36023 RECORDED: 02/05/73
2. PARCEL MAP FILE No. 354169 RECORDED: 01/13/94
3. BOUNDARY LINE ADJUSTMENT MAP FILE No. 369979 RECORDED: 04/04/95

SURVEYOR'S CERTIFICATE:

I, DAVID A. RICHARDS, A PROFESSIONAL LAND SURVEYOR IN THE STATE OF NEVADA, DO HEREBY CERTIFY THAT:

1) THIS PLAT REPRESENTS THE RESULTS OF A SURVEY CONDUCTED UNDER MY DIRECT SUPERVISION AT THE INSTANCE OF ASHLAND CAPITAL, LLC.

2) THE LANDS SURVEYED LIE WITHIN SECTION 22, T20S, R53E, M.D.M., NYE COUNTY, NEVADA, AND THE SURVEY WAS COMPLETED ON 09/07/05.

3) THIS PLAT COMPLIES WITH THE APPLICABLE STATE STATUTES AND ANY LOCAL ORDINANCES IN EFFECT ON THE DATE THE GOVERNING BODY GAVE ITS FINAL APPROVAL.

4) THE MONUMENTS DEPICTED ON THE PLAT ARE OF THE CHARACTER SHOWN AND OCCUPY THE POSITIONS INDICATED, AND ARE OF SUFFICIENT NUMBER AND DURABILITY.

David A Richards JAN. 21, 2009
DAVID A. RICHARDS, PROFESSIONAL LAND SURVEYOR DATE:
PLS NO. 10026

COUNTY SURVEYOR'S CERTIFICATE:

I, KEVIN HASKEW, COUNTY SURVEYOR, NYE COUNTY, NEVADA, DO HEREBY CERTIFY THAT ON THE 3RD DAY OF FEB 2009 I DID EXAMINE THE PARCEL MAP OF ASHLAND CAPITAL, LLC., AS SHOWN HEREON AND FOUND THAT IT IS TECHNICALLY CORRECT.

PROFESSIONAL LAND SURVEYOR STATE OF NEVADA KEVIN HASKEW No. 10111

Kevin D Haskew FEB 3, 2009
KEVIN HASKEW, NYE COUNTY SURVEYOR DATE:
NEVADA CERTIFICATE No. 10111

PAHRUMP REGIONAL PLANNING COMMISSION CERTIFICATE:

THIS MAP IS HEREBY APPROVED BY THE PAHRUMP REGIONAL PLANNING COMMISSION OF NYE COUNTY, NEVADA THIS 13 TH DAY OF FEBRUARY, 2008.

[signature] AICP 1/27/09
JACK LEEMAN, AICP, DIRECTOR OF PLANNING DATE:

COUNTY RECORDER'S NOTE:

SUBSEQUENT CHANGES TO THIS DOCUMENT SHOULD BE EXAMINED BY REFERENCE TO THE CUMULATIVE INDEX MAINTAINED BY THE NYE COUNTY RECORDER.

CIVILWISE SERVICES LLC
1240 E STATE ST. STE 101, PAHRUMP, NV. 89048 (775)751-1413

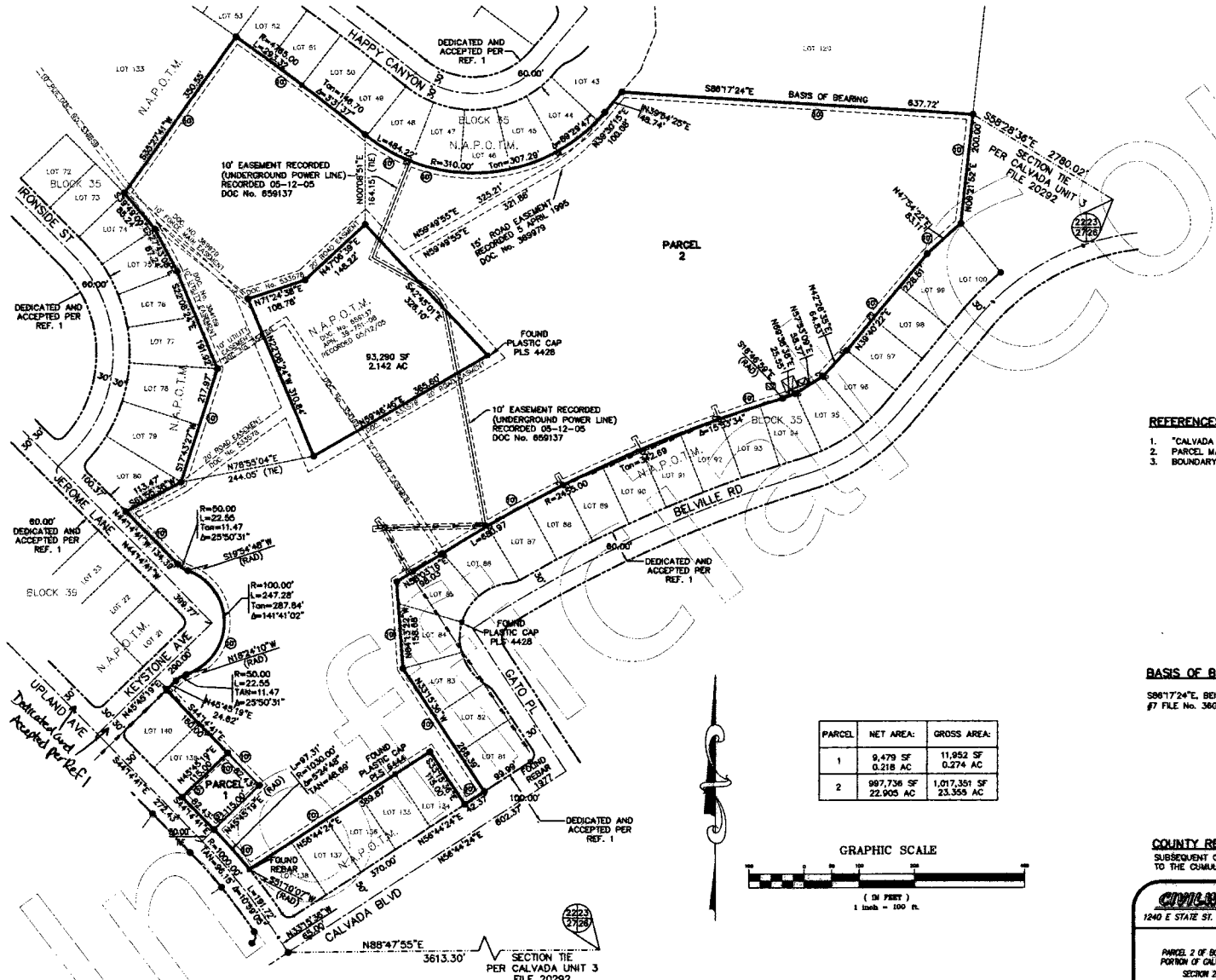
PARCEL MAP
PARCEL 2 OF BOUNDARY LINE ADJUSTMENT MAP 659137, BEING A PORTION OF CALVADA VALLEY UNIT 7, FILE No. 36023 LOCATED IN SECTION 22, T20S, R53E, MDM, NYE COUNTY, NEVADA
APN 39-751-07
PREPARED FOR:
ASHLAND CAPITAL, LLC

SCALE:	SHEET	DRAWN BY:	JOB NUMBER:
NTS	1 OF 2	JCA	1207-08

DOC # 722147
Official Records Nye County Nevada
Byron Foster - Recorder
02/03/2009 01:39:12 PM
Requested By: CIVILWISE SERVICES
Recorded By: lp
Recording Fee: $31.00
Non Conformity Fee: $
Page 1 of 2

PARCEL MAP

PARCEL 2 OF BOUNDARY LINE ADJUSTMENT MAP 659137, RECORDED 06/02/06,
BEING A PORTION OF CALVADA UNIT 7
FILE No. 36023 LOCATED IN SECTION 22, T20S, R53E, MDM, NYE COUNTY NEVADA



LEGEND:

- PROPERTY LINE
- LOT LINE
- ROW RIGHT OF WAY LINE
- OFF SITE LOT LINE
- CENTER LINE
- PUE PUBLIC UTILITY EASEMENT
- OVERHEAD POWER
- SET AND/OR REPLACED WITH 5/8" REBAR & CAP PLS 10026
- FOUND REBAR UNLESS OTHERWISE NOTED
- 10' PUBLIC UTILITY EASEMENT
- 5' PUBLIC UTILITY EASEMENT
- POWER POLE
- CONTROL PANEL
- CAD BOX
- 2 INCH PVC RISER
- N.A.P.O.T.M. NOT A PART OF THIS MAP

REFERENCES:

1.	"CALVADA VALLEY UNIT 7"	FILE No. 36023	RECORDED:	02/05/73
2.	PARCEL MAP	FILE No. 354169	RECORDED:	01/13/94
3.	BOUNDARY LINE ADJUSTMENT MAP	FILE No. 369979	RECORDED:	04/04/95

BASIS OF BEARING:

S86°17'24"E, BEING THE NORTH LINE OF LOT 132 OF BLOCK 35 IN CALVADA VALLEY UNIT #7 FILE No. 36023 DATED 02/05/73 IN NYE COUNTY, NEVADA RECORDER'S OFFICE.

PARCEL	NET AREA:	GROSS AREA:
1	9,479 SF 0.218 AC	11,952 SF 0.274 AC
2	997,736 SF 22.905 AC	1,017,351 SF 23.355 AC

GRAPHIC SCALE

(IN FEET)
1 inch = 100 ft.

COUNTY RECORDER'S NOTE:

SUBSEQUENT CHANGES TO THIS DOCUMENT SHOULD BE EXAMINED BY REFERENCE TO THE CUMULATIVE INDEX MAINTAINED BY THE NYE COUNTY RECORDER.

CIVILWISE SERVICES LLC
1240 E STATE ST. STE 101, PAHRUMP, NV. 89048 (775)751-1413

PARCEL MAP

PARCEL 2 OF BOUNDARY LINE ADJUSTMENT MAP 659137, BEING A PORTION OF CALVADA VALLEY UNIT 7 FILE No. 36023, LOCATED IN SECTION 22, T20S, R53E, MDM, NYE COUNTY, NEVADA
APN 39-751-07
PREPARED FOR:
ASHLAND CAPITAL, LLC

SCALE:	SHEET	DRAWN BY:	JOB NUMBER:
1"= 100'	2 OF 2	JCA	1207-06

PARCEL MAP

BEING LOT 128, BLOCK 35 OF CALVADA VALLEY UNIT 7 IN SECTION 22,
T20S, R53E, MDM, NYE COUNTY, NEVADA

OWNER'S CERTIFICATE:

I, DEBBIE BARNETT, MANAGING MEMBER OF ASHLAND CAPITAL, LLC, A NEVADA LIMITED LIABILITY COMPANY, OWNER OF THE LAND SHOWN HEREON, DO HEREBY CERTIFY THAT I CONSENT TO THE PREPARATION AND RECORDATION OF THIS MAP. NO ADDITIONAL PUBLIC STREETS ARE BEING CREATED HEREON OR BEING OFFERED TO NYE COUNTY ITS SUCCESSORS AND ASSIGNS FOR PUBLIC USE. ALL PUBLIC UTILITY EASEMENTS SHOWN HEREON, TOGETHER WITH A RIGHT OF ACCESS HERETO ARE HEREBY GRANTED. THE DIVISION OF THIS PROPERTY IS NOT IN CONFLICT WITH ANY EXISTING MASTER PLAN, COVENANTS, CONDITIONS OR RESTRICTIONS OR OTHER DESIGNATED LAND USE.

Debbie Barnett 1-22-2009
DEBBIE BARNETT DATE:
MANAGING MEMBER
ASHLAND CAPITAL, LLC, A NEVADA LIMITED LIABILITY COMPANY

ACKNOWLEDGMENT:

STATE OF California)
) S.S.
COUNTY OF Sacramento)

THIS INSTRUMENT WAS ACKNOWLEDGED BEFORE ME ON JAN 23, 2009 BY
DEBBIE BARNETT

By: Robert J Guthertz

ROBERT J GUTHERTZ COMM.# 1702262 NOTARY PUBLIC-CALIFORNIA SACRAMENTO COUNTY COMM. EXPIRES DEC. 17, 2010

(MY COMMISSION EXPIRES 12-17-2010)
ROBERT J. GUTHERTZ
NOTARY PUBLIC
SACRAMENTO COUNTY

BENEFICIARY STATEMENT:

RATIFICATION STATEMENTS HAVE BEEN RECORDED WITH THIS MAP IN THE NYE COUNTY RECORDER'S OFFICE AS FOLLOWS:

DOCUMENT NO.:	DATE RECORDED:
722141	2-3-09
722142	
722143	

TAX CERTIFICATE:

TAXES ON ALL REAL PROPERTY FOR THE CURRENT FISCAL YEAR ARE PAID IN FULL.

Kim Deady 2-3-09
CARY S. BUDAHL, NYE COUNTY TREASURER DATE:

WATER / SEWER NOTE:

THE SUBJECT PROPERTY WILL BE SERVICED BY PUBLIC WATER AND SEWER. THIS PROPERTY LIES WITHIN THE SERVICE AREA OF UTILITIES INC. OF NEVADA.

OWNER/DEVELOPER:

ASHLAND CAPITAL, LLC
8290 WEST SAHARA AVE, SUITE 186
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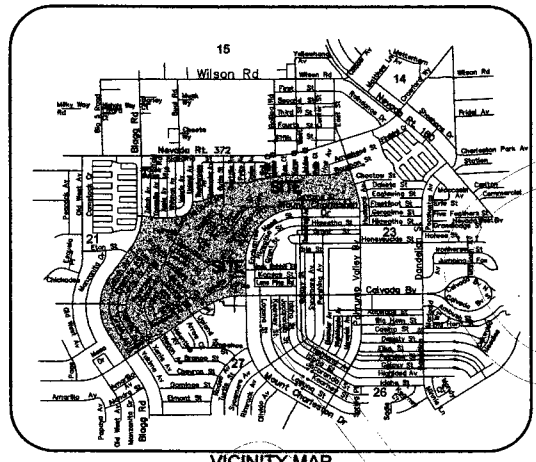

VICINITY MAP

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Steve Hemphill 01-26-09
NEVADA BELL TELEPHONE COMPANY, KIM MELFIELD dba AT&T-NEVADA DATE:

1-26-9
VALLEY ELECTRIC ASSOCIATION, MARK DUVALL DATE:

1-26-09
UTILITIES INC. OF CENTRAL NEVADA DATE:
JOSE NUNEZ, PROJECT MANAGER

1/26/09
CABLE MANAGEMENT ASSOCIATES-CABLE COMPANY DATE:
GREG PETRAS

FLOOD ZONE STATEMENT:

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1. "CALVADA VALLEY UNIT 7" FILE No. 36023 RECORDED: 02/05/73

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4) THE MONUMENTS DEPICTED ON THE PLAT ARE OF THE CHARACTER SHOWN AND OCCUPY THE POSITIONS INDICATED, AND ARE OF SUFFICIENT NUMBER AND DURABILITY.

David A. Richards JAN. 21, 2009
DAVID A. RICHARDS, PROFESSIONAL LAND SURVEYOR DATE:
PLS NO. 10026

EXP. 12/31/09

COUNTY SURVEYOR'S CERTIFICATE:

I, KEVIN HASKEW, COUNTY SURVEYOR, NYE COUNTY, NEVADA, DO HEREBY CERTIFY THAT ON THE 3RD DAY OF FEB, 2009, I DID EXAMINE THE PARCEL MAP OF ASHLAND CAPITAL, LLC., AS SHOWN HEREON AND FOUND THAT IT IS TECHNICALLY CORRECT.

Kevin Haskew FEB 3, 2009
KEVIN HASKEW, NYE COUNTY SURVEYOR DATE:
NEVADA CERTIFICATE No. 10111

PAHRUMP REGIONAL PLANNING COMMISSION CERTIFICATE:

THIS MAP IS HEREBY APPROVED BY THE PAHRUMP REGIONAL PLANNING COMMISSION OF NYE COUNTY, NEVADA THIS 15TH DAY OF FEBRUARY, 2008.

Jack Dahdah, AICP DIRECTOR OF PLANNING 1/27/09 DATE:

COUNTY RECORDER'S NOTE:

SUBSEQUENT CHANGES TO THIS DOCUMENT SHOULD BE EXAMINED BY REFERENCE TO THE CUMULATIVE INDEX MAINTAINED BY THE NYE COUNTY RECORDER.

CIVILWISE SERVICES LLC
1240 E STATE ST. STE 101, PAHRUMP, NV. 89048 (775)751-1413

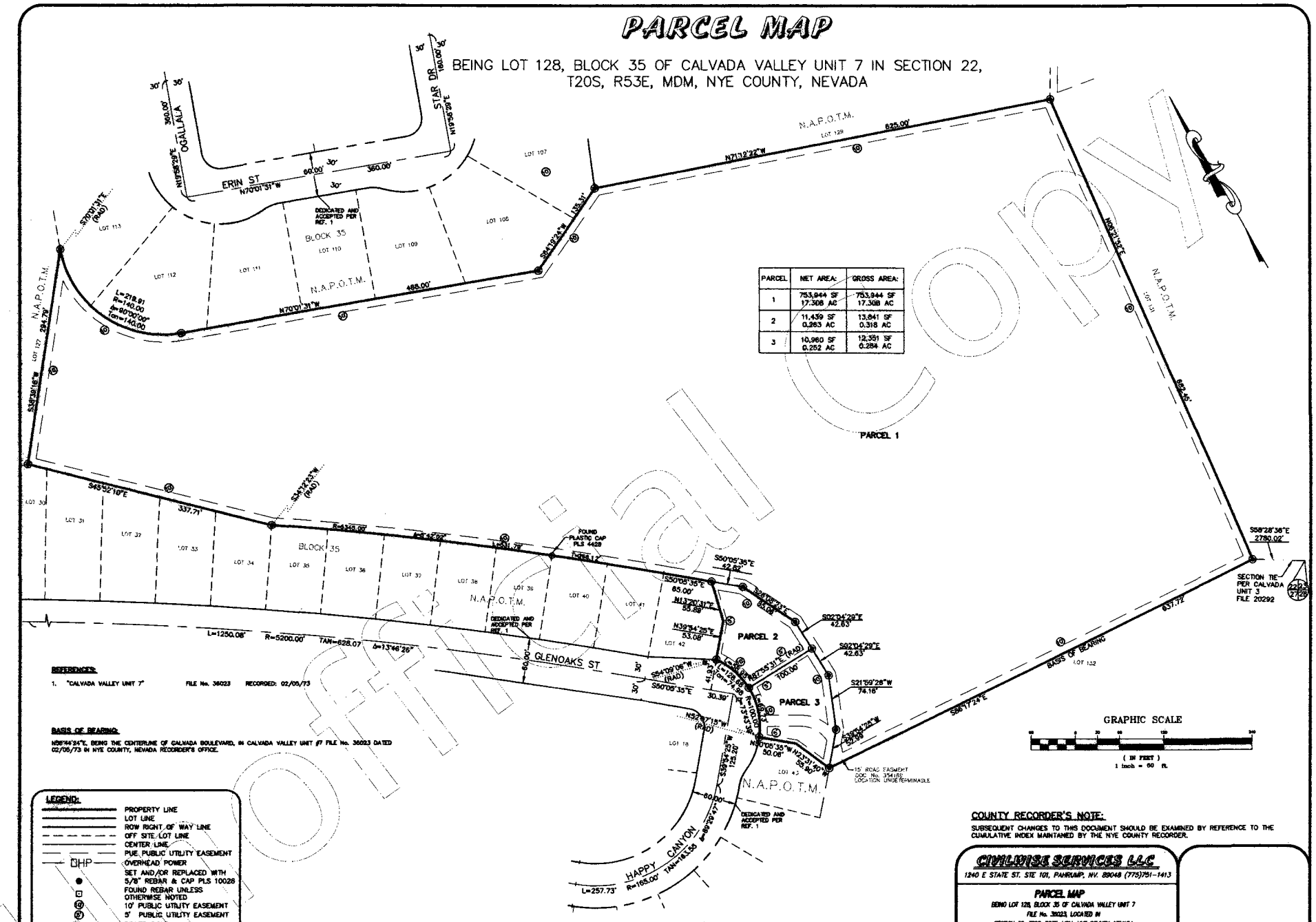
PARCEL MAP
BEING LOT 128, BLOCK 35 OF CALVADA VALLEY UNIT 7
FILE No. 36023 LOCATED IN
SECTION 22, T20S, R53E, MDM, NYE COUNTY, NEVADA
APN 39-681-01
PREPARED FOR:
ASHLAND CAPITAL, LLC

SCALE:	SHEET	DRAWN BY:	JOB NUMBER:
NTS	1 OF 2	JCA	1207-08

DOC # 722145
Official Records Nye County Nevada
Byron Fowler - Recorder
02/03/2009 01:20:12 PM
Requested By: CIVILWISE SERVICES
Recorded By: lp
Recording Fee: $31.00
Non Conformity Fee: $
Page 1 of 2

PARCEL MAP

BEING LOT 128, BLOCK 35 OF CALVADA VALLEY UNIT 7 IN SECTION 22, T20S, R53E, MDM, NYE COUNTY, NEVADA



PARCEL	NET AREA:	GROSS AREA:
1	753,944 SF 17.308 AC	753,944 SF 17.308 AC
2	11,439 SF 0.263 AC	13,841 SF 0.318 AC
3	10,960 SF 0.252 AC	12,351 SF 0.284 AC

REFERENCES:

1. "CALVADA VALLEY UNIT 7" FILE No. 36023 RECORDED: 02/05/73

BASIS OF BEARING:

N08°44'24"E, BEING THE CENTERLINE OF CALVADA BOULEVARD, IN CALVADA VALLEY UNIT #7 FILE No. 36023 DATED 02/05/73 IN NYE COUNTY, NEVADA RECORDER'S OFFICE.

LEGEND:

- PROPERTY LINE
- LOT LINE
- ROW RIGHT OF WAY LINE
- OFF SITE LOT LINE
- CENTER LINE
- PUE PUBLIC UTILITY EASEMENT
- OHP OVERHEAD POWER
- SET AND/OR REPLACED WITH 5/8" REBAR & CAP PLS 10028 FOUND REBAR UNLESS OTHERWISE NOTED
- 10' PUBLIC UTILITY EASEMENT
- 5' PUBLIC UTILITY EASEMENT
- POWER POLE
- CONTROL PANEL
- CAD BOX
- 2 INCH PVC RISER

COUNTY RECORDER'S NOTE:

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CIVILWISE SERVICES LLC
1240 E STATE ST. STE 101, PAHRUMP, NV. 89048 (775)751-1413

PARCEL MAP

BEING LOT 128, BLOCK 35 OF CALVADA VALLEY UNIT 7
FILE No. 36023, LOCATED IN
SECTION 22, T20S, R53E, MDM, NYE COUNTY, NEVADA
APN 39-681-01
PREPARED FOR:
ASHLAND CAPITAL, LLC

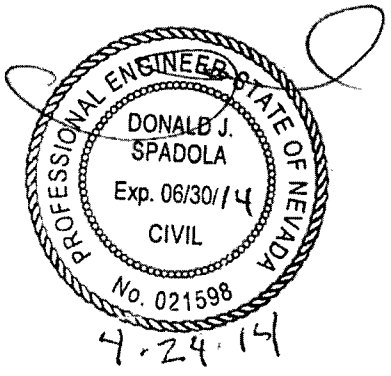
SCALE:	SHEET	DRAWN BY:	JOB NUMBER:
1" = 60'	2 OF 2	JCA	1207-08

Attachment C - Geotechnical Report

GEOTECHNICAL EVALUATION
WILLOW CREEK GOLF COURSE
NEW STORAGE PONDS AND FACILITIES
1500 RED BUTTE STREET
PAHRUMP, NEVADA
JOB NO. 4124XD007

Western Technologies Inc.
The Quality People
Since 1955

LAS VEGAS – NEVADA
6633 West Post Road
Las Vegas, Nevada 89118
(702) 798-8050 • fax 798-7664



Prepared for:

Valentine Environmental Engineers

April 24, 2014

Donald J. Spadola, P.E.
Director of Geotechnical Services

Reviewed by: Craig P. Wiedeman, P.E.
Senior Geotechnical Engineer

Western Technologies Inc.
The Quality People
Since 1955

6633 West Post Road
Las Vegas, Nevada 89118
(702) 798-8050 • fax 798-7664

April 24, 2014

Valentine Environmental Engineers
15845 South 46th Street, Suite 144
Phoenix, Arizona 85048
Attn: Teresa Valentine

Re: Geotechnical Evaluation
Willow Creek Golf Course
New Storage Ponds and Facilities
1500 Red Butte Street
Pahrump, Nevada

Job No. 4124XD007

Western Technologies Inc. has completed a geotechnical evaluation for the new Storage Ponds planned for construction at the referenced site in Pahrump, Nevada. This study was performed in general accordance with our proposal number 4124PD010.R01 dated February 13, 2014. The results of our study, including the site vicinity map, test pit location diagram, laboratory test results, test pit logs, and the geotechnical recommendations are attached.

We have appreciated being of service to you in the geotechnical engineering phase of this project and are prepared to assist you during the construction phases as well. If design conditions change, or if you have any questions concerning this report or any of our testing, inspection, design and consulting services, please do not hesitate to contact us. We look forward to working with you on future projects.

Sincerely,
WESTERN TECHNOLOGIES, INC.
Geotechnical Engineering Services

Donald J. Spadola, P.E.
Director of Geotechnical Services

Copies to: Addressee (3)

TABLE OF CONTENTS

Page No.

TABLE OF CONTENTS (Continued)

GEOTECHNICAL EVALUATION
WILLOW CREEK GOLF COURSE
NEW STORAGE PONDS AND FACILITIES
1500 RED BUTTE STREET
PAHRUMP, NEVADA
JOB NO. 4124XD007

1.0 PURPOSE

This report contains the results of our geotechnical evaluation for the proposed new Storage Ponds and facilities to be constructed within the Willow Creek Golf Course at 1500 Red Butte Street in Pahrump, Nevada. The purpose of these services is to provide information and recommendations regarding:

- foundation design parameters
- slabs-on-grade
- lateral earth pressures
- earthwork
- anticipated excavation conditions
- drainage
- corrosivity

Results of the field exploration, field tests, and laboratory testing program are presented in the Appendices.

2.0 PROJECT DESCRIPTION

The Utilities Incorporated of Central Nevada (UICN) discharges treated waste water effluent on the Willow Creek Golf Course in Pahrump, Nevada as shown on the attached Plate 1, Site Vicinity Map. The effluent is discharged through a series of storage ponds and via spray irrigation. The expansion of three existing storage ponds and the addition of a new pond are planned at the golf course. In addition, some lightly loaded walls, concrete equipment pads for pumps and electrical equipment, and shade canopies will need to be supported by shallow foundations. You requested Western Technologies Inc. to conduct a geotechnical evaluation to provide geotechnical recommendations for the project. Should any of this information not be correct, we should be notified immediately.

3.0 SCOPE OF SERVICES

3.1 Field Exploration

Four (4) test pits were excavated to a depth of approximately 10 feet below the existing ground surface at the locations shown on the attached Plate 2, Test Pit Location Diagram. Test Pits 1, 3, and 4 were excavated adjacent to existing ponds. Test Pit 2 was excavated near the location of a planned new pond. Logs of the test pits are attached. Surface and subsurface materials encountered during the excavations were observed and sampled at selected depth intervals. Percolation tests were performed near the location of Test Pits 1, 3, and 4. The results of the percolation tests are presented in Section 5.2 of this report.

A field log was prepared for each test pit. These logs contain visual classifications of the materials encountered during excavation as well as interpolation of the subsurface conditions between samples. The attached final logs represent our interpretation of the field logs and include modifications based on laboratory observations and tests of the field samples. The final logs describe the materials encountered, their thicknesses, and the locations where samples were obtained. The Unified Soil Classification System was used to classify soils. The soil classification symbols appear on the test pit logs and are briefly described on the attachments.

3.2 Laboratory Analyses

Laboratory analyses were performed on representative soil samples to aid in material classification and to estimate pertinent engineering properties of the on-site soils for preparation of this report. Testing was performed in general accordance with applicable specifications. The following tests were performed and the results are attached.

- Gradation
- Plasticity
- Expansion potential
- Water soluble sulfate and total salts
- pH and Resistivity

Test results were utilized in the development of the recommendations contained in this report.

