



Indirect Thermal Desorption

COMPLETED PROJECTS AND CASE STUDIES

Major Projects (1 of 2)

| Project Name | General Contractor | Owner / Address | Contaminants | Year |
|---|---|--|--------------------------------------|---------------|
| On-site Thermal Remediation of Soils - Allied-Signal, East Rutherford, NJ | Smith Technology New Jersey | Allied-Signal Morristown, NJ | PCB's, PAH's | 1995 |
| On-site Thermal Remediation of Chlorinated Solvents - Carteret, NJ | ERM Enviroclean Ewing, NJ | Confidential Carteret, NJ | TCE/Chlorinated Hydrocarbons | 1996 |
| Remediation of Petroleum Contaminated Soil - Baytown Texas | Tetra Process Services The Woodlands, TX | Exxon Baytown, Texas | Refinery Waste | 1997 |
| Remediation of Petroleum Contaminated Soil - Borger, Texas | Tetra Process Services The Woodlands, TX | Phillips 66 Borger, Texas | Refinery Waste | 1997 |
| Remediation of Soil Contaminated with Drill Cuttings | SR2 Ooltewah, TN | PEMX Villahermosa, Mexico | Diesel Fuel Crude Oil | 1998 |
| Remediation of Tanker bottom sludge - Singapore - Sold 3 Units | Singapore Cleanseas Singapore | Singapore CleanseasPte., Ltd. - Singapore | High Chain Hydrocarbons | 97,98 2000 |
| Remediation of Petroleum Contaminated Soil - Andrews County, West Texas | Tetra Process Services The Woodlands, TX | TSD Facility Andrews County, West Texas | TSD facility waste | 2000 |
| On-site Thermal Remediation Drill cuttings - Kristensund, Norway | Tetra Process Services The Woodlands, TX | TPS Norway Kristensund, Norway | Drill Cuttings from the North Sea | 2000 |
| On-site Thermal Remediation Drill cuttings - Fujariah, United Arab Emirates | Ecoref. Fujariah, United Arab Emirates | Ecoref. Fujariah, United Arab Emirates | Drill cuttings | 2001 |
| Remediation of Petroleum Contaminated Soil - St. Croix, Virgin Islands | Tetra Process Services The Woodlands, TX | Hess Refinery (Hovensa) St. Croix, Virgin Islands | Refinery Waste | 2001 |
| On-site Thermal Remediation Drill cuttings - Abu Dhabi, UAE- 2 Units | Gulf Environmental Abu Dhabi | GENCO-Habshan Habshan, U.A.E. | Drill cuttings | 2002 2003 |

Major Projects (2 of 2)

| Project Name | General Contractor | Owner / Address | Contaminants | Year |
|--|--|--|---|------|
| On-site Thermal Remediation Drill cuttings - Saudi Arabia. | SEW Al-Khobar, Saudi Arabia | SEW Al-Khobar, Saudi Arabia | Drill cuttings Crude Oil | 2003 |
| On-site Hazardous Waste Recycling East Chicago IN | Pollution Control Industries | Pollution Control Industries East Chicago IN | Industrial Solvents, Organic Wastes | 2004 |
| On-site Thermal Remediation Drill cuttings - Safat Kuwait | Wataniya Environmental Services | Wataniya Environmental Services. Safat Kuwait | Drill cuttings, Crude Oil & Waste from '91 War | 2005 |
| On-site Thermal Remediation Puertollano Spain | Tradebe Barcelona Spain | Repsol Puertollano Spain | Bio-Solids, Oily Sludge, TPH Soil | 2006 |
| Remediation of Petroleum Contaminated Soil - Bonny Facility Nigeria | Titan Projects Nig. Ltd Port Harcourt Nigeria | Shell Oil Nigeria | Refinery Waste | 2006 |
| On-Site Remediation Drill Cuttings San Paulo Brazil | ESBRA San Paulo Brazil | Petrobras Brazil | Drill Cuttings | 2007 |
| Central Environment Protection Facility (BeAAT) - Ruwais UAE | SNC-Lavalin Montreal Canada | ADNOC Takreer UAE | Drill cuttings & Refinery Waste | 2007 |
| Remediation of Petroleum Contaminated Soil - Bilbao Spain | Lezama Trapagaran (Bizkaia) Spain | Repsol Bilbao Spain | Refinery Waste Biological Waste | 2008 |
| On-site Thermal Remediation Drill cuttings - Louisiana | Phillips Services Corporation Houston TX | Shell Oil Houston TX | Refinery Waste | 2009 |
| ZOIL Hazardous Waste Recycling Facility - Madina-Accra , Ghana | Zoil Services Ltd Madina-Accra, Ghana | ZOOMLION Madina-Accra , Ghana | Oily Sludge, Contaminated Soils, Hazardous Materials | 2011 |
| TexCycle Hazardous Waste Recycling Facility - Kuala Lumpur, Malaysia | TexCycle | TexCycle Kuala Lumpur, Malaysia | Oily Wastes, Hazardous Materials | 2011 |

