

Summary

This section contains the formulas, rules, and principles, and the rate schedules and calculation procedures for determining the assessed value of oil and gas well resource production equipment, and buildings located at an oil or gas well site.

Description

Resource production equipment includes the fixtures, machinery and other appliances by which petroleum oil or gas is produced to the surface, stored, transported from a well site or a battery or gas handling site, or is compressed.

Resource production equipment does not include the fixtures, machinery and other appliances by which petroleum oil or gas is stored at a battery site, or is compressed where the gas is, for the most part, a by-product of petroleum oil production.

Oil or Gas Well Site

The area of land on or under which is located the resource production equipment used to raise or pump the oil or gas to the surface, the resource production equipment used to inject air, water, steam or gas to enhance the production of a well, or the resource production equipment at a water source well, that was operated for 30 or more days in the 12 month period ending July 1 of the preceding year to which the assessment roll relates.

The resource production equipment located at an oil well site includes the pumping equipment, wellhead assembly, tubing and rods, flow lines, manifolds and well accessories.

The resource production equipment located at a gas well site includes the wellhead assembly, tubing, chemical equipment, water handling equipment, metering equipment, flow line and manifold.

The resource production equipment used to inject air, water, steam or gas to enhance the production of a well, and the resource production equipment at a water source well, includes the pumping equipment, wellhead assembly, tubing and rods, metering equipment, control valves, flow lines, manifolds, cable and well accessories.

New Well Site

An oil or gas well site that was drilled in the 12 month period ending July 1 of the preceding year to which the assessment roll relates.

Swabber Well Site

An oil or gas well site where on July 1 of the preceding year to which the assessment roll relates, the resource production equipment used in the preceding year has been removed from the site, with the exception of the wellhead, and has not been replaced with any other on-site resource production equipment.

Shut-In Well Site

The area of land on or under which is located the resource production equipment used to raise or pump the oil or gas to the surface, the resource production equipment used to inject air, water, steam or gas to enhance the production of a well, or the resource production equipment at a water source well, that was operated for less than 30 days in the 12 month period ending July 1 of the preceding year to which the assessment roll relates.

Observation Well Site

The area of land on or under which is located the resource production equipment used to monitor an oil or gas well to enhance the production of the well.

Gas Storage Well Site

The area of land on or under which is located the resource production equipment used to inject gas into a gas cavern or sub surface formation and to pump gas from a gas cavern or subsurface formation.

Flow Line

A flow line is resource production equipment consisting of a line of pipe used to transport oil or gas within a well site to a battery or gas handling site.

Replacement Cost New

The replacement cost new of oil and gas well resource production equipment and buildings located at an oil or gas well site, or a new well site shall be determined by the standard unit method.

For the purposes of identifying the presence and classification of oil and gas well resource production equipment so as to determine its replacement cost new using the standard unit method, the assessor shall use and rely upon information reported by the Saskatchewan Ministry of the Economy and/or its Minister (or any successor of either) in the administration of *The Oil and Gas Conservation Act* and corresponding regulation (or any successor legislation), to the extent such information is available.

The replacement cost new of oil and gas well resource production equipment located at a swabber well site or shut-in well site or observation well site shall be limited to the wellhead assembly which shall be determined in accordance with the wellhead assembly specifications in Chapter 4 - Resource Production Equipment, Section 4.1.3 - Oil and Gas Well Resource Production Equipment, Well Classification.

The replacement cost new of oil and gas well resource production equipment located at an observation well site or gas storage well site, and the replacement cost new of flow lines shall be determined by the unit-in-place method.

The trended original cost method for determining replacement cost new shall be used where the replacement cost new of specific oil or gas well resource production equipment cannot be determined by the standard unit method or the unit-in-place method.

The trended original cost shall include all direct and indirect costs. Direct costs include materials, labour, supervision, equipment rentals, and utilities. Indirect costs include architectural and engineering fees, building permits, title and legal fees, insurance, interest and fees on construction loans, taxes incurred during construction, advertising and sales expenses, and overhead and profit. Trended original costs shall be determined FOB the well site as of January 1, 2019.

Standard Unit Method

The replacement cost new shall be determined as follows:

1. Determine the classification of the well.
2. Determine the resource production equipment needed to operate a substitute well. The substitute well must perform the same function as the well being valued.
3. Calculate the replacement cost new of the resource production equipment located at the well by summing the replacement cost of the substitute resource production equipment.

Unit-In-Place Method

The replacement cost new shall be determined as follows:

1. Determine the type of resource production equipment using the rating guide.
2. Determine the features requiring a unit-in-place lump sum or percentage adjustment.
3. Calculate the replacement cost new of the resource production equipment by adjustment of the base rate by the unit-in-place adjustments.

Trended Original Cost Method

The replacement cost new shall be determined as follows:

1. Determine the original construction cost of all the resource production equipment at the facility.
2. Determine the direct and indirect costs requiring an adjustment.
3. Determine the direct and indirect cost factor for oil and gas resource production equipment required to adjust construction costs to January 1, 2019.
4. Calculate the construction cost of all the resource production equipment at the facility by adjusting the original construction cost for any direct or indirect costs requiring adjustment and multiplying the adjusted original construction cost by the comparative cost index.
5. Determine replacement cost of resource production equipment that can be separately identified and rated by the unit-in-place method.
6. Calculate the replacement cost of the resource production equipment that can not be separately identified by subtracting the replacement cost of separately identified components from the construction cost of all the resource production equipment at the facility.

Physical Deterioration

The amount of physical deterioration for oil and gas well resource production equipment, buildings and structures shall be determined using the lifetime depreciation method. No allowance shall be made for functional and economic obsolescence, except as may be accounted for in the downtime allowance or the production adjustment factor.

Lifetime Depreciation Method

The amount of physical deterioration shall be 40 percent. When calculating replacement cost new less depreciation no additional allowance shall be made for physical deterioration except as may be accounted for in the production adjustment factor.

Downtime Allowance

The downtime allowance for oil and gas well resource production equipment shall be determined by the schedule of rates method.

The downtime allowance shall account for the loss in value due to under-utilization of the resource production equipment. This includes any loss in value due to differences in replacement cost and differences in the amount of depreciation, that have not been taken into account using the procedures in this Manual.

Schedule of Rates Method

The downtime allowance shall be 10 percent. When calculating replacement cost new less depreciation and downtime, no additional allowance shall be made for downtime except as may be accounted for in the production adjustment factor.

Production Adjustment Factor

The production adjustment factor for oil and gas well resource production equipment, buildings and structures located at an oil or gas well site, and flow lines shall be determined by the schedule of rates method.

The production adjustment factor shall account for the loss in value due to under-utilization of the resource production equipment, buildings and structures. This includes any loss in value due to differences in replacement cost and differences in the amount of depreciation, that have not been taken into account using the procedures in this Manual.

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: General Rules

A production adjustment factor shall not be applied to the oil and gas well resource production equipment, buildings and structures located at a new well site, swabber well site, shut-in well site, observation well site, or gas storage well site.

Schedule of Rates Method

The production adjustment factor shall be 0.75 for qualified resource production equipment, buildings, structures and flow lines.

Qualifying Production Level

The production adjustment factor shall be applied to resource production equipment, buildings, structures and flow lines located at an oil or gas well site. The factor shall be a three year average of production from a 36 month period ending July 1 of the preceding year to which the assessment roll relates.

The average production of the well shall be determined as follows:

1. Determine the volume of oil or gas produced by the well during the 12 month period of July 1 to June 30 for each of the three years.
2. Determine the number of days the well was operated during the 12 month period of July 1 to June 30 for each of the three years.
3. Calculate the production of the well for each year by dividing the volume of oil or gas produced by the well for the year by the number of days the well was operated during the year.
4. Calculate the average production of the well by summing the production of the well for the three years and dividing by three.

Oil Wells

Well Area (Abbreviation)	Crude Type	Qualifying Production Level	
		barrels/day	M ³ /day
Weyburn (WE)	Light	1.39	0.221
	Medium	1.47	0.234
Swift Current (SC)	Light	1.15	0.183
	Medium	1.53	0.243
	Heavy	4.25	0.676
Kindersley (KD)	Light	1.15	0.183
	Heavy	4.25	0.676
North Battleford - South (NB-S)	Heavy	4.99	0.794
North Battleford - North (NB-N)	Heavy	4.99	0.794

Gas Wells

Well Area (Abbreviation)	Qualifying Production Level	
	cu.ft./day	M ³ /day
Weyburn (WE)	49,865	1,412.02
Swift Current (SC)	35,725	1,011.61
Kindersley (KD)	40,474	1,146.10
North Battleford - South (NB-S)	49,865	1,412.02
North Battleford - North (NB-N)	49,865	1,412.02

Calculation Procedure

Resource Production Equipment at an Oil or Gas Well Site

Description	Document No.	Page No.
Standard Unit Resource Production Equipment [a), b), c)]		
a) Determine Well Characteristics		
a ₁ . Well Area	4.1.3	1
a ₂ . Well Type	4.1.3	1
a ₃ . Crude Type	4.1.3	2
a ₄ . Horizontal Completion	4.1.3	2
a ₅ . Depth	4.1.3	2
a ₆ . Rated Volume	4.1.3	2
a ₇ . Facility Type	4.1.3	2
a ₈ . Days Operated	4.1.3	2
b) Determine Substitute Well Features	4.1.3	3-18
c) Base Rate = (c ₁ + c ₂ + c ₃ ... + c ₉)		
c ₁ . Pumping Equipment Rate	4.1.5	1-5
c ₂ . Well head Assembly Rate	4.1.4	1
c ₃ . Tubing and Rods Rate	4.1.7	1
c ₄ . Chemical Equipment Rate	4.1.17	1
c ₅ . Water Handling Equipment Rate		
c ₅ = (c _{5.1} + c _{5.2})		
c _{5.1} Separator Rate	4.1.8	1-5
c _{5.2} Scraper Traps Rate	4.1.26	1
c ₆ . Metering Equipment Rate	4.1.14	1-4
c ₇ . Control Valves Rate	4.1.15	1-3
c ₈ . Manifold Rate	4.1.25	1
c ₉ . Flow Line Rectifier Rate	4.1.19	1
d) Unit-in-Place Resource Production Equipment	4.1.1	2
e) Trended Original Cost Resource Production Equipment	4.1.1	3
f) Replacement Cost New = (c + d + e)		
g) RCN less Physical Deterioration and Downtime		
Allowance = f x (1 - (g ₁ + g ₂))		
g ₁ . Physical Deterioration	4.1.1	3
g ₂ . Downtime Allowance	4.1.1	3
h) Production Adjustment Factor	4.1.1	3-5
i) Assessed Value = (g x h)		

The calculation procedure for oil and gas well buildings on an oil or gas well site is found on Document 3.1.3, Page 1.

Description

The comparative cost factors are used to determine the replacement cost of oil and gas well resource production equipment valued by the trended original cost method.

Application

The trended original cost method shall be used when the individual components of resource production equipment cannot be determined or estimated.

The trended original cost method shall not be used to determine the replacement cost of resource production and equipment located at an oil or gas well site, or to determine the replacement cost of resource production equipment that can be separately identified and rated.

Comparative Cost Factor

The comparative cost factor shall be used to calculate the replacement cost new of resource production equipment as of January 1, 2019.

Factors

Year	Comparative Cost Factor
1940 and older	
1941	
1942	
1943	
1944	
1945	
1946	
1947	
1948	
1949	
1950	
1951	
1952	
1953	
1954	
1955	
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1966	
1967	
1968	
1969	
1970	
1971	

Portions of this section are not available for viewing due to licensing with Marshall and Swift. Therefore the factors etc. have been intentionally left blank.