3.3 Analyses and Report

This geotechnical evaluation report includes a description of the project, a discussion of the field and laboratory testing programs, a discussion of the subsurface conditions, and design recommendations as required to satisfy the purpose previously described.

This report is for the exclusive purpose of providing geotechnical engineering and/or testing information and recommendations. The scope of services for this project does not include, either specifically or by implication, any environmental assessment of the site or identification of contaminated or hazardous materials or conditions. If the owner is concerned about the potential for such contamination, other studies should be undertaken. We are available to discuss the scope of such studies with you.

4.0 SITE CONDITIONS

4.1 Surface

The Site consists of gentle hills, valleys, and ponds typical of a golf course layout. The area includes mature trees with some grass or ground cover. A paved cart path runs throughout the Site.

4.2 Subsurface

The native soils consisted of medium to high plasticity clay (CL and CH) throughout the depth of the test pits. A deposit of partially cemented caliche was encountered in Test Pit 1 at a depth of 4 to 9 feet. Soil moisture contents to a depth of about 10 feet were described as slightly damp. Groundwater was not encountered in any of the test pits. Groundwater levels and soil moisture conditions can be expected to fluctuate with varying local and regional seasonal and perennial weather conditions, changes in surface and subsurface drainage patterns, adjacent construction or development, and other factors.

We researched groundwater levels and flow direction in the vicinity of the site. No recent well or groundwater information is readily available in the site vicinity. Water wells drilled in the vicinity of the site in the early 1990's indicated groundwater levels were generally encountered at depths of 30 to 40 feet below the ground surface. Groundwater flow direction in the vicinity is expected to follow the surface topography which is in a westerly to southwesterly direction.

4.3 Geology

4.3.1 Seismicity

Numerous seismic events, most of which are a probable result of underground blasting at the Nevada Test Site (about 90 miles north of Las Vegas), have been felt in and around the Pahrump area. There is a noticeable lack of earthquakes that have epicenters in the Southern Nevada area and are directly attributable to deep-seated tectonic movement. A few events recorded in the Henderson area and in Lincoln County registered between 5.0 and 6.0 Richter magnitude. Most of the recorded events in the area range between 4.0 and 4.9. Based on the 2009 International Building Code (IBC), we recommend the site be assigned Site Class D (default classification).

4.3.2 Geologic Constraints

No known or mapped earth subsidence fissures, due to regional groundwater withdrawal exist in the site vicinity. No evidence has been noted of distress arising from areal subsidence due to regional groundwater withdrawal.

Observation of the ground surface indicated no readily discernible evidence of recent compaction faulting or fissuring. Compaction faults are generally accepted as features resulting from deep-seated differential consolidation of alluvial materials with dissimilar grain-size and compressibility characteristics. Fissures are understood to be the results of a subsurface erosion process occurring in tension fractures at or near the surface of uncemented, relatively fine-grained soils.

5.0 GEOTECHNICAL PROPERTIES

5.1 Laboratory Tests

Laboratory test results indicate that the near surface soils are clays of medium to high plasticity. Expansion testing on the near surface soils indicated these soils have a moderate to high expansion potential for slabs-on-grade and lightly loaded foundations.

5.2 Field Tests

Percolation testing was performed in shallow test holes to determine the percolation rates for the below surface soils. The tests were conduced in shallow test trenches excavated by the backhoe to depths of 2 to 3 feet below the ground surface at the locations indicated below. The percolation test holes were hand excavated at the bottom of the test trenches and were approximately 1 foot square and 1 foot in depth. The test holes were presoaked for approximately 6 hours before conducting the percolation tests. During the presoaking, the water completely drained from the percolation test holes in less than 1 hour and then the test holes were refilled. The percolation tests were conducted by filling the percolation test holes with 6 inches of water and recording the time for the water to recede 1 inch. The test hole was then refilled to the 6 inch level and the test was repeated until a stabilized rate was achieved (i.e., less that 10 percent difference between 3 successive readings). The percolation test results are presented below:

Test Location		Stabilized Rate
o Test Pit 1 at 2 feet	-	20 minutes/inch
o Test Pit 3 at 2 feet	-	10 minutes/inch
o Test Pit 4 at 3 feet	-	30 minutes/inch

Based on the results of the percolation testing, we recommend that a percolation rate of 30 minutes per inch be used. We also recommend that a factor of safety of at 1.5 be used to account for silting of the ponds over time.

6.0 RECOMMENDATIONS

6.1 General

Recommendations contained in this report are based on our understanding of the project criteria described in Section 2.0, PROJECT DESCRIPTION, and the assumption that the soil and subsurface conditions are those disclosed by the borings. Others may change the plans, final elevations, number and type of structures, foundation loads, and floor levels during design or construction. Substantially different subsurface conditions from those described herein may be encountered or become known. Any changes in the project criteria or subsurface conditions shall be brought to our attention in writing.

The test pits and laboratory testing indicated that the site soils are medium to high plasticity clays. Expansion testing conducted on these site soils indicated they posses a moderate to high expansion potential when supporting concrete slabs and lightly loaded foundations. For this reason concrete equipment pads and shallow foundation should be supported on engineered fill materials consisting of imported soils of low expansion potential.

Based on the site soil conditions and Table 1704.7 of the Southern Nevada Amendments to the 2009 IBC, we recommend a Level B inspection for the project

6.2 Shallow Foundations

As previously discussed, the site soils are medium to high plasticity clays that posses moderate to high expansion potential. Therefore, we recommend that shallow foundations bear upon imported engineered fill materials of low expansive potential. The engineered fill should extend to a minimum depth of 2 feet below the bottom of the footing and a minimum of 2 feet beyond the edges of the footing. An allowable bearing pressure of 3,000 pounds per square foot (psf) can be used in sizing the footings. Footings should bear a minimum of 18 inches below the lowest adjacent grade within 5 feet of the footings. The recommended minimum width of column and wall footings is 24 inches and 16 inches, respectively. The imported granular fill materials should meet the specifications requirements presented in this report. The imported fill materials should be placed and compacted under engineering observation and testing.

Total and differential settlement of the lightly loaded structures is estimated to be ½ inch or less. Additional foundation movements (either settlement or heave) could occur if water from any source infiltrates the foundation soils. Therefore, proper drainage should be provided in the final design and during construction to help reduce moisture infiltration into the foundation soils.

All footings, stem walls, and any masonry walls should be reinforced to reduce the potential for distress caused by differential foundation movements. The use of joints at openings or other discontinuities in any masonry walls is recommended.

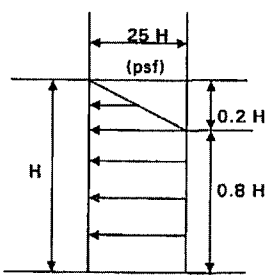
Site preparation procedures and foundation excavations should be observed by the geotechnical engineer to assess that adequate bearing conditions exist and that recompaction of existing site soils and/or placement of imported engineered fill has been performed satisfactorily. If the soil conditions encountered differ significantly from those presented in this report, supplemental recommendations will be required.

6.3 Lateral Design Criteria

Lateral loads can be resisted by soil friction and by the passive resistance of the soils. A coefficient of friction of 0.35 can be used between the concrete foundation and the supporting soils. The passive resistance of natural soils or properly compacted fill can be approximated by the pressure developed by a fluid with a density of 300 pounds per cubic foot (psf/ft). The passive pressure and the frictional resistance of the soils can be combined without reduction in determining the total lateral resistance. If necessary, an active earth pressure of 35 psf/ft and an at-rest earth pressure of 55 psf/ft can be used for the design of any retaining structures.

6.3.1 Retaining Walls

Cantilevered retaining walls, with free-draining level backfills and without surcharge, may be designed assuming that the soils will impose a pressure equal to that developed by a fluid with a density of 35 pounds per cubic foot. Braced retaining walls, with free draining level backfills and without surcharge, may be designed assuming that the soils will impose a pressure with the following distribution:



Any uniform surcharge loading should be added to the above pressures using a factor of 0.30. As indicated, the stated pressures assume that hydrostatic pressure will not develop. Therefore, we recommend that a wall drainage system be provided and that the structural fill placed behind retaining walls be granular and free draining (less than 5% fines).

Additional lateral loads on cantilevered and braced walls due to a seismic event should be added to the static pressures. Based on recommendations presented in 2000 NEHRP, the seismic component may be calculated by the following equations:

Unrestrained Elements:	$P_{AE}=\frac{3}{8}K_hH^2\gamma$	(psf/linear foot of wall)
Restrained Elements:	$P_{AE}=K_hH^2\gamma$	(psf/linear foot of wall)

Where $K_h=S_{DS}/2.5$, H is the height of the wall in feet, and γ is the unit weight of the backfill material in pcf. The resultant seismic earth pressure P_{AE}, acts at a distance of 0.6H above the base of the wall.

For this site, $P_{AE}=10H^2$ and $27H^2$ for unrestrained elements and restrained elements, respectively.

Based on information obtained from Google Maps, the Latitude and Longitude for the site are determined to be 36.1949°N and 116.0051°W, respectively.

6.4 Seismic Considerations

For structural designs based upon the 2009 International Building Code, the recommended site class is D. S_s, the spectral accelerations for short periods is 0.47g. S_1 the spectral acceleration for a 1-second period is 0.19g. F_a and F_v, in accordance with Table 1613.5.3(1) and 1613.5.3(2) are 1.43 and 2.03, respectively.

6.5 Slab-on-Grade Support

The site soils are medium to high plasticity clays that possess moderate to high expansion potential. As a result, the on-site clayey soils should not used as fill below any concrete slabs. We recommend that all concrete slabs be supported on a minimum of 2 feet of low expansive imported fill material. Therefore, depending upon the finished grade elevation, up to 2 feet of the existing site soils may need to be removed and replaced with low expansive imported fill materials. We recommend using a modulus of subgrade reaction (k) of 200 pounds per cubic inch (pci). The slab subgrade should be prepared by the procedures outlined in this report. A minimum 4 inch thick layer of granular base course (Type II or similar) should be provided beneath all slabs to help prevent capillary rise and a damp slab.

All concrete placement and curing operations should follow the American Concrete Institute manual recommendations. Improper curing techniques and/or high slump (water-cement ratio) could cause excessive shrinkage, cracking or curling. The plastic properties of the concrete should be documented at the time of placement and specimens should also be prepared for strength testing to verify compliance with project specifications. Concrete slabs should be allowed to cure adequately before placing vinyl or other moisture sensitive floor covering.

6.6 Drainage

The major potential cause of soil problems in the site vicinity is moisture increase in soils below structures. Therefore, it is extremely important that positive drainage be provided during construction and maintained throughout the life of all proposed structures. Infiltration of water into utility or foundation excavations must be prevented during construction. No surface features which could retain water adjacent to the structures should be constructed.

In areas where concrete or asphalt paving do not immediately adjoin the structures, protective slopes should be provided with an outfall of about 5 percent for at least 10 feet from structure. Backfill against footings, exterior walls, and in utility line trenches should be well compacted and free of all construction debris to minimize the possibility of moisture infiltration.

6.7 Corrosivity

The chemical test results indicate that the soils at the site classify as negligibly corrosive to concrete. However in keeping with local practice, we recommend that Type V Portland cement be utilized in all concrete in contact with site soils.

Consideration should be given to providing protection to buried metal pipes or use of nonmetallic pipe where permitted by local codes.

7.0 EARTHWORK

7.1 General

The conclusions contained in this report for the proposed construction are contingent upon compliance with recommendations presented in this section. Any excavating, trenching, or disturbance which occurs after completion of the earthwork must be backfilled, compacted and tested in accordance with the recommendations contained herein. It is not reasonable to rely upon our conclusions and recommendations if any future unobserved and untested trenching, grading or backfilling occurs.

7.2 Site Clearing

Strip and remove any existing asphalt or concrete pavements, fill materials, vegetation, debris, and other deleterious materials from the structure areas. The structure area is defined as that area within the structure footprint plus 5 feet beyond the perimeter of the footprint. All exposed surfaces should be free of mounds and depressions which could prevent uniform compaction.

7.3 Excavation

We anticipate that excavations into the upper 10 feet of the site soils can be accomplished with conventional equipment. A partially cemented caliche deposit was encountered in one of the test pits. This deposit did not prohibit excavation efforts with a backhoe.

7.4 Excavations and Slopes

The soils at the Site should be considered Type B soils when applying OSHA regulations. OSHA recommends a maximum slope inclination of 1:1 (horizontal:vertical) for Type B soils. Slopes may need to be flattened depending on conditions exposed during construction. If there is not enough space for sloped excavations, shoring should be used.

As a safety measure, it is recommended that all vehicles and soil piles be kept a minimum lateral distance back from the crest of the slope at least equal to the slope height. The exposed slope face should be protected against the elements.

The individual contractors should be made responsible for designing and constructing stable, temporary excavations as required to maintain stability of both the excavation sides and bottom. The soils to be penetrated by the proposed excavation may vary across the Site. Our soil classifications are based solely on the materials encountered in four exploratory test pits. The contractor should verify that similar conditions exist throughout the proposed area of excavation. If different subsurface conditions are found at the time of construction, we should be contacted immediately to evaluate the conditions encountered.

7.5 Foundation and Building Pad Preparation

After site clearing operations are complete, remove the existing soils to at least 2 feet below the base of the foundation elevation. Proff-roll the base of the excavation to observe for any loose or otherwise unsuitable materials that may remain below the foundation level. Any soft, loose, disturbed or otherwise unsuitable material should be over-excavated and replaced with

engineered fill material. Then place and compact, under engineering observation and testing, low expansive potential imported fill materials as necessary to reach final subbase elevation. Engineered fill for pad construction should consist of properly compacted imported granular fill material. The on-site soils should not be used as fill material to construct any structure pads at the site.

7.6 Materials

a. Imported granular soil with a maximum dimension of 6 inches should be used as fill material in the following areas:

- foundation areas
- concrete slab areas
- backfill

c. Imported soils should conform to the following:

- Gradation (ASTM C136): percent finer by weight

6"	100
4"	85-100
3/4"	70-100
No. 4 Sieve	50-100
No. 200 Sieve	30 (max)

- Maximum expansive potential (%)* 4.0
- Maximum soluble sulfates (%) 0.10

* Measured on a sample compacted to approximately 95 percent of the ASTM D1557 maximum dry density at about 3 percent below optimum water content and then oven dried. The sample is then confined under a 60 psf surcharge and submerged.

c. Base course should conform to applicable Nye County specifications or other appropriate governing specifications.

7.7 Placement and Compaction

a. Place and compact fill in horizontal lifts, using equipment and procedures that will produce recommended water contents and densities throughout the lift.

b. Uncompacted fill lifts should not exceed 8 inches.

c. Materials should be compacted to the following:

Material	Minimum Percent Compaction (ASTM D1557)
• Imported soils, reworked and fill:	
Below footings	95
Below slabs-on-grade	90
• Aggregate base:	
Below slabs-on-grade	95
• Miscellaneous backfill	90

On-site clayey soils should not be used as structural backfill on the site. The on-site soils can be used as miscellaneous backfill. The on-site soils and imported granular soils should be compacted with a moisture content that facilitates proper compaction to achieve the required density.

7.8 Compliance

Recommendations for the proposed foundations and floor slab supported on compacted fills or prepared subgrade depend upon compliance with EARTHWORK recommendations. To assess compliance, observation and testing should be performed under the direction of a geotechnical engineer.

8.0 LIMITATIONS

This report has been prepared assuming the project criteria described in Section 2.0. If changes in the project criteria occur, or if different subsurface conditions are encountered or become known, the conclusions and recommendations presented herein shall become invalid. In any such event,

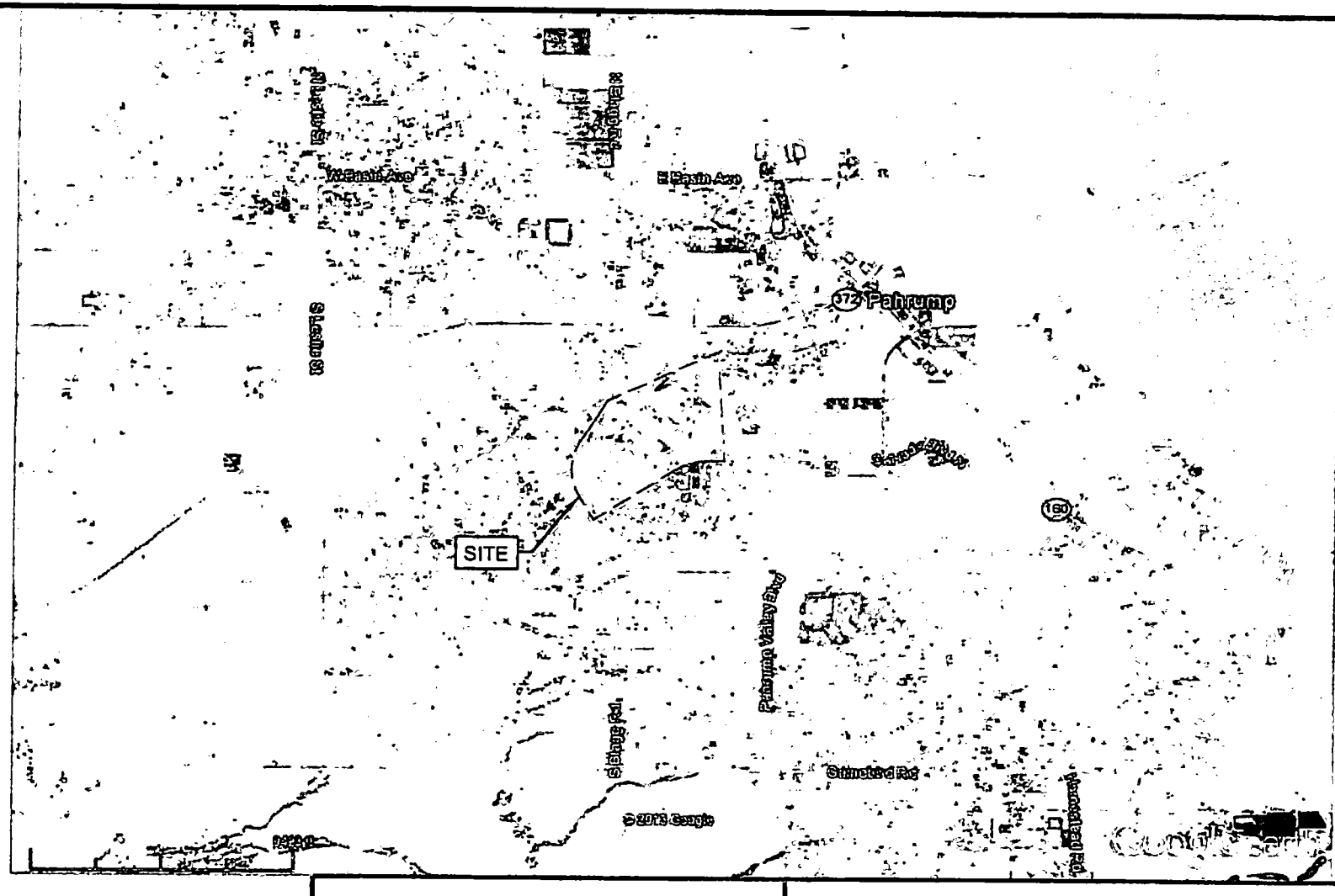
WT should be contacted in order to assess the effect that such variations may have on our conclusions and recommendations.

The recommendations presented are based entirely upon data derived from a limited number of samples obtained from widely spaced test pits. The attached logs are indicators of subsurface conditions only at the specific locations and times noted. This report assumes the uniformity of the geology and soil structure between test pits, however variations can and often do exist. Whenever any deviation, difference or change is encountered or becomes known, WT should be contacted.

This report is valid for the earlier of one year from the date of issuance, a change in circumstances, or discovered variations. After expiration, no person or entity shall rely on this report without the express written authorization of WT.

9.0 CLOSURE

We prepared this report as an aid to the designers of the proposed project. The comments, statements, recommendations and conclusions set forth in this report reflect the opinions of the authors. These opinions are based upon data obtained at the location of the test pits, and from laboratory tests. Work on your project was performed in accordance with generally accepted standards and practices utilized by professionals providing similar services in this locality. No other warranty, express or implied, is made.



NORTH

NOT TO SCALE

Geotechnical
Environmental
Inspections
Materials

Western Technologies Inc.
The Quality People
Since 1955

PLATE 1. **SITE VICINITY MAP**
Willow Creek Golf Course-Percolation Testing
1500 Red Butte Street
Pahrump, Nevada

WT Job No. 4124XD007

LEGEND

Approximate Test Pit Location

Geotechnical
Environmental
Inspections
Materials

Western Technologies Inc.
The Quality People
Since 1955

PLATE 2. TEST PIT LOCATION DIAGRAM
Willow Creek Golf Course-Percolation Testing
1500 Red Butte Street
Pahrump, Nevada

WT Job No. 4124XD007

Allowable Soil Bearing Capacity	The recommended maximum contact stress developed at the interface of the foundation element and the supporting material.
Backfill	A specified material placed and compacted in a confined area.
Base Course	A layer of specified material placed on a subgrade or subbase.
Base Course Grade	Top of base course.
Bench	A horizontal surface in a sloped deposit.
Caisson	A concrete foundation element cast in a circular excavation which may have an enlarged base. Sometimes referred to as a cast-in-place pier.
Concrete Slabs-On-Grade	A concrete surface layer cast directly upon a base, subbase or subgrade.
Crushed Rock Base Course	A base course composed of crushed rock of a specified gradation.
Differential Settlement	Unequal settlement between or within foundation elements of a structure.
Engineered Fill	Specified material placed and compacted to specified density and/or moisture conditions under observations of a representative of a soil engineer.
Existing Fill	Materials deposited through the action of man prior to exploration of the site.
Existing Grade	The ground surface at the time of field exploration.
Expansive Potential	The potential of a soil to expand (increase in volume) due to absorption of moisture.
Fill	Materials deposited by the actions of man.
Finished Grade	The final grade created as a part of the project.
Gravel Base Course	A base course composed of naturally occurring gravel with a specified gradation.
Heave	Upward movement
Native Grade	The naturally occurring ground surface.
Native Soil	Naturally occurring on-site soil.
Rock	A natural aggregate of mineral grains connected by strong and permanent cohesive forces. Usually requires drilling, wedging, blasting or other methods of extraordinary force for excavation.
Sand and Gravel Base	A base course of sand and gravel of a specified gradation.
Sand Base Course	A base course composed primarily of sand of a specified gradation.
Scarify	To mechanically loosen soil or break down existing soil structure.
Settlement	Downward movement.
Soil	Any unconsolidated material composed of discrete solid particles, derived from the physical and/or chemical disintegration of vegetable or mineral matter, which can be separated by gentle mechanical means such as agitation in water.
Strip	To remove from present location.
Subbase	A layer of specified material placed to form a layer between the subgrade and base course.
Subbase Grade	Top of subbase.
Subgrade	Prepared native soil surface.

Willow Creek Golf Course	
Definition of Terminology	
Western Technologies Inc.	
Job No. 4124XD007	Plate A-1

METHOD OF SOIL CLASSIFICATION

COARSE-GRAINED SOILS (LESS THAN 50% FINES)		
Group Symbols	**Description**	**Major Divisions**
GW	Well-graded gravels or gravel-sand mixtures, less than 5% fines	GRAVELS More than half of coarse fraction is larger than No. 4 sieve size
GP	Poorly-graded gravels or gravel-sand mixtures less than 5% fines	
GM	Silty gravels, gravel-sand-silt mixtures, more than 12% fines	
GC	Clayey gravels, gravel-sand-clay mixtures, more than 12% fines	
SW	Well-graded sands or gravelly sands, less than 5% fines	SANDS More than half of coarse fraction is smaller than No. 4 sieve size
SP	Poorly-graded sands or gravelly sands, less than 5% fines	
SM	Silty sands, sand-silt mixtures, more than 12% fines	
SC	Clayey sands, sand-clay mixtures, more than 12% fines	
NOTE: Coarse-grained soils receive dual symbols if they contain 5 to 12% fines (e.g. SW-SM, GP-GC, etc.)		

FINE-GRAINED SOILS (MORE THAN 50% FINES)		
ML	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands	SILTS AND CLAYS Liquid limits less than 50
CL	Inorganic clays or low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	
OL	Organic silts or organic silt-clays of low plasticity	
MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts	SILTS AND CLAYS Liquid limit more than 50
CH	Inorganic clays of high plasticity, fat clays	
OH	Organic clays of medium to high plasticity	
PT	Peat, muck, and other highly organic soils	HIGHLY ORGANIC SOILS
NOTE: Fine-grained soils may receive dual classification based upon plasticity characteristics		

SOIL SIZES	
Component	**Size Range**
Boulders	Above 12 in.
Cobbles	3 in to 12 in
Gravel	No. 4 to 3 in.
Coarse	¾ in. to 3 in.
Fine	No. 4 to ¾ in.
Sand	No. 200 to No. 4
Coarse	No. 10 to No. 4
Medium	No. 40 to No. 10
Fine	No. 200 to No. 40
Fines (Silt or Clay)	Below No. 200
NOTE: Only size smaller than 3 inches are used to classify soils	

CONSISTENCY	
Clays & Silts	**Blows/Foot***
Very Soft	0 – 2
Soft	2 - 4
Firm	4 – 8
Stiff	8 – 16
Very Stiff	16 – 32
Hard	Over 32

* Number of blows of 140-pound hammer falling 30 inches to drive a 2-inch O.D. (1-3/8" I.D.) split-spoon (ASTM D1686).

RELATIVE DENSITY	
Sands & Gravels	**Blows/Foot***
Very Loose	0 – 4
Loose	4 – 10
Medium Dense	10 – 30
Dense	30 – 50
Very Dense	Over 50

PLASTICITY OF FINE-GRAINED SOILS	
Plasticity Index	**Dry**
0	Non-Plastic
1 – 7	Low
8 – 25	Medium
Over 25	High

DEFINITION OF WATER CONTENT
Dry
Slightly Damp
Damp
Moist
Wet
Saturated

Willow Creek Golf Course

Western Technologies Inc.

Project No. 4124XD007 | Plate: A-2

The number shown in **"TEST PIT NO."** refers to the approximate location of the same number indicated on the "Test Pit Location Diagram" as positioned in the field by pacing or measurement from property lines and/or existing features, or through the use of Global Positioning System (GPS) devices.

"EXCAVATION TYPE" refers to the exploratory equipment used in the field.

"SAMPLE TYPE" refers to the form of sample recovery, in which **G = Grab sample.**

"MOISTURE CONTENT (% OF DRY WT.)" refers to the laboratory-determined water content in percent (Ref. ASTM D2216).

"USCS" refers to the "Unified Soil Classification System" Group Symbol for the soil type as defined by ASTM D 2487 and D 2488. The soils were classified visually in the field, and where appropriate, classifications were modified by visual examination of samples in the laboratory and/or by appropriate tests.

These notes and test pit logs are intended for use in conjunction with the purposes of our services defined in the text. Test pit log data should not be construed as part of the construction plans nor as defining construction conditions.

Test pit logs depict our interpretations of subsurface conditions at the locations and on the date(s) noted. Variations in subsurface conditions and characteristics may occur between test pits. Groundwater levels may fluctuate due to seasonal variations and other factors.

The stratification lines shown on the test pit logs represent our interpretation of the approximate boundary between soil or rock types based upon visual field classification at the test pit location. The transition between materials is approximate and may be more or less gradual than indicated.

Willow Creek Golf Course	
Test Pit Log Notes	
Western Technologies Inc.	
Job No.: 4124XD007	Plate: A-3

TEST PIT No. 1

DATE DRILLED: **3-24-14**
LOCATION: **See Figure 2**
ELEVATION: **Not measured**

EQUIPMENT TYPE: **Backhoe**
EXCAVATION TYPE: **Test Pit**
FIELD ENGINEER: **D. Johnson**

P.I.D. READING (PPM)	MOISTURE CONTENT (% OF DRY WT)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOWS/FT.	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION	MOISTURE	CONSISTENCY
			G			1–4	CL		Silty clay, light brown, some sand, medium plasticity	slightly damp	medium dense
						4–9			Caliche, white, partially cemented		
			G			5–9					
						9	CL		Silty clay, light brown, some sand, medium plasticity, some partially cemented caliche		
						10			**Stopped at 10 feet**		

N- STANDARD PENETRATION TEST
R- RING SAMPLE
C- CORE: %RECOVERY/%RQD
B- BAG
BN- BULL NOSE
CS- CALIFORNIA SAMPLER

NOTES: **Water not encountered.**

DRIVING WEIGHT (LBS)

WESTERN TECHNOLOGIES INC.

