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June 15, 2015

*Via Electronic Mail*

Mr. Jay Zimmerman  
North Carolina Department of Environment and Natural Resources  
Division of Water Resources, Director  
1611 Mail Service Center  
Raleigh, North Carolina 27699-1611

**Re: Sugarloaf Utilities, Inc. – Request for Exception Pursuant to 15A NCAC 2H .0407**

Dear Jay:

I am writing on behalf of Sugarloaf Utilities, Inc. (“Sugarloaf”) to request an exception from the requirements of 15A NCAC 02H Section .0404(g)(7) pursuant to 15A NCAC 02H .0407. We have discussed this exception request with the Division of Water Resources’ Water Quality Permitting Section, and it supports our request. Sugarloaf respectfully requests that this exception request be heard by the Environmental Management Commission (“EMC”) at its hearing scheduled for July 8 and 9, 2015.

Sugarloaf operates a 100,000-gallon per day, high-rate wastewater infiltration rotary distribution system (the “System”) serving residential and commercial developments in Carteret County. The System was originally permitted to comply with the requirements of 15A NCAC 02H .0200. Permit No. WQ0004059 for the System, attached as Exhibit A, now incorporates the requirements of 15A NCAC Subchapter 02T as well as 15A NCAC 02H .0400. In particular, 15 NCAC 02H .0404(g)(7) provides that “[w]aste disposal areas are to contain at 1,000 square feet of open ‘green area’ for each residential unit served, or 2,500 square feet per thousand gallons per day of waste flow, whichever is less.”

Under the present permit, Sugarloaf is not required to achieve compliance with effluent limitations for total nitrogen and phosphorous of 7 mg/l and 3 mg/l, respectively. Improvements to the System in order to upgrade the System to achieve compliance with these effluent limitations will require a substantial costs and expense to Sugarloaf. If this exception request is granted, Sugarloaf will cause improvements to the System in order to achieve compliance with the effluent limitations of total nitrogen and phosphorous of 7 mg/l and 3 mg/l, respectively, in

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the event that the necessary modifications are granted to the permit and all other approvals are obtained. Specifically, Sugarloaf requests an exception from the requirements of 15A NCAC 02H .0404(g)(7).

If the exception is granted and to ensure that water quality is adequately protected, Sugarloaf proposes to make certain improvements to the System and will request a major modification of its permit requiring the System to comply with the Subchapter 02T rules. Sugarloaf plans to reconfigure the existing System by removing the two rotary distributors and replacing the distributors with rectangular high-rate infiltration basins, which will comply with the requirements of 15A NCAC 02T .0706(b). The loading rate of ten (10) gallons per day per square foot will remain the same, and the permitted capacity will remain at 100,000 gallons per day.

Two primary changes will be made to the existing System. First, a one-hundred percent repair area will be added adjacent to the high-rate infiltration basin. The repair area will be of sufficient size to accommodate the installation of additional infiltration fields, if necessary. A schematic of the proposed active infiltration basin and repair field is attached as Exhibit B. Second, the wastewater treatment will be improved by modifying the System to provide for nitrogen and phosphorous reduction. These improvements will result in the modified System achieving compliance with effluents limitations for total nitrogen and phosphorous of 7 mg/l and 3 mg/l, respectively. A schematic of the proposed improvements to the System will be provided to supplement this exception request.

Sugarloaf has conducted a preliminary hydrogeologic evaluation to determine the feasibility of the proposed improvements to the System. The preliminary evaluation shows that the proposed improvements are not only feasible, but will also result in substantial water quality improvements at the site. Based on modeling results and due to the high transmissivity of the underlying soil, total nitrogen will be reduced to 7 mg/l or less. In addition, the availability of the proposed repair area will provide assurance that the improved System will be sustainable and will eliminate the need for the "green area" as required by 15A NCAC 02H .0404(g)(7). A copy of the preliminary hydrogeologic evaluation is attached as Exhibit C.

Sugarloaf's exception request is also consistent with the Division of Water Resources' recent proposed revisions to 15A NCAC Subchapters 02H and 02T. The proposed revisions to the 02H .0400 rules would exempt non-discharge facilities permitted under 15A NCAC 02T from certain 02H .0400 requirements. In addition, the proposed 02T rules would not include the "green area" requirement from which Sugarloaf seeks an exception.

In closing, Sugarloaf respectfully requests an exception from the requirements of 15A NCAC 02H .0404(g)(7) pursuant to 15A NCAC 02H .0407. If this exception is granted and subject to Sugarloaf obtaining the necessary permit modifications and all other approvals, Sugarloaf will make the above-discussed improvements to the System and comply with the Subchapter 02T rules. These exceptions will not only allow Sugarloaf flexibility in operating the

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System, but will provide substantial benefits to water quality and is consistent with the proposed revisions to the 02H and 02T rules.

Thank you for your assistance in considering this request and scheduling a hearing before the EMC in July 2015.

Sincerely,



Todd S. Roessler

cc: Gary Joyner  
Edwin Andrews III, P.G.  
Ronald D. Cullipher, P.E.  
Linwood E. Stroud, P.E.  
Nathaniel Thornburg

# EXHIBIT A



January 18, 2008

WILLIAM T. SMITH, PRESIDENT  
SUGARLOAF UTILITY, INC.  
2304 WESVILLE CT., SUITE 380  
RALEIGH, NC 27607

RECEIVED

JAN 25 2008

BY: \_\_\_\_\_

Subject: Permit No. WQ0004059  
Sugarloaf Utility, Inc.  
Atlantic Station Facility  
High-Rate Infiltration  
Carteret County

Dear Mr. Smith:

In accordance with your permit renewal request received October 31, 2007, we are forwarding herewith Permit No. WQ0004059, dated January 18, 2008, to Sugarloaf Utility, Inc. for the continued operation of the subject wastewater treatment and high-rate infiltration facilities.

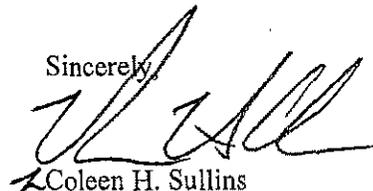
This permit shall be effective from the date of issuance until December 31, 2012, shall void Permit No. WQ0004059 issued November 18, 2002, and shall be subject to the conditions and limitations as specified therein. Please pay particular attention to the monitoring requirements in this permit. Failure to establish an adequate system for collecting and maintaining the required operational information will result in future compliance problems.

Please note that on September 1, 2006 State Administrative Code 15A NCAC Subchapter 02T – Waste not Discharged to Surface Water was adopted. This permit incorporates the requirement of the new rules, which include new setback requirements. Remember to **take the time to review this permit thoroughly**, as some of the conditions contained therein may have been added, changed, or deleted from those in previously issued permits.

If any parts, requirements, or limitations contained in this permit are unacceptable, you have the right to request an adjudicatory hearing upon written request within 30 days following receipt of this permit. This request must be in the form of a written petition, conforming to Chapter 150B of the North Carolina General Statutes, and filed with the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, NC 27699-6714. Unless such demands are made this permit shall be final and binding.

If you need additional information concerning this matter, please contact David Goodrich at (919) 715-6162 or david.goodrich@ncmail.net.

Sincerely,



Coleen H. Sullins

cc: Carteret County Health Department  
Wilmington Regional Office, Aquifer Protection Section  
Technical Assistance and Certification Unit  
APS Central Files  
LAU Files

One North Carolina  
Naturally

NORTH CAROLINA  
 ENVIRONMENTAL MANAGEMENT COMMISSION  
 DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES  
 RALEIGH  
 HIGH-RATE INFILTRATION SYSTEM PERMIT

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In accordance with the provisions of Article 21 of Chapter 143, General Statutes of North Carolina as amended, and other applicable Laws, Rules, and Regulations

PERMISSION IS HEREBY GRANTED TO

**Sugarloaf Utility, Inc.**  
 Cateret County

FOR THE

continued operation of a 100,000 high-rate wastewater infiltration rotary distributor facilities consisting of an influent bar screen, a 20,000 gallon aerated flow equalization tank with dual 80 GPM submersible pumps and high water alarms, flow control box, dual extended aeration package plants each consisting of a 50,000 gallon aeration tank and a 8,333 gallon clarifier, dual 280 CFM blowers with a stand-by blower of equal capacity, a 100,000 GPD tertiary filter unit including backwash pumps and air scouring blowers, a 8,700 gallon sludge holding tank, a 2,084 gallon chlorine contact tank with dual tablet type chlorinators, an effluent recording flow meter, a 5,863 gallon effluent dosing tank with submersible pumps and high water alarms, two (2) 86-foot diameter rotary distributors, an on-site stand-by generator with sufficient capacity to operate the entire facility, and all associated piping, valves, and appurtenances to serve Sugarloaf Utility, Inc.'s Atlantic Station with no discharge of wastes to the surface waters, pursuant to the renewal request received October 31, 2007, and in conformity with the project plan, specifications, and other supporting data subsequently filed and approved by the Department of Environment and Natural Resources and considered a part of this permit.

This permit shall be effective from the date of issuance until December 31, 2012, shall void Permit No. WQ0004059 issued November 18, 2002, and shall be subject to the following specified conditions and limitations:

**I. SCHEDULES**

1. Within 60 days of permit issuance, if not already performed, all of the wells (active and inactive) at the site, with the exception of MW-1 and MW-2 need to be properly labeled and have complete descriptive well tags according to the North Carolina Well Construction Standards 15A NCAC 2C .0108(c)(11). Additionally, within 60 days of permit issuance, monitor well MW-3 shall be temporarily abandoned by securing the wellheads to prevent access by hand. Each well shall have a lockable cap and be locked in order to reasonably ensure against unauthorized access and use [15A NCAC 02C .0108(c)(7)]. The well shall be further secured by placing a compatible watertight cap or seal onto the riser pipe to prevent potential contamination from entering the well.

2. No later than six months prior to the expiration of this permit, the Permittee shall request renewal of this permit on official Division forms. Upon receipt of the request, the Division will review the adequacy of the facilities described therein, and if warranted, will extend the permit for such period of time and under such conditions and limitations as it may deem appropriate. Please note that Rule 15A NCAC 02T .0105(d) requires an updated site map to be submitted with the permit renewal application.
3. The subject wastewater treatment and disposal facilities shall be connected to an operational publicly owned wastewater collection system within 180 days of its availability to the subject facilities, if the subject wastewater treatment or disposal facilities are in noncompliance with the terms and conditions of this non-discharge permit or the governing statutes or regulations. Prior to the initiation of these connection activities, appropriate approval must be received from this Division.

## II. PERFORMANCE STANDARDS

1. The high-rate infiltration facilities shall be effectively maintained and operated at all times so that there is no discharge to the surface waters, nor any contravention of groundwater or surface water standards. In the event that the facilities fail to perform satisfactorily, including the creation of nuisance conditions or failure of the high-rate infiltration area to adequately assimilate the wastewater, the Permittee shall take immediate corrective actions including those actions that may be required by the Division, such as the construction of additional or replacement wastewater treatment and disposal facilities.
2. The issuance of this permit shall not relieve the Permittee of the responsibility for damages to ground or surface waters resulting from the operation of this facility.
3. Effluent limitations shall not exceed those specified in Attachment A.
4. Application rate(s), whether hydraulic, nutrient, or other pollutant shall not exceed those specified in Attachment B.
5. The compliance boundary for the disposal system is specified by rules in 15A NCAC 02L, Groundwater Classifications and Standards. This disposal system was individually permitted on or after December 30, 1983; therefore, the compliance boundary is established at either 250 feet from the waste disposal area, or 50 feet within the property boundary, whichever is closest to the waste disposal area. An exceedance of groundwater standards at or beyond the compliance boundary is subject to remediation action according to 15A NCAC 02L .0106(d)(2) as well as enforcement actions in accordance with North Carolina General Statute 143-215.6A through 143-215.6C.
6. The Permittee shall apply for a permit modification prior to any sale or transfer of property that affects a compliance boundary to establish a new compliance boundary.
7. In accordance with 15A NCAC 02L .0107(d), no wells, other than monitoring wells, shall be constructed within the compliance boundary except as provided by 15A NCAC 02L .0107(g).
8. The review boundary is established around the disposal systems midway between the compliance boundary and the perimeter of the waste disposal area. Any exceedance of standards at the review boundary shall require action in accordance with 15A NCAC 02L .0106.
9. The facilities permitted herein must be constructed according to the following setbacks:
  - a. The setbacks for high-rate infiltration sites shall be as follows (all distances in feet):
 

i. Any habitable residence or place of public assembly under separate ownership:	400
ii. Any habitable residence or place of public assembly owned by the permittee:	200

- |  |     |
|--|-----|
| iii. Any private or public water supply source and any streams classified as WS or B:  | 200 |
| iv. From mean high water in any "SA" or "SB" classified surface waters; from normal high water in any other stream, canal, marsh, coastal waters; from normal high water in any Class I or Class II impounded reservoir used as a source of drinking water; any other lake or impoundment: | 200 |
| v. Groundwater lowering ditches:   | 200 |
| vi. Any drainage systems (ditches, drains, surface water diversions) and any surface drainage ditches:   | 200 |
| vii. Any well with exception of monitoring wells:  | 100 |
| viii. Any property line:   | 100 |
| ix. Top of slope of embankments or cuts of two feet or more in vertical height:  | 100 |
| x. Any water line from a disposal system:  | 10  |
| xi. Subsurface groundwater lowering drainage systems:  | 200 |
| xii. Any swimming pool:  | 100 |
| xiii. Public right of way and other treatment units:   | 50  |
| xiv. Nitrification field:  | 20  |
| xv. Any building foundation or basement:   | 15  |
| xvi. Impounded public water supplies:  | 500 |
| xvii. Public shallow groundwater supply:   | 500 |
- b. The setbacks for treatment and storage units shall be as follows (all distances in feet):
- |  |     |
|--|-----|
| i. Any habitable residence or place of public assembly under separate ownership: | 100 |
| ii. Any private or public water supply source:                                   | 100 |
| iii. Surface waters:   | 50  |
| iv. Any well with exception of monitoring wells:                                 | 100 |
| v. Any property line:  | 50  |
10. A usable green area shall be maintained for wastewater disposal. The green area shall have the capability of accommodating the average daily flow of the facility being served without exceeding the loading rates of the green area. A "green area", as defined in 15A NCAC 02H .0404 (g)(7), is an area suitable for waste disposal, either in its natural state or which has been modified by planting a vegetative cover of grasses or low growing shrubbery.

### **III. OPERATION AND MAINTENANCE REQUIREMENTS**

1. The facilities shall be properly maintained and operated at all times. The facilities shall be effectively maintained and operated as a non-discharge system to prevent the discharge of any wastewater resulting from the operation of this facility. The Permittee shall maintain an Operation and Maintenance Plan pursuant to 15A NCAC 02T .0707 including operational functions, maintenance schedules, safety measures, and a spill response plan.
2. Upon classification of the wastewater treatment and high-rate infiltration facilities by the Water Pollution Control System Operators Certification Commission (WPCSOCC), the Permittee shall designate and employ a certified operator to be in responsible charge (ORC) and one or more certified operator(s) to be back-up ORC(s) of the facilities in accordance with 15A NCAC 08G .0200. The ORC shall visit the facilities in accordance with 15A NCAC 08G .0200 or as specified in this permit and shall comply with all other conditions specified in these rules.

3. A suitable year round vegetative cover shall be maintained such that crop health is optimized, allows for even distribution of effluent, and allows inspection of the high-rate infiltration system.
4. Adequate measures shall be taken to prevent wastewater ponding or runoff from the high-rate infiltration field.
5. High-rate infiltration shall not be performed during inclement weather or when the ground is in a condition that will cause ponding or runoff.
6. All waste application equipment must be tested and calibrated at least once per year. Records of the calibration must be maintained for five years.
7. No type of wastewater other than that from Sugarloaf Utility, Inc.'s Atlantic Station facility shall be disposed onto the high-rate infiltration area.
8. An automatically activated standby power source shall be on site and operational at all times capable of powering all essential treatment units. If a generator is employed as an alternate power supply, it shall be tested weekly by interrupting the primary power source.
9. No traffic or equipment shall be allowed on the disposal area except while installation occurs or while normal maintenance is being performed.
10. The rotary distribution fields shall be raked twice weekly during the months of April through October and once a week during the months of November through March.
11. The screenings removed from the wastewater treatment plant shall be properly disposed in a sanitary landfill or by other means that have been approved by this Division.
12. Vegetative growth must be kept out of the rotary distribution areas at all times. All vegetation must be removed manually so that minimal disturbance will occur to the disposal area.
13. The application of chemicals to the distribution field(s) is expressly prohibited.
14. Diffusers shall be cleaned as needed to ensure that adequate aeration is provided. Records of this maintenance shall be maintained by the permittee.
15. The chlorine tablets used in the disinfection facility shall be of the kind and type specified in the plans and specifications approved by the Division.
16. The residuals generated from these treatment facilities must be disposed / utilized in accordance with 15A NCAC 02T .1100. The Permittee shall maintain a residual management plan pursuant to 15A NCAC 02T .0708.
17. A record shall be maintained of all residuals removed from this facility. The record shall include the name of the hauler, the permit authorizing the disposal or a letter from a municipality agreeing to accept the residuals, the date the residuals were hauled, and the volume of the residuals removed.
18. Adequate measures shall be taken to divert stormwater from the high rate infiltration area and to prevent wastewater runoff.
19. Diversion or bypassing of the untreated wastewater from the treatment facilities is prohibited.

