

Texas Commission on Environmental Quality

P.O. Box 13087 Austin, TX 78711-3087



GENERAL PERMIT TO DISCHARGE WASTEWATER

under provisions of Section 402 of the Clean Water Act
and Chapter 26 of the Texas Water Code

This is an amendment and renewal of
TPDES General Permit No. TXG530000, issued on January 21, 2014.

Wastewater from on-site wastewater treatment systems connected to single family residences located within the San Jacinto River Basin in Harris County in the State of Texas

may be discharged directly or adjacent to exceptional, high, intermediate, limited, or minimal aquatic life use receiving waters as designated in the Texas Surface Water Quality Standards

only according to effluent limitations, monitoring requirements and other conditions set forth in this permit, as well as the rules of the Texas Commission on Environmental Quality (commission), the laws of the State of Texas, and other orders of the commission. The issuance of this general permit does not grant to the permittee the right to use private or public property for conveyance of wastewater along the discharge route. This includes property belonging to but not limited to any individual, partnership, corporation or other entity. Neither does this permit authorize any invasion of personal rights nor any violation of federal, state, or local laws or regulations. It is the responsibility of the permittee to acquire any property rights necessary to use the discharge route.

This permit and the authorization contained herein will expire at midnight on January 30, 2024.

EFFECTIVE DATE: January 30, 2019

ISSUED DATE: 1-24-19



For the Commission

Table of Contents

Part I. Permit Applicability and Coverage	3
Section A. Discharges Covered	3
Section B. Limitations on Coverage.....	3
Section C. Application for Coverage.....	4
Section D. Termination of Coverage.....	5
Section E. Authorizations Under a TPDES Individual Permit.....	5
Section F. Permit Expiration	5
Part II. Permit Requirements	6
Section A. Effluent Limits.....	6
Section B. General Requirements.....	7
Section C. Design, Operation, and Maintenance Requirements	8
Part III. Discharge Monitoring and Notification Requirements	8
Section A. Discharge Notification.....	8
Section B. Sampling Requirements.....	8
Section C. Reporting Requirements	9
Part IV. Standard Permit Conditions	9
Part V. Fees.....	11
Part VI. Definitions	11
Part VII. Appendices.....	12

Part I. Permit Applicability and Coverage

Section A. Discharges Covered

1. This general permit regulates the discharges from single-family residences' on-site wastewater treatment systems that are located within segments: 1001 (San Jacinto River Tidal); 1002 (Lake Houston); 1003 (East Fork San Jacinto River); 1004 (West Fork San Jacinto River); 1005 (Houston Ship Channel/San Jacinto River Tidal); 1006 (Houston Ship Channel Tidal); 1007 (Houston Ship Channel/Buffalo Bayou Tidal); 1008 (Spring Creek); 1009 (Cypress Creek); 1010 (Caney Creek); 1013 (Buffalo Bayou Tidal); and 1014 (Buffalo Bayou above Tidal) of the San Jacinto River Basin in Harris County Texas. (See Appendix A. Detailed descriptions and maps of the on-site sewage target communities can be obtained from the authorized agent).
2. The discharge must be from an on-site wastewater treatment system located on property that was subdivided and developed prior to January 1, 1979. The property size must be insufficient to accommodate on-site disposal of all wastewater under Chapter 366 of the Texas Health and Safety Code and 30 Texas Administrative Code (TAC) Chapter 285.

Section B. Limitations on Coverage

1. Single-family residences that are able to obtain service from a regional or area wide waste collection/treatment system are not eligible for coverage under this general permit.
2. The Executive Director shall deny an application for authorization under this general permit and may require that the applicant apply for a Texas Pollutant Discharge Elimination System (TPDES) individual permit, if the Executive Director or authorized agent determines that the discharge will not maintain existing uses of the receiving waters. Additionally, the Executive Director may cancel, revoke, or suspend authorization to discharge under this general permit based on a finding of historical and significant noncompliance with the provisions of this general permit. The Executive Director shall deny or suspend a facility's authorization to discharge under this general permit based on a rating of "unsatisfactory performer" according to commission rules in 30 TAC § 60.3. An applicant who owns or operates a facility classified as an "unsatisfactory performer" is entitled to a hearing before the commission prior to having its coverage denied or suspended, in accordance with Texas Water Code (TWC) § 26.040(h). Denial of authorization to discharge under this general permit or suspension of a permittee's authorization under this general permit shall be done according to commission rules in 30 TAC Chapter 205, *General Permits for Waste Discharges*.
3. New sources or new discharges of constituent(s) of concern to impaired waters are not authorized by this permit unless otherwise allowable under applicable state and federal law. Impaired waters are those that do not meet applicable water quality standard(s) and are listed as Category 4 or 5 in the current version of the *Texas Integrated Report of Surface Water Quality* and in accordance with the Clean

Water Act § 303(d) list. Constituents of concern are those constituents for which the water body is listed as impaired.

4. Discharges of constituent(s) of concern to impaired water bodies for which there is a total maximum daily load (TMDL) implementation plan are not eligible for this permit unless they are consistent with the approved TMDL and the implementation plan. The Executive Director may amend this general permit or develop a separate general permit for discharges to these water bodies. For discharges not eligible for coverage under this permit, the discharger must apply for and receive an individual or other applicable general TPDES permit prior to discharging.
5. Discharges that would adversely affect a listed endangered or threatened species or its critical habitat are not authorized by this general permit. Federal requirements related to endangered species apply to all TPDES permitted activities, and site-specific controls may be required to ensure that protection of endangered or threatened species is achieved.

Section C. Application for Coverage

1. New dischargers seeking authorization to discharge under this general permit shall submit a completed Notice of Intent (NOI) on a form approved by the Executive Director. The NOI shall include, at a minimum, the legal name and address of the owner and operator, the location of the discharge (as described by latitude and longitude), description of the effluent discharge route from the facility for a minimum distance of three miles, and the date the proposed discharge will commence. The NOI must be submitted by certified mail, return receipt requested, to the address indicated in the NOI. The discharger shall submit the NOI a minimum of 30 calendar days before discharging into or adjacent to water in the state.
2. By submitting the NOI, the applicant acknowledges that the conditions of this general permit are applicable to the proposed discharge and that the applicant agrees to comply with the requirements of this general permit. The applicant must also submit with the NOI, copies of the maintenance agreement and the county deed record for the property. The Executive Director or the authorized agent or shall either confirm coverage by providing a notification and an authorization number to the applicant or notify the applicant that coverage under this general permit is denied.
3. Authorization under this general permit is not transferable and is site specific. If the owner or operator of the facility changes, the present owner and operator must submit a Notice of Termination (NOT), and the new owner and operator must submit a new NOI.
4. If the owner or operator becomes aware that it has failed to submit any relevant facts, submitted incorrect information or relevant information provided in the NOI changes, a Notice of Change (NOC) must be submitted to the Executive Director or authorized agent within 10 days of the change. This includes any other change with respect to the nature or operations of the facility or the characteristics of the

discharge.