PROJECT NO. **4124XD007**

PROJECT:
Willow Creek Golf Course
TEST PIT LOG

PLATE
A-4

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

DATE DRILLED: **3-24-14**
LOCATION: **See Figure 2**
ELEVATION: **Not measured**

TEST PIT No. 2

EQUIPMENT TYPE: **Backhoe**
EXCAVATION TYPE: **Test Pit**
FIELD ENGINEER: **D. Johnson**

P.I.D. READING (PPM)	MOISTURE CONTENT (% OF DRY WT)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOWS/FT.	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION	MOISTURE	CONSISTENCY
			G			1–10	CL		Silty clay, light brown, medium plasticity	slightly damp	medium dense
			G						**Stopped at 10 feet**		

N- STANDARD PENETRATION TEST
R- RING SAMPLE
C- CORE: %RECOVERY/%RQD
B- BAG
BN- BULL NOSE
CS- CALIFORNIA SAMPLER

NOTES: **Water not encountered.**

DRIVING WEIGHT (LBS)

WESTERN TECHNOLOGIES INC.

PROJECT NO. **4124XD007**

PROJECT:
Willow Creek Golf Course
TEST PIT LOG

PLATE
A-5

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

DATE DRILLED: 3-24-14
LOCATION: See Figure 2
ELEVATION: Not measured

TEST PIT No. 3

EQUIPMENT TYPE: Backhoe
EXCAVATION TYPE: Test Pit
FIELD ENGINEER: D. Johnson

P.I.D. READING (PPM)	MOISTURE CONTENT (% OF DRY WT)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOWS/FT.	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION	MOISTURE	CONSISTENCY
			G			1	CL		Silty clay, light brown, medium plasticity	slightly damp	medium dense
						2					
						3					
						4					
			G			5					
						6					
						7					
						8					
						9					
						10			**Stopped at 10 feet**		
						11					
						12					
						13					
						14					

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

N- STANDARD PENETRATION TEST
R- RING SAMPLE
C- CORE: %RECOVERY/%RQD
B- BAG
BN- BULL NOSE
CS- CALIFORNIA SAMPLER

NOTES: **Water not encountered.**

DRIVING WEIGHT (LBS)

WESTERN TECHNOLOGIES INC.

PROJECT NO. **4124XD007**

PROJECT: **Willow Creek Golf Course**

TEST PIT LOG

PLATE **A-6**

DATE DRILLED: 3-24-14
LOCATION: See Figure 2
ELEVATION: Not measured

TEST PIT No. 4

EQUIPMENT TYPE: BackHoe
EXCAVATION TYPE: Test Pit
FIELD ENGINEER: D. Johnson

P.I.D. READING (PPM)	MOISTURE CONTENT (% OF DRY WT)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOWS/FT.	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION	MOISTURE	CONSISTENCY
			G			1–3	CH		Clay, dark brown to black, high plasticity, some fine sand	slightly damp	medium dense
			G			3–10	CL		Clay, whitish brown, medium plasticity		
						10			**Stopped at 10 feet**		
						11–14					

N- STANDARD PENETRATION TEST
R- RING SAMPLE
C- CORE: %RECOVERY/%RQD
B- BAG
BN- BULL NOSE
CS- CALIFORNIA SAMPLER

NOTES: **Water not encountered.**

DRIVING WEIGHT (LBS)

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

WESTERN TECHNOLOGIES INC.

PROJECT NO. 4124XD007

PROJECT:
Willow Creek Golf Course
TEST PIT LOG

PLATE
A-7

PHYSICAL PROPERTIES

			Particle Size Distribution, % Passing by Weight														Atterberg Limits		Moisture-Density Relationship[5]				
Sample Location	Depth (ft)	Soil Type (USCS)	4"	3"	2"	1"	3/4"	1/2"	3/8"	#4	#8	#16	#30	#50	#100	#200	LL	PI	Dry Density (pcf)	Optimum Moisture (%)	Method	R-Value	Remarks
TP-1	0 to 3	CL	100	100	100	100	100	100	100	100	100	99	99	98	97	90	40	22					2
TP-1	5 to 9	GC	100	100	100	90	86	78	73	31	27	26	22	20	17	14	43	26					2, caliche
TP-2	0 to 5	CL	100	100	100	100	100	100	100	100	100	100	100	100	99	96	29	11					2
TP-2	5 to 7	CL	100	100	100	100	100	100	100	100	99	99	99	99	98	96	48	28					2
TP-3	0 to 5	CL	100	100	100	100	100	100	100	100	100	100	100	100	98	94	30	10					2
TP-3	5 to 10	CL	100	100	100	100	100	100	100	99	98	97	96	95	93	89	40	21					2
TP-4	0 to 3	CH	100	100	100	100	100	100	100	100	100	99	99	99	98	96	57	36					2
TP-4	3 to 10	CL	100	100	100	100	100	99	98	96	95	94	93	92	91	87	26	7					2

Remarks:

Classification/Particle Size

1. Visual
2. Laboratory Tested
3. Minus #200 Only

Moisture Density Relationship

4. Tested ASTM D698/AASHTO T99
5. Tested ASTM D1557/AASHTO T180

Note: NP = Nonplastic, NT = Not Tested

Willow Creek Golf Course

Physical Properties

Western Technologies Inc.

Project No. 4124XD007 Plate B-1

SilverState
Analytical Laboratories

LABORATORY REPORT

DATE: March 27, 2014

REPORT NUMBER: 14-1396-1

CLIENT: Western Technologies, Inc.
6633 West Post Road
Las Vegas, NV 89118

PAGE: 1 of 1

CLIENT PROJECT: 4144W026

CLIENT PO #: 4144P049

ANALYST: SW

Sampled By: Client
Date Sampled: 03/24/14
Time Sampled: --

Date Received: 03/25/14
Time Received: 1557

Sample ID: 14096-TP4 0'-3'

Analysis	Result	Unit	Method
Sodium	0.03	%	ASTM D2791
Water Soluble Sulfate (SO_4)	0.02	%	SM 4500 E
Total Available Water Soluble Sodium Sulfate (Na_2SO_4)	0.03	%	Calculation
Total Salts (Solubility)	0.10	%	SM2540B
Soluble Soil Chlorides	73.7	mg/kg	SM4500ClD
pH	7.92	S.U.	SM9045C
Resistivity	656	Ω-cm	ASTM G57

NOTES: The results for each constituent denote the percentage (%) for that particular element which is soluble in a 1:5 (soil to water) extraction ratio and corrected for dilution.

REVIEWED BY:

John Sloan
Laboratory Director
EPA: NV00930

3638 East Sunset Road, Suite 100 Las Vegas, NV 89120
Tel: 702-873-4478 Fax: 702-873-7967 www.ssalabs.com

SilverState
Analytical Laboratories

LABORATORY REPORT

DATE: March 27, 2014

REPORT NUMBER: 14-1396-2

CLIENT: Western Technologies, Inc.
6633 West Post Road
Las Vegas, NV 89118

PAGE: 1 of 1

CLIENT PROJECT: 4144W026

CLIENT PO #: 4144P049

ANALYST: SW

Sampled By: Client
Date Sampled: 03/24/14
Time Sampled: --

Date Received: 03/25/14
Time Received: 1557

Sample ID: 14097-TP4 3'- 9'

Analysis	Result	Unit	Method
Sodium	0.00	%	ASTM D2791
Water Soluble Sulfate (SO_4)	0.02	%	SM 4500 E
Total Available Water Soluble Sodium Sulfate (Na_2SO_4)	0.00	%	Calculation
Total Salts (Solubility)	0.06	%	SM2540B
Soluble Soil Chlorides	38.1	mg/kg	SM4500Cl D
pH	7.98	S.U.	SM9045C
Resistivity	1064	Ω-cm	ASTM G57

NOTES: The results for each constituent denote the percentage (%) for that particular element which is soluble in a 1:5 (soil to water) extraction ratio and corrected for dilution.

REVIEWED BY:

John Sloan
Laboratory Director
EPA: NV00930

3638 East Sunset Road, Suite 100 Las Vegas, NV 89120
Tel: 702-873-4478 Fax: 702-873-7987 www.ssalabs.com

SilverState
Analytical Laboratories

LABORATORY REPORT

DATE: March 27, 2014

REPORT NUMBER: 14-1396-3

CLIENT: Western Technologies, Inc.
6633 West Post Road
Las Vegas, NV 89118

PAGE: 1 of 1

CLIENT PROJECT: 4144W026

CLIENT PO #: 4144P049

ANALYST: SW

Sampled By: Client
Date Sampled: 03/24/14
Time Sampled: --

Date Received: 03/25/14
Time Received: 1557

Sample ID: 14101-TP2-7'

Analysis	Result	Unit	Method
Sodium	0.04	%	ASTM D2791
Water Soluble Sulfate (SO_4)	0.03	%	SM 4500 E
Total Available Water Soluble Sodium Sulfate (Na_2SO_4)	0.05	%	Calculation
Total Salts (Solubility)	0.09	%	SM2540B
Soluble Soil Chlorides	39.5	mg/kg	SM4500ClD
pH	8.14	S.U.	SM9045C
Resistivity	543	Ω-cm	ASTM G57

NOTES: The results for each constituent denote the percentage (%) for that particular element which is soluble in a 1:5 (soil to water) extraction ratio and corrected for dilution.

REVIEWED BY:

John Sloan
Laboratory Director
EPA: NV00930

3638 East Sunset Road, Suite 100 Las Vegas, NV 89120
Tel: 702-873-4478 Fax: 702-873-7967 www.ssalabs.com

SOIL PROPERTIES

Boring No.	Depth (ft.)	Soil Class	Initial Dry Density (pcf)	Initial Water Content (%)	Compression Properties			Expansion Properties		Plasticity		Percent Passing #200	Soluble		Remarks
					Surcharge (ksf)	Total Compression (%)		Surcharge (ksf)	Expansion (%)	LL	PI		Sulfate ppm	Chloride ppm	
						In-Situ	After Saturation								
B-4	0-3	CH	111.7	16				60	11.8	57	36	96			1, 2
B-4	0-3	CH	111.7	12				1,000	4.5	57	36	96			1, 2

Note: Initial Dry Density and Initial Water Content are in-situ values unless otherwise noted

Remarks

1. Compacted density (approx. 95% of ASTM D1557 max. density at moisture content slightly below optimum.)
2. Submerged to approximate saturation.
3. Slight rebound after saturation.
4. Sample disturbance observed.

Attachment D – Preliminary Engineering Report

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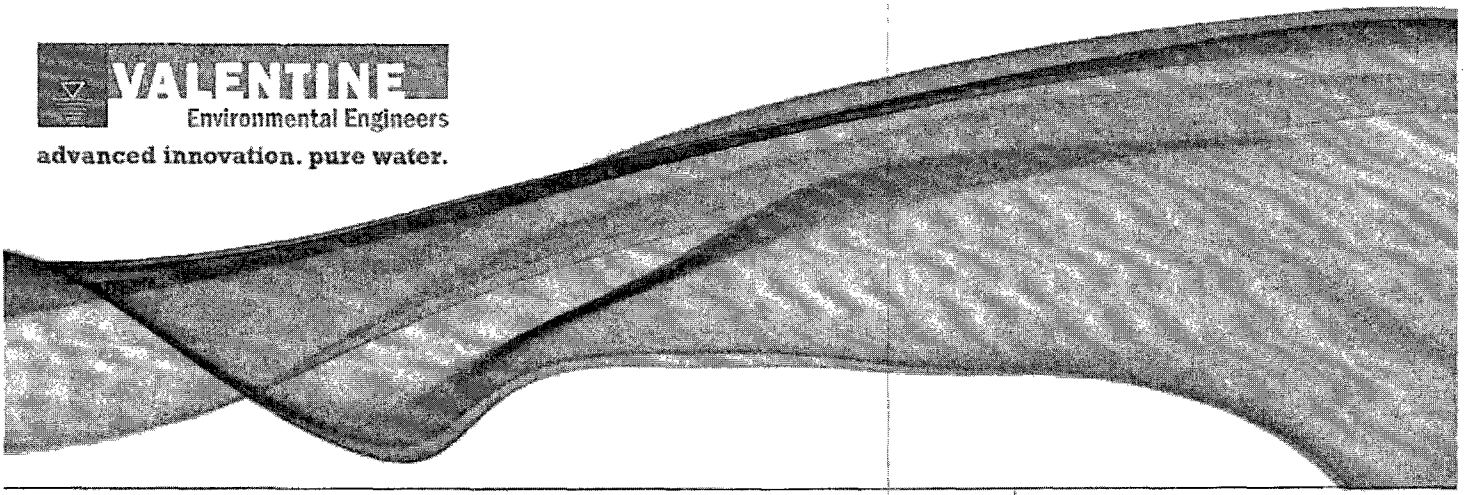
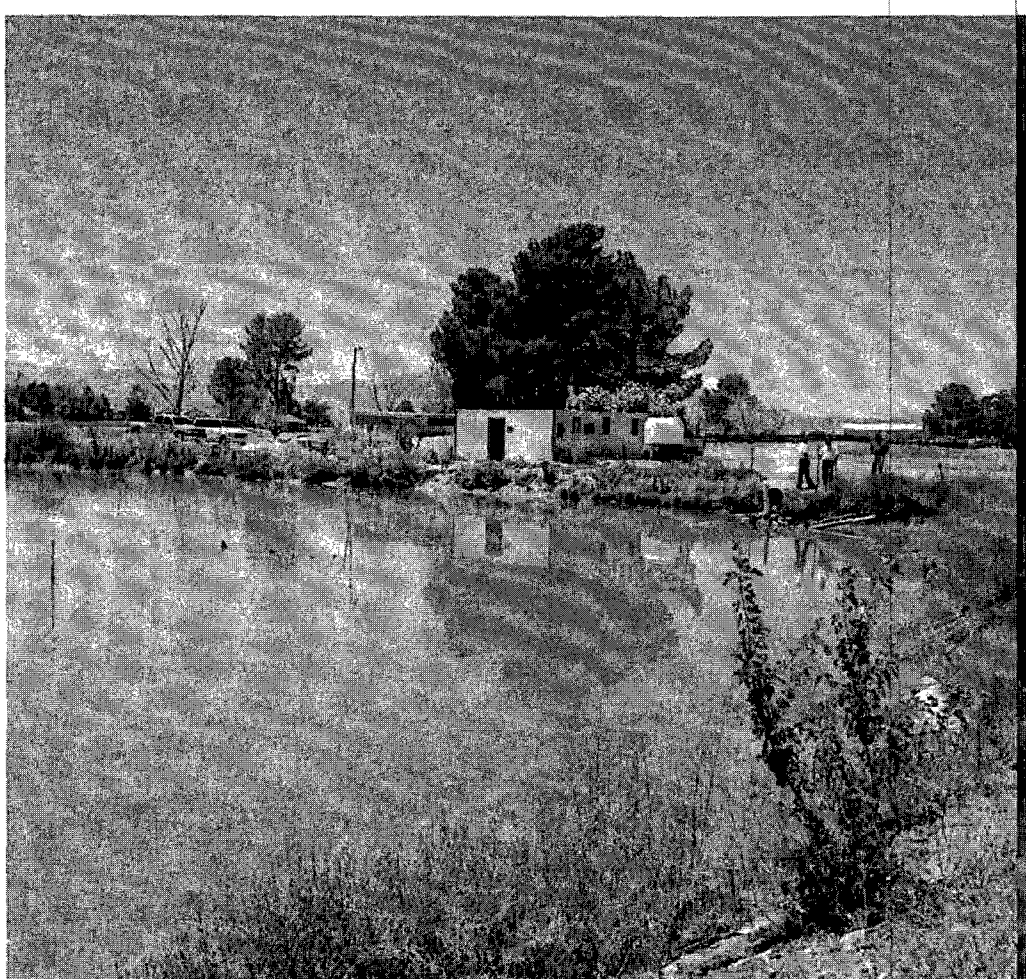
Environmental Engineers
advanced innovation. pure water.



Utilities, Inc. of Central Nevada

May 2014



Willow Creek Property Remediation Design Report - May Permit Submittal

Willow Creek Property Remediation
Design Report – May Permit Submittal
Utilities, Inc. of Central Nevada

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

1.0 INTRODUCTION

1.1 Background

The UICN service area covers approximately 43 square miles in the Pahrump Valley generally along the Highway 160 corridor. The service area is comprised of five separate water systems and three wastewater collection systems. The water systems include: Calvada Valley, Calvada North/Country View Estates, Calvada Meadows, Mountain Falls, and Mountain View Estates. The wastewater systems include: Plant 3 in the Calvada Valley area, Plant F in the Calvada North area, and Mountain Falls in the south.

For many years, UICN operated under a contractual relationship with the Willow Creek Golf Course and Lakeview Golf Course to provide effluent from Wastewater Treatment Plant (WWTP) 3 for irrigation of the golf course properties.

In October of 2008, Willow Creek Golf Course closed its doors. Power was disconnected and the treated effluent from UICN WWTP 3 was no longer being discharged to the Willow Creek Golf Course. UICN was forced to seek a TRO to order Willow Creek Golf Course to appropriately move the water. Over the years, the irrigation pump station and the effluent ponds experienced significant deterioration and the property was not being maintained. The owner of the property declared bankrupcty in November of 2012. Since that time, the court appointed Trustee for the property has developed a plan to address the issues at the property and this plan was approved by the Federal Bankruptcy Court in August of 2013. Part of the plan is to allow UICN to take ownership of the property so as to ensure safe operations of WWTP 3, ensure viable effluent disposal of WWTP 3 effluent and address the property deficiencies.

In the fall of 2013, Utilities Inc. of Central Nevada prepared an amendment to the 2011 Integrated Resources Plan to include a project to remediate the Willow Creek property receiving ponds and pump houses, evaluate the existing property irrigation system, evaluate effluent disposal options and remove dead trees on the property. The 2011 IRP Amendment was approved by the Commission on November 21, 2013. Valentine Environmental Engineers was hired in December 2013 to provide engineering and permitting services for this project.

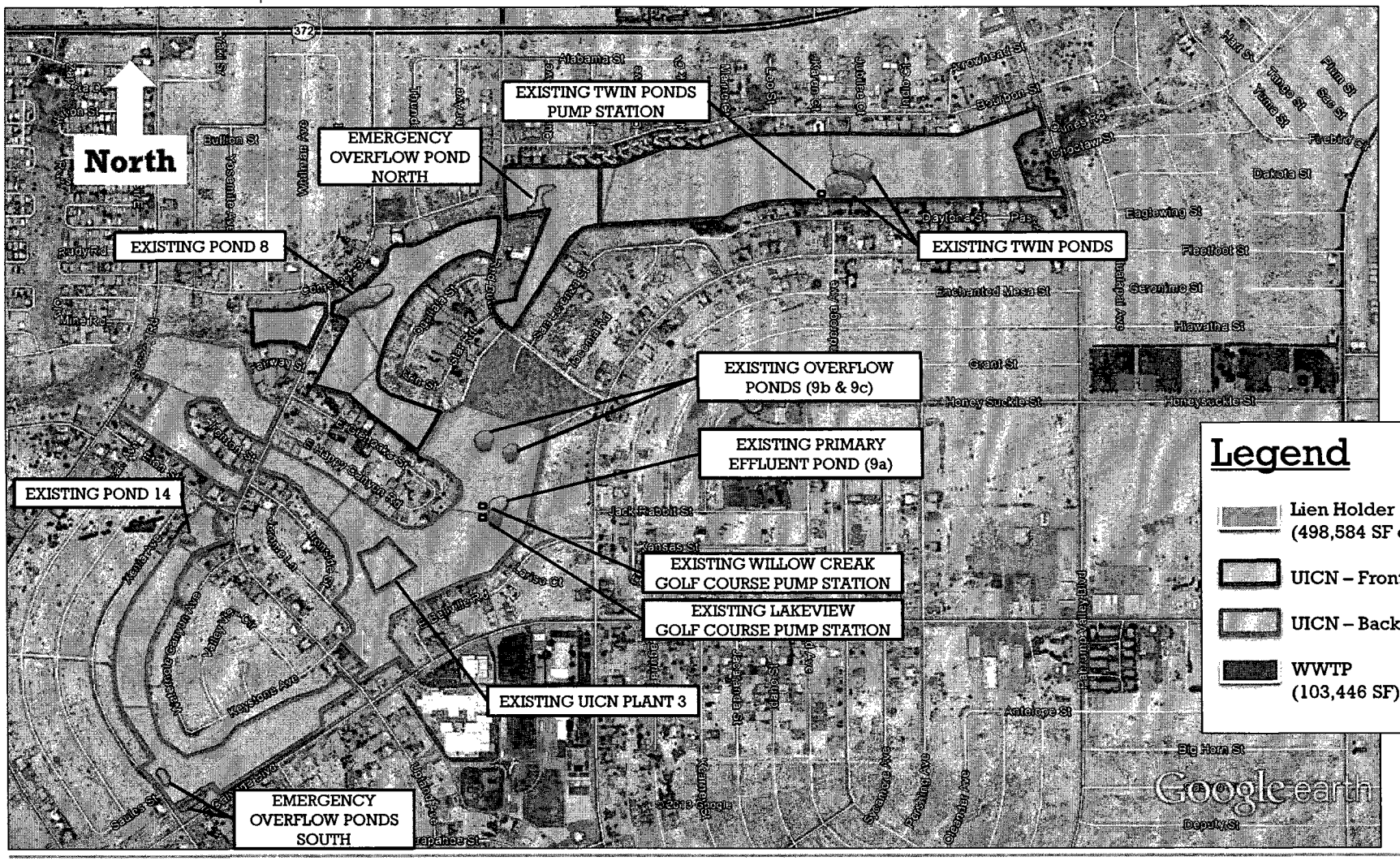
1.2 System Description

The Willow Creek Property Remediation efforts are directly associated with WWTP 3 effluent discharge and the central sewer system. WWTP 3 is a 1.5 MGD permitted plant which discharges effluent for

ultimate disposal as irrigation water. There are 10 lift stations which transmit wastewater to WWTP 3. WWTP 3 provides service to approximately 2,500 customers in the Calvada area of Pahrump, NV including the downtown section of Pahrump and Desert View Hospital. WWTP 3 is designated to serve the Calvada development, which lies generally to the south of Nevada Route 372, east of Blagg Road, west of Highway 160, and north of Jaybird Road. This can be seen in Figure 1. The service area of WWTP 3 slopes east to west falling 240 feet from the east to the west. There are approximately 11,500 parcels within the reasonable service area of WWTP 3. Of the 11,500 serviceable parcels, approximately 6,600 are currently designated as sanitary sewer parcels to be served by UICN.

UICN treats the effluent from WWTP 3 to a reuse category B which is reflected on the discharge permit parameters. No buffer zone is required for Reuse Category B and the spray irrigation of land as a parkland is permitted. UICN has never received a Notice of Alleged Violation from NDEP regarding the quality of the treated effluent discharge from any WWTP.

All of the treated reclaimed water from WWTP 3 is discharged to the existing receiving pond at the Willow Creek property. From there, it is spray irrigated on the Willow Creek property and Lakeview Golf Course. An overall aerial view of the facilities can be seen in Figure 1.



Existing Overall Aerial

Figure 1

1.3 Report Organization and Content

This report is organized into the following sections and associated content:

Section 2.0 Current Operations – The purpose of this section is to describe the condition and operation of the current reclaimed water distribution system.

Section 3.0 Effluent Pumping and Storage Improvements Basis of Design - The purpose of this section is to describe the basis of design and proposed improvements to the Willow Creek property effluent storage and pumping facilities.

Section 4.0 Effluent Disposal Improvements Basis of Design – The purpose of this section is to describe the basis of design and proposed improvements to the Willow Creek property effluent disposal system.

2.0 CURRENT OPERATIONS

WWTP 3 was designed and built to process an average of 1.5 MGD utilizing the following processes: Fine automatic processing, grit removal system, equalization, SBR biological system, tertiary filtration, chlorination, ultraviolet (UV) disinfection and sludge dewatering. Treated reclaimed water is discharged from the effluent box at the end of the UV channel via a 24-inch reclaimed water line. The 24-inch reclaimed water line discharges into an existing receiving pond located on the Willow Creek property. The effluent from the receiving pond is then distributed for reuse via irrigation. The following section describes the current operation of the irrigation system.

2.1 Existing Infrastructure

2.1.1 Existing System Overview

The Willow Creek property is approximately 160 acres. There are nine ponds, two of which are dry these are also referred to as the emergency overflow ponds. WWTP 3 discharges to the existing receiving pond which overflows by gravity to two overflow ponds. These three ponds are lined and the liners in all ponds have deteriorated and are torn in many locations. These ponds can be seen in Figure 1.

There are three pump houses. Two of the pump houses are located near the receiving pond. One of these pump houses sends water to the Lakeview Golf Course via a transmission main. The second pump house moves water around the Willow Creek property. The third pump house is located in the northwest portion of the golf course by the Twin Ponds (Ponds 3 and 5) and

moves water for that portion of the golf course. The Lakeview and Willow Creek pump houses are seriously deteriorated and unsafe. One of the pumps in the Willow Creek pump house is nonfuctioning. Pictures of the existing systems can be found in Appendix A.

2.1.2 Existing System Operation

The Trustee has been operating the Willow Creek pump station and irrigation system over the past several years. Because of limited budget and manpower, the Trustee has been irrigating the "front nine" and any excess effluent is stored in the property ponds or sent to the emergency overflow ponds or "dry" ponds. The Trustee's operator has been inadvertently recharging the effluent during the winter months. The operator reports that the "dry" ponds lose up to four feet of water between each fill cycle when operated.

2.1.3 Status of Existing Irrigation System

Valentine acquired the assistance of an irrigation system expert to perform an in-depth evaluation of the existing irrigation system. In March of 2014, the irrigation consultant inspected the irrigation system and queried the Trustee's operator on the system operation and maintenance issues. A summary of the irrigation system evaluation is provided in Appendix D.

The irrigation system evaluation has uncovered the following major defects associated with the existing irrigation system:

- The "Back nine" irrigation system has not been operated in years and is used as source of replacement parts for the "front nine".
- Only five irrigation controllers on the "front nine" are functional.
- The irrigation system is operated in hand requiring manual opening and closing of irrigation valves; resulting in 12 hour/day operation.
- Main breaks are common in the system and there are concerns that portions of the main line has been operated at velocities resulting in pipe deterioration.
- Both pump systems (Willow Creek and Lakeview) require overhaul.

The irrigation system assessment recommends the replacement of all controllers and irrigation valves on the front nine, along with replacement of the main line. The cost to rehabilitate the irrigation system is in excess of $1,000,000 and would require a significant amount of dedicated manpower by UICN to operate and maintain the irrigation system as well as perform landscape maintenance (weed abatement, mowing, etc).

In addition, the existing pump houses also have significant issues, including:

- The pump houses are in a state of disrepair with damaged roofs and walls.
- The electrical equipment is not grounded properly and there are runs of electrical conduit that are exposed and pose a safety hazard.
- The pump houses are littered with debris, making it difficult to access equipment.

Appendix A contains pictures of the existing pump houses.

3.0 EFFLUENT PUMPING AND STORAGE IMPROVEMENTS BASIS OF DESIGN

As a part of the 2011 IRP Amendment, UICN has proposed a plan to remediate the Willow Creek property to allow a reliable means of effluent disposal. As a part of this remediation effort, the pump houses and ponds would be rehabilitated. This section provides the basis of design for the proposed pumping and effluent storage improvements.

3.1 Willow Creek Improvements

3.1.1 Willow Creek Receiving Pond

The existing receiving pond will be rehabilitated and enlarged, plus a new receiving pond will be constructed. The volume of each basin will provide adequate storage for discharge to irrigation. Table 1 shows the volumes of the new receiving ponds.

Table 1. Effluent Receiving Pond Basis of Design
Utilities, Inc. of Central Nevada
Willow Creek Property Remediation

Location	Volume
Total Existing Receiving and Overflow Pond Volume	**1,700,000 gal**
New East Receiving Pond	1,396,603 gal
New West Receiving Pond	2,474,040 gal
Total New Volume	**3,870,643 gal**

The ponds will be lined with a 60-mil HDPE liner in accordance with NDEP guidance documents. This will prevent any contamination of the soil and potentially groundwater aquifers in the area. This liner will be protected from UV degradation by specifying a liner material with a UV inhibitor.

