Adopted: August 10, 2005
Revised and Re-adopted: April 12, 2006

Two Total Maximum Daily Loads for Total Dissolved Solids and Chlorides in Clear Creek above Tidal

For Segment 1102

Prepared by the:
Chief Engineer's Office, Water Programs, TMDL Section

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

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Total Maximum Daily Load Program
Texas Commission on Environmental Quality
MC-203
P.O. Box 13087
Austin, Texas 78711-3087

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Two Total Maximum Daily Loads for Total Dissolved Solids and Chlorides in Clear Creek above Tidal

Executive Summary

This document describes a project developed to address water quality impairments related to elevated levels of chloride and total dissolved solids (TDS) in Clear Creek above Tidal (Segment 1102). Clear Creek above Tidal is a freshwater, third order stream approximately 24.5 miles long, with a 115-square-mile contributing watershed. The creek originates in the eastern portion of Fort Bend County and flows east to become the boundary of Harris and Brazoria Counties, and then of Harris and Galveston Counties, before entering the tidal portion of Clear Creek. Uses were identified as impaired during the 2002 305(b) assessment process, when the average ambient TDS and chloride values were identified as being above established criteria.

In response, the Texas Commission on Environmental Quality initiated a project to identify potential sources of the elevated salts and to quantify appropriate reductions necessary to comply with established water quality standards. Potential sources and/or causes included drought conditions, geologic formations, oil exploration activities, suburban development, and wastewater discharge.

Field investigations conducted during periods of low flow identified a discharge from a sand mining operation with significantly high levels of TDS and chlorides in the upper reaches of the watershed. This source appears to represent the single most significant contribution to the observed impairment. Based upon the existing allocations, compliance with the water quality standards would require reductions of 51% and 43% for chlorides and TDS respectively. Controlling the discharge from the sand mining operation will result in ambient levels of chlorides and TDS that comply with existing criteria.

Introduction

Section 303(d) of the federal Clean Water Act requires all states to identify waters that do not meet, or are not expected to meet, applicable water quality standards. For each listed water body that does not meet a standard, states must develop a total maximum daily load (TMDL) for each pollutant that has been identified as contributing to the impairment of water quality in that water body. The Texas Commission on Environmental Quality (TCEQ) is responsible for ensuring that TMDLs are developed for impaired surface waters in Texas.

In simple terms, a TMDL is a quantitative plan that determines the amount of a particular pollutant that a water body can receive and still meet its applicable water quality standards. In other words, TMDLs are the best possible estimates of the assimilative capacity of the water body for a pollutant under consideration. A TMDL is commonly expressed as a load, with units of mass per time period, but may be expressed in other ways. TMDLs must also estimate how much the pollutant load needs to be reduced from current levels in order to achieve water quality standards.

The TMDL Program, a major component of Texas' statewide watershed management approach, addresses impaired or threatened streams, reservoirs, lakes, bays, and estuaries (water bodies) in or bordering the state of Texas. The primary objective of the TMDL Program is to restore and maintain the beneficial uses (such as drinking water, recreation, support of aquatic life, or fishing) of impaired or threatened water bodies.

This TMDL will address impairments to general water quality uses due to elevated levels of total dissolved solids (TDS) and chlorides in Clear Creek above Tidal.

Section 303(d) of the Clean Water Act and the U.S. Environmental Protection Agency's (EPA) implementing regulations (40 Code of Federal Regulations, Part 130) describe the statutory and regulatory requirements for acceptable TMDLs. The TCEQ guidance document, *Developing Total Maximum Daily Load Projects in Texas* (GI-250), further refines the process for Texas. Following these guidelines, this TMDL document describes six elements which are summarized in the following sections:

- Problem Definition
- Endpoint Identification
- Source Analysis
- Linkage Between Sources and Receiving Waters
- Margin of Safety
- Pollutant Load Allocation

This document describes the procedures followed by the TCEQ to assure water is of sufficient quality to protect and maintain existing uses in water bodies of the state, and includes descriptions of permitting procedures for impaired water bodies and in water bodies for which a TMDL has been adopted.

For water bodies where a TMDL has been adopted, the TCEQ will issue only permits, including storm water permits, that are consistent with the load allocation specified in the TMDL document.

TMDL Preparation

These TMDLs were prepared by:

- the TMDL Section, Water Programs of the Chief Engineer's Office, TCEQ.

Significant assistance was provided by:

- the Region 12 Surface Water Quality Monitoring Program, Field Operations Division of the Office of Compliance and Enforcement, TCEQ.

These TMDLs were originally adopted by the commission on August 10, 2005. Subsequently, the document was revised to correct errors in the original version. The revised TMDLs were adopted on April 12, 2006. Upon EPA approval, the TMDLs will become an update to the state's Water Quality Management Plan.

Background Information

Clear Creek above Tidal is identified as Segment 1102 in the *Texas Surface Water Quality Standards* (TCEQ 2000). This water body is a suburban, freshwater stream located in the southernmost portion of the city of Houston, Texas. This is an area which has undergone significant changes in the previous 10 years due to development around Houston. Historically, this has been a predominantly rural area influenced by agriculture and oil exploration activities. More recently, the construction of Beltway 8 has resulted in an increased amount of development and residential land uses.

Clear Creek above Tidal is a third order stream with a 24.5 mile reach and a 115-square-mile watershed (Figure 1). The creek originates in the eastern portion of Fort Bend County and flows east to become the boundary of Harris and Brazoria Counties, and then of Harris and Galveston Counties, before entering the tidal portion of Clear Creek. Land use based upon 2002 coverages indicates a primarily developed watershed with additional agriculture uses and woody land types (Figure 2). The cities of Houston, Pearland, Brookside Village, and Friendswood are located within this watershed.

Problem Definition

Clear Creek above Tidal was placed on Texas's 303(d) List in 2002 (TCEQ, 2002) because average chloride and total dissolved solids (TDS) concentrations exceeded the segment's standard of 200 milligrams per liter (mg/L), and 600 mg/L, respectively (Table 1). In the mid to late 1990s, levels of dissolved salts in the creek increased dramatically (Figure 3) and remain elevated as compared to established criteria. The cause of this dramatic increase was unclear, and could be attributed to several factors, including drought, petroleum industry activities, ongoing highway development in the area, or new discharges in the watershed.

Water Quality Standards and Designated Uses

Clear Creek above Tidal is a classified Water Quality Segment of the State of Texas with designated uses of contact recreation and high aquatic life. Appendix A of the Texas Water Quality Standards (Title 30 Texas Administrative Code Chapter 307) includes chloride and TDS criteria to protect these uses since this water body is considered a freshwater segment.

State anti-degradation policy states that "existing uses and water quality sufficient to protect those existing uses will be maintained" (30 TAC 307.5(b)(1)). Additional guidance on TCEQ's anti-degradation policy can be found in the document titled "Procedures to Implement the Texas Surface Water Quality Standards" (TNRCC 2003.)

In response to the identification of this impairment, the TCEQ initiated a project to identify the sources of dissolved salts in the watershed. The objectives of the Clear Creek TMDL project are to characterize the sources of chloride and TDS to the creek from the watershed and to identify water quality targets necessary to restore and maintain beneficial uses in the creek. The project was accomplished by TMDL Program staff with the assistance of TCEQ personnel in the Houston region (Region 12)

