



SIGMA  
Petroleum Services



■ ACCELERATE YOUR CASH FLOW ■



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**SIGMA**  
Petroleum Services



## Sigma Petroleum Services



### Values

Our core values represent the fundamental principles that guide us in our day-to-day business activities. We urge our employees to embrace these values and to conduct their business in the true spirit of these values. As a result we can supply high-quality products and services for our customers.

### Customer Satisfaction

We are dedicated to satisfy our customers. We strive to exceed their expectations in pricing , quality and on-time delivery. We also pride ourselves on the excellence of execution and the quality of the human relationships we have with our customers.

### Trust

We give you our word. In the high-stakes world of industrial and construction projects, you can count on us to be there from start to finish. Not only do we keep our promises, we make sure the job gets done. You can count on us to be there today and tomorrow, just as we have been for over 50 years.

### Teamwork

We are committed to create an atmosphere of teamwork, collaboration, open communication, mutual support, fun, respect and investment in each other's success.

### Innovation

We value the creativity and ability of people to develop new ways of identifying opportunities and solving problems.

### Effectiveness

We continue to operate as a "small company" would, with all the advantages that entails. We cut out any kind of bureaucracy and we are committed to acting faster than our competitors. Thanks to our logistic platforms and stock levels that none of our competitors can match. Our technical services make owning a solution from Sigma as easy as buying one.

### Mission

Sigma seeks at all times to optimize added value for all its workers. We aim to achieve this by careful expansion of our leading position as a reliable supplier and service provider. Our focus on specific market segments which help create added value for our workers .We stand out thanks to our customer-oriented business approach and the high quality of our products and services. It is guided at all times by an ethical and socially responsible policy with regard to our employees and the working environment.

A C C E L E R A T E   Y O U R   C A S H   F L O W





## Strategy

We are continuously working to strengthen our leading position. We do so via a process of directed growth and the provision of enhanced services. Central to this strategy is a determination to guarantee customers the maximum level of service and to provide them at an international level with as complete as product and service package as possible. We also base our strategy on a combination of international activities, a regional organizational structure and the service and experience of local specialists. This makes Sigma a powerful partner with cross-border knowledge and experience.

## Certification



we have always been recognized for the quality of our services and product. Our head office, stock and main logistic platform. **ISO 9001** Demonstrates our ability to consistently provide products that meet customer and applicable statutory and regulatory requirements.

**ISO 14001** Shows our commitment to improve company processes and to design and implement an effective environmental management system.

**OHSAS 18001** An international occupational health and safety management system specification.

## Employees

The heart of any business is its employees. They are the driving force behind all company processes. The success of Sigma depends on the quality of its people. Combining experience and expertise with enthusiasm and creativity is a vital link in Sigma's chain of success. Our employees are experts in areas such as sourcing, purchasing, logistics, stock management, distribution, transport and applications. In short, the company covers the entire supply chain. Our employees contribution is vital to the success of the company. Therefore we aim to provide an attractive working environment where the skills of our employees can be fully expressed and where they can work together well and realize their full potential. We support the professional development of our employees and make structural investments in both internal and external training.

