Original Application – April 15, 1994
Major Document Reorganization – August 26, 2009

TYPE V MUNICIPAL SOLID WASTE FACILITY
TCEQ MSW PERMIT 2234A

APPLICATION PART III – SITE DEVELOPMENT PLAN

FOR

LIQUID ENVIRONMENTAL SOLUTIONS OF TEXAS, LLC

Houston Facility
250 Gellhorn Street
Houston, Texas 77013

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Part III – SITE DEVELOPMENT PLAN
TYPE V PERMIT APPLICATION
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1. Introduction

Liquid Environmental Solutions of Texas, LLC (LES) is in the business of processing non-hazardous liquid wastes. The LES Houston Facility is a de-watering, recycling, and pre-treatment facility. The facility is designed to separate and process the waste streams received into recyclable components, water suitable for discharge into the sanitary sewer system and solid materials for appropriate disposal. The acceptance and processing of such wastes requires a Type V Municipal Solid Waste (MSW) permit.

The purpose of this major permit amendment is to increase the monthly permitted waste receipts from 6 million gallons per month to 8.35 million gallons per month. The basis for this request is included in Attachment SDP-1. Additional changes requested in this permit submittal include changing the name of the Owner/Operator from "Liquid Environmental Solutions of Texas, L.P." to "Liquid Environmental Solutions of Texas, LLC" and replacing the facility boiler. The facility has received a temporary authorization from the Texas Commission on Environmental Quality (TCEQ) regarding the boiler replacement. The new boiler is reflected in Table SDP-4.

The original MSW permit application for Permit 2234A, currently owned and operated by LES, was submitted on April 15, 1994. Since that time, there have been a total of eight revisions to the permit documents which constitute the permit, as indicated in the following Table SDP-1. The Site Operating Plan (SOP) underwent a major reorganization in the November 27, 2006 revision to comply with extensive new regulatory requirements.

Date	Site Development Plan (SDP)	Site Operating Plan (SOP)	Waste Acceptance and Analysis Plan (WAAP)	Permit Edition
4/15/1994	Original	Original (Old)	Original	Original
7/13/1995	-	-	Revision 1	Revision 1
10/13/1995	Revision 1	-	-	Revision 2
6/1/2004	Revision 2	Revision 1	Revision 2	Revision 3
11/1/2005	Revision 3	Revision 2	-	Revision 4
2/1/2006	Revision 4	Revision 3	Revision 3	Revision 5
11/27/2006	-	Original (New)	-	Revision 6
6/28/2007	-	Revision 1	-	Revision 7
5/30/2008	-	Revision 2	Revision 4	Revision 8

Table SDP-1: Revision history for MSW Permit No. 2234A.

The LES Houston facility has been authorized by TCEQ to operate in two phases, with a future phase for biological treatment. Any additional equipment associated with the biological treatment process will be installed consistent with the process described in this permit application. Ninety (90) days prior to installation of the additional equipment, a permit modification request will be prepared in accordance with 30 TAC §305.70 (Municipal Solid Waste Permit and Registration Modifications) and submitted to TCEQ. The modification will be consistent with the currently approved process included in the permit and will include an updated Closure and Post-Closure Plan for the subsequent phase along with associated cost estimates. Financial assurance documentation will also be submitted in

accordance with 30 TAC §37, Subchapter B, to include the additional equipment and amended Closure and Post-Closure costs.

This permit document submittal represents a major reorganization of the previous permit documents. The documents have been reorganized to better align with the corresponding regulatory requirements. Where applicable, regulatory citations are noted. With the concurrence of the TCEQ, these documents are being submitted as clean copies without markups.

Regulatory requirements for Part III of the MSW permit application are presented in Title 30, Texas Administrative Code (TAC), Chapter 330, Section 63.

2. Facility Access (330.63 (b) (1))

The site is enclosed by a minimum 6-foot high chain link fence topped with barbed wire. Truck traffic enters and exits the facility through two open gates as described in Section 9 of Part II of the application. Access gates are shown in the Site Layout Map, included as Attachment II-2 in Part II of the application. During plant operation activities, employees are present to restrict public access to the area.

Lights illuminate the unloading and processing areas at night, and security monitoring and recording by video camera is employed at the office reception area and the unloading areas. Gates at the entrances and exits are secured when the facility is not operational.