The receiving ponds have a total lined depth of 10-feet. This includes 2-feet of freeboard giving a total operational depth of 8-feet and a volume of 3.8 million gallons. WWTP 3 discharges treated effluent to these ponds via a 24-inch line. This line will be connected to each receiving pond with isolation valves that will allow flow to be sent to either both ponds or a single pond. The east and west receiving pond will be interconnected with a 12-inch line that will equalize the two basins as the water surface rises and falls. Each receiving pond has the necessary piping to act as the suction pond for the pump houses. Through opening and closing a series of valves, the operators will be able to control which pond supplies the pumps. This series of valves will also allow for maintenance on liners, suction screens etc. by allowing one pond to be isolated from the other.

Each lined pond will have aerators installed to provide adequate mixing and prevent the settling of solids. The mixers will operate independently and can supply sufficient turnover for its respective basin.

3.1.2 Willow Creek Pump House

The remediation to the Willow Creek pump house includes:

- Demolition of existing building.
- Demolition of existing suction piping.
- Installation of new shade structure to protect existing pumping equipment.
- Installation of new suction and discharge piping and appurtenances.
- Electrical equipment upgrades to bring all electrical gear up to current electrical code standards.

These listed improvements will assist the utility with operations and reliable effluent disposal along with providing a safe operating that meets all necessary code requirements.

The existing pumps will remain in place and be utilized to continue to draw the reclaimed water from the receiving ponds and appropriately distribute to the irrigation fields for final disposal.

With the proposed improvements, the Willow Creek pump house will be capable of drawing water from either the east or the west receiving pond.

The engineering plans show the proposed suction and discharge piping arrangements.

3.1.3 Willow Creek Safety Measures

UICN will be taking all safety measures into account to ensure that the general public will not have access to the discharged effluent in the ponds. Some of the methods used will be chain link fencing around the entire perimeter of the receiving ponds along with posted signs indicating the presence of reclaimed water. Decorative fencing will be installed at Ponds 8, 14, and the Twin Ponds as a means of prevention that will appeal to the residents and will incorporate warning signs. These precautions will be in accordance with NDEP regulations. Figure 2 shows the pond warning signage that will be utilized along with the decorative fencing.

Pond Warning Signage

Figure 2

As a means of safety for any unauthorized entry into the receiving ponds, knotted hand lines will be provided to assist with emergency egress. These knotted hand lines will be placed at the mid-point of each pond edge and will extend to the full depth of the lined ponds.

3.2 Lakeview Improvements

3.2.1 Lakeview Pump House

The proposed remediation to the Lakeview pump house would include:

- Demolition of existing buildings.
- Demolition of existing suction piping.
- Installation of new shade structure to protect existing pumping equipment.
- Installation of new suction and discharge piping and appurtenances.
- Electrical equipment upgrades to bring all electrical gear up to current electrical code standards.

These listed improvements will assist the utility with operations and reliable effluent disposal along with providing a safe operating environment that meets all applicable code requirements.

The existing pumps will remain in place and be utilized to continue to draw the reclaimed water from the receiving ponds and appropriately distribute as normally operated.

With the proposed improvements, the Lakeview pump house will be capable of drawing water from either the east or the west receiving pond. The engineering plans show the proposed suction and discharge piping arrangements.

4.0 EFFLUENT DISPOSAL IMPROVEMENTS BASIS OF DESIGN

To determine if rapid infiltration basins were a viable option in lieu of major rehabilitation of the existing irrigation system, preliminary percolation tests were performed at various locations at the Willow Creek property. Figure 3 depicts the locations of the percolation test pits and Appendix B contains the geotechnical report summarizing the results of the percolation tests. The percolation tests indicated the following infiltration rates:

- Test Pit 1: 20 min/inch or 6 ft/day
- Test Pit 3: 10 min/inch or 12 ft/day
- Test Pit 4: 30 min/inch or 4 ft/day

The geotechnical investigation recommends a safety factor of 1.5.

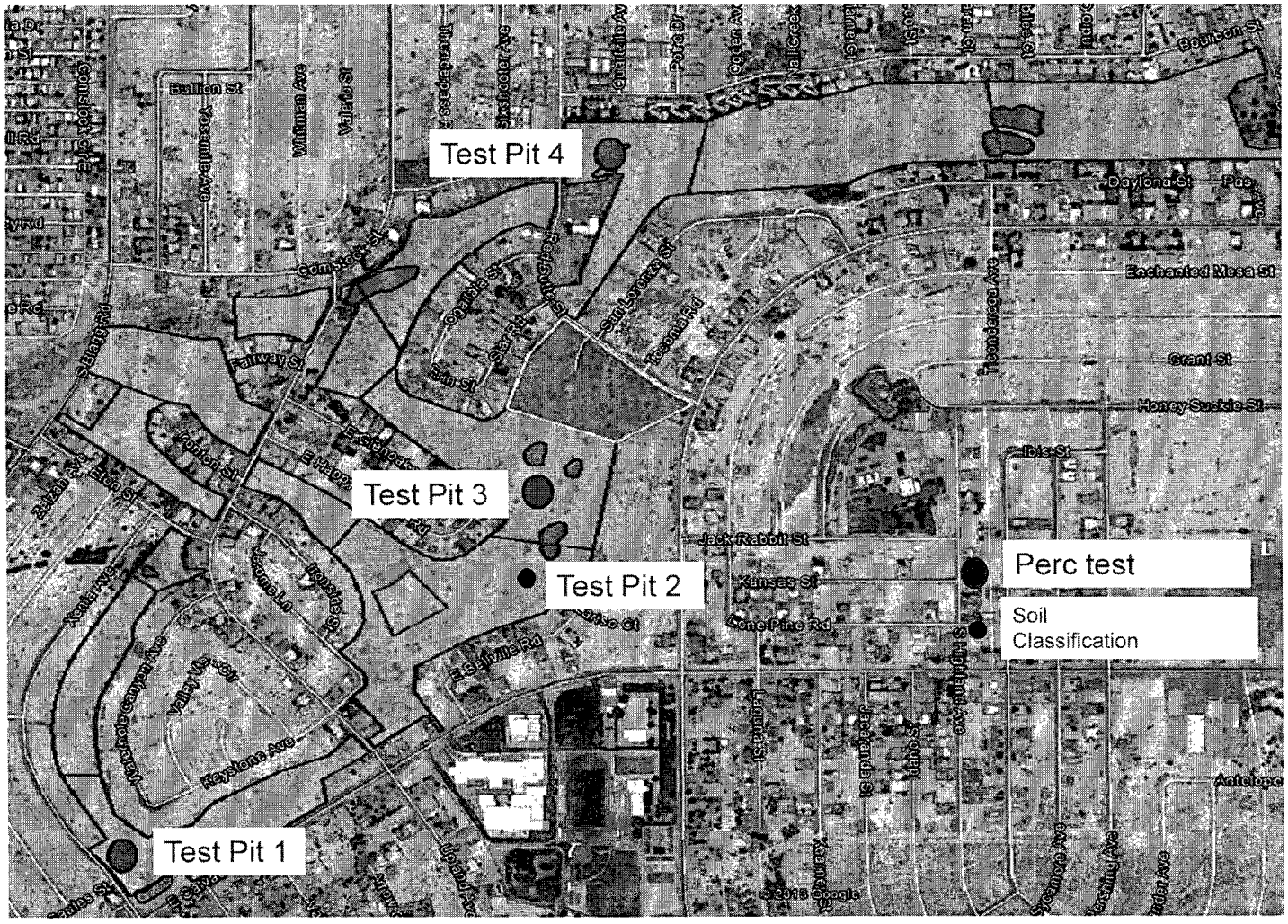
Based on the success of the preliminary recharge investigation, the primary method of effluent disposal will be to rapid infiltration basins (RIBs). The following section outlines the basis of design for the RIBs.

4.1 Rapid Infiltration Basin Basis of Design

The WWTP 3 currently treats 650,000 gpd and the facility has a permitted capacity of 1.5 mgd. UICN would like to install RIB capacity for the permitted capacity in stepwise manner:

1) Operate under current interim effluent management plan until step 2 below is completed.
2) Utilized existing overflow ponds as RIBs in the interim to accept the existing WWTP 3 effluent discharge of 650,000 gpd. The effluent management plan and discharge permit would contain stipulations to construct remaining RIB capacity in a centralized area within a certain timeframe. Irrigation of the property would still be provided for tree maintenance and irrigation of adjacent school property, but will not be primary method of disposal.
3) Install additional RIB capacity in a centralized area to accept 1.5 mgd of effluent disposal capacity within time limits specified in effluent management plan and discharge permit.

The basis of design for the first or interim phase of RIBs (650,00 gpd) is presented in Table 2 below. The plan for the RIB capacity in this phase is to utilize the existing "dry" or emergency overflow ponds and the existing overflow ponds. The liners would be removed from the existing overflow



Percolation Test Locations

Figure 3

ponds and the overflow ponds would be regraded to allow for basin access and provide a defined basin area. There would be minimal work performed on the "dry" ponds, except to remove vegetation and scarify the pond bottoms. The bottom surface area of each of these ponds is summarized in Table 2.

A surface area of 32,590 square feet is required to accept 650,000 gpd of effluent. This value is based upon applying a 1.5 factor of safety to the lowest test infiltration rate of 4 ft/day which results in a design recharge rate of 2.7 ft/day. With the largest RIB out of service for drying, there is sufficient area to accept the entire 650,000 gpd of existing effluent discharge.

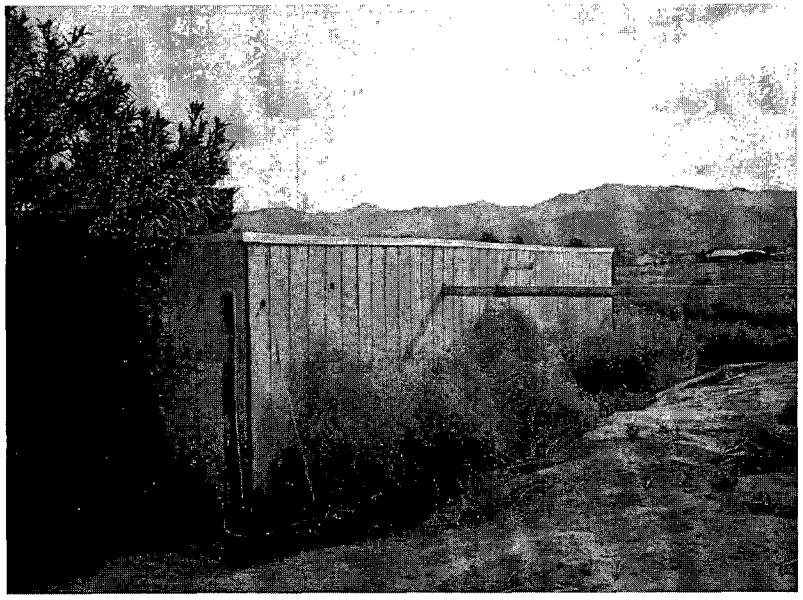
The regraded overflow ponds, denoted as the east and west recharge basins on the engineering plans will be provided with gravel trenches of approximately 12 foot depth (as measured from bottom of basin). The geotechnical report indicated a caliche layer of 4 to 9 foot depth below land surface and the east and west recharge ponds will have a bottom set at 5 feet below grade.

Table 2. Interim Rapid Infiltration Basins Basis of Design
Utilities, Inc. of Central Nevada
Willow Creek Property Remediation

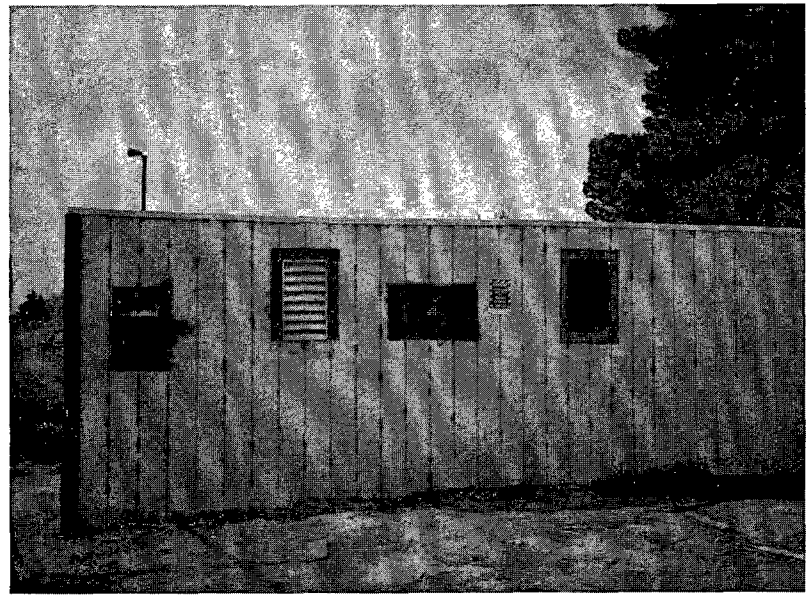
Location	Area, Sq Feet
North Recharge Basin	19,360
South Recharge Basin	12,000
Existing Emergency Overflow Pond South	7,460
Existing Emergency Overflow Pond North	12,700
Total Interim RIB Area	**51,520**
RIB Area with Largest RIB Out of Service	**32,160**

In the second phase of RIB additions, the use of the existing emergency overflow ponds will be abandoned and additional ponds in the vicinity of the north and south RIBs will be added. This will allow for a centralized recharge area.

Appendix A - Existing Pump House Photos



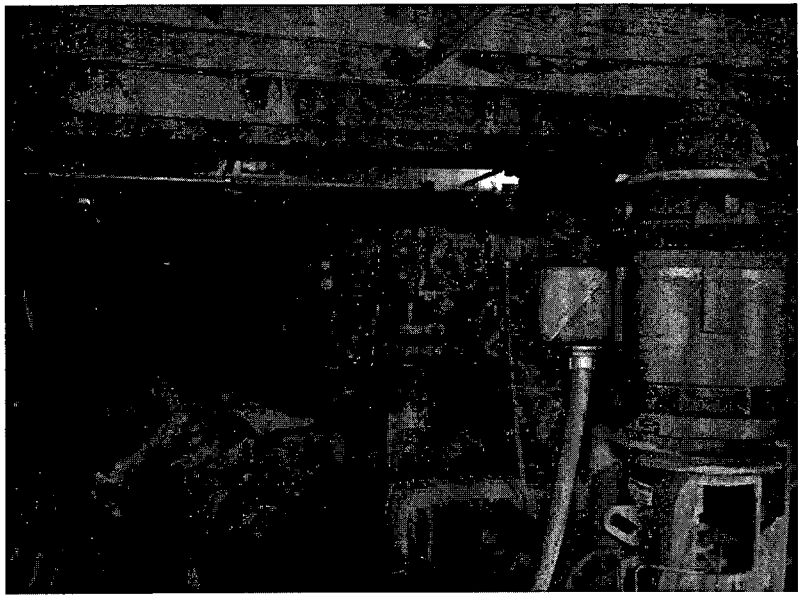
Willow Creek Pump House



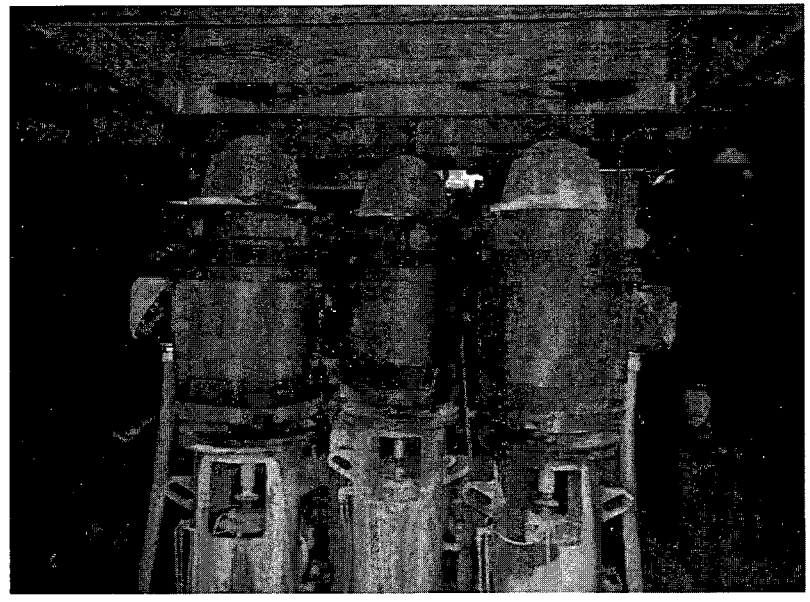
Willow Creek Pump House

Willow Creek Pump House

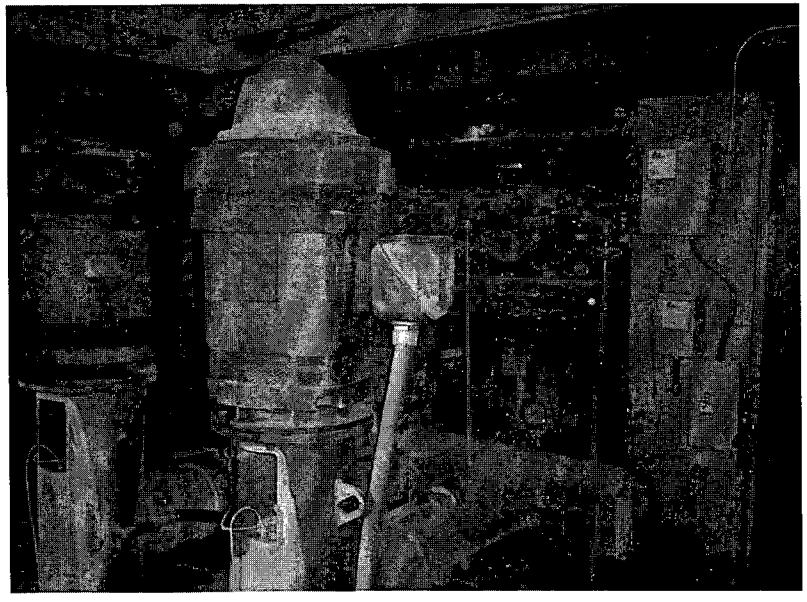
Willow Creek Pump House



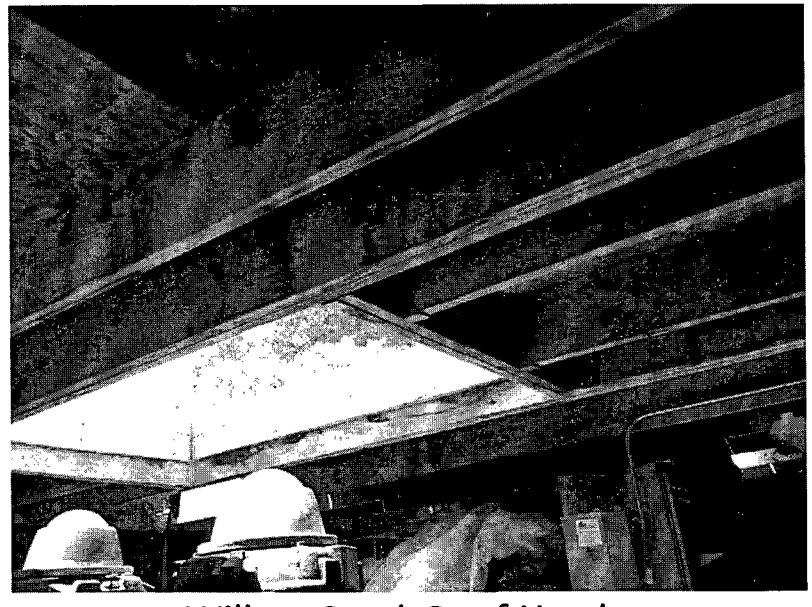
Willow Creek Pumps



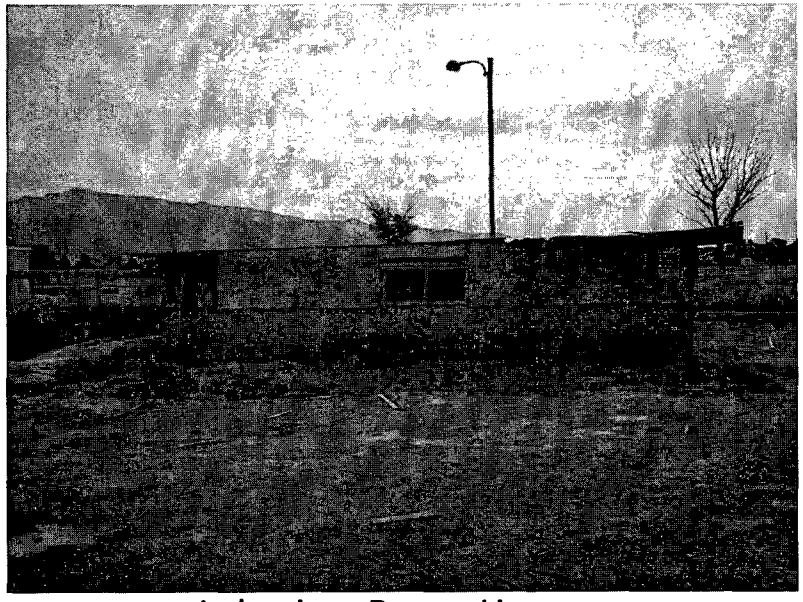
Willow Creek Pumps



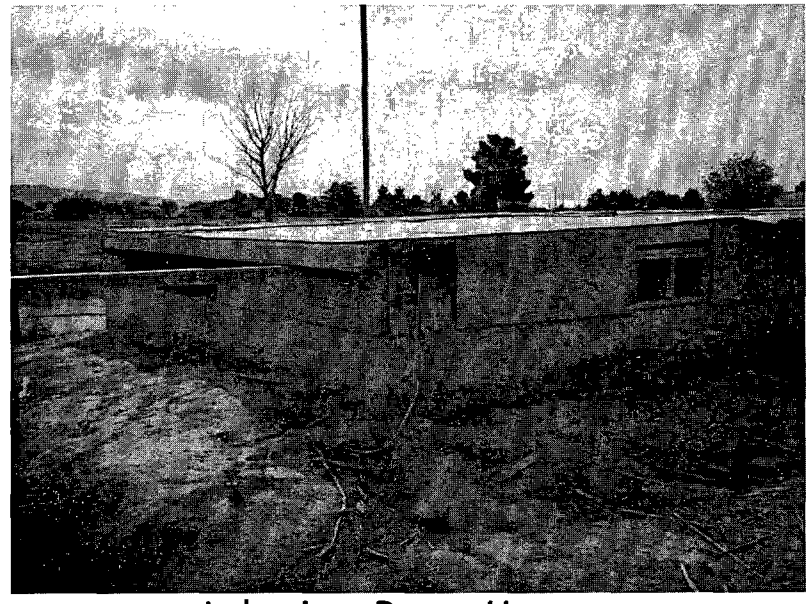
Willow Creek Pumps



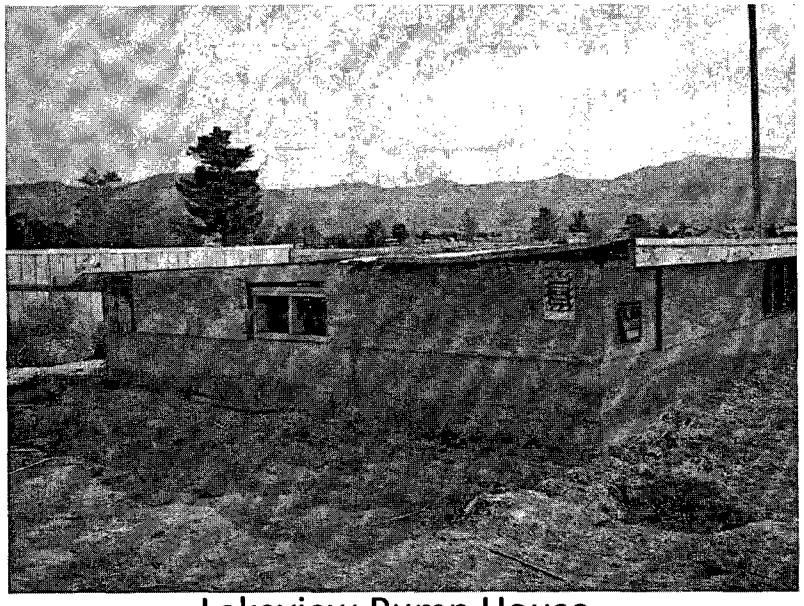
Willow Creek Roof Hatch



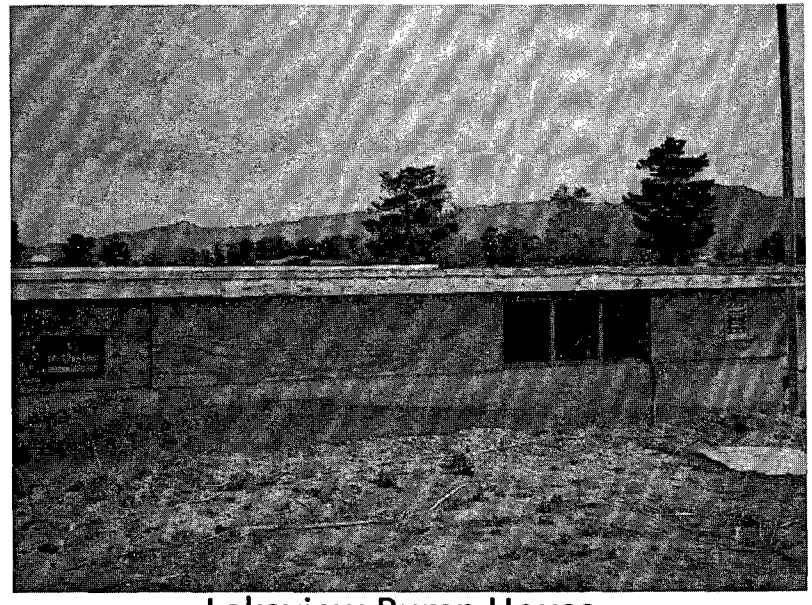
Lakeview Pump House



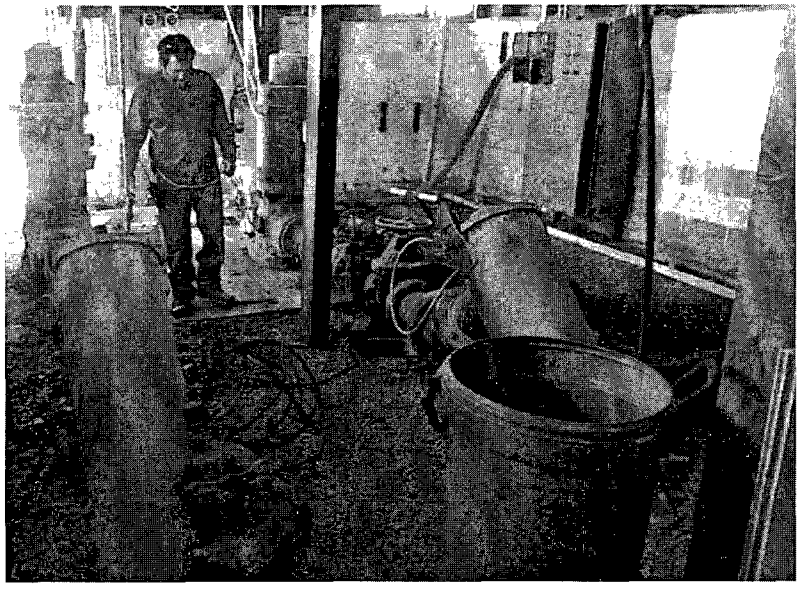
Lakeview Pump House



Lakeview Pump House

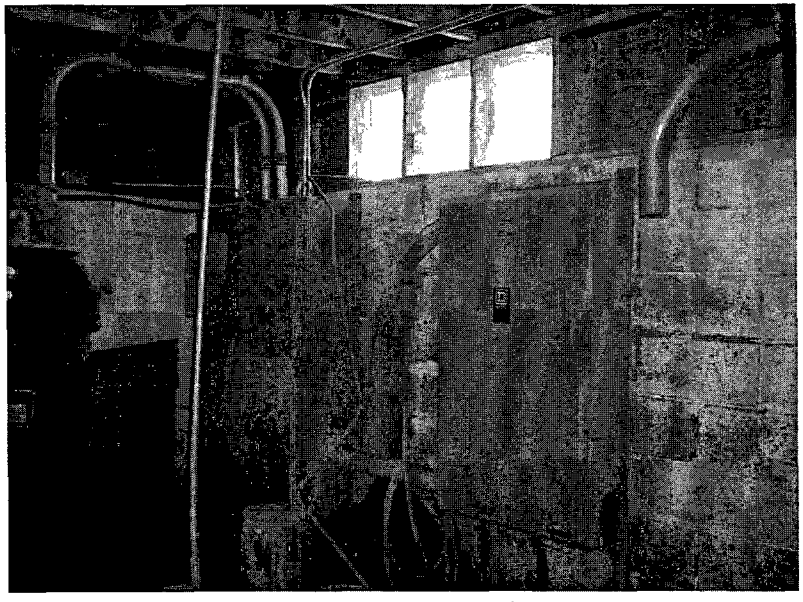


Lakeview Pump House



Lakeview Pumps

Lakeview Pumps



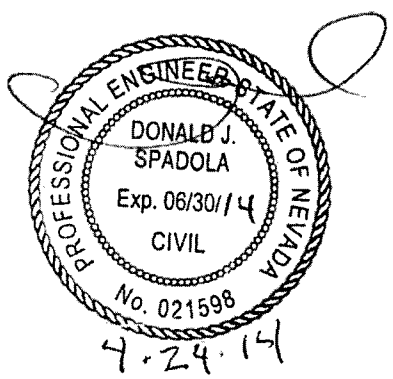
Lakeview Electrical Gear

Appendix B - Geotechnical Report

GEOTECHNICAL EVALUATION
WILLOW CREEK GOLF COURSE
NEW STORAGE PONDS AND FACILITIES
1500 RED BUTTE STREET
PAHRUMP, NEVADA
JOB NO. 4124XD007

Western Technologies Inc.
The Quality People
Since 1955

LAS VEGAS – NEVADA
6633 West Post Road
Las Vegas, Nevada 89118
(702) 798-8050 • fax 798-7664



Prepared for:

Valentine Environmental Engineers

April 24, 2014

Donald J. Spadola, P.E.
Director of Geotechnical Services

Reviewed by: Craig P. Wiedeman, P.E.
Senior Geotechnical Engineer

Western Technologies Inc.
The Quality People
Since 1955

6633 West Post Road
Las Vegas, Nevada 89118
(702) 798-8050 • fax 798-7664

April 24, 2014

Valentine Environmental Engineers
15845 South 46th Street, Suite 144
Phoenix, Arizona 85048
Attn: Teresa Valentine

Re: Geotechnical Evaluation
Willow Creek Golf Course
New Storage Ponds and Facilities
1500 Red Butte Street
Pahrump, Nevada

Job No. 4124XD007

Western Technologies Inc. has completed a geotechnical evaluation for the new Storage Ponds planned for construction at the referenced site in Pahrump, Nevada. This study was performed in general accordance with our proposal number 4124PD010.R01 dated February 13, 2014. The results of our study, including the site vicinity map, test pit location diagram, laboratory test results, test pit logs, and the geotechnical recommendations are attached.

