

Arkansas Department of Environmental Quality
No-Discharge Section Permit Application
Subsurface Disposal System

Permit No.: _____ <small>(Office Use Only)</small>	AFIN: _____ <small>(Office Use Only)</small>	SIC Code: _____	NAICS Code: _____
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1. Permit Action and Type *(Please check one of the following):*

Operator Type: <input checked="" type="checkbox"/> Corporation (State of Incorporation: _____) <input type="checkbox"/> Limited Liability Company (State of LLC: _____)	
<input type="checkbox"/> Partnership <input type="checkbox"/> Sole Proprietorship/Private <input type="checkbox"/> Public Entity (Type: _____)	
<input type="checkbox"/> New Permit <input type="checkbox"/> Renewal <input type="checkbox"/> Modification of Permit, Describe: _____	
<input type="checkbox"/> Carwash/Truck Wash <input type="checkbox"/> Domestic Septic System <input type="checkbox"/> Slaughter House <input type="checkbox"/> Laundromat	
<input type="checkbox"/> Other <u>RESIDENTIAL DEVELOPMENT</u>	

2. Permittee Legal Name and Mailing Address: *(Must Match Arkansas's Secretary of State)*

Owner Name: BETHEL OAKS PROPERTY OWNERS ASSOCIATION, INC.			
Address: 12531 BETHEL OAKS DR		Phone Number: 479-466-2812	
City: FARMINGTON	State: AR	Zip Code: 72730	
Contact Person: (Mr. / Mrs. / Ms.) DAVID LEVINE		Email: countryprideautos@gmail.com	
Title: POA PRESIDENT	Phone Number:	Cell Number: 479-466-2812	

3. Facility Location *(physical address is required; NO P.O. BOX):*

Facility Name: BETHEL OAKS SUBDIVISION			
Address (911 Address): COUNTY RD 62		Phone Number:	
City: FARMINGTON	State: AR	Zip Code: 72730	
1/4 Sec.: SW	Section: 28	Township: 16-N	Range: 31-W
Latitude 36 Deg 1' Min 46" Sec.		Longitude 94 Deg 16' Min 43" Sec.	Source Datum: NAD 83
County: WASHINGTON	Nearest Town: FARMINGTON		
Nearest Stream: GOOSE CREEK	Distance: 1300 (ft)	Stream Segment:	
Licensed Operator Name (if applicable):	KENNETH GREGORY	Lic. # and Class:	#010277 CLASS II

4. Consultant Information:

Name: CHARLEE PRESLEY		Consulting Firm: PRESLEY BRANNON ASSOCIATES	
Email: cjpres@madisoncounty.net		Phone Number:	
Address: PO BOX 607		Cell Number: 479-409-6550	
City: HUNTSVILLE	State: AR	Zip Code: 72740	

ARKANSAS DEPARTMENT OF ENVIRONMENTAL QUALITY DISCLOSURE STATEMENT

Instructions for the Completion of this Document:

- A. Individuals, firms or other legal entities with no changes to an ADEQ Disclosure Statement, complete items 1 through 5 and 18.
- B. Individuals who never submitted an ADEQ Disclosure Statement, complete items 1 through 4, 6, 7, and 16 through 18.
- C. Firms or other legal entities who never submitted an ADEQ Disclosure Statement, complete 1 through 4, and 6 through 18.

If Not Submitting by ePortal, Mail Original to:

ADEQ

DISCLOSURE STATEMENT

[List Proper Division(s)]

5301 Northshore Drive

North Little Rock, AR 72118-5317

1. APPLICANT: (Full Name)

Bethel Oaks Property Owners Association, Inc

2. MAILING ADDRESS (Number and Street, P.O.Box Or Rural Route):

12531 Bethel Oaks Dr

3. CITY, STATE, AND ZIPCODE:

Farmington AR 72730

4a. Applicant Type:

☐ Individual ☒ Corporate or Other Entity

4b. Reason for Submission:

☐ Permit ☐ License ☐ Certification ☐ Operational Authority

☐ New Application ☐ Modification ☒ Renewal Application (If no changes from previous disclosure statement, complete number 5 and 18.)

4c. Division:

☐ Air ☒ Water ☐ Hazardous Waste ☐ Regulated Storage Tank ☐ Mining ☐ Solid Waste

5. Declaration of No Changes:

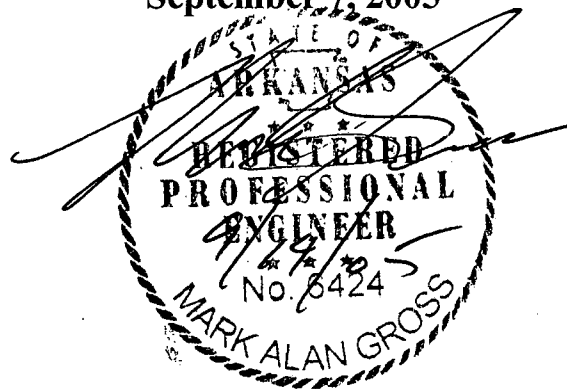
The violation history, experience and credentials, involvement in current or pending environmental lawsuits, civil and criminal, have not changed since the last Disclosure Statement that was filed with ADEQ on _____

Engineering Report

For

**Bethel Oaks Subdivision
Wastewater Treatment
And
Dispersal System**

September 7, 2005



Prepared by

Rural Engineering Services, Inc.

Prepared for

Pack Lane Development Group

Project Description:

The project is proposed as 69 residences developed over an approximately 30 acre site west of Farmington, AR. The residences will be served by public water provided by the Washington County Water Authority. The project plan has been developed with coordination with Sammi May of Morrison-Shipley Engineers, Inc., Fort Smith, AR.

The wastewater collection system will consist of a gravity collection system which will discharge to two equalization tanks in series. The effluent pumps in the equalization tank will pump to a collection manhole which will gravity flow to the package trickling filter system. The trickling filter system is equipped with sludge collection which will recycle to the collection manhole. The wastewater dispersal system will consist of a final settling tank and a dosing tank to provide storage prior to dosing the treated wastewater into subsurface drip irrigation located on the property.

Design Basis:

The wastewater flow estimates were based upon 262 gallons per day per home. For the 69 homes ultimately planned for this development, the total average daily flow is estimated at 18,078 gallons per day.

The treatment technology is a fixed-film, or attached growth process which can typically provide treatment when the system is hydraulically and organically under loaded.

The drip irrigation system is sized by using the soil loading rates provided by Sheri Herron, Arkansas Professional Soil Classifier #53.

Treatment System Components:

The treatment system utilizes one primary tank and one equalization tank, with each tank sized for 25,000 gallons nominal capacity. The equalization tank pumps approximately 1,000 feet to a collection manhole, which gravity flows into one model 36/30 BioClere® treatment unit. The treatment unit has synthetic (plastic) media for a fixed film process, and is constructed with an integral clarifier under the media for sludge (biomass) collection and recycle. The biomass is recirculated to the sludge holding tank, and thence to the collection manhole by pumps within the BioClere unit that are provided as an integral part of the BioClere package. The treatment units are followed by a 4000 gallon final settling/ chlorine contact tank, and then a 4000 gallon dosing tank with duplex pumps sized to dose the treated wastewater to subsurface drip irrigation tubing. The wastewater will be dispersed into the soil for final dispersal.

Sludge Storage Tank

The sludge storage tank is sized as recommended by AquaPoint, Inc. and will be a fiberglass tank manufactured under IAPMO standards and tested prior to installation. The tank is baffled at 2/3 volume and the sludge recycle from the BioClere® unit will gravity flow to the inlet end of the tank. Ballast for the tank will be constructed as concrete dead men holding the tanks against buoyant forces by the use of straps over the tanks and onto the dead men. The tank is to be manufactured by Xerxes Corporation of Minneapolis, MN

Treatment Unit

The treatment unit will be a package trickling filter system known as BioClere, manufactured by AquaPoint, Inc. of New Bedford, MA. The treatment unit was sized by AquaPoint, Inc. to treat a total of 18,078 gallons per day. The treatment system plans have been reviewed by an AquaPoint engineer to ensure that the design complies with the manufacturer's application requirements.

Dosing Tank and Pumps

The dosing tank is sized for 4000 gallons or approximately 5 hours of the total daily flow. Pumps from the dosing tank were sized by determining the flow required to dose the zones. The pump sizing is shown in Appendix B, and is based upon the irrigation tubing manufacturer's suggested sizing criteria. Pumps will be duplexed, and each set of zones will be served by a duplex pump package in the dosing tank. Pumps are Zoeller model 5031-0007, 3/4 HP, 7-Stage, 230VAC single phase pumps capable of approximately 24.1 gpm at 114 feet of head. The pumps, floats, junction boxes, and pump vaults are to be as manufactured by the Zoeller Company, Louisville, KY.

Each duplex pump system will be followed by a turbine flow meter capable of measuring and recording (totalizing) flows of approximately 25 gpm.

Drip Irrigation System

Area requirements for the drip zones were determined by having the soil mapped by Sheri Herron, Arkansas Professional Soil Classifier # 53. The soil loading rates are provided in Appendix A of this report. An average loading rate of 0.138 was used to determine the drip system layout and sizing. The drip irrigation system will have a capping fill of a minimum of 12-inches of loamy topsoil over the native soil.

The drip irrigation system is planned as zones of subsurface tubing manufactured by GeoFlow, Inc. of Sausalito, CA. Drip tubing will be Wasteflow, drip irrigation tubing with pressure compensated emitters spaced 24 inches on center. Tubing will be placed as nearly on contour as possible with no more than one foot of elevation difference between the beginning and the end of each run. The laterals are sized for 1 1/2-inch PVC. Each

zone will be served by a supply lateral and a return lateral having sufficient diameters to provide the pressure and flows for dosing and flushing based upon the manufacturer's sizing guidelines and software. The Geoflow sizing charts and calculations are included as Appendix B of this report.

The drip irrigation system includes a head control box (Geoflow, Inc.) to screen (filter) the treated wastewater to a minimum of 100 microns. The head control box includes the screen filter, solenoids to provide a field flush and a screen filter flush, and piping, wiring, and fittings required to complete the head control box in its enclosure.

The drip irrigation system will also include mechanical zone valves to allow the pumps to supply treated wastewater to each of the zones based upon timed dosing.

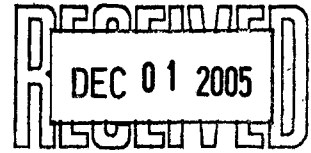
The drip irrigation sizing calculations using the GeoFlow® sizing spreadsheet are provided as Appendix B of this report.

Electrical/Electronic Controls

The BioClere wastewater treatment unit will include the electrical controls in a minimum of a NEMA 3R enclosure. The controls for the BioClere units will only control the functions of the BioClere unit.

The controls for the dosing tank, drip irrigation head control box, and displays for the flow meters will be enclosed in a separate enclosure meeting the minimum requirements of NEMA 3R. The controls for the drip irrigation dosing pumps will be set up to be programmable to provide scheduled doses ranging from 3 minutes to 60 minutes in a continuous range, and on a schedule ranging from every 15 minutes up to every 4 hours within a continuously selectable range.

The control panel enclosure will also include elapsed time meters and cycle counters for each pump. The panel will also include a display to show the total flow through each of the flow meters.