#### IV. MONITORING AND REPORTING REQUIREMENTS

1. Any monitoring (including groundwater, surface water, soil or plant tissue analyses) deemed necessary by the Division to ensure surface and ground water protection will be established and an acceptable sampling reporting schedule shall be followed.

2. All laboratory analyses for effluent, ground waters, or surface waters shall be made by a laboratory certified by the Division for the required parameter(s) under 15A NCAC 02H .0800.
3. Flow through the treatment facility shall be continuously monitored and daily flow values shall be reported on Form NDMR.

The Permittee shall install and maintain an appropriate flow measurement device consistent with approved engineering and scientific practices to ensure the accuracy and reliability of flow measurement. Flow measurement devices selected shall be capable of measuring flows with a maximum deviation of less than 10 percent from true flow, accurately calibrated at a minimum of once per year, and maintained to ensure that the accuracy of the measurements is consistent with the accepted capability of that type of device. The Permittee shall keep records of flow measurement device calibration on file for a period of at least three years. At a minimum, data to be included in this documentation shall be:

- a. Date of flow measurement device calibration,
  - b. Name of person performing calibration, and
  - c. Percent from true flow.
4. The effluent from the subject facilities shall be monitored by the Permittee at the frequency(ies) and location(s) for the parameter(s) specified in Attachment A.
  5. The Permittee tracking the amount of wastewater disposed shall maintain adequate records. These records shall include, but are not necessarily limited to, the following information:
    - a. Date of high-rate infiltration,
    - b. Volume of wastewater infiltrated,
    - c. Field infiltrated,
    - d. Length of time field is infiltrated,
    - e. Loading rates to each infiltration site list in Attachment B
    - f. Continuous monthly and year-to-date loadings for any non-hydraulic parameter specifically limited in Attachment B for each field,
    - g. Weather conditions, and
  6. Monitor wells shall be sampled at the frequencies and for the parameters specified in Attachment C. All mapping, well construction forms, well abandonment forms, and monitoring data shall refer to the permit number and the well nomenclature as provided in Attachment C and Figure 2.
  7. Two copies of the results of the sampling and analysis must be received on Form GW-59 (Groundwater Quality Monitoring: Compliance Report Form), along with attached copies of laboratory analyses, by the Division of Water Quality, Information Processing Unit, 1617 Mail Service Center, Raleigh, North Carolina 27699-1617 on or before the last working day of the month following the sampling month. Form GW-59 shall include the number of this permit and the appropriate well identification number. One Form GW-59a certification form shall be provided for each set of sampling results submitted.
  8. Three copies of all monitoring data [as specified in Conditions IV.3. and IV.4.] on Form NDMR for each point prior to irrigation (PPI) and three copies of all operation and disposal records [as specified in Condition IV.5.] on Form NDAR-1 for every infiltration area shall be submitted on or before the last day of the following month. If no activities occurred during the monitoring month, monitoring reports are still required documenting the absence of the activity. All information shall be submitted to the following address:

Division of Water Quality  
 Information Processing Unit  
 1617 Mail Service Center  
 Raleigh, North Carolina 27699-1617

9. A maintenance log shall be maintained at this facility including, but not limited to, the following items:
  - a. Daily sampling results including residual chlorine, settleable matter, and dissolved oxygen in the aeration basin and at the clarifier weir;
  - b. Visual observations of the plant and plant site.
  - c. Record of preventative maintenance (changing of filters, adjusting belt tensions, alarm testing, diffuser inspections and cleanings, etc.);
  - d. Date of calibration of flow measurement device;
  - e. Date and results of power interruption testing on alternative power supply; and
  - f. Dates fields were raked and arms inspected.

#### 10. Noncompliance Notification:

The Permittee shall report by telephone to the Wilmington Regional Office, telephone number (910) 796-7215, as soon as possible, but in no case more than 24 hours or on the next working day following the occurrence or first knowledge of the occurrence of any of the following:

- a. Any occurrence at the wastewater treatment facility which results in the treatment of significant amounts of wastes which are abnormal in quantity or characteristic, such as the dumping of the contents of a sludge digester; the known passage of a slug of hazardous substance through the facility; or any other unusual circumstances including ponding in the high-rate infiltration areas or runoff from the high-rate infiltration areas.
- b. Any process unit failure, due to known or unknown reasons, that render the facility incapable of adequate wastewater treatment such as mechanical or electrical failures of pumps, aerators, compressors, etc.
- c. Any failure of disposal system resulting in a by-pass directly to receiving waters.
- d. Any time that self-monitoring information indicates that the facility has gone out of compliance with its permit limitations including, but not limited to, freeboard measurements, effluent limitations, exceedances of groundwater standards, or overloading of any infiltration area.

For any emergency that requires immediate reporting (e.g., discharges to surface waters, imminent failure of a storage structure, etc.) outside normal business hours must be reported to the Division's Emergency Response personnel at telephone number (800) 662-7956, (800) 858-0368, or (919) 733-3300. Persons reporting such occurrences by telephone shall also file a written report in letter form within five (5) days following first knowledge of the occurrence. This report must outline the actions taken or proposed to be taken to ensure that the problem does not recur.

## V. INSPECTIONS

1. Adequate inspection and maintenance shall be provided by the Permittee to ensure proper operation of the subject facilities.
2. The Permittee or his designee shall inspect the wastewater treatment and disposal facilities to prevent malfunctions and deterioration, operator errors and discharges which may cause or lead to the release of wastes to the environment, a threat to human health, or a nuisance. The Permittee shall keep an inspection log or summary including at least the date and time of inspection, observations made, and any maintenance, repairs, or corrective actions taken by the Permittee. This log of inspections shall be maintained by the Permittee for a period of five years from the date of the inspection and shall be made available upon request to the Division or other permitting authority.

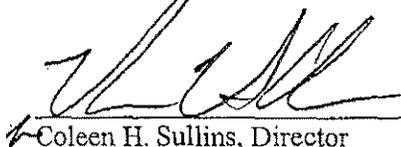
3. Any duly authorized officer, employee, or representative of the Division may, upon presentation of credentials, enter and inspect any property, premises or place on or related to the disposal site or facility at any reasonable time for the purpose of determining compliance with this permit; may inspect or copy any records that must be maintained under the terms and conditions of this permit, and may obtain samples of groundwater, surface water, or leachate.

## VI. GENERAL CONDITIONS

1. Failure to abide by the conditions and limitations contained in this permit may subject the Permittee to an enforcement action by the Division in accordance with North Carolina General Statute 143-215.6A to 143-215.6C.
2. This permit shall become voidable unless the facilities are constructed in accordance with the conditions of this permit, the approved plans and specifications, and other supporting data.
3. This permit is effective only with respect to the nature and volume of wastes described in the application and other supporting data. No variances to applicable rules governing the construction and / or operation of the permitted facilities are granted unless specifically requested and granted in this permit.
4. The issuance of this permit does not exempt the Permittee from complying with any and all statutes, rules, regulations, or ordinances, which may be imposed by other government agencies (local, state, and federal) that have jurisdiction. Of particular concern to the Division are applicable river buffer rules in 15A NCAC 02B .0200, erosion and sedimentation control requirements in 15A NCAC Chapter 4 and under the Division's General Permit NCG010000, and any requirements pertaining to wetlands under 15A NCAC 02B .0200 and 02H .0500.
5. In the event there is a desire for the facilities to change ownership, or there is a name change of the Permittee, a formal permit request must be submitted to the Division on official Division forms, documentation from the parties involved, and other supporting materials as may be appropriate. The approval of this request will be considered on its merits and may or may not be approved. The Permittee of record shall remain fully responsible for compliance until a permit is issued to the new owner.
6. The Permittee shall retain a set of approved plans and specifications for the life of the facilities permitted herein.
7. The Permittee shall maintain this permit until all permitted facilities herein are properly closed or permitted under another permit issued by the appropriate permitting authority.
8. The Permittee must pay the annual fee within 30 days after being billed by the Division. Failure to pay the fee accordingly may cause the Division to initiate action to revoke this permit pursuant to 15A NCAC 02T .0105(e).

Permit issued this the 18th of January 2008

NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION



\_\_\_\_\_  
 Coleen H. Sullins, Director  
 Division of Water Quality  
 By Authority of the Environmental Management Commission

Permit Number WQ0004059

## ATTASCHMENT A - EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

Permit Number: WQ0004059

Version 3.0

## SUGARLOAF UTILITY, INC.

## 002 WWTF Effluent

EFFLUENT CHARACTERISTICS	EFFLUENT LIMITS						MONITORING REQUIREMENTS	
	Monthly Average	Units	Weekly Average	Units	Daily Maximum	Units	Measurement Frequency	Sample Type
Chloride (as Cl) - 00940							3 X year	Composite
BOD, 5-Day (20 Deg. C) - 00310 - Summer		10 mg/l					Weekly	Composite
BOD, 5-Day (20 Deg. C) - 00310 - Winter		10 mg/l					Monthly	Composite
Solids, Total Suspended - 00530 - Winter		20 mg/l					Monthly	Composite
Nitrogen, Ammonia Total (as N) - 00610 - Winter		4 mg/l					Monthly	Composite
Nitrogen, Nitrate Total (as N) - 00620 - Summer							Weekly	Composite
Solids, Total Suspended - 00530 - Summer		20 mg/l					Weekly	Composite
Nitrogen, Nitrate Total (as N) - 00620 - Winter							Monthly	Composite
pH - 00400					6.0 - 9.0	s.u.	5 X week	Grab
Nitrogen, Ammonia Total (as N) - 00610 - Summer		4 mg/l					Weekly	Composite
Solids, Total Dissolved- 180 Deg.C - 70300							3 X year	Composite
Coliform, Fecal MF, M-FC Broth,44.5C - 31616 - Winter (geom.mean)		14 #/100ml			43	#/100ml	Monthly	Grab
Coliform, Fecal MF, M-FC Broth,44.5C - 31616 - Summer (geom.mean)		14 #/100ml			43	#/100ml	Weekly	Grab
Flow, in conduit or thru treatment plant - 50050		100,000	gpd				Continuous	Recorder
Chlorine, Total Residual - 50060							5 X week	Grab

Winter: September 1 - April 30

Summer: May 1 - August 31

3 X year - March, July, November

There shall be no discharge of floating solids or visible foam in other than trace amounts.

**ATTACHMENT B - Approved Land Application Sites**

Permit Number: WQ0004059      Version: 3.0

Sugarloaf Utility Inc

Atlantic Station WWTF

						Net				
Field/Zone Id	Owner	Lessee	County	Latitude	Longitude	Acreage	Dominant Soil Series	Parameter	Hourly Avg	Yearly Max
01	Sugarloaf Utility Inc		Carteret	34°41'59"	76°45'04"	.13	Duckston fine sand	82216 - Spray Irrigation- Application Rate		10 gpd/sf
02	Sugarloaf Utility Inc		Carteret	34°41'57"	76°45'02"	.13	Duckston fine sand	82216 - Spray Irrigation- Application Rate		10 gpd/sf
<b>Total</b>						<b>.26</b>				

## ATTACHMENT C - GROUNDWATER LIMITATIONS AND MONITORING REQUIREMENTS

Permit Number: WQ0004059

Version 3.0

Sugarloaf Utility, Inc.

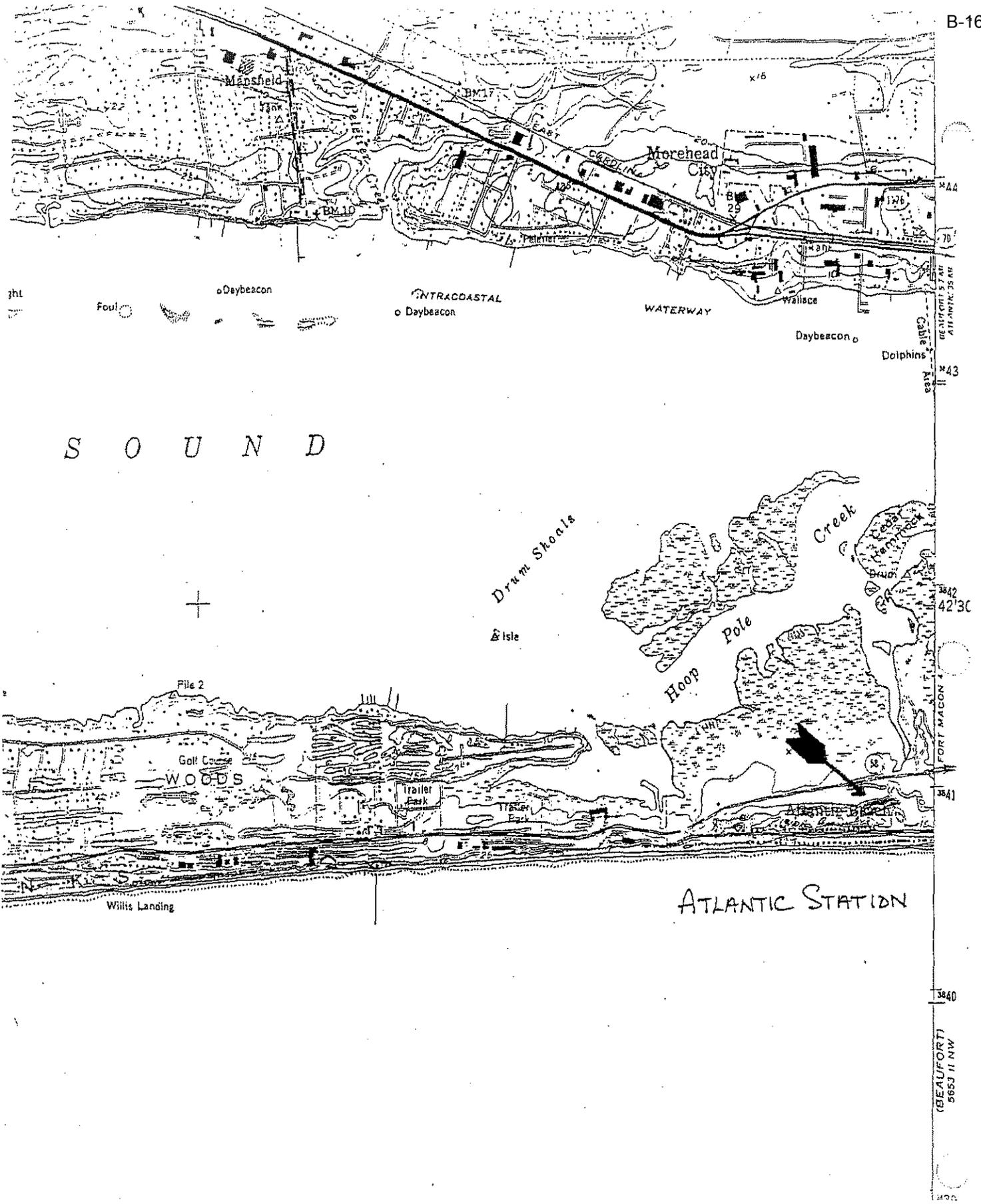
## Monitor Wells MW-1, MW-2, MW-4, MW-5 and MW-6

CHARACTERISTICS	LIMITS			MONITORING REQUIREMENTS			
	Parameter Description - PCS Code	Daily Minimum	Daily Maximum	Units	Frequency	Measurement	Footnotes
Water level, distance from measuring point - 82546					3 X year	Calculated	1, 2, 3
pH - 00400	6.50	8.50	su		3 X year	Grab	1
Coliform, Fecal MF, M-FC Broth, 44.5C - 31616					3 X year	Grab	1
Solids, Total Dissolved- 180 Deg.C - 70300		500.00	mg/l		3 X year	Grab	1
Carbon, Tot Organic (TOC) - 00680					3 X year	Grab	1, 4
Chloride (as Cl) - 00940		250.00	mg/l		3 X year	Grab	1
Nitrogen, Ammonia Total (as N) - 00610					3 X year	Grab	1
Nitrogen, Nitrate Total (as N) - 00620		10.00	mg/l		3 X year	Grab	1
Phosphorus, Total (as P) - 00665					3 X year	Grab	1
Volatile Compounds, (GC/MS) - 78732					Annually	Grab	1, 5

1. 3X year monitoring shall be conducted in March, July & October. Annual monitoring shall be conducted in October. Monitoring wells shall be reported consistent with the nomenclature and location information provided in Figure 2 and this attachment.
2. The measurement of water levels shall be made prior to purging the wells. The depth to water in each well shall be measured from the surveyed point on the top of the casing. The measurement of pH shall be made after purging and prior to sampling for the remaining parameters.
3. The measuring points (top of well casing) of all monitoring wells shall be surveyed to provide the relative elevation of the measuring point for each monitoring well. The measuring points (top of casing) of all monitoring wells shall be surveyed relative to a common datum.
4. If TOC concentrations greater than 10 mg/l are detected in any downgradient monitoring well, additional sampling and analysis must be conducted to identify the individual constituents comprising this TOC concentration. If the TOC concentration as measured in the background monitor well exceeds 10 mg/l, this concentration will be taken to represent the naturally occurring TOC concentration. Any exceedances of this naturally occurring TOC concentration in the downgradient wells shall be subject to the additional sampling and analysis as described above.
5. Volatile Organic Compounds (VOC) - In November only, analyze by one of the following methods:
  - a. Standard Method 6230D, PQL at 0.5 µg/L or less
  - b. Standard Method 6210D, PQL at 0.5 µg/L or less
  - c. EPA Method 8021, Low Concentration, PQL at 0.5 µg/L or less
  - d. EPA Method 8260, Low Concentration, PQL at 0.5 µg/L or less
  - e. Another method with prior approval by the Aquifer Protection Section Chief.