3. Flow Diagrams (330.63 (b) (2) (A) and (B))

A process flow diagram for all wastes received at this facility is presented in Figure SDP-1. Wastes received at the facility are off-loaded into one of the following four locations depending upon the waste type:

- grease trap waste receiving pit;
- non-hazardous industrial waste receiving basins;
- high solids (grit trap/septic/lint trap) receiving basins; or
- solidification pits.

Off-site disposal of materials is described in Section 7 of the SOP.

Grease Trap Treatment Process

Grease trap wastes are off-loaded at the grease trap waste treatment area. Trucks offload the grease trap wastes through a coarse screen into a concrete pit. High pressure water hoses are utilized to rinse the offloading area and direct the material through the screen. The waste stream is then routed through one or more vibratory screens. The screened wastewater is then pumped to tanks for phase separation. The wastewater is allowed to phase separate in the holding tanks. The separation time varies depending upon separation characteristics.

Heating elements are used throughout the grease trap treatment process to promote phase separation.

The refined brown grease produced by this process is pumped to the grease recycling tank. The contents of the grease recycling tank are transported off-site as described in Section 7 of the SOP. Wastewater from the separation and storage tanks is routed to the precipitation system in the non-hazardous industrial wastewater treatment process described further in this section. Screenings and solids from the grease trap unloading pit and the vibrating screen are processed through solidification. Sludge from the separation and storage tanks is routed to a sludge conditioning tank in the non-hazardous industrial wastewater treatment process.

Non-Hazardous Industrial Wastewater Treatment Process

Non-hazardous industrial wastes are off-loaded from trucks into the concrete non-hazardous industrial waste receiving basins. Typically, these waste streams are processed through a vibrating screen and empty into a floor sump. Generally, the waste stream is then pumped to storage tanks prior to processing through the precipitation system. Waste streams with high concentrations of free or emulsified oil may be routed from either the unloading basins, the floor sump, or the storage tanks to the oil separation and storage tanks. These tanks are used in series to progressively treat layers of oily wastewater. When emulsified oil is present, heat and/or chemicals may be used to facilitate phase separation as determined through laboratory testing on the specific waste stream. As phase separation occurs in the oil separation and storage tanks, wastewater is routed to the precipitation system. Recovered oil is transferred to the oil recycling tanks prior to off-site transport.

The precipitation system consists of pH adjustment, flash mix (FM), flocculation, and clarification. A two-stage rapid mix process is included for pH adjustment. In the first rapid mix tank, chemicals are used to reduce pH. Chemicals are then added in a second rapid mix tank to raise pH. An in-line system injects flocculant prior to a flash mix tank. The wastewater is then routed through a flocculation tank prior to a clarifier. Clarified water is routed to the settling marsh for final polishing. The settling marsh features channels operating in series. Effluent from the settling marsh can be discharged either continuously or in batch mode to the City of Houston sanitary sewer system. LES regularly samples the wastewater for comparison with effluent discharge limits.

In the event an oil layer or sheen develops in the settling marsh, LES will implement countermeasures to prevent discharges of free-phase oil. Such countermeasures might include using a vacuum truck to remove the floating oil or using an absorbent sock around the discharge point to remove the oil. Recovered free-phase oil is processed through solidification.

Sludge and solids from the floor sump, storage tanks, oil separation and storage tanks and clarifier are routed to a sludge conditioning tank, where slurry may be added. Sludge from this conditioning tank is routed to one or more filter presses. The filter cake may either be hauled off-site directly or transported to solidification for additional dewatering and/or drying. Filtrate from a filter press is routed to the floor sump in the process building. Solids recovered from the industrial waste receiving basins, the vibrating screen, the settling marsh, and the oil recycling tank are processed through solidification.

The facility has previously received permit approval to add biological treatment. With the addition of biological treatment, effluent from the first settling marsh channel would be routed first to an equalization tank, then through an aeration basin, then through a dissolved air flotation (DAF) system, and then be returned to the second settling marsh channel. Air would be added in the aeration basin, along with nutrients as necessary. Biological solids collected by the DAF would be pumped either to the sludge conditioning tank or to the storage tanks in the non-hazardous industrial wastewater treatment process. A process flow diagram for the future biological treatment process is included as Figure SDP-2. Although this system has not been added to date, LES would like to maintain permit approval to add this system in the future.

