



WSLCA-Annual Meeting

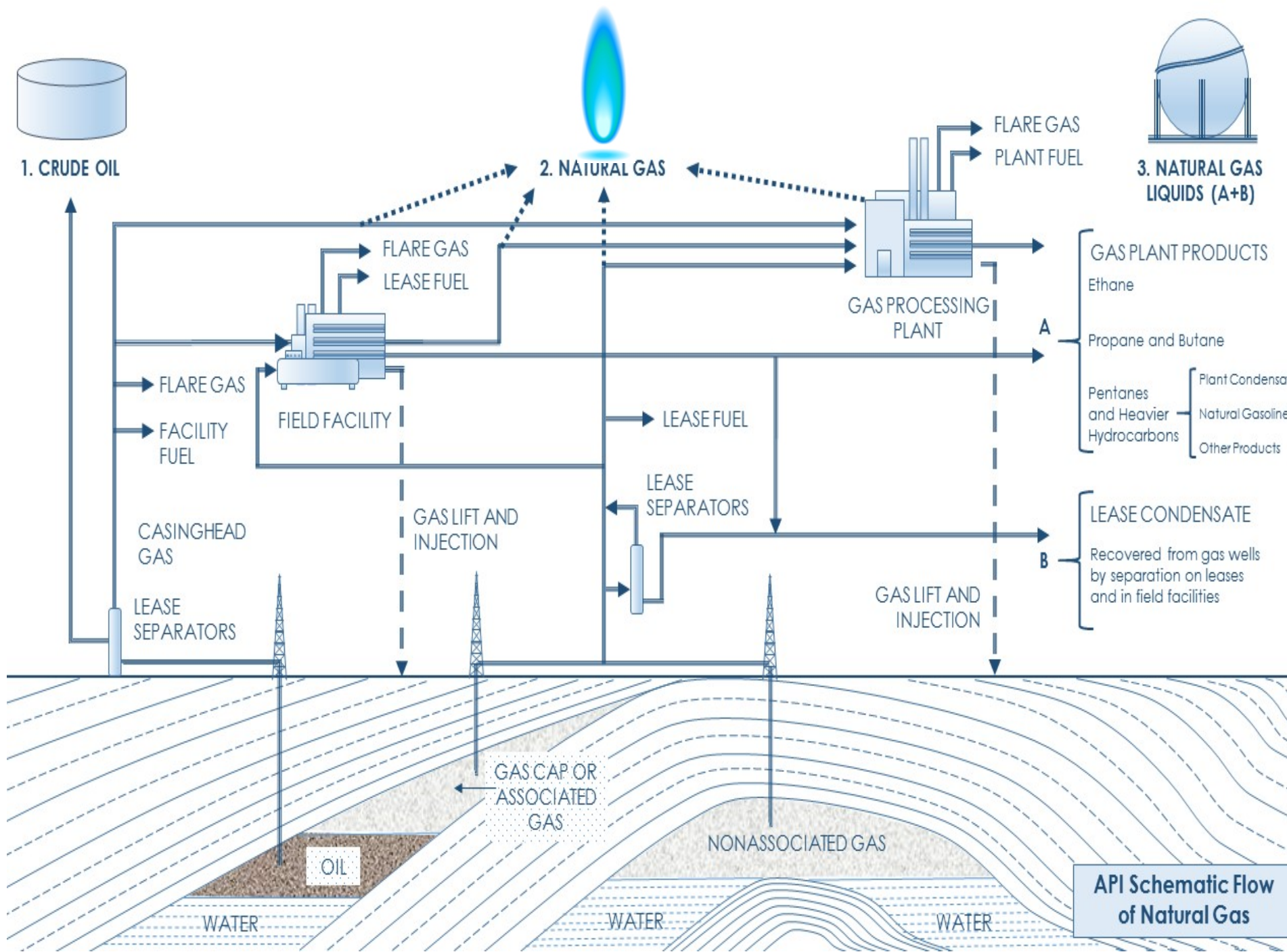
Sources & Uses of Gas on the Lease
and Gas Plant Deductions - Webinar