Any method used must meet the following qualifications:

  - a. A laboratory must be DWQ certified to run any method used.
  - b. The method used must, at a minimum, include all the constituents listed in Table VIII of Standard Method 6230D.
  - c. The method used must provide a PQL of 0.5 ug/L or less that must be supported by laboratory proficiency studies as required by the DWQ Laboratory Certification Unit. Any constituents detected above the MDL but below the PQL of 0.5 ug/L must be qualified (estimated) and reported.



B A Y

FIGURE 1  
 SUGARLOAF UTILITY, INC.  
 WASTEWATER ROTARY DISTRIBUTOR FACILITIES  
 CARTERET COUNTY  
 WQ0004059  
 SITE LOCATION MAP





North Carolina Department of Environment and Natural Resources  
Division of Water Quality

Beverly Eaves Perdue  
Governor

Coleen H. Sullins  
Director

Dee Freeman  
Secretary

February 6, 2009

William T. Smith, President  
Sugarloaf Utility, Inc.  
P.O. Box 10324  
Raleigh, NC 27605

Subject: Permit No. WQ0028890 **MODIFICATION**  
Sugarloaf Utility, Inc.  
Atlantic Station Food Lion Shopping Center  
Pressure Sewer Extension  
Carteret County

Dear Mr. Smith:

In accordance with your application received January 30, 2009, we are forwarding herewith Permit No. WQ0028890, dated February 6, 2009, to Sugarloaf Utility, Inc. for the continued operation of the subject wastewater collection system extension. This permit shall be effective from the date of issuance until rescinded, **shall void Permit No. WQ0028890 issued July 13, 2005**, and shall be subject to the conditions and limitations as specified therein. This cover letter shall be considered a part of this permit and is therefore incorporated therein by reference. **This permit shall not be transferable per Condition 4.**

This modification applies a reduced flow rate of 60-gpd/1000 sq ft for general retail space originally approved on 2-18-1999, but never applied to the permit. In addition, it simplifies the total flow allocation associated with the permit to allow for greater leasing flexibility.

Please note the following standard conditions that are contained in this permit.

- Condition 3: Requires that the wastewater collection facilities be properly operated and maintained in accordance with 15A NCAC 2T .0403 or any individual system-wide collection system permit issued to the Permittee.
- Condition 6: Requires that the system be properly certified upon completion of construction and prior to being placed into operation.
- Condition 7: Regarding the installation of gravity sewer at greater than ten percent below the minimum required slope per the Division's Gravity Sewer Minimum Design Criteria shall not be acceptable and shall not be certified until corrected.
- Condition 12: Regarding Division notification should the system fail to operate including the loss of wastewater from the collection system. In addition, note the requirement to post of pump stations with emergency contact information.

Wilmington Regional Office  
127 Cardinal Drive Extension Wilmington, NC 28405  
Phone: 910-796-7215 / FAX: 910-350-2004  
Internet: [www.ncwaterquality.org](http://www.ncwaterquality.org)

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Customer Service 1-877-623-6748

Sugarloaf Utility, Inc.  
 WQ0028890 Modification  
 February 6, 2009

Permitting of this project does not constitute an acceptance of any part of the project that does not meet 15A NCAC 2T; the Division of Water Quality's (Division) Gravity Sewer Minimum Design Criteria adopted February 12, 1996 as applicable; and the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains adopted June 1, 2000 as applicable, unless specifically mentioned herein. Division approval is based on acceptance of the certification provided by the North Carolina-licensed Professional Engineer named in the application.

It shall be Sugarloaf Utility, Inc.'s responsibility to ensure that the as-constructed project meets the appropriate design criteria and rules. Failure to comply may result in penalties in accordance with North Carolina General Statute §143-215.6A through §143-215.6C, construction of additional or replacement wastewater collection facilities, and/or referral of the North Carolina-licensed Professional Engineer to the licensing board.

A stormwater management plan shall be submitted to and approved by the Wilmington Regional Office in accordance with 15A NCAC 2H .1000.

If any parts, requirements, or limitations contained in this permit are unacceptable, you have the right to request an adjudicatory hearing upon written request within 30 days following receipt of this permit. This request must be in the form of a written petition, conforming to Chapter 150B of North Carolina General Statutes, and filed with the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, NC 27699-6714. Unless such demands are made, this permit shall be final and binding.

If you need additional information concerning this matter, please contact Lamont Allen at (910) 796-7215.

Sincerely,



for Coleen H. Sullins

Cc: Ronald D. Cullpher, Stroud Engineering  
 Katrina Winters, Carteret County Health Department  
 Town of Atlantic Beach Building Inspections Department  
 WIRO, Surface Water Protection -- Sugarloaf (WQ0004059) Sewer Ext. File  
 Central Files, Surface Water Protection Section  
 Pretreatment, Emergency Response and Collection Systems Unit Files

NORTH CAROLINA  
 ENVIRONMENTAL MANAGEMENT COMMISSION  
 DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES  
 DIVISION OF WATER QUALITY  
 RALEIGH  
 WASTEWATER COLLECTION SYSTEM EXTENSION PERMIT

In accordance with the provisions of Article 21 of Chapter 143, General Statutes of North Carolina as amended, other applicable Laws, Rules, and Regulations, and in conformity with 15A NCAC 2T; the Division's Gravity Sewer Minimum Design Criteria adopted February 12, 1996 and Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains adopted June 1, 2000 as applicable; and other supporting data subsequently filed and approved by the Department of Environment and Natural Resources and considered a part of this permit;

**PERMISSION IS HEREBY GRANTED TO:**

**SUGARLOAF UTILITY, INC.**

CARTERET COUNTY

For the continued operation of a pressure sewer collection system consisting of a 27 GPM pump station with duplex pumps, on-site audible and visual high water alarms a portable generator receptacle with telemetry and approximately 10 linear feet of 2-inch pressure sewer to serve a 34,520 square foot grocery store with meat market and deli/bakery in the Atlantic Station Food Lion Shopping Center, and the discharge of collected domestic/commercial wastewater into Sugarloaf Utility, Inc.'s existing sewerage system, pursuant to the application received May 25, 2005 and permit subsequently issued July 13, 2005, and subsequent additional information received by the Division, and in conformity with the project plans, specifications, and other supporting data subsequently filed and approved by the Department of Environment and Natural Resources and considered a part of this permit;

And the continued operation of a pressure sewer collection system consisting of ten (10) 25 GPM duplex grinder pump stations with high-water alarm and connection for emergency power; approximately 1,279 linear feet of 2-inch force main, 450 linear feet of 3-inch force main, 751 linear feet of 4-inch force main and 415 linear feet of 6-inch force main and emergency standby power to serve the Atlantic Station Shopping Center with the discharge of collected domestic/commercial wastewater into the Sugarloaf Utilities Wastewater Treatment Plant, pursuant to the application received September 9, 1985 and permit subsequently issued November 15, 1985 under Permit No. 12451 in conformity with the project plans, specifications and other supporting data subsequently filed and approved by the Department of Natural Resources and Community Development and considered a part of this permit.

In summary, this permit authorizes the connection of 100,514 square feet of general retail space (60 gpd/1000 sq ft per 2-18-1999 flow reduction), 1200 square feet of retail/food service (130 gpd/1000 sq ft), a 34,520 square foot grocery store (60 gpd/1000 sq ft + 720 gpd for deli/market), a 6-booth/chair salon, and a total of 592 restaurant seats (40 gpd/seat). The total permitted wastewater flow is 33,407 gallons per day (a slight reduction from original 33,414). I get 32,898

The sewage and wastewater collected by this system shall be treated in the Atlantic Station Wastewater Treatment Facility (Permit No. WQ0004059) prior to being land applied by rotary distribution.

Food lion Allocation is:  $(34520 \times \frac{60 \text{ gpd}}{1000 \text{ sq ft}}) + 720 = 2,791.2 \text{ gal/day}$   
 Food lion is peak month of July used  $32100 \text{ gal} / 32 \text{ days} = 1003.13$

33,407  
34,520

This permit shall be effective from the date of issuance until rescinded and shall be subject to the following specified conditions and limitations:

1. This permit shall become voidable unless the wastewater collection facilities are constructed in accordance with the conditions of this permit; 15A NCAC 2T; the Division of Water Quality's (Division) Gravity Sewer Minimum Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains adopted June 1, 2000 as applicable; and other supporting materials unless specifically mentioned herein.
2. This permit is effective only with respect to the nature and volume of wastes described in the application and other supporting data.
3. The wastewater collection facilities shall be properly maintained and operated at all times. The Permittee shall maintain compliance with an individual system-wide collection system permit for the operation and maintenance of these facilities as required by 15A NCAC 2T .0403. If an individual permit is not required, the following performance criteria shall be met as provided in 15A NCAC 2T .0403:
  - a. The sewer system shall be effectively maintained and operated at all times to prevent discharge to land or surface waters, and any contravention of the groundwater standards in 15A NCAC 2L .0200 or the surface water standards in 15A NCAC 2B .0200.
  - b. A map of the sewer system shall be developed and shall be actively maintained.
  - c. An operation and maintenance plan including pump station inspection frequency, preventative maintenance schedule, spare parts inventory, and overflow response shall be developed and implemented.
  - d. Pump stations that are not connected to a telemetry system (i.e. remote alarm system) shall be inspected by the Permittee or its representative every day (i.e. 365 days per year). Pump stations that are connected to a telemetry system shall be inspected at least once per week.
  - e. High-priority sewer lines shall be inspected by the Permittee or its representative at least once per every six-month period of time.
  - f. A general observation of the entire sewer system shall be conducted by the Permittee or its representative at least once per year.
  - g. Overflows and bypasses shall be reported to the appropriate Division regional office in accordance with 15A NCAC 2B .0506(a), and public notice shall be provided as required by North Carolina General Statute §143-215.1C.
  - h. A Grease Control Plan shall be implemented as follows:
    1. For publicly owned collection systems, the Program shall include at least bi-annual distribution of educational materials for both commercial and residential users and the legal means to require grease interceptors for new construction and retrofit, if necessary, of grease interceptors at existing establishments. The Program shall also include legal means for inspections of the grease interceptors, enforcement for violators, and the legal means to control grease entering the system from other public or private satellite sewer systems.
    2. For privately owned collection systems, the Program shall include at least bi-annual distribution of educational materials to all users of the collection system by the Permittee or its representative.
    3. Grease education materials shall be distributed more often than required in Parts 1 or 2 of this sub-paragraph if necessary to prevent grease-related sanitary sewer overflows.
  - i. Right-of-ways and easements shall be maintained in the full easement width for personnel and equipment accessibility.
  - j. Documentation shall be kept on file for Sections (a.) through (i.) of this rule for a minimum of three (3) years with the exception of the map, which shall be maintained for the life of the system.

4. **This permit shall not be transferable.** In the event there is a desire for the facilities to change ownership, or there is a name change of the Permittee, a formal permit request must be submitted to the Division of Water Quality (Division) accompanied by documentation from the parties involved and other supporting materials as may be appropriate. The approval of this request will be considered on its merits and may or may not be approved.
5. Construction of the sewers, pump station(s) and force main shall be scheduled so as not to interrupt service by the existing utilities nor result in an overflow or bypass discharge of wastewater to the surface waters of the State.
6. Per 15A NCAC 2T .0116, upon completion of construction and **prior to operation** of these permitted facilities, the completed Engineering Certification form attached to this permit shall be submitted with the required supporting documents (as-built or recording drawings and pump station designs, if applicable) to the address provided on the form. A complete certification is one where the form is fully executed and the supporting documents are provided as applicable. Any wastewater flow made tributary to the wastewater collection system extension prior to completion of this Engineer's Certification shall be considered a violation of the permit and shall subject the Permittee to appropriate enforcement actions.

A complete certification is one where the form is fully executed and the supporting documents are provided as applicable. Supporting documentation shall include the following:

- a. One copy of the project construction record drawings (plan & profile views of sewer lines & force mains) of the wastewater collection system extension. Record drawings are defined as the design drawings that are marked up or annotated with after construction information and show required buffers, separation distances, material changes, etc.
- b. One copy of the supporting pump station design calculations (selected pumps, system curve, operating point, buoyancy calculations, available storage if portable generator(s) or storage greater than longest past three year outage reliability option selected) for any pump stations permitted as part of this project.
- c. Changes to the project that do not result in non-compliance with this permit, regulations, or the Minimum Design Criteria should be clearly identified on the record drawings, on the certification in the space provided, or in written summary form.

**Prior to Certification** (Final or Partial): Permit modifications are required for any changes resulting in non-compliance with this permit (including pipe length increases of 10% or greater, increased flow, pump station design capacity design increases of 5% or greater, and increases in the number/type of connections), regulations, or the Minimum Design Criteria. Requested modifications or variances to the Minimum Design Criteria will be reviewed on a case-by-case basis and each on its own merit. Please note that variances to the Minimum Design Criteria should be requested and approved during the permitting process prior to construction. After-construction requests are discouraged by the Division and may not be approved, thus requiring replacement or repair prior to certification & activation.

7. A copy of the approved plans & specifications and construction record drawings & pump station designs, if applicable, shall be maintained on file by the Permittee for the life of the wastewater collection facilities.
8. Failure to abide by the conditions and limitations contained in this permit; 15A NCAC 2T; the Division's Gravity Sewer Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Station and Force Mains adopted June 1, 2000 as applicable; and other supporting materials may subject the Permittee to an enforcement action by the Division, in accordance with North Carolina General Statutes §143-215.6A through §143-215.6C.

9. The issuance of this permit does not exempt the Permittee from complying with any and all statutes, rules, regulations, or ordinances that may be imposed by other government agencies (i.e., local, state, and federal) having jurisdiction, including but not limited to applicable river buffer rules in 15A NCAC 2B .0200, soil erosion and sedimentation control requirements in 15A NCAC Chapter 4 and under the Division's General Permit NCG010000, and any requirements pertaining to wetlands under 15A NCAC 2B .0200 and 15A NCAC 2H .0500.
10. The Permittee shall provide the following items for the pressure sewer system:
- a. Pump on/off elevations located so that 2-8 pumping cycles may be achieved per hour in any centralized pump station serving more than one building.
  - b. An air relief valve located at all high points along the force main.
  - c. A screened vent for the wet well.
  - d. Fillets located in the wet well(s) at the intersection of the flooring and side walls.
  - e. Three feet of cover (minimum) over the force main or the use of ferrous material where three feet cannot be maintained.
  - f. Sufficient devices which will protect the pump station from vandals.
  - g. Flood protection if the pump station is located below the 100-year flood elevation.
  - h. Grease traps in the influent lines to the pump stations as specified in the design plans.
  - i. Adherence with the following minimum separations:
    - (i) Storm sewers (vertical) 12 inches
    - (ii) Water mains (vertical-water over sewer) 18 inches or (horizontal) 10 feet
    - (iii) In benched trenches (vertical) 18 inches
    - (iv) Any private or public water supply source, including any WS-I waters or Class I or Class II impounded reservoirs used as a source of drinking water 100 feet
    - (v) Waters classified WS (other than WS-I), B, SA, ORW, HQW, or SB [from normal high water (or tide elevation)] 50 feet
    - (vi) Any other stream, lake or impoundment 10 feet
    - (vii) Any building foundation 5 feet
    - (viii) Any basement 10 feet
    - (ix) Top slope of embankment or cuts of 2 feet or more vertical height 10 feet
    - (x) Drainage systems
      - (i) Interceptor drains 5 feet
      - (ii) Ground water lowering and surface drainage ditches 10 feet
    - (xi) Any swimming pool 10 feet
    - (xii) Ferrous sewer pipe with joints equivalent to water main standards, shall be used where these minimum separations cannot be maintained. The minimum separation shall however not be less than 25 feet from a private well or 50 feet from a public water supply well;
11. In the event that the facilities fail to perform satisfactorily, including the creation of nuisance conditions, the Permittee shall take immediate corrective action, including those that may be required by this Division, such as the construction of additional or replacement wastewater collection facilities.