High Solids (Grit Trap/Septic/Lint Trap) Treatment Process

Wastes which contain high concentrations of solids, such as grit trap wastes, septic tank wastes, municipal sludge, and lint trap waste, are off-loaded at the high solids (grit) receiving basins. Wastes are off-loaded by gravity through a coarse screen and into the basins. High pressure water hoses are utilized to rinse the offloading area and move the material through the coarse screen. These wastes are then routed through a vibrating screen and empty into a floor sump. The waste stream is then pumped to the storage tanks in the non-hazardous industrial wastewater treatment process prior to processing through the precipitation system. Solids removed from the high solids receiving basins, the coarse screen, and the vibrating screen are processed through solidification. Sludge from the floor sump is routed to the sludge conditioning tank in the non-hazardous industrial wastewater treatment process.

Solidification

Wastes which do not contain significant volumes of bound water but which do require additional dewatering prior to ultimate disposal are off-loaded directly to the solidification pits. Such wastes include Class 1 and Class 2 solids. Additionally, recovered solids from the grease trap, industrial, and high solids treatment process are routed to the solidification pits as described in this section and as indicated in the process flow diagram.

Sludges are mixed with a solidification agent (such as wood chips or filter cake) as required in the solidification pits and consolidated for off-site transport. The solidification pits may also be used for activated sludge drying.

4. Ventilation and Odor Control Measures (330.63(b)(2)(C))

No hazardous or toxic wastes will be received for processing. During processing, wastes will pass over screens. The screens are washed at least once per day to reduce odor emission. Normal washdown practices and waste containment procedures are expected to be satisfactory for odor control.

This facility is designed to rapidly process all incoming wastes so that waste will not be stored longer than 72 hours. Accumulated sludge is disposed of daily and process water is discharged to the sewer following treatment.

Odor is controlled at the facility by three misting/fogging systems located in the areas where historically odors are most prevalent. These areas are the non-hazardous industrial unloading basins, the grease unloading pit, and the grease vibrating screen(s). A misting/fogging system is located along the perimeter fence and solidification area to mitigate odor emissions from the property boundary. Each misting system includes a distribution piping system and a chemical feed apparatus and may include a blower.

All process buildings have open doorways and are otherwise open to the atmosphere. Additionally, all of the process buildings are equipped with forced circulation ventilation fans or use portable fans to enhance ventilation.

5. Generalized Construction Details (330.63(b)(2)(D) and (E))

Generalized construction details for storage units, processing units, and ancillary equipment are provided in Tables SDP-2, SDP-3, and SDP-4, respectively.

Available generalized construction details for the facility are maintained on site and are available to the TCEQ upon request.

The following paragraphs provide construction details for many of the structures and improvements at the site. These descriptions appear in the February 1, 2006 version of the Site Development Plan (SDP), prepared and duly sealed by another Professional Engineer, and have not been verified as part of this submittal by the sealing engineer except as indicated. Changes to the descriptions in the February 1, 2006 version are indicated by underlining added text and striking out deleted text.

> The facility is divided into the following areas: a separate office building, the bulk storage areas, Buildings A and B, the ~~drying slab~~ solidification area and Building C, the settling marsh, the boiler room, parking, and the stormwater ~~retention~~ detention basin.
>
> The offices are located within an 80-foot by 60-foot office building. The office building contains heating/ventilation/air conditioning (HVAC), lighting, and plumbing meeting City of Houston building codes.
>
> The storage tank slabs are located adjacent to the treatment Building A and adjacent (on the ~~east~~ north side) to treatment Building B. The area by Building A includes the grease trap unloading area and multiple vertical steel tanks. All equipment is mounted on a 6-inch concrete slab surrounded by a concrete curb to control spills and surface water runoff.
>
> The area around Building B includes the non-hazardous industrial, grit, and septic unloading areas and multiple vertical steel tanks. All equipment is mounted on a 6-inch concrete slab surrounded by a 36-inch high concrete wall to control spills and surface water runoff. Inside the oil tank area is a concrete slab and another cinder block wall, 6.5-feet tall, containing the ~~93%~~ sulfuric acid tank. ~~***This sulfuric acid tank is scheduled for removal in 2006 as non-hazardous polymers will replace the sulfuric acid for oil emulsion breaking.***~~