This information is available for purchase by contacting:

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Email: info.request@sama.sk.ca

Web Site: <http://www.sama.sk.ca>

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Comparative Cost Factor

Year	Comparative Cost Factor
1972	
1973	
1974	
1975	
1976	
1977	
1978	
1979	
1980	
1981	
1982	
1983	
1984	
1985	
1986	
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2004	
2005	
2006	
2007	
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2009	
2010	
2011	
2012	
2013	
2014	
2015	
2016	
2017	
2018 and newer	

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Well Characteristics

This section describes the formulas, rules and procedures for determining the classification of resource production equipment located at an oil or gas well site. Oil and gas well resource production equipment shall be classified in accordance with the following well characteristics:

Well Area	Depth
Well Type	Rated Volume
Crude Type	Facility Type
Horizontal Completion	Days Operated

Well Area

The well areas shall be:

Well Area (Abbreviation)	Description
Weyburn (WE)	All municipalities east of the third meridian, from R.M. 1 to R.M. 371 inclusive, except R.M. 282.
Swift Current (SC)	All municipalities west of the third meridian, from R.M. 43 to R.M. 261 inclusive.
Kindersley (KD)	All municipalities west of the third meridian, from R.M. 282 to R.M. 382 inclusive, including R.M. 282 and R.M. 372.
North Battleford - South (NB-S)	All municipalities from R.M. 394 to R.M. 555 inclusive.
North Battleford - North (NB-N)	All municipalities from R.M. 561 to R.M. 622 inclusive and the Northern Administrative District.

Well Type

The well types shall be:

Oil	Gas Injection
Oil (New)	Continuous Steam Injection
Gas	Cyclic Steam Injection
Gas (New)	Water Source
Air Injection	Water Source (New)
Water Injection	

Oil (New) and Gas (New) wells are those wells located on a new well site that was drilled in the 12 month period ending July 1 of the year immediately preceding the year to which the assessment roll relates.

Crude Type

The crude types shall be:

- Light
- Medium
- Heavy

Horizontal Completion:

The horizontal completion types shall be:

- Vertical
- Horizontal

Depth

The depth of an oil or gas well shall be determined by measuring the distance from the kelly bushing to the average depth of the perforations in the well casing, or in the case of a horizontal well, the distance from the kelly bushing to the kick off depth.

Rated Volume

The volume for an oil well shall be determined based on the combined volume of oil and water produced.

The volume for a water source well shall be determined based on the volume of water produced.

The period July 1 to June 30 of the year immediately preceding the year to which the assessment roll relates, shall be used to determine the volume and days operated.

The rated volume shall be determined by application of the following formula:

$$RV = \text{volume} \div \text{days operated}$$

- where: RV = rated volume
 volume = number of barrels of oil and/or water produced by the well
 days operated = number of days the well was operated

Facility Type

The facility types shall be:

Type	Description
Tanks	Used to store oil on site until it is transferred to a battery.
Flow Lines	Used to transfer oil directly to a battery or gas directly to a gas plant, satellite or compressor station.

Days Operated

The number of days that the well was operated during the period July 1 to June 30 of the year immediately preceding the year to which the assessment roll relates.

Shut-In Well Site Reporting Period

The shut-in well site status shall be determined from the 12 month period ending July 1 of the year immediately preceding the year to which the assessment roll relates.

Pumping Units

All oil well pumping units shall be conventional or hydrabeam.

Water Handling Equipment

Type	Description	Rate (\$)
1	<ul style="list-style-type: none"> 20% of Metering Cabinet 10% - 125 - 260psi 12"x5' vertical two phase Separator 60% - 2" receiving and launching trap without bypass 70% - Test Leads 	11,490
2	<ul style="list-style-type: none"> 125 - 260psi 24"x10' vertical two phase separator 3" receiving and launching trap with bypass 	58,290

Metering Equipment

Type	Description	Rate (\$)
1	<ul style="list-style-type: none"> One 300psi gas, dry flow recorder chart 100" with 2 pens 50% of one 3" 300psi senior quick change 50% of one 3" 300psi simplex 	13,160

Water Handling Buildings

Type	Description	Rate (\$)
1	<ul style="list-style-type: none"> 10% - 8' height, 64 sq.ft. metal shed with lining and insulation, floor and heat 20% of 50% 40 barrel open top plastic pop tank 20% of 50% 120 barrel open top plastic pop tank 	1,860
2	<ul style="list-style-type: none"> 8' height, 64 sq.ft. metal shed with lining and insulation, floor and heat 300 barrel lap welded steel stock tank with open top 	47,590

Chemical Equipment

Type	Description	Rate (\$)
1	<ul style="list-style-type: none"> Alcohol drip (9 imp. gal. tank) 	1,690

Substitute Well Features: Weyburn Well Area - Light Crude Oil Wells

The resource production equipment required to operate a substitute oil well that performs the same function as the oil well being valued shall be determined in accordance with the following specifications:

Pumping Equipment

1. Vertical Wells
 - New wells ... 160 pumping unit
 - All other vertical well pumping units:

Rated Volume (barrels/day)	Depth (ft.)			
	<3000	3000 to <4800	4800 to <5700	≥ 5700
< 3	40	114	114	228
3 to < 10	57	114	114	228
10 to < 75	57	160	160	320
75 to < 120	80	160	228	320
120 to < 200	PC-120	228	320	456
≥ 200	PC-120	320	456	640
Rated volume = oil per day + (water per day ÷ 2)				

2. Horizontal Wells
 - New wells ... 456 pumping unit
 - All other horizontal well pumping units:

Rated Volume (barrels/day)	All Depths (ft.)
< 120	160
120 to < 200	228
200 to < 300	456
300 to < 450	456
450 to < 600	640
≥ 600	912
Rated volume = oil per day + (water per day ÷ 2)	

3. Prime Mover ... electric motor.

Wellhead Assembly

Vertical ... threaded 2000 lbs.
 Horizontal ... flanged 2000 lbs.
 Dual wellhead for multizone completion.

Tubing and Rods

Vertical ... 2 7/8" tubing plain steel; 3/4" rod
 Horizontal ... 2 7/8" tubing plain steel; 3/4" rod
 Length ... depth of well for first tubing string
 ... depth of well minus 200 ft. for each additional tubing string

Well Accessories

Cathodic protection rectifier.

Building

n/a

Substitute Well Features: Weyburn Well Area- Medium Crude Oil Wells

The resource production equipment required to operate a substitute oil well that performs the same function as the oil well being valued shall be determined in accordance with the following specifications:

Pumping Equipment

1. Vertical wells
 - New wells ... 160 Pumping unit
 - All other vertical well pumping units:

Rated Volume (barrels/day)	Depth (ft.)			
	< 3000	3000 to < 4800	4800 to < 5700	≥ 5700
< 3	40	114	114	228
3 to < 10	57	114	114	228
10 to < 75	57	160	160	320
75 to < 120	80	160	228	320
120 to < 200	PC-120	228	320	456
≥ 200	PC-120	320	456	640
Rated volume = oil per day + (water per day ÷ 2)				

2. Horizontal Wells
 - New wells... 640 pumping unit
 - All other horizontal well pumping units:

Rated Volume (barrels/day)	All Depths (ft.)
< 120	160
120 to < 200	228
200 to < 300	456
300 to < 450	456
450 to < 600	640
≥ 600	912
Rated volume = oil per day + (water per day ÷ 2)	

3. Prime Mover ... electric motor.

Wellhead Assembly

Vertical ... threaded 2000 lbs.
 Horizontal ... flanged 2000 lbs.
 Dual wellhead for multizone completion.

Tubing and Rods

Vertical ... 2 7/8" tubing plain steel; 3/4" rod
 Horizontal ... 2 7/8" tubing plain steel; 3/4" rod
 Length ... depth of well for first tubing string
 ... depth of well minus 200 ft. for each additional tubing string

Well Accessories

Cathodic protection rectifier.

Building

n/a

Substitute Well Features: Swift Current Well Area - Light Crude Oil Wells

The resource production equipment required to operate a substitute oil well that performs the same function as the oil well being valued shall be determined in accordance with the following specifications.

Pumping Equipment

1. Vertical wells
 - New wells ... 40 pumping unit
 - All other vertical well pumping units:

Rated Volume (barrels/day)	Depth (ft.)		
	< 2000	2000 to < 4500	≥ 4500
< 1.7	25	40	40
≥ 1.7	25	40	40
Rated volume = oil per day + (water per day ÷ 0.67)			

2. Horizontal Wells
 - New wells ... 456 pumping unit
 - All other horizontal well pumping units:

Rated Volume (barrels/day)	All Depths (ft.)
< 120	160
120 to < 200	228
200 to < 300	456
300 to < 450	456
450 to < 600	640
≥ 600	912
Rated volume = oil per day + (water per day ÷ 2)	

3. Prime Mover... electric.

Wellhead Assembly

Vertical... threaded 2000 lbs.
 Horizontal... flanged 2000 lbs.
 Dual wellhead for multizone completion.

Tubing and Rods

Vertical ... 2 7/8" tubing plain steel; 5/8" rod
 Horizontal ... 2 7/8" tubing plain steel; 3/4" rod
 Length ... depth of well for first tubing string
 ... depth of well minus 200 ft. for each additional tubing string

Building

n/a

Substitute Well Features: Swift Current Well Area - Medium Crude Oil Wells

The resource production equipment required to operate a substitute oil well that performs the same function as the oil well being valued shall be determined in accordance with the following specifications:

Pumping Equipment

1. Vertical Wells
 - New wells ... 114 pumping unit
 - All other vertical well pumping units:

Rated Volume (barrels/day)	Depth (ft.)		
	< 2000	2000 to < 4500	≥ 4500
< 7	40	114	114
7 to < 190	57	114	114
≥ 190	228	228	228
Rated volume = oil per day + (water per day ÷ 1.5)			

2. Horizontal Wells
 - New wells ... 640 pumping unit
 - All other horizontal well pumping units:

Rated Volume (barrels/day)	All Depths (ft.)
< 120	160
120 to < 200	228
200 to < 300	456
300 to < 450	456
450 to < 600	640
≥ 600	912
Rated volume = oil per day + (water per day ÷ 2)	

3. Mover ... electric motor.

Wellhead Assembly

Vertical ... threaded 2000 lbs.
 Horizontal ... flanged 2000 lbs.
 Dual wellhead for multizone completion.

Tubing and Rods

Vertical ... 2 7/8" tubing plain steel; 5/8" rod
 Horizontal ... 2 7/8" tubing plain steel; 3/4" rod
 Length ... depth of well for first tubing string
 ... depth of well minus 200 ft. for each additional tubing string

Building

n/a

Substitute Well Features: Swift Current Well Area - Heavy Crude Oil Wells

The resource production equipment required to operate a substitute oil well that performs the same function as the oil well being valued shall be determined in accordance with the following specifications:

Pumping Equipment

1. Vertical wells
 - New wells ... 160 pumping unit
 - All other vertical well pumping units ... 160 pumping unit
 - Related Volume = oil per day

2. Horizontal Wells
 - New wells ... PC-54 pumping unit
 - All other horizontal well pumping units:

Rated Volume (barrels/day)	All Depths (ft.)
< 180	PC-54
180 to < 500	PC-64
≥ 500	PC-80
Rated volume = oil per day + (water per day ÷ 7)	

3. Prime Mover

Facility Type	Prime Mover
Tank	Gas Motor
Flow Line	Electric Motor

Wellhead Assembly

Vertical ... flanged 2000 lbs.

Horizontal ... flanged 2000 lbs.

Dual wellhead for multizone completion.