12. **Noncompliance Notification:**

The Permittee shall verbally report to a Division of Water Quality staff member at the Wilmington Regional Office, telephone number (910) 796-7215, as soon as possible, but in no case more than 24 hours or on the next working day, following the occurrence or first knowledge of the occurrence of either of the following:

- a. Any failure, due to known or unknown reasons, that renders the system incapable of adequate wastewater transport, such as mechanical or electrical failures of pumps, line blockage or breakage, etc.; or
- b. Any failure of a pumping station or sewer line resulting in a by-pass of any wastewater directly to receiving waters from the station or sewer line.

Voice mail messages or faxed information is permissible, but shall NOT be considered as the initial verbal report. Overflows and spills occurring outside normal business hours may also be reported to the Division of Emergency Management at telephone number (800) 858-0368 or (919) 733-3300. Persons reporting any of the above occurrences shall file a spill report by completing Part I of Form CS-SSO (or the most current Division approved form), within five days following first knowledge of the occurrence. This report shall outline the actions taken or proposed to ensure that the problem does not recur. Part II of Form CS-SSO (or the most current Division approved form) can also be completed to show that the SSO was beyond control.

Each pump station shall be clearly and conspicuously posted with the telephone number of the owner/operator of the pressure sewer system and instructions to call the number in the event of high water alarm activation.

**Permit issued this day:                      February 6, 2009**

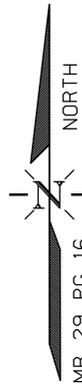
NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION

  
for Coleen H. Sullins, Director  
Division of Water Quality  
By Authority of the Environmental Management Commission

**Permit Number WQ0028890 Modification**



# EXHIBIT B



MB 29 PG 16

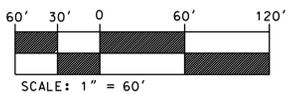
OCEAN RIDGE II PHASE 2  
M.B. 29 PG. 16



REVISIONS:

No.	BY	DATE	DESCRIPTION

NOTE:  
THIS SURVEY IS OF AN  
EXISTING PARCELS OF LAND.



SKETCH PLAN

## PARK PLACE

ATLANTIC BEACH, CARTERET COUNTY, NORTH CAROLINA

CLIENT: SUGARLOAF UTILITIES	DESIGNED: RDC
ADDRESS:	DRAWN: RDC
	APPROVED: RDC
<b>STROUD ENGINEERING, P.A.</b> 151A HIGHWAY 24 MOREHEAD CITY, N.C. 28557 (919) 247-7479	
	DATE: 3/10/14
	SCALE: 1" = 60'

preliminary not for construction

# EXHIBIT C

---

**EDWIN ANDREWS & ASSOCIATES, P.C.**

CONSULTING HYDROGEOLOGY AND SOIL SCIENCE

P.O. BOX 30653

RALEIGH, N.C. 27622 - 0653

PHONE: (919) 851 - 7844

FAX: (919) 851 - 6058

June 2, 2015

Sugarloaf Utilities Inc.  
C/O: Mr. Gary K. Joyner  
4208 Six Forks Road, Suite 1400  
Raleigh, NC 27609

Re: Preliminary Letter Report for Permit Variance at Sugarloaf WWTP Site  
Atlantic Beach, NC, Proj. INF 0115

Dear Mr. Joyner:

This preliminary evaluation for Sugarloaf Utilities, Inc., Atlantic Beach, North Carolina, addresses a proposed reconfiguration of the existing wastewater rotary distributor system to updated standards. This site was originally permitted complying with 15A NCAC 2H .0200 using two rotary distributors. The proposed update will be to remove the two rotary distributors and replace with a single rectangular high rate infiltration basin complying with 15A NCAC 2T .0706. The loading rate of 10 gallons per day per square foot will be retained and the permitted capacity will remain at 100,000 gallons per day.

Two significant changes will be made with this reconfiguration. First will be the addition of a 100% repair area contiguous to the rectangular high rate infiltration basin area. The second will be to improve the wastewater treatment, by adding nitrogen and phosphorous reduction, resulting in a total nitrogen of 7 milligrams per liter and a Phosphorous of 3 milligrams per liter.

We have completed the first stage of analysis for reconfiguration from the two existing rotary distributors to a proposed single rectangular 10,000 square foot infiltration basin designed to accommodate 100,000 gallons per day at the Sugarloaf Waste Water Treatment Plant. This stage included test well drilling; piezometer construction; a potentiometric map of the water table aquifer; and testing to determine hydraulic conductivity of the surficial aquifer for support of a potential variance request.

The data collected in the field was applied to a new calibration model (2015 data). From this calibration a transient state model was configured to simulate the proposed changes due to the upgraded treatment and reconfigured high rate infiltration basin. The transient state model simulated an additional 360 days of loading using the two rotary distributors with existing treatment technology (estimated at 15 milligrams per liter - total nitrogen). After 360 days, the simulation adjusts to the new rectangular basin with total nitrogen reduction to 7 milligrams per liter. The purpose of this modeling approach is to determine if the change of disposal and treatment would improve water quality on the site.

## Field Results:

The test well construction confirmed the presence of very well sorted fine to medium sand typical of a regressive beach ridge complex (Table 1, Soil Boring Profiles)(Figure 1, Site Map). The mud rotary drilling of the pumping well extended to a depth of 50 feet below land surface (Table 2, Lithology Log). Previously, test borings were completed by Geotechnologies, Inc. (October 10, 2006 Report third table). Borings 5A, 10, 11, 12, 13, and 14 were located on the Sugarloaf WWTP site and the others were on the adjacent shopping center site. All of the borings confirmed the presence of the surficial aquifer characterized by regressive beach ridge sequence deposits (sand).

Nine Piezometers were constructed in the hand soil boring holes in order to develop a water table contour map, depth to water map and to be used for calibration of computer modeling (Table 40, Water Level Data). The piezometers, and associated ground surface were surveyed by Stroud Engineering, PA for Location (State Plane NAD 83 feet), top of pipe elevation (NAD88 feet mean sea level) and ground (NAD88 feet mean sea level). From this the water level data was calculated (Table 4, Water Level Data).

A pumping well and an observation well were installed and developed to determine that the Transmissivity of the Surficial Aquifer in the sand matrix was 2,380 square feet per day, with a calculated hydraulic conductivity of 47.7 feet per day for a fifty foot thick aquifer (Table 5, Aquifer Test Results).

Using the aquifer test results and the ground water elevations a computer simulation (Visual MODFLOW™) was built using a one layer conceptual model for the regressive beach ridge sediments. The model was initially built using a hydraulic conductivity of 47.7 feet per day. With minor adjustments of hydraulic conductivity the model was refined and calibrated to the surveyed ground water elevations to a normalized root mean squared error of 5.398% with a residual mean of 0.002 feet by adjusting hydraulic conductivity from 35 to 48 feet per day (Figures 5A through 5F, Calibration and Sensitivity Analysis).

## MODFLOW Simulation:

After calibration of the steady state MODFLOW simulation, a loading model was compiled for a transient state loading analysis of 10 gallons per day per square foot. The first 360 days simulated the two rotary distributors with 15 milligrams per liter of nitrogen. After 360 days the two rotary distributors were abandoned in the model and the flow was reallocated to a single rectangular basin with a total nitrogen of 7 milligrams per liter.

Figure 6A displays the maximum water levels during the first 360 days at Basin A (north rotary distributor). The water level was approximately 7.2 feet above mean sea level (Figures 6A, Time vs Water Level at the Rotary Sites, and 6B, Water level Map at 330 days). Figure 6C displays the maximum water levels from 360 days to 20 years at the new high rate disposal basin. The water level was approximately 6.9 feet above mean sea level at the center of the new high rate infiltration basin (Figures 6C, Time vs Water Level at the High Rate Infiltration Basin Site, and 6D, Water level Map at 390 days). The maximum water level at the two rotary distributor sites lowered from 7.2 feet above mean sea level to approximately 5.3 feet above mean sea level.

The mounding due to hydraulic loading at the rotary distributors was more than 4.8 feet at 210 days (Figure 7A, Time vs Mounding from 0 to 360 days). The model for the period from 360 days to 20 years showed a mound height of 4.2 feet at 2,724 days, at the High Rate Infiltration Basin Site (Figure 7B, Time vs Mounding).

Basically, reconfiguration from the two rotary distributors to one high rate infiltration basin did not reveal significant change of water levels. It appears that the reconfiguration to the single basin should function in a manner similar to the two existing rotary distributors. The advantage of the new configuration of the one basin, is that 100% repair area is proposed contiguous to the high rate infiltration basin.

A Nitrogen model was completed using USGS solute transport model MT3D. The model was intended to compare the effects of nitrogen from the two loading alternatives. The old loading was simulated from 0 to 360 days. This model showed that the change of the basin configuration did not have as much influence on the nitrogen plume as the improvement of treatment to include more nitrogen reduction. The water quality improved quickly with the improved treatment.

The nitrogen changed from more than 15 milligrams during the first 360 days, using the two rotary distributors, then drops to less than 7 milligrams per liter for the reconfiguration to the area containing the proposed high rate infiltration basin (Figure 8A and 8B, Time vs Nitrogen Concentration).

Conclusion:

This analysis shows that two major advantages will be realized by converting from the two rotary distributors to a single high rate infiltration basin with an adjacent repair area:

1. Nitrogen potential will become greatly reduced quickly due to the high transmissivity resulting in environmental improvement.
2. The availability of the repair area, while it has not been needed in the past, will provide assurance that the site operation will be sustainable.

The addition of the dedicated 100% repair area will eliminate the need for the old concept of "Green Area."

This evaluation will be converted to a full report supporting final design after NCDWR approves the recommended variance or provides for the appropriate plan to proceed.

If you have any questions please contact me on my cell at 919 -306-3069..

Very truly yours,  
Edwin Andrews & Associates, P.C.



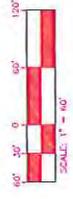
Edwin E. Andrews III, P.G., N.C.L.S.S.  
Consulting Hydrogeologist and Soil Scientist  
encl.



Map surveyed and originally mapped by Stroud Engineering, PA



N.C. HWY 58  
90' PUBLIC R/W

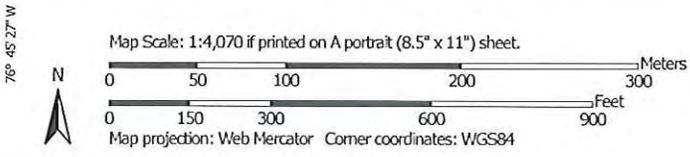


**Figure 1**  
**Scale: 1" = 200'**  
**EAA Proj. HRI 0115**

**Edwin Andrews & Associates, P.C.**  
**Consulting Hydrogeology and Soil Science**

**Sugarloaf WWTP**  
**Site Map**

Soil Map—Carteret County, North Carolina  
(Figure 2, NRCS Soil Survey Map)



Sugarloaf WWTPTable 1 - Soil Profile Descriptions

## P 1

0-3 inches; Very dark grayish brown (10YR 3/2) sand.  
 3-16 inches; Dark grayish brown (10YR 4/2) sand.  
 16-38 inches; Brownish yellow (10YR 6/6) loamy sand sub angular blocky.  
 38-66 inches; Light brownish gray (10 YR 6/2) fine sand.

Soil Series: Duckston fine sand Landscape: Coastal Plain  
 Landform: Barrier Island, Beach Ridge, Interdune  
 Parent Material: Marine sediments Drainage Class: Poorly drained  
 Particle Size Class: Sandy Temperature Regime: thermic  
 Subgroup Classification: Typic quartzipsamment Slope: 0-2%  
 Examination Method: auger boring Date: March 24, 2015  
 Weather: Sunny Investigator: Edwin Andrews

## P-2

0-12 inches; Very dark grayish brown (10YR 3/2) sand.  
 12-16 inches; Dark grayish brown (10YR 4/2) sand.  
 16-84 inches; Brownish yellow (10YR 6/6) fine sand loose.

Soil Series: Duckston fine sand Landscape: Coastal Plain  
 Landform: Barrier Island, Beach Ridge, Interdune  
 Parent Material: Marine sediments Drainage Class: Poorly drained  
 Particle Size Class: Sandy Temperature Regime: thermic  
 Subgroup Classification: Typic quartzipsamment Slope: 0-2%  
 Examination Method: auger boring Date: March 24, 2015  
 Weather: Sunny Investigator: Edwin Andrews

## P-3

0-8 inches; Very dark grayish brown (10YR 3/2) sand.  
 8-16 inches; Dark grayish brown (10YR 4/2) sand.  
 16-42 inches; Brownish yellow (10YR 6/6) loamy sand sub angular blocky.

Soil Series: Duckston fine sand Landscape: Coastal Plain  
 Landform: Barrier Island, Beach Ridge, Interdune  
 Parent Material: Marine sediments Drainage Class: Poorly drained  
 Particle Size Class: Sandy Temperature Regime: thermic  
 Subgroup Classification: Typic quartzipsamment Slope: 0-2%  
 Examination Method: auger boring Date: March 24, 2015  
 Weather: Sunny Investigator: Edwin Andrews

Sugarloaf WWTPTable 1 - Soil Profile Descriptions

P 4

- 0-7 inches; Light yellowish brown (2.5Y 6/4) loamy sand subangular blocky.
- 7-16 inches; Light brownish gray (10YR 6/2) sand loose.
- 16-26 inches; Light yellowish brown (10.5Y 6/4) sandy loam subangular blocky.
- 26-82 inches; Grayish brown (10YR 5/2) fine sand.

Soil Series: Newhan/Urban Complex      Landscape: Coastal Plain  
 Landform: Barrier Island, Beach Ridge, Interdune  
 Parent Material: Marine sediments    Drainage Class: Excessively well drained  
 Particle Size Class: Sandy    Temperature Regime: thermic  
 Subgroup Classification: Typic quartzipsamment    Slope: 0-2%  
 Examination Method: auger boring    Date: March 24, 2015  
 Weather: Sunny      Investigator: Edwin Andrews

P 5

- 0-5 inches; Grayish brown (10YR 5/2) fine sand.
- 2-31 inches; Light gray (10YR 7/2) sand, with few medium distinct reddish brown (5YR 4/4) mottles.
- 31-34 inches; Light brownish gray (10YR 6/2) sand.
- 34-39 inches; Dark grayish brown (10YR 4/2) sand; few fine gray (10YR 5/) mottles.
- 39-46 inches; Grayish brown (5 Y 5/1) fine sand. (Caving below 40 inches)

Soil Series: Newhan/Urban Complex      Landscape: Coastal Plain  
 Landform: Barrier Island, Beach Ridge, Interdune  
 Parent Material: Marine sediments    Drainage Class: Excessively well drained  
 Particle Size Class: Sandy    Temperature Regime: thermic  
 Subgroup Classification: Typic quartzipsamment    Slope: 0-2%  
 Examination Method: auger boring    Date: March 24, 2015  
 Weather: Sunny      Investigator: Edwin Andrews

P 6

- 0-12 inches; Very dark grayish brown (10YR 3/2) sand.
- 12-16 inches; Dark grayish brown (10YR 4/2) sand.
- 16-84 inches; Brownish yellow (10YR 6/6) loamy sand subangular blocky.

Soil Series: Corolla fine sand      Landscape: Coastal Plain  
 Landform: Barrier Island, Beach Ridge, Interdune  
 Parent Material: Marine sediments    Drainage Class: Poorly drained  
 Particle Size Class: Sandy    Temperature Regime: thermic  
 Subgroup Classification: Typic quartzipsamment    Slope: 0-2%  
 Examination Method: auger boring    Date: March 24, 2015  
 Weather: Sunny      Investigator: Edwin Andrews

Sugarloaf WWTPTable 1 - Soil Profile Descriptions**P 7**

0-14 inches; Grayish brown (10YR 5/2) fine sand loose.  
 14-26 inches; Yellowish brown(10YR 5/4) fine sand loose.  
 26-61 inches; Light brownish gray (10YR 6/4) fine sand loose.  
 61-108 inches; Pale brown (10YR 6/3) fine sand loose.