Appendix A

Soil Evaluation Report



Herron
Soil
Interpretations, LLC

Post Office Box 1086
Farmington, Arkansas 72730

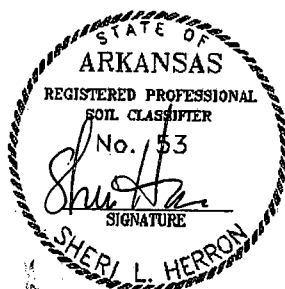
Phone 479•267•3991
Fax 479•267•5683

BETHEL OAKS SUBDIVISION

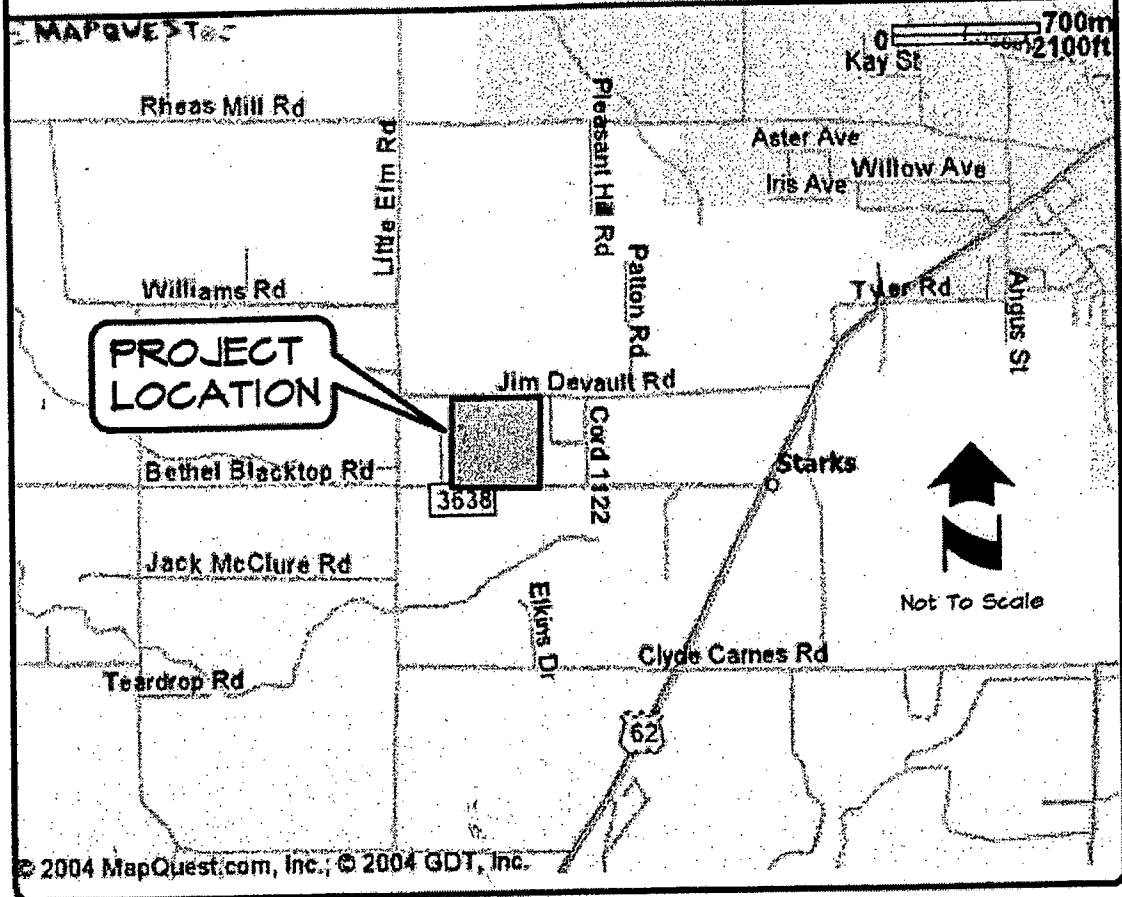
SOIL ANALYSIS FOR DRIP IRRIGATION

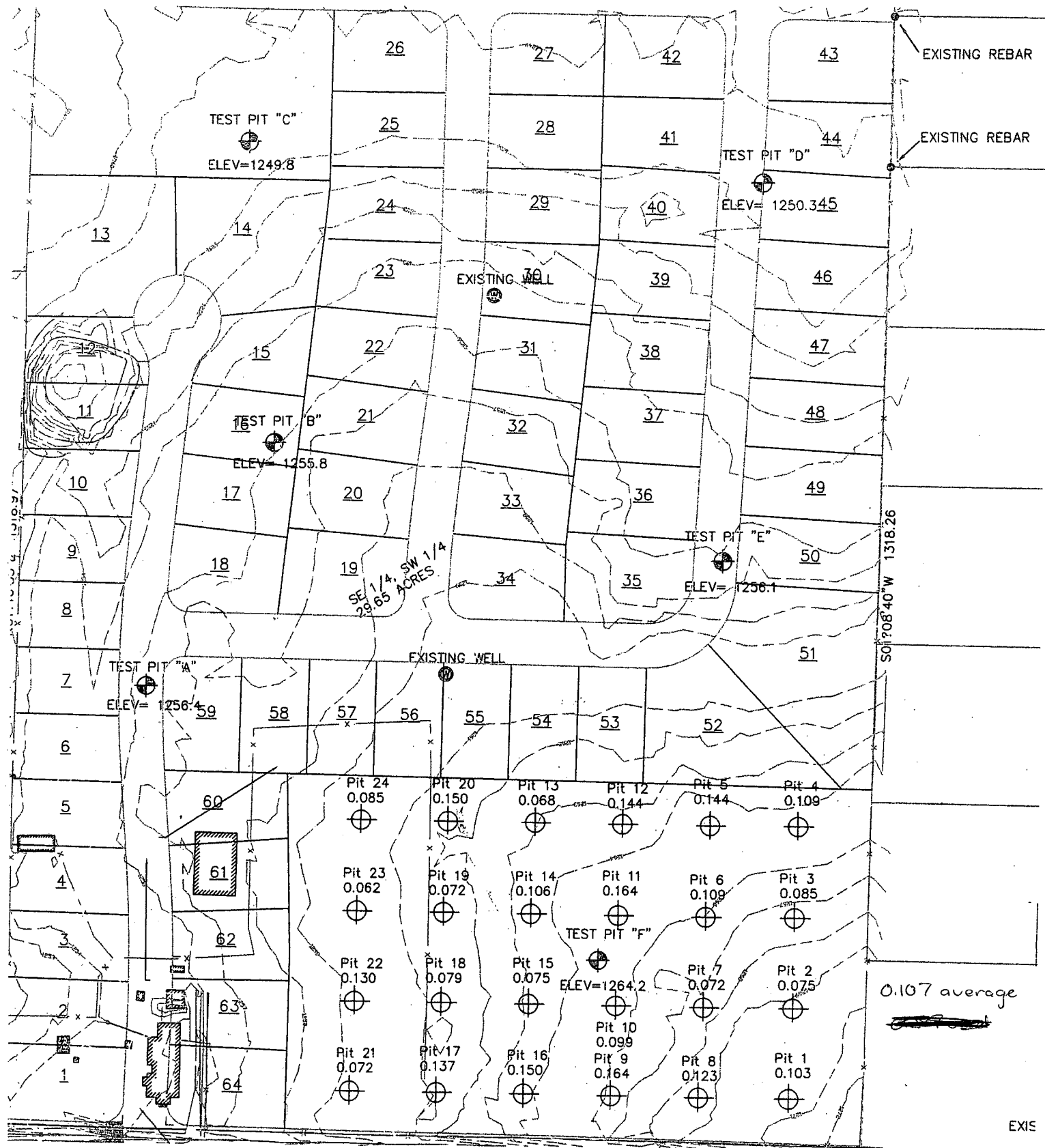
March 28, 2005

Sheri Herron, M.S., PSC, CPSSc
Principal Soil Scientist



VICINITY MAP





EXIS

Soil Analysis for Drip Irrigation Disposal of Treated Effluent **Bethel Oaks, Washington County, Arkansas**

The suitable soils on this site are Pickwick (PsC2). They contain varying depths to the extremely stony layers of chert and clay, which are restricting water movement down the profile. All pits are similar to Pit 24. Loading rates are from ADH Guidelines for the Design and Construction of Drip Dispersal Systems, and do not exceed manufacturer's loading rates.

PIT #	1	
BSWT	12	inches
MSWT	17	inches
AMSWT	15	inches
DEPTH	45	inches
LOADING RATE	0.103	gpd/sq.ft.

PIT #	6	
BSWT	13	inches
MSWT	17	inches
AMSWT	16	inches
DEPTH	44	inches
LOADING RATE	0.109	gpd/sq.ft.

PIT #	2	
BSWT	17	inches
MSWT	21	inches
AMSWT	20	inches
LSWT	24	inches
ALSWT	22	inches
DEPTH	45	inches
LOADING RATE	0.075	gpd/sq.ft.

PIT #	7	
BSWT	12	inches
MSWT	18	inches
AMSWT	16	inches
LSWT	26	inches
ALSWT	21	inches
DEPTH	48	inches
LOADING RATE	0.072	gpd/sq.ft.

PIT #	3	
BSWT	17	inches
MSWT	20	inches
AMSWT	19	inches
LSWT	31	inches
ALSWT	25	inches
DEPTH	48	inches
LOADING RATE	0.085	gpd/sq.ft.

PIT #	8	
BSWT	15	inches
MSWT	20	inches
AMSWT	18	inches
DEPTH	45	inches
LOADING RATE	0.123	gpd/sq.ft.

PIT #	4	
BSWT	12	inches
MSWT	18	inches
AMSWT	16	inches
DEPTH	50	inches
LOADING RATE	0.109	gpd/sq.ft.

PIT #	9	
BSWT	19	inches
MSWT	26	inches
AMSWT	24	inches
DEPTH	46	inches
LOADING RATE	0.164	gpd/sq.ft.

PIT #	5	
BSWT	17	inches
MSWT	23	inches
AMSWT	21	inches
DEPTH	50	inches
LOADING RATE	0.144	gpd/sq.ft.

PIT #	10	
BSWT	16	inches
MSWT	26	inches
AMSWT	23	inches
LSWT	36	inches
ALSWT	29	inches
DEPTH	50	inches
LOADING RATE	0.099	gpd/sq.ft.



Soil Analysis for Drip Irrigation Disposal of Treated Effluent **Bethel Oaks, Washington County, Arkansas**

PIT # 11
 BSWT 21 inches
 MSWT 26 inches
 AMSWT 24 inches
 DEPTH 46 inches
 LOADING RATE 0.164 gpd/sq.ft.

PIT # 16
 BSWT 18 inches
 MSWT 24 inches
 AMSWT 22 inches
 DEPTH 45 inches
 LOADING RATE 0.15 gpd/sq.ft.

PIT # 12
 BSWT 18 inches
 MSWT 22 inches
 AMSWT 21 inches
 DEPTH 47 inches
 LOADING RATE 0.144 gpd/sq.ft.

PIT # 17
 BSWT 18 inches
 MSWT 21 inches
 AMSWT 20 inches
 DEPTH 45 inches
 LOADING RATE 0.137 gpd/sq.ft.

PIT # 13
 BSWT 17 inches
 LSWT 20 inches
 ALSWT 20 inches
 DEPTH 43 inches
 LOADING RATE 0.068 gpd/sq.ft.

PIT # 18
 BSWT 15 inches
 MSWT 18 inches
 AMSWT 17 inches
 LSWT 28 inches
 ALSWT 23 inches
 DEPTH 45 inches
 LOADING RATE 0.079 gpd/sq.ft.

PIT # 14
 BSWT 22 inches
 LSWT 33 inches
 ALSWT 31 inches
 DEPTH 48 inches
 LOADING RATE 0.106 gpd/sq.ft.

PIT # 19
 BSWT 18 inches
 MSWT 20 inches
 AMSWT 19 inches
 LSWT 22 inches
 ALSWT 21 inches
 DEPTH 48 inches
 LOADING RATE 0.072 gpd/sq.ft.

PIT # 15
 BSWT 13 inches
 MSWT 20 inches
 AMSWT 18 inches
 LSWT 26 inches
 ALSWT 22 inches
 DEPTH 48 inches
 LOADING RATE 0.075 gpd/sq.ft.

PIT # 20
 BSWT 18 inches
 MSWT 24 inches
 AMSWT 22 inches
 DEPTH 50 inches
 LOADING RATE 0.15 gpd/sq.ft.



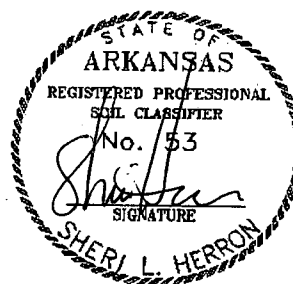
Soil Analysis for Drip Irrigation Disposal of Treated Effluent
Bethel Oaks, Washington County, Arkansas

PIT # 21
 BSWT 14 inches
 MSWT 19 inches
 AMSWT 17 inches
 LSWT 24 inches
 ALSWT 21 inches
 DEPTH 50 inches
 LOADING RATE 0.072 gpd/sq.ft.

PIT # 22
 BSWT 17 inches
 MSWT 20 inches
 AMSWT 19 inches
 DEPTH 48 inches
 LOADING RATE 0.13 gpd/sq.ft.

PIT # 23
 BSWT 14 inches
 MSWT 17 inches
 AMSWT 16 inches
 LSWT 20 inches
 ALSWT 18 inches
 DEPTH 45 inches
 LOADING RATE 0.062 gpd/sq.ft.

PIT # 24
 BSWT 17 inches
 MSWT 20 inches
 AMSWT 19 inches
 LSWT 30 inches
 ALSWT 25 inches
 DEPTH 49 inches
 LOADING RATE 0.085 gpd/sq.ft.



BETHEL OAKS
LOADING RATE SUMMARY PER PIT

Pit #	GPD/sq.ft.	Capping Fill Rate (12", 6" credt)
1	0.103	0.144
2	0.075	0.096
3	0.085	0.106
4	0.109	0.150
5	0.144	0.185
6	0.109	0.150
7	0.072	0.092
8	0.123	0.164
9	0.164	0.205
10	0.099	0.120
11	0.164	0.205
12	0.144	0.185
13	0.068	0.089
14	0.106	0.126
15	0.075	0.096
16	0.150	0.191
17	0.137	0.178
18	0.079	0.099
19	0.072	0.092
20	0.150	0.191
21	0.072	0.092
22	0.130	0.171
23	0.062	0.082
24	0.085	0.106
Avg.	0.107	0.14



PICKWICK SERIES

The Pickwick series consists of very deep, well drained, moderately permeable soils on stream terraces. These soils formed in old alluvium or in a silty mantle 1 to 3 feet thick over old alluvium. Slopes range from 2 to 20 percent.

TAXONOMIC CLASS: Fine-silty, mixed, semiactive, thermic Typic Paleudults

TYPICAL PEDON: Pickwick silt loam - cultivated. (Colors are for moist soil.)

Ap-- 0 to 6 inches; brown (10YR 4/3) silt loam; weak fine and medium granular structure; very friable; many fine roots; neutral; clear wavy boundary. (5 to 10 inches thick)

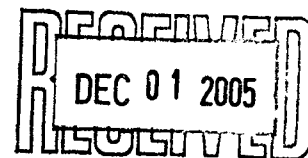
Bt1-- 6 to 14 inches, reddish brown (5YR 4/4) silty clay loam; weak fine and medium subangular blocky structure; friable; common fine roots; common wormcasts filled with brown silt loam; few fine concretions; slightly acid; clear smooth boundary.

Bt2-- 14 to 20 inches, yellowish red (5YR 4/6) silty clay loam; moderate fine and medium subangular blocky structure; friable; common fine roots and pores; few faint clay films on faces of peds; few fine black concretions; strongly acid; clear smooth boundary.

Bt3-- 20 to 32 inches, yellowish red (5YR 4/6) silty clay loam; moderate fine subangular blocky structure; friable; few fine roots and pores; few faint clay films on faces of peds and in pores; few fine and medium black concretion; few fine pebbles; strong acid; clear wavy boundary.

Bt4-- 32 to 41 inches, dark red (2.5YR 3/6) silty clay loam; few brown and yellowish brown silty streaks about 1/2 inch in width; some dusky red and reddish brown coatings on peds; moderate fine and medium subangular blocky structure; firm; few fine roots and pores; few faint clay films on faces of peds; few pebbles; few dusky red, reddish brown, and black coatings on some peds; few fine black concretions; strongly acid; gradual wavy boundary.

Bt5-- 41 to 60 inches, dark red (2.5YR 3/6) silty clay loam; strong fine subangular blocky structure; friable, few fine roots and pores; few distinct clay films on faces of peds; few coarse pebbles; few lenses of brown and yellowish brown from highly weathered pebbles; few black stains; strongly acid; (combined thickness of the Bt horizon is 50 inches or more)



Appendix B

Drip Field Pump Sizing

GEOFLOW Spreadsheets

Geoflow Subsurface Dripline Dispersal: Field Calculation

Job Description:	Bethel Oaks Subdivision - Washington County
Contact:	Sammi May 479-452-3072
Prepared by:	Mark Gross 573-578-1661
Date:	31 May, 2005

Please fill in the shaded areas and drop down menus below:

Note. This worksheet can be found in Geoflow's Design and Installation Manual

Worksheet - Field Design

		Dispersal Field as Single Zone	Dispersal Field as Multiple Zones	
Number of Zones		1	12	zone(s)
A)	Quantity of effluent to be disposed per day	18,078	1,507	gallons / day
B)	Hydraulic loading rate	0.138	0.138	gallons / sq.ft. / day
C)	Determine total area required	131,000	10,917	square ft.
D)	Choose spacing between WASTEFLOW lines	2	2	ft.
D)	Choose spacing between WASTEFLOW emitters	2 ft. ▼	2	ft.
E)	Total linear ft.	65,500	5,458	each
F)	Total number of emitters	32,750	2,729	each
G)	Select Wasteflow dripline	Wasteflow PC - 1/2gph ▼	Wasteflow PC 1/2 gph	dripline
H)	Pressure at the beginning of the dripfield	20 psi ▼	20	psi
I)	Feet of Head at the beginning of the dripfield	46.2	46.2	ft.
J)	What is the flow rate per emitter in gph?	0.53	0.53	gallons per hour
K)	Total flow for the area (gph)	17,358	1,446	gallons per hour
	Total flow for the area (gpm)	289.29	24.11	gallons per minute
L)	Select pipe diameters for manifolds and submains	Refer to a PVC chart	1.5	inch
M)	Select Vortex Filter (item no.)	Consult Factory	AP4E-1F (1in.)	
N)	Maximum length of each WASTEFLOW line. For additional technical flow, pressure and flushing data please refer to Geoflow's Design Manual and WASTEFLOW hydraulics worksheet.	424	424	ft.