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1-10-17

Webinar Outline

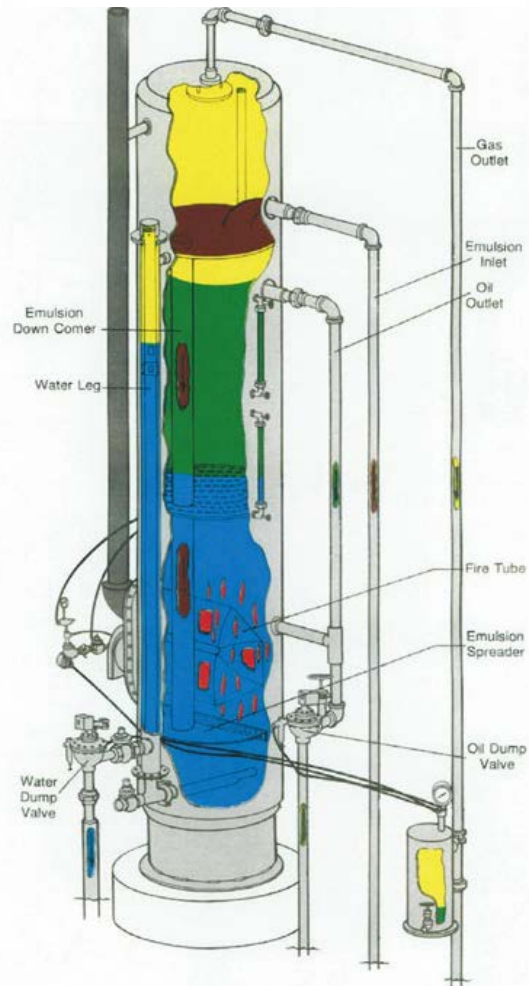
- Uses/Dispositions of Raw Gas in the Field
 - Equipment
 - Non-equipment dispositions
- Uses/Dispositions of Residue Gas
 - Field operations
 - Field development
- Gas Processing Deductions
 - Volume deductions
 - Value deductions



Field Equipment - Types

- Heater-treater – heats emulsion to separate oil from gas from water content
- Indirect heater – water filled vessel that heats the water as the gas passes through its coils – keeps hydrates in gas from freezing
- Glycol dehydrator – glycol attracts water vapor from gas, “wet” glycol is heated and “dried”
- Gas burning engines – any equipment requiring a gas powered engine to run / function, such as a compressor, pumping unit, etc.

Emulsion Heater Treater



VESSEL SIZE

Diameter x Height
Max. BTU/Hr.
Capacity Oil Bbl./Day
Capacity Water Bbl./Day
Gas Oil Ratio

3 x 15	4 x 20	6 x 20
208000	350000	500000
35 - 150	95 - 430	190 - 600
175 - 350	300 - 600	700 - 1300
1000:1	1000:1	1000:1

LEGEND

Raw Emulsion
Clean Oil
Water
Gas
Heat and Fire

Gas Glycol Unit



Field Equipment – Gas Utilization

- Depending on well/field situation – eg. – single gas well vs large oil field – gas utilized for field equipment may or may not be metered
- Large field equipment typically have meters in place to measure gas usage
- In instances where meters not utilized – several ways to estimate gas utilized:
 - equipment manufacturer recommendations
 - engines – volume per horsepower/hour
 - heaters - volume per BTU/hour

Field Equipment – Gas Utilization

- for reporting purposes – depending on state
 - produced and utilized gas typically reported as lease fuel
- for severance tax and or royalty purposes, valuation should be the same as any gas sold by the producer
- if no gas sold – then index less differential typically acceptable
- in some states, county average reported sales price can be used – internet available

Non-Equipment Dispositions

- Flaring-the burning of gas into the atmosphere due to non-marketability or as waste
 - If volume constant or significant – s/b metered
 - State regulations differ – N. Dakota/Bakken
- Venting-direct release of gas into the atmosphere
 - usually small, insignificant amounts
 - wellwork
 - line repairs
 - stock tank maintenance



Non-Equipment Dispositions

- Inter-lease sales – sales of natural gas from one property to another
 - may be same or different operator
 - usually receiving property does not produce sufficient gas for its needs
 - may be month to month or long term
 - typically volume sold in metered
 - Sales price should be commensurate with third party gas sales contracts

