



OSEI Corporation Waste Water Treatment Presentation

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Waste Treatment Plants And Pumping Stations

The OSEI Corporation performed tests with OSE II for the Trinity River Waste Treatment Plant in Dallas, Texas. The tests were conducted in three separate areas for the Trinity River Waste Treatment Plant, and a subsequent test was performed for the City of Wylie Texas in their pumping station or lift station.

The first test was performed in the TRA wet well where the waste stream enters the plant.

Two and a half gallons of OSE II was directly applied to the Wet Well by Pump-Up Spray Device. Once the entire two and a half gallons of OSE II was applied, it was allowed to work for approximately thirty minutes. A water hose was used to stir the Wet Well and the grease broke down into smaller particles, which were no longer capable of adhering to the side of the wet well, or anything in the well including a board. Three quarters of the surface of the Wet Well was covered in grease prior to the application of OSE II. Once the grease was stirred the grease only covered less than a quarter of the Wet Wells surface. The smell was dramatically reduced as soon as OSE II was through being applied.

NOTE:

The Wet Well can only show the initial actions of OSE II since there is a continuous flow of waste into the plant.



Picture 1 is OSEI Personnel mixing OSE II for application to the RTA wet well or inlet well. Picture 2 is OSEI personnel applying OSE II to the grease floating on the surface of the wet well. Picture 3 is 4 hours after application of OSE II TRA personnel used a water jet to see how well OSE II had caused the grease break up, reduce in size, and to determine if the grease would still adhere to anything as well. The grease had already started breaking up and reducing in size.

For continuous use of OSE II in a waste treatment plant similar to the TRA #6 Wet Well you would calculate as follows. After reviewing the number 6 well, we have calculated the approximate amount of grease that will be potentially present. Based on this volume observed, we have determined the amount of OSE II required.

Grease: 24' L x 6' W x 1" deep = a volume of 90 gallons of grease

Based on this volume, you will need 2.5 gallons of OSE II.

NOTE: See water oil volume determination instructions in the OSEI technical library at www.osei.us on page 155 to determine the amount of oil and grease on the surface of a given area.

The recommended application will be to directly apply a stream of OSE II from a water tank to the grease. Once application of OSE II is complete, add 200 gallons of water to create the correct mixing ratio and to cause agitation to help increase surface area.

OSEI Corporation allows for variances in the amount of grease that could be present. The calculations are for approximate volumes.

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For wells the size of the TRA #6 it is recommend that OSE II be applied each hour by a drip pump system, to the same area using the same instructions as above, only using 1 gallon of OSE II and 50 gallons of water. This will account for the continuous inlet flow of waste and grease, and the water will stir or break up the surface.

The next area OSE II was applied to was the separator/clarifier next to where some of the grease is collected (in roll off boxes).

Approximately one gallon of OSE II was applied to the grease on the separator/clarifier. Once again the grease would loose its ability to adhere and partitioned into smaller globuals. This increase in surface area starts the remediation process of the grease. The TRA wanted to see how capable OSE II was at cleaning these separators for roll off boxes, in case they need to be repaired. They were very impressed, that OSE II was capable of cleaning these areas, and caused no adverse interference with the plants remediation capabilities.



The next area OSE II was applied was in a 55 Gallon Test Drum, with an aeration device in the bottom of the drum. Approximately 40 gallons of wastewater was decanted into the drum. Then approximately 7 to 7.5 gallons of grease was added to the drum. The grease immediately floated to the surface. The grease was in large pieces forming a layer of grease 5 inches in depth on the water surface in the drum.



Next 26 ounces of OSE II was applied to the grease in the drum. The aeration device was turned on and 2 samples of grease were extracted for analysis.

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OSEI Corporation personnel immediately delivered the sample to Anachem Laboratory in Allen, Texas. OSEI Corporation understands that TRA uses the old Freon Extraction Method. However, virtually all of the commercial labs have gone to the Methylene Chloride Extraction methods due to the EPA's recommendations. However the OSEI Corporation and TRA agreed upon the use of gravitational analysis for the test demonstrations with OSE II.

