ENERGY DRILLING AUSTRALIA

Rig 4

Schramm T500XD
(Sn. J138-0002)

ENERGY DRILLING AUSTRALIA – Rig 4
Schramm T500XD

Component	Description
Drilling Rig	The T500XD is a trailer mounted portable land rig designed to API 4F, 7K and 8C standards. Dual MTU V2000 diesel engines provide power to the hydraulic system for drilling operations. The trailer mounted Telemast system consists of fewer loads and offers rapid set-up and deployment. Automated pipe handling, slip actuation and breakout systems set this machine apart from conventional oilfield equipment. The Half-Triple concept is designed to utilize Range 3 drill pipe for increased drilling efficiency and quick trip times. The three axle trailer mounted unit includes the engine packages and hydraulic power systems. Four outriggers are supplied to provide a stable platform for the power trailer. Quick coupled hoses transmit the hydraulic supply to the rig's Mast Unit.
Hydraulic System	Each engine is directly coupled to a pump drive gearbox to power its hydraulic power system. To obtain full system performance, both engines must be operated at 1800 rpm. However, when drilling conditions permit, one engine can be operated for fuel savings and to provide maintenance capability without stopping the drilling process. Each engine has an identical hydraulic system so either unit can be run with the same performance. The hydraulic system includes a 1000 gallon tank with full return oil filtrations. All pumps are protected by suction line strainers and all hydraulic circuits are protected by relief valves and oil cooler system. Walkway platforms are provided for access to hydraulic tank during maintenance operations. Pumps: Each engine powers (9) pumps; (8) piston and (1) one gear type Filters: (18) twin element 10-micron replaceable elements with magnetic particle strainers on return ports. High pressure 10-micron elements are located on the power unit, mast unit and Load Safe Tank Capacity: 1,000 gal. Magnetic strainers and shut-off valves on all suction ports
Mast Unit	The Schramm Telemast is mounted on a 4 axle trailer with tandem tag axle and includes hydraulic components necessary to transmit power to the feed, rotation and auxiliary functions. Quick coupled hoses transmit the hydraulic supply from the Power Unit to the rig's Mast Unit. Telescoping construction permits long head travel and working height, yet short overall length in the transport position. Equipped with a 30" (762 mm) cylinder operated slide, the mast is free-standing; all pullback loads are directed into the floor, not the rig frame. The mast is anchored to the rig floor via locking pins. A multi-point system is provided to simplify lubrication of drill components. Provides centralized grease fitting locations for top head, crown, jib boom.
Feed System	The top head is raised and lowered by hydraulic traverse cylinders through 2-7/16" (63 mm) OD wire rope (370 Tons Nominal Breaking Strength per strand) and 77" PD Nylatron sheaves. As the top head is raised, the inner mast section extends by a ratio of 1:2 until it reaches its fully extended position at 56’ of head travel. Top Head Travel: 56’ (17.f07 m) Hook load: 500,000 lbs. Actual (227,227 kg) Hoist Speed (Both Engines): 0 - 130,000 lbs. @ 136 fpm (regeneration), 101,000 lbs. - 285,000 lbs. @ 106 fpm,

Component	Description
	286,000 lbs. - 305,000 lbs. 100 fpm, 306,000 lbs. - 419,000 lbs. @ 76 fpm & 420,000 lbs. - 500,000 lbs. @ 64 fpm Pull down Capacity: 80,000 lb (36.363 kg) Pull down Speed: 0 - 180 fpm loaded; 0 - 200 fpm free head (no load)
Rig Engines	2 x MTU 12V-2000TA DDEC Tier 2, 760 bhp (567 kw) @ 1,800 rpm w/ electric start, includes (2) two 220 gal fuel tanks, diesel air shut down system and silencer style muffler with heat wrap on exhaust components. Cooling: 2 x Two core, side by side package, 130°F (54.4°C) ambient rating, with 60" hydraulically driven fan.
Top Drive Details	The hydraulic top drive is powered by a radial piston motor and is mounted to a tilting slab-back to facilitate pipe handling functions via the Load-Safe. A floating sub is provided to extend the life of threads by removing feed cylinder and pipe weight forces from threads while making and breaking tool joints. Casing lifting eyes are slab-back mounted to work in conjunction with commercially available elevator links (not included). The top drive includes a rotation lock and rebound prevention circuitry for use when directional drilling. An in-line mud saver valve is mounted in the top drive spindle. Connection at top drive swivel is 3". Power: 950 HP (708 kw) Rotation Speed: 0- 140 RPM (+/- 5%) Rotation Torque: Up to 35,000 ft/lbs (+/- 5%) Swivel: 3" cartridge style Fluid Pressure Rating: 5000 psi Air/Mud Fluid Lines - A 4" stand pipe and travelling hose is mast mounted and includes 1502 class hammer unions for 5000 psi operation.
Main Winch	A hydraulically powered winch is mounted to the side of the mast for utility lifting operations. The winch is a planetary type with overrunning clutch, hydraulic brake valve and spring applied hydraulic release brake. The winch operates independently of the other drilling functions. Winch is reeved over a hydraulic jib boom which centres the line over the centre of the borehole. Model: Braden PD12C Drum Capacity: 547 ft (167 m) of 1/2" cable (12.7 mm) Bare Drum Pull: 9,600 lb (4,354 kg) Bare Drum Speed: 151 fpm (46.0 mpm) 150 ft Drum Pull: 8,700 lb (3,946 kg) 150 ft Drum Speed: 165 fpm (50.3 mpm) Cable Supplied: 150 ft (46 m) of 1/2" cable (12.7 mm) HSLR (high strength low rotation) cable.
Survey Line Winch	Survey line “Wire Line” Electrically powered & Hydraulically controlled, Wire capacity of 25,000 feet & a wire dimension of 0.092”
Load-Safe XD	The Load-Safe XD automated pipe handling system is skid mounted and provides hands-free pipe handling for drill pipe, drill collars and casing. The Load-Safe lifts tubulars from the horizontal position into alignment with tilting top head and advances forward or slides back to allow easy interface with the top drive spindle