Section D. Termination of Coverage

A discharger may voluntarily terminate coverage under this general permit through the submittal of a NOT form approved by the Executive Director. An NOT shall be submitted when the owner or operator of the facility changes, the discharge becomes authorized under an individual permit or alternative general permit, the use of the property changes and is no longer subject to regulation under this general permit or the discharge becomes unnecessary. Authorization to discharge wastewater terminates on the day that an NOT is postmarked for delivery.

Section E. Authorizations Under a TPDES Individual Permit

1. Discharges eligible for authorization by this general permit may alternatively be authorized by an individual permit according to 30 TAC Chapter 305, *Consolidated Permits*.
2. If an individual permit is issued to a discharger that is currently authorized under this general permit, the permittee shall submit an NOT to the Executive Director or authorized agent. Authorization to discharge under this general permit terminates upon receipt of the NOT.

Section F. Permit Expiration

1. This general permit is effective for five years from the effective date. Authorizations for discharge under the provisions of this general permit may be issued until the expiration date of the general permit. This general permit may be amended, revoked, or canceled by the commission.
2. If the Executive Director proposes to reissue this general permit before its expiration date, the general permit shall remain in effect for those existing discharges covered by the general permit in accordance with 30 TAC Chapter 205. This general permit shall remain in effect for those discharges until the date on which the commission takes final action on the proposal to reissue this general permit. No new NOIs will be accepted or new authorizations honored for authorization under the general permit after the expiration date.
3. Upon issuance of a renewed or amended general permit, all permittees, including those covered under the expired general permit, shall submit an NOI within 90 days after the effective date according to the requirements of the new general permit or obtain a TPDES individual permit.
4. According to 30 TAC § 205.5(d), if the commission has made a determination that the general permit will not be renewed at least 90 days before the expiration date, permittees authorized under this general permit shall submit an application for an individual permit before the expiration date. If the application for an individual permit is submitted before the general permit expiration date, authorization under this expiring general permit remains in effect until the issuance or denial of an

individual permit or alternative general permit.

Part II. Permit Requirements

Section A. Effluent Limits

The following effluent limitations apply:

1. The monthly average discharge (flow) of effluent shall not exceed 500 gallons per day (gpd). Flow shall be measured once per six months by estimate.
2. The effluent discharged shall meet the following limitations.

Parameter	Daily Average Limitations	Single Grab Limitations	Sample Type	Monitoring Frequency
Carbonaceous Biochemical Oxygen Demand (5-day)	10 mg/L	35 mg/L	Grab	Once per six months
Total Suspended Solids	15 mg/L	60 mg/L	Grab	Once per six months
Ammonia Nitrogen	3 mg/L	15 mg/L	Grab	Once per six months
Bacteria (colonies per 100 ml)				
<i>E. coli</i> (*1)	63 (*2)	197	Grab	Once per six months
Enterococci (*3)	23 (*2)	57	Grab	Once per six months
Dissolved Oxygen	4.0 mg/L	4.0 mg/L	Grab	Once per six months
Chlorine Residual	1.0 - 4.0 mg/L	1.0 - 4.0 mg/L	Grab	Once per six months
pH (Standard Units)	6.0 - 9.0 SU	6.0 - 9.0 SU	Grab	Once per six months

(*1) When discharging into freshwater.

(*2) The daily average is a geometric mean of the values for all effluent samples collected in a 24-month reporting period.

(*3) When discharging into saltwater.

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

Section B. General Requirements

1. The rate of discharge shall be controlled to prevent flooding and erosion.
2. On-site disposal of sewage sludge is not authorized. Solid wastes, including cleanup wastes, shall be disposed of according to Chapter 361 of the Texas Health and Safety Code, 30 TAC Chapter 312, and other applicable rules of the TCEQ.
3. The discharge shall not cause any nuisance conditions to adjacent landowners along the discharge route.
4. The permittee shall provide the following noncompliance notifications:
 - a. The permittee shall take all steps necessary to prevent any adverse effect to human health or safety, or to the environment. Immediately upon the notification from the TCEQ's Houston Regional Office or authorized agent that the discharge presents a hazard to the uses of the receiving water, the discharger shall terminate the discharge. The discharger shall immediately cease discharging whenever it is discovered the discharge may endanger human health or safety, or the environment, and the noncompliance shall be reported to the TCEQ's Houston Regional Office and authorized agent within 24 hours of becoming aware of the noncompliance. The permittee shall also provide a written report to the Houston Regional Office, the authorized agent, and the TCEQ's Enforcement Division (MC-224) within five working days of the noncompliance. The report shall contain:
 - 1) description of the location of the discharge;
 - 2) the exact date and time the problem was first identified;
 - 3) the potential danger to human health or safety, or the environment;
 - 4) the immediate steps that were taken to correct the problem;
 - 5) steps planned or taken to mitigate any adverse effects; and
 - 6) plans to prevent the reoccurrence of similar problems during future discharges.
 - b. Any effluent violation which deviates from the permitted effluent limitation by more than 40% shall be reported in writing to the TCEQ's Houston Regional Office, the authorized agent, and the TCEQ's Enforcement Division (MC-224) within five working days of the noncompliance.
 - c. Any noncompliance other than that specified in paragraphs (a) and (b) above must be submitted to the authorized agent and the TCEQ's Enforcement Division (MC-224) as promptly as possible. For effluent limitation violations, noncompliances shall be reported on the approved Discharge Monitoring Report (DMR) (EPA Form 3320-1).

Section C. Design, Operation, and Maintenance Requirements

The discharger shall use the wastewater treatment facility design in Appendix B. The facility shall be operated and maintained in accordance with Appendix B.

Part III. Discharge Monitoring and Notification Requirements

Section A. Discharge Notification

Dischargers shall notify the TCEQ's Houston Regional Office and the authorized agent by telephone at least two days prior to commencing discharge. For emergency facility repair or replacement, the discharger shall notify the Houston regional office and the authorized agent as soon as possible.

Section B. Sampling Requirements

1. The discharger shall ensure that properly trained and authorized personnel monitor and sample the discharge.
2. The sampling point shall be after the filter media.
3. Monitoring and reporting requirements are as follows:
 - a. Monitoring samples and measurements shall be taken at times and in a manner so as to be representative of the monitored activity.
 - b. The discharger shall retain all records related to the application, monitoring, or certification for a period of five years from the date of discharge. This period may be extended at the request of the Executive Director or authorized agent. The records shall be retained at the facility or be readily available for review by the Executive Director or authorized agent upon request.
 - c. Records of monitoring activities shall include:
 - 1) date, time and place of sample or measurement;
 - 2) name of individual who collected the sample or made the measurement;
 - 3) date of laboratory analysis;
 - 4) identity of the individual and laboratory who performed the analysis;
 - 5) the technique or method of analysis; and
 - 6) the results of the analysis or measurement.
4. All sample collections shall be conducted according to recommendations in the latest edition of "Standard Methods for the Examination of Water and Wastewater" (prepared and published jointly by the American Public Health Association, the American Waterworks Association, and the Water Pollution Control Federation), or Environmental Protection Agency, "Methods for Chemical Analysis of Water and Wastes" (1979), or Environmental Protection Agency, "Biological Field and Laboratory Methods for Measuring the Quality of Surface Waters and Effluents" (1973).