Tubing and Rods

Vertical ... 3 ½" tubing plain steel; 1" rod

Horizontal ... 3 ½" tubing plain steel; 1" rod

Length ... depth of well for first tubing string

... depth of well minus 200 ft. for each additional tubing string

Building

Facility Type	Building	Rate (\$/unit)
Tank	64 sq.ft. pump shack	6,600
Flow Line	n/a	

Substitute Well Features: Kindersley Well Area - Light Crude Oil Wells

The resource production equipment required to operate a substitute oil well that performs the same function as the oil well being valued shall be determined in accordance with the following specifications:

Pumping Equipment

1. Vertical Wells
 - New wells ... 40 pumping unit
 - All other vertical pumping well units:

Rated Volume (barrels/day)	Depth (ft.)		
	< 2000	2000 to < 4500	≥ 4500
< 1.7	25	40	40
≥ 1.7	25	40	80
Rated volume = oil per day + (water per day ÷ 0.67)			

2. Horizontal Wells
 - New wells ... 456 pumping unit
 - All other horizontal well pumping units:

Rated Volume (barrels/day)	All Depths (ft.)
< 120	160
120 to < 200	228
200 to < 300	456
300 to < 450	456
450 to < 600	640
≥ 600	912
Rated volume = oil per day + (water per day ÷ 2)	

3. Prime Mover... electric motor.

Wellhead Assembly

Vertical ... threaded 2000 lbs.
 Horizontal ... flanged 2000 lbs.
 Dual wellhead for multizone completion.

Tubing and Rods

Vertical ... 2¾" tubing plain steel; ⅝" rod
 Horizontal ... 2⅞" tubing plain steel; ¾" rod
 Length ... depth of well for first tubing string
 ... depth of well minus 200 ft. for each additional tubing string

Building

n/a

Substitute Well Features: Kindersley Well Area- Heavy Crude Oil Wells

The resource production equipment required to operate a substitute oil well that performs the same function as the oil well being valued shall be determined in accordance with the following specifications:

Pumping Equipment

1. Vertical Wells
 - New wells ... 160 pumping unit
 - All other vertical well pumping units ... 160 pumping unit
 - Rated Volume = oil per day

2. Horizontal Wells
 - New wells ... PC-54 pumping unit
 - All other horizontal well pumping units:

Rated Volume (barrels/day)	All Depths (ft.)
< 180	PC-54
180 to < 500	PC-64
≥ 500	PC-80
Rated volume = oil per day + (water per day ÷ 7)	

3. Prime Mover

Facility Type	Prime Mover
Tank	Gas motor
Flow Line	Electric motor

Wellhead Assembly

Vertical ... flanged 2000 lbs.
 Horizontal ... flanged 2000 lbs.
 Dual wellhead for multizone completion.

Tubing and Rods

Vertical ... 2 7/8" tubing plain steel; 7/8" rod
 Horizontal ... 3 1/2" tubing plain steel; 1" rod
 Length ... depth of well for first tubing string
 ... depth of well minus 200 ft. for each additional tubing string

Building

Facility Type	Building	Rate (\$/unit)
Tank	64 sq.ft. pump shack	6,600
Flow Line	n/a	

Substitute Well Features: North Battleford (South) Well Area - Heavy Crude Oil Wells

The resource production equipment required to operate a substitute oil well that performs the same function as the oil well being valued shall be determined in accordance with the following specifications:

Pumping Equipment

1. Vertical Wells
 - New wells ... PC-15 pumping unit
 - All other vertical well pumping units:

Rated Volume (barrels/day)	All Depths (ft.)
< 30	PC-10
30 to < 80	PC-15
80 to < 120	PC-28
120 to < 180	PC-54
≥ 180	PC-64
Rated volume = oil per day + (water per day ÷ 3)	

2. Horizontal Wells
 - New wells ... PC-54 pumping unit
 - All other horizontal well pumping units:

Rated Volume (barrels/day)	All Depths (ft.)
< 180	PC-54
180 to < 500	PC-64
≥ 500	PC-80
Rated volume = oil per day + (water per day ÷ 7)	

3. Prime Mover

Facility Type	Prime Mover
Tank	Gas motor
Flow Line	Electric motor

Wellhead Assembly

Vertical ... flanged 2000 lbs.

Horizontal ... flanged 2000 lbs.

Dual wellhead for multizone completion.

Tubing and Rods

Vertical ... 3 ½" tubing plain steel; 1" rod

Horizontal ... 3 ½" tubing plain steel; 1" rod

Length ... depth of well for first tubing string

... depth of well minus 200 ft. for each additional tubing string

Building

Facility Type	Building	Rate (\$/unit)
Tank	64 sq.ft. pump shack	6,600
Flow Line	n/a	

Substitute Well Features: North Battleford (North) Well Area - Heavy Crude Oil Wells

The resource production equipment required to operate a substitute oil well that performs the same function as the oil well being valued shall be determined in accordance with the following specifications:

Pumping Equipment

1. Vertical Wells
 - New wells ... PC-15 pumping unit
 - All other vertical well pumping units:

Rated Volume (barrels/day)	Depth (ft.)		
	<1000	1000 to < 2000	≥2000
< 9.0	40	80	PC-15
≥ 9.0	57	PC-15	PC-15
Rated volume = oil per day + (water per day ÷ 3)			

2. Horizontal Wells
 - New wells ... PC-54 pumping unit
 - All other horizontal well pumping units:

Rated Volume (barrels/day)	All Depths (ft.)
< 180	PC-54
180 to < 500	PC-64
≥ 500	PC-80
Rated volume = oil per day + (water per day ÷ 7)	

3. Prime Mover

Facility Type	Prime Mover
Tank	Gas motor
Flow Line	Electric motor

Wellhead Assembly

Vertical ... flanged 2000 lbs.

Horizontal ... flanged 2000 lbs.

Dual wellhead for multizone completion.

Tubing and Rods

Vertical ... 3 ½” tubing plain steel; 1” rod

Horizontal ... 3½” tubing plain steel; 1” rod

Length ... depth of well for first tubing string

... depth of well minus 200 ft. for each additional tubing string

Building

Facility Type	Building	Rate (\$/unit)
Tank	64 sq.ft. pump shack	6,600
Flow Line	n/a	

Substitute Well Features: Swift Current Well Area - Gas Wells

The resource production equipment required to operate a substitute gas well that performs the same function as the gas well being valued shall be determined in accordance with the following specifications:

Description	Specifications	
Tubing	<ul style="list-style-type: none"> 1" diameter, plastic Length: depth of well for first tubing string, depth of well minus 200 ft. for each additional tubing string 	
Wellhead assembly	<ul style="list-style-type: none"> Threaded, 1000 pound pressure. Dual wellhead for multi-zone completions. 	
Chemical Equipment	60% of Type 1	
Water handling buildings	100% of Type 1	
Water handling equipment	100% of Type 1	
Metering equipment	10% of Type 1	
Rated Volume = gas per day		
Total Rate (\$) (Excludes tubing, flow line and manifold)	Threaded, 1000 pound pressure	30,170
	Dual wellhead	32,070

Substitute Well Features: Kindersley Well Area - Gas Wells

The resource production equipment required to operate a substitute gas well that performs the same function as the gas well being valued shall be determined in accordance with the following specifications:

Description	Description	
Tubing	<ul style="list-style-type: none"> 2 3/8" diameter, plain steel Length: depth of well for first tubing string, depth of well minus 200 ft. for each additional tubing string 	
Wellhead assembly	<ul style="list-style-type: none"> Threaded, 2000 pound pressure Dual wellhead for multi-zone completions 	
Chemical equipment	None	
Water handling buildings and equipment	65% of Type 2	
Metering equipment	80% of Type 1	
Rated volume = gas per day		
Total Rate (\$) (Excludes tubing, flow line and manifold)	Threaded, 2000 pound pressure	100,180
	Dual wellhead	102,580

Substitute Well Features: North Battleford (South) Well Area - Gas Wells

The resource production equipment required to operate a substitute gas well that performs the same function as the gas well being valued shall be determined in accordance with the following specifications:

Description	Specifications	
Tubing	<ul style="list-style-type: none"> • 2$\frac{3}{8}$" diameter, plain steel • Length: depth of well for first tubing string, depth of well minus 200 ft. for each additional tubing string 	
Wellhead assembly	<ul style="list-style-type: none"> • Threaded, 2000 pound pressure • Dual wellhead for multi-zone completions 	
Chemical equipment	Alcohol drip	
Water handling buildings and equipment	55% of Type 2	
Metering equipment	80% of Type 1	
Rated volume = gas per day		
Total Rate (\$) (Excludes tubing, flow line and manifold)	Threaded, 2000 pound pressure	91,280
	Dual wellhead	93,680

Substitute Well Features: North Battleford (North) Well Area - Gas Wells

The resource production equipment required to operate a substitute gas well that performs the same function as the gas well being valued shall be determined in accordance with the following specifications:

Description	Specifications	
Tubing	<ul style="list-style-type: none"> • 2$\frac{3}{8}$" diameter, plain steel • Length: depth of well for first tubing string, depth of well minus 200 ft. for each additional tubing string 	
Wellhead assembly	<ul style="list-style-type: none"> • Flanged, 2000 pound pressure • Dual wellhead for multi-zone completions 	
Chemical equipment	Alcohol drip	
Water handling buildings and equipment	48% of Type 2	
Metering equipment	80% of Type 1	
Rated volume = gas per day		
Total Rate (\$) (Excludes tubing, flow line and manifold)	Flanged, 2000 pound pressure	85,780
	Dual wellhead	93,530

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Well Classification

Substitute Well Features: Air, Water and Gas Injection Wells

The resource production equipment required to operate a substitute air, water or gas injection well that performs the same function as the injection well being valued shall be determined in accordance with the following specifications:

Description	Specifications	
Tubing	<ul style="list-style-type: none"> • 2⁷/₈" tubing, plain steel • Length: depth of well for first tubing string, depth of well minus 200 ft. for each additional tubing string 	
Wellhead assembly	Threaded, 2000 pound pressure	
Metering equipment	1 - 2" floco meter	
Control valves	1 - 3" choke 1 - pressure control switch	
Well accessories	All wells east of the third meridian: Cathodic protection rectifier	
Building	20 sq.ft. fibreglass wellhead shelter	
Total Rate (\$) (Excludes tubing, flow lines and manifolds)	All wells east of the third meridian	58,010
	All wells west of the third meridian	43,480

Substitute Well Features: Continuous Steam Injection Wells

The resource production equipment required to operate a substitute continuous steam injection well that performs the same function as the injection well being valued shall be determined in accordance with the following specifications:

Description	Specifications	
Tubing	<ul style="list-style-type: none"> • 3¹/₂" tubing, lined • Length: depth of well for first tubing string, depth of well minus 200 ft. for each additional tubing string 	
Wellhead assembly	Flanged, 3000 pound pressure	
Metering equipment	1 - 3" turbine meter and totalizer	
Control valves	1 - 3" choke	
Total Rate (\$) (Excludes tubing, flow lines and manifolds)	67,440	

Substitute Well Features: Cyclic Steam Injection Wells

The resource production equipment required to operate a substitute cyclic steam injection well that performs the same function as the injection well being valued shall be determined in accordance with the following specifications:

Description	Specifications
Tubing and rods	<ul style="list-style-type: none"> • 3½" tubing, lined; 1" rods • Length: depth of well for first tubing string, depth of well minus 200 ft. for each additional tubing string
Pumping equipment	67% of a conventional 160 pumping unit with electric motor
Wellhead assembly	Flanged, 3000 pound pressure
Metering equipment	3 - 3" turbine meters and totalizers
Control valves	1 - 3" choke
Total Rate (\$) (Excludes tubing, rod, flow lines and manifolds)	197,530

Substitute Well Features: Water Source Wells

The resource production equipment required to operate a substitute water source well that performs the same function as the water source well being valued shall be determined in accordance with the following specifications:

Tubeing and Rods

1. New Wells
 - 2⁷/₈" tubing, plain steel; 7⁸/₈" rod
 - Length: depth of well for first tubing string, depth of well minus 200 ft. for each additional tubing string
2. Rated volume <150,000 imp. gal./day
 - 2⁷/₈" tubing, plain steel; 7⁸/₈" rod
 - Length: depth of well for first tubing string, depth of well minus 200 ft. for each additional tubing string
3. Rated volume >150,000 imp. gal./day
 - 2⁷/₈" tubing plain steel
 - Length: depth of well for first tubing string, depth of well minus 200 ft. for each additional tubing string for depth of well