Component	Description
	and will pass 24" casing. Built-in holding clamp allows for make-up or break-out of tool joints from top drive spindle. Two (2) pipe arms per side are provided with indexing systems insure that one pipe is loaded at a time. Arms are positioned to allow the use of Range 2 or Range 3 tubulars. Arm Length: 129" per side. Only one set of jaws is required to cover the full range of tubular diameters (4" 24"). The jaws are simply moved to one of 4 locations on the clamp arms to accommodate 4 separate diameter ranges. Diameter Range 1: 4" - 10" Diameter Range 2: 10" - 14" Diameter Range 3: 14" - 20" Diameter Range 4: 20" - 24" Six (6) hydraulic outriggers are provided to level the machine for stable operation. Capacity: Up to Range 3 Lift: Up to 10,000 lbs The LoadSafe is capable of an average tripping rate of 1,000 fph
BOP Carriage	BOP Transport skid is designed to hydraulically lift the entire stack to a vertical position & hoisted with twin Air Hoists rated at 10T each. A trolley mounted hoist lifts BOP and rolls it into position over the borehole.
Interface Connections	Includes (18) hydraulic hoses and (3) electrical cord sets required to connect the Power Unit to the Mast Unit and the Load-Safe.
Sub Base	The sub base is a cantilever design which offers a stable platform and compact footprint and is a multi-piece package consisting of 5 transport loads. The sub base includes a walking system which allows the rig to be accurately position over the conductor hole and provides quick moves from hole to hole while operating on pad drill sites. The walking system also allows for re-levelling of the machine if required. The sub structure set-up and walking systems are operated by a radio control module. Includes staircases, walkways and railings as required. Floor Height: 22’ Clearance: 19’ under table bushing Ground Pressure: Dead Load: 26 psi; Live Load: 57 psi Walking, Mast Down: 41 psi Walking Mast Up: 56 psi HPU for Sub Base is provided with both manual and radio remote controls: Diesel Engine - 4-cylinder Perkins Hydraulic System: Single fixed volume pump Hydraulic Tank - 750 gal.
Walking System	Unlike traditional rigs that are on rails and only allow movement from left to right or front to back, the T500XD has a walking system that lifts the entire rig off the ground, allowing the rig to turn and rotate. The rig can walk at 30 fph and rotate 360°. The walking system consists of 4 hydraulically operated pad systems which are located at each corner of the parallel lift sections. Lift cylinders raise the machine 6" off of the ground and slide cylinders translate the machine 12" in any direction in 5 degree increments.