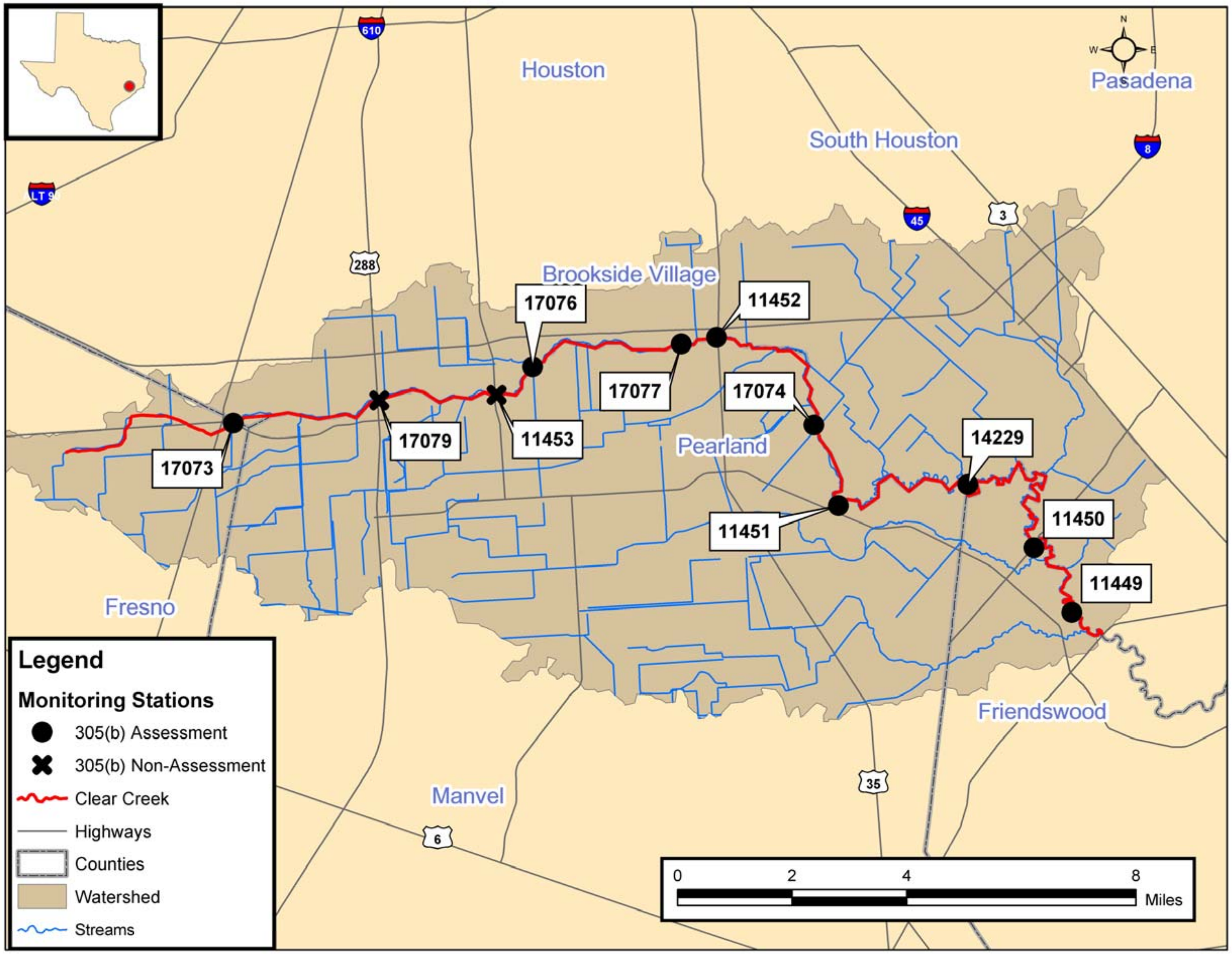


Figure 1. Study Area

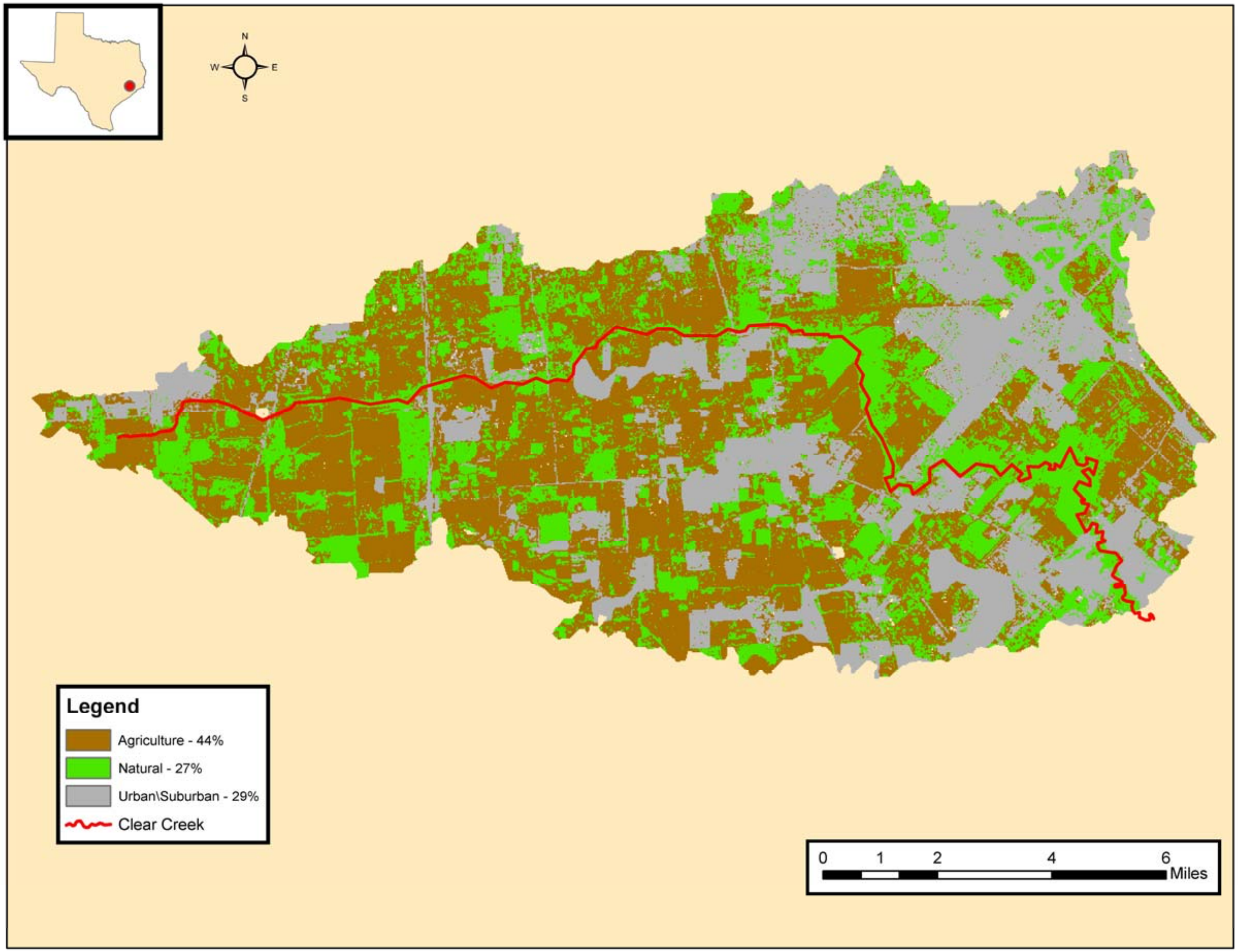


Figure 2. Land Use of Clear Creek Watershed

Table 1. 2002 Assessment Data

Use	Parameter	Number of Samples	Average (mg\L)	Water Quality Standard (mg\L)
General	Chloride	33	361.6	200
General	TDS	195	1055.4	600

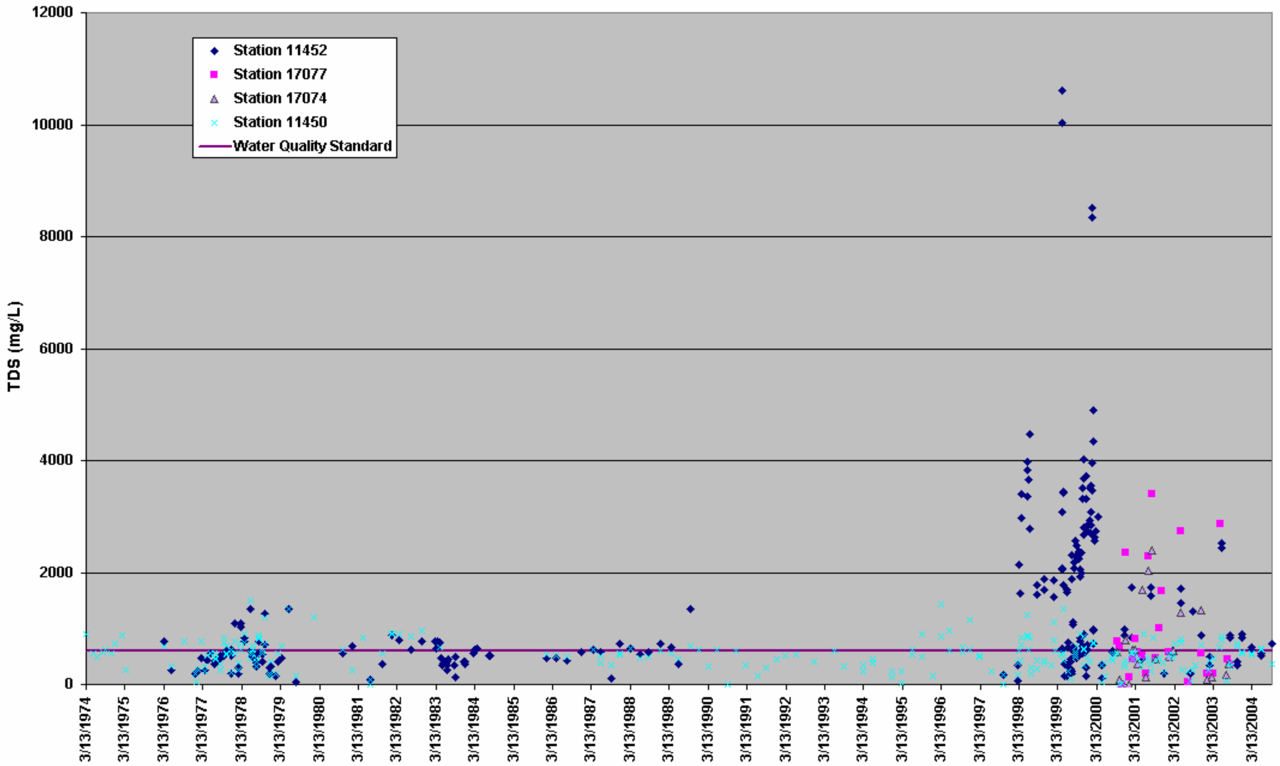


Figure 3. Historic Levels of TDS in Clear Creek, 1974-2004

Endpoint Identification

The *Texas Surface Water Quality Standards* (TSWQS) are rules developed by the TCEQ that establish goals for water quality throughout the state and provide a basis on which regulatory programs may be carried out. Four categories are defined by the TCEQ to describe the way that water bodies in the state are used. These include aquatic life use, contact recreation, fish consumption, and public water supply. Each use category is associated with a suite of standards and criteria developed to protect the continued use of each water body in the state. The specific designated uses assigned to Clear Creek above Tidal include high aquatic life use, contact recreation, and public water supply.