5. Sample containers, holding times, preservation methods, and the physical, chemical, and microbiological analyses of effluents shall meet the requirements in 40 Code of Federal Regulations (CFR) Part 136, as amended. All analyses shall be conducted according to 40 CFR Part 136, as amended, or the latest edition of "Standard Methods for the Examination of Water and Wastewater."
6. All laboratory tests submitted to demonstrate compliance with this permit shall meet the requirements of 30 TAC Chapter 25, *Environmental Testing Laboratory Accreditation and Certification*.

Section C. Reporting Requirements

1. Analytical results for determining compliance with effluent limitations shall be recorded on a Discharge Monitoring Report (DMR) (EPA No. 3320-1), a TCEQ-approved self-generated form, or a copy of record, if using the eReporting function of the TCEQ eServices webpage. Effluent sampling shall be conducted in accordance with the monitoring frequencies specified in this general permit and shall be submitted on a monthly or annual basis, depending on the required sampling frequency, to the TCEQ Enforcement Division (MC 224) or by eDMR through the eReporting function of the TCEQ eServices webpage. The DMR for any given month shall be due by the 20th day of the following month and shall be signed in accordance with the requirements in Part IV.7 of the general permit. If noncompliance with a discharge limitation occurs, the permittee shall provide notification according to Part II.B.4 of the general permit.
2. The permittee shall retain all records required by this permit, including monitoring records and records related to the application or any certification requirements for a period of three years from the date of record.

Part IV. Standard Permit Conditions

1. The permittee has a duty to comply with all conditions in this general permit. Failure to comply with any condition is a violation of the general permit and the statutes under which the general permit was issued. Any violation may be grounds for enforcement action, for terminating coverage under this general permit, or for requiring a permittee to apply for and obtain an individual permit.
2. It is not a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted discharge to maintain compliance with conditions of the general permit.
3. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) installed or used by the permittee to achieve compliance with conditions of the general permit. Proper operation and maintenance also includes adequate laboratory and process controls, and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary

to achieve compliance with conditions of the general permit.

4. The permittee shall submit, upon request of the Executive Director, any information that is necessary for the Executive Director to determine whether cause exists for revoking, suspending, or terminating authorization under this general permit. Additionally, the permittee shall submit, upon request of the Executive Director, copies of all records that the permittee is required to maintain as a condition of this general permit. The requested information or records shall be provided within a reasonable time and in no case later than 30 days from the date of the request.
5. The permittee shall give notice to the Executive Director and authorized agent before making physical alterations or additions to the permitted facility if alterations would result in a violation of the general permit requirements.
6. Inspection and entry by the Executive Director or authorized agent shall be allowed under TWC Chapter 26, Texas Health and Safety Code §§ 361.032-361.033 and 361.037; and Title 40 CFR § 122.41(i). The statement in TWC § 26.014 that entry of a regulated entity will occur in accordance with an establishment's rules and regulations concerning safety, internal security, and fire protection are not grounds for denial or restriction of entry to any part of the regulated entity, but merely describes the commission's or authorized agent's duty to observe appropriate rules and regulations during an inspection.
7. All NOIs, NOTs, and NOCs shall meet the requirements of 30 TAC § 305.44(a), *Signatories to Applications*. All reports and other information requested by the Executive Director or the authorized agent shall meet the requirements of 30 TAC § 305.128, *Signatories to Reports*.
8. Authorization under this permit may be suspended or revoked for the reasons stated in 30 TAC § 205.4, *Authorizations and Notices of Intent*. The filing of notification by the discharger of planned changes or anticipated noncompliance does not stay any permit condition.
9. This general permit does not convey any property rights of any sort, or any exclusive privilege.
10. The discharger is subject to administrative, civil, and criminal penalties, as applicable, under TWC §§ 7.051 - 7.075 (relating to Administrative Penalties), 7.101-7.111 (relating to Civil Penalties), and 7.141-7.202 (relating to Criminal Offenses and Penalties) for violations including, but not limited to, negligently or knowingly violating the federal CWA §§ 301, 302, 306, 307, 308, 318, or 405, or any condition or limitation implementing any sections in a general permit issued under CWA § 402(a)(3) or 402(b)(8); intentionally or knowingly tampering with, modifying, disabling, or failing to use pollution control or monitoring devices, systems, methods, or practices required under this permit; or intentionally or knowingly making or causing to be made, a false material statement, representation, or certification in, or omitting or causing to be omitted material information from, an application, notice, record, report, plan, or other document, including monitoring

device data, filed or required to be maintained by this permit.

11. Applicants seeking authorization under this general permit and permittees that are authorized under this general permit are hereby issued a waiver from the electronic reporting requirements of 40 CFR Part 127. Therefore, applicants and permittees may continue to submit NOI, NOT, and NOC forms in paper format. Permittees may submit DMR forms in paper format or online using the NetDMR reporting system available through the TCEQ website.

Part V. Fees

An NOI submitted to the Executive Director or authorized agent shall include an application fee of \$100. Dischargers covered under this general permit are not subject to pay an annual Water Quality Fee under TWC § 26.0291 and according to 30 TAC Chapter 205, *General Permits for Waste Discharges*.

Part VI. Definitions

The following words and terms, used in this general permit, shall have the following meanings:

Authorized agent - For the purpose of this general permit, an authorized agent is a local governmental entity that has been authorized by the commission or Executive Director to implement Chapter 366 of the Texas Health and Safety Code; that has adopted a resolution under TWC § 7.352 authorizing the county to exercise enforcement power under TWC Chapter 7, Subchapter H; and that has entered into an agreement with the commission to inspect, investigate, and otherwise monitor compliance with this general permit.

Bacteria concentration (*E. coli* or *Enterococci*) - Colony Forming Units (CFU) or Most Probable Number (MPN) of bacteria per 100 milliliters effluent. The daily average bacteria concentration is a geometric mean of the values for the effluent samples collected in a 24-month period. The geometric mean shall be determined by calculating the n th root of the product of all measurements made in a 24-month period, where n equal the number of measurements made; or, computed as the antilogarithm of the arithmetic mean of the logarithms of all measurements made in a 24-month period. For any measurement of bacteria equaling zero, a substituted value of one shall be made for input into either computation method.

Daily average limitations - The arithmetic average of results of analyses for a parameter from a minimum of four samples of the discharges that occur in a single calendar month. When results of analyses of four samples are not available in a single calendar month, the arithmetic average of the most recent results, not to exceed four, must be reported as the daily average concentration.

Discharge - To deposit, conduct, drain, emit, throw, run, allow to seep, or otherwise release or dispose of, or to allow, permit, or suffer any of these acts or omissions.