Component	Description
Rig floor and Control Room	The rig floor and control room are mounted on a three axle trailer assembly that is integrated to the sub base during rig up operations. The rig floor contains 37-1/2" false table adapter and a 27-1/2" Master Bushing.
Doghouse	The control room is 10' x 15' and provides a climate controlled environment for the driller and Load-Safe operator. All rig and Load-Safe controls are within easy reach of the operators. The control room is positioned to provide good visibility of the rig floor and camera systems provide the operators with views of the area around the Load-Safe and BOP. Joy sticks are provided for most drilling and tripping related functions for the rig and the Load-Safe. Other functions are operated via switches located on related operator touch-screens. The main Drilling screen display provides details of Hook-load, Weight on Bit (WOB), Top Drive Position, Rotation Torque, Standpipe Pressure and Hole Depth Information. This same information can be supplied to third party instrumentation companies. Monitors: (3) 15" touch screen type Controls: (2) control positions, (1) for the driller and (1) for the LoadSafe operator. The driller has (2) screens, (3) multi-function joysticks and additional control switches. The Load-Safe operator has (1) screen and (2) multi-function joysticks. Seating: (2) fully adjustable swivelling chairs Lighting: (2) 240V 40W fluorescent fixtures Electrical Accessory Circuits: (10) duplex outlets, 80 amps total accessory supply Heating: air handler, 24,000 btu Cooling: air handler, 11,000 btu Power Requirement: 100 amp, 240V AC Single Phase, routed through a distribution panel. The control room is equipped with hardware for wireless remote connectivity which allows for monitoring of rig system from a remote location. Various information screens are also available for troubleshooting operations.
Iron Roughneck- Power Breakout	The arm swings beneath the top head by a hydraulically powered geared actuator. The lower jaws grab and hold the lower joint while the upper jaws grab and rotate the upper joint to make or break the connection. Height is adjustable 24" to allow for variances in the landed height of the drill string. Two (2) sets of jaw dies are required to cover the full diameter range of this unit. Eight (8) x PN 3528-0011 dies are required for clamping diameters under 4-1/2" (order separately if required). Torque is adjustable in both the make and break directions and is monitored via a hydraulic pressure gauge. Range: 4-1/2" - 13-3/8" diameter Clamping Force: Adjustable to 61,500 lbs @ 3000 psi Break/Make Torque: 60,000 ft/lbs @ 3500 psi
Blow Out Preventers	One (1) – 11" 5000# W.P. Integrated Spherical Style Annular BOP Bore: 11" Working Pressure: 5000 PSI Top Connection: 11" 5000 studded with R53 ring groove Bottom Connection: 11" 5000 flanged with R53 ring groove Packing Element: Nitrile Rubber Certification: API 16A, NACE MR01-75, Latest Edition, ERCB 3 Year Inspection One (1) – 11" 5000# W.P Integrated (IWS) Hydraulic Double Ram BOP Bore: 11" Working Pressure: 5000 PSI Top Connection: 11" 5000 studded with R53 ring groove

Component	Description
	Bottom Connection: 11” 5000 studded with R53 ring groove Outlets: None Certification: API 16A, NACE MR01-75 Latest Edition, One (1) – 11” 5000# W.P Integrated (IWS) Hydraulic Single Ram BOP Bore: 11” Single Ram 5K Working Pressure: 5000 PSI Top Connection: 11” 5000 studded with R53 ring groove Bottom Connection: 11” 5000 studded with R53 ring groove Outlets: None Certification: API 16A, NACE MR01-75 Latest Edition,
BOP storage & transport system	Hydraulic operated storage & transport skid with lifting collar suitable to lift entire BOP Stack.
BOP Test Stump	1 x 11” 5K test stump incorporated with the BOP transport skid.
BOP Accumulator	CPC 8 Station (5 in use), 80 Gallon BOP Accumulator Control Unit. Unit is manufactured to meet ISO 9001, API 16D. Consists of 16 X11 gallon, 5,000 Psi working pressure separator bladder type accumulators which are provided with ASME U-1A certificates. Unit has one (1) pressure relief valve set at 3,300 Psi. The pressure relief valve prevents over pressuring the accumulators and pump systems, and is self-resetting. Relief valves comply with API RP 16E. Paragraphs 2 3 2 and 5 3. One (1) electric pump module model number T10- using triplex pump series CPC BP4032 and equipped with 1” plungers. The triplex reciprocating plunger pump is a heavy-duty pump capable of operation even when small pieces of debris get into the system. Pump is unitized with one new 25 HP explosion proof IEC Ex electric motor. In addition it has one (2) 8½” air driven motor coupled to 40:1 ratio plunger pump with self-adjusting packing. This assembly produces approximately 4 GPM at mid-range pressure of 2,000 psi.
BOP Remote Control Panel	One (1) air pilot operated graphic remote panel for remote display of unit pressures as well as functioning of both ram functions, and by pass regulator. This is mounted inside doghouse with umbilical connection to koomy and is fitted with annular pressure regulator, annular pressure gauge, accumulator pressure gauge, rig air pressure gauge & bypass control valve System incorporates pneumatic alarm system designed to alert driller of problems with the control unit. Visual indication is displayed by pneumatic indicators showing green if everything is ok and red when there is a fault. When a fault occurs, horn sounds. An isolation valve is provided to disable to horn if fault isn't immediately repairable. Alarms are: • Low Tank Level • Low Accumulator Pressure • Low Supply Air supply
BOP Suitcase	1 X BOP Suitcase (6 Station) 40 feet long skid role design with 4 additional provisions.