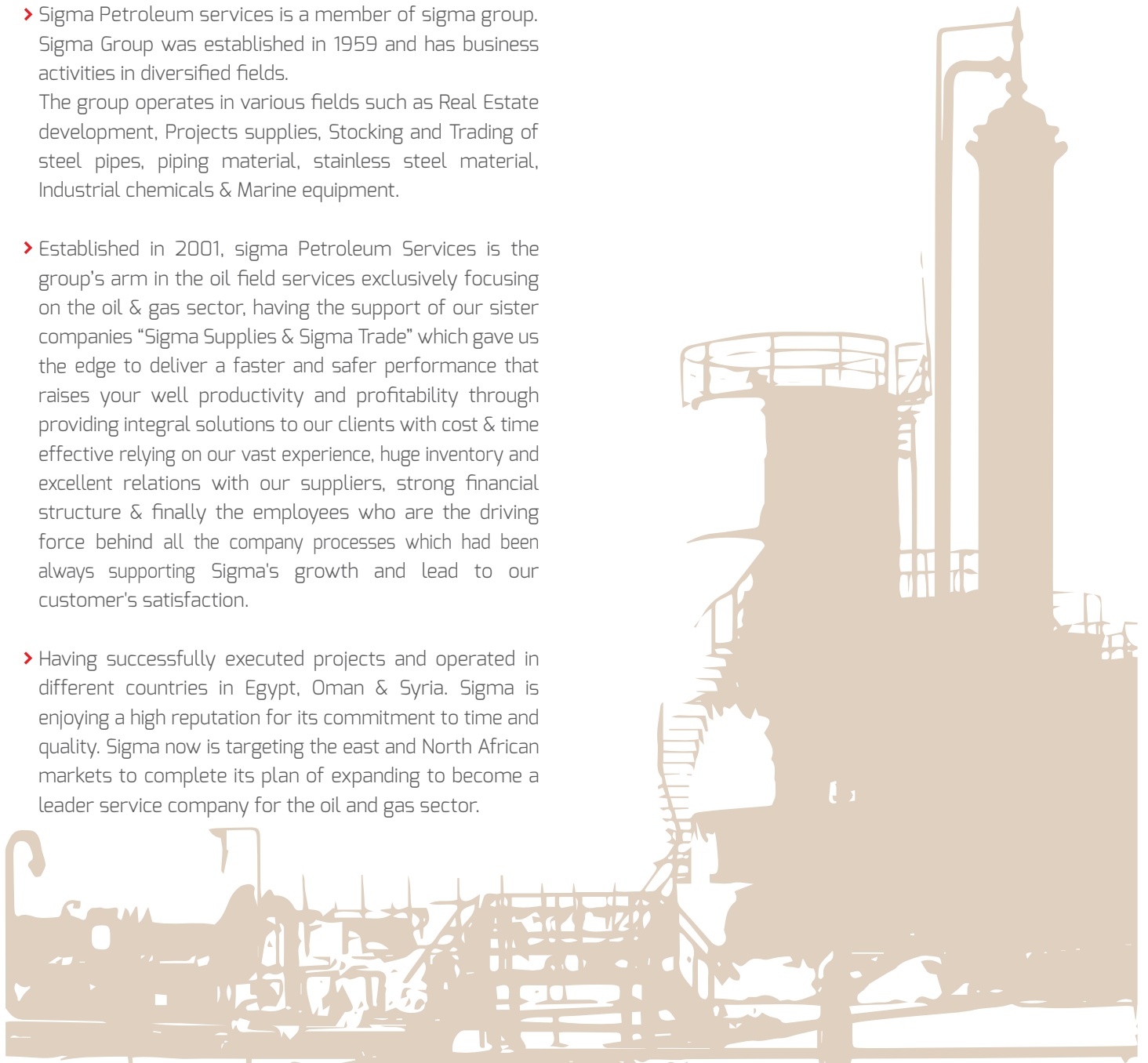
## Social Responsibility

We care. Thanks to our longstanding involvement in the industrial sectors. We developed clear and comprehensive policies governing the way we handle the environmental, health and safety issues that affect our business, our people and our communities. But these policies would be nothing if they weren't for the dedication of our people. We place them at the heart of our company and make significant investment every year in their health, safety, training and career development.



## History

- Sigma Petroleum services is a member of sigma group. Sigma Group was established in 1959 and has business activities in diversified fields. The group operates in various fields such as Real Estate development, Projects supplies, Stocking and Trading of steel pipes, piping material, stainless steel material, Industrial chemicals & Marine equipment.
- Established in 2001, sigma Petroleum Services is the group's arm in the oil field services exclusively focusing on the oil & gas sector, having the support of our sister companies "Sigma Supplies & Sigma Trade" which gave us the edge to deliver a faster and safer performance that raises your well productivity and profitability through providing integral solutions to our clients with cost & time effective relying on our vast experience, huge inventory and excellent relations with our suppliers, strong financial structure & finally the employees who are the driving force behind all the company processes which had been always supporting Sigma's growth and lead to our customer's satisfaction.
- Having successfully executed projects and operated in different countries in Egypt, Oman & Syria. Sigma is enjoying a high reputation for its commitment to time and quality. Sigma now is targeting the east and North African markets to complete its plan of expanding to become a leader service company for the oil and gas sector.



# Appreciation Letters

## دليل النفط ش.م.م. DALEEL PETROLEUM L.L.C.

June 3<sup>rd</sup>, 2007

Engr. Ihab Hosni,  
General Manager,  
Sigma Petroleum Services,  
P.O. Box 676 P.C. 117,  
Marsa Matruh, Egypt.

RE: **Sigma Early Production Facility (EPF) Contract**

To: Whom It May Concern

Daleel Petroleum L.L.C. Sultanate of Oman would like to document our appreciation to Sigma for the work done from February 2007 to May 2007 in Daleel oil field, Block-5, Oman.

Sigma Petroleum Services operated early production facility (EPF) for 3 months.

Sigma Petroleum Services had all the necessary resources and experience to do the job successfully. Their response was prompt, performance was excellent and without any down-time.

Daleel appreciates and thanks Sigma Petroleum Services for excellent performance and efforts to complete the campaign in an extremely short notice.

On behalf of  
Daleel Petroleum LLC

*Imiaz Ahmad Chowdhury*  
Imiaz Ahmad Chowdhury  
Production Technologist

Daleel Petroleum LLC,  
Imiaz Ahmad Chowdhury  
Production Technologist  
E & O Department



Letter of Technical Support

Signed on 17th day of July 2008

Between

NATCO is a business entity existing under the law of USA and having its registered office in 11210 Equity Drive Suite 100, Houston, Texas 77041 USA, represented by John Trombka, Aftermarket Sales and Service Manager (hereinafter referred to as "NATCO")

And

Sigma Petroleum Services Co., a company incorporated and existing under the laws of the Egypt and having its registered office in 5 St Catherine Square, Mansheya, Alex, Egypt, represented by Mr. Hassan Bishr (hereinafter referred to as "SIGMA" and collectively with "NATCO" as "The Parties" and individually as "The Party")

### PREAMBLE

The Parties hereto intend to establish a technical, procurement and sales cooperation to explore jointly the opportunity for the Production Facilities in Egypt and Oman and have agreed to enter into this LTS in order to regulate their collaboration and harmonize their efforts in pursuing this opportunity.

The Parties wish to summarize their discussion and create a framework for their possible cooperation which identifies the essential milestones for establishing such opportunity and the parameters in which such opportunity would establish.

NOW, THEREFORE the Parties agree as follows:

1. NATCO and SIGMA will provide all market and commercial data to conduct a complete feasibility study for each project. The evaluation shall be jointly performed in cooperation between the Parties whereby each party shall bear its own expenses.
2. Sigma will buy equipment from NATCO and resell to Operators in Egypt and Oman. In return NATCO will support technically Sigma in all applications.
3. NATCO will have the right to get the help of Sigma in case NATCO would prefer. In the case only Sigma will act as agent for NATCO in this deal and will take 6% of the total invoice value.
4. NATCO will send Sigma all tenders in Egypt and Oman that NATCO decided to decline for any reason.



11210 Equity Drive  
Suite 100  
Houston, Texas 77041

Tel: (713) 849-7500  
Fax: (713) 849-8975



5. Sigma will handle all tender requirements and deal with the customer and achieve the customer requests within the scope of NATCO. Sigma will buy equipment from NATCO and then resell the same equipment to others.