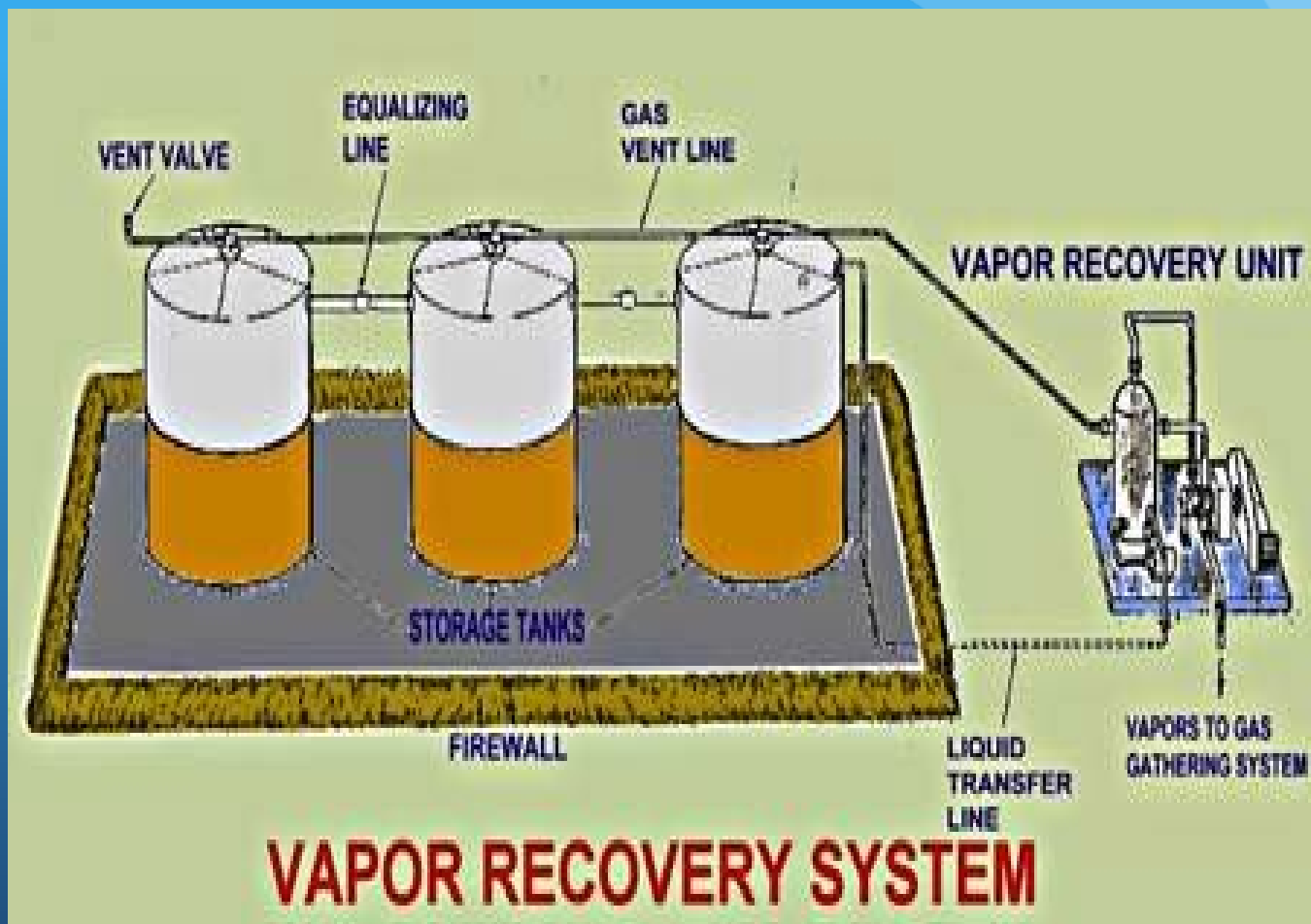
Non-Equipment Dispositions

- Ranching / farm uses
 - irrigation pump fuel
 - heating of barns
 - drying crops
 - personal home use
 - typically free to mineral owner as needed
 - lease wording specific
 - may occur in unitized properties (state/private mineral ownership)
 - typically not metered