Check below to choose quantity and length of daily doses

Dosing			
Number of doses per day/zone:	12	12	
Pump run time per dose/zone (minutes):	5.21	5.21	minutes
Pump run time per day/zone (hours):	1.04	1.04	hours / day
Pump run time per day/all zones (hours):	1.04	12.50	hours

Geoflow Subsurface Dispersal: Pump Size Calculation

Job Description:	Bethel Oaks Subdivision - Washington County
Contact:	Sammi May 479-452-3072
Prepared by:	Mark Gross 573-578-1661
Date:	31 May, 2005

Please fill in the shaded areas below:

Information automatically inserted is from the multiple zone column in 'Worksheet 1-Field Design'

Note. This worksheet can be found in Geoflow's Design and Installation Manual

Worksheet - Pump Sizing

O)	Minimum pump capacity	24.11 gpm	
P)	Header pipe size	1.5 inch	
Q)	Pressure loss in 100 ft. of pipe	2.27 psi	
R)	Friction head in 100 ft. of pipe	5.24 ft.	
S)	Static head		
	i) Height from pump to tank outlet	9.5 ft.	
	ii) Elevation increase or decrease	3.7 ft.	
T)	Total static head	13.2 ft.	
U)	Friction head		
	i) Equivalent length of fittings	0 ft.	
	ii) Distance from pump to field	440 ft.	
	iii) Total equivalent length of pipe	440 ft.	
	iv) Total effective feet	23.07228 ft.	
	v) Head required at dripfield	46.2 ft.	
	vi) Headloss through filter or Headwork	27.72 ft.	12 psi
	vii) Head loss through zone valves	3.927 ft.	1.7 psi
V)	Total friction Head	100.91928	
W)	Total dynamic head	114.12 ft.	
X)	Minimum pump capacity	24.11 gpm	
Y)	Choose the pump	Zoeller 5032-0007 6 Stage	

*** Note a few States + counties require additional flow for flushing. Please check your local re

If you need assistance designing for this additional flow, please

- See Geoflow flushing worksheet or
- Contact Geoflow at 800-828-3388.

AQUAPOINT
241 Duchaine Blvd.
New Bedford, MA 02745

BIOCLERE WASTEWATER TREATMENT SYSTEM DESIGN SPECIFICATIONS

SITE: Bethel Oaks Subdivision – Washington County, AR

A Bioclere treatment system is proposed to treat 18,078 gpd of wastewater from the Bethel Oaks Subdivision located in Washington County, AR. The system will consist of the following components in series: primary tank(s), an equalization tank, a model 36/30 Bioclere unit, 4,000 gallon final settling tank, and 4,000 gallon dosing tank. The system will be capable of treating the daily design wastewater flow with the following maximum influent characteristics.

	<u>Raw Influent</u>	<u>Effluent</u>
Design flow (gpd)	18,078	18,078
BOD5 (mg/L)	250	-
CBOD5 (mg/L)	-	<15
TSS (mg/L)	250	<15
pH	6.5-8.5	6.5-8.5
Fecal Coliform (MPN/200 mls)	-	<1000

PRIMARY TANK(s)

Please see site plans by Morrison & Shipley Engineers, Inc. to review the sewer collection system and the primary tank details.

PRE-EQUALIZATION TANK

Primary settled wastewater shall flow into the flow equalization tank (FET) before processing in the Bioclere unit. The purpose of the FET is to transfer the wastewater to the Bioclere unit at a steady flow rate over a minimum period of 18 hours. The FET system shall consist of a 25,000 gallon tank located ahead of the 36/30 Bioclere unit. The following equipment is included in this tank: 2 submersible Zoeller Model 185 Effluent pumps, associated piping, slide rail assemblies, valving, controls and appurtenances.

Four control float switches are located in the tank and govern the following functions:

- 1) Low level float: Redundant off and internal alarm. If Timer float fails to turn pumps off, the redundant off turns the floats off and provides an internal and visual (not audio) alarm for the operator.
When the circuit is closed the float switch will activate the timer and alternate the Zoeller pumps, transferring wastewater to the Bioclere unit.

- 2) Mid-level float #1: Energizes pump timer to provide a pump run time of 30 minutes on, 30 minutes off. Pumps will alternate between lead pump and lag pump.
- 3) Mid-level float #2: Resets pump timer to allow for 45 minutes on, 15 minutes off until the float falls and the timer settings revert to 30 minutes on, 30 minutes off and are controlled by normal operation of Mid-level float #1. Pumps alternate between lead pump and lag pump.
- 4) High level float: The high-level float activates both pumps (lead and lag pumps) and energizes an audio and visual alarm. The float will activate a locking relay that must be manually reset by the operator. This will provide an indication to the operator that the high-level alarm condition has occurred.

BIOCLERE UNIT

The Bioclere consists of a trickling filter that is situated over a final settling tank. The Bioclere is manufactured with fiberglass inner and outer skins with the cavity between filled with polyurethane foam insulation for maximum treatment efficiency.

As wastewater is generated it will flow to the center baffled chamber in the Bioclere clarifier. Wastewater is supplied to the filter by means of two alternating Grundfos AP12 stainless steel submersible pumps that are situated in the center baffle. In case of one pump failure, the operational pump automatically takes over both dosing cycles. Dosing is controlled using fully adjustable timer and the wastewater is uniformly distributed over the entire surface area of the filter by means of fixed nozzles that are constructed of nylon. The Bioclere contains a PVC dosing array and nozzles centered above the filter media to ensure uniform dosing.

Recirculation of sludge and wastewater is accomplished in the unit using a submersible stainless steel Grundfos AP12 pump controlled by a fully adjustable timer. The pump is located on the bottom of the cone shaped clarifier. The diameter of each settling tank is 12 feet with 60-degree sloping sides. Internal baffling is provided in the secondary settling tank to prevent short-circuiting of wastewater and biological solids. The biological solids generated in the filter are returned to the sludge storage facility at regular intervals, typically every hour. The Bioclere recycle pump will run 4 minutes per 34 minutes (225 gallons). This equates to approximately 8800 gallons per day. Therefore, the sludge will not collect in the secondary settling tank and a sludge blanket will not form. The efficiency of the Bioclere secondary settling tank has been proven by the numerous installations and successful operating experience.

The benefits or recirculation are numerous and include: 1) removing biological sludge from the Bioclere so that only the sludge storage tank(s) need periodic pumping, 2) diluting the influent pollutant concentrations which results in a thinner and more effective biofilm on the media bed, 3) odors are reduced in the primary tanks and the treatment components, 4) diluting biological inhibitors (cleaning agent, sanitizers, etc.) that may exist in the wastewater, 5) achieving nitrogen removal through denitrification due to the recirculation of nitrate to the anoxic zone.

The filter media consists of manufactured PVC randomly packed media. The media has a void ratio of >95%, is UV resistant and resistant to a wide range of aqueous solutions, acids, alkalis, oxidizing agents, oils, fats and alcohols. Media with a specific surface area of 140 m²/m³ is used for residential strength wastewater carbonaceous reduction and nitrification.

Forced air ventilation is provided in the Bioclere since it is a covered trickling filter. Each Bioclere contains an axial fan with an airflow capacity of 240 cfm. The fan is exposed to the atmosphere due to its enclosure location on top of the Bioclere. Air flows subsequently through the filter, underdrain, and is discharged through the effluent pipe. A PVC vent is installed after each Bioclere. The air requirements are based on the WEF Special Publication - Aerobic Fixed-Growth Reactors 2000, which arguably provides the most comprehensive and current design criteria on airflow requirements for forced draft trickling filters.

Filter and clarifier sizing calculations

The media loading rates are based on over 10,000 municipal, commercial and industrial installations throughout the world and approximately 600 in the United States. The loading rates conform with those that are accepted by the United States Environmental Protection Agency (*Nitrogen Control* 1993 and *Assessment of Single Stage Trickling Filter Nitrification* 1991), Water Environment Federation (*Aerobic Fixed Film Reactors 2000*) and Metcalf & Eddy, (*Wastewater Engineering* 1991).

The filter media organic loading rates are based on the design criteria outlined on page 1 of this document. The media in the Bioclere unit will have specific surface area 140 m²/m³ respectively.

Bioclere Organic and Hydraulic Loading:

Organic Loading:

Assuming a recirculation rate of approximately 50%, the system will receive 32.4 lbs. BOD₅/day based on the design flow of 18,078 gpd. This assumes a 20% BOD₅ reduction through the primary septic tank.

BOD₅ (lbs./day) = Influent from primary tank + Recirculation

$$\begin{aligned} &= \frac{(18,078 \text{ gpd} \times 8.34 \text{ (lbs./gal)} \times 200 \text{ (mg/l)})}{1 \times 10^6} + \frac{(0.5 \times 18,078 \text{ (gpd)}) \times 8.34 \text{ (lbs./gal.)} \times 30 \text{ (mg/l)}}{1 \times 10^6} \\ &= 32.4 \text{ lbs. of BOD}_5/\text{day} \end{aligned}$$

The model 36/30 Bioclere unit contains 30 m³ of PVC media (1048 ft³). The specific surface area is 140 m²/m³ and the void ratio is >95%. Therefore, the media organic loading rate in the Bioclere will be:

$$= 32.4 \text{ lbs. BOD}_5/\text{day} / (1048 \text{ ft}^3 \text{ media}) = .031 \text{ lbs. BOD}_5/\text{ft}^3\text{-day} (1.08 \text{ lbs. BOD}_5/\text{m}^3\text{-day})$$

Bioclere effluent shall pass through a final settling tank having a minimum recommended volume of 4000 gallons. Assuming an 18 hour flow distribution, this tank will provide a hydraulic retention time of: $(4000 \text{ gallons}) / (18,078 \text{ gpd} / 0.83 \text{ hr}) * 24 \text{ hr/day} = 4.4 \text{ hours}$.

Hydraulic loading

The secondary settling tank calculations are detailed below:

Tank Diameter	12 feet
Surface Area	113 ft ²
Tank Volume	3500 gallons

Surface overflow rate (SOR):

$$\text{SOR} = \text{Flow to clarifier (gpd)} / \text{Surface area of clarifier (ft}^2\text{)}$$

$$\text{SOR at average daily flow: (Assuming a 18 hour flow distribution due to equalization)} \\ = (18,078 \text{ (gpd)}/0.75 \text{ day distribution}) / 113 \text{ (ft}^2\text{)} = \mathbf{213 \text{ gal/day/ft}^2}$$

SOR at peak hourly flow: (Assuming gravity flow with a peaking factor of four times the average hourly flow):

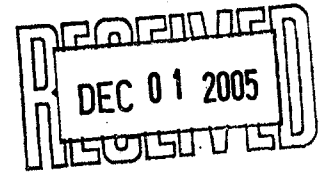
$$\begin{aligned} \text{Peak hourly flow} &= 18,078 \text{ gpd}/24 \text{ hour} = 753 \text{ gallons/hour (in 24 hours)} \\ 753 \text{ gph} * 4 &= 3012 \text{ gph @ peak} \\ 3012 * 24 &= 72,288 \text{ gpd} \\ &= 72,288 \text{ gal/day} / 113 \text{ (ft}^2\text{)} = \mathbf{640 \text{ gal/day/ft}^2} \end{aligned}$$

The recommended SOR for design average flow and peak flow is between 400-800 gal/day/ft² and 1000-1200 gal/day/ft² respectively (EPA and Metcalf & Eddy). Therefore, the SOR for the Bioclere settling tank is conservatively below the recommended ranges for design average and peak flow rates.

BIOCLERE CONTROL PANEL

The control components for the Bioclere unit shall be housed in a single NEMA 4X fiberglass enclosure. All pumps and mechanical components are connected to audio and visual alarms to alert the operator in case of failure (based on high or low amperage draw). The control panel contains dry contacts for a common external alarm. The Bioclere unit shall require a 30 amp (230V/1 phase/60 hz) power feed.

Appendix C
Bioclere Design
Specifications



TECHNICAL SPECIFICATIONS

For

**Bethel Oaks Subdivision
Wastewater Treatment
And
Dispersal System**

Washington County, Arkansas

Prepared by

Rural Engineering Services, Inc.

Prepared for:

Pack Lane Development Group

September 7, 2005



SECTION 1.0

PIPING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Piping for all of the wastewater treatment and dispersal system

PART 2 - PRODUCTS

2.01 Materials

- A. All materials shall conform to the respective specifications and other requirements specified herein except where noted otherwise on the drawings. No deviation from the material specified will be allowed without prior written approval from the Owner/Engineer.
- B. All pressure sewer lines shall be Polyvinyl Chloride (PVC) and all pipe installed shall be of the type, size, class, and thickness indicated in these specifications and/or on the drawings.
- C. Force Sewer Mains shall be the diameter specified on the drawings and shall be Class 200, SDR-21 PVC pipe. The pipe shall be bell and spigot type supplied in 20 feet lengths except for special fittings to connect to the tanks, the treatment units, the drip irrigation tubing, and the alternating zone valves. These special fittings may require solvent-weld joints as necessary. All pipe must bear the approval of the National Sanitation Foundation. The pipe shall also meet the following requirements.
 - 1. The pipe shall be made from Class 12454-A or Class 12454-B virgin compounds conforming to ASTM D1784, Type 1, Grade 1 (PVC 1120), or clean rework materials generated from the manufacturer's own production provided they comply with all applicable requirements of ASTM D1784 and produce a product equal in quality to that derived from the virgin compounds.
 - 2. The pressure rating of the pipe shall conform to the requirements and specifications of ASTM D2241.
 - 3. The minimum wall thickness of the bell, at any point shall conform to the SDR requirements of the pipe.
 - 4. Provision shall be made for expansion and contraction at each joint by use of a gasket type joint. No field made solvent weld joints will be permitted except as herein specified or shown on the drawings. Where special adapters are required, they shall be fashioned by the manufacturer.

- D. Fittings shall be either PVC, fiberglass, or ductile iron. PVC fittings shall meet the material specification above and shall be gasketed push-on type except where solvent weld is specified. Ductile iron fittings shall conform to AWWA Standard C110. The fittings used shall be bell and spigot, flanged, or mechanical joint type.
- E. Air and Vacuum Release Valves shall be PVC valves and shall be located at all highpoints of pressure piping and at the high point of each drip irrigation zone. Enclosure shall be PVC 24" Diameter with a fiberglass gasketed bolt-down lid.
- F. Concrete for thrust blocks shall be provided as necessary and shall have a 28-day compressive strength of at least 3,000 psi. Cement, sand, and aggregate shall be free from all the foreign matter graded and proportioned and the concrete shall be mixed, transported, deposited, and cured in accordance with standards adopted by the American Concrete Institute. All material shall be subject to the approval and testing of the Engineer.
- G. Reinforcing Bars shall be "Billet-Steel Concrete Reinforcement Bars" conforming to the requirements of ASTM A15 or "Rail-Steel Concrete Reinforcement Bars" conforming to the requirements of ASTM A16. No field bending of rail-steel bars will be permitted. All reinforcing bars shall be deformed bars. Deformation shall comply with the "Minimum Requirements for the Deformation of Deformed Steel Bars for Concrete Reinforcement-ASTM A305".