Soil Series: Newhan/Urban Complex Landscape: Coastal Plain  
 Landform: Barrier Island, Beach Ridge, Interdune  
 Parent Material: Marine sediments Drainage Class: Excessively well drained  
 Particle Size Class: Sandy Temperature Regime: thermic  
 Subgroup Classification: Typic quartzipsamment Slope: 2-6%  
 Examination Method: auger boring Date: March 24, 2015  
 Weather: Sunny Investigator: Edwin Andrews

**P 8**

0-24 inches; Grayish brown (10YR 5/2) fine sand loose.  
 25-40 inches; Yellowish brown(10YR 5/4) fine sand loose.  
 40-66 inches; Light brownish gray (10YR 6/4) fine sand loose.  
 66-121 inches; Pale brown (10YR 6/3) fine sand loose.

Soil Series: Duneland Complex Landscape: Coastal Plain  
 Landform: Barrier Island, Beach Ridge, Interdune  
 Parent Material: Marine sediments Drainage Class: Excessively well drained  
 Particle Size Class: Sandy Temperature Regime: thermic  
 Subgroup Classification: Typic quartzipsamment Slope: 6-20%  
 Examination Method: auger boring Date: March 24, 2015  
 Weather: Sunny Investigator: Edwin Andrews

**P 89**

0-24 inches; Grayish brown (10YR 5/2) fine sand loose.  
 25-40 inches; Yellowish brown(10YR 5/4) fine sand loose.  
 40-66 inches; Light brownish gray (10YR 6/4) fine sand loose.  
 66-121 inches; Pale brown (10YR 6/3) fine sand loose.

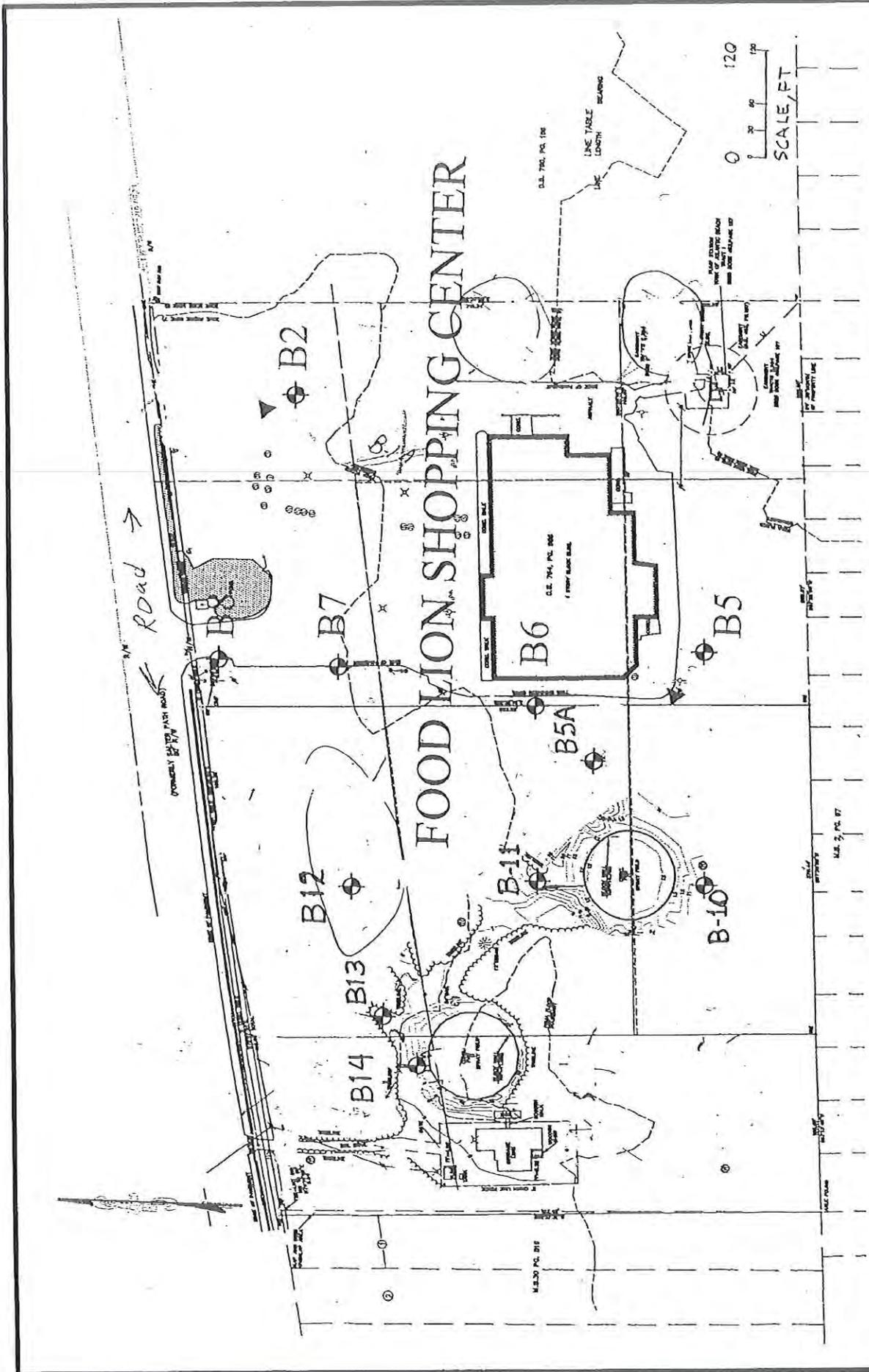
Soil Series: Duneland Complex Landscape: Coastal Plain  
 Landform: Barrier Island, Beach Ridge, Interdune  
 Parent Material: Marine sediments Drainage Class: Excessively well drained  
 Particle Size Class: Sandy Temperature Regime: thermic  
 Subgroup Classification: Typic quartzipsamment Slope: 6-20%  
 Examination Method: auger boring Date: March 24, 2015  
 Weather: Sunny Investigator: Edwin Andrews

**TABLE NO. 2  
LITHOLOGY LOG**

**PW (Basin Site)**

<b>0-5 ft.</b>	<b>Brown fine to medium well sorted sand</b>
<b>5-10 ft.</b>	<b>Gray fine to medium well sorted sand</b>
<b>10-15 ft.</b>	<b>Gray fine to medium well sorted sand</b>
<b>15-20 ft.</b>	<b>Gray fine to medium well sorted sand</b>
<b>20 - 50 ft.</b>	<b>Gray fine to medium well sorted sand with shell fragments</b>

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SCALE: As Shown

JOB No: 1-06-1344-EA

FIGURE No: 1

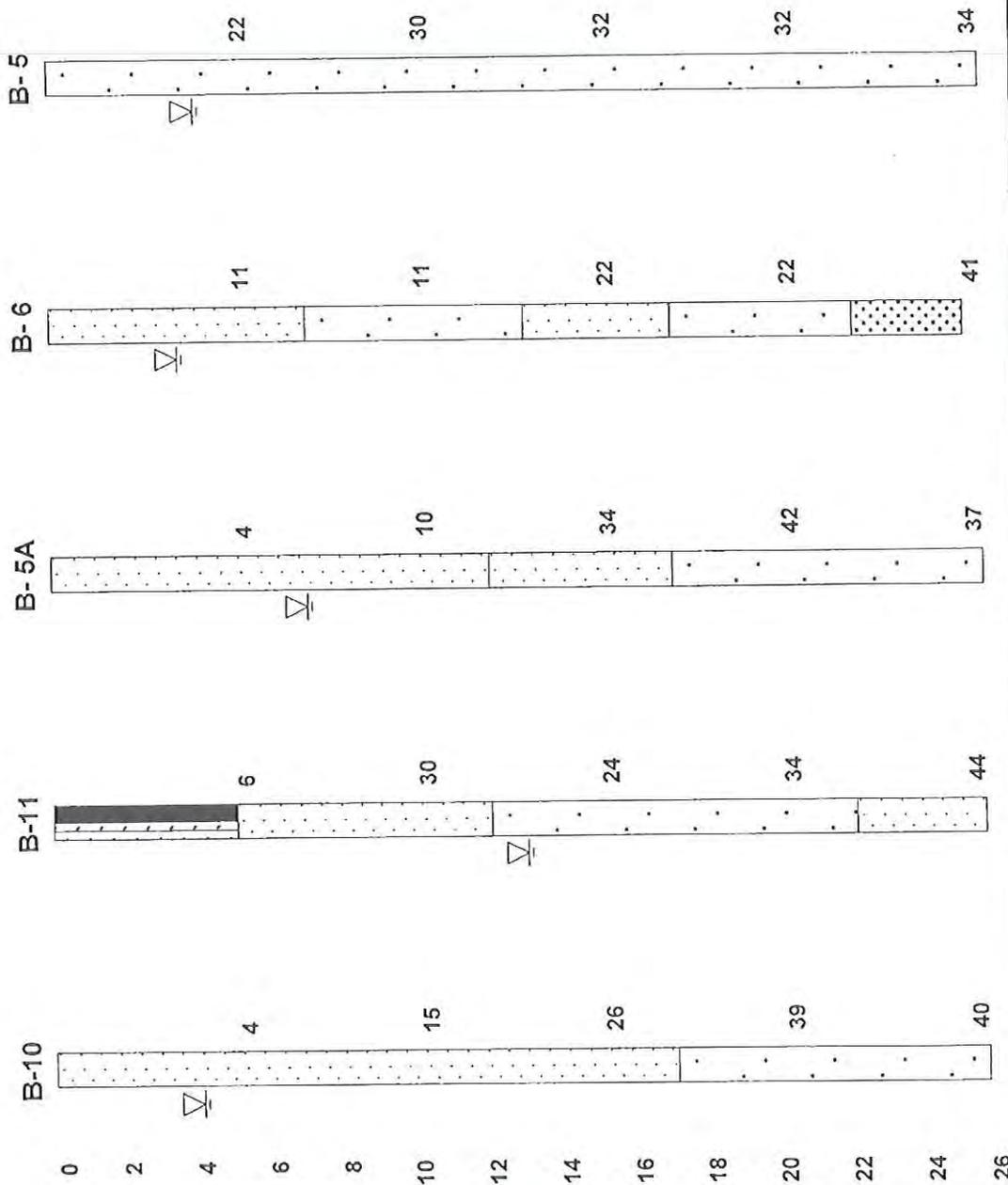
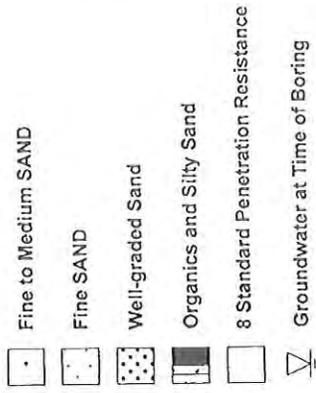


PROJECT:

Boring Location Plan  
 Atlantic Beach WWTP  
 Atlantic Beach, North Carolina

# GENERALIZED SUBSURFACE PROFILE

Depth (Feet)



SCALE: As Shown

JOB No:1-06-1344-EA

FIGURE No:2

**PROJECT:**

Southern Half  
Atlantic Beach WWTP  
Atlantic Beach, NC

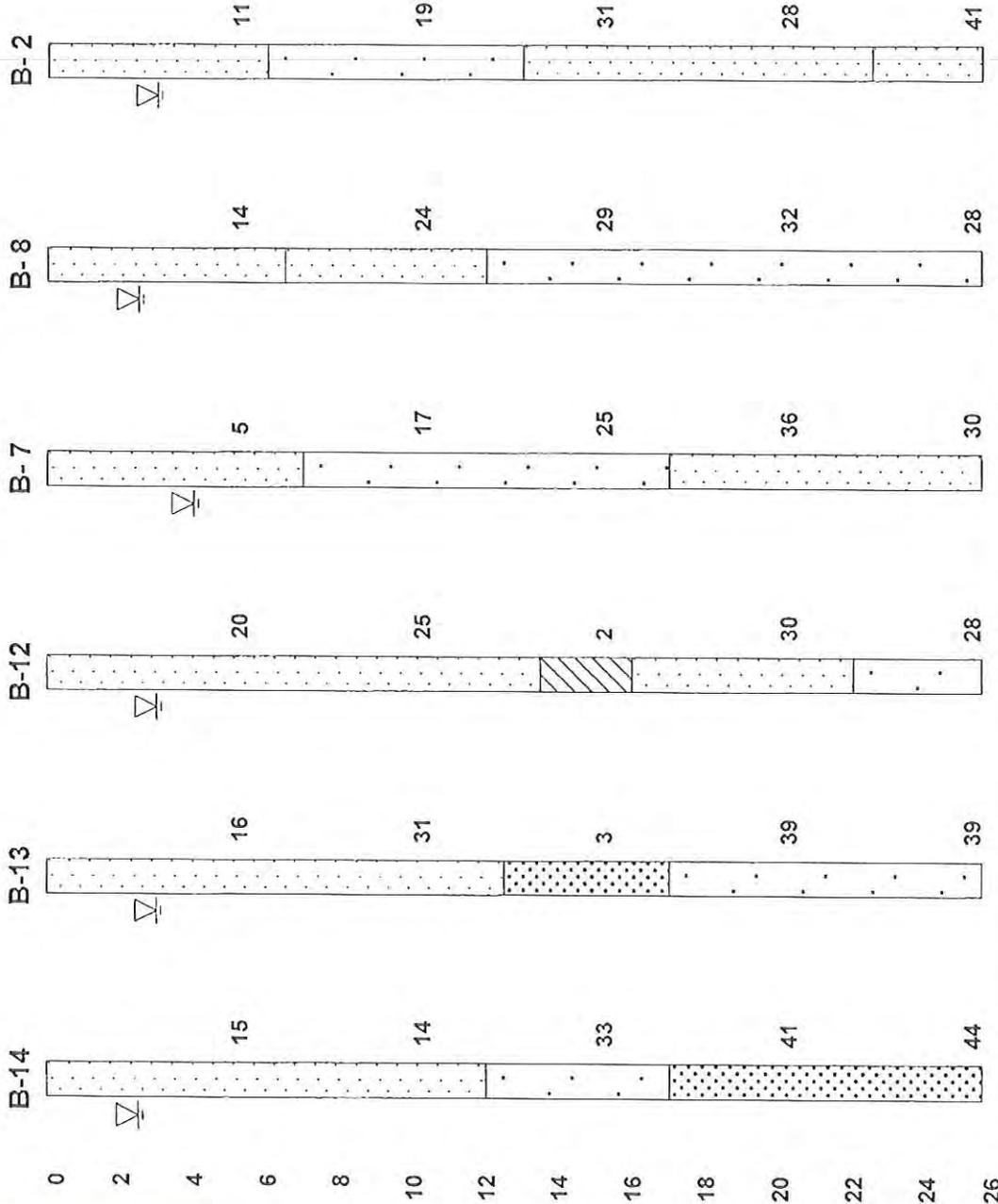


# GENERALIZED SUBSURFACE PROFILE

Depth (Feet)

## LEGEND

-  Fine SAND
-  Fine to Medium SAND
-  Low Plasticity Clay
-  Well-graded Sand
-  8 Standard Penetration Resistance
-  Groundwater at Time of Boring



SCALE: As Shown

JOB No:1-06-1344-EA

FIGURE No:3



PROJECT:

Northern Half  
Atlantic Beach WWTP  
Atlantic Beach, NC

**Sugarloaf WWTP**  
**Table 4, Water Level Data**

East State Plane NAD 83 Ft.	North State Plane NAD 83 Ft.	Water		Piezometer	Pipe		Ground		Measured Water Depth Feet
		Elevation Ft. M.S.L.	Thickness Feet		Elevation Ft. M.S.L.	Elevation Ft. M.S.L.	Elevation Ft. M.S.L.		
2675095	353521	1.79	1.91	P1	5.9	3.7		4.11	
2675401	353600	1.87	1.13	P2	5.3	3		3.43	
2675349	353477	2.09	2.11	P3	5.9	4.2		3.81	
2675269	353438	2.12	3.38	P4	7.6	5.5		5.48	
2675233	353409	2.14	4.86	P5	7.8	7		5.66	
2675454	353419	2.26	0.14	P6	4.3	2.4		2.04	
2675347	353255	2.48	2.52	P7	6.6	5		4.12	
2675405	353104	2.48	8.22	P8	12.1	10.7		9.62	
2675557	353222	2.62	8.68	P9	12.7	11.3		10.08	
2675310	353355	2.46	2.54	OW	6.6	5		4.14	

Edwin Andrews & Assoc. PC  
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Raleigh, N.C. 27622

Pumping test analysis  
NEUMAN's method  
Unconfined aquifer with  
delayed water table response