The initial test showed a level of 14,000 mg/L in the drum. The test was started on December 5, 2002 and the drum was allowed to aerate.

The next sampling extraction was performed on December 13, 2002. Two samples were extracted – one for TRA and one for OSEI, Corp. Once again OSEI, Corp. delivered the sample immediately to Anachem Labs in Allen, TX. The drum showed a visible reduction in grease. The analysis showed a number of 1200 mg/L, of oil and grease, which was a great reduction in oil and grease levels.

The next step with the drum was carried out on December 20, 2002. One sample was extracted for TRA. TRA personnel then measured the depth of the grease remaining on the surface of the drum after the aeration device had been turned off for over 15 minutes.



It was determined that 0.25 inches, or $\frac{1}{4}$ of an inch of grease remained on the surface. This represents a 92.2% reduction of grease by volume. The TRA lab confirmed the OSEI Grease reduction findings tests as well.

Trinity River Waste Treatment plant Drum tests are as follows.

Anachem, Inc.

Date: 11-Dec-02

CLIENT:	OSEI Company	Client Sample ID:	O&G TRA
Work Order:	0212095	Location:	TRA, Dallas, TX
Project:	TRA O&G	Collection Date:	12/5/2002
Lab ID:	0212095-01A	Matrix:	LIQUID

Analyses	Result	Limit	Units	Date Analyzed
OIL & GREASE BY 413.1 GRAVIMETRIC - AQUEOUS				
BatchID: R21433				Prep Date: 12/10/2002 Analyst: AT
Oil & Grease, Total Recoverable	14000	0.5	mg/L	12/10/2002

Anachem, Inc.

Date: 18-Dec-02

CLIENT:	OSEI Company	Client Sample ID:	TRA
Work Order:	0212230	Location:	Dallas, TX
Project:	TRA	Collection Date:	12/13/2002
Lab ID:	0212230-01A	Matrix:	LIQUID

Analyses	Result	Limit	Units	Date Analyzed
OIL & GREASE BY 413.1 GRAVIMETRIC - AQUEOUS				
BatchID: R21570				Prep Date: 12/16/2002 Analyst: HH
Oil & Grease, Total Recoverable	1200	0.5	mg/L	12/16/2002
The sample was extracted using EPA method 3510 with the extraction solvent being methylene chloride. This extraction solvent provides exceptable recovery for oil and grease.				

The volumetric measurement of the initial grease depth and the final measurement of grease absolutely define the reduction of grease. This measurement, helps alleviate the differences between laboratory extraction methods and sampling variances.

The Drum Test proved definitively that OSE II causes a dramatic decrease in grease volume. TRA personnel were very impressed with the function and remediation capabilities of OSE II and asked for more demonstrations/tests, in other parts of the treatment plant.

OSE II was then demonstrated and tested in the TRA retention ponds. The amount of oil and grease on the surface was calculated, and the appropriate amount of OSE II, was decanted into the sprayer. OSE II was then applied directly to the oil and grease to meet the 1 to 1 application ratio of OSE II and oil and grease. OSE II was applied while TRA personnel looked on.

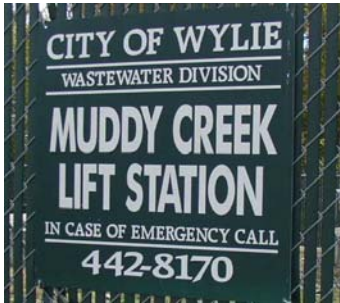


After application of OSE II, TRA personnel removed some of the oil and grease to see how the initial reactions of OSE II were affecting the breakdown of the oil and grease. A subsequent sample was extracted 4 hours after OSE II application by TRA. This retention pond test showed OSE II reducing the size of the oil and grease globules, as well as the measurable volume of the oil and grease. As OSE II breaks down the oil and grease, the globules became smaller and smaller, since OSE II

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increases the oil/grease water interface, this allows microphages to digest the oil/grease easier, since there is access to the entire oil/grease molecular structure.