Component	Description
Choke Line Valves	1 x 3⅛" 5000 psi remotely (hydraulic) operated valve 1 x 3⅛" 5000 psi manual valve
Kill Line Valves	1 x 2 1/16" 5000 psi hyd remotely operated valve 1 x 2 1/16" 5000 psi manual valve 1 x 2 1/16" 5000 psi check valve
Choke Line	3" 5000 psi coflex type choke hose with 3" bore. Fitted with 3⅛" x 5000 psi flanges. 12m long hose.
Kill Line	2 1/16" 5000 psi flanged to 2" kill hose with 2" bore, 8m long.
Choke Manifold	3⅛" x 5,000 psi 4 way block located on dedicated skid housing both the choke manifold and poor boy degasser. 3⅛" 5000 psi inlet choke manifold, with single 3⅛" 5000 psi bypass valve 2 1/16" 5000 psi choke chambers leading to one adjustable manual chokes and one remote (hydraulic); each choke has a 2 1/16" 5000 psi downstream isolating valve; at the back of the manifold each line enters a 4 way block and the blocks are connected to each other by 2-1/16" 5000 psi valves. Each block has an external isolating valve down to hammer union. Test inlet is via 5 way block with a riser consisting of 3⅛" 5000 psi valve with 3 way data header for pressure point.
Flare Tank	Designed and Manufactured by Practical Engineering. Physical dimensions are; Skid width: 2.4 m, Skid length: 4.5 m, Skid height: 3.1 m in stowed position and7.5 m in operating position. Skid weight: 3100 kg tare, 30,000 kg loaded (approx.) Capacity: 10760 Litres max. Type: Dry Gas (CBM) Max Operating pressure: 20.68 Mpa (3000 psi) Standard Cubic Feet per Hour:1,400,000 (SCFH) Energy rating: 377 MW
Flare Line	4" schedule 40 pipe with figure 200 hammer unions. 45m length and anchors.
Auto Igniter	Gas - pilot Type: LPG Gas Max Operating pressure: 2.75 Kpa
Mud Gas Separator	Poor boy type Degasser is manufactured by DFE New Zealand and consists of; 1 x Vertical 36" x 20' elevated mud gas separator with; 4" inlet on degasser 2" hose from choke manifold 8" mud discharge to shaker 6" vent line Design temp; 0-100 Operating temp; 0-80 Design Pressure; 150psi Operating Pressure; 100psi

Component	Description
	Hydrotest (max test pressure); 230psi Fluid density design 2.3 4' Butterfly dump valve on bottom of unit 24' inspection hatch 12.5 ft mud seal.
Mud Gas Separator Vent Line	6" schedule 40 vent line to atmosphere 4450mm, connected to top of 20ft degasser tank.
Drilling spools and adaptors	One (1) – 11" 5000# WP SARA Drilling Spool Bore: 11" Working Pressure: 5000 PSI Top Connection: 11" 5000 flange with R53 ring groove Bottom Connection: 11" 5000 flange with R53 ring groove Outlets: One (1) 3 1/8" 5000 with R31 ring groove and One (1) 2 1/16" 5000 with R24 ring groove Certification: API 16A, NACE MR01-75 Latest Edition, ERCB 3-Year Certification.
Riser & Flow Lines	12" round enclosed riser flow-line to 12" mud return to shale shaker 1 x 12" surface hole riser
Mud Pump	Two (2) Gardener Denver PZ-8 triplex mud pumps mounted on oilfield skid base. Max pressure 5,000 psi Driven by 805HP Detroit Diesel, MTU 12V – 2000 Allison Transmission Model DP8962 with electric shift control Electric driven low rpm lube pump Residential type Spark arresting muffler with all exhaust piping covered with heat blankets. 10 dia X 6" pipe Suction manifold w/screens 4" discharge manifold, Type Solid Block 3" pressure safety valve 0-6,000 psi pressure gauge 4" 5000 psi rated 20 Gal discharge pulsation damper and strainer cross with applicable flanges for discharge connections Maximum continuous RPM 145 (Jack Shaft-652/Min) Pump is supplied with 6½" liners and pistons. Other sizes can be made available upon request subject to availability. Max pressure with 4" Liners 5,000 psi (189 GPM@ 145 strokes) Max flow with 7" Liners 1,996 psi (580 GPM @ 145 strokes) Controls for mud pump engine throttle, gears and stop valves located at the drillers control panel in the doghouse. Pumps fitted with emergency stop controls, stroke counters, air strangler, and fire suppression system Pumps engine is electric start.
Charge Pump for Mud Pump	Charge pump is an electrically driven SPD 6 x 5 x 14 pump with 5" discharge, 6" suction, and 14" impellor. Electric motor is a 50hp 1800rpm motor @ 50 Hz.