Field Operations

- Vapor recovery units – designed to recover vapors from oilfield storage tanks
 - flashing occurs when entrained gases are released from oil due to pressure drop or temperature change
 - recovered gases flow out the top of the tanks and are accumulated
 - the flash gas is compressed, metered and combined with the rest of the field casinghead gas
 - the compressor engine is usually gas driven and fuel gas typically not metered

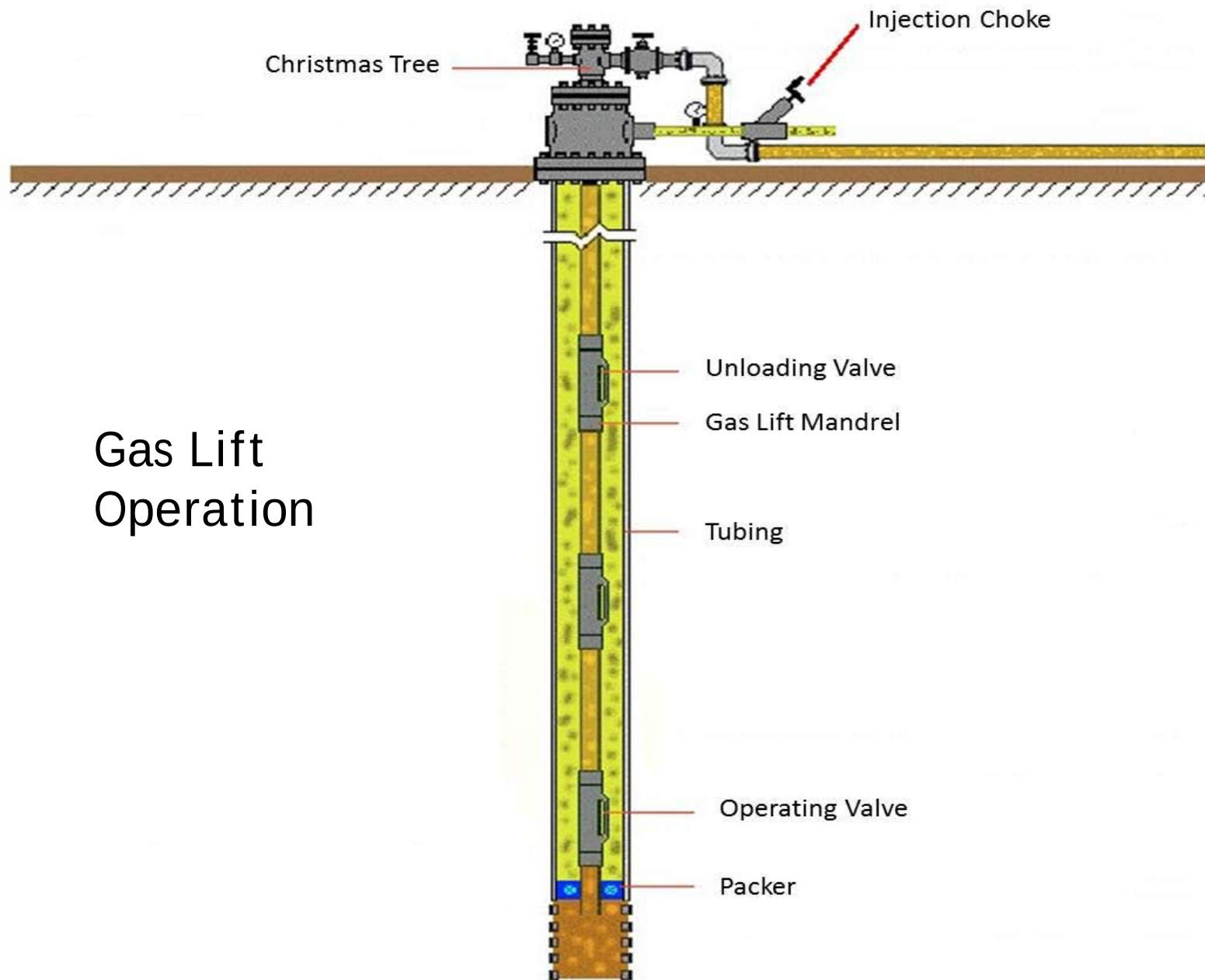