We have appreciated being of service to you in the geotechnical engineering phase of this project and are prepared to assist you during the construction phases as well. If design conditions change, or if you have any questions concerning this report or any of our testing, inspection, design and consulting services, please do not hesitate to contact us. We look forward to working with you on future projects.

Sincerely,
WESTERN TECHNOLOGIES, INC.
Geotechnical Engineering Services

Donald J. Spadola, P.E.
Director of Geotechnical Services

Copies to: Addressee (3)

TABLE OF CONTENTS

Page No.

TABLE OF CONTENTS (Continued)

GEOTECHNICAL EVALUATION
WILLOW CREEK GOLF COURSE
NEW STORAGE PONDS AND FACILITIES
1500 RED BUTTE STREET
PAHRUMP, NEVADA
JOB NO. 4124XD007

1.0 PURPOSE

This report contains the results of our geotechnical evaluation for the proposed new Storage Ponds and facilities to be constructed within the Willow Creek Golf Course at 1500 Red Butte Street in Pahrump, Nevada. The purpose of these services is to provide information and recommendations regarding:

- foundation design parameters
- slabs-on-grade
- lateral earth pressures
- earthwork
- anticipated excavation conditions
- drainage
- corrosivity

Results of the field exploration, field tests, and laboratory testing program are presented in the Appendices.

2.0 PROJECT DESCRIPTION

The Utilities Incorporated of Central Nevada (UICN) discharges treated waste water effluent on the Willow Creek Golf Course in Pahrump, Nevada as shown on the attached Plate 1, Site Vicinity Map. The effluent is discharged through a series of storage ponds and via spray irrigation. The expansion of three existing storage ponds and the addition of a new pond are planned at the golf course. In addition, some lightly loaded walls, concrete equipment pads for pumps and electrical equipment, and shade canopies will need to be supported by shallow foundations. You requested Western Technologies Inc. to conduct a geotechnical evaluation to provide geotechnical recommendations for the project. Should any of this information not be correct, we should be notified immediately.

3.0 SCOPE OF SERVICES

3.1 Field Exploration

Four (4) test pits were excavated to a depth of approximately 10 feet below the existing ground surface at the locations shown on the attached Plate 2, Test Pit Location Diagram. Test Pits 1, 3, and 4 were excavated adjacent to existing ponds. Test Pit 2 was excavated near the location of a planned new pond. Logs of the test pits are attached. Surface and subsurface materials encountered during the excavations were observed and sampled at selected depth intervals. Percolation tests were performed near the location of Test Pits 1, 3, and 4. The results of the percolation tests are presented in Section 5.2 of this report.

A field log was prepared for each test pit. These logs contain visual classifications of the materials encountered during excavation as well as interpolation of the subsurface conditions between samples. The attached final logs represent our interpretation of the field logs and include modifications based on laboratory observations and tests of the field samples. The final logs describe the materials encountered, their thicknesses, and the locations where samples were obtained. The Unified Soil Classification System was used to classify soils. The soil classification symbols appear on the test pit logs and are briefly described on the attachments.

3.2 Laboratory Analyses

Laboratory analyses were performed on representative soil samples to aid in material classification and to estimate pertinent engineering properties of the on-site soils for preparation of this report. Testing was performed in general accordance with applicable specifications. The following tests were performed and the results are attached.

- Gradation
- Plasticity
- Expansion potential
- Water soluble sulfate and total salts
- pH and Resistivity

Test results were utilized in the development of the recommendations contained in this report.

3.3 Analyses and Report

This geotechnical evaluation report includes a description of the project, a discussion of the field and laboratory testing programs, a discussion of the subsurface conditions, and design recommendations as required to satisfy the purpose previously described.

This report is for the exclusive purpose of providing geotechnical engineering and/or testing information and recommendations. The scope of services for this project does not include, either specifically or by implication, any environmental assessment of the site or identification of contaminated or hazardous materials or conditions. If the owner is concerned about the potential for such contamination, other studies should be undertaken. We are available to discuss the scope of such studies with you.

4.0 SITE CONDITIONS

4.1 Surface

The Site consists of gentle hills, valleys, and ponds typical of a golf course layout. The area includes mature trees with some grass or ground cover. A paved cart path runs throughout the Site.

4.2 Subsurface

The native soils consisted of medium to high plasticity clay (CL and CH) throughout the depth of the test pits. A deposit of partially cemented caliche was encountered in Test Pit 1 at a depth of 4 to 9 feet. Soil moisture contents to a depth of about 10 feet were described as slightly damp. Groundwater was not encountered in any of the test pits. Groundwater levels and soil moisture conditions can be expected to fluctuate with varying local and regional seasonal and perennial weather conditions, changes in surface and subsurface drainage patterns, adjacent construction or development, and other factors.

We researched groundwater levels and flow direction in the vicinity of the site. No recent well or groundwater information is readily available in the site vicinity. Water wells drilled in the vicinity of the site in the early 1990's indicated groundwater levels were generally encountered at depths of 30 to 40 feet below the ground surface. Groundwater flow direction in the vicinity is expected to follow the surface topography which is in a westerly to southwesterly direction.

4.3 Geology

4.3.1 Seismicity

Numerous seismic events, most of which are a probable result of underground blasting at the Nevada Test Site (about 90 miles north of Las Vegas), have been felt in and around the Pahrump area. There is a noticeable lack of earthquakes that have epicenters in the Southern Nevada area and are directly attributable to deep-seated tectonic movement. A few events recorded in the Henderson area and in Lincoln County registered between 5.0 and 6.0 Richter magnitude. Most of the recorded events in the area range between 4.0 and 4.9. Based on the 2009 International Building Code (IBC), we recommend the site be assigned Site Class D (default classification).

4.3.2 Geologic Constraints

No known or mapped earth subsidence fissures, due to regional groundwater withdrawal exist in the site vicinity. No evidence has been noted of distress arising from areal subsidence due to regional groundwater withdrawal.

Observation of the ground surface indicated no readily discernible evidence of recent compaction faulting or fissuring. Compaction faults are generally accepted as features resulting from deep-seated differential consolidation of alluvial materials with dissimilar grain-size and compressibility characteristics. Fissures are understood to be the results of a subsurface erosion process occurring in tension fractures at or near the surface of uncemented, relatively fine-grained soils.

5.0 GEOTECHNICAL PROPERTIES

5.1 Laboratory Tests

Laboratory test results indicate that the near surface soils are clays of medium to high plasticity. Expansion testing on the near surface soils indicated these soils have a moderate to high expansion potential for slabs-on-grade and lightly loaded foundations.

5.2 Field Tests

Percolation testing was performed in shallow test holes to determine the percolation rates for the below surface soils. The tests were conduced in shallow test trenches excavated by the backhoe to depths of 2 to 3 feet below the ground surface at the locations indicated below. The percolation test holes were hand excavated at the bottom of the test trenches and were approximately 1 foot square and 1 foot in depth. The test holes were presoaked for approximately 6 hours before conducting the percolation tests. During the presoaking, the water completely drained from the percolation test holes in less than 1 hour and then the test holes were refilled. The percolation tests were conducted by filling the percolation test holes with 6 inches of water and recording the time for the water to recede 1 inch. The test hole was then refilled to the 6 inch level and the test was repeated until a stabilized rate was achieved (i.e., less that 10 percent difference between 3 successive readings). The percolation test results are presented below:

Test Location		Stabilized Rate
o Test Pit 1 at 2 feet	-	20 minutes/inch
o Test Pit 3 at 2 feet	-	10 minutes/inch
o Test Pit 4 at 3 feet	-	30 minutes/inch

Based on the results of the percolation testing, we recommend that a percolation rate of 30 minutes per inch be used. We also recommend that a factor of safety of at 1.5 be used to account for silting of the ponds over time.

6.0 RECOMMENDATIONS

6.1 General

Recommendations contained in this report are based on our understanding of the project criteria described in Section 2.0, PROJECT DESCRIPTION, and the assumption that the soil and subsurface conditions are those disclosed by the borings. Others may change the plans, final elevations, number and type of structures, foundation loads, and floor levels during design or construction. Substantially different subsurface conditions from those described herein may be encountered or become known. Any changes in the project criteria or subsurface conditions shall be brought to our attention in writing.

The test pits and laboratory testing indicated that the site soils are medium to high plasticity clays. Expansion testing conducted on these site soils indicated they posses a moderate to high expansion potential when supporting concrete slabs and lightly loaded foundations. For this reason concrete equipment pads and shallow foundation should be supported on engineered fill materials consisting of imported soils of low expansion potential.

Based on the site soil conditions and Table 1704.7 of the Southern Nevada Amendments to the 2009 IBC, we recommend a Level B inspection for the project

6.2 Shallow Foundations

As previously discussed, the site soils are medium to high plasticity clays that posses moderate to high expansion potential. Therefore, we recommend that shallow foundations bear upon imported engineered fill materials of low expansive potential. The engineered fill should extend to a minimum depth of 2 feet below the bottom of the footing and a minimum of 2 feet beyond the edges of the footing. An allowable bearing pressure of 3,000 pounds per square foot (psf) can be used in sizing the footings. Footings should bear a minimum of 18 inches below the lowest adjacent grade within 5 feet of the footings. The recommended minimum width of column and wall footings is 24 inches and 16 inches, respectively. The imported granular fill materials should meet the specifications requirements presented in this report. The imported fill materials should be placed and compacted under engineering observation and testing.

Total and differential settlement of the lightly loaded structures is estimated to be ½ inch or less. Additional foundation movements (either settlement or heave) could occur if water from any source infiltrates the foundation soils. Therefore, proper drainage should be provided in the final design and during construction to help reduce moisture infiltration into the foundation soils.

All footings, stem walls, and any masonry walls should be reinforced to reduce the potential for distress caused by differential foundation movements. The use of joints at openings or other discontinuities in any masonry walls is recommended.

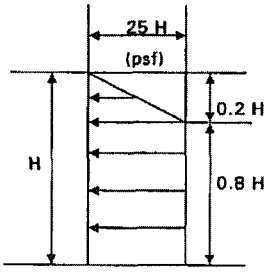
Site preparation procedures and foundation excavations should be observed by the geotechnical engineer to assess that adequate bearing conditions exist and that recompaction of existing site soils and/or placement of imported engineered fill has been performed satisfactorily. If the soil conditions encountered differ significantly from those presented in this report, supplemental recommendations will be required.

6.3 Lateral Design Criteria

Lateral loads can be resisted by soil friction and by the passive resistance of the soils. A coefficient of friction of 0.35 can be used between the concrete foundation and the supporting soils. The passive resistance of natural soils or properly compacted fill can be approximated by the pressure developed by a fluid with a density of 300 pounds per cubic foot (psf/ft). The passive pressure and the frictional resistance of the soils can be combined without reduction in determining the total lateral resistance. If necessary, an active earth pressure of 35 psf/ft and an at-rest earth pressure of 55 psf/ft can be used for the design of any retaining structures.

6.3.1 Retaining Walls

Cantilevered retaining walls, with free-draining level backfills and without surcharge, may be designed assuming that the soils will impose a pressure equal to that developed by a fluid with a density of 35 pounds per cubic foot. Braced retaining walls, with free draining level backfills and without surcharge, may be designed assuming that the soils will impose a pressure with the following distribution:



Any uniform surcharge loading should be added to the above pressures using a factor of 0.30. As indicated, the stated pressures assume that hydrostatic pressure will not develop. Therefore, we recommend that a wall drainage system be provided and that the structural fill placed behind retaining walls be granular and free draining (less than 5% fines).

Additional lateral loads on cantilevered and braced walls due to a seismic event should be added to the static pressures. Based on recommendations presented in 2000 NEHRP, the seismic component may be calculated by the following equations:

Unrestrained Elements:	$P_{AE}=\frac{3}{8}K_hH^2\gamma$	(psf/linear foot of wall)
Restrained Elements:	$P_{AE}=K_hH^2\gamma$	(psf/linear foot of wall)

Where $K_{h/}=S_{DS}/2.5$, H is the height of the wall in feet, and γ is the unit weight of the backfill material in pcf. The resultant seismic earth pressure P_{AE}, acts at a distance of 0.6H above the base of the wall.

For this site, $P_{AE}=10H^2$ and $27H^2$ for unrestrained elements and restrained elements, respectively.

Based on information obtained from Google Maps, the Latitude and Longitude for the site are determined to be 36.1949°N and 116.0051°W, respectively.

6.4 Seismic Considerations

For structural designs based upon the 2009 International Building Code, the recommended site class is D. S_s, the spectral accelerations for short periods is 0.47g. S_1 the spectral acceleration for a 1-second period is 0.19g. F_a and F_v, in accordance with Table 1613.5.3(1) and 1613.5.3(2) are 1.43 and 2.03, respectively.

6.5 Slab-on-Grade Support

The site soils are medium to high plasticity clays that possess moderate to high expansion potential. As a result, the on-site clayey soils should not used as fill below any concrete slabs. We recommend that all concrete slabs be supported on a minimum of 2 feet of low expansive imported fill material. Therefore, depending upon the finished grade elevation, up to 2 feet of the existing site soils may need to be removed and replaced with low expansive imported fill materials. We recommend using a modulus of subgrade reaction (k) of 200 pounds per cubic inch (pci). The slab subgrade should be prepared by the procedures outlined in this report. A minimum 4 inch thick layer of granular base course (Type II or similar) should be provided beneath all slabs to help prevent capillary rise and a damp slab.

All concrete placement and curing operations should follow the American Concrete Institute manual recommendations. Improper curing techniques and/or high slump (water-cement ratio) could cause excessive shrinkage, cracking or curling. The plastic properties of the concrete should be documented at the time of placement and specimens should also be prepared for strength testing to verify compliance with project specifications. Concrete slabs should be allowed to cure adequately before placing vinyl or other moisture sensitive floor covering.

6.6 Drainage

The major potential cause of soil problems in the site vicinity is moisture increase in soils below structures. Therefore, it is extremely important that positive drainage be provided during construction and maintained throughout the life of all proposed structures. Infiltration of water into utility or foundation excavations must be prevented during construction. No surface features which could retain water adjacent to the structures should be constructed.

In areas where concrete or asphalt paving do not immediately adjoin the structures, protective slopes should be provided with an outfall of about 5 percent for at least 10 feet from structure. Backfill against footings, exterior walls, and in utility line trenches should be well compacted and free of all construction debris to minimize the possibility of moisture infiltration.

6.7 Corrosivity

The chemical test results indicate that the soils at the site classify as negligibly corrosive to concrete. However in keeping with local practice, we recommend that Type V Portland cement be utilized in all concrete in contact with site soils.

Consideration should be given to providing protection to buried metal pipes or use of nonmetallic pipe where permitted by local codes.

7.0 EARTHWORK

7.1 General

The conclusions contained in this report for the proposed construction are contingent upon compliance with recommendations presented in this section. Any excavating, trenching, or disturbance which occurs after completion of the earthwork must be backfilled, compacted and tested in accordance with the recommendations contained herein. It is not reasonable to rely upon our conclusions and recommendations if any future unobserved and untested trenching, grading or backfilling occurs.

7.2 Site Clearing

Strip and remove any existing asphalt or concrete pavements, fill materials, vegetation, debris, and other deleterious materials from the structure areas. The structure area is defined as that area within the structure footprint plus 5 feet beyond the perimeter of the footprint. All exposed surfaces should be free of mounds and depressions which could prevent uniform compaction.

7.3 Excavation

We anticipate that excavations into the upper 10 feet of the site soils can be accomplished with conventional equipment. A partially cemented caliche deposit was encountered in one of the test pits. This deposit did not prohibit excavation efforts with a backhoe.

7.4 Excavations and Slopes

The soils at the Site should be considered Type B soils when applying OSHA regulations. OSHA recommends a maximum slope inclination of 1:1 (horizontal:vertical) for Type B soils. Slopes may need to be flattened depending on conditions exposed during construction. If there is not enough space for sloped excavations, shoring should be used.

As a safety measure, it is recommended that all vehicles and soil piles be kept a minimum lateral distance back from the crest of the slope at least equal to the slope height. The exposed slope face should be protected against the elements.

The individual contractors should be made responsible for designing and constructing stable, temporary excavations as required to maintain stability of both the excavation sides and bottom. The soils to be penetrated by the proposed excavation may vary across the Site. Our soil classifications are based solely on the materials encountered in four exploratory test pits. The contractor should verify that similar conditions exist throughout the proposed area of excavation. If different subsurface conditions are found at the time of construction, we should be contacted immediately to evaluate the conditions encountered.

7.5 Foundation and Building Pad Preparation

After site clearing operations are complete, remove the existing soils to at least 2 feet below the base of the foundation elevation. Proff-roll the base of the excavation to observe for any loose or otherwise unsuitable materials that may remain below the foundation level. Any soft, loose, disturbed or otherwise unsuitable material should be over-excavated and replaced with

engineered fill material. Then place and compact, under engineering observation and testing, low expansive potential imported fill materials as necessary to reach final subbase elevation. Engineered fill for pad construction should consist of properly compacted imported granular fill material. The on-site soils should not be used as fill material to construct any structure pads at the site.

7.6 Materials

a. Imported granular soil with a maximum dimension of 6 inches should be used as fill material in the following areas:

- foundation areas
- concrete slab areas
- backfill

c. Imported soils should conform to the following:

- Gradation (ASTM C136): percent finer by weight

6"	100
4"	85-100
3/4"	70-100
No. 4 Sieve	50-100
No. 200 Sieve	30 (max)

- Maximum expansive potential (%)* 4.0
- Maximum soluble sulfates (%) 0.10

* Measured on a sample compacted to approximately 95 percent of the ASTM D1557 maximum dry density at about 3 percent below optimum water content and then oven dried. The sample is then confined under a 60 psf surcharge and submerged.

c. Base course should conform to applicable Nye County specifications or other appropriate governing specifications.

7.7 Placement and Compaction

a. Place and compact fill in horizontal lifts, using equipment and procedures that will produce recommended water contents and densities throughout the lift.

b. Uncompacted fill lifts should not exceed 8 inches.

c. Materials should be compacted to the following:

Material	Minimum Percent Compaction (ASTM D1557)
• Imported soils, reworked and fill:	
Below footings	95
Below slabs-on-grade	90
• Aggregate base:	
Below slabs-on-grade	95
• Miscellaneous backfill	90

On-site clayey soils should not be used as structural backfill on the site. The on-site soils can be used as miscellaneous backfill. The on-site soils and imported granular soils should be compacted with a moisture content that facilitates proper compaction to achieve the required density.

7.8 Compliance

Recommendations for the proposed foundations and floor slab supported on compacted fills or prepared subgrade depend upon compliance with EARTHWORK recommendations. To assess compliance, observation and testing should be performed under the direction of a geotechnical engineer.

8.0 LIMITATIONS

This report has been prepared assuming the project criteria described in Section 2.0. If changes in the project criteria occur, or if different subsurface conditions are encountered or become known, the conclusions and recommendations presented herein shall become invalid. In any such event,

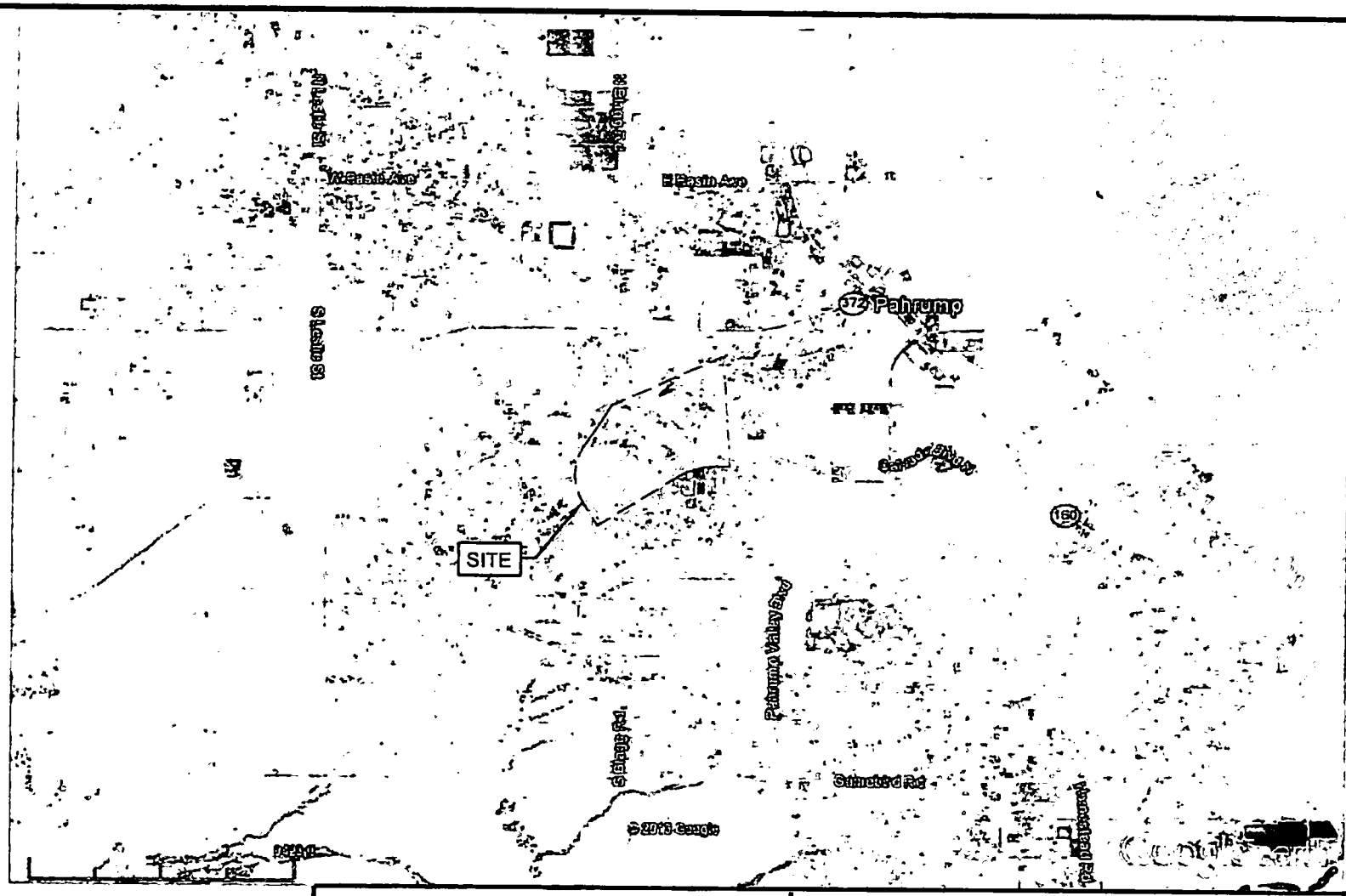
WT should be contacted in order to assess the effect that such variations may have on our conclusions and recommendations.

The recommendations presented are based entirely upon data derived from a limited number of samples obtained from widely spaced test pits. The attached logs are indicators of subsurface conditions only at the specific locations and times noted. This report assumes the uniformity of the geology and soil structure between test pits, however variations can and often do exist. Whenever any deviation, difference or change is encountered or becomes known, WT should be contacted.

This report is valid for the earlier of one year from the date of issuance, a change in circumstances, or discovered variations. After expiration, no person or entity shall rely on this report without the express written authorization of WT.

9.0 CLOSURE

We prepared this report as an aid to the designers of the proposed project. The comments, statements, recommendations and conclusions set forth in this report reflect the opinions of the authors. These opinions are based upon data obtained at the location of the test pits, and from laboratory tests. Work on your project was performed in accordance with generally accepted standards and practices utilized by professionals providing similar services in this locality. No other warranty, express or implied, is made.



NORTH

NOT TO SCALE

Geotechnical
Environmental
Inspections
Materials

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PLATE 1. SITE VICINITY MAP
Willow Creek Golf Course-Percolation Testing
1500 Red Butte Street
Pahrump, Nevada

WT Job No. 4124XD007

LEGEND

Approximate Test Pit Location

Geotechnical Environmental Inspections Materials

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PLATE 2. TEST PIT LOCATION DIAGRAM
Willow Creek Golf Course-Percolation Testing
1500 Red Butte Street
Pahrump, Nevada

WT Job No. 4124XD007

Allowable Soil Bearing Capacity	The recommended maximum contact stress developed at the interface of the foundation element and the supporting material.
Backfill	A specified material placed and compacted in a confined area.
Base Course	A layer of specified material placed on a subgrade or subbase.
Base Course Grade	Top of base course.
Bench	A horizontal surface in a sloped deposit.
Caisson	A concrete foundation element cast in a circular excavation which may have an enlarged base. Sometimes referred to as a cast-in-place pier.
Concrete Slabs-On-Grade	A concrete surface layer cast directly upon a base, subbase or subgrade.
Crushed Rock Base Course	A base course composed of crushed rock of a specified gradation.
Differential Settlement	Unequal settlement between or within foundation elements of a structure.
Engineered Fill	Specified material placed and compacted to specified density and/or moisture conditions under observations of a representative of a soil engineer.
Existing Fill	Materials deposited through the action of man prior to exploration of the site.
Existing Grade	The ground surface at the time of field exploration.
Expansive Potential	The potential of a soil to expand (increase in volume) due to absorption of moisture.
Fill	Materials deposited by the actions of man.
Finished Grade	The final grade created as a part of the project.
Gravel Base Course	A base course composed of naturally occurring gravel with a specified gradation.
Heave	Upward movement
Native Grade	The naturally occurring ground surface.
Native Soil	Naturally occurring on-site soil.
Rock	A natural aggregate of mineral grains connected by strong and permanent cohesive forces. Usually requires drilling, wedging, blasting or other methods of extraordinary force for excavation.
Sand and Gravel Base	A base course of sand and gravel of a specified gradation.
Sand Base Course	A base course composed primarily of sand of a specified gradation.
Scarify	To mechanically loosen soil or break down existing soil structure.
Settlement	Downward movement.
Soil	Any unconsolidated material composed of discrete solid particles, derived from the physical and/or chemical disintegration of vegetable or mineral matter, which can be separated by gentle mechanical means such as agitation in water.
Strip	To remove from present location.
Subbase	A layer of specified material placed to form a layer between the subgrade and base course.
Subbase Grade	Top of subbase.
Subgrade	Prepared native soil surface.