PART 3 – EXECUTION

3.01 CLEARING AND GRUBBING

- A. All construction for this project will take place within the public right-of-way, easements, or on property owned by the Owner.
- B. Where necessary, the construction areas and easements shall be cleared of all fences, trees, logs, stumps, brush, vegetation, rubbish, and/or any other material considered by the Owner/Engineer to be in the way of construction.
- C. Upon completion of the work, the construction area shall be cleaned up and left in a neat manner, free of all objectionable debris or material. Where permanent improvements were disturbed, they shall be returned to as near as original condition as possible unless otherwise directed by the Owner.

3.02 TRENCH EXCAVATION

- A. Trenches for pressure lines shall be of the width and depth necessary for the proper installation of the pipe. All sewer lines shall be laid in trenches of such depth as to provide a minimum cover of 30 inches over the pipe unless otherwise shown on the plans.

- B. The bottom of the trench shall be accurately graded so that the pipe will be in continuous and uniform contact with the select backfill and have a longitudinal bearing on undisturbed soil for the length of the pipe.
- C. If the soil at the bottom of the trench is mucky or if the subgrade is too soft to properly support the pipe, the Contractor shall stabilize the subgrade. Where rock is encountered, a 6-inch cushion of sand or fine soil shall be placed in the trench prior to placing the pipe. In either case, the subgrade shall meet the approval of the Owner/Engineer.
- D. Blasting will be permitted only when proper precautions are taken for the protection of persons, the work, and adjacent property. Any damage done to the work or property by blasting shall be the responsibility of the Contractor. All operations involving the handling, storage, and use of explosives shall be conducted in accordance with the latest rules, regulations, legal ordinances, and State and Federal laws.
- E. Upon termination of a day's work, or before leaving the jobsite for any lengthy period of time, the Contractor shall cover all open ends of laid pipe with a j-plug or cap.

3.03 BEDDING AND BACKFILL

- A. After pipe work has been approved, trenches, where encasement is not required, shall be bedded with fine loose earth free from clods or stones larger than ½ inch in diameter and of proper moisture content. This selected material shall be carefully deposited in layers not to exceed 4 inches in thickness on both sides of the pipe and thoroughly and carefully compacted around the pipe to provide no less than 12 inches of cover over the pipe. The remainder of the backfill may be native material free from stones or clods larger than 8 inches in any dimension, and may then be placed by a dozer or any approved method that will not injure or disturb the pipe.
- B. When the material excavated from the trench does not yield enough select material at the trench site to meet the specifications for proper backfill and bedding materials, sufficient additional select material shall be hauled from other sources to provide a 12 inch cushion of selected material over the pipe or as otherwise specified.
- C. All trenches and excavations shall be backfilled immediately after the pipe is laid, using methods that will not disturb the pipe. Material used for backfilling shall consist of the excavation or borrow of sand, gravel, or other materials approved by the Engineer and shall be free of trash, large rock, lumber, or other debris.
- D. All trenches shall include minimum 12 AWG THHN tracer wire attached to the pipe. The tracer wire shall be brought to the surface at the valve boxes and cleanout locations.

- E. All trenches shall include detection tape buried a minimum of 18 inches over the pipe. The detection tape shall be 2" wide mylar-coated detectable with a metal detector, and shall have green markings for sewer and shall have the word "SEWER" printed upon the tape. The tape shall be Linegard® for sewer or equal.
- F. It is the intent of this specification that all trenches be backfilled, settled and the ground restored to its original condition as soon as possible after the pipe has been installed. Any unnecessary delay in restoring trenches to their original condition shall constitute just cause for stopping all other work until the trenches are so restored. The Contractor shall be responsible for all settlement of backfill in trenches occasioned by the work covered herein. He shall refill trenches as soon as necessary to bring them back to original grade and during the period when settlement is occurring shall refill them frequently enough to maintain traffic without hazard at all times.
- G. All excavated material that is unsuitable or not needed for the backfill shall be placed in a stockpile for disposal at the completion of the project. The contractor shall be responsible for disposing of the excess material. Surfaces shall be cleaned up, all earth piles smoothed down, and the surface left neat and workmanlike. Where existing culverts or drainage ditches are disturbed or obstructed with excavated material, such material shall be entirely removed and the culvert or ditch shall be left true to original line, grade, and condition.
- H. Backfill under paved surfaces shall be Class 7 base compacted with a pneumatic tamper in layers not to exceed 8 inches thick for the entire depth of the trench. Material shall not be deposited by a dozer or other equipment when the paved surface is in place at the time of backfill.

3.04 CUTTING AND REPLACING SPECIAL SURFACES

- A. Whenever it becomes necessary in excavating to disturb special surfaces such as paved or gravel roadways, drives, walks, or parking areas, the Contractor shall use care not to disturb or destroy any special surfaces other than what is absolutely necessary for completing the work. In these instances, care shall be used in placing the backfill to eliminate future settlement and the surface shall be restored using the same type of materials that were used in the original surface and in accordance with any details for such work which may be contained in respective specifications.
- B. The Contractor shall replace all special surfaces as soon as complete settlement has occurred. However, on highways and asphalt streets the Contractor shall compact the backfill to a point 10 inches below the paved surface and shall then pour a pad of concrete to a point 2 inches below the surface. After 72 hours the remaining volume shall be filled with cold mix asphalt and rolled until the surface is smooth.
- C. The Contractor shall maintain these repaired areas as often as necessary to provide a smooth crossing that is not hazardous to traffic.

- D. On gravel-surfaced streets and other areas, the gravel will be disturbed in excavating for trenches. After the backfill has been placed so that no further appreciable settlement will occur, gravel over the trench shall be replaced to the same compacted thickness as the original surfacing. During construction, the gravel of the remainder of the street not occupied by the trench may be covered with dirt from the excavation. After completion of the backfill in the trench, such dirt shall be removed, in so far as possible, and additional gravel shall be placed on the street until the surface is as weather-resistant and traffic-resistant as the original surfacing.
- E. In disturbing bituminous or concrete surfaces, the Contractor must cut the surface with the approved tools or equipment ahead of the trenching operation if in the opinion of the Owner/Engineer the edges of the surface will be damaged during the trenching.
- F. Prior to the replacement of bituminous or concrete pavement, the edge of the pavement along each side of the trench will be trued and straightened and the subgrade and base material replaced in accordance with the original surfacing.

3.05 HANDLING AND LAYING PIPE FITTINGS

- A. Pipe and fittings shall be installed to match the proper diameter as indicated in the plans.
- B. In the transportation, unloading, and handling of the pipe it shall not be dropped, let roll or collide with other pipe, or be subject to any unnecessary jar, impact, or other treatment that might crack, chip, scar, or otherwise damage the pipe.
- C. The inside of the bell and outside of the pipe end or spigot shall be thoroughly cleaned of all dirt, mud, grease, and other foreign material before starting the joint.
- D. Joints in the pipe shall be made in accordance with the manufacturer's recommendations, with care taken to avoid excessive deflections in any joint. The inside of the pipe shall be cleaned of all foreign material before the pipe is placed in service. The ends of the pipe shall be temporarily plugged at the close of each day's work.

3.06 SETTING VALVES AND FITTINGS

- A. Valves, plugs, and other fittings shall be set and jointed to pipe in the manner recommended by the manufacturer and approved by the Owner/Engineer if not shown on the drawings.
- B. Valves shall be located as shown on the plans and valve boxes or risers shall be set to finish grades.

- C. Valve boxes or risers shall be provided for every valve. The valve box or riser shall not transmit shock or stress to the valve and shall be centered and plumb over the operating nut or the valve, with the lid flush with the surface of the ground or such other level as may be directed by the Owner/Engineer.
- D. All dead ends shall be terminated with one-way cleanouts as shown on the drawings.

3.07 TESTING

- A. All sections of the pipe shall be given a hydrostatic pressure test. This test shall be performed by the contractor in the presence of the Owner/Engineer.
- B. The test shall be made by filling each section of line to be tested slowly with water, expelling all air. Pressure shall be applied by means of a pressure pump and maintained for at least two hours.
- C. The test pressure shall be at 50% above normal operating pressure. The maximum leakage per hour shall be calculated by the following formula:

$$L = \frac{ND\sqrt{P}}{7400}$$

L = Allowable Leakage (gallons per hour)
N = Number of Joints in Pipeline Tested
D = Nominal Diameter of Pipeline Tested (inches)
P = Test Pressure (psi), 50 psi minimum

- D. The Contractor shall furnish all pressure gauges, meters, pumps, fittings, materials, and labor necessary to assist the Engineer in making these tests. Should any section of line disclose defects or leaks greater than allowed, the contractor shall repair, at his own expense, defective pipe until the leakage is within the specified allowance.

SECTION 2.0

EQUALIZATION TANK, FINAL SETTLING TANK, AND DOSING TANK

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. The Equalization Tanks and Final Settling Tank for the wastewater treatment system and the Dosing Tank for the irrigation system. Two equalization tanks shall be provided having a nominal capacity of 25,000 (twenty-five thousand) gallons each. One final settling tank and one dosing tank shall be provided having a nominal capacity of 4000 (four thousand) gallons each.

PART 2 - PRODUCTS

2.01 Tanks

- A. The tanks shall be single-wall fiberglass underground tank manufactured by Xerxes Corporation.
- B. The tanks shall be supplied with the fittings shown on the plans in the locations shown on the plans.
- C. Loading Conditions: Tank shall meet the following design criteria:
 - 1. Internal Load: Tank shall be designed to withstand a 5-psig air-pressure test (3 psig for a 12-foot tank) with a 5:1 safety factor.
 - 2. Surface Loads: Tank shall withstand surface H-20 axle loads when properly installed according to manufacturer's current installation instructions.
 - 3. External Hydrostatic Pressure and Burial Depth: The Equalization tanks shall be capable of being buried in ground with 7 feet of overburden, the hole fully flooded and a safety factor of 5:1 against general buckling.

The dosing tank shall be capable of being buried in the ground with 3 feet of overburden, the hole fully flooded, and a safety factor of 5:1 against buckling.

- 4. Tank shall support accessory equipment—such as inlet and outlet piping, effluent-filter chamber, ladders and baffles—as shown on tank drawings and when installed according to tank manufacturer's recommendations.

B. Product Storage:

1. Tank shall be capable of storing septic tank effluent limited to the collection and storage of human solid or liquid organic sewage.
2. Tank shall be vented to atmospheric pressure as the tank is not designed as a pressure vessel.

C. Materials:

1. Tank shall be manufactured of 100% resin and glass-fiber reinforcement, with no sand fillers and no exposed glass fibers.
2. Resin used in tank and accessories shall be isophthalic polyester

D. Tank Dimensions:

1. Equalization tank
 - A. The equalization tank shall have a nominal outside diameter of 10 feet.
 - B. The equalization tank shall have an approximate overall length of 47 feet six and three-quarter inches.
2. Final Settling tank
 - A. The final settling tank shall have a nominal outside diameter of 8 feet.
 - B. The final settling tank shall have an approximate overall length of fifteen feet zero and one-half inches.
3. Dosing tank
 - A. The dosing tank shall have a nominal outside diameter of 8 feet.
 - B. The dosing tank shall have an approximate overall length of fifteen feet zero and one-half inches.
 - C. The dosing tank shall be baffled at 2/3 volume with connecting PVC tees as shown in the drawings.

2.02 ACCESSORIES

A. Piping:

1. Schedule 40 PVC or FRP pipe shall be used for inlet and outlet piping.
2. Inlets and outlets shall have PVC tees for baffles to prevent the sludge and scum layers from escaping from the tanks

3. All piping shall be factory sealed to enable field tightness testing with at least one piping opening provided with a threaded fitting for connecting a pressure test manifold.

B. Access Openings:

1. All access openings 24 inches in diameter or larger, shall be manufactured of FRP. The access riser shall be attached to the tank in such a manner to provide a watertight seal between the tank and the riser. The riser lids be fiberglass and shall have gaskets to prevent odors and shall have stainless steel bolts with hex-type (Allen) recessed heads and shall be countersunk into the fiberglass lid. The lids shall be securely fastened to prevent entry by unauthorized persons.

2. All access openings shall be factory sealed to enable field tightness testing.

3. Location(s) shall be shown on tank drawings.

4. Riser extensions shall be FRP or PVC securely attached to the tank access openings to provide a watertight seal. Risers may be attached to the tanks in the field. Riser lids shall be gasketed fiberglass or plastic capable of withstanding an H-20 wheel load and shall have secure bolt-down capability.

C. Anchor Straps:

1. Straps shall be FRP anchor straps as supplied by tank manufacturer.

2. Number and location of straps shall be shown on tank drawings.

3. Straps shall be securely fastened to dead men according to the manufacturer's installation instructions, and the dead men shall be of appropriate size and dimensions required to meet the manufacturer's specifications to prevent floating due to buoyant forces.

D. Pumps:

1. The equalization tank shall contain duplex Zoeller Model 185 Effluent pumps, 230 Volt AC Single Phase motors capable of at least 68 gallons per minute at 42 feet total dynamic head.

4. The pumps shall be mounted on the Zoeller stainless steel guide rail system supplied with the pumps.

PART 3 - EQUALIZATION TANK

Primary settled wastewater shall flow out of the first tank by gravity into the pre-equalization tank (pre-EQ) located ahead of the Aquapoint supplied aerobic treatment system. The purpose of the pre-EQ shall be to transfer the wastewater to the treatment system over a 20 hour period at a consistent flow rate. Installation and assembly of the components shall be completed by the general contractor.

3.0 PRODUCTS

3.01 MATERIALS

- A. The pre-EQ system shall consist of a fiberglass tank (contractor supplied) located after the primary settling tank(s). The following equipment shall be included in this tank: 2 submersible pumps with slide rail assemblies, associated piping, valving, controls and appurtenances. This system shall be capable of providing a 20 hour equalized flow to the treatment system. The control panel for this unit shall be labeled as **"Pre-Equalization"**.
- B. This tank shall contain two alternating solids handling submersible sewage pumps that shall transfer primary Bioclere effluent to the treatment reactor at a rate that shall be set to approximately 40 gpm. It is recommended that the flow rate be measured periodically by the operator and adjusted as needed.

3.02 CONTROLS

- A. The UL approved control panel shall be furnished with an audio and visual alarm for pump failure and tripped circuit breaker conditions, an exterior alarm silence button, and an on/off/test power/alarm toggle switch. Within the NEMA 4X enclosed fiberglass panel pump timers, relays, terminal strip, on/off/test switches, run lights, dosing pump alternator, circuit breakers and current sensors shall be provided. Four control float switches are located in the tank and govern the following functions:
 - 1. Low level float: Redundant off and internal alarm. If Timer float fails to turn pumps off, the redundant off turns the floats off and provides an internal and visual (not audio) alarm for the operator.
 - 2. Mid-level float #1: Energizes pump timer to provide a pump run time of 30 minutes on, 30 minutes off. Pumps will alternate between lead pump and lag pump.
 - 3. Mid-level float #2: Resets pump timer to allow for 45 minutes on, 15 minutes off until the float falls and the timer settings revert to 30 minutes

on, 30 minutes off and are controlled by normal operation of Mid-level float #1. Pumps alternate between lead pump and lag pump.