6. Sigma will participate in the tender on NATCO Behalf. Sigma will pay NATCO and Sigma will charge the customer.

7. For huge projects upon completion of the feasibility study the Parties shall evaluate the results and draw a business plan accordingly. A Technical and Supply Cooperation Agreement shall be established to govern the business relationship between the Parties.

8. SIGMA and NATCO will supply all techno-commercial information respectively and project cost related data to assure the efficient and accurate preparation of the above mentioned study.

9. Each of the Parties hereby undertakes to the other that it shall not disclose information of confidential nature relating to the project other than such information as becomes available to the public or is required to be disclosed by law or required to fulfill the requirements to this LTS. This clause remains in force also after the termination of the LTS.

10. This LTS shall deem automatically terminated if no agreement can be reached between the Parties. However during the existence of the LTS neither Party can engage itself in discussion with third parties on a similar project in Egypt or in Oman that has been brought to NATCO by Sigma or that NATCO has acquired through the relationships that have been established with its customers.

11. This LTS and all agreements to be concluded by both Parties shall be governed and construed in accordance with the laws of Delaware in the United States of America.

12. This LTS shall expire after 2 (two) years from the execution date of the LTS.

IN WITNESS whereof the Parties have signed this LTS as of the day and year written above.

For NATCO

*John Trombka*  
Name: Mr. John Trombka  
Designation: Export Manager

For SIGMA Petroleum Services Co.

*Hassan Bishr*  
Name: Hassan Bishr  
Designation: Operations Mgr.



11210 Equity Drive  
Suite 100  
Houston, Texas 77041

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Fax: (713) 849-8975

## دليل النفط ش.م.م. DALEEL PETROLEUM L.L.C.

June 3<sup>rd</sup>, 2007

Engr. Ihab Hosni,  
General Manager,  
Sigma Petroleum Services,  
P.O. Box 676 P.C. 117,  
Marsa Matruh, Egypt.

RE: **Mobile Test Separator Services**

To: Whom It May Concern

Daleel Petroleum L.L.C. Sultanate of Oman, would like to document our appreciation to Sigma for the work done in our Daleel oil field, Block-5, Oman.

Sigma Petroleum Services supplied a complete test package of 1440 ps. separator to do the production testing campaign for two months; a total of 20 wells were tested during the campaign.

Sigma Petroleum Services had all the necessary resources and experience to do the job successfully. Their response was prompt, performance was excellent and without any down-time.

Daleel appreciates and thanks Sigma Petroleum Services for excellent performance and efforts to complete the campaign in an extremely short notice.

On behalf of  
Daleel Petroleum LLC

*Imiaz Ahmad Chowdhury*  
Imiaz Ahmad Chowdhury  
Production Technologist

Daleel Petroleum LLC,  
Imiaz Ahmad Chowdhury  
Production Technologist  
E & O Department



No. PTTEP OMAN OMA/03/2008

May 24, 2008

Subject: Certificate of Experience

To Whom It May Concern:

This is to certify that Sigma Petroleum Services Co.(Oman Branch), a company organized and existing under the laws of the Sultanate of Oman and having its registered office at P.O. Box 676, Postal Code: 117, Grand Wadi, the Sultanate of Oman, provided the below services to PTTEP Oman Company Limited.

Contract description: Early Production Facilities of Shams-10 well  
Services duration: 14<sup>th</sup> November 2007 to 14<sup>th</sup> May 2008  
Scope of work performed: Supply, Installation and Operate Shams-10 Early Production Facilities  
Location: Block 44, Samsah, Sultanate of Oman

PTTEP Oman Company Limited, hereby declares and certifies that the said services were performed and provided in an acceptable manner, with good HSE statistical record of zero LTI, and in accordance with the specifications set out in the above mentioned services contract.

Sincerely yours,

*Sameeha Lamminta*  
Sameeha Lamminta  
Operation Manager  
PTTEP Oman Company Limited

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## Early Production Facilities

- Sigma petroleum services has been providing Production Facility Systems since 2001 and is recognized as one of the leaders for the provision of fast-track and cost-effective production facilities, delivered on a lease, operate and maintain basis for either short term or long-term projects in Egypt, the middle east & Africa.
- Our Early-production facilities provide our customers with the ability to bring their new discoveries on stream in a very short time span from 7 to 21 days with a full range of fast-track options which helps to limit your exposure to early capital expenditures on production systems and maximize your long term return on investment & allow you better evaluation of the reservoir.
- Thanks to our comprehensive inventory of equipment & the strength of Sigma team.  
we can design, supply, install, commission and operate early production facilities for small – medium oil fields and production enhancement systems for medium - large oil fields.  
Sigma petroleum services has designed and installed modular fit-for-purpose EPFs for more than 10 years and to date has completed more than 70 projects.  
Sigma offers a variety of commercial agreement options for EPFs that affords to our clients the flexibility to maximize their return on investment.



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## Our Key Strengths

- › Proven fast-track capability
- › Extensive experience from delivered projects.
- › Huge inventory, variety of equipment & materials.
- › Operations and maintenance services available with any selected agreement
- › Quick equipment addition capability
- › Short- or long-term contract options
- › Tailored solutions utilizing our fleet of existing equipment
- › Flexible process design to meet changing conditions
- › Providing high quality service to our customers with a commitment to health, safety and environmental protection.

## Benefits

- › Early cash flow
- › Minimum initial upfront cost.
- › Minimum risk
- › Powerful track record for delivery of EPF projects in timescales that are unrivalled
- › Our EPF solutions are built around modular, prefabricated equipment with reconfiguration flexibility for production optimization.