General permit - A permit, issued under the provisions of 30 TAC Chapter 205, authorizing the discharge of waste into or adjacent to water in the state for one or

more categories of waste discharge within a geographical area of the state or the entire state as provided by TWC § 26.040.

Grab sample - An individual sample collected in less than 15 minutes.

Monthly average flow - The arithmetic average of results of analyses of flow from a minimum of four measurements of the discharges that occur in a single calendar month. When results of analyses of four measurements are not available in a single calendar month, the arithmetic average of the most recent results, not to exceed four, must be reported as the monthly average flow.

Notice of Change or NOC - A written submittal to the Executive Director or authorized agent from a regulated entity authorized under a general permit that provides information on changes to information previously provided to the commission, or any changes with respect to the nature or operations of the facility or the characteristics of the discharge.

Notice of Intent or NOI - A written submittal to the Executive Director or authorized agent from an applicant that requests coverage under the terms of a general permit.

Notice of Termination or NOT - A written submittal to the Executive Director or authorized agent from a discharger authorized under a general permit that requests termination of coverage.

Operator - The person responsible for the overall operation of a treatment facility.

Owner - The person who owns a facility or part of a treatment facility.

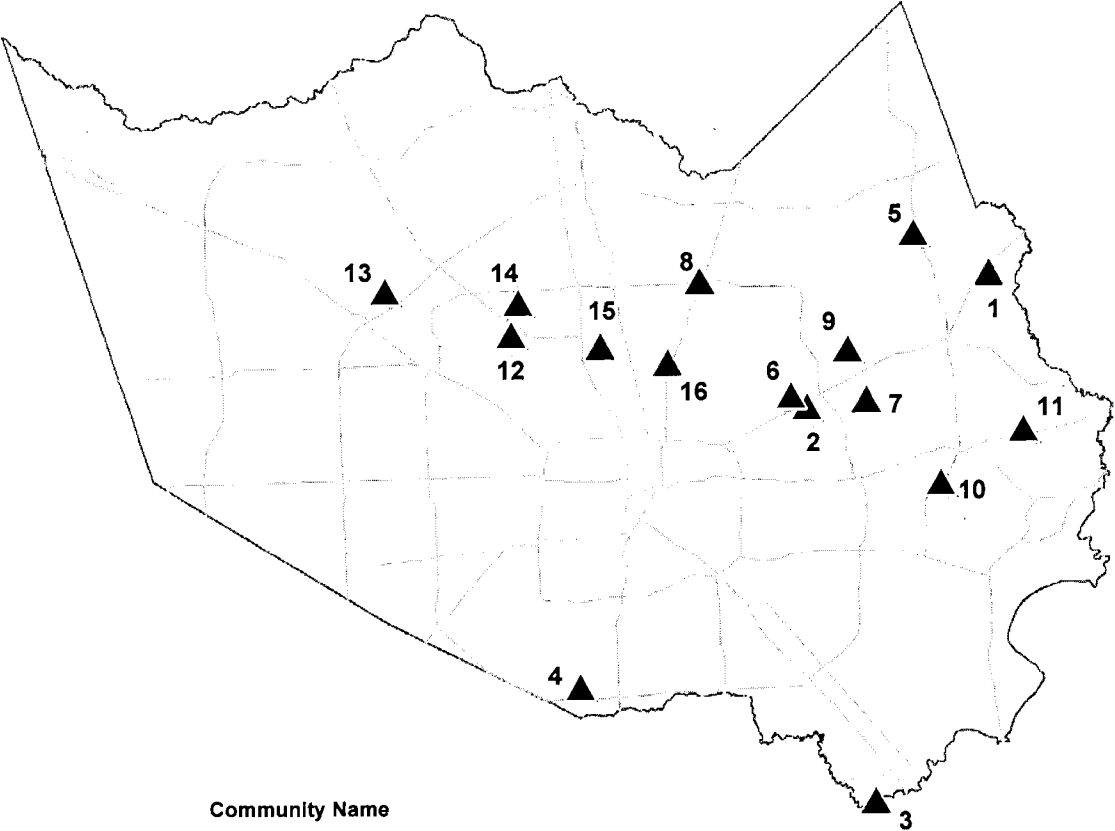
Texas Pollutant Discharge Elimination System (TPDES) - The state program for issuing, amending, terminating, monitoring, and enforcing permits, and imposing and enforcing pretreatment requirements, under Clean Water Act §§307, 402, 318 and 405, Texas Water Code, and Texas Administrative Code regulations.

Treatment Facility (facility) - Wastewater facilities used in the conveyance, storage, treatment, recycling, reclamation or disposal of domestic sewage, including sludge handling or disposal facilities under the jurisdiction of the commission.

Water in the state - Groundwater, percolating or otherwise, lakes, bays, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, wetlands, marshes, inlets, canals, the Gulf of Mexico, inside the territorial limits of the state, and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, navigable or non-navigable, and including the beds and banks of all watercourses and bodies of surface water, that are wholly or partially inside or bordering the state or inside the jurisdiction of the state.

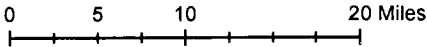
Part VII. Appendices

Appendix A
On-Site Sewage Target Communities
Harris County, Texas



Community Name

- | | |
|-----------------------|---|
| 1 Adlong School Road | 10 Lynchburg |
| 2 Beaumont Place | 11 MeadowLake |
| 3 Clear Creek Shores | 12 Recreation Farms |
| 4 Fruittland Addition | 13 Tower Oaks |
| 5 Heathergate Estates | 14 Weisenberger City |
| 6 Houmont Park | 15 Airline Improvement District Area |
| 7 Houston Farms | 16 East Aldine Management District Area |
| 8 Humble Estates | |
| 9 Jacinto Park | |



8/18/2019
D:\GIS\Projects\TPDES\Map_Series\Map_Series_Template.aprx

APPENDIX B

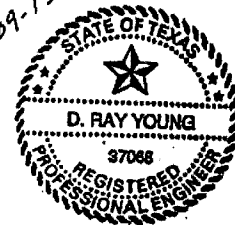
DESIGN DOCUMENTATION

**For a
PROTOTYPICAL SINGLE FAMILY DWELLING
ON-SITE WASTEWATER TREATMENT AND
DISPOSAL SYSTEM WITH A DISCHARGE CAPABILITY**

Under Provisions of

**Section 402 of the Clean Water Act
and Chapter 26 of the Texas Water Code**

*D. Ray Young
09-13-2000*



Engineering Consultant
Richard Carter & Associates, Inc.
Civil Engineering Consultants
Post Office Box 400 ~ Cypress, Texas 77410-0400
281/373-3838 FAX 281/373-1113 Email RCAHOU@aol.com

TABLE OF CONTENTS

1. Preliminary Engineering Report
2. Prototypical Site Plans
3. Prototypical Wastewater Treatment System Plans
4. Prototypical Wastewater Treatment System Sections
5. Prototypical Wastewater Treatment System Disposal Plan & Section

PRELIMINARY ENGINEERING REPORT

1.0 INTRODUCTION

The Harris County Public Infrastructure Department, Engineering Division, has authorized Richard Carter & Associates, Inc., to prepare a preliminary engineering report and supporting documentation for design and construction of on-site wastewater systems with discharge serving single family residences in Harris County, Texas.