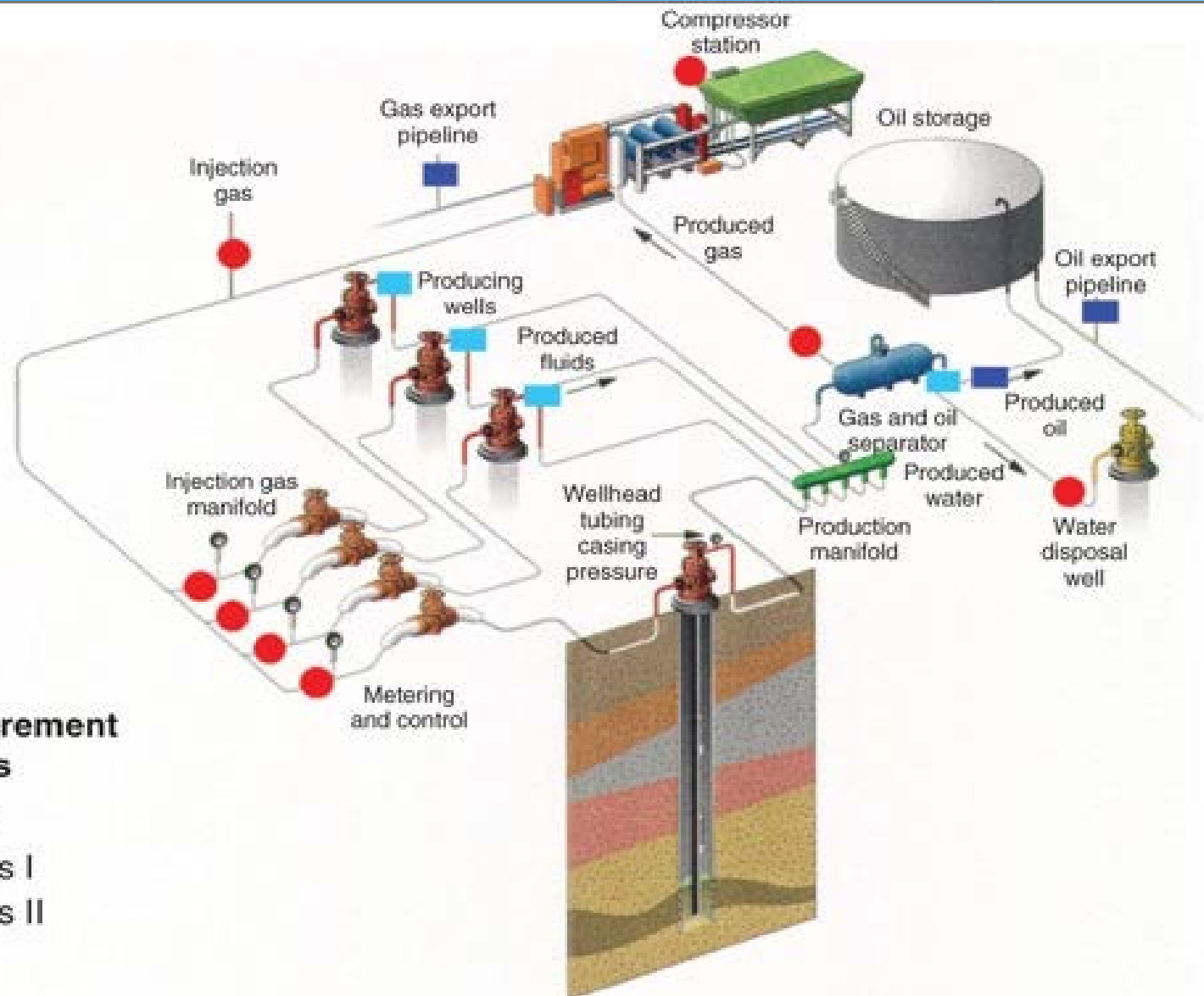
Field Operations

- Gas lift gas

- residue gas utilized when reservoir pressure not sufficient to flow oil up to the surface
- gas is injected down tubing and mixes with reservoir fluids in the well
- the gas reduces the mixture density allowing reservoir pressure to flow the mixture
- The gas typically is pumped down the well utilizing a gas fueled compressor
- gas losses usually occur – to the reservoir or in the recovery of the oil