Date: 27.05.2015

Table 5, Page 1

Project: Sugarloaf WWTP

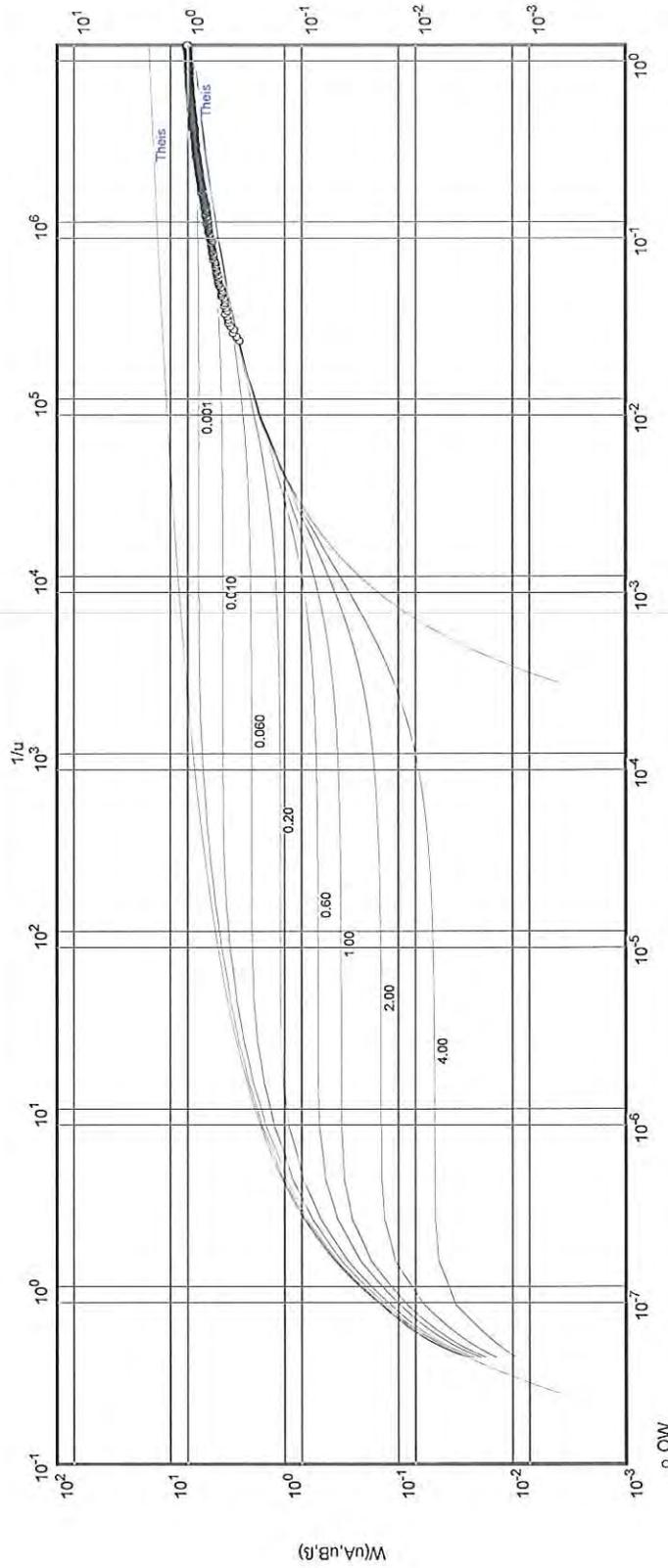
Evaluated by: eea

Pumping Test No. 1

Test conducted on: 3/25/2015

OW

Discharge 22.00 U.S.gal/min



Transmissivity [ft<sup>2</sup>/d]:  $2.38 \times 10^3$

Hydraulic conductivity [ft/d]:  $4.77 \times 10^1$

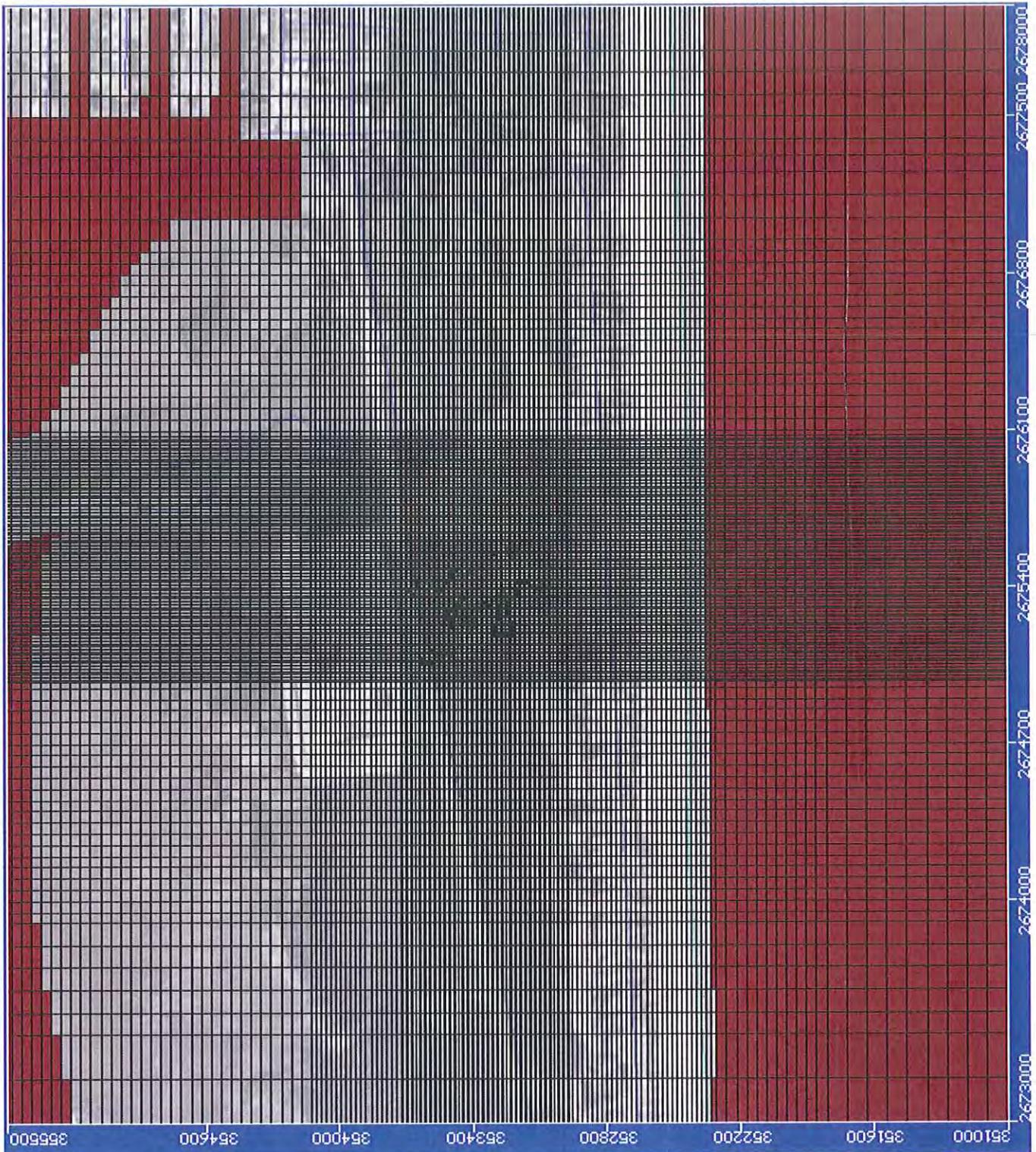
Aquifer thickness [ft]: 50.00

Storage:  $3.63 \times 10^{-6}$

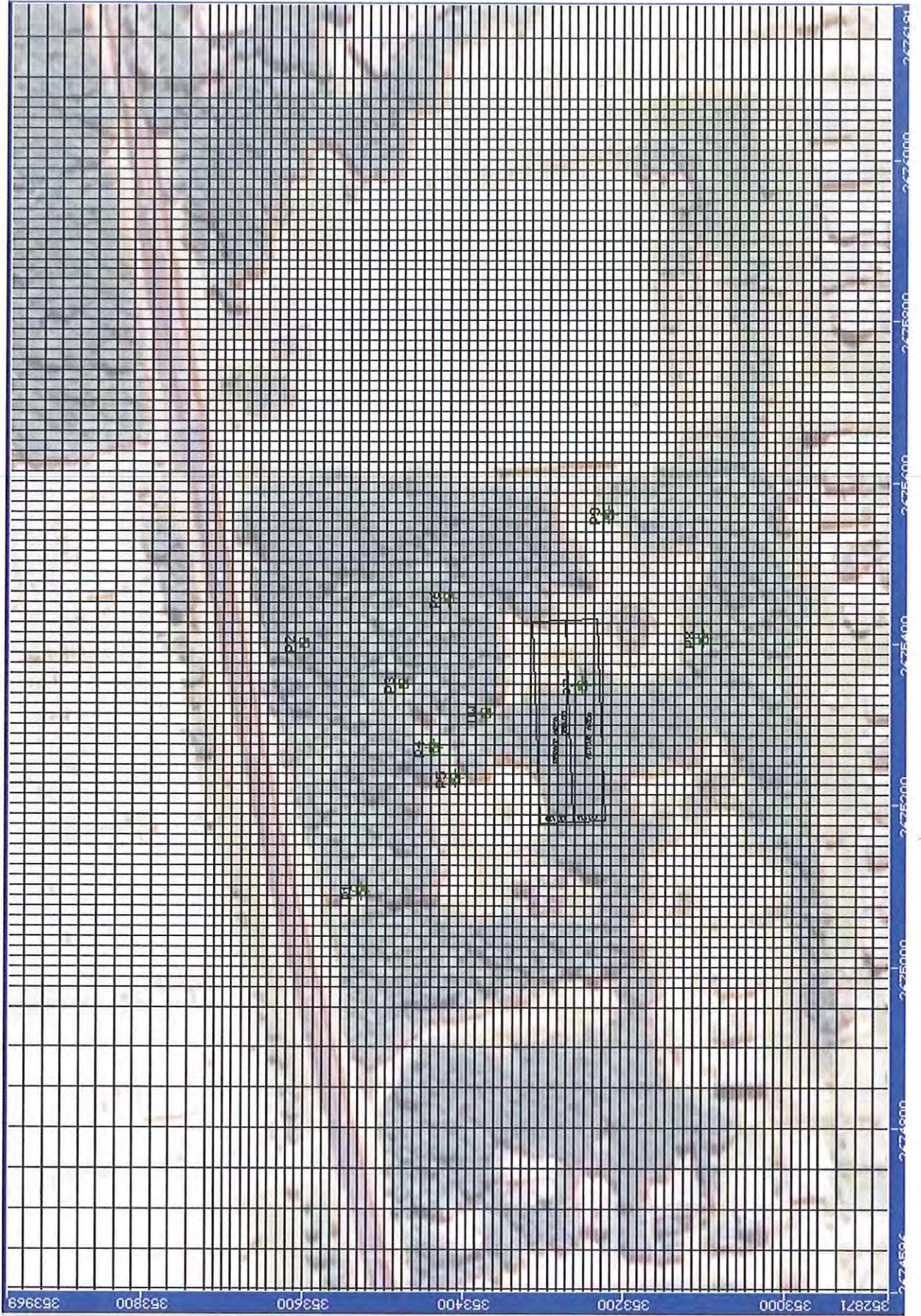
Hydraulic conductivity vertical [ft/d]:  $2.20 \times 10^1$

Specific yield:  $3.63 \times 10^{-2}$

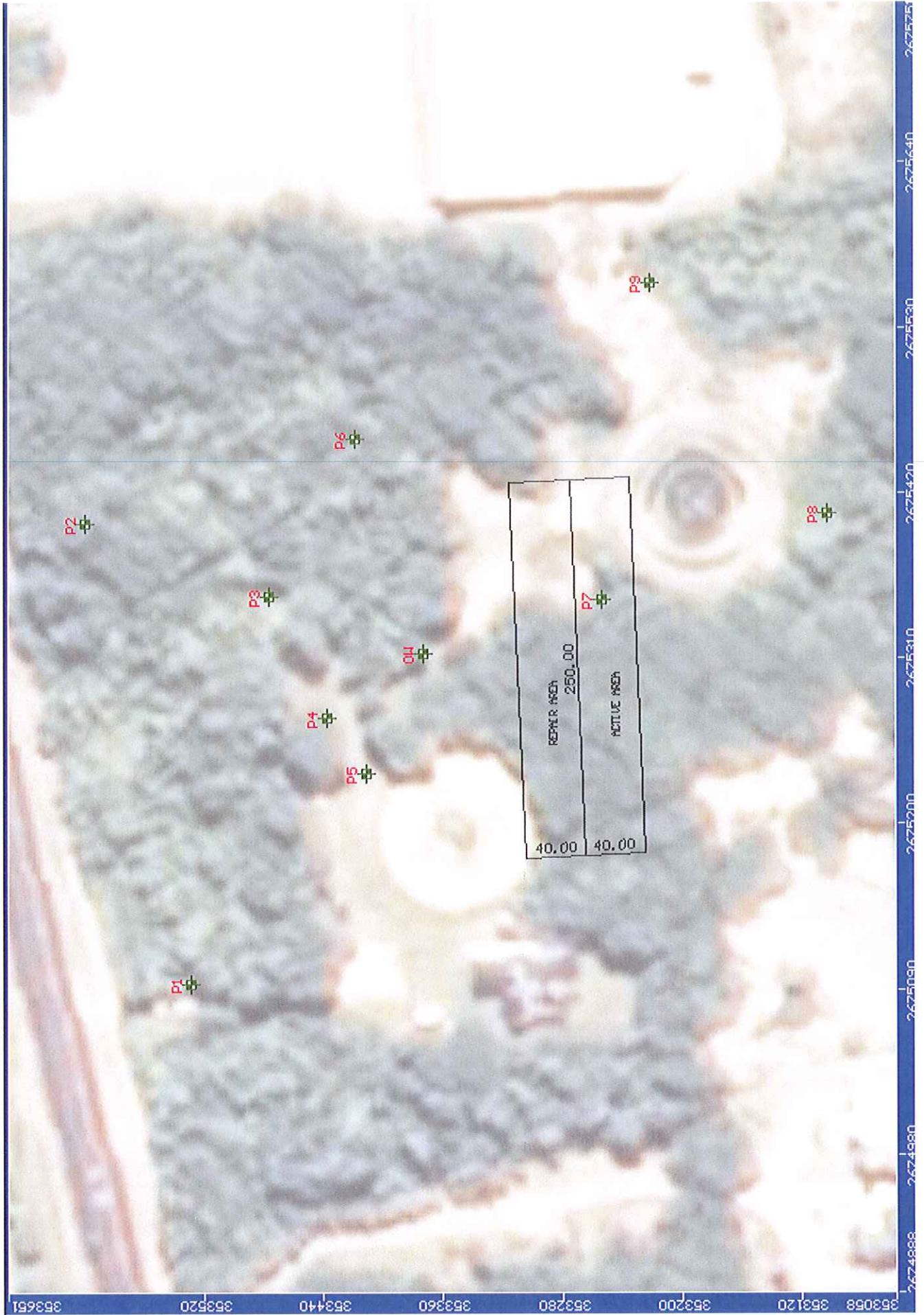
# Sugarloaf WWTP Site Figure 5A, Model Grid