The systems designed are to meet Texas Water Code, Chapter 26 criteria for discharge into a receiving stream. Additional county-specified criteria include economy of construction, operation and maintenance.

The areas considered for discharge into a receiving stream involve subdivisions with small residential lots which were developed prior to regulatory involvement in the design and operation of on-site wastewater systems. Current rules require large lot sizes capable of accommodating individual on-site wastewater systems.

2.0 STATEMENT OF THE PROBLEM

Harris County has a significant number of single family residential subdivisions that rely on individual water wells and on-site wastewater treatment and disposal systems for each lot in the subdivision. Many of the individual lots have malfunctioning on-site wastewater systems. The primary causes of system failure are:

1. Low permeability soils.
2. Seasonal soil saturation during the wetter months.
3. Nearly level topography with poor storm water runoff.
4. Insufficient land area for effluent disposal.

The specific problems being addressed by this report are single family residences that were constructed and occupied prior to July 1, 1978, and have insufficient land area for construction of an approved on-site wastewater system.

Prior to 1990, all on-site wastewater systems, by rule, were required to use subsurface means for effluent disposal. Most systems constructed used anaerobic (septic tank) treatment followed by pipe and gravel trenches or beds for final disposal.

Beginning in 1994, Harris County began requiring site evaluations instead of percolation tests for determination of the method of final disposal. The site evaluation procedure recognizes the existence of seasonal ground water indicators. The end result of this rule change, along with Texas Natural Resource Conservation Commission rules adopted in 1997, resulted in most of the new wastewater systems in Harris County being installed using aerobic treatment followed by disinfection and using surface application (spray irrigation) over living ground cover as final treatment and disposal.

3.0 EXISTING SITE CONDITIONS

With few exceptions, the general soil types for Harris County are characterized by poor internal drainage, low permeability and nearly level topography.

A significant part of the county lies within the 100-year floodplain. Generally, storm runoff from individual lots is by sheet flow across the lot into an open road ditch. The road ditches connect to larger publicly maintained ditches or bayous. Road ditch runoff is slow due to nearly flat topography. Localized street flooding due to slow road ditch runoff is a frequent occurrence. Such flooding contributes to soil saturation on individual lots.

PRELIMINARY ENGINEERING REPORT

Average annual rainfall at Houston's Bush Intercontinental Airport is 47 inches. The rainfall is well distributed during the year, except for the months June through August, which tend to be drier. Septic systems with subsurface disposal often function well during the summer months but fail during the wetter months, with failures becoming most common from December to April.

The existing residential subdivisions most likely to be candidates under the proposed discharge permit process share the two critical factors of small lot sizes and unsuitable soils for on-site disposal.

4.0 DISCUSSION OF TREATMENT AND DISPOSAL PROCESSES

The proposed treatment and disposal process includes primary settling (septic tank), aerobic treatment unit, chlorine addition, chlorine contact/settling, discharge to a subsurface rock filter trench and final discharge into a roadside ditch. The proposed process schematic is shown in attached Sheets 1 and 2. The process treatment units are expected to provide the following effluent quality at the various stages of treatment if they are operated properly.

STAGE	CBOD	TSS	NH3-N	Fecal Coliform
Raw Wastewater	150-250 mg/l	240 mg/l	45 mg/l	> 2,000,000 CFU
Primary Effluent	100 mg/l	120 mg/l	45 mg/l	> 2,000,000 CFU
Aerobic Unit Effluent	20 mg/l	20 mg/l	< 1 mg/l	>200,000 FCU
Chlorine Contact Effluent	10 mg/l	10 mg/l	< 1 mg/l	< 200 CFU
Rock Filter Trench Effluent	< 5 mg/l	< 5 mg/l	< 1 mg/l	< 10 CFU

In addition, consideration has been given to the variation of effluent quality under short-term adverse loading and operating conditions, including loss of power to the treatment system, introduction of toxicants in the influent, excessive peak flow rates and/or loss of chlorine feed. Based on the minimal need for pumping, the number of stages and the simplicity of the primary and final stages of the process, it is believed that for short periods of upset, the process will be able to meet the required 10 mg/l BOD, 15 mg/l TSS, 3 mg/l NH₃-N and 200 FC requirements.

In addition to providing a high level of treatment, the final stage rock filter trench will provide a minimum of 250 square feet of absorption trench between the chlorine contact tank and the point of discharge into a roadside ditch. During dry weather, it is anticipated that much of the effluent from the chlorine contact tank will be absorbed into the soil walls.

Prototypical planning materials are shown in the attached drawings and are as follows:

Sheet Number	Description
1	Site Plan 50' X 100' Lot, 900 sq ft Residence
2	Site Plan 50' X 100' Lot, Single Wide Mobile Home
3	Wastewater Treatment System Plan - Option 1
4	Wastewater Treatment System Plan - Option 2
5	Wastewater Treatment System Sections
6	Wastewater Treatment System Disposal and Discharge

5.0 OPERATION & MAINTENANCE

Operational requirements and performance of the process units is predictable because there are over 2,800 aerobic units installed in Harris County at this time. Effluent sampling data from the aerobic treatment pump tanks indicates that the expected 20 mg/l BOD and 20 mg/l TSS is attainable. Harris County intends to oversee the operation of the on-site discharge units.