## Production Enhancement Solutions

- › There is nothing more important than keeping your production or processing facility up and running. But when operations are not going as planned you may need equipment experts to help turn things around.
- › Our technical services personnel have the application skills and operating experience to solve problems, collaborate with you for equipment solutions and recommend the corrective actions or retrofit solutions to enhance the performance of your process equipment from audits and troubleshooting, to on-site inspection, repair, installation, commissioning, and startup. Our operating services personnel are highly trained and ready to go.
- › Our strong presence combined with knowledge gained through many years of providing equipment and services right in your area, means that we can be your first responders for operating services. We maintain an inventory of available equipment solutions for sale and lease completed with the quality and reliability you expect.
- › Our operating services are backed up by the engineering and technology personnel of our entire company to ensure we can solve your most challenging operating problems.



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## Equipment Rental And Sales

- Sigma offers the oil and gas industry time proven and quality oilfield equipment & services.
- Our equipment are installed in some of the largest and most diverse production regions.
- We have developed a reputation for providing products of superior quality and state-of-the-art design.
- We also provide a complete range of spares as well as installation assistance and commissioning of all our Equipments

### Products

- LP, MP and HP Horizontal 3 phase separators.
- LP, MP and HP Vertical 3 phase separators.
- 1 MMBTU/Hr to 12 Million MMBTU/Hr Heaters treaters.
- 1 MMBTU/Hr to 4 Million MMBTU/Hr Water bath indirect fired heaters.
- Production units.
- Dehydration units.
- HCDP units.
- Sweetening units.
- Gas compressors.
- Knockout drums and Gas boots.
- Atmospheric tanks up to 2500 BBL.
- Surge tanks.
- Production & test manifolds.
- Chemical and Water injection skid units
- High pressure triplex pumps.
- High pressure shipping pumps.
- Booster pumps.
- Tanker loading pumps & shipping gantries.
- API, centrifugal & gear pumps.
- Chemical injection pumps.
- Air diaphragm & piston pumps.
- 45 KVA to 500 KVA Generators.
- Consoles and controls.
- Portable flare systems.
- Burner booms.
- Flow lines equipment
- Air compressors.





## Well Testing

- › Sigma is a leading provider of Production Well Testing Services operates testing units across Egypt, Middle East and Africa. We specialize in providing well-test services in challenging conditions such as high-flow rate, small locations and sour production. Sigma has fast & precise testing methods, as well as to perfect well testing operations and processes, and make them as effective and efficient as possible
- › Sigma understands the need for accurate and efficient production testing data. These data are used to determine commercial viability, as well as to plan potential completion and production facilities. That's why our Production Well Testing team works with customers to design the correct solution for their unique situation. Our testing resources include sour and high-pressure systems, trailer-mounted systems for difficult location access, and secure on-line access to testing data. Our experience and commitment ensure to provide accurate information in a safe and efficient manner. Most well tests can be grouped as productivity testing or descriptive testing.

### **Productivity well tests are conducted to:**

- › Identify produced fluids and determine their respective volume ratios
- › Measure reservoir pressure and temperature
- › Obtain samples suitable for pressure-volume-temperature (PVT) analysis
- › Determine well deliverability
- › Evaluate completion efficiency
- › Characterize well damage
- › Evaluate work over or stimulation treatment.



### Well test mobile units service

A custom-built package including equipment and crew for mobile well testing to cover all the production wells of a field or block. The generated accurate and timely well data serve client's need of reservoir monitoring, well management and production optimization.



### Well test manifolds service

Sigma offers a wide range of choke manifold configurations and sizes of different pressures and temperatures for all types of well test or clean-up operations to meet the client's demands and well conditions.



### The surface well testing service

Realize real time monitoring and real time display of the process of the well from initial flowing to flow on different choke sizes and provide primary data for reservoir evaluation during the exploration stage.





## Gas Treatment

We provide standard or custom designed solutions for virtually any operating environment backed by a tradition of excellence that comes from placing more units into operation than any other competitor.



### Dehydration

Gas dehydration processes remove water vapor from natural gas. Removing water vapor prevents hydrate formation and corrosion and maximizes pipeline efficiency. The choice of absorbent or adsorbent systems is on a case by case basis depends on the level of dehydration required, the location of operation and the flow rate and inlet feed composition.



### Heating

Gas heaters can be used to raise the gas stream temperature above that at which hydrate formation may occur. Heat transfer can be done either directly or indirectly through an additional medium.



### Hydrocarbon Dew Pointing

Dew Point Control Systems recover valuable marketable hydrocarbon liquids, thus delivering more revenue while preparing the gas to meet pipeline specifications. Dew point control is necessary when raw gas lines are constrained in liquid content. As the liquid reduces, the gas throughput causes slugging and interferes with gas metering.



### Separation

Gas entering a treatment facility can contain solids and liquids, either as particulates or as a distinct phase. The solids and liquids will need to be removed from the gas phase prior to the gas being sent onwards for additional processing and purification.



### Treating | Sweetening

Most gas processing facilities have a gas treating step to remove the acid gases Hydrogen Sulphide and Carbon Dioxide. Although many natural gases are free from objectionable amounts of H<sub>2</sub>S and CO<sub>2</sub>, substantial quantities of these impurities are found in both gas reserves and production throughout the world.

## High Water Cut Solutions

Produced water quality has become an increasingly large area of concern for the oil production industry. Production facilities have been re-evaluating their conventional approaches to oil removal from water due to increasing water cuts caused by the maturation of their oil wells as well as a need for cleaner water for re-injection or disposal purposes. As such, the main concerns for producers are that not only do many facilities require an upgrade to their existing equipment to handle higher capacities, but also that their facilities require a more rigorous and reliable system to maintain their water quality for re-injection or disposal specifications. Sigma delivers simple and economic systems for an efficient oil/water separation with complete process containment.