4. High level float: The high-level float activates both pumps (lead and lag pumps) and energizes an audio and visual alarm. The float will activate a locking relay that must be manually reset by the operator. This will provide an indication to the operator that the high-level alarm condition has occurred.

The purpose of this float arrangement is to provide for surges due to infiltration and inflow from the gravity sanitary sewers. The mid-level alarm settings are calculated to allow the normal residential flow plus the infiltration and inflow to be pumped to the treatment unit over a 3-day period.

3.03 TIMER SETTINGS

- 3.03.1 The pre-EQ pumps shall be set for an "on/off" cycle between zero minutes and several hours using a timer in the control panel.
- 3.03.2 For example, if the pre-EQ pumps are set for 8 minutes on and 4 minutes off, the maximum volume they will dose per day is: **20 gpm * (8/12) minutes dosing * 24 hours * 60 minutes/hr = 19,200 gpd.**

3.04 MISCELLANEOUS

- 3.04.1 The pre-EQ pumps shall alternate between dosing cycles. However, if one pump fails the remaining pump will take over the failed pump's cycle and an audio/visual alarm will be activated.

3.05 EXECUTION

3.05.1 INSTALLATION

- A. All materials and equipment shall be installed in a neat, workmanlike manner.
- B. Installation of the treatment equipment supplied by AQUAPOINT shall be in accordance with written instructions provided by the manufacturer or approved representative.

3.06 CLEAN UP

- A. Prior to start-up and field-testing, foreign matter shall be removed from all treatment system tanks.

3.07 FIELD TESTING

- A. The system shall be field-tested by an Aquapoint representative using clean fresh water prior to acceptance. The system shall be operated to test the efficiency of all components. All systems, controls, and sequences shall be operated and demonstrated to operate as approved. The contractor shall be responsible for all necessary temporary connections, testing equipment and utilities and shall provide and dispose (if necessary) of all water used.

4.0 EXECUTION

A. Testing and Installation:

1. Tank shall be tested and installed according to manufacturer's current Installation Manual and Operating Guidelines.
2. Prior to installation, a tank tightness test consisting of a 5 psi air pressure/soap test shall be performed on all 4, 6, 8 and 10 ft. diameter tanks per the tank testing procedure outlined in the manufacturer's Installation Manual and Operating Guidelines.

5.0 WARRANTY

- A. Warranty shall be manufacturer's current standard limited warranty.

SECTION 4.0

WASTEWATER TREATMENT SYSTEM

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. The Package trickling filter unit and associated appurtenances for the wastewater treatment system. The treatment systems shall include all pumps, piping, blowers, and the control panel (in an enclosure) required for complete functioning of the treatment system to treat a minimum of 18,078 gallons per day of settled sewage to a water quality of 15 mg/L BOD₅ and 15 mg/L Total Suspended Solids.

PART 2 - PRODUCTS

2.01 Package treatment units

- A. The treatment system shall consist of one model 36/304 BioClere wastewater treatment unit manufactured by AquaPoint of New Bedford, MA.

2.02 BioClere Treatment System

A. General

1. The BioClere treatment system shall include a trickling filter situated over a final settling tank. The BioClere treatment system shall be delivered complete from the supplier and shall include: random PVC manufactured media, ventilation fan, dosing pumps, sludge return pumps, internal piping, wiring and controls for a complete operational treatment system. The trickling filter portion of the tank shall have fiberglass inner and outer skins with the cavity between filled with polyvinyl foam insulation. The remainder of the unit shall be constructed of FRP or plastic as recommended by the equipment manufacturer. All internal piping shall be Schedule 40 PVC plastic pipe. The BioClere unit shall withstand normal pressures from the interior hydrostatic load and from the soil and seasonal water table.

The design criteria are as follows:

<u>Settled influent characteristics</u>	<u>Required effluent</u>
Flow, 18,078 gpd	18,078
BOD ₅ , \pm 250 mg/L	No greater than 15 mg/L
CBOD ₅ , \pm 250 mg/L	No greater than 15 mg/L
TSS, \pm 2500 mg/L	No greater than 15 mg/L
pH, 6.5-8.5 s.u.	6.5 - 8.5 s.u.
Ammonium, \pm 80 mg/L (as nitrogen)	No effluent limit at this time
TKN, \pm 80 mg/L	No requirements at this time
Oil and Grease, \pm 60 mg/L	No greater than 15 mg/L
Nitrate, nearly zero mg/L	No requirements at this time
Total Nitrogen, \pm 80 mg/L	No requirements at this time
Fecal Coliform	1,000 MPN/200 mL

B. Pre-Cast Mounting Pad

1. The contractor shall be responsible for providing a pre-cast mounting pad upon which to set each BioClere vessel. The mounting pads shall be as shown on the plans

C. Filter Media

1. The PVC randomly packed filter media shall have a void ratio of greater than 95 percent. The media shall be resistant to ultraviolet radiation and resistant to a wide range of aqueous solutions, acids, alkalis, oxidizing agents, oils, fats and alcohols.

D. Settling tank

1. The settling tank shall be cone shaped and have 60 degree sloped sides to prevent the accumulation of biological and inorganic suspended solids and shall contain the necessary internal piping to prohibit short-circuiting of the wastewater

E. Ventilation Fan

1. The CSA approved ventilation fan shall be 115 VAC single phase, 60 Hz ball bearing fan with a minimum manufactured rated airflow rate of 240 cubic feet per minute. The fan shall have an aluminum housing and polycarbonate blade.

F. Pumps

1. Two alternating pumps and one recycle pump shall be supplied with each BioClere treatment unit and they shall be 200/230VAC single phase, 60 Hz stainless steel submersible pumps. All pumps shall have an internal high temperature shut off switch. Each pump shall be capable of 65 gpm at 21 ft. of head. Each pump shall be rated for intermittent or continuous duty when fully submerged between 0° - 55° C. The alternating dosing pumps shall be controlled such that when one pump fails the remaining will complete both dosing cycles.

G. Float Switches

1. The CSA and UL approved low level 115 VAC, single phase, 60Hz float switches shall be installed to prevent the recycle pump from operating when water levels are abnormally low in the BioClere units (i.e. during primary tank pumping) The float switches shall be mercury-activated wide-angle switches.

H. Power Supply

1. Each BioClere treatment unit shall have a dedicated 30-amp, 208 VAC or 230VAC single phase, 60 Hz power supply.

I. Control Panel

1. The UL approved control panel shall be furnished with an audio and visual alarm for pump failure and tripped circuit breaker conditions, and exterior alarm silence button, and an on/off/test power/alarm toggle switch. Within the NEMA 4X

enclosed fiberglass panel pump timers, relays, terminal strip, on/off/test switches, run lights, dosing pump alternator, circuit breakers, and current sensors shall be provided. A dry contact shall be installed in each control panel so that a common Bioclere alarm may be wired to a convenient location.

J. Wiring

1. The Electrical Contractor shall complete the wiring between the BioClere control panel and the terminal strip within the Bioclere fan module meeting all local, state, and federal codes.
2. All fittings, connections, etc. shall be water proof and water tight construction. Ground terminals are provided in both the main panel and the terminal strip within the Bioclere fan module located on each unit.
3. Care shall be taken to match the wires between the control panel and the terminal strip within the Bioclere fan module located on each unit.

K. Warranty

- 1 All equipment provided shall be warranted against defects in material and workmanship for a period of one year from the date of installation.

L. Spare Parts

1. A recommended list of spare parts shall be detailed in the site specific Technical Manual that details the Installation, Operation, & Maintenance procedures. The site specific Technical Manual shall be provided by the manufacturer or supplier of the Bioclere treatment system.

M. Services Provided

1. AquaPoint or an approved (by the manufacturer) manufacturer's representative shall provide the following services. The general contractor shall install the Bioclere units and all related components
 - a. Provide onsite technical assistance for the handling and positioning of the Bioclere units the day of installation
 - b. Return to the site for testing/commissioning of the Bioclere units upon substantial completion of site work by the general contractor (backfill, piping, electrical, grading, etc.). AquaPoint shall install the randomly packed media and pumps into the Bioclere units. AquaPoint shall be available to train the operators and instruct the owners on Bioclere operation the day of testing/commissioning.
 - c. Remain accessible to the owner and/or operator for phone consultation.
 - d. Be available on a contract basis for additional site visits or consultation.

2.03 Product Handling

- A. All material and equipment shall be shipped, stored, handled, and installed in such a manner as not to degrade the quality, serviceability, or appearance. The BioClere units shall be stored outdoors in a secure location according to the manufacturer's recommendations. Loose-shipped items shall be stored in a clean, dry location free from precipitation and excess moisture.

2.04 Installation

- A. All materials and equipment shall be installed in a neat, workmanlike manner
- B. Installation of the Bioclere treatment system and ancillary equipment supplied by AquaPoint shall be in accordance with written instructions provided by the manufacturer or approved (by the manufacturer) manufacturer's representative.
- C. The Bioclere and all applicable treatment units supplied by AquaPoint shall be installed with sufficient ballast to offset buoyant forces due to induced or high groundwater conditions.

2.05 Cleanup

- A. Prior to start-up and field testing, all foreign matter shall be removed from the grease trap, septic (settling) tanks, pump stations and Bioclere unit.

2.06 Field Testing

- A. The Bioclere treatment system shall be field tested using clean fresh water prior to acceptance. The system shall be operated to test the efficiency of all components. All systems, controls, and sequences shall be operated and demonstrated as operating as approved. The contractor shall perform all tests and shall be responsible for all necessary connections, testing equipment and utilities and shall provide and dispose (if necessary) of all water used. A factory trained representative shall be present for the testing.

2.07. Prohibitions

- A. Organic solvents, fuel oils, paint thinners, photographic fluids, floor waxes and strippers, solutions containing copper compounds, cleaning agents containing quaternary ammonium chlorides and products containing compounds that are documented to inhibit biological growth should not be discharged to the sewage treatment system.

SECTION 5.0

SUBSURFACE DRIP IRRIGATION DISPERSAL SYSTEM

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. The dosing pumps and controls, the drip irrigation tubing and associated appurtenances for the wastewater dispersal system, and the control panel for the drip irrigation system.

PART 2 - PRODUCTS

2.01 Pumps, pump vaults, and associated controls for the dosing pumps located in the dosing tank

- A. The pumps shall be duplex model 5032-0007, 230 Volt AC Single Phase 3/4 Hp, 6 stage turbine pumps. The pump power requirement is 230 VAC single phase, 7.5 FLA.
A total of 4 pumps shall be supplied. Three of the pumps shall be installed in the dosing tank as shown on the plans, and the fourth pump shall be held as a reserve pump.
- B. Each pump shall be installed in a duplex Zoeller filtered effluent STEP vault in the dosing tank.
- C. The pump discharge assemblies shall be supplied by the manufacturer and shall include a check valve, union, shut off valve, and anti-siphon device for each pump discharge.
- D. The pumps and vaults shall include appropriate floats to provide a high water alarm and lag pump start, a low water alarm, and a timer enable float mounted on a float tree supplied by the manufacturer with the pump vault.
- E. Watertight junction boxes for the pump controls and wiring supplied with cord grips and a gasketed bolt-down lid for each junction box, and a conduit seal.
- F. All pumps shall be installed in the dosing tank within the filtered pump vaults according to the manufacturer's instructions.
- G. Wiring for the pumps from the control panel to the junction boxes in the dosing tank shall be provided by the contractor and shall be placed inside conduit. All wiring and connections shall be rated for underground burial, and shall be of the appropriate size to prevent excessive voltage drop at Full Load Amperage.

2.02 Drip tubing, head control box, and associated connections for the subsurface drip irrigation system

A. Drip Tubing

The dripline shall consist of nominal sized one-half inch linear low density polyethylene tubing, with turbulent flow, drip emitters bonded to the inside wall. The drip emitter flow passage shall be 0.032" x 0.045" square. The tubing shall have an outside diameter (O.D.) of approximately .64-inches and an inside diameter (I.D.) of approximately .55-inches. The tubing shall consist of three layers; the inside layer shall be a Ultra Fresh protection, the middle layer shall

be black and the outside layer shall be purple striped for easy identification. The dripline shall have emitters regularly spaced 24" apart. The pressure compensating emitters shall be molded from virgin polyethylene resin with a silicone rubber diaphragm. The pressure compensating emitters shall have nominal discharge rates of 0.53 gallons per hour. The emitters shall be impregnated with Treflan® to inhibit root intrusion for a minimum period of ten years and shall be guaranteed by the manufacturer to inhibit root intrusion for this period. The 0.53 gph WASTEFLOW PC pressure compensating dripline shall be Geoflow model number WFPC16-2-24.

B. Head Control Boxes

1. Head Control boxes shall be provided on the outlet of each duplex pump system. The head control boxes shall be provided by the manufacturer complete with all components and wiring to be installed in place. The head control box shall be supplied with the appropriately sized riser with lid or meter box with lid to contain all of the components and to allow adequate room for removal of or servicing the components.
2. Each head control box shall contain a 2" API vortex filter, solenoids to provide filter flush and field flush, and appropriate piping and fitting to make all connections within the head control box.

C. Connectors

1. All connections shall be supplied by GeoFlow to make the connections between the PVC supply and return manifolds and the drip tubing. Flexible PVC loops shall be provided as shown on the plans where loops are made in the irrigation tubing layout.

2.03 Control panel to control and monitor the pump cycles and flows, the field flushing cycles and flows, and the filter flushing cycles and flows.