Description	Specifications		
	New Wells and Wells Rated Volume <150,000 imp. gal./day	Rated Volume ≥150,000 imp. gal./day	
Pumping equipment	<ul style="list-style-type: none"> • PC-15 pumping unit • 50% of 1 - variable frequency drive 	<ul style="list-style-type: none"> • Submersible pumping unit 400 series 100 stage • Submersible pump motor 456 series 80 hp • Switchboard 100 hp • Transformer 75 kva • Size 4 submersible pump cable x well depth x 1.05 • 50% of 1 - variable frequency drive 	
Wellhead assembly	Threaded, 2000 pound pressure	Threaded, 2000 pound pressure	
Metering equipment	None	None	
Control Valves	<ul style="list-style-type: none"> • 1 - 3" choke • 1 - pressure control switch 	<ul style="list-style-type: none"> • 1 - 3" choke • 1 - pressure control switch 	
Well Accessories: Cathodic Protection	All wells east of the third meridian	All wells east of the third meridian	
Building	None	20 sq.ft. fibreglass wellhead shelter with heat	
Total Rate (\$) (Excludes tubing, rod, cable, flow lines and manifolds)	All wells east of the third meridian	146,210	222,650
	All wells west of the third meridian	131,680	208,120

Substitute Well Features: Heavy Crude Steam Assisted Gravity Drainage (SAGD) Oil Wells (entire Province)

The resource production equipment required to operate a substitute oil well that performs the same function as the oil well being valued shall be determined in accordance with the following specifications:

Pumping Equipment

1. Vertical SAGD Wells
 - New wells ... PC-15 pumping unit
 - All other vertical well pumping units:

Rated Volume (barrels/day)	All Depths (ft.)
< 30	PC-10
30 to < 80	PC-15
80 to < 120	PC-28
120 to < 180	PC-54
≥ 180	PC-64
Rated volume = oil per day + (water per day ÷ 3)	

2. Horizontal SAGD Wells
 - New wells ... 456 pumping unit
 - All other horizontal well pumping units:

Rated Volume (barrels/day)	All Depths (ft.)
< 180	PC-54
180 to < 500	PC-64
500 to < 600	320
600 to < 800	456
≥ 800	640
Rated volume = oil per day + (water per day ÷ 7)	

3. Prime Mover

Facility Type	Prime Mover
Tank	Gas motor
Flow Line	Electric motor

Wellhead Assembly

Vertical ... flanged 3000 lbs.
 Horizontal ... flanged 3000 lbs.
 Dual wellhead for multizone completion.

Tubing and Rods

Vertical ... 3 ½" tubing plain steel; 1" rod
 Horizontal ... 4½" tubing plain steel; 1" rod
 Length ... depth of well for first tubing string
 ... depth of well minus 200 ft. for each additional tubing string

Building

Facility Type	Building	Rate (\$)
Tank	64 sq.ft. pump shack	6,600
Flow Line	n/a	

Description

A typical well head assembly is made up of a casing head, tubing head and Christmas tree. The well head may be screwed onto the casing or it may be an assembly that is bolted together. These are called the threaded or flanged well heads respectively.

Rates

The rates for well head assembly are dollars per unit.

Type	Size			
	Series 400 W.P. ≤ 1000 psi	Series 600 W.P. 2000 psi	Series 900 W.P. 3000 psi	Series 1500 W.P. 5000 psi
Pumping Oil				
Single Flanged	15,700	18,190	18,920	30,880
Single Threaded	13,820	15,800	16,400	26,330
Dual Flanged	27,650	32,080	33,970	34,360
Dual Threaded	15,640	24,690	29,440	29,290
Flowing Oil & Gas				
Single Flanged	18,120	22,740	29,630	29,670
Single Threaded	14,490	20,830	26,810	27,050
Dual Flanged	25,130	30,490	35,930	35,950
Dual Threaded	16,390	23,230	26,090	26,150
Injection - Air, Gas or Water				
Flanged	18,190	22,740	30,160	30,170
Threaded	14,370	20,830	27,220	27,050
Dual Threaded	16,390	23,230	26,090	26,150
Injection - Steam				
Flanged	39,690	39,700	39,700	39,700
Steam Injection & Pumping				
Flanged	56,700	56,790	56,740	56,620
Tubingless (Casing Head)				
Flanged	14,360	15,850	15,700	16,000
Threaded	9,570	10,170	10,590	10,840

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Well Head Assembly

Conventional and Hydrabeam

This is the typical horsehead or grasshopper counterbalance unit. The rods are raised by carrier bar at the horsehead end of the waling beam. On the downstroke, the weight of the rod assembly is counterbalanced by large weights. The picot point of the assembly is in the middle of the walking beam.

Rates

The rates for conventional and hydrabeam pumping units are in dollars per unit.

Gear Box Torque Rating (x 1000) (lb.)	Without Prime Mover (2)	Electric Prime Mover (1)		Gas Prime Mover (1)	
		Rate	Range (hp)	Rate	Range (hp)
25	38,210	55,830	5	91,920	9 - 12
40	42,350	59,280	6	94,730	9 - 12
57	51,170	70,150	5 - 10	108,760	9 - 12
80	54,710	74,930	5 - 10	119,860	9 - 19
114	91,780	113,550	7.5 - 15	163,020	13 - 19
160	99,590	124,410	15 - 25	179,410	20 - 29
228	118,000	145,860	20 - 40	214,750	20 - 39
320	139,170	174,120	30 - 60	261,680	30 - 59
456	175,730	213,980	40 - 75	315,440	40 - 99
640	205,230	244,770	50 - 75	382,060	60 - 99
912	239,270	282,880	60 - 100	452,960	60 - 149
1280	393,250	435,810	70 - 125	608,160	100 - 199

Rates include:

- prime mover where noted
- belt
- rod rotator
- concrete base
- bottom hole pump
- frame extension and side rails
- polish rod
- beam chemical injector at 50%
- counter weights
- pressure switch
- stuffing box
- installation

NOTE: 1) Costs include:

- per electrified site - \$10,160
- per gas operated site - propane vessel and/or scrubber with self-feed gas at \$12,440

2) Cost without Prime Mover:

- electrical and propane vessel costs are not included and must be added if these rates are used.
- apply these rates to non-typical installations

3) Strap jacks and slant jacks:

- increase conventional pumping unit cost by 20%

Unitorque and Air- Balanced Beam

The entire walking beam for unitorque and air-balanced beam pumping units moves up and down with the pivot point at the end of the beam. Unitorque pumping units have a counterweight system similar to conventional pumping units. The air-balanced beam pumping units have no counterweights. The downstroke is cushioned by a very large air-supplied “shock absorber”. There will be a small compressor mounted on the pumping unit to feed the unit.

Rates

The rates for unitorque and air-balanced beam pumping units are dollars per unit.

Gear Box Torque Rating (x 1000) (lb.)	Without Prime Mover (2)	Electric Prime Mover (1)		Gas Prime Mover (1)	
		Rate	Range (hp)	Rate	Range (hp)
114	99,450	122,170	7.5 - 15	163,880	13 - 19
160	121,450	146,950	15 - 25	202,450	20 - 29
228	139,630	170,510	20 - 40	237,420	20 - 39
320	167,780	203,460	30 - 60	291,750	30 - 59
456	197,160	236,180	40 - 75	338,450	40 - 99
640	219,290	259,470	50 - 75	397,640	60 - 99
912	269,400	314,490	60 - 100	485,560	60 - 149
Rates include: <ul style="list-style-type: none"> - prime mover where noted - belt - rod rotator - concrete base - bottom hole pump - frame extension and side rails - polish rod - beam chemical injector at 50% - counter weights - pressure switch - stuffing box - installation 					
NOTE: 1) Costs include: <ul style="list-style-type: none"> - per electrified site - \$10,130 - per gas operated site - propane vessel and/or scrubber with self-feed gas at \$12,410 2) Cost without Prime Mover: <ul style="list-style-type: none"> - electrical and propane vessel costs are not included and must be added if these rates are used - apply these rates to non-typical installations 					

Submersible Pumping Equipment

Submersible pumps have the major working system suspended at the bottom of the well bore inside the tubing. This system is identified on the surface by heavy electric cable emerging from the top of the wellhead.

Motor Rates

The motor rates for submersible pumping equipment are in dollars per unit.

Rating (hp)	Rate		
	375 4½"	456 5½"	540 6⅝"
7.5	39,970	36,700	
10	47,060	39,290	
15	52,930	43,840	
19.5	56,780	48,350	
22.5	60,010	51,580	
25	67,700	53,560	
30		58,020	45,860
40		66,950	49,590
50		76,110	56,040
60		79,840	63,720
70		88,260	68,930
80		96,690	74,750
90		105,120	79,960
100		113,560	84,420
110		122,490	90,250
120		130,910	95,950
130			101,780
150			112,190
160			118,020
180			128,930
200			140,460
225			152,730

NOTE: 1) Series number refers to outside diameter size of motor or pump, eg. series 456 is 4.56 inches O.D.
 2) Motors and pumps can be stacked, eg. in 4½" casing, to achieve 100 hp, 4 - 25 hp motors are stacked.
 3) Generally, the pump is the value of the motor. This can be used as a guide if proper size information is not available.

Pump Rates

The pump rates for submersible pumping equipment are in dollars per unit.

Stages	Length (ft.)	Rate			
		338 400-1500 4½"	400 280-4000 5½"	540 2000-7000 6⅝"	540 10000 6⅝"
≤ 20	2.1	13,450	13,310	13,230	13,170
21 - 40	3.5	16,790	13,560	17,260	23,980
41 - 60	4.9	20,230	15,930	20,070	28,070
61 - 80	6.3	23,630	18,640	22,760	32,180
81 - 100	7.8	27,020	21,170	25,590	36,170
101 - 120	9.1	30,280	23,690	28,300	41,810
121 - 140	10.5	33,670	26,270	31,080	44,360
141 - 160	11.9	37,070	28,710	33,760	48,310
161 - 180	13.3	40,470	31,280	36,590	52,330
181 - 200	14.7	43,870	33,890	39,280	56,400
201 - 220	16.1		36,400	42,070	60,580
221 - 240	17.5		38,990	44,870	64,630
241 - 260	18.9			50,280	68,700
261 - 280	20.4			53,200	72,840
> 280	21.8			56,240	76,950

Switchboards

The switchboard rates for submersible pumping equipment are in dollars per unit.

Rating (hp)	Rate
25	14,420
50	16,200
100	18,710
200	28,480
1000	47,340
1500	48,620
2000	49,930

Transformers

The transformer rates for submersible pumping equipment are in dollars per unit.

Size (kVA)	Rate
50	11,780
75	12,440
100	16,360
125	17,670
150	21,600
200	30,760
250	33,370

Cable

The cable rates for submersible pumping equipment are in dollars per linear foot.

Size	Power (hp)	Rate
1	> 200	32.34
2	150 - 200	28.27
4	< 150	21.14

Progressive Cavity (PC)

Pump Rates

The pump rates for progressive cavity pumping equipment are in dollars per unit.

Size M ³ /100 rpm	Rate
10	71,120
12	72,850
15	75,170
28	78,900
54	85,190
64	92,470
80	95,540
95	97,530
120	115,950
Rates Include: - drive system (gas or electric prime mover, hydraulic or electric skid) - bottom hole pump (rotor, stator) - installation	

Variable Frequency Drive

The rate for a variable frequency drive shall be \$52,990 per unit.

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Pumping Units

Description

Prime movers include electric and gas motors used to provide power to pumping units.

Triple-Rated Motors

The triple-rated motor prime mover rates are in dollars per unit.