## Pulling unit Service

- › Sigma offers a wide range of pulling units with different pulling capacities and effective jacking capacities.  
Our units are single Drum or double Drum truck mounted self-propelled workover rig which consists of self-propelled chassis, transfer case, angle gear box, drawworks and brake system, mast, deadline anchor a weight indicator, hydraulic winch, hook block, pneumatic system, hydraulic system and electrical system.
- › The whole unit structure is compact and adopts hydraulic + mechanical driving mode with high comprehensive efficiency.
- › The units adopt II-class or self-made chassis with various to meet the users different requirements.
- › The mast is face open single or double telescoped sections, hydraulically or mechanically raised and telescoped.
- › The raising and telescoping controls are located near the operator's console for easy access and operation.
- › Our units are powered by cat engine, the power is transmitted to the front drive axle, the rear drive axle and the drawworks system by transfer case separately. The driver can control shift in the cab when the carrier is running and the driller can operate the remote control valve on the driller's console when workover.
- › All drawworks meet or exceed API recommendation for oil and gas design criteria and are engineered to meet a minimum 4.1 safety factor.
- › Drawworks Drums are dynamically balanced to ensure smooth running. Wide barrel design reduces line interference when operating double fast line.
- › Heavy-duty 4-axle or 5-axle oilfield carriers with two front steering axles, two rear-driving axles.
- › All frame members are open and welded for superior strength and durability.
- › The oilfield carrier is designed for maximum maneuverability, road clearance and turning radius.
- › The location of the carrier axles is specially engineered to correctly distribute weight in proportion to front and rear axles.

### Applications

- › New GL completion
- › New Water injector completion
- › ESP Conversions
- › Water Injection Conversions
- › PCP Conversion
- › ESP Pump Replacements
- › PCP Replacements
- › Tubing Replacements / Re-Completion
- › Water Shut Off
- › Beam Pump Installations / Repairs
- › Lateral Cleaning
- › Perforation
- › Water injector tubing replacement
- › Abandonment
- › Casing Repair





## Client List

### Egypt

- › Khalda Petroleum Company
- › Agiba Petroleum Company
- › Petrobel Petroleum Company
- › Qarun Petroleum Company
- › Edison International
- › Marina Petroleum Company
- › Belayim Petroleum Company
- › Magawish Petroleum Company
- › Al Amal Petroleum Company
- › Alamein Petroleum Company
- › Apache Egypt Companies
- › Dara Petroleum Company
- › East Zeit Petroleum Company
- › Esh El Malaha Petroleum Company
- › Fanar Petroleum Company
- › Gebel El Zeit Petroleum Company
- › INA-Naftapllin
- › IPR Group of companies.
- › North Bahariya Petroleum Co.
- › Oasis Petroleum Company
- › Sipetrol International S.A
- › South Dabaa Petroleum Company
- › Suez Oil Company
- › Vegas Oil & Gas S.A
- › Wadi El Sahl Petroleum Company
- › Mansoura Petroleum Company
- › TransGlobe Petroleum Egypt
- › Abu Quir Petroleum