# Sugarloaf WWTP Site Figure 5B, Model Grid at Site

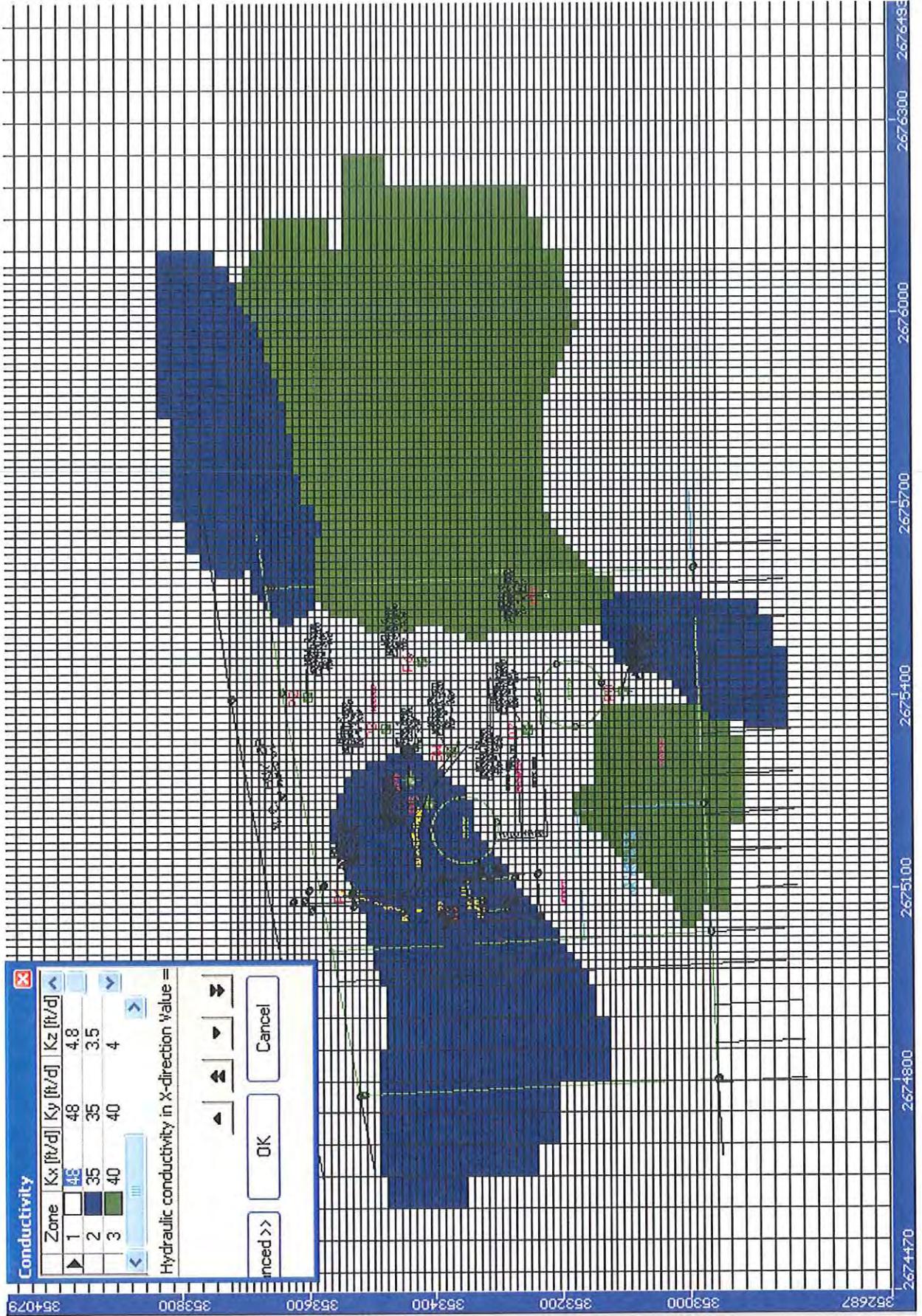


# Sugarloaf WWTP Site Figure 5C, Site Map



# Sugarloaf WWTP Site

## Figure 5D, Conductivity Map

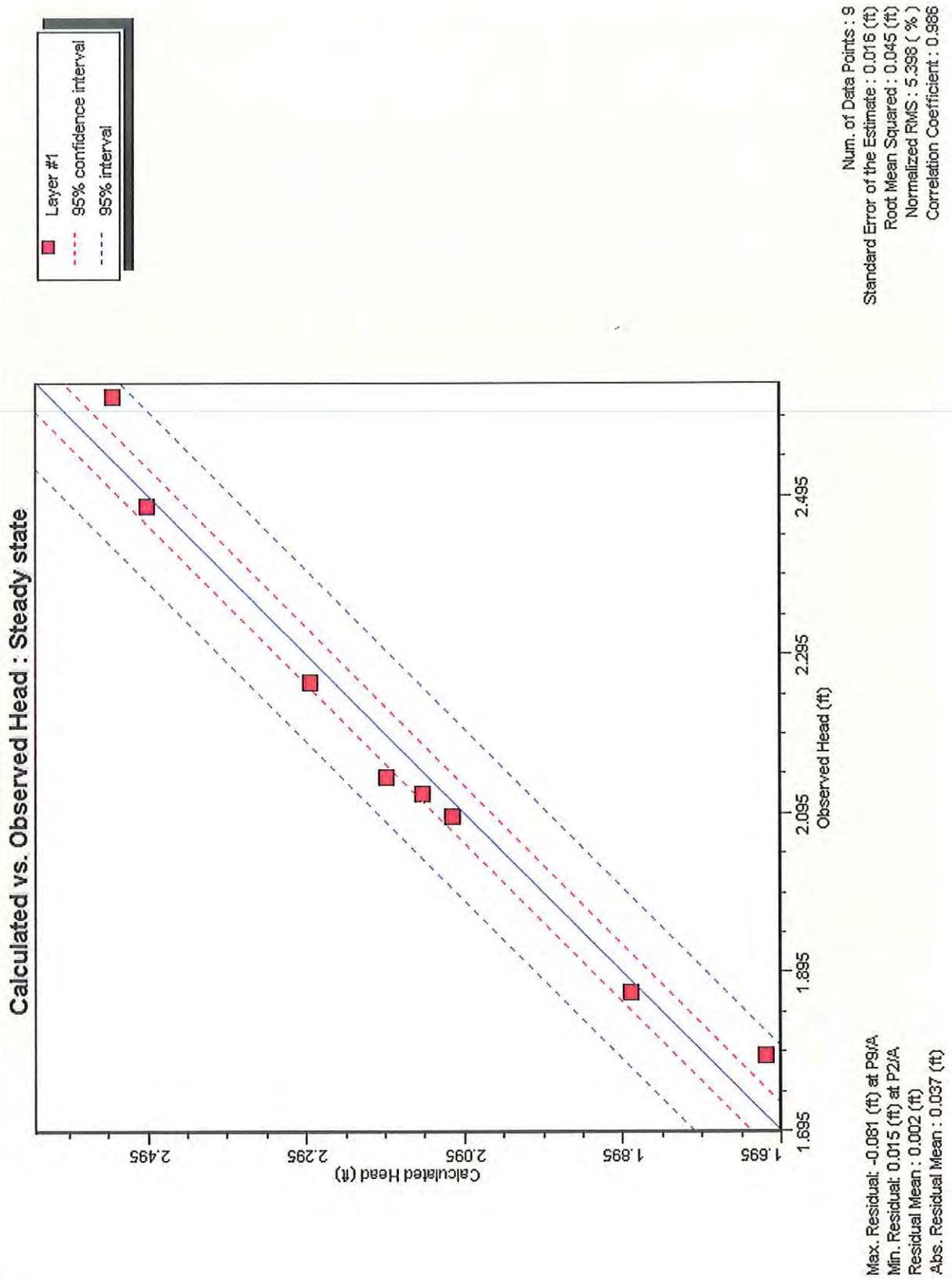


**Sugarloaf WWTP Site  
Figure 5E, Calibration Map**



# Sugarloaf WWTP Site

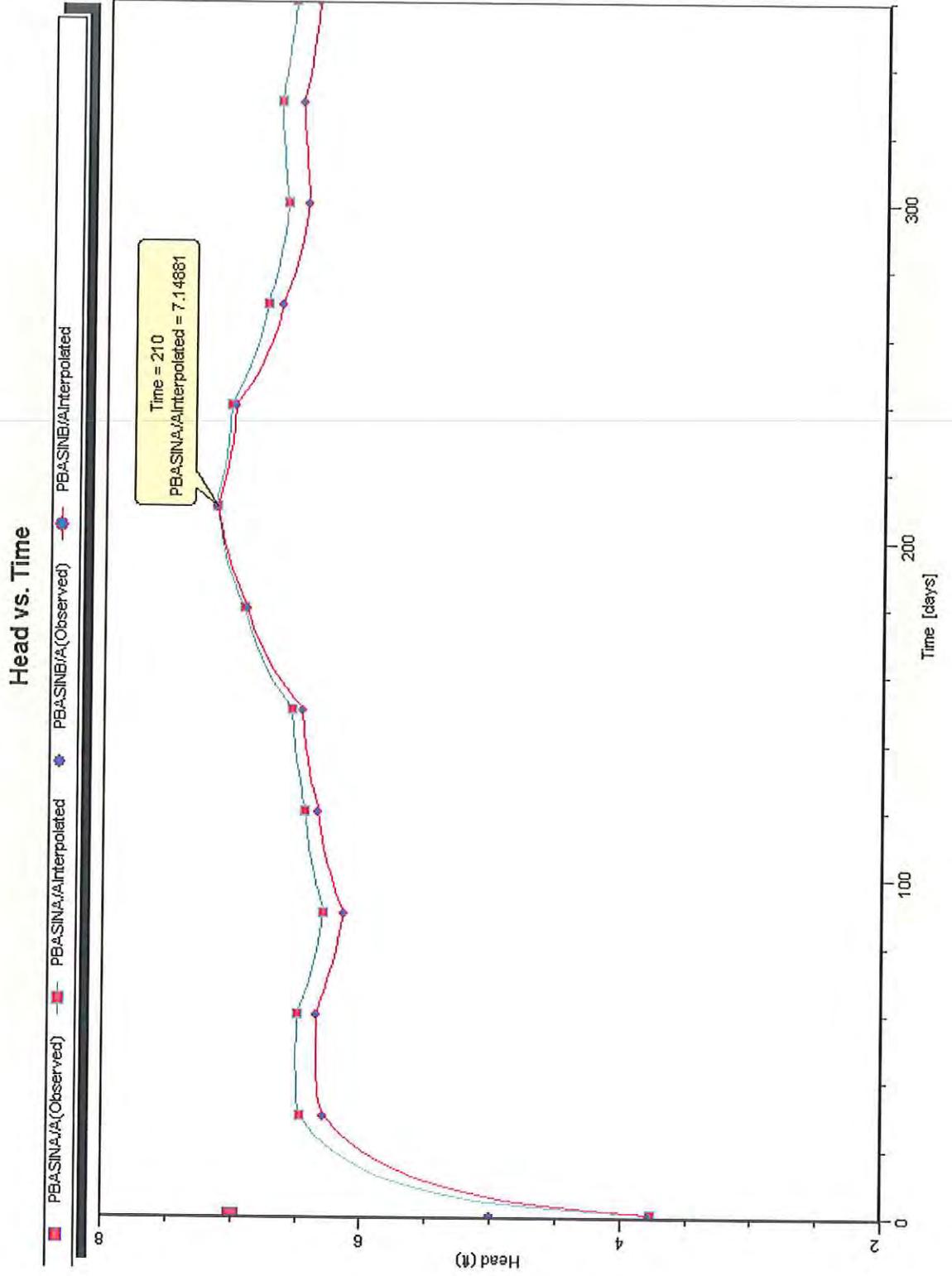
## Figure 5F, Calibration Graph



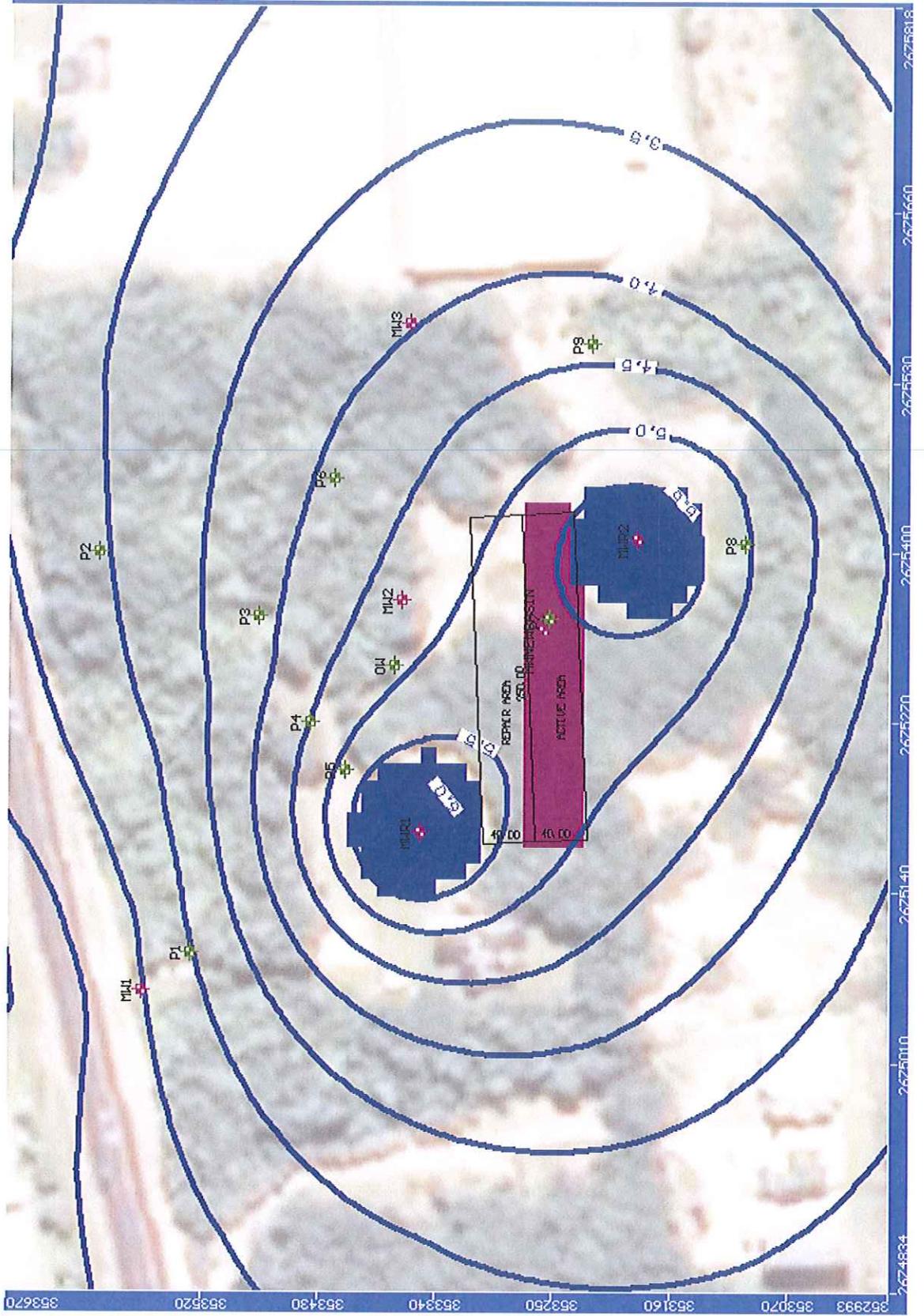
# Sugarloaf WWTP Site

## Figure 6A, Time vs Water Level

### 0 to 360 Days - Existing Disposal Pattern



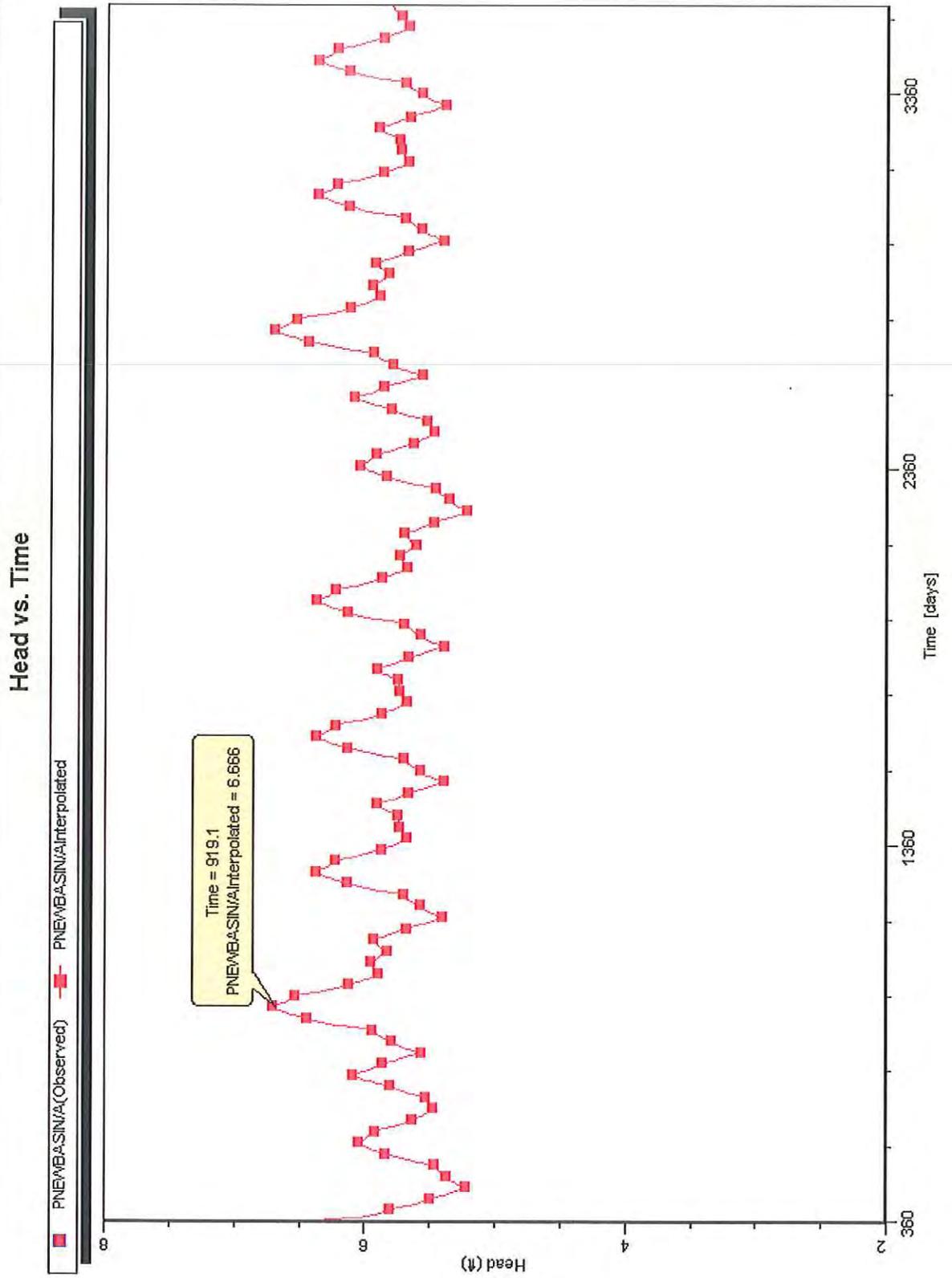
**Sugarloaf WWTP Site  
Figure 6B, Water Level Map at 330 Days  
Existing Rotary Distributors**