PRELIMINARY ENGINEERING REPORT

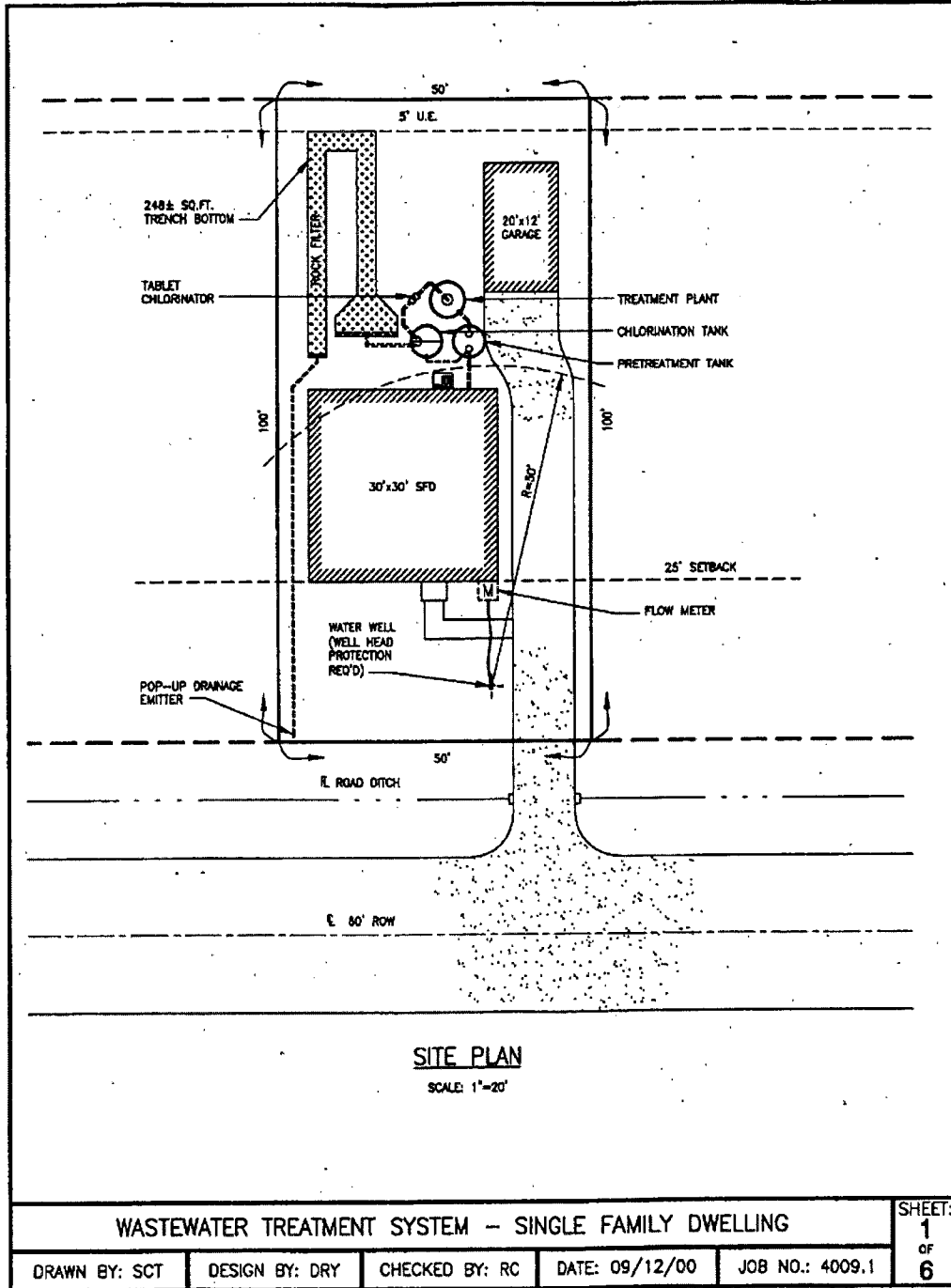
The normal frequency of operator attention for on-site aerobic units is once every three months, with the homeowner being responsible for adding chlorine tablets to the chlorine feeder between operator visits. It is anticipated that an operator will need to visit each site once a month to collect samples, check operations, pump sludge out of the chlorine contact tank as well as make process adjustments.

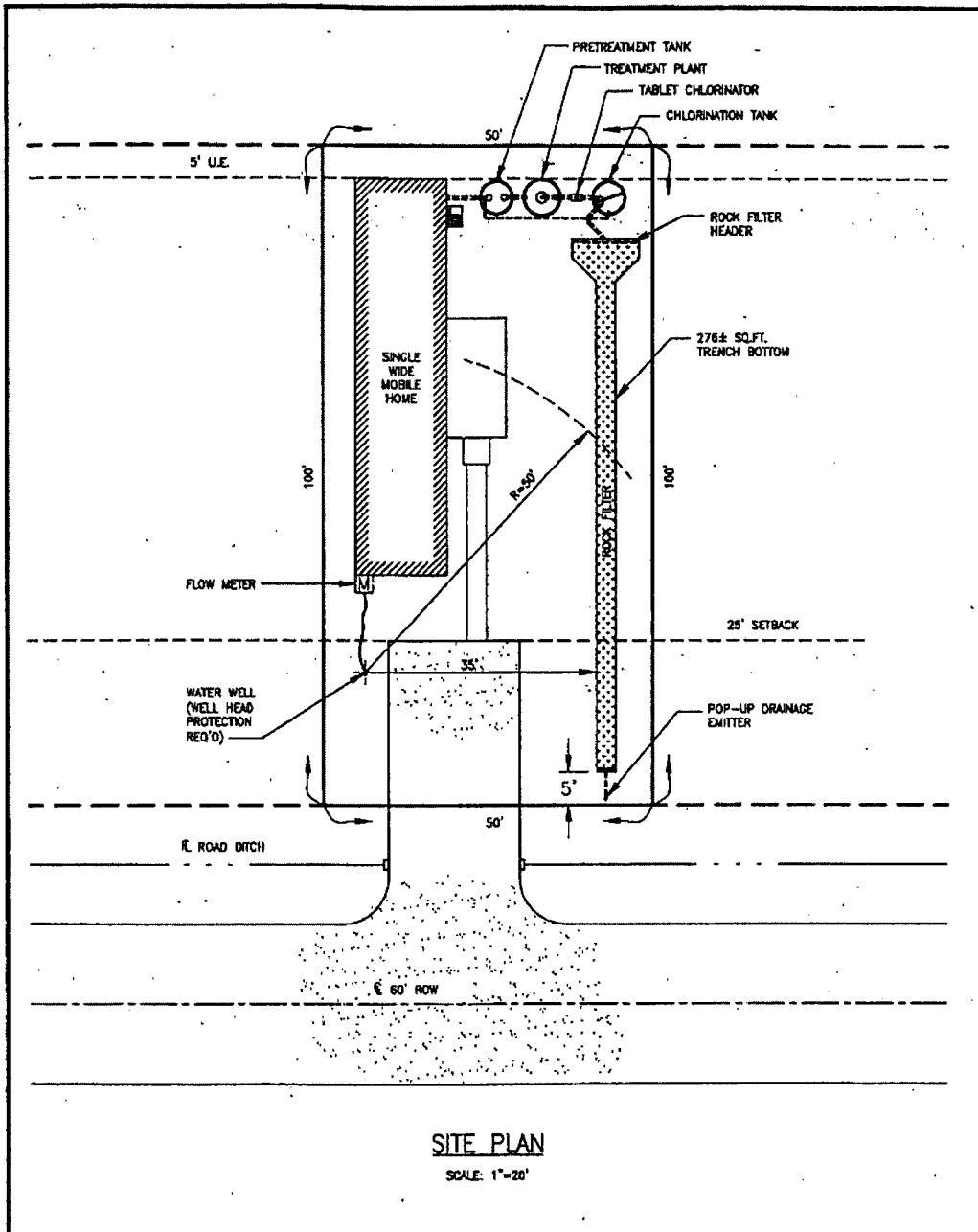
It is proposed that monthly effluent quality sampling be limited to BOD(total) and Fecal Coliform in order to keep operating costs to the homeowner at a more affordable level.