Gas Lift Operation





Flow Measurement Points

- Vortex
- Coriolis I
- Coriolis II

Field Development

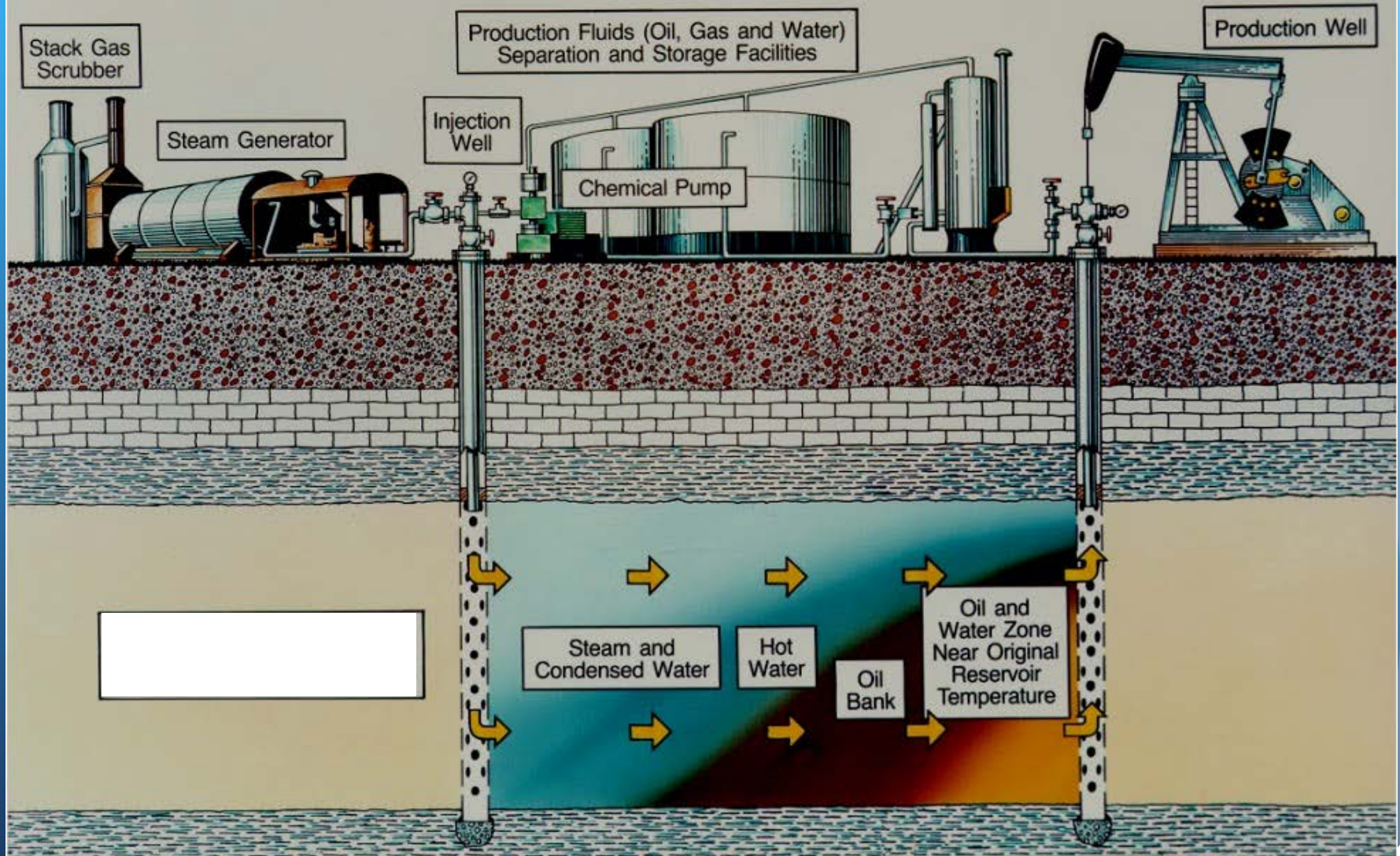
- Miscible gas injection
 - residue gas is injected under pressure into the reservoir via injection wells
 - the gas mixes with the oil allowing the oil to flow more freely to the production wellbore
 - methane and propane may also be used
 - the gas is also used to pressurize the reservoir which helps the fluid mixture to flow to the production well
 - gas driven injection compressors are used to pressurize the reservoir
 - injected gas should be recovered