A. Control Panel Functions

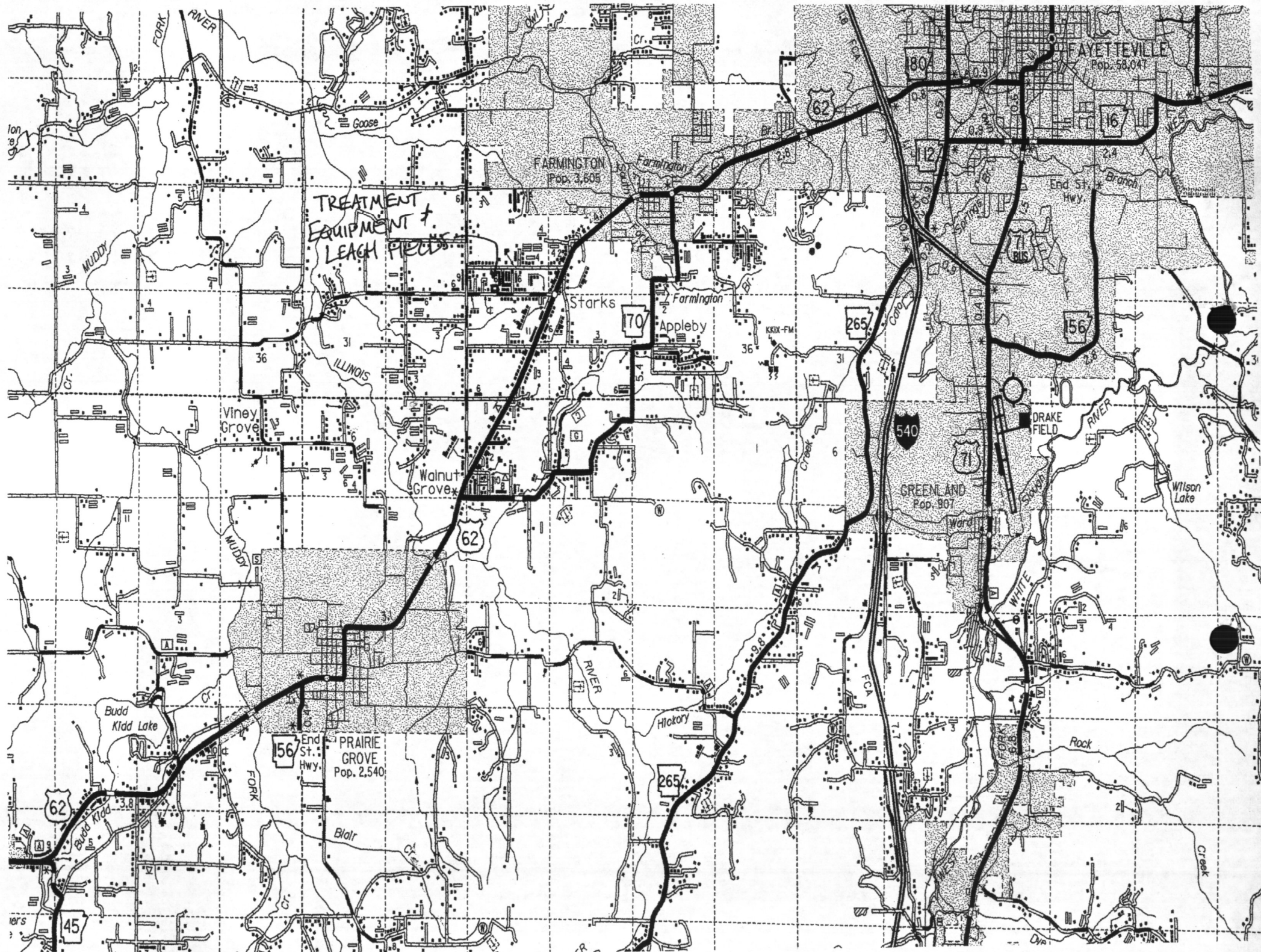
1. The control panel shall contain a programmable logic controller with appropriate motor starters, relays, timers, audio/visual alarms, and displays to provide the following functions:
 - A. Operate all dosing pumps in a duplex alternating mode with 4 pumps normally running simultaneously. The programmable logic controller(s) shall be capable of programming each of the four duplex pump systems such that their dosing times and frequencies can be set for each of the duplex systems independently.
 - B. Provide for dosing cycles ranging in duration from 3 minutes to one hour and ranging in frequency from once every 15 minutes up to once every 4 hours with continuously selectable durations and dosing frequencies. Each duplex pump system shall be capable of being set with different dosing times and frequencies.

- C. Provide for field flushing and filter flushing operation of the drip irrigation headworks box.
- D. Provide for manual/off/automatic selection for operations of each pump.
- E. Provide audible and visible alarms for each high water and low water float condition. The audio silence button shall be located on the outside of the enclosure.
- F. Provide for run indicators for each pump. This may be a light or it may be an indicator easily accessible in the programmable logic controller display.
- G. Appropriate wiring tracks, contact rails, and harnesses to prevent loose wires inside the enclosure and to provide a neat and uncluttered panel appearance when the panel is opened.
- H. Provide for a heater inside the enclosure if necessary for the PLC. The heater shall be activated when temperatures drop below the acceptable operating condition of the PLC.
- I. Provide for an air circulation fan in the enclosure for the PLC. The circulator shall be activated when temperatures rise above the acceptable operating condition of the PLC.
- J. The control panel shall be mounted inside a minimum NEMA 3R enclosure.
- K. The panel shall be protected from sewer gases by appropriate conduit seals.
- L. All penetrations through the enclosure shall be sealed to prevent moisture from entering the enclosure.

2.0 The panel shall not be mounted in a location where direct sunlight will strike the enclosure at any time of the year, nor where rain can fall onto or can drip or blow into the panel.

3.0 All wiring to the panel shall be placed in conduit and shall be of the appropriate size and type for underground burial. The wiring size shall be of correct gage to prevent an excessive voltage drop at the full load amperage of the pumps.

**MAP(S)/PLAN(S) SCANNED IN
SEPARATE FILE**



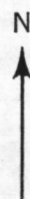


34

(Joins sheet 25)

R. 31 W.

PeB



(Joins sheet 33) BaF

T. 16 N.

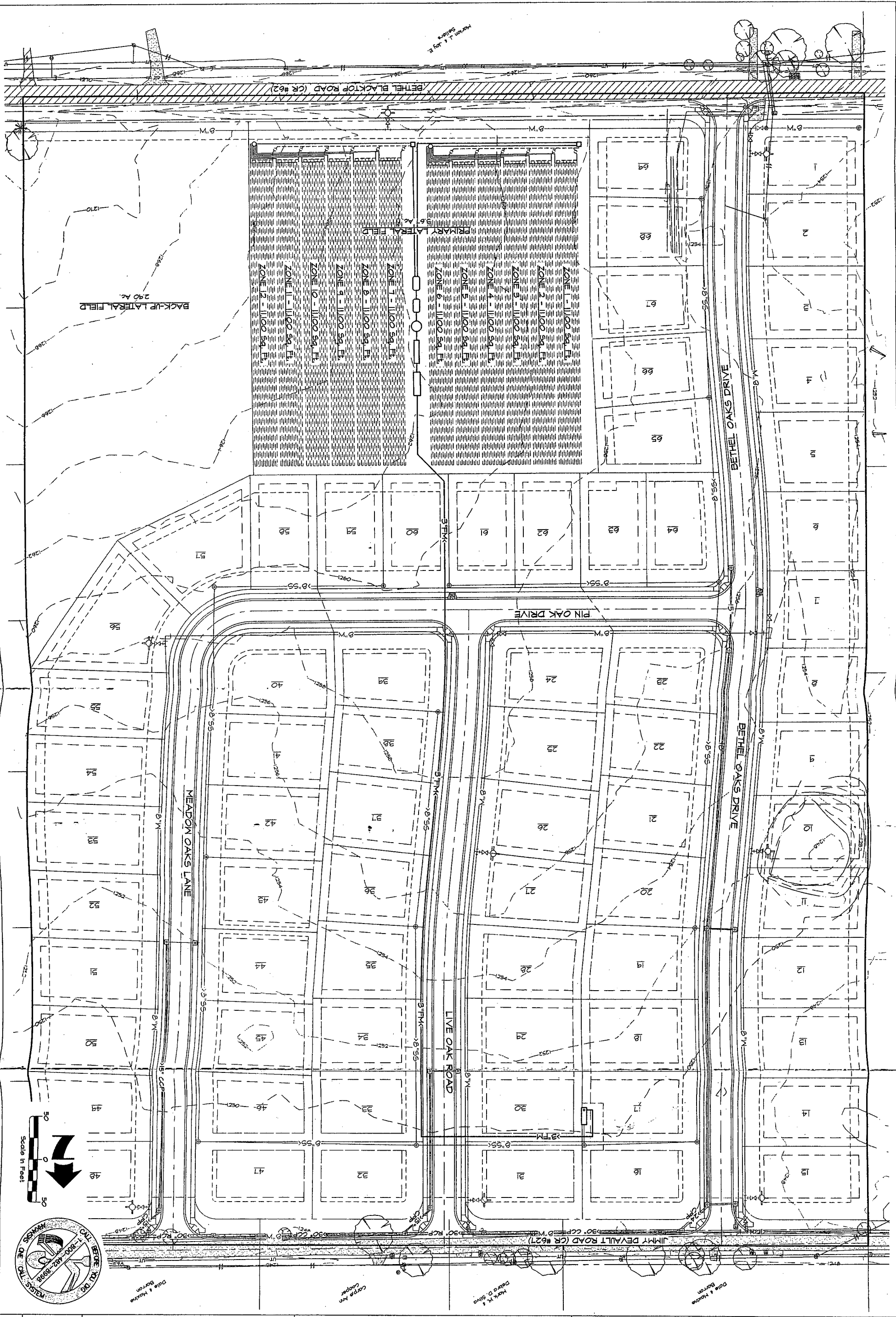
(Joins sheet 35)



(Joins sheet 42)

Eg

0 1/2 1 Mile Scale 1:20000 0 5000 Feet



WASHINGTON COUNTY, ARKANSAS		REVISION		DATE	
BETHEL OAKS SUBDIVISION					
SANITARY SEWER COLLECTION AND TREATMENT SYSTEM					
DATE: JUNE 13, 2005					
SCALE: 1"=50'					
DESIGNED BY: JAH					
DRAWN BY: JAH					
JOB NO.: 2004015					
DWG. NO.: GEN. LAY					
SHEET NO. 1 OF 3					

Rural Engineering
Services, Inc.

Nonmunicipal Domestic Sewage Treatment Works Trust Fund Requirement Form

Permittee (Legal) Name: Bethel Oaks Property Owners Association, Inc
Facility Name: Bethel Oaks Subdivision
Permit No. 4875-WR-3

Section A – Information Requiring Engineering Certification

Part I – Operating and Maintenance Expenses

	Units/Year	Unit Cost	Annual Cost	5-Year Cost ¹
Operating Expenses				
Operating Labor ²	12	350	4200.00	22260.00
Electricity ³	12	188.00	2256.00	11956.00
Supplies & Chemicals	6	100.00	600	3180.00
Analytical Testing	12	185.00	2220.00	11766.00
Generator Fuel				
Other				
Maintenance Expenses				
Maintenance Labor ²				1000.00 sludge removal
Parts & Supplies				1000.00 misc parts
Other				
Administrative Expenses				
Administrative Labor ²				
Customer Fee Collection				
Insurance & Bonding				
Consulting and Legal Fees				
Interest Expenses				
Property Taxes				
Permit Fees			500.00	2650.00
Other Miscellaneous Expenses Mowing dripfield	7	450.00	3150.00	16695.00
TOTAL				70,507.00

¹ Assuming no inflation data are available, assume an inflation rate of 3% in years two through five and multiply the annual cost by 5.3 to estimate the five-year cost.

² Labor costs must include fringe benefits and payroll taxes.

³ For existing facilities, include historical data if they are representative of future operations. For new facilities, show the electricity consumption calculations in kilowatt hours (kWh).

Part II – Capital Expenditures

- The wastewater treatment plant (WWTP) must be examined by a Professional Engineer registered in the State of Arkansas to determine all necessary capital expenditures, system upgrades, or significant repairs which may be needed within the following five (5) years. *A list of all of these items must be attached to this document.*

Nonmunicipal Domestic Sewage Treatment Works Trust Fund Requirement Form

Part III – Financial Plan

A financial plan that demonstrates to the Department's satisfaction the permittee's ability to operate and maintain the WWTP for five (5) years must be prepared. This plan should also include a comprehensive connection summary listing the number of connections and types of connections based on Appendix B of the Arkansas Department of Health Rules and Regulations Pertaining to Onsite Wastewater Systems. The summary should include the number of existing connections and an estimated number of new connections for the next five (5) years. *The financial plan must be attached to this document.*

Part IV – Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Printed Name of AR Professional Engineer: Charles L. Presley

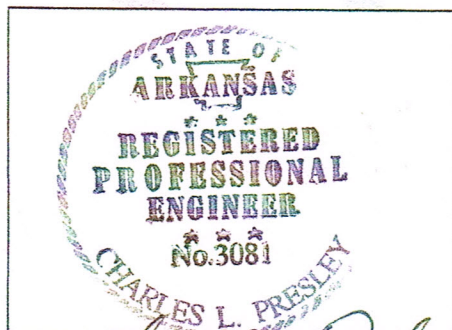
Registration License Number: 3081

Signature of AR Professional Engineer: Charles L. Presley

Date: 10/31/2017 Telephone Number: 479-738-2979

E-mail: cjpres@madisoncounty.net Fax Number: _____

Stamp of AR Professional Engineer



Charles L. Presley
10/31/17

Nonmunicipal Domestic Sewage Treatment Works Trust Fund Requirement Form

Section B – Service Area Information and Certification of Compliance

Part I – Legal Description

A legal description of the service area ***must be attached to this document.*** This requirement may be satisfied by providing a plat for the area served by the non-municipal domestic sewage treatment works.

Part II – Potable Water Sources

A list of the sources of the potable water for the service area ***must be attached to this document.***

Washington Water Authority

Part III – Certification of Compliance

Has the permit applicant complied with all local zoning ordinances, local planning authority regulations, local permitting requirements, and any other applicable local regulations necessary for the construction and operation of this facility?

Yes X

No _____

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Printed Name of Permittee Responsible Official: *David Levine*

Signature of Permittee Responsible Official: *DAVID LEVINE*

Date: *11/1/17* Telephone Number: *(479) 446-2812*

E-mail: *countryprideautos@gmail.com* Fax Number: _____

PRESLEY, BRANNAN, & ASSOCIATES, INC.

CONSULTING ENGINEERS AND LAND SURVEYORS

Office (479) 738-6630

CHARLES PRESLEY, PE & PLS

cjpres@madisoncounty.net

P.O. Box 607

Huntsville, AR. 72740

Part I – Capital Expenditures

The Bethel Oaks Subdivision Wastewater Treatment Facility was put into operation in April, 2009. At present it has been built to capacity with 68 homes, there are no further connections planned. All components of the collection and treatment system are functioning as designed and there are no planned upgrades or capital expenditures necessary.



PO Box 848 | Fayetteville, AR 72702 | 800.521.6144 | www.ozarksecc.com

853 1 AV 0.370
BETHEL OAKS POA
12531 BETHEL OAKS DR
FARMINGTON AR 72730-5000

5 853
C-4 P-9



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Statement Date	10/25/2017
Account Number	269578003
Payment Due	11/13/2017

Service Summary	
Previous Balance	167.49
Payment(s) Received	-167.49
Balance Forward	0.00
Current Charges	158.61
Total Amount Due	\$158.61

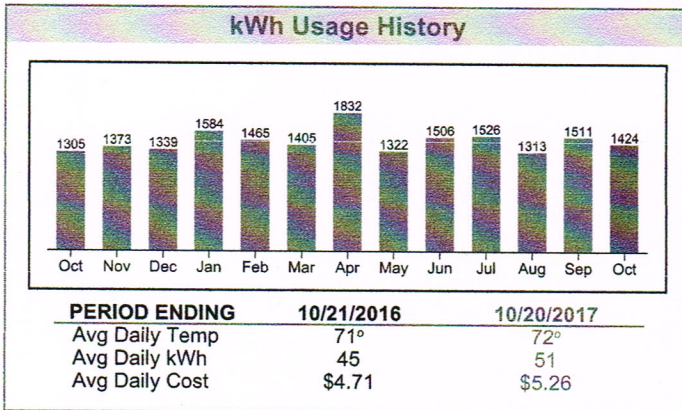
Bank Draft - Do Not Pay



Account Number: 269578003

Phone Number: (479) 646-7444

Meter Number	Services		Days	Readings		Usage	Rate	Service Address Location Number
	From	To		Previous	Present			
1864645	09/22/2017	10/20/2017	28	2621	4045	1424	5A1	12945 BETHEL BLACKTOP RD COMM 28289424



Current Service Detail	
Balance Forward	0.00
Customer Charge	22.00
Energy Charge	1424 kWh @ 0.0899000 128.02
Fuel Cost Adj	1424 kWh @ -0.0043930 -6.26
Debt Cost Adj	1424 kWh @ 0.0024170 3.44
Washington County Tax	1.84
Arkansas State Tax	9.57
Total Charges	158.61
Total Amount Due 11/13/2017	\$158.61
\$4.93 late charge applies after 5 p.m. on 11/13/2017	



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Pay your bill quickly and securely with our automated phone system, available 24/7. Call 1-855-386-9904 to make a payment.