Willow Creek Golf Course	
Definition of Terminology	
Western Technologies Inc.	
Job No. 4124XD007	Plate A-1

METHOD OF SOIL CLASSIFICATION

COARSE-GRAINED SOILS (LESS THAN 50% FINES)		
Group Symbols	**Description**	**Major Divisions**
GW	Well-graded gravels or gravel-sand mixtures, less than 5% fines	GRAVELS More than half of coarse fraction is larger than No. 4 sieve size
GP	Poorly-graded gravels or gravel-sand mixtures less than 5% fines	
GM	Silty gravels, gravel-sand-silt mixtures, more than 12% fines	
GC	Clayey gravels, gravel-sand-clay mixtures, more than 12% fines	
SW	Well-graded sands or gravelly sands, less than 5% fines	SANDS More than half of coarse fraction is smaller than No. 4 sieve size
SP	Poorly-graded sands or gravelly sands, less than 5% fines	
SM	Silty sands, sand-silt mixtures, more than 12% fines	
SC	Clayey sands, sand-clay mixtures, more than 12% fines	
NOTE: Coarse-grained soils receive dual symbols if they contain 5 to 12% fines (e.g. SW-SM, GP-GC, etc.)		

FINE-GRAINED SOILS (MORE THAN 50% FINES)		
ML	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands	SILTS AND CLAYS Liquid limits less than 50
CL	Inorganic clays or low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	
OL	Organic silts or organic silt-clays of low plasticity	
MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts	SILTS AND CLAYS Liquid limit more than 50
CH	Inorganic clays of high plasticity, fat clays	
OH	Organic clays of medium to high plasticity	
PT	Peat, muck, and other highly organic soils	HIGHLY ORGANIC SOILS
NOTE: Fine-grained soils may receive dual classification based upon plasticity characteristics		

SOIL SIZES	
Component	**Size Range**
Boulders	Above 12 in.
Cobbles	3 in to 12 in
Gravel	No. 4 to 3 in.
Coarse	¾ in. to 3 in.
Fine	No. 4 to ¾ in.
Sand	No. 200 to No. 4
Coarse	No. 10 to No. 4
Medium	No. 40 to No. 10
Fine	No. 200 to No. 40
Fines (Silt or Clay)	Below No. 200
NOTE: Only size smaller than 3 inches are used to classify soils	

CONSISTENCY	
Clays & Silts	**Blows/Foot***
Very Soft	0 – 2
Soft	2 - 4
Firm	4 – 8
Stiff	8 – 16
Very Stiff	16 – 32
Hard	Over 32

* Number of blows of 140-pound hammer falling 30 inches to drive a 2-inch O.D. (1-3/8" I.D.) split-spoon (ASTM D1586).

RELATIVE DENSITY	
Sands & Gravels	**Blows/Foot***
Very Loose	0 – 4
Loose	4 – 10
Medium Dense	10 – 30
Dense	30 – 50
Very Dense	Over 50

PLASTICITY OF FINE-GRAINED SOILS	
Plasticity Index	**Dry**
0	Non-Plastic
1 – 7	Low
8 – 25	Medium
Over 25	High

DEFINITION OF WATER CONTENT
Dry
Slightly Damp
Damp
Moist
Wet
Saturated

Willow Creek Golf Course

Western Technologies Inc.

Project No. 4124XD007 | Plate: A-2

The number shown in **"TEST PIT NO."** refers to the approximate location of the same number indicated on the "Test Pit Location Diagram" as positioned in the field by pacing or measurement from property lines and/or existing features, or through the use of Global Positioning System (GPS) devices.

"EXCAVATION TYPE" refers to the exploratory equipment used in the field.

"SAMPLE TYPE" refers to the form of sample recovery, in which **G = Grab sample.**

"MOISTURE CONTENT (% OF DRY WT.)" refers to the laboratory-determined water content in percent (Ref. ASTM D2216).

"USCS" refers to the "Unified Soil Classification System" Group Symbol for the soil type as defined by ASTM D 2487 and D 2488. The soils were classified visually in the field, and where appropriate, classifications were modified by visual examination of samples in the laboratory and/or by appropriate tests.

These notes and test pit logs are intended for use in conjunction with the purposes of our services defined in the text. Test pit log data should not be construed as part of the construction plans nor as defining construction conditions.

Test pit logs depict our interpretations of subsurface conditions at the locations and on the date(s) noted. Variations in subsurface conditions and characteristics may occur between test pits. Groundwater levels may fluctuate due to seasonal variations and other factors.

The stratification lines shown on the test pit logs represent our interpretation of the approximate boundary between soil or rock types based upon visual field classification at the test pit location. The transition between materials is approximate and may be more or less gradual than indicated.

Willow Creek Golf Course	
Test Pit Log Notes	
Western Technologies Inc.	
Job No.: 4124XD007	Plate: A-3

TEST PIT No. 1

DATE DRILLED: **3-24-14**
LOCATION: **See Figure 2**
ELEVATION: **Not measured**

EQUIPMENT TYPE: **Backhoe**
EXCAVATION TYPE: **Test Pit**
FIELD ENGINEER: **D. Johnson**

P.I.D. READING (PPM)	MOISTURE CONTENT (% OF DRY WT)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOWS/FT.	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION	MOISTURE	CONSISTENCY
			G			1–4	CL		Silty clay, light brown, some sand, medium plasticity	slightly damp	medium dense
			G			4–9			Caliche, white, partially cemented		
						9	CL		Silty clay, light brown, some sand, medium plasticity, some partially cemented caliche		
						10			**Stopped at 10 feet**		
						11–14					

N- STANDARD PENETRATION TEST
R- RING SAMPLE
C- CORE: %RECOVERY/%RQD
B- BAG
BN- BULL NOSE
CS- CALIFORNIA SAMPLER

NOTES: **Water not encountered.**

DRIVING WEIGHT (LBS)

WESTERN TECHNOLOGIES INC.

PROJECT NO. **4124XD007**

PROJECT:
Willow Creek Golf Course
TEST PIT LOG

PLATE
A-4

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

DATE DRILLED: 3-24-14
LOCATION: See Figure 2
ELEVATION: Not measured

TEST PIT No. 2

EQUIPMENT TYPE: Backhoe
EXCAVATION TYPE: Test Pit
FIELD ENGINEER: D. Johnson

P.I.D. READING (PPM)	MOISTURE CONTENT (% OF DRY WT)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOWS/FT.	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION	MOISTURE	CONSISTENCY
			G			1	CL		Silty clay, light brown, medium plasticity	slightly damp	medium dense
						2					
						3					
						4					
			G			5					
						6					
						7					
						8					
						9					
						10			**Stopped at 10 feet**		
						11					
						12					
						13					
						14					

N- STANDARD PENETRATION TEST
R- RING SAMPLE
C- CORE: %RECOVERY/%RQD
B- BAG
BN- BULL NOSE
CS- CALIFORNIA SAMPLER

NOTES: **Water not encountered.**

DRIVING WEIGHT (LBS)

WESTERN TECHNOLOGIES INC.

PROJECT NO. 4124XD007

PROJECT:
Willow Creek Golf Course
TEST PIT LOG

PLATE
A-5

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

DATE DRILLED: 3-24-14
LOCATION: See Figure 2
ELEVATION: Not measured

TEST PIT No. 3

EQUIPMENT TYPE: Backhoe
EXCAVATION TYPE: Test Pit
FIELD ENGINEER: D. Johnson

P.I.D. READING (PPM)	MOISTURE CONTENT (% OF DRY WT)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOWS/FT.	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION	MOISTURE	CONSISTENCY
			G			1	CL		Silty clay, light brown, medium plasticity	slightly damp	medium dense
						2					
						3					
						4					
			G			5					
						6					
						7					
						8					
						9					
						10			Stopped at 10 feet		
						11					
						12					
						13					
						14					

N- STANDARD PENETRATION TEST
R- RING SAMPLE
C- CORE: %RECOVERY/%RQD
B- BAG
BN- BULL NOSE
CS- CALIFORNIA SAMPLER

NOTES: **Water not encountered.**

DRIVING WEIGHT (LBS)

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

WESTERN TECHNOLOGIES INC.

PROJECT NO. 4124XD007

PROJECT: Willow Creek Golf Course

TEST PIT LOG

PLATE **A-6**

DATE DRILLED: **3-24-14**
LOCATION: **See Figure 2**
ELEVATION: **Not measured**

TEST PIT No. 4

EQUIPMENT TYPE: **BackHoe**
EXCAVATION TYPE: **Test Pit**
FIELD ENGINEER: **D. Johnson**

P.I.D. READING (PPM)	MOISTURE CONTENT (% OF DRY WT)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOWS/FT.	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION	MOISTURE	CONSISTENCY
			G			1–3	CH		Clay, dark brown to black, high plasticity, some fine sand	slightly damp	medium dense
			G			3–10	CL		Clay, whitish brown, medium plasticity		
						10			**Stopped at 10 feet**		

N- STANDARD PENETRATION TEST
R- RING SAMPLE
C- CORE: %RECOVERY/%RQD
B- BAG
BN- BULL NOSE
CS- CALIFORNIA SAMPLER

NOTES: **Water not encountered.**

DRIVING WEIGHT (LBS)

WESTERN TECHNOLOGIES INC.

PROJECT NO. **4124XD007**

PROJECT:
Willow Creek Golf Course
TEST PIT LOG

PLATE
A-7

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

PHYSICAL PROPERTIES

			Particle Size Distribution, % Passing by Weight														Atterberg Limits		Moisture-Density Relationship[5]				
Sample Location	Depth (ft)	Soil Type (USCS)	4"	3"	2"	1"	3/4"	1/2"	3/8"	#4	#8	#16	#30	#50	#100	#200	LL	PI	Dry Density (pcf)	Optimum Moisture (%)	Method	R-Value	Remarks
TP-1	0 to 3	CL	100	100	100	100	100	100	100	100	100	99	99	98	97	90	40	22					2
TP-1	5 to 9	GC	100	100	100	90	86	78	73	31	27	26	22	20	17	14	43	26					2, caliche
TP-2	0 to 5	CL	100	100	100	100	100	100	100	100	100	100	100	100	99	96	29	11					2
TP-2	5 to 7	CL	100	100	100	100	100	100	100	100	99	99	99	99	98	96	48	28					2
TP-3	0 to 5	CL	100	100	100	100	100	100	100	100	100	100	100	100	98	94	30	10					2
TP-3	5 to 10	CL	100	100	100	100	100	100	100	99	98	97	96	95	93	89	40	21					2
TP-4	0 to 3	CH	100	100	100	100	100	100	100	100	100	99	99	99	98	96	57	36					2
TP-4	3 to 10	CL	100	100	100	100	100	99	98	96	95	94	93	92	91	87	26	7					2

Remarks:

Classification/Particle Size

1. Visual
2. Laboratory Tested
3. Minus #200 Only

Moisture Density Relationship

4. Tested ASTM D698/AASHTO T99
5. Tested ASTM D1557/AASHTO T180

Note: NP = Nonplastic, NT = Not Tested

Willow Creek Golf Course

Physical Properties

Western Technologies Inc.

Project No. 4124XD007 Plate B-1

SilverState
Analytical Laboratories

LABORATORY REPORT

DATE: March 27, 2014

REPORT NUMBER: 14-1396-1

CLIENT: Western Technologies, Inc.
6633 West Post Road
Las Vegas, NV 89118

PAGE: 1 of 1

CLIENT PROJECT: 4144W026

CLIENT PO #: 4144P049

ANALYST: SW

Sampled By: Client
Date Sampled: 03/24/14
Time Sampled: --

Date Received: 03/25/14
Time Received: 1557

Sample ID: 14096-TP4 0'-3'

Analysis	Result	Unit	Method
Sodium	0.03	%	ASTM D2791
Water Soluble Sulfate (SO_4)	0.02	%	SM 4500 E
Total Available Water Soluble Sodium Sulfate (Na_2SO_4)	0.03	%	Calculation
Total Salts (Solubility)	0.10	%	SM2540B
Soluble Soil Chlorides	73.7	mg/kg	SM4500ClD
pH	7.92	S.U.	SM9045C
Resistivity	656	Ω-cm	ASTM G57

NOTES: The results for each constituent denote the percentage (%) for that particular element which is soluble in a 1:5 (soil to water) extraction ratio and corrected for dilution.

REVIEWED BY:

John Sloan
Laboratory Director
EPA: NV00930

3638 East Sunset Road, Suite 100 Las Vegas, NV 89120
Tel: 702-873-4478 Fax: 702-873-7967 www.ssalabs.com

SilverState
Analytical Laboratories

LABORATORY REPORT

DATE: March 27, 2014

REPORT NUMBER: 14-1396-2

CLIENT: Western Technologies, Inc.
6633 West Post Road
Las Vegas, NV 89118

PAGE: 1 of 1

CLIENT PROJECT: 4144W026

CLIENT PO #: 4144P049

ANALYST: SW

Sampled By: Client
Date Sampled: 03/24/14
Time Sampled: --

Date Received: 03/25/14
Time Received: 1557

Sample ID: 14097-TP4 3'- 9'

Analysis	Result	Unit	Method
Sodium	0.00	%	ASTM D2791
Water Soluble Sulfate (SO_4)	0.02	%	SM 4500 E
Total Available Water Soluble Sodium Sulfate (Na_2SO_4)	0.00	%	Calculation
Total Salts (Solubility)	0.06	%	SM2540B
Soluble Soil Chlorides	38.1	mg/kg	SM4500Cl D
pH	7.98	S.U.	SM9045C
Resistivity	1064	Ω-cm	ASTM G57

NOTES: The results for each constituent denote the percentage (%) for that particular element which is soluble in a 1:5 (soil to water) extraction ratio and corrected for dilution.

REVIEWED BY:

John Sloan
Laboratory Director
EPA: NV00930

3638 East Sunset Road, Suite 100 Las Vegas, NV 89120
Tel: 702-873-4478 Fax: 702-873-7867 www.ssalabs.com

SilverState
Analytical Laboratories

LABORATORY REPORT

DATE: March 27, 2014

REPORT NUMBER: 14-1396-3

CLIENT: Western Technologies, Inc.
6633 West Post Road
Las Vegas, NV 89118

PAGE: 1 of 1

CLIENT PROJECT: 4144W026

CLIENT PO #: 4144P049

ANALYST: SW

Sampled By: Client
Date Sampled: 03/24/14
Time Sampled: --

Date Received: 03/25/14
Time Received: 1557

Sample ID: 14101-TP2-7'

Analysis	Result	Unit	Method
Sodium	0.04	%	ASTM D2791
Water Soluble Sulfate (SO_4)	0.03	%	SM 4500 E
Total Available Water Soluble Sodium Sulfate (Na_2SO_4)	0.05	%	Calculation
Total Salts (Solubility)	0.09	%	SM2540B
Soluble Soil Chlorides	39.5	mg/kg	SM4500ClD
pH	8.14	S.U.	SM9045C
Resistivity	543	Ω-cm	ASTM G57

NOTES: The results for each constituent denote the percentage (%) for that particular element which is soluble in a 1:5 (soil to water) extraction ratio and corrected for dilution.

REVIEWED BY:

John Sloan
Laboratory Director
EPA: NV00930

3638 East Sunset Road, Suite 100 Las Vegas, NV 89120
Tel: 702-873-4478 Fax: 702-873-7967 www.ssalabs.com

SOIL PROPERTIES

Boring No.	Depth (ft.)	Soil Class	Initial Dry Density (pcf)	Initial Water Content (%)	Compression Properties			Expansion Properties		Plasticity		Percent Passing #200	Soluble		Remarks
					Surcharge (ksf)	Total Compression (%)		Surcharge (ksf)	Expansion (%)	LL	PI		Sulfate ppm	Chloride ppm	
						In-Situ	After Saturation								
B-4	0-3	CH	111.7	16				60	11.8	57	36	96			1, 2
B-4	0-3	CH	111.7	12				1,000	4.5	57	36	96			1, 2

Note: Initial Dry Density and Initial Water Content are in-situ values unless otherwise noted

Remarks

1. Compacted density (approx. 95% of ASTM D1557 max. density at moisture content slightly below optimum.)
2. Submerged to approximate saturation.
3. Slight rebound after saturation.
4. Sample disturbance observed.

Appendix C - NDEP Guidance Document for Design of a Lined Wastewater Holding Pond

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES DIVISION OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER POLLUTION CONTROL
Carson City Office
901 S. Stewart St., Suite 4001
CARSON CITY, NEVADA 89701
PHONE: (775) 687-9418, FAX: (775) 687-9484

WTS – 37 (Revised: September 2011)

GUIDANCE DOCUMENT FOR THE DESIGN OF A LINED WASTEWATER HOLDING POND (SURFACE IMPOUNDMENT)

Information from the items listed below shall be presented as a minimum in an application prepared by a Nevada Registered Professional Engineer (P.E.) for a lined holding pond (surface impoundment) that contains wastewater regulated and permitted by the Bureau of Water Pollution Control (BWPC). Surface impoundments storing and/or treating wastewater require a discharge permit to be issued from BWPC prior to commencement of construction and operation.

BWPC does not permit the storage of any wastewater that is classified as a hazardous waste.

Also, please note that the Nevada Division of Water Resources (NDWR), Phone: (775) 684-2800, must approve any basin with a depth greater than 20 feet or a storage capacity of more than 20 acre-feet (AF).

This document is solely intended as guidance to the regulated community. It shall not replace best professional engineering judgment in the design of a wastewater holding pond or the regulations on dam safety from the DWR.

KEY WORDS:

NAC: Nevada Administrative Code
ASTM: American Society for Testing and Materials
GSI: Geosynthetic Institute
LCRS: Leak Collection and Recovery Systems

TABLE OF CONTENTS:

1. SITE CHARACTERIZATION DATA REQUIRED

A. A topographical map of the site with 5-foot contour intervals. On this map, please provide identification of the following within a one mile radius of the proposed pond:

1) Creeks and Rivers;
2) Dwelling units (e.g., residences and commercial buildings);
3) Earthquake fault lines;
4) Drinking water wells;
5) Wellhead Protection Zone Area delineation (if available).

B. The depth to the groundwater table shall be provided along with a description of the underlying strata (confining layers, soil types, etc.). The groundwater gradient and direction, depth to groundwater, and groundwater quality shall be provided.

If this information is not available from available data, the applicant may have to drill borings to the water table and have the strata categorized by a licensed professional with expertise in this discipline.

C. Watershed map of the site which depicts the 100-year flood plain and storm water drainage channels in and around the proposed pond(s) site.

D. Direction of prevailing winds shall be provided.

2. GENERAL POND CONSTRUCTION DETAILS

A. Interior embankments shall be sloped no steeper than 3:1 (horizontal to vertical).
Pond embankments are set to a slope of 3:1 (horizontal to vertical). See Drawing C2.0.

B. Pond bottom shall be level unless a leak detection system is proposed using a leak collection media.
Pond bottom is level and is set to an elevation of 2,606. See Drawing C1.0.

C. Top of the embankment shall be a minimum of 8 feet wide for non-vehicular access. If the top of the embankment is used as a service road, the top embankment width must be at least 12 feet and designed to support the load weight for all service vehicles.
Top of embankment is 15 feet.

D. Pond geometry should be either square or rectangular. If rectangular, the side lengths shall be no longer than 3 times the side width. Other pond geometry will be reviewed on a case by case basis.
Pond geometry is rectangular and all side lengths are less than three times the side width.

E. A freeboard of 3-feet is required for all large ponds (greater than 1 acre of surface area).
A freeboard of 2-feet may be acceptable for smaller ponds (1 acre or less of surface area) if it can be determined that wave action will not be a problem based upon a wave fetch analysis using local wind (meteorological) data.
All ponds have 3-feet of freeboard regardless of surface area.

F. The pond must withstand and contain, without release, the 25-year, 24-hour storm event.
The ponds are equipped with berms to prevent runoff of rain event into the ponds. The area is in Zone AO with 1 to 3 feet of sheet flow.

G. Plans for protection from floodwater must be presented. The pond must be designed to withstand the run-off generated by the 24-hour storm event with a 100-year recurrence interval. The pond should remain operational after such an event, with no structural damage.
The ponds are equipped with berms to prevent runoff of rain event into the ponds. The area is in Zone AO with 1 to 3 feet of sheet flow.

H. The engineer shall attempt to not locate any ponds within the 100-year flood plain (NAC445A.285).
The ponds are equipped with berms to prevent runoff of rain event into the ponds. The area is in Zone AO with 1 to 3 feet of sheet flow.

I. A method for recording the liquid level in each pond shall be provided. This may include staff gages, sidewall depth markings, or pressure-depth sensors. If using staff gages, then the length intervals shall be marked in units of a quarter of a foot or inches and be easily readable from 30 feet away.
Staff gages will be provided.

J. A plan for leak detection must be presented for all ponds. Examples of acceptable leak detection systems include double liner designs with leak collection sumps, and monitoring wells. Other innovative plans for leak detection will be reviewed by BWPC on a case by case basis.
An existing monitoring well can be used to provide leak detection. If additional leak detection is required, additional monitoring wells can be added in the future.

K. A water balance demonstrating storage capacity of the pond within the required freeboard shall be presented. This balance shall incorporate local figures for pond surface evaporation and average precipitation rates.
In Progress.

L. Inlet piping must have an adequate erosion protection measure at the discharge point into the pond.
Inlet piping has adequate erosion protection. See Drawing M3.0.

M. Seepage collars must be installed at junctions at piping penetrations to the pond embankment.
Noted.

N. Ballast measures shall be considered to protect liner uplift from wind activity or high water table. *Ballast measures have been provided.*

O. Odor control plans (if required). These may include providing aeration or recirculation of the flow to the pond(s) or other acceptable measures (chemical oxidants, algal control chemicals, scum removal, sludge removal, etc.).
Pond aeration is provided. See Drawing C1.0.

P. The chemical compatibility of the liner material with the stored wastewater must be evaluated with the liner manufacturer and found suitable for the proposed wastewater.
See specification 2701.

Q. A plan for measuring the depth of solids (sludge) accumulation in the pond shall be provided (e.g., Sludge Judge™, ultrasonic sounder, etc.). Additionally, a plan for solids removal from the pond shall be presented that will be protective of the liner system.
Sludge judge of the solids is the proposed method of measuring solids accumulation. Two ponds have been provided so that one can be taken out of service while the other pond is maintained in operation. The pond that is removed from service will be pumped down to near sludge level and then the solids will be vactored from the pond for dewatering or discharge into WWTP 3.

R. The ponds shall be enclosed within an acceptable fence to keep out non-authorized personnel (e.g., the public), wildlife, and livestock. Waterfowl protection (e.g., bird balls, netting, etc.) may be also required by applicable state or federal wildlife agencies.
Chain link fencing is provided around both receiving ponds. See Drawing C1.0.

S. The perimeter fence shall be posted at the entrance gate and on all four sides at a recommended 300 ft. spacing interval per sign. The warning signs shall indicate usage of the pond(s) as a wastewater storage facility. The entrance gate sign shall denote the facility's name and emergency contact number.
The perimeter fencing will be marked and signs will be at 300 ft spacing intervals.

T. A safety plan (emergency egress) for getting people out of the pond shall be presented
(e.g. roped life rings, textured liner, sidewall ladders, service rowboat, etc.).
A means of emergency egress will be provided. Knotted hand lines will be at the mid-point of each pond side and will extend to the depth of the pond.

3. DESIGN ITEMS FOR GEOMEMBRANE LINER SYSTEMS

A. The liner should have a coefficient of permeability of at least 1 x 10^{-11} cm/sec and minimum thicknesses of 60-mil (primary liner) and 40-mil (secondary liner), respectively. The primary or upper liner is the liner layer in contact with the wastewater. *Not applicable to this project.*

B. Reclaimed water ponds (e.g. golf courses, effluent storage reservoirs, etc.) storing denitrified domestic effluent (i.e. < 10 mg/l of Total Nitrogen content) may utilize a PVC liner with a minimal thickness of 30-mil provided that the PVC liner is protected from UV degradation (e.g., soil or sand cover, sprayed-on concrete, etc.).
See specification 2701, project proposed to use 60-mil HDPE geomembrane system.

C. The liner material specifications shall meet the standards listed in the Geosynthetic Research Institute Test Method GM13 (e.g. UV Resistance, Puncture Resistance). *See specification 2701, project proposed to use 60-mil HDPE geomembrane system.*

D. A plan for protection of the liner from ice damage, temperature extremes, wind uplift, oxidation, and sharp objects shall be presented. *See engineering plans and specifications - ballast measures have been provided and access to site has been limited to operations staff only.*

E. If there is the potential for gas generation in the sub-base, a plan to remove the gases beneath the liner must be presented.
There is no known potential for gas generation in the sub-base.

F. Supporting geotechnical data on the embankment foundation and slope stability shall be submitted.
Supporting geotechnical documents provided in Appendix D.

G. Subsurface or underlayment prep for the liner installation shall be provided.
Preparation recommendations are provided in the geotechnical report in Appendix D.

H. It is strongly recommended that the primary liner material be textured on the exposed side for personnel slip prevention.
Liner will be textured on exposed side.

I. A means of emergency egress shall be provided (e.g. knotted hand lines, welded in ladder rungs, etc.).
A means of emergency egress will be provided. Knotted hand lines will be at the mid-point of each pond side and will extend to the depth of the pond.

J. Provide the details on liner anchoring and all pipe penetrations. It is recommended that liner penetrations be limited to the best extent possible and reserved to areas above the pond freeboard to reduce potential for leaks.
Details on liner anchoring and pipe penetrations are provided. See Drawing M3.0.

K. The engineer-of-record for the approved design shall submit a Quality Assurance/Quality Control (QA/QC) letter and report on the liner installation when complete. This documentation shall include a summary of the results of all field tests conducted on the liner.
Noted.

4. DOUBLE LINED LEAK DETECTION SYSTEMS DESIGN ITEMS

A. A double-lined pond is required when any industrial and/or process (non-domestic) wastewater is stored. Plans for a single-lined pond storing and/or treating only domestic (sanitary) wastewater shall be prepared and submitted in accordance with WTS-5: Guidance Document for Design of Wastewater Treatment Ponds.
Not Applicable

B. The liner materials shall be at least 60-mil (primary liner) and 40-mil (secondary liner) thick, respectively, and made of HDPE or approved equivalent material (e.g. LLDPE, PVC, Polypropylene, etc.).
Not Applicable

C. The leak collection material between the two liners shall be designed to rapidly transmit primary liner leakage to a collection sump and prevent hydraulic head transference from the primary liner onto the secondary liner. This interstitial material should be an engineered geo-net or equivalent material.
Not Applicable

D. The Leak Collection and Recovery System or LCRS (e.g., collection sump, pumps, collection media, etc.) shall be designed to remove the collected leakage at a rate equal to or greater than the maximum rate collected in the interstitial leak detection media and/or at a rate that prevents the overfilling of the detection sump.
Not Applicable

E. The leak detection metering system must allow for accurate recording of the daily volume of leakage from the primary liner.
Not Applicable

F. The maximum allowable leakage rate for the primary liner is 500 gallons/acre-day. The action leakage rates for the primary liner should be as follows (note: a more restrictive action leakage rate schedule may be required in the discharge permit on a case-by-case basis):

   i. When the leakage rate exceeds 125 gallons/acre-day, the facility shall develop a plan to identify the source of the leakage. This plan shall be submitted to the BWPC for its review and approval within one months' time upon discovery of the leakage.
   Not Applicable

   ii. When the leakage rate exceeds 250 gallons/acre-day, the approved plan shall be initiated.
   Not Applicable

   iii. When the leakage rate exceeds 500 gallons/acre-day, the permittee shall notify the BWPC in writing within five (5) business days, shall cease discharge to the identified leaking pond(s), and shall implement all necessary corrective action measures to mitigate the liner leakage.
   Not Applicable

   iv. Leak-detection monitoring wells may be required to assess impacts to environment.