Component	Description
High Pressure Mud Lines	Air/mud fluid lines 4” schedule XXS piping. Mast plumbing is fully welded with no threaded connections and is rated to 5,000 psi (206bar). Includes a 5,000 psi mud gauge, mud pump knock-off connection union, hydraulic operated drill string vent valve.
Standpipe manifold	Stand Pipe: 4”, 5000 psi working pressure. Fitted with welded and/or integral fig 1502 union connections. 1 x 4” gate valve to isolate flow to mast stand pipe 1 x 2” gate valve Kill Line. 1 X 2” Choke Line. 1 X 2” 1502 Pressure sensors. 1 X 2”bleed line 1 X 2” Pressure gauge flange type. All valves with MXF 1502 Hammer unions, flexibility to replace leaking valves without major change, Manifold mounted on side of mast with an independent frame support & direct access from drill floor.
Standpipe Ground Manifold	1X Ground Manifold for 2 X Mud Pumps with provision to interface a 3rd Mud Pump
Mud Tank System	Skid mounted 800 bbl mud tank manufactured by DFE in New Zealand with configuration as follows: Shaker Tank 385 BBL’s total; Sand Trap 35 bbls, Trip Tank 25 bbls, Desander Tank 100 bbls, Desilter Tank 100 bbls, Settling Tank 120 bbls, Suction Tank 415 BBL’s Total; Suction Tank 1 170 bbl’s Premix Tank 170 bbl’s, Slug Tank 75 bbls Operating dimensions; 3.0m W x 4.16m H x 14.0m L Transport dimensions; 3.0m W x 4.40m H x 14.0m L Skid: Triple beam runner skid. Lifting points are certified for 1.25 x dry weight of tanks to ASNZ standards. Floor: 8mm thick mild steel floor. The floor has a 1 in 10 slope for complete draining and easy cleaning. The corners are plated in at an angle to prevent the accumulation of solids.
Bulk Bag Handling System	Bulk bag Hopper Air hoist system with 2 Ton lifting capacity
Mud mixing equipment	All agitators offered are DFE HD series. Agitators are sized to provide a turnover rate (TOR) of 45 – 60 seconds for mixing applications where a higher shear rate is preferred. Solids control and homogenising agitators are designed with a 60-90 second TOR to minimise solids degradation but still maintain a homogenous feed to solids removal equipment.
Shaker tank equipment	1 x 385 BBL Skid Mounted Shaker Tank 3 x DFE-SCR-HG Linear Motion Shaker 1 x DFE-SCR-HG Linear Motion Shaker 1 x 1000 GPM Desilter and Desander incl (see below) 1 x 250 Series 6 x 5 x 75 HP Desander Pump 1 x 250 Series 6 x 5 x 75 HP Disilter Pump

Component	Description
	1 x 10 HP Agitator c/w 40” Impeller 1 x Vacuum Degasser
Desilter / Desander	1 X DFE 12 x 5” Cone (1,000 GPM) desilter and a 2 x 10” cone desander c/w inlet pressure gauge, feed and discharge piping, cone underflow tray, discharge chute and skid mounting. Rated to process 1000 GPM while yielding a 25 and 75 micron cut respectfully. Cones come with replaceable inserts. Manifold has DFE’s unique pressure drop manifold system maximising removed solids/mud ratio in the cone underflow. All mounted over a High G shale shaker as a mud cleaner.
Centrifugal Pumps	2 x mixing pumps - Mission 6 x 5 x 75 HP – 750 GPM 2 x Desilting and Desanding Pumps - Mission 6 x 5 x 75 HP – 1000 GPM
Suction tank equipment	2 x 250 Series 6 x 5 x 75 HP Mixing Pump 2 x 10 HP Agitator c/w 40” Impeller 1 x 7.5 HP Agitator c/w 32” Impeller 1 x Derrickmans Bench and work station
Day Water Tank	1 x rock-over trailer for easy/fast manoeuvrability with 500bbl water tank with transfer pump.
Generators	Rig (main) Generator - Two (2) generators located on a Separate skid - Power Plant • Rating: Prime rated @ 635kVA, 508kW, 3-phase, 415v, 50Hz, 1500rpm • Engine Model: Caterpillar C18 EUI Injection • Fuel Tank: 1000 litre base mounted with float switch and fuel solenoid with self bunded engine bay. • Canopy: Sound attenuated, lockable enclosure rated at 61.7 dBa@7m on full load • Spill management tray
Power Plant Skid	Generator Skid (1) that will house the 2X C18 Main Rig Generators
Compressor	Two (2) only Champion CSE45 Rotary screw air compressor rated at 213cfm @ 10bar. Air is reticulated via quick disconnect hoses and fittings to various building and engine modules for positive shutdown (strangler valves), operation of doghouse window wipers, air supply to koomy backup power pack and general use as required. Two (2) x 520 litre air receiver tanks adjacent to Compressor with one tank dedicated as a backup to the koomy.
Air Dryer	One (1) Sullair DRDii095 Refrigerated Air Dryer @335 cfm/14 Bar 240V50 Hz
Air Plant Skid	Air Plant Skid (1) that will house the 2X Air compressors CSE45,2X Air Receivers 520 litre ea,1X Air Dryer DRDii095 & 1 X Power Control MCC panel
Bulk Fuel Storage	One trailer mounted 23,590 litre capacity self bunded tank manufactured and complies with AS1692 & AS1940. Tank is fully baffled for transport and has an emergency pressure vacuum vent with rollover shutoff protection. Handrails and stairwells for access and egress comply to AS1657 Features of the units consist of;