The desirable site-specific conditions to support designated uses contained within the TSWQS are described by numeric and narrative criteria. Statewide criteria are applied to each segment unless the results of targeted studies support the development of segment-specific criteria. Segment-specific criteria may be either more or less restrictive than statewide criteria, depending on the natural conditions of the water body and the contributing watershed. Segment-specific standards for chloride and TDS have been assigned to

Clear Creek above Tidal based upon ambient conditions within the region. The numeric criteria for this creek are 200 mg/L for chloride and 600 mg/L for TDS (TCEQ, 2000). These criteria are intended to protect the high aquatic life use as designated in Appendix A of the Texas Water Quality Standards. It should be noted that these criteria are expressed as maximum annual averages for this segment.

All TMDL projects must identify a quantifiable water quality target for each constituent appearing on the CWA Section 303(d) list. For the Clear Creek above Tidal TMDL, the water quality targets are readily available from the criteria published in the TSWQS. This TMDL is designed to achieve and maintain the current segment-specific standards for chloride and TDS, *i.e.*, 200 and 600 mg/L respectively.

Source Analysis

Elevated levels of TDS and chlorides could result from several sources related to anthropogenic activities and/or environmental conditions within this watershed.

Drought (Natural Background)

This region of the country has experienced drought conditions at various periods throughout the past 50 years. Rainfall data from Houston Hobby Airport indicates typical cycles of dry and wet conditions throughout the 51-year period of record (Figure 4).

Drought conditions during the late 1990s correspond to the elevations of TDS and chlorides identified by the water quality data. Drought conditions during the late 1980s, however, did not result in similar elevations of dissolved salts. This would indicate that drought could not be solely responsible for the observed levels and that there is likely another source within the watershed.

Geology (Natural Background)

The geologic composition of the watershed land surface consists of unconsolidated clays, clay shales, and poorly-cemented sands extending to depths of several miles. The region's geology developed over time by means of sedimentation and stratification processes. The sediments consist of a series of sands and clays deposited on decaying organic matter that, over time, was transformed into oil and natural gas. Beneath these tiers is a water-deposited layer of halite, a rock salt. Over time, the porous layers were compressed and forced upward, dragging surrounding salt sediments into dome shapes, often trapping oil and gas that seeped from the surrounding porous sands. Salt formations of this type have the potential to impact surface water quality in cases where the overlying sediment layers are disturbed (TSHA, 2003).

Oil Exploration (Nonpoint source)

This area has experienced significant levels of oil exploration and development throughout the 20th century. Much of this activity is related to the geologic properties and the presence of salt dome formations. This area is within the Frio Deep-Seated Salt Dome fields which lie south and southeast of Houston in Brazoria, Fort Bend, Harris, Galveston, and Chambers counties along the Texas coast. The most efficient extraction mechanism in this area was the development of a large number of individual oil fields. The combined production of these fields represented the highest levels of any oil-producing

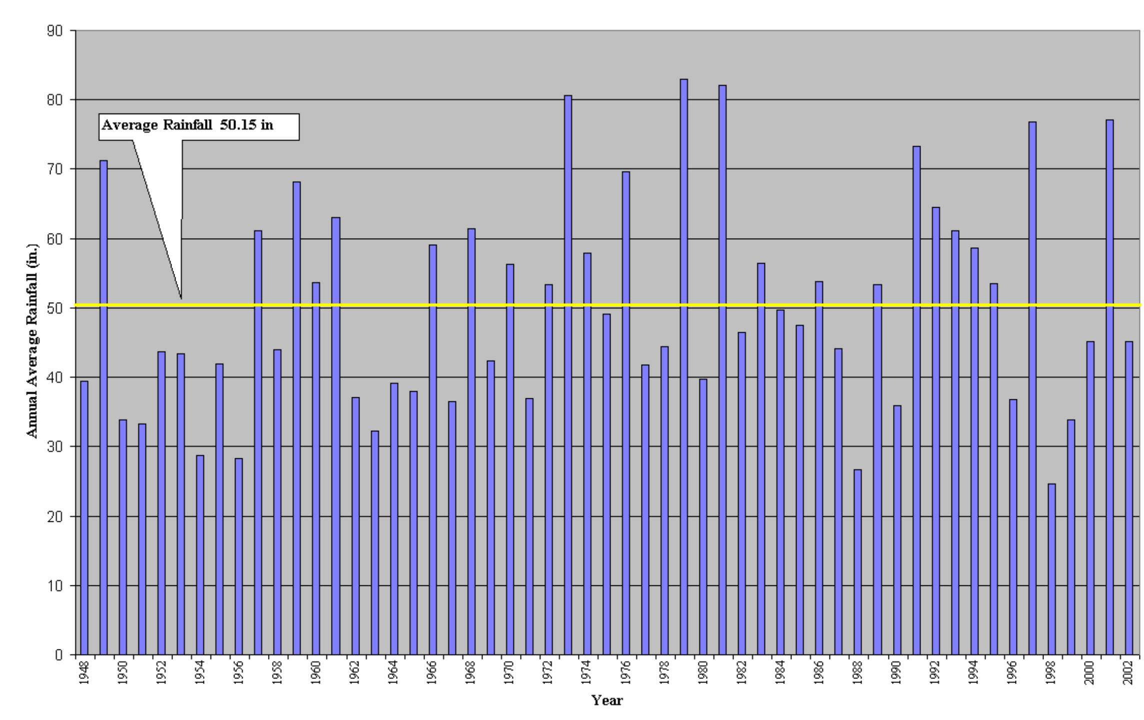


Figure 4. Houston Hobby Airport Annual Precipitation, 1948-2002

formation in southeast Texas. Much of this activity occurred prior to 1960; however, exploration activities continued in many insignificant fields into the 1980s (TSHA, 2003).

As a result of these activities and the supporting industry, there is significant potential for introductions of salt to the surface water. Dissolved salts in the form of brine water are often associated with oil deposits found deep underground and are a byproduct of extraction. The extraction process requires the disposal of this water as waste after the oil has been removed from the ground. This can be done by means of a treatment process whereby water is then discharged back to the environment, or the brine can be simply pumped back into the ground. Thus, abandoned brine disposal wells which have been improperly contained have the potential to contribute brine to nearby surface waters. All activities related to oil and gas exploration are regulated by the Railroad Commission of Texas.

Development (Nonpoint source)

The Houston-Galveston-Brazoria Metropolitan Area experienced significant population growth during the 1990s. The Clear Creek watershed was directly affected by this growth due to intense residential, commercial, and infrastructure development. A major manifestation of this development was the construction of the southern part of Beltway 8 through the northern portion of this watershed. Construction activities related to this project had the potential to affect levels of dissolved salts in Clear Creek due to the geologic composition and proximity within the watershed.

Wastewater Permits (Point Source)

Another developmental pressure on the water quality in Clear Creek would be an increase in either the amount or number of wastewater discharges. An inventory of permitted wastewater facilities is presented in Figure 5. Effluent reporting requirements do not track dissolved salts in detail; consequently, information concerning levels of dissolved salts in discharges is limited. The majority of the discharges in this area consist of municipal effluents which, in areas with low hardness waters, do not normally contain elevated levels of dissolved solids. Therefore, it is not anticipated that levels of dissolved salts would be elevated in these discharges. Neither of the two industrial outfalls in the watershed occurs in the areas exhibiting elevated levels of dissolved salts, which would indicate that these outfalls were unlikely sources for the elevated levels of TDS and chloride.

Linkage Between Sources and Receiving Waters

Levels of dissolved salts in Clear Creek have the potential to be influenced by many factors associated with physical, geologic, chemical, and anthropogenic processes within the watershed. This TMDL employs a simplistic empirical approach to allocating loads to point and nonpoint contributors. This approach analyzes trends (spatial and temporal) and statistics related to dissolved solids to determine how the sources are related to the observed levels in the receiving water.