6.0 COST CONSIDERATIONS

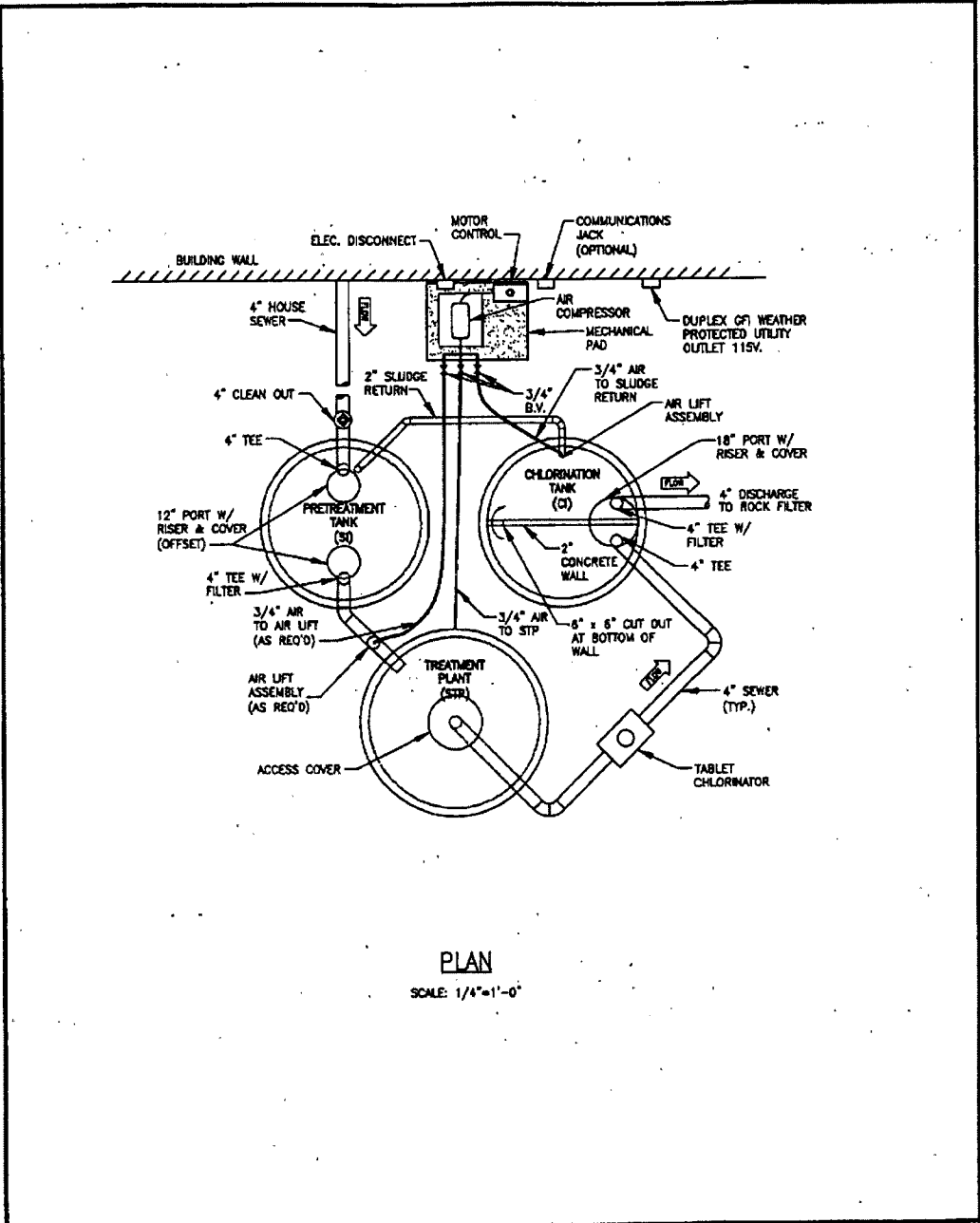
Current costs to install an aerobic spray system in Harris County for a new residence are in the \$4,500 to \$5,000 range. The proposed on-site/discharge process does not have an irrigation system, but will have the additional rock filter trench to install. Since the proposed systems will replace existing failed systems where space may be extremely limited and some demolition may be required, the estimated cost of installing an on-site/discharge treatment system is \$6,000 to \$10,000 per home.

Monthly operating costs are expected to run \$35 to \$40 per unit, which is about twice the cost of a monthly municipal sewer bill.





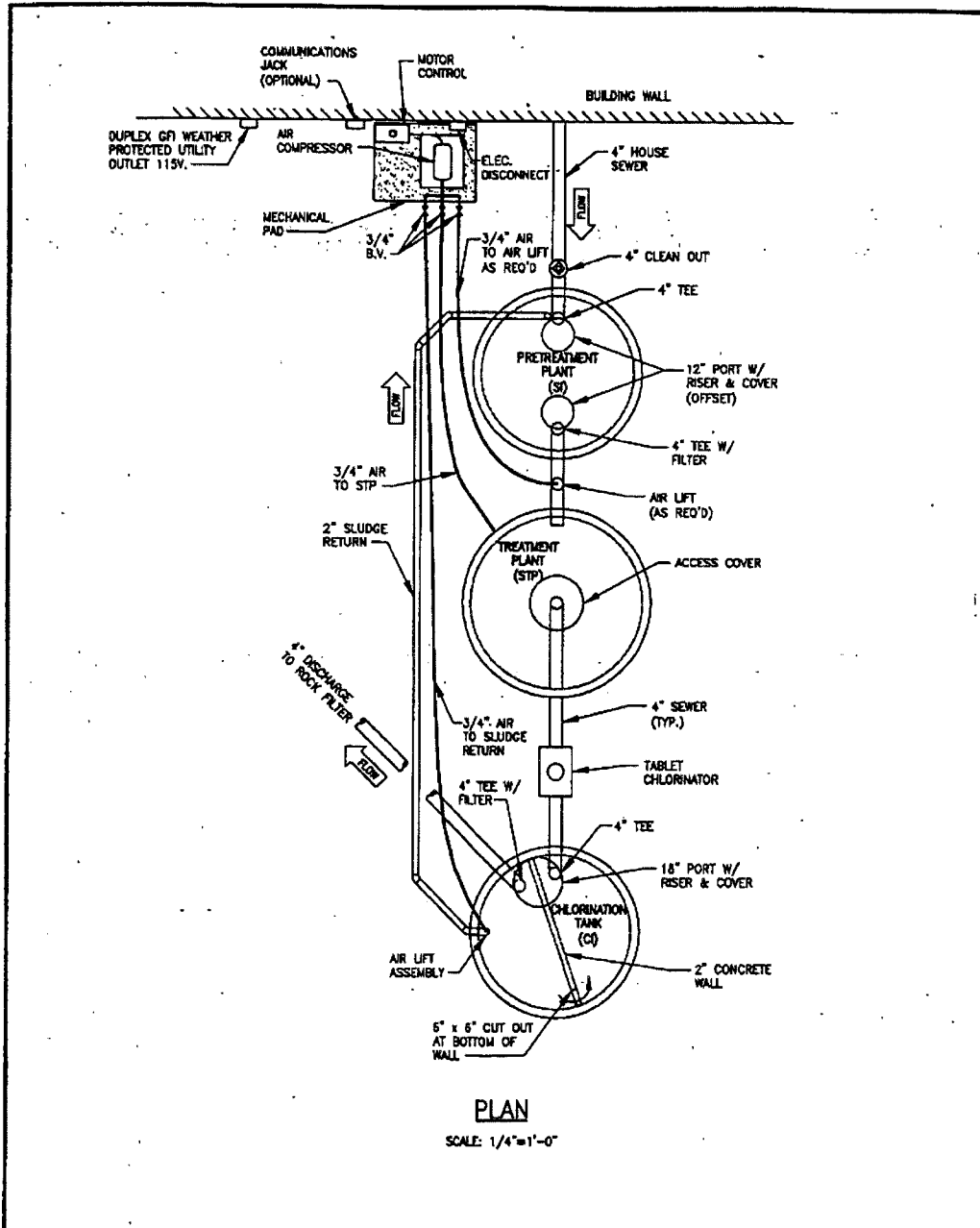
WASTEWATER TREATMENT SYSTEM - SINGLE WIDE MOBILE HOME					SHEET:
DRAWN BY: SCT	DESIGN BY: DRY	CHECKED BY: RC	DATE: 09/12/00	JOB NO.: 4009.1	2
					OF
					6