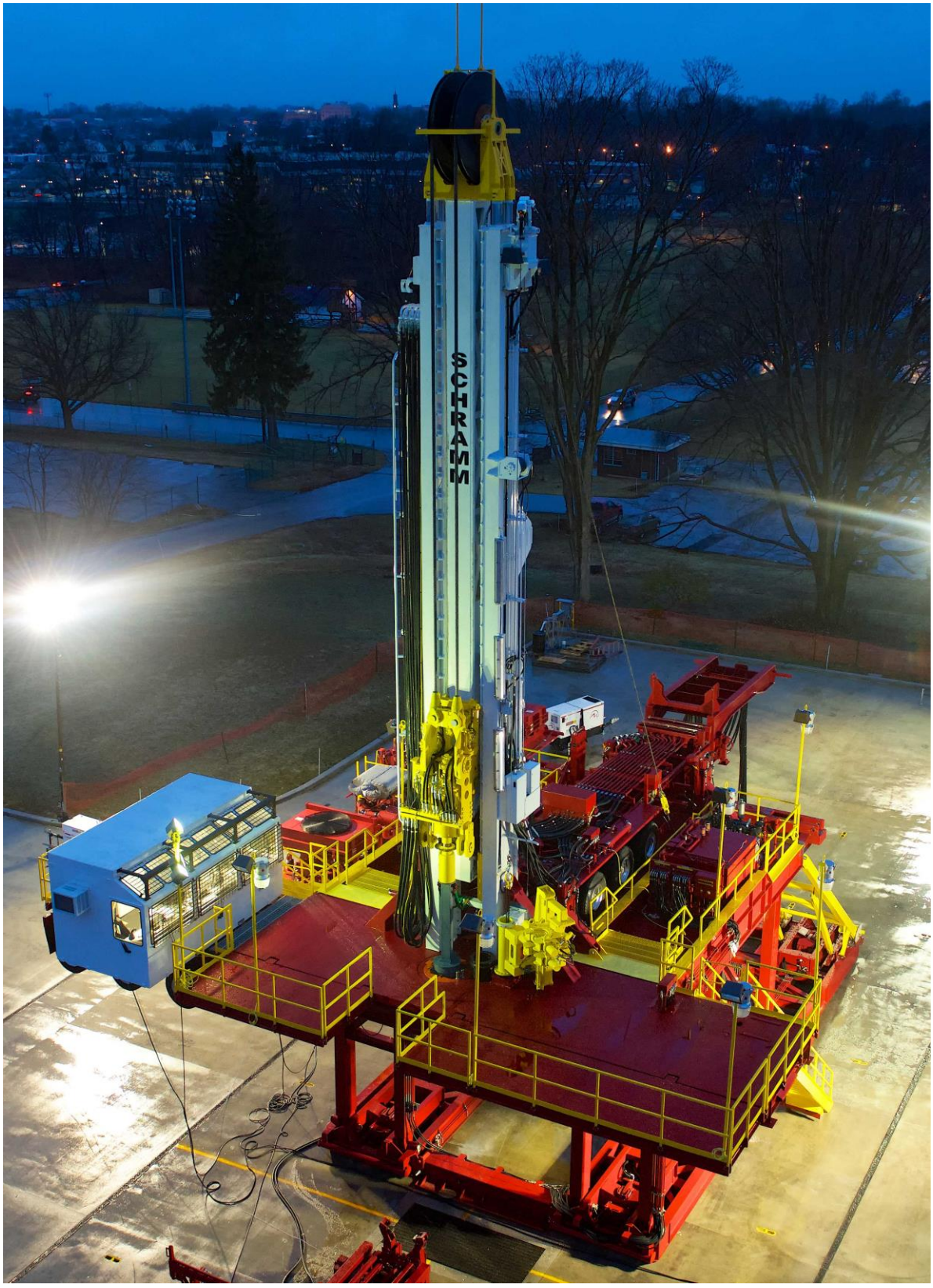
Component	Description
	• Loop feed system circulating diesel fuel to all engines with return to tank for cooling using AusEx rated electric motor and pump with a capacity of 5 litres per minute. • Backup fuel circulating pump • High flow fill pump using AusEx rated electric motor and pump with a capacity of 30 litres per minute. • Anti-static hose reel. • Earth stake • Hi-flow fuel meter • Fast fill capacity for transfer of fuel between commercial fuel tanker and tank One new 1,000 litre double skinned portable fuel cell with pump, fork pockets and lift points, manufactured and complies with AS1692 & AS1940
Oil & Lubricant Storage	One (1) 10' bunded container mounted forward of the fuel trailer on gooseneck with bulk oil, packaged oil and filtration storage capability.
Dangerous Goods Storage	Storage cabinet for paints and aerosols in the Rig tool shack.
Waste Oil Storage	Dedicated 1000 litre self bunded tank located independently
Mechanics Shack / Whitehouse (parts store)	Mechanics store consists of 1 x 40' container comprising of; Work bench, grinder/wire wheel, hydraulic hose crimp, cut off saw, vice, various hand tools, storage cupboards and generator / welder. Parts storage with protected shelving.
Roughneck Shack / Junk basket	Roughneck shack consists of 1 x 20' container comprising of; Work bench, hand tools, storage cupboards. Junk basket contains all heavy tooling, subs, hoses etc Both units are located together on a rock-over trailer.
Rig lighting	Stahl 2 x 36w florescent EX rated (zone 1) light fittings are located in the following locations: 4 x rig mast, 2 x cellar, 2 x rig deck, 4 x mud tank deck including shaker, 1 x mixing pump room, 1 x choke manifold room, 1 x stairwell on mud tank, 1 x stairwell of doghouse, 1 x inside doghouse, 1 x bulk fuel tank, 1 x koomy room, 1 x compressor room, 1 x storage room and 1 x main rig generator room, 1 x emergency generator room. In addition for flood lighting we have installed several Cooper EX rated (zone 1) L.E.D lighting which feature 100V to 300V hence not affected by voltage fluctuations, instant lighting when switched on. All L.E.D lights are located as follows: 4 x top of doghouse pointing in various directions including up the mast, 4 x on the combination building pointing to strategic locations. Zone rated lighting compliant to API500-505. Two x back of pipe handler, 4 x mud tank pointing to strategic locations, 2 x fuel pointing to strategic locations. All lights are protected via earth leakage and circuit breakers, PO's have lockout (isolation) capability and all fitted with wire safety harnesses.