The sumps ~~and basins~~ associated with the non-hazardous industrial and grit/septage unloading areas and portions of the Primary Wastewater Treatment System, including the clarifier, the sludge conditioning tank and the filter presses, are located in a pre-engineered metal building (Building B). The building was constructed on a 6-inch reinforced concrete slab. The building is 50 feet by 100 feet, with 24-foot eaves and a roof peak of 26 feet. Lighting within the process area is supplied by overhead fixtures. The process area contains forced circulation ventilation fans and portable fans. The building design and construction were constructed subject to approval by the City of Houston to meet all applicable codes.

Building C is a pre-engineered metal building, constructed on a 6-inch reinforced concrete slab. The building is 40 feet by 60 feet with 14-foot eaves and a roof peak of 16 feet. Building C contains the ~~two~~ grease trap vibrating screens and provides storage for treatment chemicals in drums and tote bins.

This paragraph describes proposed construction details for the aerobic process area, which has not yet been constructed. The aerobic process area ~~is~~ will be constructed on an 80'5" by 128'5" reinforced concrete slab with a 15-inch concrete curb that houses a 55-foot diameter equalization tank, a 33'5" diameter MBBR (aeration) tank, and aeration blowers. A 50-foot by 50-foot pre-engineered metal building that contains the DAF system will round~~s~~ out the contents of the aerobic process area. The DAF building ~~has~~ will have a roof gutter system that drains into the stormwater structure at the southwest corner of the oil tank storage area.

The ~~drying slab~~ solidification area is constructed of 6-inch reinforced concrete with ~~6"~~ minimum 7.5-inch thick ~~and two foot tall~~ reinforced concrete walls. The height of the walls vary as the solidification area slopes downward from the off-load area, as indicated in the site survey included in Attachment I-3 of Part I of the permit application. The ~~drying slab~~ solidification area is 60 feet by 140 feet and is graded to a drain at the west side of the ~~slab~~ area. The ~~drying slab~~ solidification area has a partition at the east side for segregation of Class I and Class II wastes.

The settling marsh was constructed using 6-inch reinforced concrete walls, and then lined with a 60 mil high density polyethylene (HDPE) liner to assure containment of all liquids. The marsh is divided into two bays, each of which is 20 feet by 90 feet. The walls are 4 inches high, with a variable design operating level ~~of 2~~', leaving a minimum of 3 inches of freeboard.

The boiler room, which houses the boiler and employee sanitation facilities, is 560 square feet in size with a 14-foot roof. It is a wood frame building with a metal roof, and was constructed on a 4-inch reinforced concrete slab. The building was constructed and the boiler installed in conformance with City of Houston construction and safety code requirements. Employee sanitation facilities are located in the southwest corner of the building.

All driveways and unloading areas are or will be constructed of 6-inch reinforced concrete slabs. The employee parking areas are constructed of 4-inch concrete. The unlined stormwater ~~retention~~ detention basin is constructed of earth and is covered with grass. A temporary truck parking area constructed of gravel is located between the industrial basins and the stormwater detention basin. Trucks containing wastes are prohibited from parking in this area. The gravel construction will be replaced with reinforced concrete in the future.

6. Containment Dikes and Enclosing Walls (330.63(b)(2)(F))

Containment dikes surround the oil storage area, the grease tank storage area, and the process buildings, as indicated on the facility map included as Attachment II-2 to Part II of the application. Thicknesses and heights of dike walls for all existing containment areas are indicated in Table SDP-5. The planned design for the containment around the future biological treatment system is described in Section 5.

Containment Area	Dike Thickness (inches)	Dike Height (inches)
Building A	6	4
Building B	6	4.5
Building C	6	4.5
Grease Tank Storage Area	5.5	5.5
Oil Storage Area	9.5	36

Table SDP-5: Secondary Containment at the Facility

7. Grease, Oil, and Sludge Storage (330.63(b)(2)(G))

Solids and sludges are stored in containers prior to removal off site for ultimate disposal. The containers are open topped and will be removed from the site within 72 hours of filling. Recovered grease will be stored in the recycling vessel for no more than 7 days following processing. Recovered light hydrocarbons will be stored and further separated in a fully enclosed tank inside of the oil storage area. The storage period will vary according to the amount of hydrocarbons reclaimed, but in no event will they remain on site longer than 90 calendar days. Final disposition of facility wastes and processed materials is described in Section 7 of the SOP.