OSE II can be very useful in lift stations as well. The City of Wylie Texas, USA had a pump fail in a lift station. They called to ask for a demonstration as to how OSE II could help them reduce the amount of grease and its adhesion properties in a lift station; in order for repair personnel to have better access to the lift station pump. OSEI Corporation arrived at the lift station to discover the entire surface of the lift station was covered in approximately 4 inches of oil and grease



The amount of oil and grease was calculated $30 \times 3.14 \times 4$ converted to yards length \times yards width since it was a cylinder it became $(\text{pie } r^2)$ $3.14 \times$ inches to determine approximately how much grease was present and how much OSE II would be needed. It was determined that there was 125.6 gallons of oil/grease in the lift station. The city of Wylie requested the first test to be at a 125 to 1 ratio. The OSEI Corporation personnel added 1 gallon of OSE II to the sprayer and applied all of its contents to the surface of the oil/grease.



The application to the oil/grease was allowed to set overnight. Upon opening the lift station cover it appeared the oil had thinned slightly. However once the city of Wylie personnel took a long piece of PVC and stirred the waters surface the oil and

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grease, seemed to disappear before their eyes. OSE II had broken down the molecular structure of the oil and grease, and increased the oil water interface so the entire volume of oil and grease could now be digested to CO₂ and water. The water started to flow in the lift station as well. The application of OSE II helps the North Texas water district handle their inflow of grease.

The city of Wylie pump repair personnel was then able to pull the pump out from the bottom of the lift station and the pump was free of grease. This made repair of the pump immediately since there was no need to spend time trying to clean the pump.



OSE II can be used in Wet Wells, Clarifiers, Retention Ponds, in Lift Stations, and OSE II will help reduce oil and grease levels in all. The city of Wylie uses OSE II to keep their lift stations from clogging and whenever there is a need for a pump repair or the lift station becomes clogged. This has decreased the cost of dealing with these problems in their lift stations by 50%.

OSE II is also used by the Crandle Waste Treatment Plant. The city of Crandle, had someone dump some distilled hydrocarbons in a car wash drain that flowed into their small race track digester. OSE II was immediately deployed and the macrophage film was saved. The chemicals were so toxic the aerators were turned up full force for three days, and all flow was stopped until OSE II could have time to start reducing the toxicity of the chemicals. OSE II saved the city of Crandle thousands of dollars trying to rebuild their macrophage film, and trying to restart their race track digester.

OSE II can help solve some of the problems coming into waste treatment plants decrease costs; as well as increasing the efficiency of the plant by reducing oil and

grease, breaking down toxic hydrocarbon based chemicals, and working in conjunction with the plants waste reduction.

There are more pictures of TRA, and Muddy Creek pump station, on the OSEI Corporation web site at www.osei.us click on photos then click on Muddy creek-Demo Wylie, Texas, and or Trinity River authority and OSE II. OSE II is the answer to enhance and help waste treatment plants handle hazardous material as well as common wastes associated with waste treatment plants operations.

Steven Pedigo

Chairman/CEO OSEI Corporation

The protocol for the drum test follows as well as the full test pages for the TRA, grease tests.

PROTOCOL FOR TESTING

1. Pour 45 gallons of Waste Water into the drum.
2. Pour 2.5 gallons of oil and grease into the drum.
3. Extract a sample for initial contamination level of oil and grease. Test in triplicate.
4. Apply 13 ounces of OSE II Concentrate into the drum since the drum already contains water.

Note time when you apply OSE II.

5. Turn on the aerator.
6. Then each hour for four hours, starting from the time noted in #4 above, add an additional ½ gallon of grease into the drum and 6 ounces of OSE II Concentrate.
7. 30 minutes from the start time in 4 above extract a sample and test for O & G in triplicate.
8. Each hour from the start time in 4 above, add ½ gallon of oil and grease and 6 ounces of OSE II Concentrate.
9. At each hour, immediately after adding O & G, (before adding OSE II) pull a sample and test for O & G in triplicate.