Account Number	269578003
Location Number	28289424
Total Due 11/13/2017	\$158.61

Bank Draft - Do Not Pay

BETHEL OAKS POA



OZARKS ELECTRIC COOPERATIVE
PO BOX 22114
TULSA OK 74121-9948



2026957800300000000015861



PO Box 848 | Fayetteville, AR 72702 | 800.521.6144 | www.ozarksecc.com

852 1 AV 0.370
BETHEL OAKS POA
12531 BETHEL OAKS DR
FARMINGTON AR 72730-5000

5 852
C-4 P-9



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Statement Date	10/25/2017
Account Number	269578002
Payment Due	11/13/2017

Service Summary	
Previous Balance	35.60
Payment(s) Received	-35.60
Balance Forward	0.00
Current Charges	34.41
Total Amount Due	\$34.41

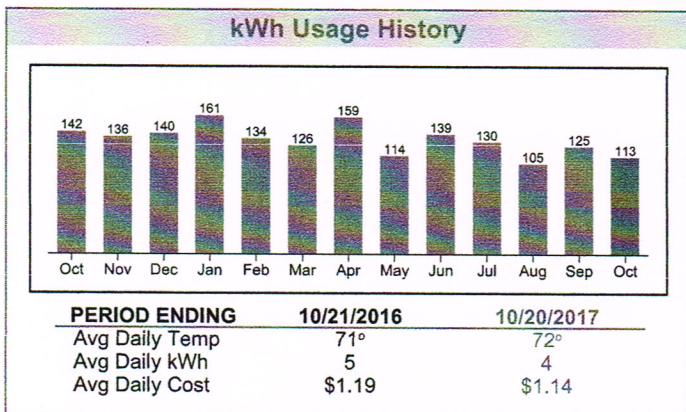
Bank Draft - Do Not Pay



Account Number: 269578002

Phone Number: (479) 646-7444

Meter Number	Services From	To	Days	Readings Previous	Present	Usage	Rate	Service Address Location Number
3512914	09/22/2017	10/20/2017	28	9605	9718	113	5A1	12922 JIM DEVAULT RD COMM 28287493



Current Service Detail	
Balance Forward	0.00
Customer Charge	22.00
Energy Charge	113 kWh @ 0.0899000 10.16
Fuel Cost Adj	113 kWh @ -0.0043930 -0.50
Debt Cost Adj	113 kWh @ 0.0024170 0.27
Washington County Tax	0.40
Arkansas State Tax	2.08
Total Charges	34.41
Total Amount Due 11/13/2017	\$34.41
\$4.93 late charge applies after 5 p.m. on 11/13/2017	



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Want to pay by credit card?

Pay your bill quickly and securely with our automated phone system, available 24/7. Call 1-855-386-9904 to make a payment.

Account Number	269578002
Location Number	28287493
Total Due 11/13/2017	\$34.41

Bank Draft - Do Not Pay

BETHEL OAKS POA



OZARKS ELECTRIC COOPERATIVE
PO BOX 22114
TULSA OK 74121-9948



6026957800200000000003441

FINANCIAL PLAN FOR LONG TERM OPERATIONS AND MAINTENANCE

As per the terms of the contract executed between the Bethel Oaks Property Owners Association and Bethel Oaks Utility LLC, a NWA Utility Services company; this facility has secured long term operations and maintenance for the facility. The following pertinent language is defined in the terms of the executed agreement.

This agreement (this "Agreement") is entered into as of this 1 day of October, 2016 by and between BETHEL OAKS PROPERTY OWNERS ASSOCIATION, an Arkansas company ("OWNER") and BETHEL OAKS UTILITY, LLC, an Arkansas limited liability company ("UTILITY").

WHEREAS, OWNER is the governing authority of that real estate subdivision that is described on Exhibit A-1, attached hereto (the "Subdivision");

WHEREAS, OWNER desires to retain UTILITY to operate and maintain the wastewater treatment plant that is located in the subdivision described in Exhibit A-2 (the "Plant") in accordance with Applicable Laws and this Agreement; and

WHEREAS, UTILITY is willing to provide said services in exchange for that compensation that is referenced herein.

NOW, THEREFORE, in consideration of the covenants and conditions referenced and exchanged herein, and for other good and valuable consideration received, and intending to be fully and legally bound hereby, the parties hereto covenant and agree as follows:

3. Operations and Maintenance Consideration. In consideration for the performance of the Operations and Maintenance Services, OWNER does hereby agree to allow UTILITY to bill all customers with an active water meter a monthly wastewater service fee of 56.50 UTILITY reserves the right to increase this fee by an amount necessary to pay costs associated with any subsequently enacted or required Health Department, Department of Environmental Quality, or other federal, state, county, city or local rule or regulation, and/or by any other objectively demonstrable increase in the operation of the Plant.

4.Term; Extension. This Agreement shall have an initial term beginning on the date hereof and expiring on March 31, 2023. This Agreement may be extended thereafter for (1) additional (5) year term should the parties hereto subsequently so agree in writing.

CONNECTION SUMMARY

YEAR	NUMBER OF RESIDENTIAL CONNECTIONS	MONTHLY SEWER RATE	ANNUAL REVENUE	CAPITAL RESERVE RETAINED ANNUALLY
2017	69	56.50	46,782.00	5796.00
2018	69	56.50	46,782.00	5796.00
2019	69	56.50	46,782.00	5796.00
2020	69	56.50	46,782.00	5796.00
2021	69	56.50	46,782.00	5796.00



NWA UTILITY SERVICES, INC
PO Box 9299 Fayetteville, AR 72703
Office 479-530-5926 Fax 479-925-7217
www.nwutilityservices.com

Nov 3, 2017

Arkansas Department of Health
Engineering Section
4815 W Markham Slot 37
Little Rock, AR 72705

Re: Renewal Application / Bethel Oaks Subdivision WWTF
Permit No 4875-WR-2

On behalf of the permittee for the above referenced facility, we have submitted the application paperwork for the renewal of Permit No 4875-WR-2. This facility will continue to operate under the previously approved Waste Management Plan as there have been no changes to the facility. Currently this facility does not require any capital expenditures, system upgrades or significant repairs. The subdivision currently has 68 homes connected to the facility and there will be no additional connections.

The following documents were included with the packet sent to the ADEQ:

- No Discharge Form
- ADEQ Disclosure Statement
- Request for Change of Authorization Form
- Arkansas Secretary of State Certificate of Good Standing
- Legal Description of the service area by means of a plat

As requested by Katherine McWilliams ADEQ Water Permit Division, I have included a copy of the renewal permit application for your record along with a set of maps of the subdivision location and a copy of the engineering report. If there is any further information you require feel free to contact me directly.

Regards

Kathy Bartlett
Internal Operations Manager
NWA Utility Services
Office: 479-530-5926

EXHIBIT A-2

Tract A and Tract B, Final Plat of Bethel Oaks in Washington County, Arkansas, as shown on Plat Record 23A, at page 287.

Formerly known as:

A part of the Southeast Quarter (SE1/4) of the Southwest Quarter (SW1/4) of Section 28, Township 16 North, Range 31 West of the Fifth Principal Meridian, Washington County, Arkansas, being more particularly described as follows: Commencing at a found PK nail at the SW corner of the SE1/4 of the SW1/4 of Section 28, thence S 88°54'20" E along the South line of said SE1/4 of the SW1/4 a distance of 320.17 feet to the Point of Beginning; thence leaving said South line N 01°05'40" E a distance of 227.25 feet; thence N 01°15'05" W a distance of 202.92 feet; thence S 88°54'20" E a distance of 417.03 feet; thence N 64°09'24" E a distance of 79.28 feet; thence N 61°23'01" E a distance of 79.73 feet; thence N 31°27'30" E a distance of 92.73 feet; thence N 16°44'19" E a distance of 62.96 feet; thence S 85°10'05" E a distance of 48.05 feet to the West line of Golden Acres Subdivision; thence S 01°08'40" W along said West line a distance of 642.93 feet to said South line of the SE1/4 of the SW1/4; thence N 88°54'20" W along said South line a distance of 659.89 feet to the Point of Beginning, containing 7.09 acres, more or less.

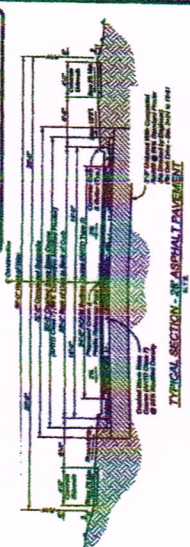
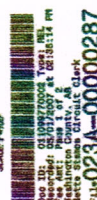
MINIMUM SETBACK REQUIREMENTS (FL)			
Front	Rear	Side (Int.)	Side (Ext.)
25	20	10	25

Setbacks Not Shown For Clarity

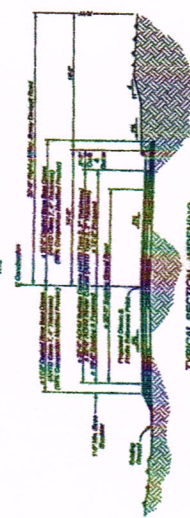
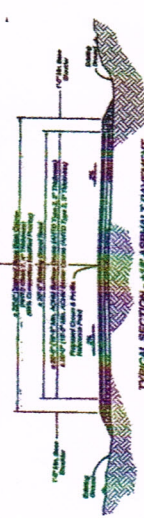
SQUIDS DESCRIPTION:
Site Consists Mostly of Pickwick Loom?
(Pac2) & Johnsburg Loom (JO).

LEGEND

- Found Iron Pin
- Set Iron Pin
- Property Line
- Right-of-Way Line (ROW)
- Cornering
- Easement Line (USE, O&D)
- Building Setback Line (BSL)
- Utility Condition (N-F-P-C)
- Sidewalk
- Lot Address
- Street Light



STREET	STATORS	ACRM SURFACE	ACRM BINDER	CLASS 7 BASE
1st St. S. to 2nd St. S.	0.141 7.57	1	1	1
2nd St. S. to 3rd St. S.	0.141 7.57	1	1	1
3rd St. S. to 4th St. S.	0.141 7.57	1	1	1
4th St. S. to 5th St. S.	0.141 7.57	1	1	1
5th St. S. to 6th St. S.	0.141 7.57	1	1	1
6th St. S. to 7th St. S.	0.141 7.57	1	1	1
7th St. S. to 8th St. S.	0.141 7.57	1	1	1
8th St. S. to 9th St. S.	0.141 7.57	1	1	1
9th St. S. to 10th St. S.	0.141 7.57	1	1	1
10th St. S. to 11th St. S.	0.141 7.57	1	1	1
11th St. S. to 12th St. S.	0.141 7.57	1	1	1
12th St. S. to 13th St. S.	0.141 7.57	1	1	1
13th St. S. to 14th St. S.	0.141 7.57	1	1	1
14th St. S. to 15th St. S.	0.141 7.57	1	1	1
15th St. S. to 16th St. S.	0.141 7.57	1	1	1
16th St. S. to 17th St. S.	0.141 7.57	1	1	1
17th St. S. to 18th St. S.	0.141 7.57	1	1	1
18th St. S. to 19th St. S.	0.141 7.57	1	1	1
19th St. S. to 20th St. S.	0.141 7.57	1	1	1
20th St. S. to 21st St. S.	0.141 7.57	1	1	1
21st St. S. to 22nd St. S.	0.141 7.57	1	1	1
22nd St. S. to 23rd St. S.	0.141 7.57	1	1	1
23rd St. S. to 24th St. S.	0.141 7.57	1	1	1
24th St. S. to 25th St. S.	0.141 7.57	1	1	1
25th St. S. to 26th St. S.	0.141 7.57	1	1	1
26th St. S. to 27th St. S.	0.141 7.57	1	1	1
27th St. S. to 28th St. S.	0.141 7.57	1	1	1
28th St. S. to 29th St. S.	0.141 7.57	1	1	1
29th St. S. to 30th St. S.	0.141 7.57	1	1	1
30th St. S. to 31st St. S.	0.141 7.57	1	1	1
31st St. S. to 32nd St. S.	0.141 7.57	1	1	1
32nd St. S. to 33rd St. S.	0.141 7.57	1	1	1
33rd St. S. to 34th St. S.	0.141 7.57	1	1	1
34th St. S. to 35th St. S.	0.141 7.57	1	1	1
35th St. S. to 36th St. S.	0.141 7.57	1	1	1
36th St. S. to 37th St. S.	0.141 7.57	1	1	1
37th St. S. to 38th St. S.	0.141 7.57	1	1	1
38th St. S. to 39th St. S.	0.141 7.57	1	1	1
39th St. S. to 40th St. S.	0.141 7.57	1	1	1
40th St. S. to 41st St. S.	0.141 7.57	1	1	1
41st St. S. to 42nd St. S.	0.141 7.57	1	1	1
42nd St. S. to 43rd St. S.	0.141 7.57	1	1	1
43rd St. S. to 44th St. S.	0.141 7.57	1	1	1
44th St. S. to 45th St. S.	0.141 7.57	1	1	1
45th St. S. to 46th St. S.	0.141 7.57	1	1	1
46th St. S. to 47th St. S.	0.141 7.57	1	1	1
47th St. S. to 48th St. S.	0.141 7.57	1	1	1
48th St. S. to 49th St. S.	0.141 7.57	1	1	1
49th St. S. to 50th St. S.	0.141 7.57	1	1	1
50th St. S. to 51st St. S.	0.141 7.57	1	1	1
51st St. S. to 52nd St. S.	0.141 7.57	1	1	1
52nd St. S. to 53rd St. S.	0.141 7.57	1	1	1
53rd St. S. to 54th St. S.	0.141 7.57	1	1	1
54th St. S. to 55th St. S.	0.141 7.57	1	1	1
55th St. S. to 56th St. S.	0.141 7.57	1	1	1
56th St. S. to 57th St. S.	0.141 7.57	1	1	1
57th St. S. to 58th St. S.	0.141 7.57	1	1	1
58th St. S. to 59th St. S.	0.141 7.57	1	1	1
59th St. S. to 60th St. S.	0.141 7.57	1	1	1
60th St. S. to 61st St. S.	0.141 7.57	1	1	1
61st St. S. to 62nd St. S.	0.141 7.57	1	1	1
62nd St. S. to 63rd St. S.	0.141 7.57	1	1	1
63rd St. S. to 64th St. S.	0.141 7.57	1	1	1
64th St. S. to 65th St. S.	0.141 7.57	1	1	1
65th St. S. to 66th St. S.	0.141 7.57	1	1	1
66th St. S. to 67th St. S.	0.141 7.57	1	1	1
67th St. S. to 68th St. S.	0.141 7.57	1	1	1
68th St. S. to 69th St. S.	0.141 7.57	1	1	1
69th St. S. to 70th St. S.	0.141 7.57	1	1	1
70th St. S. to 71st St. S.	0.141 7.57	1	1	1
71st St. S. to 72nd St. S.	0.141 7.57	1	1	1
72nd St. S. to 73rd St. S.	0.141 7.57	1	1	1
73rd St. S. to 74th St. S.	0.141 7.57	1	1	1
74th St. S. to 75th St. S.	0.141 7.57	1	1	1
75th St. S. to 76th St. S.	0.141 7.57	1	1	1
76th St. S. to 77th St. S.	0.141 7.57	1	1	1
77th St. S. to 78th St. S.	0.141 7.57	1	1	1
78th St. S. to 79th St. S.	0.141 7.57	1	1	1
79th St. S. to 80th St. S.	0.141 7.57	1	1	1
80th St. S. to 81st St. S.	0.141 7.57	1	1	1
81st St. S. to 82nd St. S.	0.141 7.57	1	1	1
82nd St. S. to 83rd St. S.	0.141 7.57	1	1	1
83rd St. S. to 84th St. S.	0.141 7.57	1	1	1
84th St. S. to 85th St. S.	0.141 7.57	1	1	1
85th St. S. to 86th St. S.	0.141 7.57	1	1	1
86th St. S. to 87th St. S.	0.141 7.57	1	1	1
87th St. S. to 88th St. S.	0.141 7.57	1	1	1
88th St. S. to 89th St. S.	0.141 7.57	1	1	1
89th St. S. to 90th St. S.	0.141 7.57	1	1	1
90th St. S. to 91st St. S.	0.141 7.57	1	1	1
91st St. S. to 92nd St. S.	0.141 7.57	1	1	1
92nd St. S. to 93rd St. S.	0.141 7.57	1	1	1
93rd St. S. to 94th St. S.	0.141 7.57	1	1	1
94th St. S. to 95th St. S.	0.141 7.57	1	1	1
95th St. S. to 96th St. S.	0.141 7.57	1	1	1
96th St. S. to 97th St. S.	0.141 7.57	1	1	1
97th St. S. to 98th St. S.	0.141 7.57	1	1	1
98th St. S. to 99th St. S.	0.141 7.57	1	1	1
99th St. S. to 100th St. S.	0.141 7.57	1	1	1