Field Development

- Thermal recovery
 - aka – steam injection or steam drive
 - surface generated steam is injected under pressure down injection wells to reduce reservoir oil viscosity and push to production wells
 - gas driven surface equipment convert water into steam
 - gas fueled compressors force generated steam down injection wellbores
 - field gas utilized to run surface equipment should be metered and reported

THERMAL RECOVERY

This is accomplished either by hot fluid injection (hot water or steam) or *in situ* combustion (burning a part of the crude oil in place). Variations of these methods improve production of crudes by heating them, thereby improving their mobility and ease of recovery by fluid injection.



Field Development

- infield drilling – expansion of field bounds
- nearby drilling operations (other field)
- workovers, frac jobs
- not all equipment diesel driven
- equipment may utilize gas burning equipment from same or other fields depending on proximity

Processed Gas

Prior Period Adjustment

Percent of Proceeds Statement - Allocated

METER AND CONTRACT INFORMATION

Meter Name:	Meter Number:	Accounting Date:	January 2015	System Name:	Grasslands	Pressure:	50.63
Contract Party:	Contract Party Number:	Production Date:	July 2012	Pressure/BTU:	14.73 Wet	BTU Factor:	1,436.55
Contract Number:	CCT Number:	Statement Date:	December 21, 2015	Alloc. Decimal:	1.0000	Flow Hours:	

SETTLEMENT SUMMARY

Accounting Date	Wellhead MCF	Wellhead MMBTU	Purchased Value	Liquid Value	Residue Value	Helium Value	Gross Value	Fees	Taxable Value	Taxes	Net Value
January 2015	19,822.31	28,475.69	\$0.00	\$61,307.24	\$33,190.96	\$0.00	\$94,498.20	\$11,118.24	\$83,379.96	\$2,527.52	\$80,852.44
December 2012	See Previous Statement for this Accounting Period										
Net Total											

LIQUIDS

PLANT TOTALS

METER TOTALS

Product	Theoretical Gallons	Actual Gallons	Theoretical Gallons	Actual Gallons	TIK Gallons	Shrink MMBTU	Contract Percent	Contract Gallons	Liquid Price	Liquid Value
Ethane			104,108.97	156.70	0.00	10.40	77.50%	121.44	\$(0.2046)	\$(24.84)
Propane			53,363.11	45,940.47	0.00	4,206.45	77.50%	35,603.86	\$0.3411	\$12,145.63
Iso-Butane			7,033.52	6,762.12	0.00	673.71	77.50%	5,240.64	\$1.2663	\$6,636.45
Normal Butane			23,341.96	21,205.27	0.00	2,199.83	77.50%	16,434.08	\$0.8589	\$14,115.60
Natural Gasoline			12,491.20	18,538.82	0.00	2,094.46	77.50%	14,367.59	\$1.8257	\$26,231.37
Condensate			12,491.20	1,870.13	0.00	211.28	77.50%	1,449.35	\$1.5200	\$2,203.03
Total				94,473.51	0.00	9,396.13		73,216.96		\$61,307.24

RESIDUE

PLANT TOTALS

METER TOTALS

Units	Theoretical Residue	Residue Available	Gross Wellhead	Net Delivered	Shrink	Theoretical Residue	Gas Available	Contract Percent	Gas Sold	Residue Price	Residue Value
MCF			19,822.31	19,575.61			15,845.23	77.50%	12,280.05		
MMBTU			28,475.69	28,121.26	9,396.13	18,725.13	18,857.40	77.50%	14,614.49	\$2.2711	\$33,190.96