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10. After pulling O & G sample for testing, add six ounces of OSE II.
11. After 55 minutes, pull sample for O & G Test in triplicate.
12. Repeat the above procedure for four days.
13. 24 hours after the last application of OSE II, extract a sample and perform an oil and grease analysis in triplicate.
14. 3 Days after applying the last application of OSE II, extract a sample and perform an oil and grease analysis in triplicate.
15. 7 days after applying the last application of OSE II, extract a sample and perform an oil and grease analysis in triplicate.
16. If more test times are needed, they would be on days 10 and 15 after last application of OSE II.

This should conclude the test and establish a time frame for reducing oil/grease and waste from continuous flow of waste and grease into a plant. This test attempted to emulate for a few days how OSE II's remediation process would reduce oil/grease, and normal waste with a continuous flow system as additional oil/grease and waste's enter a system.

The TRA tests are one full page and they follow on the next page.



ANACHEM INC.

8 Prestige Circle, Suite 104 Allen, Texas 75002
972/727-9003 • FAX # 972/727-9886 • 1-800-966-1186

December 18, 2002

Steven Pedigo
OSEI Company
13127 Chandler Dr.

Dallas, TX 75234
TEL: 972-669-3390 972-644-8359

Work Order: 0212230
Project: TRA

Dear Client:

Anachem, Inc. received 1 sample on 12/13/2002 for the analyses presented in the following report.

The samples were analyzed for the following tests:

Oil & Grease by 413.1 Gravimetric - Aqueous

Respectfully Submitted,
Anachem, Inc.

Howard H. Hayden, B.S.
Chemist

NOTE: Submitted material will be retained for 60 days unless notified or consumed in analysis. Material determined to be hazardous will be returned. The use of our name and reports are for the exclusive use of the client to whom they are addressed. The use of our name must receive our prior written approval. Our letters and reports apply to the sample tested and/or inspected, and are not necessarily indicative of the qualities of apparently identical or similar materials.

Anachem, Inc.

Date: 11-Dec-02

CLIENT:	OSEI Company	Client Sample ID:	O&G TRA
Work Order:	0212095	Location:	TRA, Dallas, TX
Project:	TRA O&G	Collection Date:	12/5/2002
Lab ID:	0212095-01A	Matrix:	LIQUID

Analyses	Result	Limit	Units	Date Analyzed
OIL & GREASE BY 413.1 GRAVIMETRIC - AQUEOUS				
BatchID: R21433				Prep Date: 12/10/2002 Analyst: AT
Oil & Grease, Total Recoverable	14000	0.5	mg/L	12/10/2002

REVISED REPORT

Qualifiers: ND - Not Detected at the Reporting Limit
B - Analyte detected in the associated Method Blank

Anachem, Inc.

Date: 11-Dec-02

CLIENT: OSEI Company
Work Order: 0212095
Project: TRA O&G

QC SUMMARY REPORT

Oil & Grease by 413.1 Gravimetric - Aqueous

BatchID: R21433	Units: mg/L	Analysis Date: 12/10/2002					
Analyte	SPK value	REC 1	REC 2	LowLimit	HighLimit	%RPD	RPDLimit
Oil & Grease, Total Recoverable	100	93.0%	91.0%	60%	140%	2.2%	30



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BatchID: R21570				
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The sample was extracted using EPA method 3510 with the extraction solvent being methylene chloride. This extraction solvent provides acceptable recovery for oil and grease.				

Qualifiers: ND - Not Detected at the Reporting Limit
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QC SUMMARY REPORT

Oil & Grease by 413.1 Gravimetric - Aqueous

BatchID: R21570	Units: mg/L	Analysis Date: 12/16/2002					
Analyte	SPK value	REC 1	REC 2	LowLimit	HighLimit	%RPD	RPDLimit
Oil & Grease, Total Recoverable	100	91.0%	96.0%	60%	140%	5.3%	30