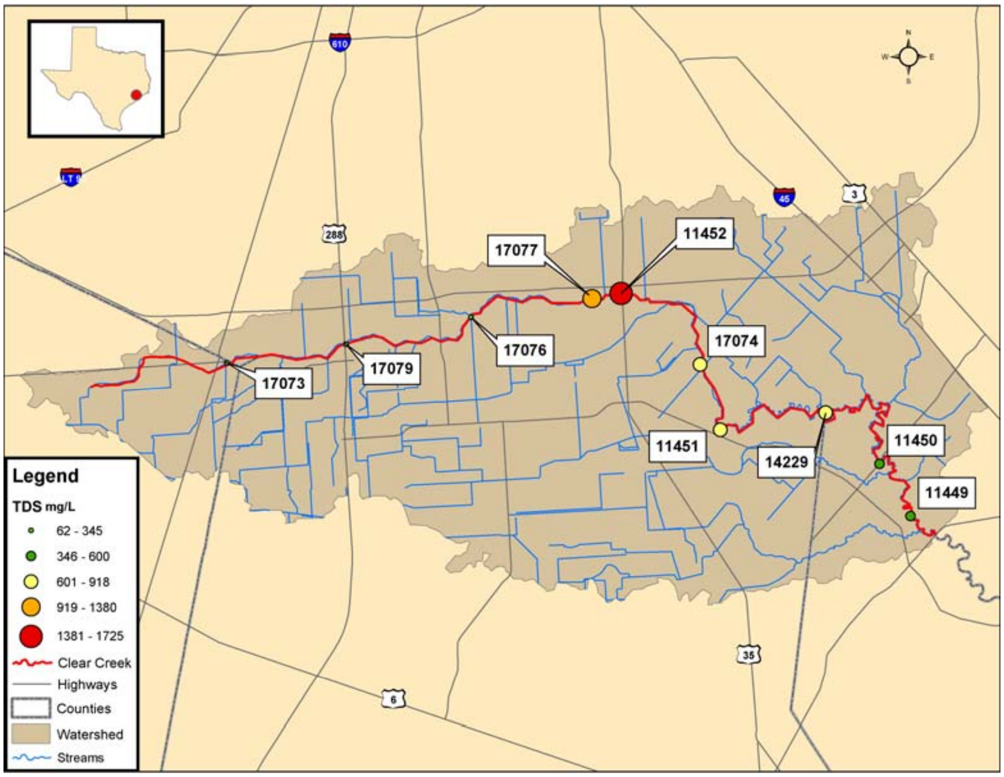
Seasonality

Seasonal variability has a pronounced effect on levels of TDS and chloride levels in Clear Creek. During dry periods of the year (low flows) levels of dissolved salts will generally be highest while during periods of higher flows levels will be lower. Ambient contaminant levels peaked in 1999 and 2000, which reflect periods of significant drought for this area. Seasonal variation is considered in the assessment process since attainment of the water quality standard is evaluated by comparison of the criteria to the long term average of the ambient data.

Spatial Analysis

An evaluation of the spatial extent of the elevated levels of TDS allows for a preliminary identification of potential sources. An analysis of this type determines if the problem is localized, or spread throughout the entire water body. Average TDS values for each station, representing historic data from March 1, 1996 through September 1, 2004, are presented in Figure 6. This appears to indicate that elevated pollutant levels are due to a localized event and/or source immediately upstream of State Highway 35. Levels of TDS are higher than the established water quality standard at stations 17077, 11452, 17074, 11451, and 14229.

Another aspect of the spatial analysis was the identification of specific geologic features associated with the area observed to have elevated levels of TDS. Figure 7 illustrates the location of the Mykawa Salt Dome feature previously discussed. The salt dome is situated in this watershed immediately upstream of the impaired reach.



ID	Permit Number	Permittee	WLA (lbs\day)	
			TDS	Chloride
1	WQ0001910-000	TEXAS GENCO LP	97.01	15.11
2	WQ0003593-000	SYNTECH CHEMICALS INC	0.00	0.00
3	WQ0010134-002	CITY OF PEARLAND	10032.31	1913.19
4	WQ0010134-005	CITY OF PEARLAND	0.00	0.00
5	WQ0010134-007	CITY OF PEARLAND	7981.52	1306.66
6	WQ0010134-007	CITY OF PEARLAND	0.00	0.00
7	WQ0010134-008	CITY OF PEARLAND	0.00	0.00
8	WQ0010134-009	CITY OF PEARLAND	0.00	0.00
9	WQ0010134-010	CITY OF PEARLAND	10939.60	2246.23
10	WQ0010134-010	CITY OF PEARLAND	11789.20	2107.01
11	WQ0010495-075	CITY OF HOUSTON	2391.71	438.63
12	WQ0010495-079	CITY OF HOUSTON	5947.60	1962.62
13	WQ0012295-001	BRAZORIA COUNTY MUD 5	4.88	0.74
14	WQ0012332-001	BRAZORIA COUNTY MUD 1	0.00	0.00
15	WQ0012680-001	KORENEK ALBERT H	360.20	60.92
16	WQ0012849-001	CMH PARKS INC	0.00	0.00
17	WQ0012939-001	HARRIS COUNTY WCID 89	0.00	0.00
18	WQ0013307-001	MARTIN PEYTON	0.00	0.00
19	WQ0013784-001	BRAZORIA COUNTY MUD 6	37.07	4.66
20	WQ0013864-001	CELL-U-FOAM CORPORATION	0.00	0.00
21	WQ0013865-001	TIKI LEASING COMPANY LTD	361.99	75.75
22	WQ0014050-001	NORMAN CLAUDE AND NORMAN DIA	0.00	0.00
23	WQ0014135-001	BRAZORIA COUNTY MUD 19	141.02	30.96
24	WQ0014160-001	HARVARD ESTATES LTD	97.01	15.11
25	WQ0012822-001	WALKER WATER WORKS INC	0.00	0.00

Figure 5. TCEQ Permitted Wastewater Facilities

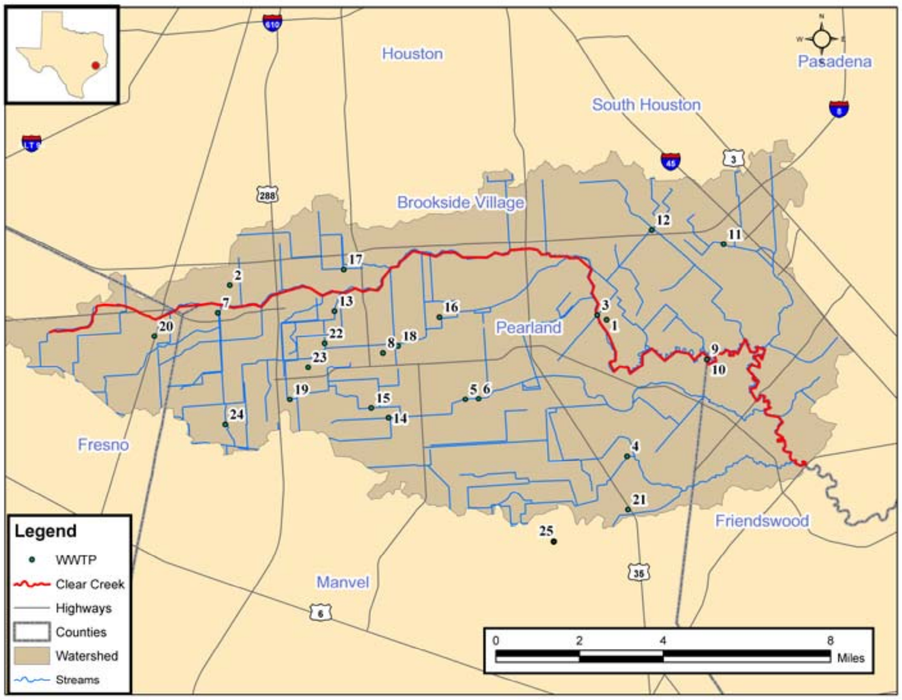


Figure 6. Average TDS Concentrations in Clear Creek

Load Duration Analysis

Due to the simplicity of the sources, an empirical approach (as opposed to a mechanistic one) was considered to be the most appropriate means to proceed with categorizing the sources responsible for the observed levels of TDS. A method which uses flow frequency distributions to assess flow conditions at the time of the exceedances is a simple way to make initial determinations of broad sources (point or nonpoint) of TDS. For Clear Creek, the focus was on Station 11452 at State Highway 35 since this was where the highest levels were observed, and was where there existed the largest amount of data. The results of this analysis are provided in Figure 8 (data are shown in Attachment D).