### Oman

- › PDO
- › CCED
- › Daleel Petroleum Company
- › PTTEP

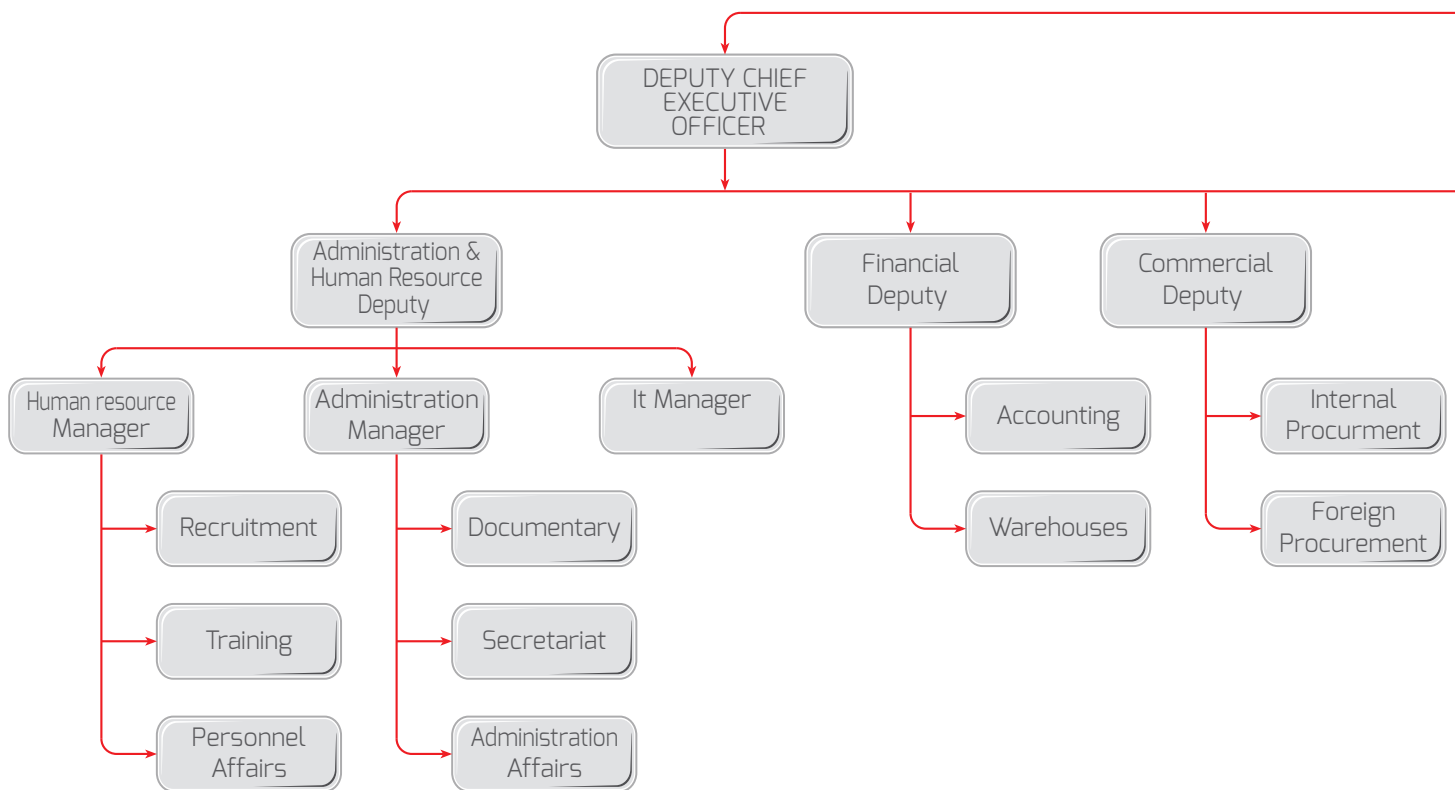
### Syria

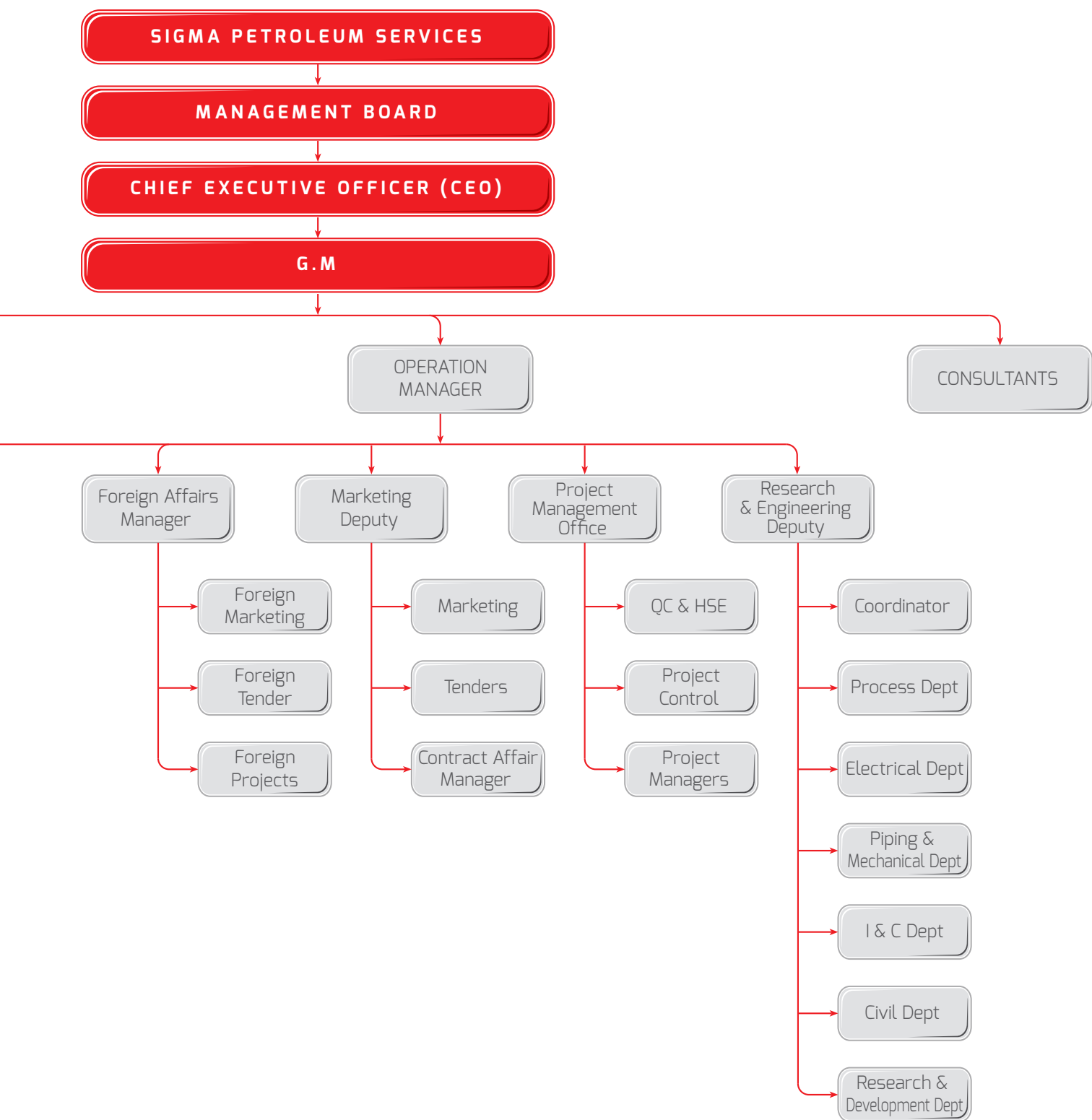
- › Petrocanada





# ORGANIZATION CHART







## Recent Projects

COMPANY	SUBJECT
SUCO / RWE	GAS Treatment Facility
PETROSANNAN	50 KM Gas Pipeline
KPC	Early Production Facilities
PETROCANADA	Early Production Facilities
CCED	Early Production Facilities
PETROSANNAN	GAS Treatment Facility
AGIBA	Early Production Facilities
EDISON	Early Production Facilities
SIPETROL	Early Production Facilities
MARINA PETROLEUM Co.	Early Production Facilities
QARUN PETROLEUM Co.	Early Production Facilities
DANA GAS	Early Production Facilities
PETROSHAHD	Early Production Facilities
PETRODARA	Early Production Facilities
KHALDA PET Co.	Early Production Facilities
CCED	Well Testing
Daleel Pet Co.	Well Testing
PETROSHAHD Co.	Early Production Facilities