Not Applicable

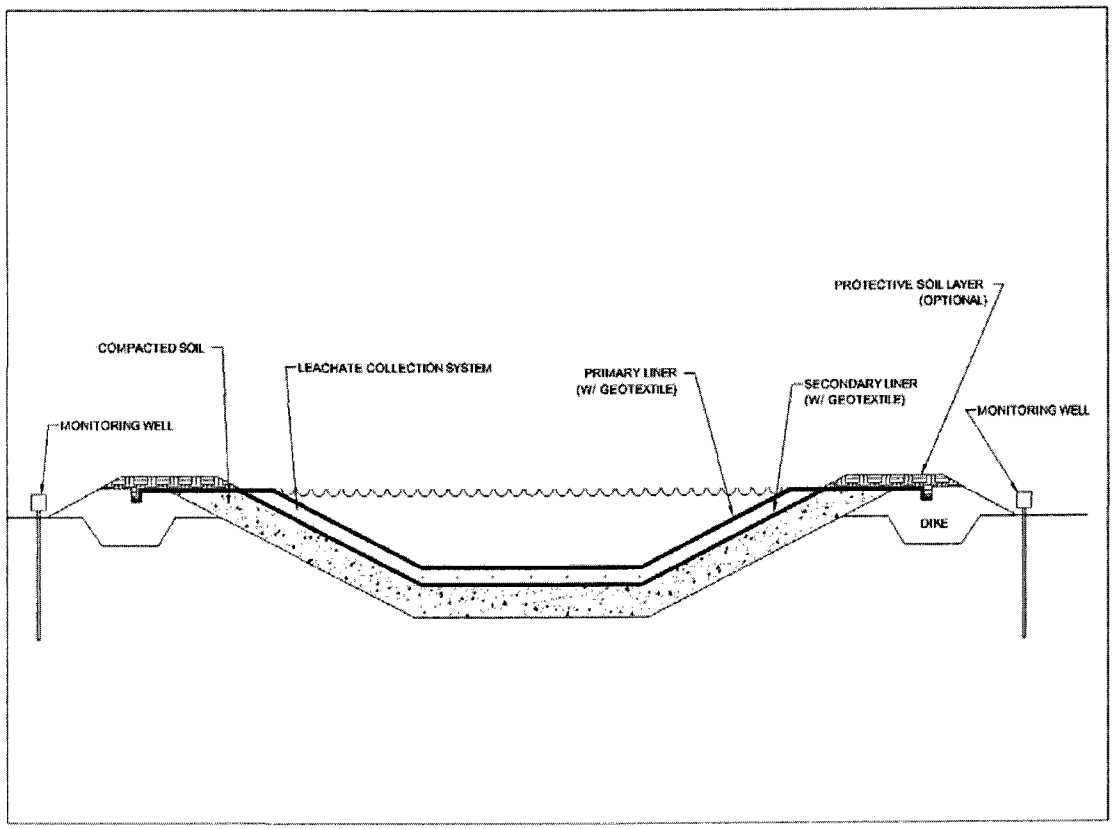


Figure 1 - Example of a Surface Impoundment

References:

1. Geosynthetic Institute, http://www.geosynthetic-institute.org/
2. Ten States Standards, *Recommended Standards for Wastewater Facilities*, http://10statesstandards.com/wastewaterstandards.html
3. U.S. EPA, *Introduction to Land Disposal Units (40 CFR Parts 264/265, Subparts K, L, M, N)*, http://www.epa.gov/osw/inforesources/pubs/hotline/training/ldu05.pdf

Appendix D - Irrigation System Assessment Report

Aqua Engineering Inc.
Innovative Water Solutions

11022 South 51st Street, Suite 104
Phoenix, AZ 85044-1789
480.222.0360 office
970.226.3855 fax
www.aquaengineering.com

MEMORANDUM

April 30, 2014

TO: Teresa Valentine e-mail: tvalentine@valentineengineers.com
Valentine Environmental Engineers
15845 S. 46th Street, Suite 144
Phoenix, AZ 85048

FROM: John B. Coleman, RLA, ASLA
Douglas G. Macdonald, ASIC, LEED-AP BD+C

RE: **Willow Creek Golf Course Phase 2 - Irrigation Inventory and Analysis Study - Revised**

Summary of Priority Recommendations:

Lake Storage Facility

- Excavate and expand current storage ponds and consider adding additional ponds for the storage of reclaimed water during off-peak irrigation season. Consider the use of unlined ponds for additional infiltration and percolation of reclaimed water. A water quality program should be considered to maintain water quality in the storage ponds
- Include a lake bed aeration system with the new ponds to help improve water quality.

Irrigation and Transfer Pumping System

- Contact Flowtronics for the local service company and have them review the status of Pumping Stations "1" and "2" (See "Pumping Station and Lakes with Labels" below) and provide an estimate to bring both pumping stations back to automatic operation status.

Mainline Pipe Enhancements

- Replace mainline pipe at Pumping Station "1" discharge segments with larger pipe to maintain lower velocities at build-out flow demands.
- Consider relocating or obtaining easement for the portion of mainline that crosses property owned by others where the golf course club house is located.
- Commit to providing sufficient knowledgeable staff to maintain the existing system and to make ongoing rapid repairs of mainline segments when they fail.

Irrigation Control System Replacement

- The control system is obsolete and needs to be replaced with a central/satellite control system that provides features such as a flow monitoring interface, handheld radio remote control, and remote alert notification via cell phone in order to provide automated operation of the system and reduce the current labor costs associated with the manual operation of the system.
- Consider the installation of a two-wire control system which will minimize controller quantities, low voltage wire quantities, and multiple 120VAC power source requirements.

Irrigation Sprinkler Replacement

- Develop a systematic program to replace current sprinklers with a single manufacturer and model that operates at a comparable flow rate and at a lower pressure which will help prolong the life of the existing mainline.

Opinion of Probable Costs

- Cost for new sprinklers, lateral pipe and RCV's = $0.45/SF of irrigated area (Approximately 2.1M square feet of land is currently irrigated)
- Cost for controllers & new low voltage wire = $5,000/controller (assume five 24-station controllers required for currently irrigated area) = $25,000
- Cost for new mainline pipe and fittings:
    - 10-inch PVC = $25/LF
    - 8-inch PVC = $20/LF
    - 6-inch PVC = $15/LF
    - 4-inch PVC = $10/LF

Note:

1. The Opinions of Probable Cost presented are not intended for use in bidding or ordering of equipment. Aqua Engineering will not be responsible for differences between this information and actual project equipment quantities or construction costs.
2. Aqua Engineering has no control over the cost of labor, materials, or equipment, or over Contractor's method of determining prices, or over competitive bidding or market conditions. The opinions of probably construction cost that may be provided for herein are made on the basis of experience. These opinions represent the best judgment of a design professional familiar with the construction industry. However, Aqua Engineering cannot, and does not, guarantee that proposals, bids, or the constriction cost will not vary from opinions of probably cost prepared as a part of the work.

Memorandum – Willow Creek Golf Course Phase 2 - Irrigation Inventory and Analysis Study - Revised
April 30, 2014

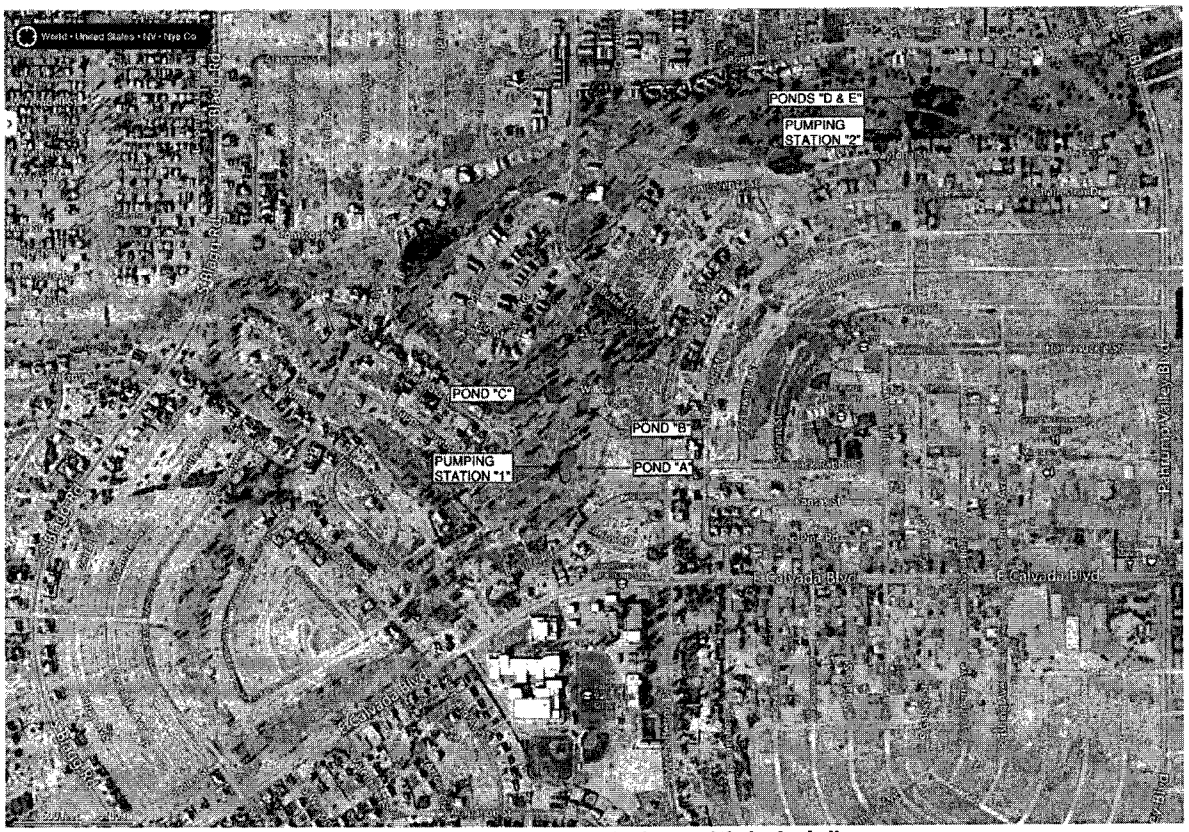
Overview:
Aqua Engineering, Inc. was contracted by Valentine Environmental Engineers (VEE) and Utilities Incorporated of Central Nevada (UICN) to conduct a review of the irrigation system in operation at the Willow Creek Golf Course (WCGC) in Pahrump, Nevada. The site analysis portion of this study was conducted on two consecutive days, 3/25/14 and 3/26/14, with the assistance of the on-site maintenance person, Basilio Sanchez, and long-time resident, Richard Cantino (local representatives).

Richard Cantino (left), Boyd Coleman & Basilio Sanchez

The intent of the study was two-fold. First, Aqua Engineering assessed the system to determine what components of the aging irrigation system are currently operational. Secondly, Aqua Engineering assessed the system to determine what components of the irrigation system are not operational at this time but could possibly be repaired in order to bring them into working order to aid in dispersing up to 650,000 gallons per day of reclaimed water from the adjacent UICN water treatment facility during off-peak irrigation season when LVEGC is not using irrigation water.

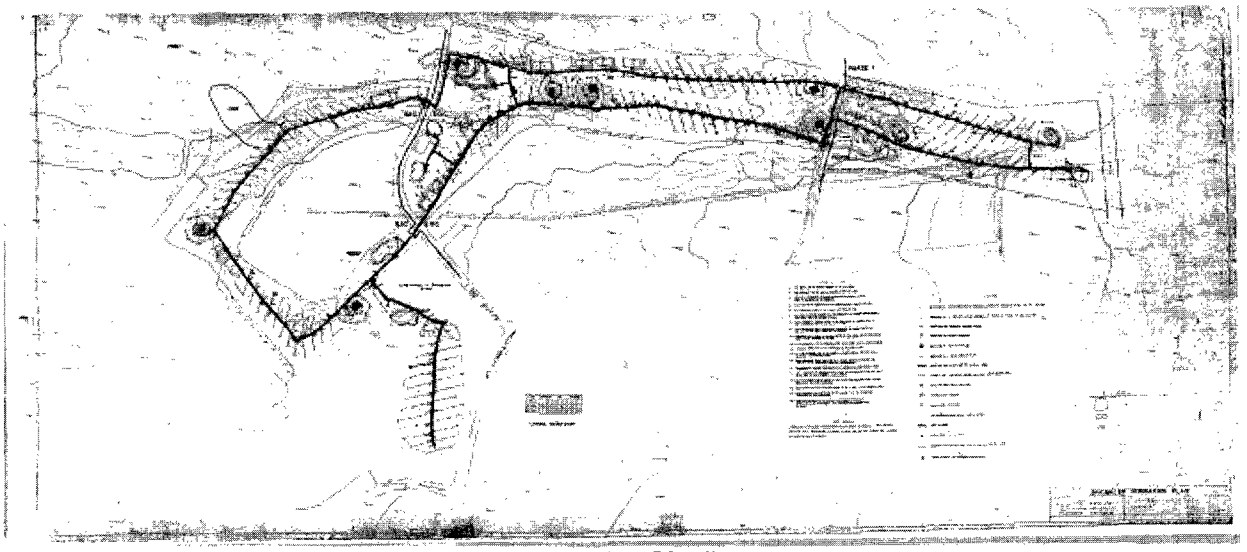
This memorandum will describe some general information related to the overall non-potable irrigation system, observations regarding the operation of the pumping stations, the current status of the control system, analysis of the mainline pipe system with a computerized hydraulic model, and recommendations for short term system-wide improvements for the next 3-5 years or until a master plan is established for the project site.

For ease of reference, the map below shows the two pumping stations (labeled "Pumping Stations 1 & 2" and the five irrigation storage lakes (labeled "Ponds A-E).

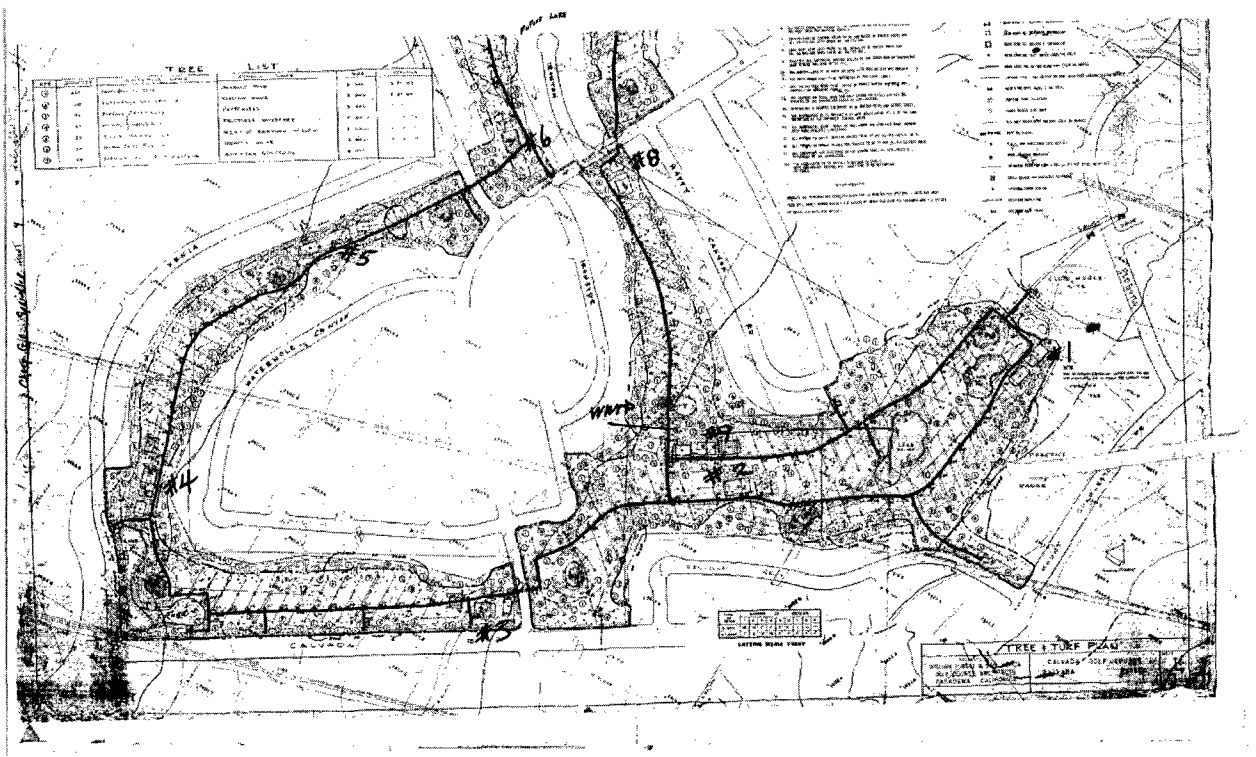


"Pumping Station and Lakes with Labels"

General System Information:
Initial discussions with maintenance personnel helped determine that the portion of the existing Willow Creek Golf Course irrigation system that remains partially operational is confined to the holes located east of Red Butte Road as shown on the "Sprinkler Irrigation Plan", and holes identified as #2, #8 and #9 near the UICN water treatment facility west of Red Butte Road on the marked-up "Tree & Turf Plan" provided by UICN (Holes 1-9).



"Sprinkler Irrigation Plan"



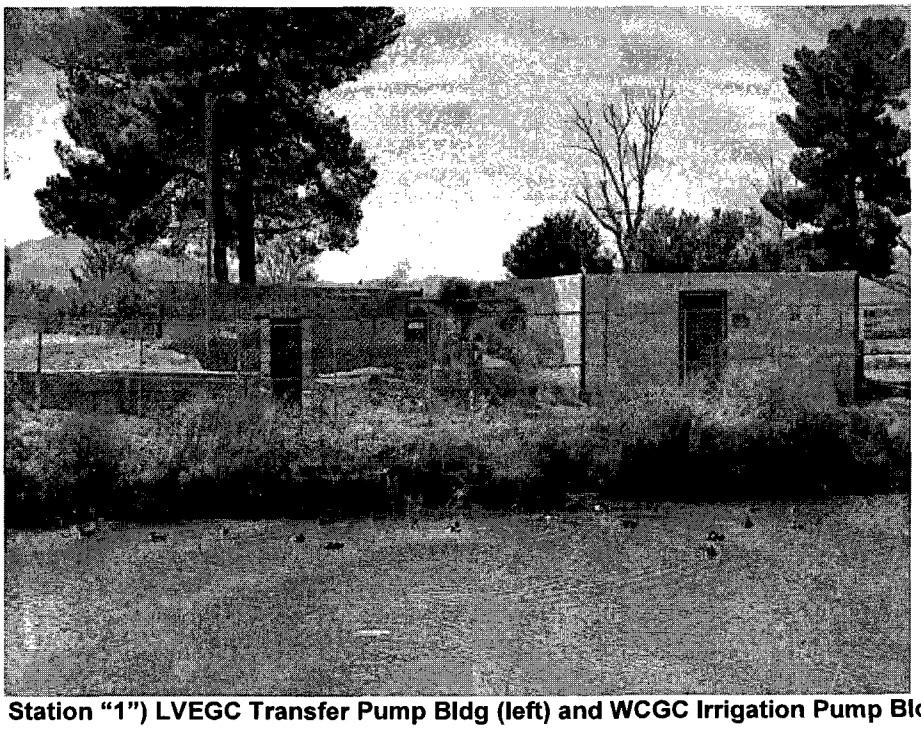
"Tree &Turf Plan"

The remainder of the golf course irrigation system is not operational, and has not been for quite some time. The existing sprinklers on holes ten through eighteen and the driving range are currently being utilized as an equipment inventory source; maintenance personnel are harvesting sprinklers and equipment on an "as-needed basis" from the non-operational portion of the system when repairs are required on the partially operational portion of the system.

Aqua Engineering conducted a review of the available irrigation system design documents (provided prior to the site visit by UICN and shown on Page 3 of this report) with the local representatives. It was determined during that review session that these design documents are no longer valid or useful in describing the irrigation system design, layout, equipment manufacturer, model numbers, or quantities, and course routing. Significant changes have occurred to the site and the irrigation system since these drawings were developed and the majority of those changes went unrecorded. However, local representatives were able to use the available drawings as a basis to describe the approximate mainline size and pipe routing for our use in developing a theoretical hydraulic model as noted later in this memorandum.

Currently, there is an on-site water treatment plant managed by UICN that produces up to 650,000 gallons per day (GPD) of treated effluent water (reclaimed) which is discharged into Pond "A". There is a nearby golf course, Lake View Executive Golf Course (LVEGC), that is entitled to a daily allotment of 425,000 GPD of this reclaimed water and they utilize a transfer pumping system located adjacent to the WCGC Irrigation Pumping Station "1" at Pond "A".

The remainder of the reclaimed water is pumped throughout the WCGC irrigation system and is used to either fill storage ponds or is dispersed via the operational portion of the irrigation system.



(Pumping Station "1") LVEGC Transfer Pump Bldg (left) and WCGC Irrigation Pump Bldg (right)

There are two identical irrigation pumping stations on-site for the WCGC. Pumping Station "1" is located adjacent to Pond "A" between holes 1 and 9. Pumping station "2" is located adjacent to Ponds "D & E" near hole 5.

The mainline for the irrigation system is a multiple looped system consisting of 4-inch, 6-inch and 8-inch Class 200 PVC pipe with PVC fittings. Due to the age of the system, the onsite maintenance operator has repaired multiple mainline breaks in last 6 months.

The irrigation system was designed as a block sprinkler system (i.e. a low-voltage solenoid-activated control valve services several sprinklers on a lateral piping system downstream of the valve, rather than valve-in-head sprinklers under constant pressure which represent the current standard for golf course irrigation). The irrigation control valves are very old and the onsite maintenance operator has repaired many valve leaks over the last 6 months. Many of the valves are not easily accessible because the valve boxes have been completely filled with dirt from burrowing animals. There are also a variety of irrigation rotary sprinklers from different manufacturers in use throughout the site. This lack of consistency makes it more difficult and more costly to repair or replace broken heads and apply water at a consistent or manageable rate.

Water Source:
As stated above, the UICN water treatment facility currently produces up to 650,000 gallons of reclaimed water per day. During the irrigation peak season, the nearby LVEGC utilizes all of its allotted 425,000 GPD of this reclaimed water. The remaining 425,000 GPD is either lost through percolation and evaporation in the storage ponds, or is dispersed through the operational portion of the irrigation system. During the irrigation "off-peak" season, the LVEGC does not take its full allotment and the balance of water produced by the UICN facility must be dispersed through the WCGC irrigation system.

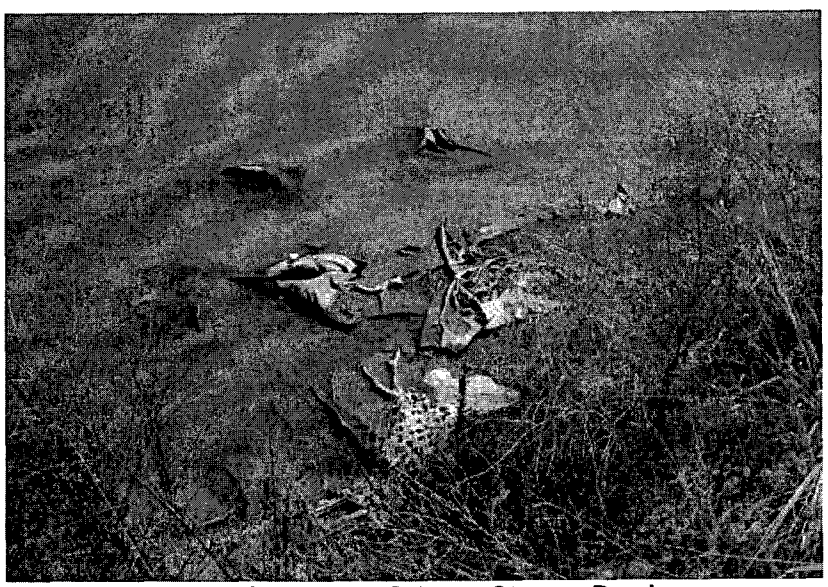
Directly downstream of the LVEGC transfer pumping system discharge is an in-line paddlewheel-type flow meter used to track the amount of water pumped to the LVEGC site. Both Basilio and Richard questioned whether the calibration, operation and reporting of the flow meter is accurate, based on the amount of time it takes to disperse the water at WCGC on days LVEGC takes their allotment of water vs. days they do not.

According to information received from UICN, the water treatment facility has the potential to discharge 1.5 million gallons of treated water per day after build-out. Based on the current pipe sizes of the WCGC mainline network and the hydraulic modeling of the system that was conducted as part of this study, the WCGC irrigation system in its current state cannot support dispersing the potential build-out volume of water from the water treatment facility within a 24-hour period.

Water Storage Facilities:
There are three hydraulically connected water storage ponds located in close proximity to each other near holes 10 and 18 (Ponds "A", "B", and "C"). Pond "A" adjacent to Pumping Station "1" is fed directly by a 24-inch discharge pipe directly from the water treatment plant. Pond "B" is fed means of a balance pipe between it and Pond "A". There is also a balance pipe between Ponds "B" and "C".

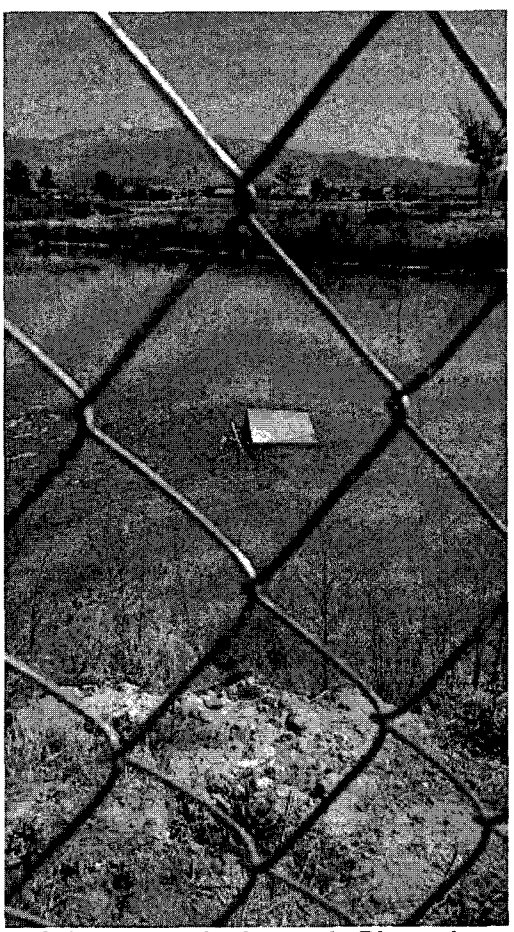
Ponds "B" and "C" were originally designed to store water supplied from Pumping Station "2" via the irrigation mainline and a 6-inch PVC transfer pipe serviced by a horizontal centrifugal pump at Pumping Station "2" which discharges into Pond "C". According to Basilio, the 6-inch PVC transfer pipe has a significant break somewhere between the pumping system discharge and the inlet at Pond "C" that will be difficult to repair because he believes it is located beneath the street paving for Mount Charleston Drive.

From visual observation during the site visit, it appears that the lining system at each of the ponds (Ponds "A"-"E") is in a state of significant disrepair. It is likely that reclaimed water is being lost to the adjacent soil through leaks in this liner system. In addition, it appears that the intake screen and intake piping system within Pond "A" that conveys water to the pumping system wet well is in a state of significant disrepair. The water quality in these ponds appeared to be in a declined state and it does not appear that these ponds are serviced by a functional aeration system. If the water quality continues to exist in this declined state, it will continue to degrade the functionality of the overall irrigation system as well as cause additional wear and tear on the pumping systems and clog their suction filters.



Degraded Liner at Primary Storage Pond

Degraded Water Quality in Primary Storage Pond



Irrigation Intake Screen in Disrepair

The two ponds near hole five (Ponds "D" & "E"), are fed by a manual valve connected to the irrigation mainline and they have a balance pipe between them. According to local representatives, these two ponds also have the capability of being supplied with raw water from an agricultural water source via an on-site ditch conveyance when necessary. There are also three unlined dry-ponds (2 on UICN property) located throughout the non-irrigated portions of the WCGC site that have the capability of storing water via manually operated valves connected to the irrigation mainline in the event of flooding in Ponds "A" – "E".