Interpretation of these results allow for the general determinations of the source of the TDS based upon flow conditions at the time of the exceedance. Samples which are above the 600 mg/L standard are generally associated with the lower flows (right side of the chart), whereas there are very few samples which are above the standard at higher flows (left side of the chart). Since there are a high proportion of samples which exceed the standard at lower flows, it is likely that elevated levels of TDS and chloride are due to some sort of point source in the vicinity of State Highway 35.

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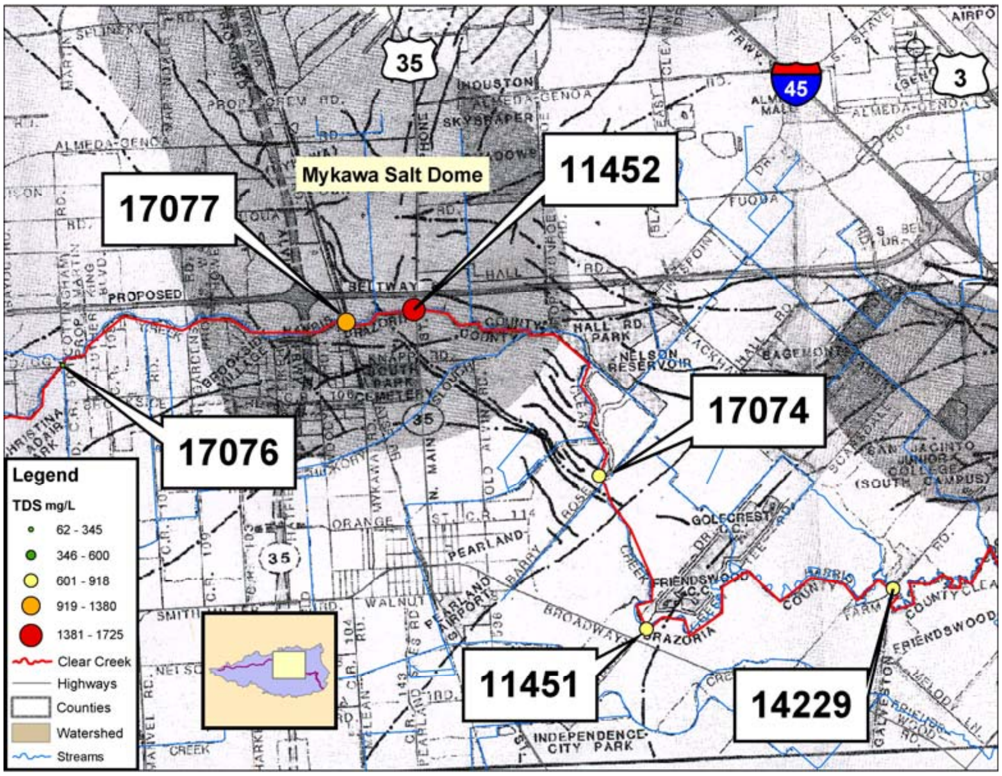

Figure 7. Location of the Mykawa Salt Dome in Relation to Elevated TDS

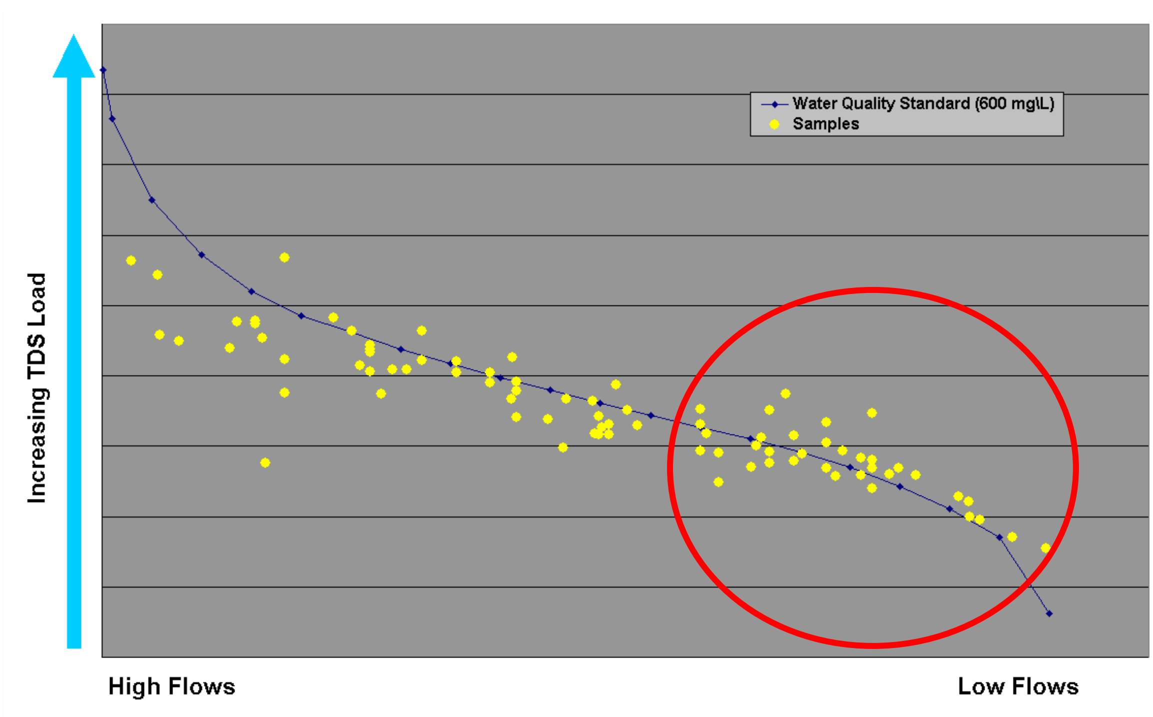

Figure 8. Load Duration Analysis at Station 11452

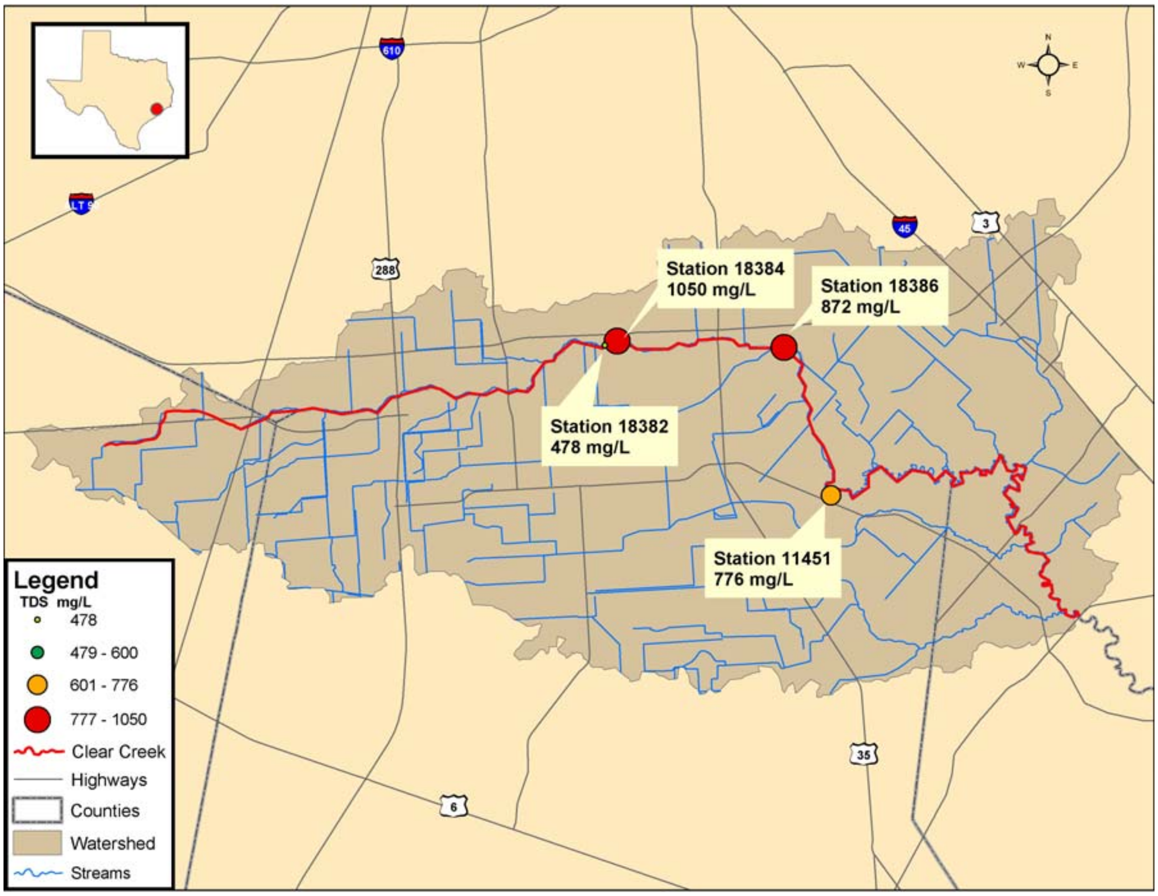

Figure 9. TDS Concentrations from Targeted Sampling Event, July 2004

Targeted Sampling

A targeted data collection effort was initiated to further define the potential point sources which could be responsible for this impairment. Samples were collected at several stations upstream of State Highway 35 on July 15, 2004. There had been no rainfall for more than 10 days prior to this date. Several new stations (18382, 18384, 18386) were included, in addition to the historic stations, in order to increase the level of resolution in the source assessment. Based upon these low flow conditions, it was anticipated that any flow entering the creek should be the result of a specific point source discharge. The sampling sites and resulting TDS values are shown in Figure 9.