PLAN

SCALE: 1/4"=1'-0"

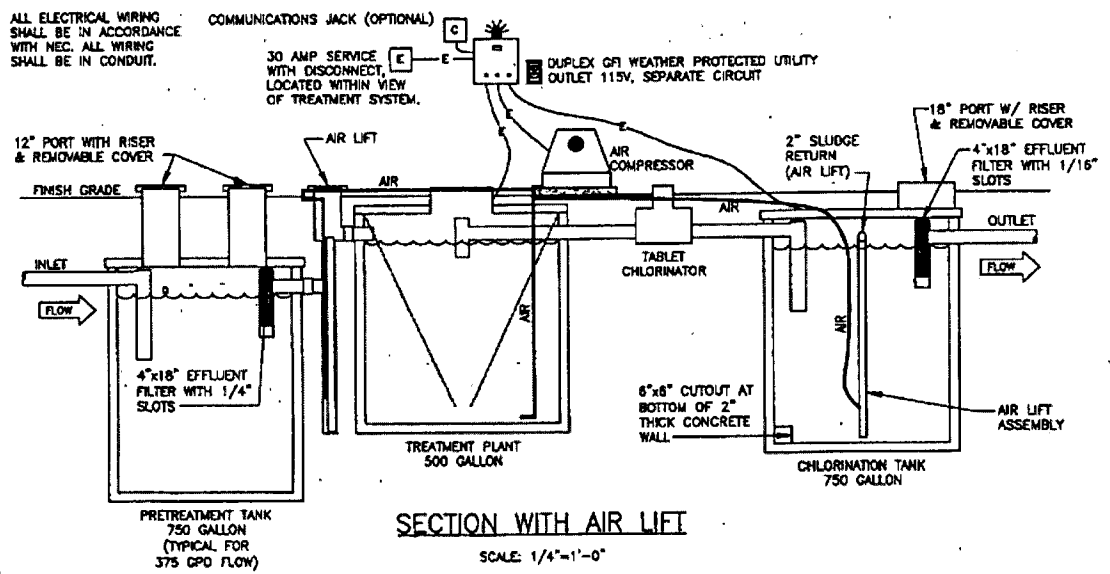
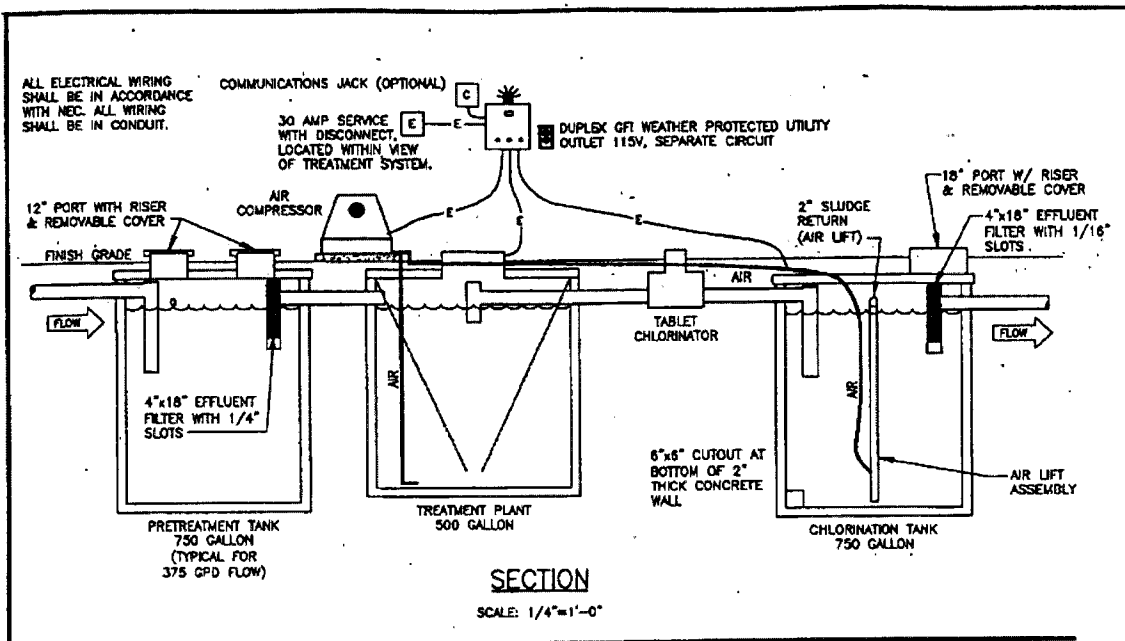
WASTEWATER TREATMENT SYSTEM PLAN - OPTION 1					SHEET: 3 OF 6
DRAWN BY: SCT	DESIGN BY: DRY	CHECKED BY: RC	DATE: 09/12/00	JOB NO.: 4009.1	



PLAN

SCALE: 1/4"=1'-0"

WASTEWATER TREATMENT SYSTEM PLAN - OPTION 2					SHEET: 4 OF 6
DRAWN BY: SCT	DESIGN BY: DRY	CHECKED BY: RC	DATE: 09/12/00	JOB NO.: 4009.1	



WASTEWATER TREATMENT SYSTEM SECTION

SHEET:
5
OF
6

DRAWN BY: SCT	DESIGN BY: DRY	CHECKED BY: RC	DATE: 09/12/00	JOB NO.: 4009.1
---------------	----------------	----------------	----------------	-----------------