8. Disposition of Effluent (330.63(b)(2)(H))

Effluent from the treatment and processing operation will be discharged to the sanitary sewer system pursuant to the facility's City of Houston Industrial Discharge Permit (Permit No. 6817). A copy of this permit is included in Attachment SDP-2.

9. Sanitation (330.63(b)(3))

The site around the process areas is graded in a manner which reduces surface water runoff onto, into, and off the treatment area. In general, stormwater which does not come in contact with process areas is segregated from process area stormwater. Runoff from the parking area at the southern end of the facility is routed to the stormwater detention basin prior to discharge to the City of Houston storm sewer system. The contents of the detention basin are sampled and compared to discharge criteria prior to discharge. Stormwater falling in unimproved areas along the northern side of the property generally flow into a Harris County Flood Control District drainage ditch. Stormwater in non-process areas along the southeastern property boundary flow to stormwater inlets along Gellhorn Drive, entering the City of Houston storm sewer system. Stormwater falling within process areas is generally collected and processed through the non-hazardous industrial wastewater treatment process described in Section 3. The facility is engaged in a series of projects to improve stormwater segregation capability as described in Section 13.

Walls and floors in operating areas are made of steel and concrete which facilitates pressure cleaning and scrubbing. All working surfaces which come in contact with wastes to which employees are regularly exposed will be washed down on at least a weekly basis. Floors will be swept daily and washed down at least two times per week.

Water hose bibs and/or steam hose connections are provided at appropriate locations throughout the facility. Greasy materials will be removed using steam and/or water.

Floor sumps are provided to facilitate collection of wash-down liquids. Floor sumps are located in the center of Building A and on the east side of the grease tank storage area. The sump in Building A is drained into the grease trap unloading basin. The sump in the grease tank storage area can be drained into the grease trap unloading basin. A sump is centrally located in Building B and two sumps are located in the solidification area. Water collected in the sumps will be collected and pumped through the non-hazardous industrial wastewater treatment process. A collection sump is also located in Building C.

10. Water Pollution Control (330.63(b)(4))

The Facility complies with the provisions of the Texas Pollutant Discharge Elimination System Permit Program. Impacted wastewater, wash water, and stormwater is pre-treated and discharged to the City of Houston sanitary sewer system in accordance with a permit through the City and is regularly sampled to check compliance with discharge criteria. The Facility will continue to renew the Industrial Wastewater Discharge Permit as required by the City of Houston. Discharges from the stormwater detention basin are also sampled prior to discharge through the City storm sewer system. As described in Section 13, the facility is engaged in a series of projects to improve stormwater segregation capability.

11. Endangered Species Protection (330.63(b)(5))

Impacts on endangered species are addressed in Section 14 of Part II of the application.

12. Surface Water Drainage (330.63(c))

The containment described previously is designed to prevent run-on into and run-off from the process areas. The ability of the facility to manage stormwater from a 25-year, 24-hour event is described in Section 13.

13. Waste Management Unit Design: Storage and Transfer Units (330.63(d)(1))

Section 3 describes how incoming wastes are processed. Section 7 of the SOP describes how wastes are disposed. As discussed in Section 7 of this SDP, unprocessed wastes do not remain on site for longer than 72 hours. All liquid wastes and recovered materials are stored in fixed-roof tanks limiting exposure of wastes to the elements. Section 4 describes odor control measures implemented by the facility.

Existing secondary containment structures are described in Section 6. The perimeter of the process area of the facility is shown on the facility layout map in Attachment II-2 of Part II of the application. The facility uses the sloped contours of the existing pavement and active secondary containment measures to prevent releases of impacted stormwater, spills, and leaks from the process area. Although the truck parking area is not completely graded towards process area sumps, trucks loaded with any waste materials are not allowed to park in this area.