One of the purposes of this specific sampling effort, as previously stated, was to identify unknown potential point sources. Since there had been limited rainfall during the time prior to this sampling effort, discharge from small tributaries was expected to be minimal to nonexistent. Any substantial flow to the main body of Clear Creek could be considered a potential source under these conditions. Between stations 18382 and 18384, levels of TDS more than doubled (478 to 1050 mg/L), indicating a potential source in this immediate vicinity.

This area was investigated further to identify possible sources of contamination. During this investigation, a discharge to Clear Creek from a drainage ditch was identified. The conductivity of this discharge was 5734 umhos/cm^3. This was significantly higher than the 793 umhos/cm^3 measured at station 18382 immediately upstream of this discharge, within the main body of Clear Creek. Water samples collected for further TDS and chloride analyses in the tributary to Clear Creek confirm that this discharge was in fact responsible for the elevated TDS and chloride observed (Figure 10 – ID1). The TDS at this point was measured at 3060mg/L.

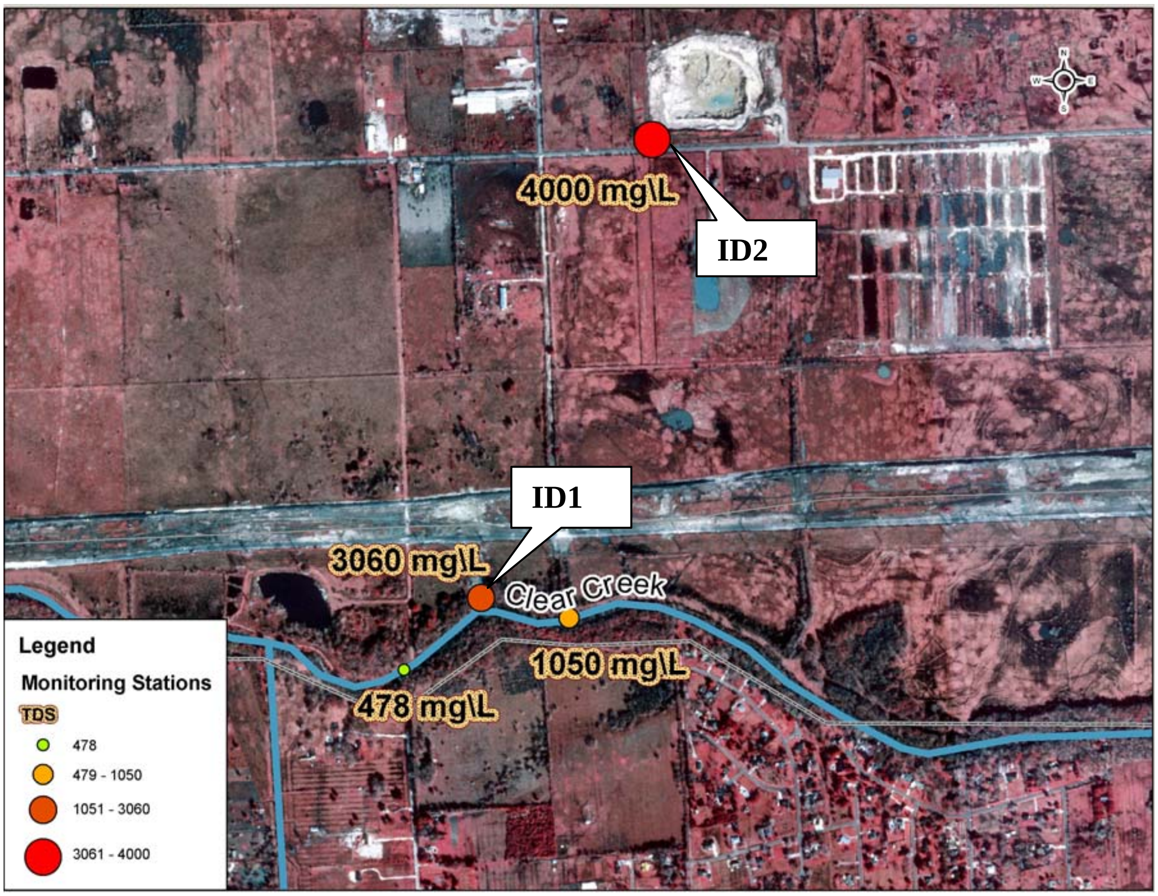

Figure 10. TDS Concentrations from Targeted Sampling Event Near the Location of an Illicit Discharge, July 2004

Due to the dry conditions, it was possible to trace this discharge to a single source several miles upstream (Figure 10 –ID2). At this point, a discharge from a property along Schurmier Road was identified as the source of the elevated levels of TDS (4000 mg/L). Upon further examination, it was discovered that the discharge was water pumped from a pit on the site that was maintained and operated by the Hill Sand Company. Based upon discussions with on-site staff, the sand pit required pumping to prevent groundwater from filling the pit and halting mining operations. Geologic information generated from the spatial analysis locates this operation within the boundaries of the Mykawa Salt Dome.

Margin of Safety

Elevated levels of TDS in Clear Creek were found to be the result of a single source of pollution. As a result, the elimination of this source would allow levels of TDS to return to levels well below the general use criteria of 600 mg/L average TDS and 200 mg/L average chloride. This analysis employs an implicit margin of safety since the load allocation will be calculated based upon critical conditions, which typically represent the highest levels of dissolved salts on an annual basis. As a result, it is expected that ambient long-term chloride and TDS levels calculated as an annual average will be lower than the established criteria.

Implementation and Reasonable Assurance

It is the policy of the TCEQ to develop plans that describe the regulatory and voluntary activities necessary to achieve the pollutant reductions identified in all TMDLs adopted by the TCEQ (TNRCC 1999, TCEQ 2002) and to assure the plans are implemented.

All TMDL projects undertaken by the TCEQ include two components (phases). These phases are: (a) TMDL Development; and (b) TMDL Implementation. During TMDL development, the TCEQ determines the acceptable pollutant load for impaired water bodies and the acceptable load is apportioned among broad categories of pollutant sources in the watershed. This information is summarized in a TMDL report such as this document.

During TMDL implementation, the TCEQ develops the management strategies needed to restore water quality to an impaired water body. This information is summarized in a TMDL Implementation Report (TMDL IP) which references, but is separate from the TMDL document. The TMDL IP Report details load reduction and other mitigation measures planned to restore water quality in an impaired water body. The TCEQ will recommend to EPA Region 6, to continue monitoring the chloride and TDS levels in Clear Creek following elimination of the unauthorized discharge. This additional data would be collected to determine attainment of water quality standards.

This approach provides reasonable assurances that the regulatory and voluntary activities necessary to achieve the pollutant reductions identified will be implemented.

Public Participation

The public and stakeholder participation process in TMDL development is described in detail in the TCEQ general information document entitled *Developing Total Maximum Daily Load Projects in Texas: A Guide for Lead Organizations* (GI-250, June, 1999).

Because of the simplicity of the sources of contamination and the geographically limited extent of contamination, public and stakeholder participation in the TMDL for TDS and chloride was limited to a 30-day comment period followed by a public meeting to accept oral comments. The draft TMDL document is available over the Web along with a summary of the response to comments and the modifications made to the document as a result of the public comment process.

More information about public participation in TMDL development and implementation can be found on the Web at: <www.tceq.state.tx.us/implementation/water/tmdl/tmdlresources.html>.

Pollutant Load Allocation

Removal or reduction of the Hill Sand Company's discharge to Clear Creek is expected to reduce chloride and TDS levels below the average criteria specified in the TSWQS.

The percent reduction can be developed using the following equation:

TMDL = ΣWLA + ΣLA + MOS

where WLA is the waste load allocation representing contributions from point source discharges, LA is the load allocation representing contributions from nonpoint source discharges, and MOS is the margin of safety.

The current reduction requirements under critical conditions are presented in Table 2. Data and calculations are provided in Attachment E.

Table 2: TMDL Calculation for Chloride and TDS in Clear Creek above Tidal

	WLA (lbs\day)	+	LA (lbs\day)	+	MOS	=	Existing Total Load (lbs\day)	TMDL (Standard) (lbs\day)	Percent Reduction
Chloride	3677.02		1653.8		0		10874.95	5330.8	51%
TDS	6800.29		9192.2		0		27987.01	15992.5	43%

Since this impairment is due to a single point source discharge, the entire reduction should be taken from the WLA. Based upon calculations using the WLA, existing loadings of chloride and TDS would need to be reduced by at least 51% and 43% respectively to meet the TMDL under critical conditions.