Component	Description
Rig Emergency Lighting	The lighting circuit is split into two circuits. Emergency lighting is provided by the CSE hazardous areas 230V twin 4 ft. If power is lost through failure of the main rig generator, the following areas maintain emergency lighting: mast lights, stairwells, cellar, and Accumulator room, inside doghouse, choke manifold room, generator, fuel pump room, compressor room and carrier. Auxiliary power is able to be provided to the above-mentioned lighting plus the Accumulator unit in the event the main generator needs to be shut down. Power is provided via an auxiliary generator located on the combination building near to the compressor and main rig generator.
Drill Pipe	265 joints of 4 ½" 16.6Lb/FT S135 Drill Pipe with NC46DS Connections, Range 3 with 6 ¼" OD X 3 ¼" ID tool joints, 14" box tong and 11" pin tong
Drill Pipe Pup Joint	Two (2) 5' pup, 4½" OD 16.6# drill pipe with NC46 Two (2) 10' pup, 4½" OD 16.6# drill pipe with NC46 Two (2) 15' pup, 4½" OD 16.6# drill pipe with NC46
Drill Collars	8 x 8 ¼" Range 2 spiral drill collars with 6 5/8" REG connection, OD 8 ¼", ID 2 13/16". 14" Crushed Tungsten Hard banding 16 x 6¼" Range 2 spiral drill collars with 4" IF (DS46) connection, OD 6¼", ID 2¼". 14" Crushed Tungsten Hard banding.
Heavy Weight Drill Pipe	12 x 4½" Range 2 Slick HWDP with DS46 Connection tool joint, 6 ¼ " OD x 2 7/8 " ID tool joint x 30" long. 10" Casing Friendly Hard banding
Tubular Storage	5 x skid mounted pipe bins for the storage and transport of drill pipe. Each cradle is equipped with hinged loader access door for safe loading unloading of tubulars.
Crossover Subs	1 x NC38 Box x NC46 Pin, 6 1/4'" OD x 2 9/16" ID 1 x NC50 Box x NC46 Pin, 6 ½" OD x 2 9/16" ID 2 x NC50 Box x NC38 Pin, 6 ½" OD x 2 9/16" ID 2 x NC46 Box x 6 5/8" Reg Pin, 8 ¼" OD x 2 9/16" ID 2 x NC46 Box x 2 7/8" EUE Pin, 6 ¼" OD x 2 ¼" ID 2 x NC46 Box x 3 ½" EUE Pin, 6 ¼" OD x 2 ¼" ID 1 x NC46 Box x NC38 Pin, 6 ¼" OD x 2 ¼" ID 1 x NC38 Box x NC46 Pin, 6 ¼" OD x 2 ¼" ID 1 x NC50 Box x NC46 Pin, 6 ½" OD x 2 ¼" ID 1 x DS46 Box x NC38 Pin, 6 ¼" OD x 2 9/16" ID 1 x NC38 Box x DS46 Pin, 6 ¼" OD x 2 9/16" ID 1 x DS46 Box x NC50 Pin, 6 ½" OD x 2 9/16" ID 1 x NC50 Box x DS46 Pin, 6 ½" OD x 2 9/16" ID 1 x NC46 Pin x NC50 Pin, 6 ½" OD x 2 9/16" ID 1 x NC46 Pin x NC46 Pin, 6 ½" OD x 2 9/16" ID
Saver Subs	4 x NC50 Box x NC46 Pin, 6 ½" OD x 2 9/16" ID 2 x NC50 Box x 6 5/8" Reg Pin, 7 5/8" OD x 2 9/16" ID 2 x NC50 Box x NC38 Pin, 6 ½" OD x 2 9/16" ID 2 x NC50 Box x 3 ½" EUE Pin, 6 ½" OD x 2 ¼" ID 2 X NC50 Box x 2 7/8" EUE Pin, 6 ½" OD x 2 ¼" ID