During normal operations, the facility is staffed approximately 21.5 hours per day during the week and approximately 8 hours on weekends. If a storm occurs when personnel are on site, facility staff monitor the accumulation of stormwater in the process areas and pump the accumulated stormwater to temporary storage or directly to treatment using vacuum trucks, tanker trucks, portable pumps, or other suitable devices. Prior to vacating the site, work crews empty all waste receiving pits and basins and clean up any waste spills or leaks. If storms are either occurring or forecast at the end of the last shift, key personnel remain on site to manage accumulated stormwater until the next crew arrives. On weekends, a supervisor is on call and is able to direct personnel to respond in case of a weather event. Key staff are responsible for monitoring weather conditions in the area when the facility is unmanned.

If a major storm such as a tropical storm or hurricane is forecast which will require vacating the facility during the event, facility personnel empty and clean out all waste receiving pits and basins, and shelter all waste contacting equipment (such as hoses) from the elements. These measures prevent releases of impacted stormwater from the process area.

Any wastes that are spilled during unloading will flow from the unloading driveway into an unloading basin. The unloading areas are sloped into the basins and curbed to prevent the flow of spills outside of the designated areas. Water taps and tools to assist the flow of

materials from the driveway into the basins are available in the immediate unloading areas. Any waste spilled outside the off-load areas, such as in driveways leading to these areas, shall be immediately cleaned up by an appropriate method, such as by using inert absorbent material, and removed for proper disposal. Any free-flowing rinse waters from cleaning will be immediately transferred to the wastewater treatment area or into the receiving pit area using an in-house pump, vacuum truck, or similar device.

The facility is currently engaged in projects to assess the existing passive containment capability of the process area and to design and construct a passive secondary containment system which will prevent releases from a 25-year, 24-hour storm or a worst case spill from the largest unit without the need to implement active containment measures.

14. Geology Report (330.63(e))

This requirement does not apply to liquid waste processing facilities.

15. Groundwater Sampling and Analysis Plan (330.63(f))

This requirement does not apply to liquid waste processing facilities.

16. Landfill Gas Management Plan (330.63(g))

This requirement does not apply to liquid waste processing facilities.

17. Closure Plan (330.63(h))

A Final Closure Plan is included in Attachment SDP-3. The Final Closure Plan provides procedures to remove wastes, clean equipment, and close the Facility should operations cease or otherwise be terminated. Closure of the Facility would include the removal of all wastes, wastewater and sludge from the equipment and removal of all recovered materials and chemicals for the current phase of the project. Ninety (90) days prior to installation of the biological treatment equipment, a permit modification request will be prepared in accordance with 30 TAC §305.70 (Municipal Solid Waste Permit and Registration Modifications) and submitted to TCEQ. The modification will be consistent with the currently approved process included in the permit and will include an updated Closure and Post-Closure Plan for the subsequent phase along with associated cost estimates. Financial assurance documentation will also be submitted in accordance with 30 TAC §37, Subchapter B, to include the additional equipment and amended Closure and Post-Closure costs.

18. Post-Closure Plan (330.63(i))

Following implementation of the Closure Plan, no waste materials would remain on site. Therefore, no Post-Closure Plan is required.

19. Cost Estimate for Closure and Post-Closure Care (330.63(j))

A cost estimate for closure is included in the Final Closure Plan in Attachment SDP-3 for the current phase of the project. Financial assurance documentation for the biological treatment process will also be submitted in accordance with 30 TAC §37, Subchapter B, to include the additional equipment and amended Closure and Post-Closure costs, prior to installation of the equipment as indicated in Section 17 of the SDP.

TABLE 2

GENERALIZED CONSTRUCTION DETAILS – STORAGE UNITS

TABLE 3

GENERALIZED CONSTRUCTION DETAILS – PROCESSING UNITS

TABLE 4

GENERALIZED CONSTRUCTION DETAILS – ANCILLARY EQUIPMENT

SDP -1
PROCESS FLOW DIAGRAM

SDP -2
Process Flow Diagram With Future Biological Treatment

ATTACHMENT SDP-1

BASIS FOR WASTE RECEIPT INCREASE

ATTACHMENT SDP-2

WASTEWATER DISCHARGE PERMIT

ATTACHMENT SDP-3

FINAL CLOSURE PLAN