FUELS

FEES

TAXES

Fuel Type	Fixed %	MCF	MMBTU	Fee Type	Fee Volume	Fee Rate	Value	Tax Type	Tax Due
Lease Return		0.00	0.00	3rd Party Services	7,660.20	\$1.0000	\$7,660.20	Gas Gross Production Tax	\$2,249.08
Plant Fuel		273.87	320.18	Electric Fee	3,458.04	\$1.0000	\$3,458.04	Nd Oil Production Tax	\$121.06
Shrinkage		3,081.68	9,396.13	Metering	1.00	\$0.0000	\$0.00	Nd Oil Extraction Tax	\$157.38
Field Fuel		0.00	0.00	Treating	19,822.31	\$0.0000	\$0.00		

GAS ANALYSIS

Units	Helium	Nitrogen	Carbon Dioxide	Sulfur	Methane	Ethane	Propane	Iso-Butane	Normal Butane	Iso-Pentane	Normal Pentane	Hexanes Plus	Other	Total
GPM						5.3183	2.7260	0.3593	1.1924	0.2220	0.3009	0.1152	0.0000	10.2341
MOL %	0.0000	1.5714	0.7014	0.0000	61.3555	19.8912	9.8974	1.0983	3.7833	0.6073	0.8302	0.2640	0.0000	100.0000

Processed Gas – Things to Consider

- Producer / processor affiliated? Arms length contracts?
- Any TIK producers? How are royalties paid and by whom on unitized properties?
- Get flow diagrams depicting gas flow from wellhead to plant tailgate wherever possible
- Any field / plant inlet scrubbers? Disposition of liquids captured?
- Gas plant shutdowns / equipment repairs?

Processed Gas - Contracts

- Gas sales contract
 - also called Percentage of Proceeds contract (POP)
 - title & possession pass to processor at sales point (wellhead, field, plant inlet)
 - risk of loss passes to processor at the sales point
 - *important*
 - processor sells all residue gas and NGL's
 - payment to producer may be:
 - flat rate per mcf / mmbtu
 - percent of NGL's and or residue gas

Processed Gas - Contracts

- Gas processing agreement
 - possession passes to processor at sales point (wellhead, field, plant inlet)
 - title and risk of loss remains with producer
 - producer may dispose of all NGLs and residue gas unless stated differently in the contract
 - typically processor sells all NGL's, producer sells residue gas
 - processor may be paid
 - flat rate per mcf / mmbtu
 - percent of NGL's and or residue gas
 - other fees

Processed Gas

- Whatever contract type – volumetric dispositions should be addressed in the contract
- Any and all fees, deductions, and taxes should be addressed in the contract
- Product valuation depends on contract type and language
- Does the plant produce a fractionated or unfractionated NGL stream?

Processed Gas - Volumes

- The gas plant statement should explain the disposition of all gas taken possession of
- There will always be a certain volume of gas that is lost or unaccounted for – hopefully small
- Age of the plant or gathering system may explain lost or unaccounted for volumes
- Gas measurement is not precise – but should be close
- Are all meters the same kind / make

Processed Gas - Volumes

- Plant Fuel
 - does it appear reasonable
 - what equipment makes up plant fuel?
 - is it metered or estimated?
 - what is the allocation methodology of the plant fuel back to each meter / well? (shrink/inlet?)
- Shrinkage
 - how calculated / allocated?
 - GPA tables utilized? (Pub. 2145)
- Any bypass gas? Why?

Processed Gas – Deductions/Fees

- Verify all deductions / fees with contract
- 3rd party service fees – what, who, why?
- Electricity fee – common in some contracts
 - what equipment?
 - why not gas generation of electricity?
- Metering fees
 - flat fee or volume based?
 - what meters?
 - where are the meters?

Processed Gas – Deductions/Fees

- Marketing fees
 - are they 3rd party related?
 - transportation for tailgate sales?
 - overhead fee?
- Severance taxes – should not be deducted from state royalties?

Processed Gas – Valuation

- Residue gas (if applicable)
 - price appropriate for area
 - gross or net price
 - sold @ tailgate or downstream
- Natural gas liquids
 - how is price arrived at?
 - gross or net price
 - where sold?

Questions?

Thank You – Happy New Year