Size		Controller Size	Rate
(hp)	(kw)		
10 / 7.5 / 5	7.5 / 5.6 / 3.7	1	8,410
15 / 10 / 7.5	11.2 / 7.5 / 5.6	2	11,130
20 / 15 / 10	14.9 / 11.2 / 7.5	2	12,480
25 / 20 / 15	18.6 / 14.9 / 11.2	2	14,360
30 / 22 / 15	22.4 / 18.6 / 11.2	3	16,000
40 / 30 / 20	29.8 / 22.4 / 14.9	3	19,800
50 / 40 / 30	37.3 / 29.8 / 22.4	3	22,700
60 / 50 / 40	44.8 / 37.3 / 29.8	4	26,390
75 / 60 / 50	56 / 44.8 / 37.3	4	28,780
100 / 75 / 60	74.6 / 56 / 44.8	4	32,900
125 / 100 / 75	93.3 / 74.6 / 56	4	34,740
Rates include: <ul style="list-style-type: none"> - 3 phase - 1200 RPM - fan-cooled motor - 60 Hz - class F insulation - controller - 460 volt - totally enclosed - installation 			

Single-Rated Motors

The single-rated motor prime mover rates are in dollars per unit.

Size (hp)	Rate
1 - 2	6,120
3 - 5	6,360
7.5 - 10	7,160
15 - 20	9,570
25 - 30	12,500
40	14,860
50	15,760
60	18,830
75	20,990
100	28,620
125	32,780
150	36,900
200	50,080
250	59,930

Rates include:

- 3 phase
- 1200 RPM
- fan-cooled motor
- 60 Hz
- class F insulation
- controller
- 460 volt
- totally enclosed
- installation

Gas Engines

The gas engine prime mover rates are in dollars per unit.

Group #	Size (hp)	Rate
1	9 - 12	38,960
2	13 - 19	48,850
3	20 - 29	65,660
4	30 - 39	82,240
5	40 - 59	107,380
6	60 - 99	123,810
7	100 - 149	196,500
8	150 - 199	202,000

NOTE: Deduct \$3,710 if no electric start in groups #1 to #4.

Rates include:

- twin-disk clutch
- condensing radiator with fan
- pressure lubrication
- combination gas-gasoline carburetor
- adjustable sub-base
- miscellaneous pipe fittings
- power take off
- heavy flywheel
- regulator
- air cleaner
- engine starter
- installation

Description

The bottom hole pump is suspended from the surface by a series of 20 foot steel or fibreglass rods that are threaded together. The most common size for the tubing is 2 $\frac{7}{8}$ inches (plain) in diameter and for the rod it is $\frac{7}{8}$ inches in diameter.

Rates

The rates for tubing and rods are dollars per lineal foot.

Tubing

Size (in.)	Steel		Plastic
	Plain	Lined	
$\leq 1\frac{1}{2}$	5.87		2.08
2	6.52		
2 $\frac{3}{8}$	7.07	7.89	
2 $\frac{7}{8}$	8.07	14.28	
3 $\frac{1}{2}$	11.26	15.50	
4	15.08	19.40	
4 $\frac{1}{2}$	20.31	24.91	

Rods

Size (in.)	Rate
$\frac{5}{8}$	2.83
$\frac{3}{4}$	3.53
$\frac{7}{8}$	4.45
1	5.35

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Tubing and Rods

Description

A separator is a vertical, spherical or horizontal vessel through which the emulsion is passed to split liquids and gases. Centrifugal action created by baffles inside the unit causes the split to occur.

Vertical Two-Phase Separators

A treater is a vessel that heats the emulsion to finalize the field separation cycle.

The rates for separators are in dollars per unit.

Diameter (in.)	Height (ft.)			
	5	7.5	10	15
125-260 psi Working Pressure				
≤ 16	23,370	24,610	25,820	28,120
24	39,930	41,930	44,210	47,890
30	53,830	54,870	57,600	62,830
36	56,460	67,860	71,240	77,580
42	76,830	80,750	84,840	92,480
48	89,160	93,770	98,460	107,320
54	101,500	106,680	112,060	122,250
60	113,930	119,690	125,720	137,080
500-1000 psi Working Pressure				
≤ 16	27,500	28,940	30,370	33,190
24	45,850	49,840	52,300	57,010
30	64,390	65,590	68,980	75,000
36	77,410	81,250	85,300	92,990
42	92,390	96,990	101,740	110,970
48	107,730	112,900	127,440	132,200
54	122,330	128,370	146,930	151,190
60	136,990	143,980	157,110	164,940
1200-1440 psi Working Pressure				
≤ 16	29,660	31,220	32,790	35,730
24	49,210	54,440	57,230	62,450
30	68,430	71,310	75,540	82,470
36	83,060	87,300	91,720	102,360
42	101,660	106,850	112,180	122,380
48	118,310	124,300	130,520	142,340
54	134,880	141,760	148,810	162,410
60	151,480	159,240	167,260	182,380
Rates include:				
- 1 oil dump valve		- 1 gauge glass assembly		
- 1 liquid level controller		- 1 safety relief valve		
- 1 pilot gas supply regulator		- 1 pressure gauge		

Vertical Three-Phase Separators

The rates for vertical three-phase separators are in dollars per unit.

Diameter (in.)	Height (ft.)			
	5	7.5	10	15
125-260 psi Working Pressure				
≤ 16	39,350	44,560	49,740	52,850
20	43,280	50,200	56,940	60,070
24	54,000	57,110	58,360	70,510
30	56,300	65,050	66,710	78,200
36	57,470	66,850	68,120	80,870
42	81,070	89,380	91,260	94,230
500-1000 psi Working Pressure				
≤ 16	47,700	48,910	50,390	57,360
20	54,120	55,570	57,200	68,310
24	55,780	59,680	65,560	76,430
30	63,450	65,560	82,390	114,080
36	65,610	75,940	94,600	120,130
42	87,700	107,050	133,420	165,640
1200-1440 psi Working Pressure				
≤ 16	48,760	50,850	53,080	59,940
20	60,890	64,410	68,090	75,150
24	64,980	67,100	69,450	84,800
30	69,060	72,610	87,790	118,070
36	81,190	90,920	100,770	131,860
42	111,830	125,240	138,950	185,870
Rates include: <ul style="list-style-type: none"> - 2 oil and water dump valves - 1 oil level controller - 1 pilot gas supply regulator - 1 gauge glass assembly - 1 safety relief valve - 1 pressure gauge - 1 water level controller 				

Horizontal Two-Phase Separators

The rates for horizontal two-phase separators are in dollars per unit.

Diameter (in.)	Length (ft.)		
	8	10	15
125-260 lb. Working Pressure			
≤ 16	37,060	37,980	39,850
20	40,030	40,990	43,100
24	45,600	46,650	49,180
30	45,730	49,540	52,210
36	55,370	56,720	59,720
42	60,380	61,820	65,200
48	65,770	67,330	70,870
54	71,040	72,830	76,920
60	76,420	78,350	82,720
500-1000 lb. Working Pressure			
≤ 16	38,220	39,230	41,510
20	40,340	43,510	45,820
24	48,360	49,540	52,210
30	51,870	53,190	55,990
36	61,390	62,740	66,130
42	67,150	68,660	72,390
48	73,660	75,460	79,570
54	80,300	82,240	86,730
60	86,940	89,030	93,820
1200-1440 lb. Working Pressure			
≤ 16	45,900	46,910	48,830
20	57,380	58,500	60,830
24	58,010	59,180	61,780
30	67,530	68,860	71,750
36	87,070	88,810	92,560
42	94,610	96,530	100,630
48	105,870	108,020	112,660
54	117,140	119,520	124,520
60	128,420	131,040	136,570
Rates include: <ul style="list-style-type: none"> - 1 oil dump valve - 1 liquid level controller - 1 pilot gas supply regulator - 1 gauge glass assembly - 1 safety relief valve - 1 pressure gauge 			

Horizontal Three-Phase Separators

The rates for horizontal three-phase separators are in dollars per unit.

Diameter (in.)	Length (ft.)		
	8	10	15
125-260 lb. Working Pressure			
≤ 16	39,670	43,670	53,330
20	45,890	50,470	61,700
24	53,740	59,160	72,260
30	59,270	63,100	77,120
36	64,890	71,400	87,270
42	78,510	86,570	105,900
48	84,210	92,750	113,420
54	92,500	101,710	124,390
60	101,070	110,790	135,490
500-1000 lb. Working Pressure			
≤ 16	40,310	44,500	54,250
20	50,570	55,580	68,000
24	55,770	61,320	75,010
30	61,730	67,810	82,930
36	71,460	78,570	96,140
42	91,870	104,640	127,890
48	100,260	110,180	134,990
54	111,790	122,650	150,040
60	122,850	135,170	165,220
1200-1440 lb. Working Pressure			
≤ 16	62,180	68,420	72,610
20	65,330	71,810	87,780
24	65,520	72,140	88,290
30	76,430	84,090	102,700
36	97,010	106,740	125,420
42	110,150	121,240	153,990
48	121,560	133,730	163,560
54	134,760	148,220	181,300
60	147,940	162,810	198,980
Rates include: <ul style="list-style-type: none"> - 2 oil and water dump valves - 1 oil level controller - 1 pilot gas supply regulator - 1 water level controller - 1 gauge glass assembly - 1 safety relief valve - 1 pressure gauge 			

Spherical Separators

The rates for spherical separators are in dollars per unit.

Working Pressure (lb.)	Diameter (in.)	Rate
125	36	33,070
	42	36,940
260	36	37,120
	42	41,360
	48	49,000

Rollo Metering Separators

The rates for rollo metering separators are in dollars per unit.

Rollo Metering - Vertical: 125 lb. working pressure		
Size (in. x ft.)	Rate Without Automatic Sampler	Rate With Automatic Sampler
24 x 6	26,140	28,390
30 x 6	30,420	33,130
36 x 6	34,860	38,040
48 x 6	40,600	44,580
Rates include: - separator - meter - recorder - installation Pounds (force) per sq.in. x 6.894757 = kpa rating		

Treater Accessories

The rates for treater accessories are in dollars per unit.

Ignition System

Type	Rate
Automatic	20,520
Manual	3,440

Desand System

Length (ft.)	Rate	
	Automatic	Manual
≤ 25	89,810	12,830
26 - 35	116,540	42,380
36 - 45	143,280	71,390
≥ 46	170,070	

Burner

The rate for a burner shall be \$62,130 per unit.

Atmospheric Treater - Coalescer Wash Tank

The rates for atmospheric treaters – coalescer wash tanks are in dollars per unit.

Size (barrels)	Rate
≤ 400	120,930
750	161,220
900	174,680
1,000	181,400
1,500	235,100
2,000	248,560
2,500	288,920
3,000	315,840
3,500	335,900
4,000	349,350
≥ 5,000	369,660

Rates include:

- burn and heating equipment including 2 firetubes
- lining
- gas regulators and scrubbers
- fittings
- cone bottoms
- stacks
- flame arrestors
- all piping
- valves and meters
- baffles and all necessary materials
- installation

Horizontal Mechanical Coalescer Treater

The rates for horizontal mechanical coalescer treaters are in dollars per unit.

Diameter (in.)	Length (ft.)			
	4	6	8	10
15-50 lb. Working Pressure				
15.5	220,400	243,040	257,620	293,310
20	241,810	262,430	292,440	347,060
22	259,780	273,450	335,670	376,760
25	282,380	292,380	365,950	450,060
30	302,690	332,690	409,430	537,890
75 lb. Working Pressure				
20		312,620	355,420	509,590
22		328,250	364,680	518,600
25		347,940	375,480	532,230
30		368,820	421,250	552,110
44		390,950	482,210	607,200
45		414,410	515,120	624,680
50		439,270	546,410	643,460
Rates include: <ul style="list-style-type: none"> - single firetube - fuel gas system c/w burning equipment - ladder and crownsnest - thermometer - water and oil outlet valve - relief valve - flame arrestor and stack anodes - insulation - water siphon - pressure gauge and gauge glass - gas back pressure valve - water meter - installation - scrubber 				

Vertical Treater

The rates for vertical treaters are in dollars per unit.