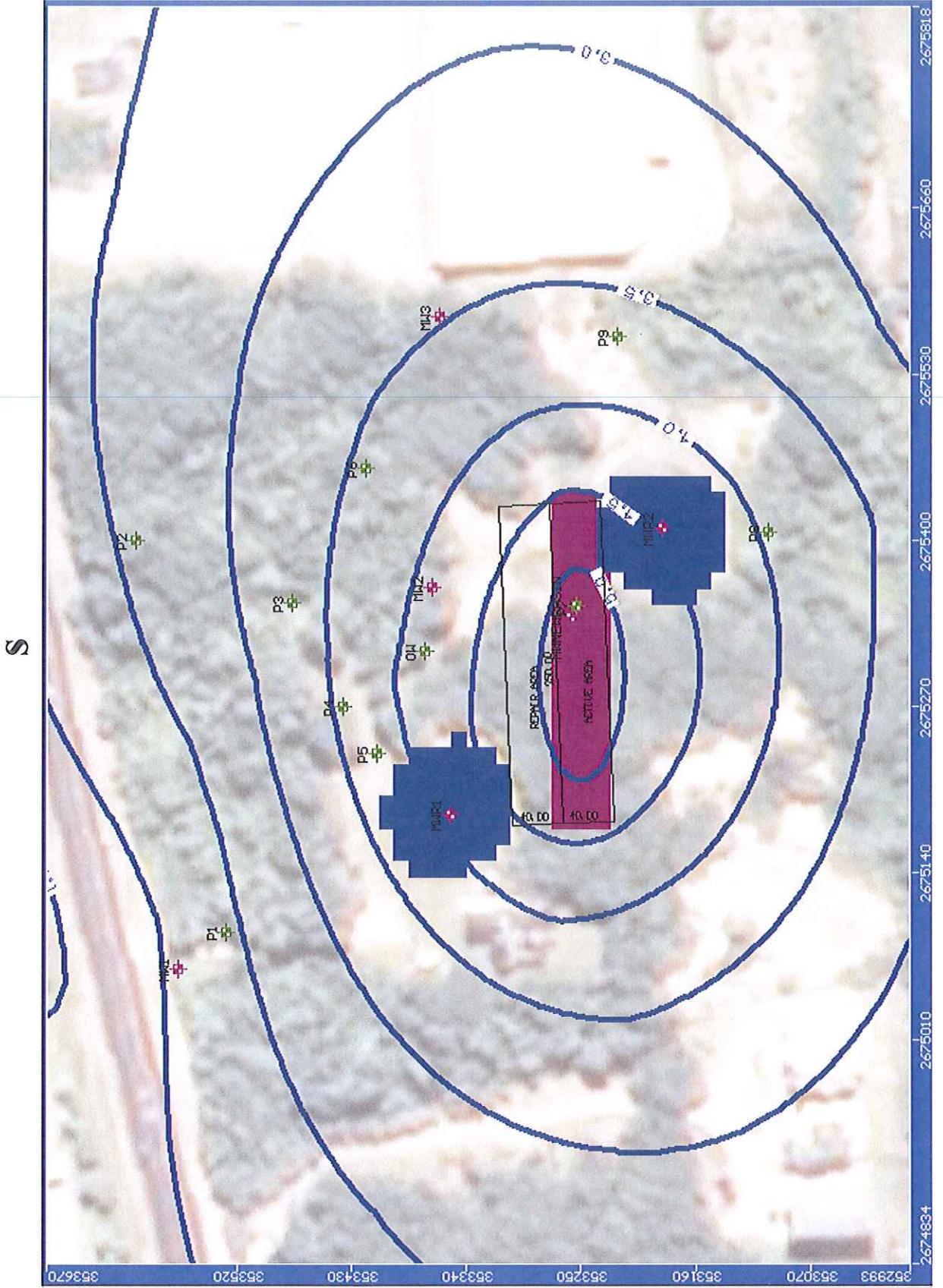
# Sugarloaf WWTP Site

## Figure 6C, Time vs Water Level

### 360 to 3600 Days - New Disposal Pattern



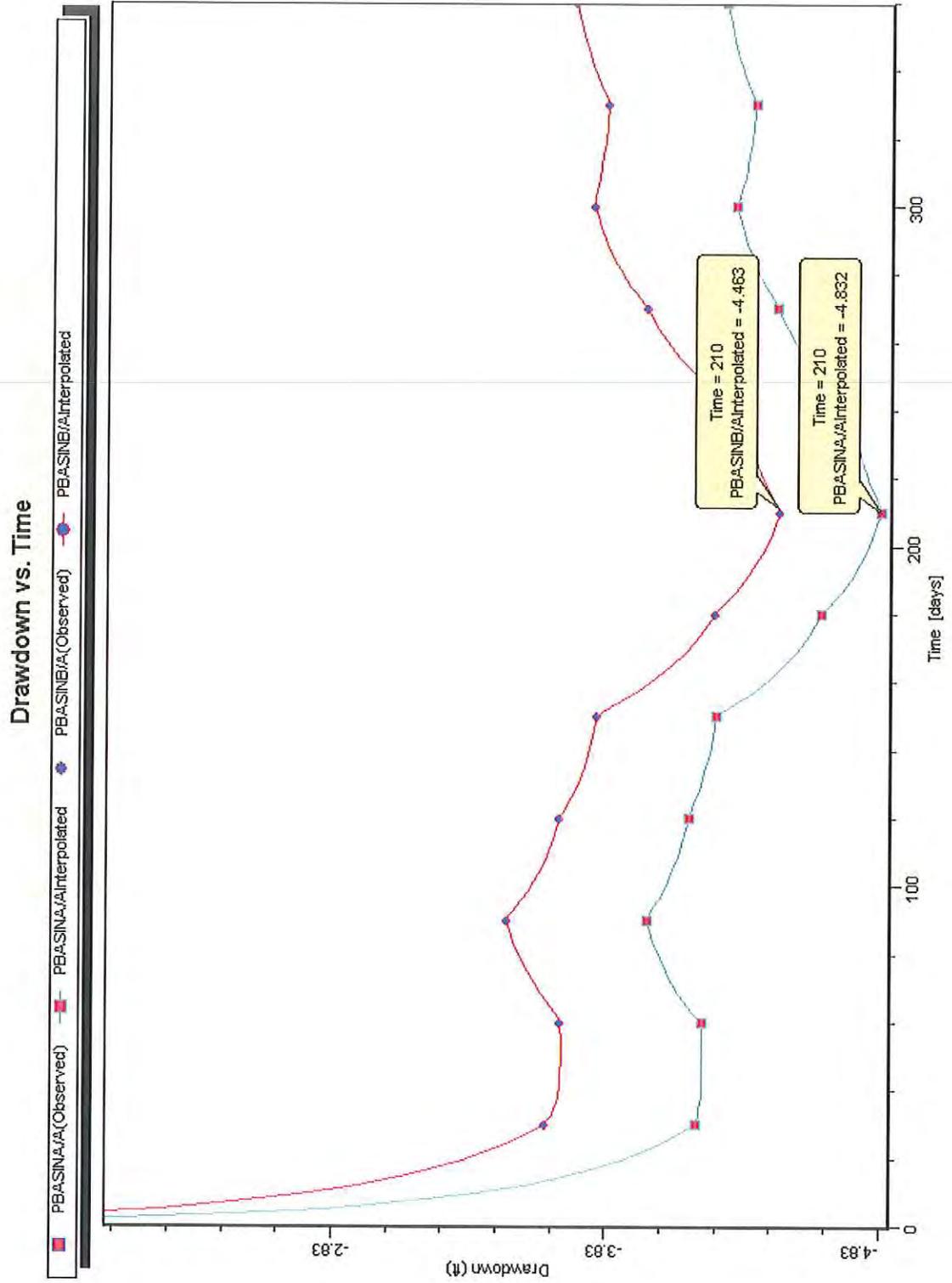
# Sugarloaf WWTP Site Figure 6D, Water Level Map at 390 Days New High Rate Infiltration Basin



# Sugarloaf WWTP Site

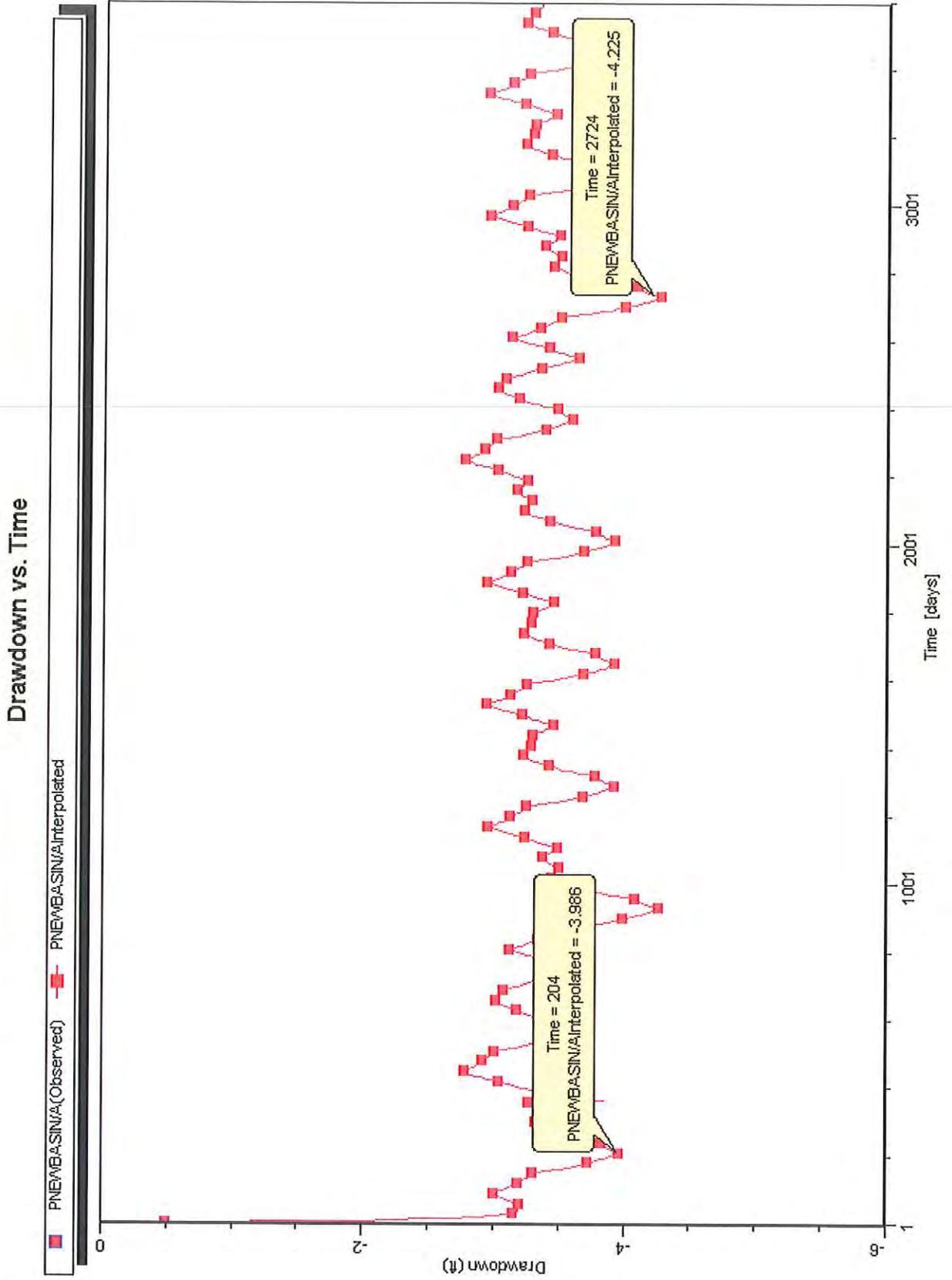
## Figure 7A, Time vs Mounding (negative Drawdown)

### 0 to 360 Days - Existing Disposal Pattern



# Sugarloaf WWTP Site

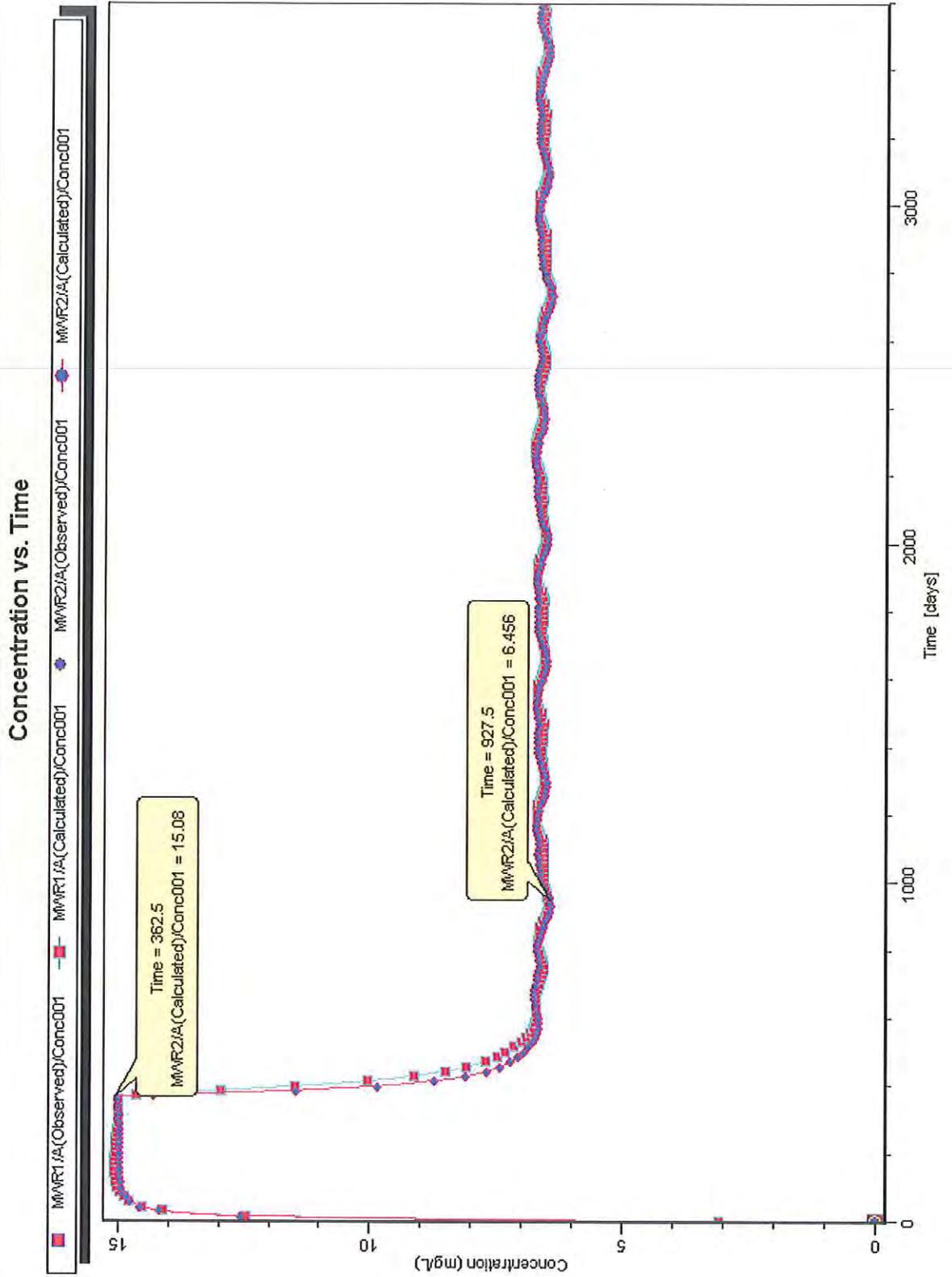
## Figure 7B, Time vs Mounding (negative Drawdown) 360 to 3,600 Days - New Disposal Pattern



# Sugarloaf WWTP Site

## Figure 8A, Time vs Nitrogen

### Monitoring Location at Existing Basins



# Sugarloaf WWTP Site Figure 8B, Time vs Nitrogen Monitoring Location at New Basin