Component	Description
Bit Subs	2 x 6 5/8" Reg Box x 6 5/8" Reg Box, 8 ¼" OD x 2 ¼" ID 1 x 6 5/8" Reg Box x NC46 Box, 8 ¼" OD x 2 ¼" ID 2 x 4 ½" Reg Box x NC46 Box, 6 ¼" OD x 2 ¼" ID 2 x 6 5/8" Reg Box x 7 5/8" Reg Box, 9 ¼" OD x 2 ¼" ID
Lifting Nubbins	Lifting nubbins to suit all rig subs
Drill String Float Valves	2 x each of 4R & 6R safety valves
Casing Running Subs	2 x NC50 Box x 7" BTC, 7 ¼" OD x 3" ID 2 x NC50 Box x 9 5/8" BTC, 10 ¼" OD x 3" ID
Bit Breakers	1 set each for 8-1/2" and 12-1/4" tricone bits.
Power Slips	The unit has an hydraulic operated Schramm power lifter, operated from the drillers console and equipped Dencon slips and inserts to suit: 13 3/8", 9 5/8" & 7" Casing, 5 ½" & 4 1/2" Drill Pipe 5 ½"-7" & 6 ¾"–8 ¼" Drill Collars
Manual Slips	Drill pipe slips-4-1/2" SDS X 4 ea Drill Collar slips Mdl/LDC (8")& UDC(6-1/4",Sn-32614 & 32621-2 ea Casing Slips (9-5/8")-Dencon,Sn-32630 & 32631-2 ea.
Handling Tools for Casing & Tubing	Safety Clamps (dog collars) for 7" and 9⅝" casing
Cup Tester	Cup tester sub (NC46 box up, pin down) with rubber for 7" casing. 840mm OAL. 5076psi Rating Cup tester sub (NC46 box up, pin down) with rubber for 9⅝" casing. 840mm OAL. 5076psi Rating
Inside BOP	2 x 10k NC46 x 6 1/2" OD IBOP x 900mm OAL c/w Top cap
Kelly Cock	2 x 10k NC50 K/C c/w Wrench, 6 ½" OD x 2 ¼" ID
Stabbing Valve (Kelly Cock Type)	2 x 10k NC46 S/V c/w Wrench, 6 5/8" OD x 2 ¼" ID
Drill string circulating heads & Testing subs	1 x NC46 Box x NC46 Pin x 2" 1502 Weco Female Side Entry sub, 6 ¼" OD 1 x NC38 Box x NC38 Pin x 2" 1502 Weco Female Side Entry sub, 5" OD 1 x Plane end x NC46 Pin x 2" 1502 Weco Female Circulating sub, 6 ¼" OD 1 x Plane end x NC38 Pin x 2" 1502 Weco Female Circulating sub, 5" OD 1 x NC46 Box x Plane end x ½" NPT Test plug, 6 ¼" OD 1 x NC50 Box x Plane end x ½" NPT Test Plug, 6 ½" OD 1 x NC38 Box x Plane end x ½" NPT Test Plug, 5" OD
Wellhead Installation Tool	Potato masher type for 11" Braden head c/w NC46 Box up connection

Component	Description
Water transfer pump	One (1) 3 x 2 x 11 centrifugal pump fitted with a 7.5 Hp electric motor, water transfer pump permanently located on the end of the day tank.
Gas Detector Systems	1 X Hard wired Crowcon gas detection system as used throughout the industry. It uses IECEX certified “Xgard” EXD detectors feeding information back to a controller in the doghouse. It features X3 H2S sensors at the shakers, bell nipple and the cellar. And X3 LEL sensors at the bell nipple and the shakers. When gas is detected a beacon and audible alarm is set off on the rig floor. The audible alarm has 2 tones (LO and HI level). A flashing beacon is also activated in the doghouse when any gas is detected.
Fire Suppression System	Two (2) individual x C106 Of Pressure Suppression Systems fitted to Schramm Duel Engine Power Pack. One (1) x C106 Rise Of Pressure Suppression System fitted to Gardener Denver PZ-8 pump skid. One (1) x C106 Of Pressure Suppression System fitted to Gardener Denver PZ-8 pump skid. One (1) x C65 Rise OF Pressure Suppression System fitted to main rig generator
Alarm system	Visual and audible alarms incorporated on doghouse. Four X aerosol powered air horns with agreed signals as backup.
Rig Motor Remote Emergency Shutdown System	All engines on site have the ability to be emergency stopped individually through use of the independent stop devices fitted at various and easy to reach locations on each piece of equipment. In addition both mud pumps can be emergency stopped individually from the doghouse, and the Rig HPU engines can be individually soft stopped and E stopped together from there also. Further there is also an overall E Stop system that shutdowns all rig engines if an Estop is actuated in the doghouse, or outside the pushers shack. Emergency stopping activates air shutoff solenoid valves on all engines
Rig Internal Communication System	Rig floor/doghouse communications via a Gaitronics 400-011 Rig Com system. 6 intrinsically safe hand held radios with base station in the site office general crew communication.

E&OE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