Diameter (in.)	Length (ft.)				
	3	4	6	8	10
50 lb. Working Pressure					
20	127,720	149,220	159,970	200,670	233,430
24	129,460	152,630	165,600	211,420	246,480
28	130,660	156,130	171,230	220,630	257,750
30	131,720	158,430	173,530	225,540	264,650
75 lb. Working Pressure					
20	127,130	152,030	169,060	218,190	255,440
24	149,220	158,950	178,140	230,610	270,280
28	155,090	165,090	184,800	241,240	283,200
30	158,420	168,420	188,890	246,990	290,000
Rates include: <ul style="list-style-type: none"> - single firetube - fuel gas system c/w burning equipment - ladder and crownsnest - thermometer - water and oil outlet valve - relief valve - flame arrestor and stack anodes - insulation - water siphon - pressure gauge and gauge glass - gas back pressure valve - water meter - installation - scrubber 					

Horizontal Electrostatic Coalescer Treater

The rates for horizontal electrostatic coalescer treaters are in dollars per unit.

Diameter (in.)	Length (ft.)		
	6	8	10
50 lb. Working Pressure			
20	355,140	458,380	562,140
25	406,620	532,980	622,020
30	458,380	570,280	682,200
40	562,140	687,960	802,070
50	665,890	799,860	921,230
75 lb. Working Pressure			
20	363,820	469,940	648,030
25	417,660	547,690	675,870
30	469,940	585,260	700,310
40	577,230	672,390	767,540
50	683,490	747,850	812,200
Rates include: <ul style="list-style-type: none"> - single firetube, flame arrestor & stack - gas out scrubber dome - high temperature shutdown - 1 oil and 1 gas outlet valve - instrument air manifold c/w regulators - water meter - pressure gauge and thermometer - gauge glasses - pre-piping to skid edge c/w valves - ladder and transformer platformer - fuel gas manifold c/w burning equipment - low level shutdown - oil and water level controller - 2 water outlet valves - relief valve - scrubber - transformer circuit breaker - skid - anodes - insulation - installation 			

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Separators and Treaters

Description

Dehydrators remove liquid from the gas to prevent corrosion or plugging of the flow.

Glycol Absorber Tower (600# ANSI Rating)

The rates for glycol absorber towers are in dollars per unit.

Size Diameter (in.) x Length (ft.)	Rate		
	Standard Unit	Including 2-Phase Inlet Scrubber	Including 3-Phase Inlet Scrubber
1400 #DWP			
12 x 12	28,960	43,500	51,200
12 x 14	30,100	44,210	52,260
12 x 16	31,220	45,910	53,730
12 x 18	32,210	47,000	54,760
12 x 20	33,350	48,080	55,790
12 x 30	38,300	52,580	61,790
1420 #DWP			
16 x 12	35,100	51,580	61,770
16 x 14	36,840	53,020	63,180
16 x 16	38,270	54,380	64,940
16 x 18	40,010	55,790	66,300
16 x 20	41,370	57,480	68,100
16 x 30	47,940	65,650	76,470
1400 #DWP			
20 x 12	44,930	64,210	75,090
20 x 14	47,000	66,300	77,170
20 x 16	49,130	68,430	79,290
20 x 18	51,200	70,480	81,760
20 x 20	53,730	72,690	83,880
20 x 30	63,890	82,690	94,440
1380 #DWP			
24 x 12	55,790	83,880	96,980
24 x 14	60,690	88,410	101,370
24 x 16	65,250	93,030	106,310
24 x 18	69,840	97,510	110,520
24 x 20	74,370	102,410	115,450
24 x 30	96,410	124,260	137,340

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Dehydrators

Size Diameter (in.) x Length (ft.)	Rate		
	Standard Unit	Including 2-Phase Inlet Scrubber	Including 3-Phase Inlet Scrubber
1400 #DWP			
30 x 12	93,930	138,910	155,700
30 x 14	100,490	145,430	162,240
30 x 16	107,140	152,040	169,180
30 x 18	114,040	158,950	175,780
30 x 20	119,880	165,660	182,010
30 x 30	151,270	197,410	213,590
36 x 12	122,060	176,890	194,800
36 x 14	130,140	185,350	203,190
36 x 16	138,100	193,330	211,210
36 x 18	140,850	201,750	219,290
36 x 20	154,960	209,790	227,470
36 x 30	193,800	248,940	266,430
42 x 20	189,980	246,110	262,700
42 x 30	228,860	283,950	301,510
<p>Rates include:</p> <ul style="list-style-type: none"> - knitted 304 stainless wire mesh mist extractor - glycol gas heat exchanger in upper section - liquid level controller with supply gas regulator - diaphragm operated liquid discharge valve with shut-off ball valve - fuel gas shut-off valve - reflex gauge column assembly with safety cocks - thermometer with thermowell - pressure gauge with isolating valve - ASME safety relief valve 1" threaded - skid and building - gas outlet line to skid edge 			
<p>Integral scrubber includes:</p> <ul style="list-style-type: none"> - liquid level controller with supply gas regulator (2 or 3 phase) - diaphragm operated liquid discharge valve with shut-off ball valve (2 or 3 phase) - gauge column assembly with safety cocks (reflex) - cold weather coil - phase drain valve (Apollo) 			
<p>NOTE: DWP refers to design working pressure</p>			

Standard Glycol Reconcentrator Units

The rates for standard glycol reconcentrator units are in dollars per unit.

Heat Output (BTU/hr.)	Reboiler Size Diameter(in.) x Length (ft.)	Surge Tank Size Diameter(in.) x Length (ft.)	Rate
100,000	18 x 3.5	18 x 3	70,530
155,000	18 x 5.5	18 x 3.5	78,670
235,000	18 x 5.5	18 x 3.5	92,320
375,000	24 x 6.5	24 x 6	131,140
545,000	30 x 6.5	30 x 6	166,550
750,000	30 x 15	30 x 12.5	189,420
1,000,000	50 x 15	30 x 15	226,150
1,250,000	50 x 17.5	30 x 15	278,940
Rates include: <ul style="list-style-type: none"> - glycol pump - flame arrestor - glycol filter - gas firing accessories - thermostats - still column - equipment mounted on structural steel skid - installation Rates do not include: <ul style="list-style-type: none"> - ladders - gas or electric pumps - stand-by pumps - gas sparging or stripping accessories for high concentration glycol 			

Accessories (Lump Sum)

Description	Rate
Skid	
8' x 16'	9,660
9' x 22'	14,750
Ladder	6,210
Gas sparging or stripping accessories	6,410

CaCl Rollo Units

Tower Size Diameter (in.) x Length (ft.)	Rate
22 x 15	70,080
24 x 15	76,670
26 x 15	79,200
22 x 17	75,780
24 x 17	80,160
26 x 17	84,550
24 x 24	89,250
30 x 24	105,850
Rates include: <ul style="list-style-type: none"> - pipes - valves - fittings - installation Rates do not include meters and chemical injectors	

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Dehydrators

Description

A gas boot is a vapour recovery system that draws gases that are being released in storage tanks.

Rates

The rates for gas boots are in dollars per unit.

Size Diameter (in.) x Length (ft.)	Rate
16 x 5	8,680
16 x 10	12,170
16 x 20	19,080
16 x 40	35,810
16 x 50	37,630
24 x 10	27,400
24 x 20	30,010
24 x 40	35,750
24 x 50	39,350
30 x 20	53,490
30 x 40	72,900
30 x 50	82,590
36 x 35	72,550
36 x 50	91,580
NOTE: For 30 in. or 36 in. diameter no ladder or platform included with rates - add \$12,870 if present	
Rates include:	
<ul style="list-style-type: none"> - miscellaneous pipe - valves - fittings - installation 	

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Gas Boots

Description

A flare stack is used to burn off excess gas.

Rates

The rates for flare stacks are in dollars per stack.

Height (ft.)	Rate (Diameter) (in.)		
	4	6	8
30 - 60	19,740	24,080	30,200
70 - 100	21,320	26,150	33,160

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Flare Stacks

Description

The gas passes through this vessel to remove liquids. It functions as a small scale separator.

Fuel Gas Scrubber

The rate for fuel gas scrubbers is in dollars per unit.

	Rate
All sizes	5,130
Rates include: <ul style="list-style-type: none">- shut-off valve- pressure gauge- relief valve- installation	

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Gas Scrubbers

Description

Heaters and heat exchangers are used to prevent line and equipment from freezing.

Heaters

The rates for direct and indirect heaters are in dollars per unit.

Output Range (BTU)	Rate	
	Indirect	Direct
50,000 - 170,000	47,410	41,390
171,000 - 375,000	48,430	42,790
376,000 - 625,000	51,980	44,930
626,000 - 875,000	58,950	48,430
876,000 - 1,250,000	69,480	58,970
1,251,000 - 1,750,000	82,350	71,830
1,751,000 - 2,500,000	96,390	75,340
2,501,000 - 3,500,000	117,410	110,410
3,501,000 - 4,500,000	145,440	114,330
Rates include: <ul style="list-style-type: none"> - fire tube - thief hatch - skid - temperature control and high temperature shut down - flame arrestor and stack - expansion pot c/w instruments - soil (not included with direct) - fuel gas manifold c/w burning - installation 		

Tubular and Rectangular Plate Heat Exchangers

The rates for tubular and rectangular plate heat exchangers are in dollars per cubic foot.

Face Area (sq.ft.)	Rate (\$/cu.ft.)
≤ 2	2,454
3	2,357
4	2,290
6	2,119
8	1,949
10	1,791
12	1,675
14	1,456
Rates include:	
<ul style="list-style-type: none"> - standard unit stainless steel plates - installation 	
Sample Calculation:	
Face Area = 3 ft. x 4 ft.	
Length = 8 ft.	
Volume = 3 ft. x 4 ft. x 8 ft.	
= 96 cu.ft.	
Rate = \$1,675 /cu.ft.	
Value = Volume x Rate	
= 96 cu.ft. x \$1,675/cu.ft.	
= \$160,800	

Description

Meters are used to calibrate the pressure and volume of gas flowing through a flow line or at a gas well.

Dry Flow Meters

The rates for dry flow meters are in dollars per unit.

Type	Rate
Gas, Dry Flow Recorder Chart 100" (\leq 1000 psi)	
1 or 2 pen	6,450
3 pen	8,160

Orifice Fittings and Meter Runs

The rates for orifice fittings and meter runs are in dollars per unit.

Size (in.)	Rate
Senior Quick Change (100 - 600 psi)	
2	8,720
3	10,170
4	12,140
6	15,400
8	18,680
10	21,960
Simplex (150 - 600 psi)	
2	2,570
3	3,240
4	3,880
6	5,950
8	7,480
10	9,170
Rates include: - orifice fittings - regulator - pipes - valves and fitting for meter run - installation	

Net Oil Computer and Micro Motion Meter

Inlet Size (in.)	Rate
2	45,370
3	48,770
4	52,420
Rates include:	
- capacitance probe	
- indicator	
- installation	

Positive Displacement Meter

The rates for positive displacement meters are in dollars per unit.

Line Size (in.)	Rate
Floco Meter	
≤ 2	6,030
3 to 4	8,890
Sampler	3,400
Sales Meter	
≤ 2	14,170
3 to 6	46,580
≥ 8	79,000
Ticket printer	3,510
Temperature Compensator	3,920
Brine Meters	
≤ 2 Low (pressure)	3,040
2 High (pressure)	4,450
3 Low (pressure)	4,980
3 High (pressure)	5,390
Digital Meter	
1	7,260
2 w/cubic meter readout	9,880

Turbine Meters and Totalizer

The rates for turbine meters and totalizers are in dollars per unit.

Size (in.)	Rate
≤ 2	13,500
3	14,850
Rates include:	
- meter	- fittings
- pipes	- miscellaneous valves
- totalizer	- installation

Vortex Liquid Gas or Steam Meters

The rates for vortex liquid gas or steam meters are in dollars per unit.