COMPANY	SUBJECT
AGIBA	Early Production Facilities
Khalda Pet Co.	Rental of Early Production Facilities for Abu El Gharadek
APACHE EGYPT	Early Production Facilities
DANA PETROLEUM	Work Over Rig
Khalda Pet Co.	Rental of heating package
PETROBEL Co.	Rental of heating package
AGIBA PETROLEUM Co.	Production Enhancement Package
KUWAIT EMERGY	Water Injection Package
HAMRA OIL	11 KM Shipping Pipeline
PETROSHAHD Co.	Production Enhancement Package
NORPETCO	Production Enhancement Package
AMPETCO	Rental of 3 phase separators
EAST ZEIT PETROLEUM Co.	Rental of 3 phase separators
AGIBA PETROLEUM Co.	Rental of heater treaters
PETROBEL Co.	Rental of Oil storage tanks
QARUN PETROLEUM Co.	Production Enhancement Package
OASIS PETROLEUM Co.	Rental of Oil storage tanks
AGIBA PETROLEUM Co.	Rental of 3 phase separators



## Useful Conversion Factors

Conversion Factors		
Multiply	By	To Get
acres, ac acres, ac acres, ac	0.4047 43,560 4047	hectares, ha square feet, ft <sup>2</sup> square meters, m <sup>2</sup>
acre-feet atmospheres, atm bars	43560 14.70 0.9869	cubic feet, ft <sup>3</sup> pounds per square inch, lb/in <sup>2</sup> atmospheres, atm
bars barrels, bbl barrels, bbl	14.5 5.614 0.159	pounds per square inch, lb/in <sup>2</sup> cubic feet, ft <sup>3</sup> cubic meters, m <sup>3</sup>
barrels, bbl British thermal units, Btu British thermal units, Btu	42 252 777.65	gallons, gal calories (gram), g-cal foot pounds, ft-lb
Btu/hr calories (gram), g-cal calories (gram), g-cal	0.29287 0.003969 4.183	watts, W British thermal units, Btu joules, j
Celsius, (degrees) centipoise, cp centipoise, cp	(C x 9/5) + 32 0.001 0.002089	Fahrenheit (degrees) newton-sec per sq meter, N-sec/m <sup>2</sup> pound-sec per sq foot, lb-sec/ft <sup>2</sup>
cubic feet, ft <sup>3</sup> cubic feet, ft <sup>3</sup> cubic feet, ft <sup>3</sup>	0.0370 0.0283 7.4805	cubic yards, yd <sup>3</sup> cubic meters, m <sup>3</sup> gallons, gal
cubic feet, ft <sup>3</sup> cubic feet per minute, ft <sup>3</sup> /min Fahrenheit (degrees)	28.32 0.4719 (F-32) x 5/9	liters, l 0.4719 liters per second, l/sec Celsius (degrees)
feet, ft feet, ft feet, ft	12 0.3048 30.48	inches, in meters, m centimeters, cm
feet of water, (head) feet per minute, ft/min feet per minute, ft/min	0.0295 0.5080 0.0183	atmospheres, atm centimeters per second, cm/sec kilometers per hour, km/hr
feet per minute, ft/min feet per second, ft/sec feet per minute, ft/min	0.0114 0.6818 0.3048	miles per hour, mi/hr miles per hour, mi/hr meters per minute, m/min
foot pounds, ft-lb foot pounds, ft-lb foot pounds, ft-lb	0.001286 0.3236 1.356	British thermal units, Btu calories (gram), g-cal newton meters, Nm
gallons, gal (U.S.) gallons, gal (U.S.) gallons, gal (U.S.)	3785 0.1337 231	cubic centimeters, cm <sup>3</sup> cubic feet, ft <sup>3</sup> cubic inches, in <sup>3</sup>



Conversion Factors		
Multiply	By	To Get
gallons, gal (U.S.)	0.003785	cubic meters, m3
gallons, gal (U.S.)	3.7854	liters, l
gallons per minute, gal/min (gpm)	0.0238	barrels per minute, bbl/min
gallons per minute, gal/min (gpm)	0.00223	cubic feet per second, ft3/sec
gallons per minute, gal/min (gpm)	0.003785	cubic meters per minute, m3/min
gallons per minute, gal/min (gpm)	0.0631	liters per second, l/sec
grams per cubic centimeter, g/cm3	62.43	pounds per cubic foot, lb/ft3
grams per cubic centimeter, g/cm3	0.03613	pounds per cubic inch, lb/in3
grams per liter, g/l	0.00834	pounds per gallon, lb/gal
hogsheads (U.S.)	8.422	cubic feet, ft3
horsepower, hp	42.44	Btu per minute, Btu/min
horsepower, hp	746	joules per second, j/sec
horsepower, hp	746	watts, W
inches, in	2.54	centimeters, cm
inches, in	0.0833	feet, ft
inches, in	0.0254	meters, m
inches of mercury, in	0.0333	atmospheres, atm
inches of mercury, in	1.133	feet of water (head)
inches of mercury, in	0.03453	kilograms per sq centimeter, kg/cm2
inches of mercury, in	0.4911	pounds per square inch, lb/in2
inches of water, (4°C)	0.002455	atmospheres, atm
inches of water, (4°C)	0.0361	pounds per square inch, lb/in2
joules, j	0.2391	calories (gram), g-cal
kilograms, kg	2.205	pounds, lb
kilograms, kg	0.001102	tons (short)
kilograms per cubic meter, kg/m3	0.001	grams per cubic centimeter, g/cm3
kilograms per cubic meter, kg/m3	0.06243	pounds per cubic foot, lb/ft3
kilograms per square centimeter, kg/cm2	28.96	inches of mercury, in Hg
kilograms per square centimeter, kg/cm2	32.81	feet of water, ft (head)
kilograms per square centimeter, kg/cm2	14.22	pounds per square inch, lb/in2
kilometers, km	0.6214	miles, mi (statute)
kilometers, km	0.5396	miles, NM (nautical)
kilometers per hour	27.78	centimeters per second, cm/sec
kilometers per hour	54.68	feet per minute, ft/min
kilometers per hour	0.6214	miles per hour, mi/hr
kilopascals, kPa	0.145	pounds per square inch, lb/in2
kilowatts, kW	56.92	Btu per minute, Btu/min
kilowatts, kW	1.341	horsepower, hp
kilowatt-hours, kWh	860.5	kilogram-calories, kg-cal