Case Study 1

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| 1. | Contract Title: | ADCO Drilling Operations | |
| 2. | Client Contact Information: | Client name and contact information available upon approved request . | |
| 3. | Contract Location | Habshan, U.A.E. | |
| 4. | Contract Start Date | 10/2002 | |
| 5. | Contract Finish Date | 2005 | |
| 6. | Quantity Treated (m³) | 30,000 tons | |
| 7. | Treatment Method | Thermal Desorption | |
| 8. | Rate of Treatment (m³/hr) | 3.5 to 4.5 tons per hour (dependent upon feed) | |
| 9. | Working Hours per Day | 24 | |
| 10. | Working Days per Week | 5.5 | |
| 11. | Project Description: | <p>RLC Technologies contracted to manufacture equipment to be used for the ADCO drilling operations in Habshan, UAE. The equipment was used to process drill cuttings.</p> <p>Project requirements per contract exert:</p> <p>The typical composition of the Waste cuttings or Sludge, is as follows: Solids Content: ±70% Volume/Volume Oil Content: ±25% Volume/Volume Water Content: ±5% Volume/ Volume</p> <p>The above mentioned Waste shall be treated to reduce the Total Petroleum Hydrocarbon (TPH), as per EPA procedures SW846/8015B and 1664, to below an environmentally acceptable limit of 0.5% Weight/Weight and to satisfactorily dispose of or recycle all recovered solids, liquids and other material used in the performance of the Services in compliance with all applicable environmental laws, regulations and also ADNOC / ADCO guidelines.</p> | |
| 17. | Types of Contamination | Level of Contamination (ppm) | Achieved Treatment Levels (ppm) |
| 1. | Drill Cuttings | ±250,000 ppm | 581 ppm (See Attached) |



Case Study 2

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|-----|--|--|----------------------------------|
| 1. | Contract Title: | WES | |
| 2. | Client Contact Information: | Client name and contact information available upon approved request. | |
| 7. | Contract Location | Safat, Kuwait | |
| 9. | Contract Start Date | July 2005 | |
| 10. | Contract Finish Date | November 2005 Manufacturing Complete and Plant Shipped | |
| 11. | Quantity Treated (m ³) | In excess of 75,000 tons | |
| 12. | Treatment Method | Thermal Desorption | |
| 13. | Rate of Treatment (m ³ /hr) | 3.5 tons per hour | |
| 14. | Working Hours per Day | 24 | |
| 15. | Working Days per Week | 5.5 | |
| 16. | <u>Project Description:</u> | <p>RLC Technologies contracted to manufacture equipment for WES to process drill cuttings, crude oil and waste from the '91 war. The RLCT plant has been in continual use and remains in use today, processing these waste streams.</p> <p>RLC Technologies continues to support the equipment by providing technical knowledge as needed, and procuring spare parts for our customer.</p> <p>Cleanup criteria was 1% (~10,000 mg/L)</p> | |
| 17. | Types of Contamination | Level of Contamination (mg/L) | Achieved Treatment Levels (mg/L) |
| 1. | Drill Cuttings | 89,100 | 1,300 |



Case Study 3

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|-----|--|--|--|
| 1. | Contract Title: | PCI | |
| 2. | Client Contact Information: | Client name and contact information available upon approved request. | |
| 3. | Contract Location | East Chicago, IN | |
| 4. | Contract Start Date | 2/16/2004 | |
| 5. | Contract Finish Date | 10/14/2004 | |
| 6. | Quantity Treated (m³) | Hazardous Materials, Industrial Wastes | |
| 7. | Treatment Method | Thermal Desorption | |
| 8. | Rate of Treatment (m³/hr) | 1.5 to 2.5 tons per hour | |
| 9. | Working Hours per Day | 24 | |
| 10. | Working Days per Week | 6 | |
| 11. | Project Description: | <p>RLC Technologies was contracted by PCI to supply an ATDU system for a hazardous material recycling facility located in East Chicago. The facility treats and recycles paint waste, resins, polymers, solvent soaked rags, oily wastes, and discarded commercial products. The RLCT plant has been in continual use and remains in use today, processing these waste streams.</p> <p>RLC Technologies continues to support the equipment by providing technical knowledge as needed, and procuring spare parts for our customer.</p> <p>Cleanup criteria was 1% (10,000 ppm)</p> | |
| 12. | Types of Contamination | Level of Contamination (WT %) | Achieved Treatment Level (mg/L) |
| 1. | Aromatics (toluene, xylene, etc.) | 20-60 | (see attached) |
| 2. | Aliphatics (heptane, mineral spirits, etc.) | 20-60 | (see attached) |
| 3. | Alcohols (methanol, ethanol, etc.) | 0-25 | (see attached) |
| 4. | Ketones (MEK, acetone, etc.) | 5-40 | (see attached) |
| 5. | Esters (methl, acetate, butyl acetate, etc.) | 0-15 | (see attached) |
| 6. | Chlorinated Solvents (methylene chloride, 1,1,1-trichloroethane, etc.) | 0-5 | (see attached) |



Case Study 4

Before Processing

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| 1. | Contract Title: | PSC | |
| 2. | Client Contact Information: | Client name and contact information available upon approved request. | |
| 3. | Contract Location | Norco, Louisiana | |
| 4. | Contract Start Date | 9/3/2008 | |
| 5. | Contract Finish Date | 10/14/2009 | |
| 6. | Quantity Treated (m ³) | >35,000 tons | |
| 7. | Treatment Method | Thermal Desorption | |
| 8. | Rate of Treatment (m ³ /hr) | 2.5 to 3.5 tons per hour | |
| 9. | Working Hours per Day | 24 | |
| 10. | Working Days per Week | 5 | |
| 11. | Project Description: | <p>RLC Technologies was contracted by PSC to supply an ATDU system for a hazardous material recycling facility located in Norco, Louisiana. The facility processes refinery waste from the Shell and Valero refineries, as well as outside sources. The RLCT plant has been in continual use and remains in use today, processing these waste streams.</p> <p>RLC Technologies continues to support the equipment by providing technical knowledge as needed, and procuring spare parts for our customer.</p> <p>Cleanup criteria was 1% (10,000 ppm)</p> | |
| 12. | Types of Contamination | Level of Contamination (WT %) | Achieved Treatment Levels (mg/L) |
| 1. | Petroleum Hydrocarbon Sludge (PHC) | (see attached) | (see attached) |

After Processing