Size (in.)	Rate
2	6,090
6	10,440
8	16,590
Rates include:	
- meter	- analog amplifier or enhancer
- meter run	- miscellaneous valves
- fittings	- installation

Transmitters

The rates for transmitters are in dollars per unit.

Type	Rate
Pressure or flow transmitter	10,440
Temperature transmitter	6,260

Additives

Type	Rate per Readout
Computer Assist	1,260

Weighmatic

The rate for weighmatic is in dollars per unit.

Description	Rate
Weighmatic - crude oil production rate test system Complete unit	136,170
Rates include: <ul style="list-style-type: none"> - separator - valves and fittings - computer related equipment - installation Rates do not include gas metering equipment.	

Cabinet Type Meter Housing

The rate for a meter cabinet is in dollars per unit.

Type	Rate
Meter Cabinet	20,330
Includes: <ul style="list-style-type: none"> - 1-2 pen dry flow recorder - 2 door shed - small separator and associated equipment - lines, valves, meters, gauges, etc - installation - freight 	

Description

A valve is a device used to control the rate of flow in a line, to open or shut off a line completely, or to serve as an automatic or semi-automatic safety device.

Valves

The rates for valves are in dollars per unit.

Gate Valves

Size (in.)	Rate	
	1500 Working Pressure (lb.)	
2	9,790	
3	13,150	
4	16,030	

Ball Valves

Size (in.)	Rate	
	Working Pressure (lb.)	
	< 2000	≥ 2000
2	5,160	6,400
3	6,810	8,300
4	8,790	12,810
6	12,430	17,400
8	22,580	32,420

Water Check Valves

Size (in.)	Rate		
	Working Pressure (lb.)		
	150	300	600
< 4	1,660	2,050	2,400
6 - 8	2,960	4,060	6,080
10	5,530	7,090	10,600
12	7,490	8,800	13,120

Check Valves

Size	Rate
< 4	2,660
6	8,980
8	15,210

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Valves and Controls

Desurgers

Size (in.)	Rate
≤ 2	8,610
3	11,680
4	14,380

Pneumatic and Electric

Size (in.)	Rate	
	2-Way	3-Way
Pneumatic		
≤ 2	6,720	10,080
3	9,200	14,460
4	12,010	17,250
6	19,440	
Electric		
≤ 2	9,720	10,390
3	12,180	13,070
Rates include: - valve - actuator - installation		
NOTE: High-low pressure shutdown, rate at \$2,060. Intermitter (time cycle control), rate at \$2,770.		

Surface Safety Valves

Type	Typical Model	Rate
Self actuating	Willis B-15 & B-20	11,880
	Willis C-15	11,880
Hydr/Elect. actuating	Willis HYG 20 3000#	17,880
	Willis HYG 30 3000#	17,880
	Willis HYG 40 3000#	17,880
Pneumatic actuating	Willis PG 20 3000#	26,970
	Willis PG 30 3000#	26,970
	Willis PG 40 3000#	26,970
Rates include: - valve - actuator and fittings - installation		

Pressure Control Switch

Type	Rate
Presco, Murphy	1,320

Choke

The rates for chokes are in dollars per unit.

Type	Size (in.)	Rate
Low pressure and low volume	≤ 2	1,520
High pressure and high volume	3 - 6	12,890

Lease Automatic Custody Transfer Unit

The rates for lease automatic custody transfer units are in dollars per unit.

Size (in.)	Rate	
	150 & 300 ANSI	600 ANSI
2	117,040	128,050
3	140,260	153,500
4	174,720	203,500
6	232,760	280,340
8	289,220	369,630

Rates include:

- meter
- sampler
- valves
- strainer
- pressure indicator
- pipe fittings
- BS&W monitor
- skid
- installation

Rates do not include booster and shipping pumps.

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Valves and Controls

Description

A pump is used to increase the pressure on a fluid in order to move the fluid through a pipe.

Rates

The rates for pumps are in dollars per unit.

Centrifugal Pump

Inlet Size (in.)	Rate
1	4,680
2	5,500
3	6,200
4	6,610
5	7,740
6	9,190

Gear Pump

Inlet Size (in.)	Rate
2	4,820
3	6,020
4	10,430
6	11,530

Progressive Cavity

Inlet Size (in.)	Rate
1	4,740
2	6,810
3	8,760
4	13,310
6	15,560
8	20,580
<p>NOTE:</p> <ol style="list-style-type: none"> 1) Add for prime movers 2) The rates above are for 1 stage pumps. To determine the 2 and 3 stage pump rates, 12% of the 1 stage pump rate is added to each subsequent stage. 	
<p>Rate include:</p> <ul style="list-style-type: none"> - pump - base - valves and fittings - installation 	

Reciprocating (Plunger) Pumps

Input (hp)	Rate			
	Simplex	Duplex	Triplex	Quintuplex
3	30,050	39,180		
5	33,200	39,940		
10	42,210	44,030		
< 21			47,490	56,640
21 - 40			60,030	71,640
41 - 70			86,730	140,290
71 - 100			126,920	152,770
101 - 150			156,020	230,720
151 - 250			216,180	238,150
> 250			386,980	389,460
Rates include: - pump - base - prime mover - installation				

Transformer and Injection Pumps

Size (hp)	Rate
10	95,240
20	100,610
30	106,090
50	116,760
100	143,650
250	224,690
500	359,310
750	494,000
1000	628,880
Rates include: - motor - thrust chamber - intake section - pump - shutdown switches - skid - installation	

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Chemical Injectors

Description

Chemical injectors are used to add chemicals to prevent freezing, plugging or corrosion or to assist in whatever process is being carried out in the treatment or other cycle.

Rates

The rates for chemical injectors are in dollars per unit.

Description	Size (hp)	Rate
Electric motor driven (add for tanks > 60 imp. gal.)	≤ 2	8,210
	3 and 5	20,820
Multiple head proportioning pump		8,520
Air/gas driven		4,790
Alcohol drip (9 imp. gal. tank)		1,690

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Chemical Injectors

Description

Compressors are used to supply air pressure to operate valves, fire flood wells and to transport gas in a flow line.

Utility Air Compressors

The rates for utility air compressors are in dollars per unit.

Size		Rate
(hp)	(KW)	
½ - 1	0.37	8,660
1½ - 3	2.20	15,220
5	3.70	18,390
Rates include: - air receiver - motor - installation		

Instrument Air Compressors

The rates for instrument air compressors are in dollars per unit.

Size		Rate
(hp)	(KW)	
≤ 10	0.37	36,950
11 - 15	7.46 - 11.19	50,880
16 - 20		69,070
> 20		74,950
Rates include: - air receiver - explosion-proof motor - dryer and after cooler - installation		

Injection Air Compressors

The rates for injection air compressors are in dollars per unit.

Size (hp)	Rate
400	1,204,120
550	1,542,610
1000	2,457,490
2000	2,785,420
3000	3,309,980
4000	3,904,300
Rates include:	
- air intake, coolers	- valves
- fittings and equipment	- concrete base
- engine or electric motor	- installation
- miscellaneous pipes	
- metering and controls	

Natural Gas Compressors

The rates for natural gas compressors are in dollars per horsepower unit.

Description	Rate
Turbine engine/centrifugal (gas plant)	8,570
Reciprocating engine (gas plants)	6,060
Reciprocating or electric (field gathering)	4,020
Rates include:	
- building	
- gauge board	
- filters	
- electrical equipment	
- atmospheric-type jacket water cooler	
- free air and exhaust duct	
- scrubber	
- supports	
- electrical substation	
- skid or concrete base	
- suction or discharge bottles	
- compressor	
- conductors and conduit	
- central panel	
- pumps	
- intake or exhaust silencer	
- main switchboard	
- installation	

Description

Cathodic protection uses a rectifier with a network of wires and anodes installed to create an electric field around flow lines and casing in corrosion prevention.

Rates

The rates for cathodic protection rectifiers are in dollars per unit.

Size (amperage)	Rate
Single well (12 - 16)	14,530
Field system (17 - 25)	21,790
Rates include:	
<ul style="list-style-type: none"> - rectifier - conduit and fittings - 2" x 60" steel anodes - cadwelds and handicap - cables - splice kits and connectors - installation 	

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Cathodic Protection Rectifiers

Description

Control panels are switches and other devices used to start, stop, measure, monitor or signal the operation of equipment.

Rates

The rates for control panels are in dollars per unit.

Power Rating		Rate
(hp)	(KW)	
≤ 50	< 38	32,930
51 - 450	38 - 336	73,360
451 - 850	337 - 634	127,890
851 - 1500	635 - 1119	219,010
1501 - 2500	1120 - 1865	293,090
2501 - 4000	1866 - 2984	365,570
Rates include: - relays - control circuit gauges - installation		

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Control Panels

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Steam Generators

Description

Steam generators are used to inject steam to the producing formation for enhanced oil recovery systems.

Rates

The rates for steam generators are in dollars per unit.

Description	Rate
10,000,000 BTU/hr. unit	
Generator	1,147,470
Water softener and filter	90,930
Trailer	127,250
Building (on trailer)	86,260
Total for Unit	1,451,910
18,500,000 BTU/hr. unit	
Generator	1,158,020
Water softener and filter	91,020
2 Trailers (soft and gen)	199,610
2 Buildings (on trailer)	148,710
Total for unit	1,597,360
22,000,000 BTU/hr. unit	
Generator	1,178,810
Water softener and filter	102,010
2 Trailers (soft and gen)	236,330
2 Buildings (on trailer)	156,420
Total for unit	1,673,570
25,000,000 BTU/hr. unit	
Generator	1,346,770
Water softener and filter	109,440
1 Trailers	200,170
1 Buildings	91,300
Total for unit	1,747,680
50,000,000 BTU/hr. unit schedule 80 to 160	
1,750 to 2,400 psi	
Base, installation, tie-in	2,497,110
Generator	2,549,760
Water softeners and filters	212,480
Materials and accessories	405,260
Total for Unit	5,664,610

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Steam Generators

Description	Rate
≥ 100,000,000 BTU/hr. unit schedule 80 to 160	
1,750 to 2,400 psi	
Base, installation, tie-in	2,743,420
Generator	3,444,260
Water softeners and filters	292,520
Materials and accessories	405,760
Total for Unit	6,885,960
Rates include: <ul style="list-style-type: none"> - softeners - filters - accessories - installation 	

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Filters

Description

Filters are used for cleaning water.

Sand Filter

The rates for sand filters are in dollars per tank unit.

Tank Size (in.)	Imp. Gal. per Minute	Pipe Size (in.)	Rate
20 x 54	30	1½	18,200
24 x 54	40	1½	21,120
30 x 60	60	2	28,790
36 x 60	90	2½	37,810
42 x 60	120	3	58,620
48 x 60	150	3	71,110
60 x 60	250	4	104,260
72 x 60	420	6	158,860
84 x 60	580	6	211,260

Carbon Filter

The rates for carbon filters are in dollars per tank unit.

Tank Size (in.)	Imp. Gal. per Minute	Pipe Size (in.)	Rate
20 x 54	10	1½	16,770
24 x 54	15	1½	19,810
30 x 60	25	2	24,310
36 x 60	35	2	32,540
42 x 60	50	2½	47,040
48 x 60	65	2½	55,810
60 x 60	100	3	76,250
Rates include:			
- concrete base		- miscellaneous pipes	
- valves and fittings		- installation	

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Filters

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Industrial Water Softeners

Description

Water softeners are used to soften the water for steam generators.

Rates

The rates for industrial water softeners are in dollars per tank unit.