Conversion Factors		
Multiply	By	To Get
liters, l liters, l liters, l	0.2642 0.00629 0.0353	gallons, gal barrels (oilfield), bbl cubic feet, ft <sup>3</sup>
liters, l liters, l liters per minute, l/min	0.001 1.057 0.2642	cubic meters, m <sup>3</sup> quarts (U.S.), qt gallons per minute, gal/min
liters per minute, l/min meters, m meters, m	0.00629 100 3.281	barrels per minute, bbl/min centimeters, cm feet, ft
meters, m meters per min, m/min meters per min, m/min	0.9144 3.281 0.060	yards, yd feet per minute, ft/min kilometers per hour, km/hr
meters per min, m/min miles (statute), mi miles (statute), mi	0.03728 5280 1609	miles per hour, mi/hr feet, ft meters, m
miles (statute), mi miles (statute), mi miles per hour, mi/hr	1.609 0.8690 1.466	kilometers, km nautical miles, NM feet per second, ft/sec
miles per hour, mi/hr miles per hour, mi/hr miles per hour, mi/hr	0.6214 0.8690 26.82	kilometers per hour, km/hr knots, kn meters per minute
nautical miles, NM nautical miles, NM nautical miles, NM	6076 1852 1.151	feet, ft meters, m statute miles, mi
newtons per square meter, N/m <sup>2</sup> ounces, oz ounces, oz	1 28.35 0.0625	pascals, Pa grams, g pounds, lb
ounces, oz parts per million, ppm parts per million, ppm	0.9115 0.0584 0.0001	ounces (troy) grains per gal (U.S.), grain/gal weight percent, wt%
pounds, lb pounds, lb pounds, lb	453.6 0.4356 16	grams, g kilograms, kg ounces, oz
pounds per gallon, lb/gal pounds per gallon, lb/gal pounds per square inch, lb/in <sup>2</sup>	119.8 7.48 2.307	kilograms per cubic meter, kg/m <sup>3</sup> pounds per cubic foot, lb/ft <sup>3</sup> feet of water (head)
pounds per square inch, lb/in <sup>2</sup> pounds per square inch, lb/in <sup>2</sup> pounds per square inch, lb/in <sup>2</sup>	703.1 6.897 144	kilograms per square meter, kg/m <sup>2</sup> kilopascals, kPa pounds per square foot, lb/ft <sup>2</sup>
quarts (U.S.), qt quarts (U.S.), qt quarts (U.S.), qt	946.3 0.9463 0.0334	cubic centimeters, cm <sup>3</sup> liters, l cubic feet, ft <sup>3</sup>





Conversion Factors		
Multiply	By	To Get
quarts (U.S.), qt radians 57.30 square centimeters, cm <sup>2</sup>	57.75 57.30 0.001076	cubic inches, in <sup>3</sup> degrees square feet, ft <sup>2</sup>
square centimeters, cm <sup>2</sup> square centimeters, cm <sup>2</sup> square feet, ft <sup>2</sup>	0.1550 0.0001 929	square inches, in <sup>2</sup> square meters, m <sup>2</sup> square centimeters, cm <sup>2</sup>
square feet, ft <sup>2</sup> square feet, ft <sup>2</sup> square inches, in <sup>2</sup>	144 0.0929 6.45	square inches, in <sup>2</sup> square meters, m <sup>2</sup> square centimeters, cm <sup>2</sup>
square inches, in <sup>2</sup> square inches, in <sup>2</sup> square kilometers, km <sup>2</sup>	0.00694 0.000645 247.1	square feet, ft <sup>2</sup> square meters, m <sup>2</sup> acres, ac
square kilometers, km <sup>2</sup> square meters, m <sup>2</sup> square meters, m <sup>2</sup>	0.3861 0.000247 10.76	square miles, mi <sup>2</sup> acres, ac square feet, ft <sup>2</sup>
square meters, m <sup>2</sup> square yards, yd <sup>2</sup> square yards, yd <sup>2</sup>	1.196 9 1296	square yards, yd <sup>2</sup> square feet, ft <sup>2</sup> square inches, in <sup>2</sup>
square yards, yd <sup>2</sup> tons (long) tons (long)	0.8361 1016 2240	square meters, m <sup>2</sup> kilograms, kg pounds, lb
tons (long) tons (long) tons (metric)	1.016 1.120 1000	tons (metric) tons (short) kilograms, kg
tons (metric) tons (metric) tons (metric)	2204.6 0.9841 1.1023	pounds, lb tons (long) tons (short)
tons (short) tons (short) tons (short)	907.2 2000 0.8929	kilograms, kg pounds, lb tons (long)
tons (short) watts, W watts, W	0.907 3.415 44.25	tons (metric) Btu per hour, Btu/hr foot pounds per minute, ft-lb/min
watts, W yards, yd yards, yd	1 91.44 3	joules per second, j/sec centimeters, cm feet, ft
yards, yd yards, yd yards, yd	36 0.000914 0.9144	inches, in kilometers, km meters, m
yards, yd	0.000568	miles, mi



**SIGMA**  
Petroleum Services





**SIGMA**  
Petroleum Services

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