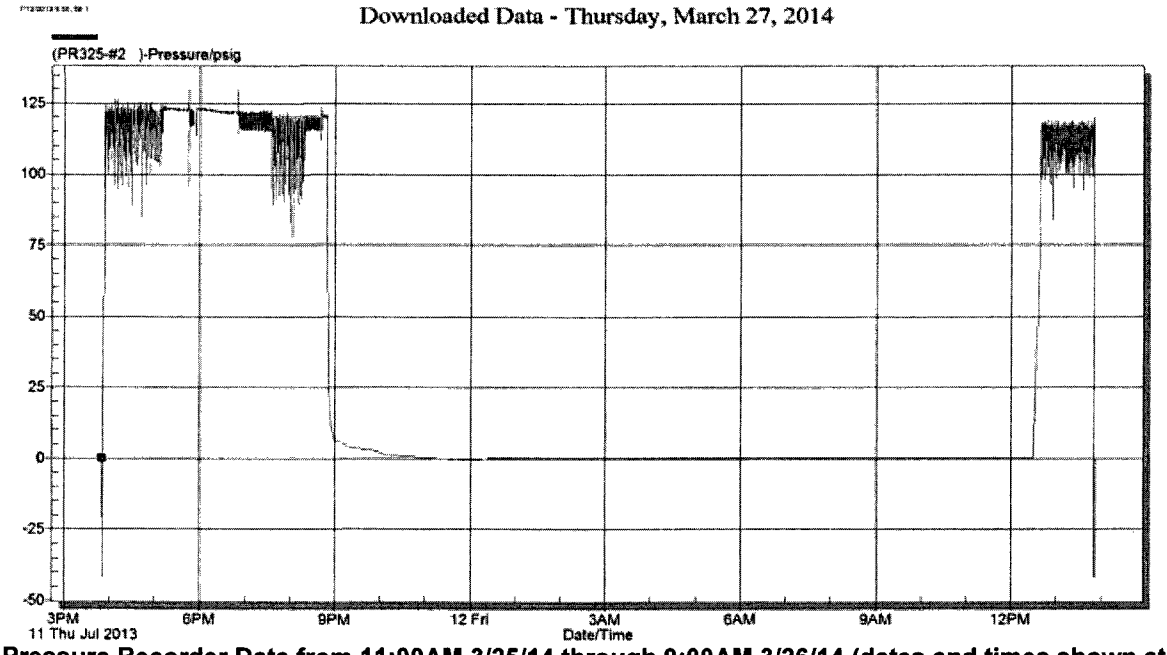
It should be noted that one of these ponds is on a parcel of land that has been sold and is no longer used since it is not on UICN property. There are also two additional unlined ponds near holes 14 and 17 that are considered aesthetic ponds which are kept full of reclaimed water year-round. These two aesthetic ponds receive water from the mainline via manually operated valves; however, water cannot be discharged from these ponds or used for irrigation purposes.

According to local representatives, all of the ponds on the golf course property serve as temporary stormwater detention when significant storm events occur in the valley. When large storm events occur, the ponds occasionally top-over from stormwater runoff and the water runs along the surface of the golf course until it disperses through the community's storm drain system.

Irrigation Pumping Systems:
Pumping Stations "1" and "2" are identical. The vertical turbine pumping stations were manufactured by Flowtronex and installed as part of an irrigation system renovation project in 2004 or 2005. Each pump station is designed for a maximum flow rate of 2,100 GPM at a discharge pressure of approximately 130 PSI. Each pumping system includes three 75 HP pumps and one 5 HP pressure maintenance pump controlled by a Variable Frequency Drive (VFD) and programmable logic control panel located on the pumping station skid.

Pumping Station "1" near holes 10 and 18 is not operated automatically at this time. Pump #1 will start up and run, however it shuts down within a matter of minutes, possibly due to multiple fault conditions that have not been corrected but have been recorded by the Operator Interface Device (OID) and/or VFD controls. The pumping system controls do allow for alternating operation between pumps #2 and #3 as well as combined operation of both pumps concurrently under higher flow demand conditions, but without the availability of pump #1, it is unlikely that the system will be able to achieve the specified 2100 GPM flow rate and discharge pressure. In addition, it appears that the packing gland on Pump #3 is leaking excessively.

A pressure recorder was connected to the discharge manifold at this pumping system (Pumping Station "1") and allowed to log pressure data in the system for approximately 22 hours during the site analysis visit. It appears that there are significant pressure spikes that range from 75PSI to 125PSI occurring during the system operation and that the VFD controls are not functional at this pumping system. These spikes in discharge pressure will continue to have a significant negative impact on the irrigation mainline pipe network in the form of fitting failures.

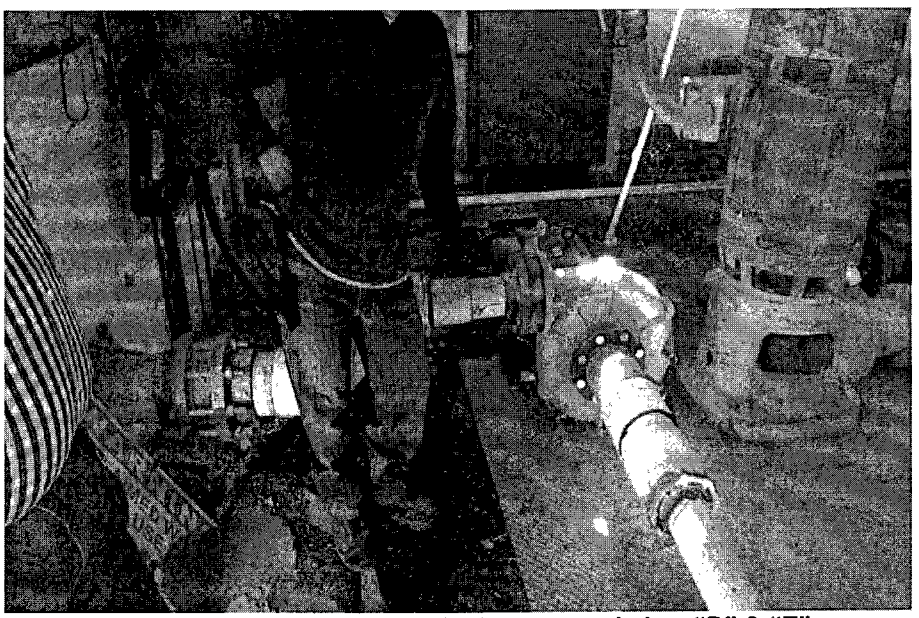


Pressure Recorder Data from 11:00AM 3/25/14 through 9:00AM 3/26/14 (dates and times shown at the bottom of this chart are not accurate)

The pressure maintenance pump and flow meter are also not operational on this pumping system. An automatic suction-screen filtration system is installed as part of the pumping station; however the screens for the filtration system have been removed by onsite maintenance operators because they were continuously clogging. This may be caused by the increased degradation of water quality in Pond "A" as noted above and an ineffective intake screen element.

Pumping Station 2, near Hole 5 is operational but requires manual activation and control. It is also not being used on a functional basis at this time. The OID has been vandalized and is not functional. The onsite maintenance operator manually operates the pumping station approximately once a month to exercise the motors and to make sure it is operational in the event Pumping Station "1" becomes inoperable or requires maintenance.

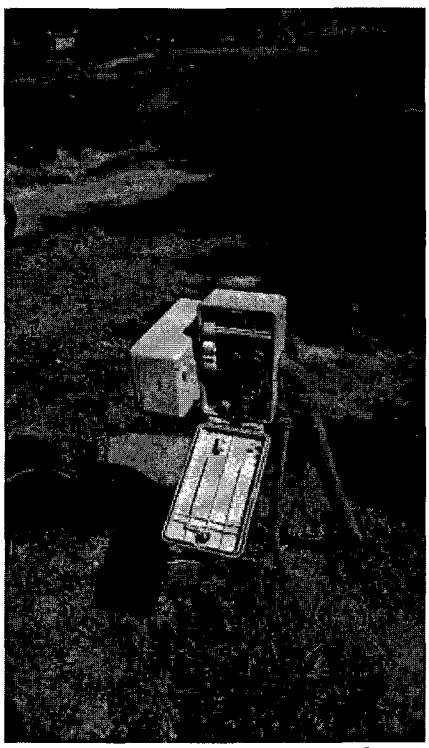
There is also a 20 HP horizontal centrifugal transfer pump located in the building adjacent to Pumping Station "2" near Hole 5. This pump requires manually priming from the wet well. In the past, this pump was used to divert water via a dedicated 6-inch PVC pipe from Ponds "D" & "E" back to Pond "C" near Pumping Station "1". As described previously in this report, the 6-inch PVC transfer pipe has been capped due to a break in that line thought to be under the street.



Horizontal Centrifugal Transfer Pump near Lakes "D" & "E"

Irrigation Control System:

There are remnants of a TORO OSMAC central/satellite control system which was installed around 2004 or 2005 as part of an irrigation pumping system and control system upgrade, replacing the Rain Bird Model RC-A (originally specified) and Rain Master Model RME stand-alone controllers (interim upgrade) located throughout the course.



Toro OSMAC Controller Interface

The central control communications system is not currently able to interface with the field satellite controllers as originally specified. A significant amount of the existing low-voltage wire paths between the controllers and existing remote control valves have been damaged over time, rendering most of the valves inoperable from the controllers. Only five of the Toro OSMAC Satellite Controllers are still operational, in standalone mode only, and are currently being activated via handheld radio, even though the radio frequency that is being used for control system communications is not available for continued licensing.

The remainder of the irrigation system that is functional is currently being managed manually by the onsite maintenance personnel who daily tours the golf course property to physically open and close the irrigation control valves via the manual bleed mechanism in each valve box. This is an extremely inefficient way to manage the irrigation system, requiring constant on-site monitoring and attention. This also may create hydraulic flow and velocity conditions within the mainline that exceed the system's design and operational parameters to the eventual or potential detriment of the piping and irrigation equipment.

Irrigation Mainline:
The irrigation mainline is comprised of four-inch, six-inch, and eight-inch Class 200 PVC pipe. Research on the internet indicates that the golf course was constructed in 1978 and 1979. The mainline fittings appear to be mainly constructed using PVC solvent-weld connection methods. It is well documented (reference "*Designing, Operating and Maintaining Piping Systems using PVC Fittings*", Ron D. Bliesner, 1987) that PVC fittings tend to fatigue over time when subjected to multiple cycles of flow and pressure, even under optimum conditions, such as those created by smooth pumping system operation via VFD controls and when velocities are maintained

under the industry standard of 5 FPS. Since neither of those optimum conditions appear to be the case at this site, it is anticipated that the fitting fatigue will continue to be a pervasive issue and continued mainline pipe and fitting failure can be expected. The mainline pipe and fittings would now be considered well past their optimal life-span (typically between 20-25 years in a golf course application) and would likely be a high-priority consideration for replacement if the golf course were still in operation as a revenue generating resource and amenity. During our site visit we observed a number of locations where the mainline has been repaired due to fitting failure.

Example of Large Diameter Solvent-weld PVC Fitting with Fatigue Fracture

Currently the industry standard for an irrigation system using PVC pipe in the diameters installed at WCGC (3-inches and larger) would be to utilize deep-bell ductile iron fittings with gasketed joints and either concrete thrust blocks or joint restraints to maintain the integrity of joint connections within segments of the mainline pipe network. The use of HDPE pipe with butt-fusion welded joints is also considered to be a viable option in the current golf construction industry. The mainline piping network is a critical component of any irrigation system, and care should be taken to preserve its integrity through effective hydraulic system management especially considering the fragile conditions of the mainline and fittings on this system.

Aqua Engineering utilized the available information provided by WCGC representatives to develop a theoretical hydraulic model (See Figure 1.1 Sample Hydraulic Model at the end of this report) to evaluate several flow/velocity/pressure scenarios for the existing irrigation mainline network. A summary of the results of this model is below.

The hydraulic model shown graphically represents the believed mainline routing. It is not intended to represent the actual location of the mainline as installed. It should be noted that the blue nodes represent a theoretical 150 GPM dispersion location (typical) for a total flow rate of 1,200 GPM. The hydraulic model shows that between the Pumping Station "1" discharge and node J12, the water velocity in the 8-inch mainline pipe exceeds the recommended maximum of 5 FPS flow velocity for PVC pipe. It is recommended that this section be upgraded to 10" Class 200 PVC pipe to reduce the velocity and improve system hydraulics downstream of this segment.

Irrigation Sprinklers:
The sprinklers used to disperse the reclaimed water over the irrigated landscape areas are currently a conglomeration of several different models from two different manufacturers. According to on-site maintenance personnel approximately 50% of the operational portions of the system uses the original Rain Bird 47 series and 51 series pop-up rotary impact sprinklers, 25% of the system uses Rain Bird Eagle gear-driven rotary sprinklers, and 25% of the system uses Toro 735 gear-driven rotary sprinklers.

The gear-driven sprinklers were apparently installed as replacements to the original impact sprinklers over a period of time due to the fact that the impacts are obsolete and replacement parts are not readily available.

The lack of consistency in sprinkler manufacturer and model makes it difficult for the site maintenance staff to manage the system flows and uniformity of coverage (or dispersal in this case) within a reasonable degree of accuracy and efficiency. In addition, over time the nozzle orifices tend to wear and expand, thus creating a higher flow than specified or anticipated. Each of these conditions can affect the overall flow volume and system management/operational parameters, especially when multiple valves and sprinklers are operating concurrently.

Recommendations for Prioritized Repairs and Improvements:
Based on the findings outlined in this memorandum, Aqua Engineering makes the following recommendations:

<u>Lake Storage Facility</u>
Excavation and expansion of the existing storage ponds will allow for increased "off-peak" storage volume and consolidation of storage facilities. The existing liners are torn in many places and allow leakage of the water in the storage ponds into the ground below. Continued degradation could cause portions of the liner to block the intake screens. Degraded water quality is an issue in the existing storage ponds. The addition of a lake bed aeration system will help "turn-over" the water within the storage ponds, reduce algae blooms, and increase the longevity of the irrigation system.

Irrigation and Transfer Pumping System

Both pumping stations are not completely operational at this time. The onsite maintenance personnel currently operate both pumping stations in the "manual" mode only. We recommend that UICN contact Flowtronics and have a local service technician evaluate both pumping stations and provide an estimate for bringing them back to fully automatic operational status.

The existing WCGC Irrigation Pumping System "2" may remain operational as a transfer pumping system for water from ponds "D" and "E" into the new storage facility as necessary.

Mainline Pipe Enhancements

Replace the mainline pipe at Pump Station "1" discharge segments as described previously in this report to maintain lower velocities even at build-out flow demands. Because part of the mainline crosses a portion of the parcel where the golf course club house is located, UICN should negotiate an easement for installation and repair of the existing mainline pipe. Commit to providing sufficient staff who are knowledgeable about the existing system for on-going rapid repairs of mainline segments that must remain operational while developing a strategy for the complete replacement of mainline piping and valve infrastructure as soon as possible.

Irrigation Control System Replacement

The control system is obsolete and needs to be replaced using current technologies. A central/satellite control system that provides features such as a flow monitoring interface, hand-held radio remote control, and remote alert notification via cell phone is an important consideration for this site. As an alternative to a conventional multiple pilot/common low-voltage wire control system, consider the installation of a two-wire system which will minimize controller quantities, low voltage wire quantities, and multiple 120VAC power source requirements. However, this type of system would require retrofit or replacement of existing control valves with DC-latching solenoids and trenching for installation of new two-wire path to each valve.

Irrigation Sprinkler Replacement

Develop a systematic program to replace current sprinklers with a single manufacturer and model that operates at a comparable flow rate and at a lower pressure which will enhance existing mainline preservation and reduced pumping system power requirements. Expand the current system to add remote control valves, lateral pipe and sprinklers to infill non-irrigated areas within the current operational footprint, and provide future expansion to current non-operational areas to accommodate future peak flow outputs from the water treatment facility.

In order to evaluate the dispersal of 650,000 gallons of reclaimed water on a daily basis, Aqua Engineering developed a diagrammatic Sprinkler Layout Study (See Figure 1.2 Theoretical Sprinkler Layout for New System of Dispersal at the end of this report) for the areas that are currently under operation to assess the anticipated quantity of sprinklers and valves required, and the impact on the existing mainline hydraulics. A brief summary is provided below.

The major issue with the irrigation system at this time is the age of the mainline pipe and the high operating pressures the pump provide in manual mode operation. The purpose of this exercise is to determine the average flow rate required to disperse 650,000 gallons over a 12-hour water window by reducing the pressure in half (60 psi). The flow rate is approximately 902 GPM. In this example, a 70' triangulated layout was used over the portion of the WCGC that is currently used to disperse reclaimed water, as well as a few additional holes adjacent to Pump Station #1.

The diagrammatic Sprinkler Layout Study uses comparable sprinklers from three manufacturers at an operating pressure of 60 PSI at the sprinkler to disperse 650,000 gallons of reclaimed water in 12 hours. A total of 743 sprinklers are shown to disperse water over the study area. Using new 2" Remote Control Valves (RCVs) at a maximum flow rate of 94 GPM per RCV, 186 RCV's would be required, and 10 RCVs would need to be operated concurrently from the control system. If new 3" RCVs are specified, then 124 RCV's would be required and 7 RCVs would need to be operated concurrently. If it is determined that the existing mainline must remain operational for an extended period of time due to budgetary constraints, replacing the existing RCV's and installing new sprinklers that use the lower operating pressure will aid in prolonging the life of the existing pipe and fittings.

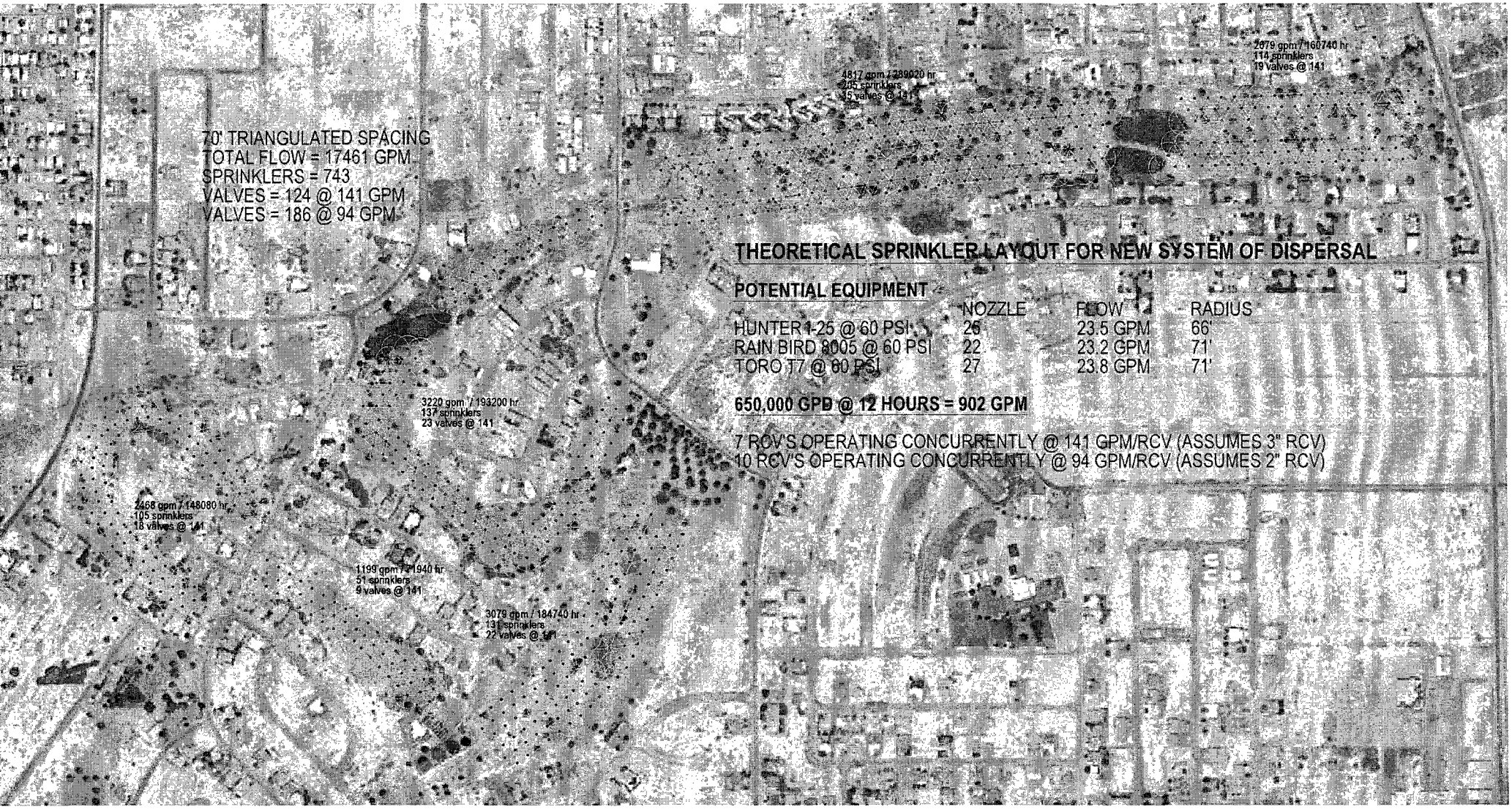
The foregoing is our understanding of the issues discussed and conclusions reached. Please contact Boyd Coleman (480.222.0360) immediately should you have any questions, or require clarifications or additional documentation.

End of Memorandum

Figure 1.1 Sample Hydraulic Model


COLOR CODING LEGEND
PIPE: VELOCITY (FT/S)
<= 1.71
<= 3.30
<= 4.88
<= 6.47
<= 8.06
OTHER
ABANDONED 6" MAINLINE USED TO FILL POND "C" FROM PUMPING STATION "2" (CONTINUES UNDER LEGEND ALONG ROADWAY)
ACCORDING TO WCGC REPRESENTATIVES, THE PROPERTY SURROUNDING THE EXISTING CLUBHOUSE IS PRIVATE AND ANY IMPROVEMENTS WITHIN THIS PROPERTY BOUNDARY MAY REQUIRE AN EASEMENT
BASED ON THIS MODEL, THESE TWO SEGMENTS OF 8-INCH MAINLINE SIGNIFICANTLY EXCEED 5 FPS MAXIMUM VELOCITY FOR PVC. RECOMMEND CONSIDERING REPLACEMENT OF MAINLINE PIPE BETWEEN PUMP DISCHARGE AND NODE J12 WITH 10-INCH MAINLINE.
WILLOW CREEK GOLF COURSE
THEORETICAL HYDRAULIC MODEL PARAMETERS
- BLUE NODES REPRESENT 150GPM DISPERSION LOCATION (TYPICAL), THEREFORE TOTAL FLOW = 1,200 GPM
- MAINLINE PIPE ROUTING AND SIZES SHOWN REPRESENT INFORMATION PROVIDED BY WCGC REPRESENTATIVES
2150 ft

Figure 1.2 Theoretical Sprinkler Layout for New System of Dispersal



THEORETICAL SPRINKLER LAYOUT FOR NEW SYSTEM OF DISPERSAL

POTENTIAL EQUIPMENT

	NOZZLE	FLOW	RADIUS
HUNTER I-25 @ 60 PSI	26	23.5 GPM	66'
RAIN BIRD 8005 @ 60 PSI	22	23.2 GPM	71'
TORO T7 @ 60 PSI	27	23.8 GPM	71'

650,000 GPD @ 12 HOURS = 902 GPM

7 RCV'S OPERATING CONCURRENTLY @ 141 GPM/RCV (ASSUMES 3" RCV)
10 RCV'S OPERATING CONCURRENTLY @ 94 GPM/RCV (ASSUMES 2" RCV)

Attachment E – Public Notice and Proof of Publication

The Public Notice below is a corrected version of the notice published on Wednesday, Jun 25th

BEFORE THE PUBLIC UTILITIES COMMISSION OF NEVADA NOTICE OF APPLICATION FOR A PERMIT TO CONSTRUCT UTILITY FACILITIES UNDER THE UTILITY ENVIRONMENTAL PROTECTION ACT

Utilities, Inc. of Central Nevada (the "Company") is submitting, pursuant to the Nevada Utility Environmental Protection Act ("UEPA"), an application to the Public Utilities Commission of Nevada (the "Commission") for authority to rehabilitate and enlarge the existing receiving pond at the Willow Creek property, add a second overflow pond, rehabilitate two pump houses on the property and install two rapid infiltration basins in the approximate location of the existing overflow ponds on the Willow Creek property. In addition, the Company will be replacing and relocating approximately 810 lineal feet of the Willow Creek Pump House discharge piping, 190 feet of Lakeview Pump House discharge piping and associated valves and appurtenances. The project will be located in Pahrump, Nevada adjacent to the Company's existing Wastewater Treatment Plant No. 3 which is generally located North of Calvada Boulevard and East of Upland Avenue and more specifically in Southeast Quarter of the Southwest Quarter of Section 22, Township 20 South, Range 53 East,. This project is being undertaken to rehabilitate the existing effluent storage pond and overflow ponds for the betterment and safety of the community and to establish a reliable method of effluent disposal for Wastewater Treatment Plant No. 3.

The contents of the UEPA Application will include, but are not limited to:

1. A general description of the location of the project;
2. A statement on the environmental effect of the project;
3. A description of the rehabilitation to be performed on the existing overflow pond and pump stations and a description of the new facilities including the overflow pond, associated piping and appurtenances and the rapid infiltration basins;
4. A description of how the rehabilitated effluent storage and pumping components and new effluent storage and disposal components will aid in providing customers with reliable service and will serve the public interest.

A copy of the application will be available on the Commission's website following the Company's filing of the application. Additional information about the UEPA process and a person's right to participate in that process can be found in Nevada Revised Statutes and Nevada Administrative Code Chapters 703 and 704.

Affidavit of Publication

STATE OF NEVADA)
COUNTY OF NYE) SS:

UTILITIES INC OF CENTRAL NV
2335 SANDERS ROAD
NORTHBROOK IL 60062

Account # **22483**
Ad Number **0000236809**

Phyllis Trice, being 1st duly sworn, deposes and says: That she is the Legal Clerk for the Pahrump Valley Times, a bi-weekly newspaper regularly issued, published and circulated in the Town of Pahrump, County of Nye, State of Nevada, and that the advertisement, a true copy attached for, was published in said Pahrump Valley Times in 1 edition(s) of said newspaper issued from 07/02/2014 to 07/02/2014, on the following days:

07 / 02 / 14 Willow Creek - Revised

SEE ATTACHED

/S/ Phyllis Trice
LEGAL ADVERTISEMENT REPRESENTATIVE

Subscribed and sworn to before me on this 2nd day of July, 2014

Notary Holly Hernandez

HOLLY HERNANDEZ
NOTARY PUBLIC
STATE OF NEVADA
No. 07-4195-14 - NYE COUNTY
MY APPT. EXPIRES JULY 8, 2015

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PUBLISH: July 2, 2014.

CERTIFICATE OF SERVICE

I hereby certify that I am an employee of Lionel Sawyer & Collins and on July 11, 2014, I caused to be served, a true and correct copy of the foregoing UEPA Application via U.S. Mail or as indicated below to the following parties:

Tammy Cordova (Via U.S. Mail)
PUBLIC UTILITIES COMMISSION OF NEVADA
9075 West Diablo Drive, Suite 250
Las Vegas, Nevada 89148

OFFICE OF THE ATTORNEY GENERAL (VIA U.S. MAIL)
BUREAU OF CONSUMER PROTECTION
10791 West Twain Avenue, Suite 100
Las Vegas, NV 89135-3022

NEVADA DEPARTMENT OF ADMINISTRATION (CD ROM VIA HAND DELIVERY)
209 E. Musser Street
Carson City, Nevada 89701

NEVADA DIVISION OF ENVIRONMENTAL PROTECTION (CD ROM VIA HAND DELIVERY)
901 S. Stewart Street, Suite 4001
Carson City, Nevada 89701

NEVADA DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES (CD ROM VIA HAND DELIVERY)
John Walker, Executive Secretary
901 S. Stewart Street, Suite 5001
Carson City, Nevada 89701

NYE COUNTY (VIA U.S. MAIL)
2100 E. Walt Williams Dr.
Ste. 100
Pahrump, NV 89048

DATED this 11th day of July, 2014.

Jane Harrell