Single Unit

Softener Tank Width (in.) x Height (in.)	Brine Tank Width (in.) x Height (in.)	Imp. Gal. per Minute	Pipe Size (in.)	Rate	
				Single Units	Duplex Units
20 x 54	24 x 80	55	2	25,590	51,430
24 x 54	30 x 48	75	2½	30,080	60,440
30 x 60	38 x 48	125	3	40,970	82,280
36 x 60	42 x 48	175	4	54,350	109,210
48 x 60	48 x 60	150	3	62,880	126,190
54 x 60	54 x 60	275	4	73,950	148,460
60 x 60	60 x 60	400	4	83,790	168,310
72 x 60	72 x 60	560	6	128,420	257,880
84 x 60	84 x 60	760	6	170,930	343,380

Rates include:

- time clock control
- specific gravity meter
- injectors
- valves and fittings
- liquid level control
- hardness monitor
- concrete base
- water meters
- chemical
- miscellaneous pipes
- installation

Rates do not include pumps and motors.

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Industrial Water Softeners

Description

A flow line is a line of pipe used to transport or conduct oil or gas within a well site to a battery or gas handling site, satellite, gas plant, compressor station, or other facility at which the oil or gas is prepared for pipeline transport.

A service line is a line of pipe used to transport water from a water source well or to transport fuel gas to an oil well site prime mover or to transport water, steam, air, oxygen, acid or carbon dioxide to enhance the recovery of oil from an oil well.

Oil, Gas, Water and Air Lines

The rates for oil, gas, water and air lines are in dollars per lineal foot.

Line Size (in.)	Rate		
	Plastic (L)	Steel (N)	Fibreglass (F)
1	8.56	20.16	
2	10.05	22.18	20.22
3	13.79	26.70	26.28
4	18.13	30.69	35.26
6	30.79	41.87	62.31
8	43.73	56.67	97.51
10	59.03	76.36	118.80
12	75.56	92.59	145.38
14	89.92	100.44	171.96
Rates include: - construction contract - land right-of-way - pipe - exterior coating - damages and pre-staking - engineering - radiographic inspection - legal survey			

Internal Coated Pipes

The rates for internal coated pipes are in dollars per lineal foot.

Pipe Size (in.)	Rate (C)
2	53.09
3	65.73
4	80.05
6	118.34
8	156.57

Steel Pipe with Polyethylene Liner

The rates for steel pipe with polyethylene liner are in dollars per lineal foot.

Pipe Size (in.)	Rate
2	47.53
3	53.44
4	60.60
6	82.99
8	103.29
10	128.97
12	163.18
14	193.93

Steam Service Lines

The rates for steam service lines are in dollars per lineal foot.

Pipe Size (in.)	Rate
1	69.25
2	78.70
3	80.93
4	84.61
6	109.72
8	132.30

Description

Manifolds are systems of headers and branch piping that can be used to gather or distribute fluids. Typically manifolds include valves for controlling the on/off flow of fluids.

Rates

The rates for manifolds are in dollars per manifold.

Production

Size (in.)	Rate	
	Manual	Automatic
1	3,160	11,000
2	7,850	14,680
3	11,320	21,760
4	15,500	27,330
6	22,400	34,610
8	32,030	45,690
10	46,450	57,570
12	67,170	84,630
14	97,060	122,290

Injection

Size (in.)	Rate		
	Water	Air & Gas	Steam
2	9,130	9,910	11,780
3	12,740	13,680	16,410
4	16,610	17,700	21,200
Rates include: - pipe - fittings - valves - installation			

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Manifolds

Description

Scraper traps are used to insert scrapers to clean out the flow lines and service lines.

Rates

The rates for scraper traps are in dollars per trap or injection unit.

Receiving and Launching Traps

Line Size (in.)	Rate	
	With Bypass	Without Bypass
2	11,650	5,210
3	14,080	6,380
4	16,360	7,400
6	24,230	
8	31,250	
10	44,850	
12	56,820	

Automatic Pig Injection

Line Size (in.)	Rate
2	16,080
3	26,030
4	42,660
Rates include:	
<ul style="list-style-type: none"> - valves - miscellaneous pipe and fittings - installation 	

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Scraper Traps

Description

In heavy oil areas, oil is often trucked to the battery where it is measured by weight and dumped into a receiving pit.

Rates

Balance scales are the typical platform-type scale that allow the complete vehicle to be weighed. Load cell scales weigh one set of axles at a time. The rates for scales are in dollars per unit.

Type	Rate
Balance scale	215,060
Load cell scale	163,200

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Truck Scales

Summary

This section describes the formulas, rules and principles for determining the assessed value of mine resource production equipment.

Definitions

Mine resource production equipment is the fixtures, machinery, tools, railroad spur tracks, and other appliances used to extract and produce the ore but does not include equipment used to process or refine the ore.

Shaft linings, safety equipment, shop tools for maintenance service, spare parts, and surplus equipment are not resource production equipment by which a mine is operated.

Formulas, Rules and Principles

The assessed value of mine resource production equipment shall be determined by the replacement cost method established in this section. The replacement cost new shall be determined using the unit-in-place method or the trended original cost method.

The replacement cost of continuous belt conveyors over 1,000 feet in length, and solution mining resource production equipment shall be determined by the unit-in-place method. The unit-in-place base rates account for all direct and indirect costs. No additional adjustments shall be made to the base rates.

The unit-in-place base rates for solution mining resource production equipment shall be determined in accordance with the rates schedules in Chapter 4 – Resource Production Equipment, Section 4.1 – Oil and Gas Well Resource Production Equipment.

The trended original cost shall include all direct and indirect costs. Direct costs include materials, labour, supervision, equipment rentals, and utilities. Indirect costs include architectural and engineering fees, building permits, title and legal fees, insurance, interest and fees on construction loans, taxes incurred during construction, advertising and sales expense, and overhead and profit. Trended original costs shall be determined FOB the mine site as of January 1, 2019.

Depreciation shall be determined by calculating the amount of physical deterioration using the lifetime depreciation method. Functional and economic obsolescence shall not be accounted for in the calculation of depreciation. No additional allowance shall be made for depreciation except as may be accounted for in the downtime allowance factor.

The downtime allowance and the downtime allowance factor for mine resource production equipment shall be determined by the schedule of rates method. The downtime allowance and the downtime allowance factor shall account for all the loss in value due to under-utilization of the resource production equipment. This includes any loss in value due to differences in replacement cost and difference in the amount of depreciation, that have not been taken into account using the procedures in this Manual.

Replacement Cost New

The following mine resource production equipment shall be valued:

- Head frame and head house including mechanical and electrical equipment;
- Service and production hoists c/w cages, skips, pulleys, cables, guide ropes and rails, skip load and dump facilities;
- Water control – pipes, pumps, motors;
- Compressed – air service – piping, compressors, motors, controls;
- Personnel and service vehicles;
- Mobile and overhead cranes, forklifts;
- Ventilation systems, fans, ducts;
- Heating and cooling facilities;
- Warning system;
- Production equipment – miners, drag lines, loaders, loading shovels, front-end loaders, ore trucks, ore haulers, scoop trams, conveyor systems and numerous ancillary and auxiliary equipment;
- Drills and blasting equipment;
- Feeders and crushers;
- Roof and floor maintenance equipment, rock bolters, graders, scraper haulers;
- Crawler and wheel tractors c/w dozers and/or buckets;
- Electrical wiring and equipment required to operate plant and equipment; and
- Any other equipment used in the mining operation that is not listed as an exclusion.

The following mine resource production equipment shall not be valued:

- Shaft linings – concrete, steel, wood, etc. (tubing and cribbing);
- Safety equipment – fire, personal, etc.;
- Sharp tools for maintenance and service;
- Spare parts; and
- Surplus equipment.

Unit-In-Place Method

The replacement cost of new conveyors and solution mining resource production equipment shall be determined as follows:

1. Determine the type of resource production equipment using the rating guide.
2. Determine the features requiring unit-in-place adjustment.
3. Calculate the replacement cost of the resource production equipment by adjusting the base rate by the unit-in-place adjustments.

Trended Original Cost Method

The replacement cost new shall be determined as follows:

1. Determine the original construction cost of all the resource production equipment at the facility.
2. Determine the direct and indirect costs requiring an adjustment.
3. Determine the comparative cost index for mine resource production equipment required to adjust construction costs to January 1, 2019.
4. Calculate the construction cost of all the resource production equipment at the facility by adjusting the original construction cost for any direct or indirect costs requiring adjustment and multiplying the adjusted original construction cost by the comparative cost index.
5. Determine replacement cost of conveyors and solution mining resource production equipment that is valued by the unit-in-place method.
6. Calculate the replacement cost new of the resource production equipment by subtracting the replacement cost new of conveyors and solution mining resource production equipment from the construction cost of all the resource production equipment in the facility.

Physical Deterioration

Lifetime Depreciation Method

The amount of physical deterioration shall be 40 percent. When calculating replacement cost less depreciation no additional allowance shall be made for depreciation.

Downtime Allowance

Schedule of Rates Method

The downtime allowance for all mine resource production equipment shall be 10 percent.

Downtime Allowance Factor

Schedule of Rates Method

The downtime allowance factor shall be determined for mine resources production equipment that is not used for 30 days or more in the 12 month period preceding January 1st of the year to which the assessment roll relates.

Periods of time less than 7 consecutive days during which mine resource production equipment is not used shall not be included in the calculation of the number of down days.

The downtime adjustment factor shall be determined by application of the following formula:

$$DAF = 1 - \frac{DD - 30}{365}$$

where: DAF = downtime adjustment factor
DD = number of down days

Section: Mine Resource Production Equipment

Resource Production Equipment

Subject: General Rules

Calculation Procedure

Description	Document No.	Page No.
a) Conveyor Base Rate	4.2.3	1
b) Unit-in-Place Resource Production Equipment	4.2.1	2
c) Trended Original Cost Resource Production Equipment	4.2.1	3
d) Replacement Cost New = (a + b + c)		
e) RCN less Physical Deterioration and Downtime Allowance = $d \times (1 - (e_1 + e_2))$		
e ₁ . Physical Deterioration	4.2.1	3
e ₂ . Downtime Allowance	4.2.1	3
f) Downtime Allowance Factor	4.2.1	3
g) Assessed Value (e x f)		

Section: Mine Resource Production Equipment

Resource Production Equipment

Subject: Comparative Cost Factor

Description

The comparative cost factors are used to determine the replacement cost new of mine resource production equipment valued by the trended original cost method.

Application

The trended original cost method shall be used when the individual components of resource production equipment cannot be determined or estimated. The trended original cost method shall not be used to determine the replacement cost of conveyors or solution mining resource production equipment.

Comparative Cost Factor

The comparative cost factor shall be used to calculate the replacement cost new of resource production equipment as of January 1, 2019.

Factors

Year	Comparative Cost Factor
1940 and older	
1941	
1942	
1943	
1944	
1945	
1946	
1947	
1948	
1949	
1950	
1951	
1952	
1953	
1954	
1955	
1956	
1957	
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1973	
1974	

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Section: Mine Resource Production Equipment

Resource Production Equipment

Subject: Comparative Cost Factor

Year	Comparative Cost Factor
1975	
1976	
1977	
1978	
1979	
1980	
1981	
1982	
1983	
1984	
1985	
1986	
1987	
1988	
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2010	
2011	
2012	
2013	
2014	
2015	
2016	
2017	
2018 and newer	

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Section: Mine Resource Production Equipment

Resource Production Equipment

Subject: Conveyors

Description

Conveyors are used to transport ore within a mine facility.

Application

The rate schedule shall be applied to continuous belt conveyors over 1,000 feet in length. Continuous belt conveyors less than 1,000 feet in length and all special design, tripper automatic loading and unloading, extensible, mobile bridge and bridge conveyors shall be valued by the trended original cost method.

Continuous Belt Conveyor

The rates for conveyors are in dollars per lineal foot.

Belt Width (in.)	Rate
24	257
30	302
36	353
42	380
48	474
54	533
60	570
72	678
Rates include: - belting - drives - structure - hardware	

Section: Mine Resource Production Equipment

Resource Production Equipment

Subject: Conveyors