As a result of this TMDL project, the TCEQ initiated an investigation of the Hill Sand Company (Attachment 1). This investigation determined that the discharge from the property was in violation of the Multi Sector General Permit (MSGP) #TXR050000, Part II, Section B.6, which addresses compliance with water quality standards. Representatives from the Hill Sand Company requested (Attachment 2), and were granted, a six month extension (Attachment 3) to develop a compliance plan which will include one of the following: an individual TPDES Permit, an alternative General Permit, or modification of their existing practices so as not to contribute to a violation of water quality standards. The company provided a plan to the TCEQ at the end of April 2005, however, this plan was reviewed by regional staff and determined to be insufficient. Additional information was requested to by the end of May 2005. Legal representatives of Hill Sand Company responded to this request with an evaluation which opposed the State's position that this discharge represents a violation of Texas law. The TCEQ is currently in the process of enforcement action against this discharge.

References

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Attachment A.
TCEQ Investigation Report, Hill Sand Company

STW/TXR05M185/72604

Texas Commission on Environmental Quality
Investigation Report

HILL SAND COMPANY INC

COPY

HOUSTON SAND PIT

RN103872164

Investigation # 340317

Investigator: JAMES RICE

Incident #

Site Classification
MULTISECTOR GENERAL PERMIT FOR INDUSTRIAL WW

Conducted: 11/04/2004 -- 11/04/2004
Program(s): STORMWATER

No Industry Code Assigned

Investigation Type : Compliance Invest File Review

Location :

Additional ID(s) : TXR05M185

Address: 6265 SCHURMIER RD; HOUSTON, TX 77048

Activity Type : SWFRR

Principal(s) :

Role	Name
RESPONDENT	HILL SAND COMPANY INC

Contact(s) :

Role	Title	Name	Phone	
Regulated Entity Contact	PRESIDENT	MR ARDEN HILL III	Work	(281) 482-1213

Other Staff Member(s) :

Role	Name
QA REVIEWER	RUSTY EVELO
SUPERVISOR	JOHN WARD

Associated Check List

Checklist Name	Unit Name
WQ GENERIC VIOLATIONS	generic00185

Investigation Comments :

STORMWATER MULTISECTOR GENERAL PERMIT FOR INDUSTRIAL WW

This is a sand mining operation. The facility SIC Code is 1442 and it is in Sector J. Sand is dug from a pit and loaded into the companies own dump trucks for transport to construction sites in the Houston Area In addition, much of the sand from this pit is sold to a stabilized sand plant, owned by Hallett Materials, that shares part of the same site. The facility does have a storm water permit. The facility discharges regularly. The primary sources of discharge from the sand pit are accumulated storm water and ground water seepage. The facility has in place some pollution prevention techniques. The water from the sand pit is pumped into an inactive sand pit, then to an onsite ditch, then to the roadside ditch along Schurmier Rd just West of Mykawa Rd.

This inspection was performed in response to a request from the Total Maximum Daily Load (TMDL) Team in the Austin Central Office of the TCEQ. Sampling done as part of a TMDL study of Clear Creek Above Tidal (Segment 1102) revealed elevated Total Dissolved Solids (TDS) levels. The elevated TDS was traced to a discharge from the Hill Sand Houston Pit.

ALLEGED NONCOMPLIANCES NOTED AND RESOLVED

Track No: 179638 **Resolution Date: 11/4/04**

PERMIT MSGP TXR050000, Section B (6)

Alleged Violation:

Investigation: 333467 Comment Date: 09/14/2004

Failure to meet the requirements of Permit TXR050000, Permit Applicability and Coverage, Limitations on Permit Coverage. The Permit, in section B. 6. Compliance with Water Quality Standards states, "Discharges that would cause or contribute to a violation of water quality standards or that would fail to protect and maintain existing designated uses of receiving waters are not eligible for coverage under this general permit". Samples collected during the site visit made on July 26, 2004 resulted in a Total Dissolved Solids (TDS) value of 4680 mg/L. Clear Creek Above Tidal (Segment 1102) has routinely been above the TDS standard for the segment, which is 600 mg/L. The discharge from the Hill Sand Houston Pit contributes to a violation of the water quality standard for TDS in Segment 1102. Because of the very elevated TDS values of the discharge from the pit, in order to continue to discharge to Segment 1102, Hill Sand must obtain coverage under an individual TPDES Permit or alternative General Permit. Alternatively, Hill Sand may modify their sand mining operation to reduce the discharges of TDS to levels which will not contribute to a violation of the water quality standard for TDS in Segment 1102.

Investigation: 340317 Comment Date: 11/04/2004

See violation description above.

Recommended Corrective Action: Submit a plan to reduce the discharges of TDS or submit a copy of a new permit application.

Resolution: In a letter Dated October 14, 2004, Mr. Trey Hill, President of Hill Sand Company, requested an extension of six months in the compliance date in order for their engineers to complete a review and report regarding the plan to resolve the problems with total dissolved solids at their Houston Sand Pit. This violation is being resolved with a compliance plan more details of which will be submitted after the engineers for Hill Sand complete their studies.

Signed James A Rice **Date** 11/4/04
Environmental Investigator

Signed ____________ **Date** 11/8/04
Supervisor

Attachments: (in order of final report submittal)

___Enforcement Action Request (EAR)
X Letter to Facility (specify type) : NOV
Investigation Report
___Maps, Plans, Sketches
___Photographs
X Correspondence from the facility

___Sample Analysis Results

___Manifests

___NOR

___Other (specify) :

____

____

Attachment B.
Letter from Hill Sand Company to TCEQ

HILL SAND COMPANY, INC.
HILL WASTE SERVICES
DIXIE FARM ROAD LANDFILL
P.O. Box 184 Friendswood, TX 77549-0184 Ph. (281) 482-1213
Fax (281) 482-1266

October 14, 2004

Mr. John R. Ward
Texas Commission on Environmental Quality
Region 12
5425 Polk Avenue, Suite H
Houston, Texas 77023-1486

Re: Notice of Violation for Compliance Evaluation Investigation: Hill Sand Company, Inc., Houston Sand Pit, 6265 Schurmier Road, TNRCC ID No.: TXR05M185

Dear Mr. Ward:

This letter serves as a response to your letter dated September 16, 2004, that details an investigation performed at the above referenced facility by Mr. Jim Rice of TCEQ, Region 12. During Mr Rice's investigation, an alleged violation was noted and documented with respect to the above referenced facility failing to comply with the requirements of Permit No. TXR050000 and specifically exceeding stated water quality requirements contained within this permit.

As a result of Mr. Rice's investigation, I met with Mr. Rice and my duly appointed environmental consultants, Tolunay-Wong Engineers, to discuss the alleged violation and potential corrective actions. At the conclusion of this meeting, I directed Tolunay-Wong Engineers to proceed with a site investigation of the property to assess subsurface conditions and to determine the necessary corrective action to address the alleged violation. Tolunay-Wong Engineers has commenced with their efforts to investigate the Houston Sand Pit, but they have requested additional time to complete their field investigation and summarize their findings in the form of a report.

Therefore, I am hereby requesting that the TCEQ grant a six-month extension to Hill Sand Company to conclude all efforts in addressing the Houston Sand Pit and offering a corrective action to resolve the alleged violation. If you have any questions or need any additional information, please feel free to contact Mr. Harold Barber of Tolunay-Wong Engineers at (713) 722-7064.

Thank you for your time and consideration.

RECEIVED
OCT 18 2004
REGION 12

Sincerely,

Hill Sand Company, Inc.
Hill Waste Services
Dixie Farm Road Landfill

Arden Hill

Arden C. Hill, III
President

cc: Mr. Jim Rice, Texas Commission on Environmental Quality, Region 12

Attachment C.
Letter from TCEQ to the Hill Sand Company

Robert J. Huston, *Chairman*
R. B. "Ralph" Marquez, *Commissioner*
Kathleen Hartnett White, *Commissioner*
Margaret Hoffman, *Executive Director*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

November 12, 2004

CERTIFIED MAIL 7001 2510 0000 8109 4664
RETURN RECEIPT REQUESTED

Trey Hill, President
Hill Sand Company Inc
P O Box 184
Friendswood, TX 77549

Re: Acceptance of Compliance Plan for:
Hill Sand Company Inc, Houston Sand Pit, 6265 Schurmier Rd., TCEQ ID No: TXR05M185

Dear Mr. Hill:

The Texas Commission on Environmental Quality (TCEQ) Houston Region Office has completed a review of the compliance plan that you submitted October 14, 2004 for resolving the alleged violation dealing with the the discharges of total dissolved solids. This alleged violation was noted during the investigation of the above-referenced facility conducted on September 7, 2004. The compliance plan appears to identify necessary corrective action for the alleged violation. We will monitor your progress in implementing the corrective action. You should submit a copy of the report from your engineers to our office by April 15, 2005 demonstrating that the alleged violation has been resolved. Please be advised, though, that if we determine during follow-up monitoring that you are not working towards compliance or the problem has escalated, further enforcement action will be considered.