CURVE	LENGTH	RADIUS	DELTA	TANGENT	CHORD	CHORD DIRECTION	CHORD LENGTH
C1	165.79	1500.00	18.30°	28.30'	165.79	N 85°42'W	165.79
C2	178.17	1500.00	17.30°	34.07'	178.17	S 01°17'W	178.17
C3	178.17	1500.00	17.30°	34.07'	178.17	N 85°42'E	178.17
C4	164.84	1500.00	6.10°	23.55'	164.84	N 85°42'E	164.84
C5	164.84	1500.00	6.10°	23.55'	164.84	N 04°17'E	164.84
C6	114.96	750.00	37.40°	72.11'	114.96	N 10°00'E	114.96
C7	57.51	1500.00	38.41°	38.41'	57.51	N 85°16'W	57.51

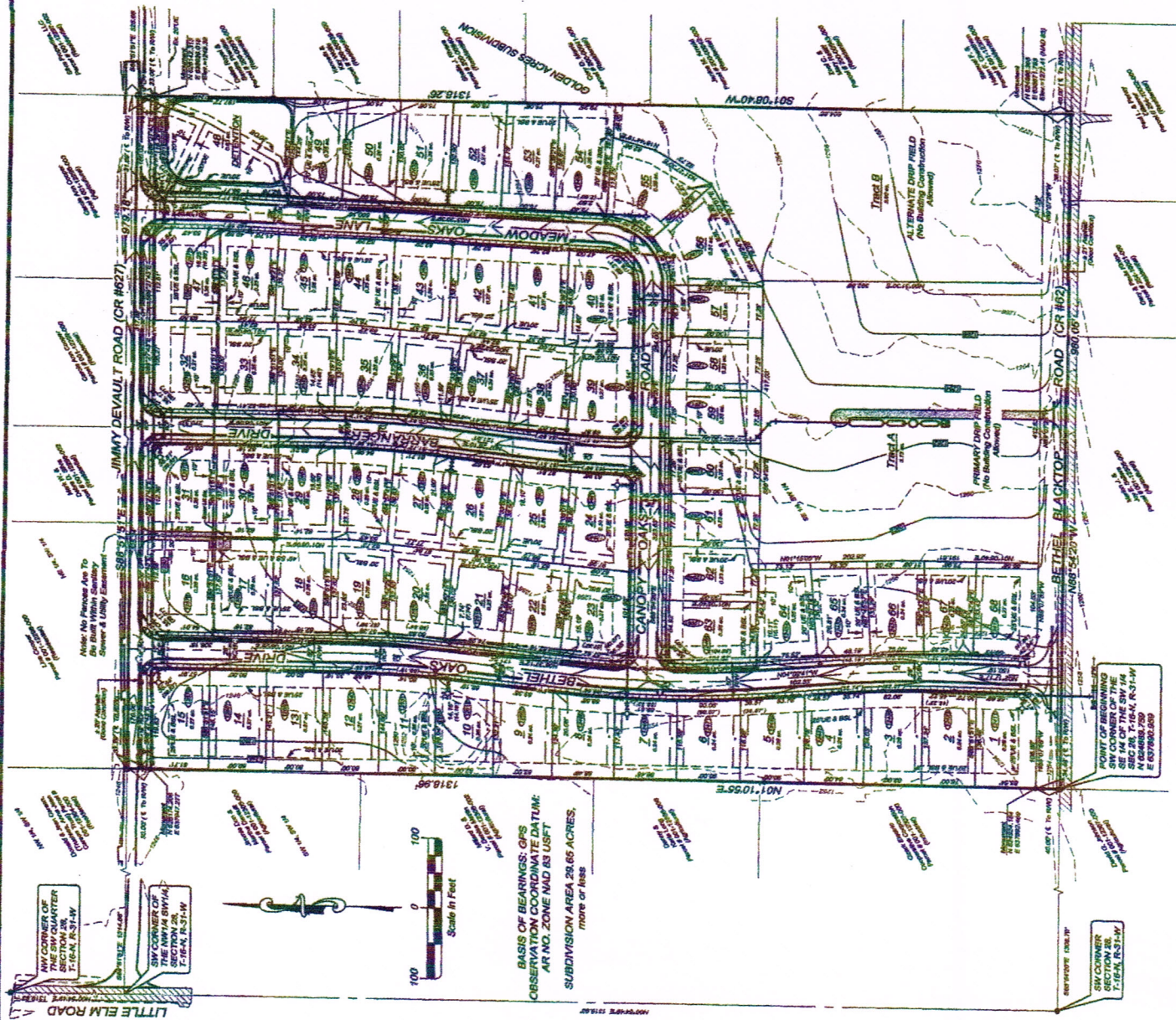
Final Plat

BETHEL OAKS

(Lots 1 thru 68, Tracts A & B)

MORRISON-SHIPLEY ENGINEERS, INC.
DATE: March 19, 2007

SHEET 2 of 2



BETHEL OAKS SUBDIVISION

BEDROOMS

BUILT OUT WITH 68 HOMES

1	12411 Bethel Oaks	3
2	12412 Bethel Oaks	3
3	12423 Bethel Oaks	3
4	12424 Bethel Oaks	3
5	12432 Bethel Oaks	3
6	12434 Bethel Oaks	3
7	12435 Bethel Oaks	3
8	12447 Bethel Oaks	3
9	12454 Bethel Oaks	3
10	12459 Bethel Oaks	3
11	12471 Bethel Oaks	3
12	12471 Bethel Oaks	3
13	12483 Bethel Oaks	3
14	12484 Meadow Oaks	3
15	12491 Barranger	3
16	12492 Barranger	3
17	12493 Meadow Oaks	3
18	12494 Bethel Oaks	3
19	12495 Bethel Oaks	3
20	12496 Meadow Oaks	3
21	12503 Barranger	3
22	12504 Barranger	3
23	12505 Meadow Oaks	3
24	12506 Bethel Oaks	3
25	12507 Bethel Oaks	3
26	12508 Meadow Oaks	3
27	12515 Barranger	3
28	12516 Barranger	3
29	12517 Meadow Oaks	3
30	12518 Bethel Oaks	3
31	12519 Bethel Oaks	3
32	12520 Meadow Oaks	3
33	12527 Barranger	3
34	12528 Barranger	3
35	12529 Meadow Oaks	3
36	12530 Bethel Oaks	3
37	12531 Bethel Oaks	3
38	12532 Meadows Oaks	3
39	12539 Barranger	3
40	12540 Barranger	3
41	12541 Meadow Oaks	3
42	12542 Bethel Oaks	3

BETHEL OAKS SUBDIVISION**BEDROOMS**

43	12543 Bethel Oaks	3
44	12544 Meadow Oaks	3
45	12550 Meadow Oaks	3
46	12551 Barranger	3
47	12552 Barranger	3
48	12553 Meadow Oaks	3
49	12554 Bethel Oaks	3
50	12555 Bethel Oaks	3
51	12563 Barranger	3
52	12564 Barranger	3
53	12565 Meadow Oaks	3
54	12566 Bethel OaksL	3
55	12567 Bethel Oaks	3
56	12575 Barranger	3
57	12576 Barranger	3
58	12577 Meadow Oaks	3
59	12578 Bethel Oaks	3
60	12579 Bethel Oaks	3
21	12877 Canopy Oaks	3
62	12899 Canopy Oaks	3
63	12901 Canopy Oaks	3
64	12913 Canopy Oaks	3
65	12925 Canopy Oaks	3
66	12937 Canopy Oaks	3
67	12949 Canopy Oaks	3
68	12961 Canopy Oaks	3

From: [McWilliams, Katherine](#)
To: [Deardoff, Amy](#)
Subject: FW: 4875 WR-3 deficiencies submittal
Date: Monday, November 06, 2017 12:12:20 PM
Attachments: [bethel_oaks_defincencies_submittal.pdf](#)
Importance: High

Permit. No. 4875 WR-3

From: Kathy Bartlett [<mailto:kathy@aquatechsys.com>]
Sent: Monday, November 06, 2017 10:14 AM
To: McWilliams, Katherine
Subject: 4875 WR-3 deficiencies submittal
Importance: High

Katherine

Attached are the additional documents you required for the permit renewal on 4875-WR-3
I will also be submitting this same information through the portal or by fed ex today

Thank You
Kathryn Bartlett
Internal Operations Manager
NWA Utility Services, Inc
www.nwautilityservices.com
Direct: 479-530-5926

From: McWilliams, Katherine [<mailto:MCWILLIAMSK@adeq.state.ar.us>]
Sent: Monday, October 30, 2017 12:12 PM
To: Kathy Bartlett
Subject: RE: Questions re 4875-WR-3

Kathy,

I have attached a the draft word version of the document.

Thanks,
Katherine McWilliams
Engineer
ADEQ, Office of Water Quality
501-682-0651

From: Kathy Bartlett [<mailto:kathy@aquatechsys.com>]
Sent: Monday, October 30, 2017 11:28 AM
To: McWilliams, Katherine
Subject: RE: Questions re 4875-WR-3

Katherine

Do you have the attached form in a word format?

If so would you please send it to me

Thanks

Kathryn Bartlett

Internal Operations Manager

NWA Utility Services, Inc

www.nwautilityservices.com

Direct: 479-530-5926

From: McWilliams, Katherine [<mailto:MCWILLIAMSK@adeq.state.ar.us>]

Sent: Wednesday, October 04, 2017 3:55 PM

To: kathy@aquatechsys.com

Cc: Solaimanian, Jamal

Subject: RE: Questions re 4875-WR-3

Kathy,

1. What is the ADEQ looking for in regards to Certification of compliance with applicable local ordinances?
 - a. I have attached a draft template that is currently in routing for approval regarding the requirements detailed in Item No. 2. It provides information to answer your question regarding the certification.
2. Number and Type of Connections
 - a. The summary provided is not comprehensive with the types of connections based on Appendix B of the Arkansas Department of Health Rules and Regulations Pertaining to Onsite Wastewater Systems. The referenced document breaks down residences into 1 bedroom, 2 bedroom, etc. Therefore, the residential connections should be as detailed as Appendix B.
3. I have a copy of the original WMP signed and stamped for this facility and it has not changed. Will this suffice?
 - a. Yes, a copy of a WMP signed and stamped will suffice.
4. What documents do you want transmitted to the ADH? Since this is a permit renewal do you just want me to send them a letter stating the permit is being renewed?
 - a. The notice must include a complete set of maps indicating the facility location and a description (type, size, etc.) of the facility. A complete renewal application was not received 180 days prior to the expiration date of the permit as the permit application was deemed administratively incomplete. Therefore, the permit application is not considered a renewal application.

If you have any questions, please let me know.

Thanks,

Katherine McWilliams

Engineer

From: Kathy Bartlett [<mailto:>]
Sent: Wednesday, October 04, 2017 2:10 PM
To: McWilliams, Katherine
Subject: Questions re 4875-WR-3

Katherine

I have reviewed your letter dated Oct 4 regarding the deficiencies for 4875-WR-3 and have the following questions:

2 A

What is the ADEQ looking for in regards to **Certification** of compliance with applicable local ordinances?

2 D

The summary should include the number of existing connections and estimated number of new connections

-

The cover letter dated Sept 27 and submitted with the application for renewal provided the following information:

The subdivision currently has 68 homes connected to the facility and there will be no additional connections

Does this not suffice for item D?

3.

Submittal of Waste Management Plan stamped and signed by a PE registered in the state of AR

I have a copy of the original WMP signed and stamped for this facility and it has not changed. Will this suffice?

5.

Submit a letter transmitting the below document to the ADH

What documents do you want transmitted to the ADH? Since this is a permit renewal do you just want me to send them a letter stating the permit is being renewed?

Please reply by email or letter to me directly since I am the person assisting the permit holder on their renewal.

-

Thank you

-
Kathryn Bartlett
Internal Operations Manager
NWA Utility Services, Inc
www.nwutilityservices.com
Direct: 479-530-5926

From: [McWilliams, Katherine](#)
To: [Deardoff, Amy](#)
Subject: FW: Additional forms 4875-WR-3
Date: Monday, November 06, 2017 12:47:30 PM
Attachments: [bethel oaks definciencies submittal 2.pdf](#)
[Bethel Oaks Waste Management Plan 20050907.pdf](#)

4875-WR-3

Thanks

From: Kathy Bartlett [mailto:kathy@aquatechsys.com]
Sent: Monday, November 06, 2017 12:26 PM
To: McWilliams, Katherine
Subject: Additional forms 4875-WR-3

Here you go Katherine

Thank You

Kathryn Bartlett
Internal Operations Manager
NWA Utility Services, Inc
www.nwautilityservices.com
Direct: 479-530-5926