The Texas Commission on Environmental Quality appreciates your assistance in this matter and anticipates that you will resolve the alleged violation as required in order to protect the State's environment. If you or members of your staff have any questions, please feel free to contact If you or members of your staff have any questions, please feel free to contact Jim Rice in the Houston Region Office at 713/767-3675

Sincerely,

John R. Ward

John R. Ward
Team Leader
Water Quality Management
Region 12 Houston

JRW/JAR/cs

REPLY TO: REGION 12 • 5425 POLK AVE., STE. H • HOUSTON, TEXAS 77023-1486 • 713/767-3500 • FAX 713/767-3520

(Rev. 9/28/00) P.O. Box 13087 • Austin, Texas 78711-3087 • 512/239-1000 • Internet address: www.tceq.state.tx.us

Attachment D.
Load Duration Calculations

**Flow frequency distribution for data from USGS Gage 8077000
for the period from 8/1/44 - 9/4/94**

Data used in the development of the curve representing the water quality standard

Flow (cfs)	Percentile	TDS Standard (600 mg\L) as a load	log TDS Standard (600 mg\L) as a load
1470	0.1	4757080.55	6.68
656.72	1	2125217.65	6.33
173.15	5	560332.31	5.75
71	10	229763.75	5.36
39	15	126208.26	5.10
26	20	84138.84	4.92
20	25	64722.18	4.81
15	30	48541.64	4.69
12	35	38833.31	4.59
9.5	40	30743.04	4.49
7.8	45	25241.65	4.40
6.3	50	20387.49	4.31
5.1	55	16504.16	4.22
4.2	60	13591.66	4.13
3.5	65	11326.38	4.05
2.8	70	9061.11	3.96
2.2	75	7119.44	3.85
1.6	80	5177.77	3.71
1.1	85	3559.72	3.55
0.7	90	2265.28	3.36
0.2	95	647.22	2.81
0	99		
0	100		

Data used for the representation of the individual samples in the load duration curve

Date	TDS (mg\L)	Daily average flow from gage 8077000(cfs)	Percent Flows Exceeding based upon distribution	Loading	log Load
03/11/76	764	0.98	87	4039.29	3.61
05/25/76	257	17	28	23592.56	4.37
12/28/76	185	50	12.8	49861.84	4.70
01/20/77	243	7.4	46.3	9691.67	3.99
02/28/77	475	6.4	49.8	16380.68	4.21
03/29/77	257	30	18.3	41633.94	4.62
04/28/77	431	6.1	50.9	14183.38	4.15
05/24/77	547	3.4	65.7	10030.14	4.00
06/30/77	366	19	25.9	37499.15	4.57
07/13/77	432	15	30.6	34949.98	4.54
08/29/77	512	9	41.6	24853.32	4.40
09/27/77	542	4.2	60.7	12277.80	4.09
10/24/77	609	0.95	87.1	3120.42	3.49
11/30/77	196	156	5.6	164912.13	5.22
12/07/77	518	2.5	72.7	6984.60	3.84
01/09/78	1095	2.5	72.7	14764.75	4.17
02/16/78	308	46	13.6	76415.33	4.88
03/06/78	1036	3.2	67	17880.58	4.25
04/03/78	779	2.5	72.7	10503.87	4.02
05/31/78	609	20	25.1	65693.02	4.82
06/26/78	501	2.9	69.4	7836.24	3.89
07/26/78	380	38	15.4	77882.36	4.89
08/21/78	764	1.5	81.7	6180.97	3.79
09/19/78	529	3.2	67	9130.14	3.96
10/19/78	716	0.58	91.3	2239.82	3.35
11/29/78	304	36	16.1	59026.63	4.77
12/07/78	330	9	41.6	16005.23	4.20
01/24/79	149	30	18.3	24058.68	4.38
02/21/79	402	6.3	50.2	13664.20	4.14
03/27/79	475	18	26.9	46070.67	4.66
05/30/79	1344	30	18.3	217386.46	5.34
08/02/79	40	35	16.4	7564.00	3.88
10/21/80	547	2.1	76.1	6195.09	3.79
01/21/81	692	22	23.2	82085.63	4.91
07/08/81	76	150	5.8	61709.25	4.79
10/22/81	364	7.9	44.8	15530.04	4.19
01/21/82	873	9.1	41.2	42838.87	4.63
04/06/82	786	4.3	60	18227.25	4.26
07/20/82	619	12	35.6	40087.24	4.60
03/09/83	763	2.9	69.4	11934.23	4.08
03/16/83	648	1.8	79	6291.00	3.80
03/22/83	766	1.7	79.9	7023.44	3.85
04/13/83	742	2.3	74.3	9210.48	3.96
05/04/83	461	2	77.3	4972.82	3.70
05/11/83	351	18	26.9	34076.23	4.53
05/18/83	378	3.5	65.1	7135.62	3.85
06/22/83	351	6.5	49.4	12305.31	4.09

Data used for the representation of the individual samples in the load duration curve

Date	TDS (mg\L)	Daily average flow from gage 8077000(cfs)	Percent Flows Exceeding based upon distribution	Loading	log Load
06/29/83	255	4	61.9	5501.39	3.74
06/29/83	416	4	61.9	8974.81	3.95
07/07/83	442	3.2	67	7628.59	3.88
08/31/83	348	6.4	49.8	12012.44	4.08
09/07/83	133	289	3	207310.55	5.32
09/07/83	133	289	3	207310.55	5.32
09/14/83	499	18	26.9	48444.56	4.69
11/29/83	397	4.3	60	9207.27	3.96
12/06/83	405	16	29.2	34949.98	4.54
12/14/83	359	38	15.4	73578.34	4.87
02/29/84	552	7.3	46.6	21733.71	4.34
03/05/84	620	10	38.9	33439.80	4.52
03/28/84	644	3.3	66.2	11462.30	4.06
07/18/84	521	10	38.9	28100.22	4.45
07/31/84	514	12	35.6	33267.20	4.52
01/15/86	475	5.5	53.7	14077.15	4.15
04/16/86	475	2.4	73.6	6142.76	3.79
07/23/86	438	9.2	41.1	21750.65	4.34
12/09/86	585	5.7	52.7	17995.13	4.26
03/27/87	619	4.3	60	14364.60	4.16
06/04/87	583	6.6	49.2	20759.13	4.32
09/17/87	100	104	7.7	56189.14	4.75
12/09/87	725	2.1	76.1	8212.73	3.91
03/14/88	649	2	77.3	7001.47	3.85
06/07/88	540	18	26.9	52468.06	4.72
09/01/88	584	2.8	70.2	8817.84	3.95
12/20/88	735	1.1	85.9	4362.05	3.64
03/28/89	658	0.84	88.1	2979.98	3.47
06/08/89	366	6.1	50.9	12039.20	4.08
09/26/89	1344	0.26	94.7	1884.02	3.28
02/15/00	734	2	77.3	7917.68	3.90
11/29/00	868	14	32.1	65542.00	4.82
02/08/01	840	6	51.6	27183.32	4.43
05/09/01	536	14	32.1	40472.94	4.61
08/09/01	1580	2	77.3	17043.51	4.23
02/20/02	588	9	41.6	28542.48	4.46
05/16/02	1460	3	68.6	23623.60	4.37

Attachment E.
TMDL Calculations

Chloride	Date	Station	Location	Flow (MGD)	Conc (mg\L)	Load (lbs\day)1
LA	7/14/04	18382	Upstream	2.30	86	1653.84
WLA		= TMDL - LA = 5330.86 - 1653.84				3677.02
TMDL(WQS)	7/14/04	18385	Downstream	3.19	200	5330.86
Existing	7/14/04	18384	Downstream	3.19	408	10874.95

TDS	Date	Station	Location	Flow (MGD)	Conc (mg\L)	Load (lbs\day)1
LA	7/14/04	18382	Upstream	2.30	478	9192.28
WLA		= TMDL - LA = 15992 - 9192.28				6800.29
TMDL(WQS)	7/14/04	18384	Downstream	3.19	600	15992.58
Existing	7/14/04	18384	Downstream	3.19	1050	27987.01

	LA	WLA	Standard Load TMDL (WQS)	Existing Load	Percent Reduction2
Chloride	1653.84	3677.02	5330.86	10874.95	51%
TDS	9192.28	6800.29	15992.58	27987.01	43%

1. Calculated as flow(mgd) * Conc (mg\L) * 8.345
2. Calculated as (Exisitng Load - Standard Load) / Existing Load