CITY OF PORT ARANSAS, TEXAS

AGENDA

PLANNING AND ZONING COMMISSION
REGULAR MEETING
Monday, December 30th, 2013 @ 3:00pm
Port Aransas City Hall, 710 W. Avenue A
Port Aransas, Texas 78373

Notice is hereby given of the Regular Meeting of the Planning and Zoning Commission of Port Aransas to be held on Monday, December 30th, 2013 beginning at 3:00 pm at: City Hall – Council Chamber, 710 W. Avenue A, Port Aransas, Texas, for the purpose of considering the following agenda items.

1. **CALL TO ORDER:**

2. **CITIZEN COMMENTS:** *In accordance with the Open Meeting Act, Planning and Zoning Commission is prohibited from acting or discussing (other than factual responses to specific questions) any items brought before them at this time. Comments will be limited to three (3) minutes or less.*

3. **ITEMS FOR DISCUSSION:**

A. Discussion of Harbor Island and Harbor Island District Uses.

4. **PLANNING AND ZONING COMMENTS AND ITEMS FOR FUTURE CONSIDERATION:**

5. **ADJOURNMENT OF SPECIAL MEETING:**

This facility is wheelchair accessible and accessible parking spaces are available. Requests for accommodations or interpretive services must be made 48 hours prior to this meeting. Please contact the City Secretary's office at 361-749-4111 or fax 361-749-4101 or email iparker@cityofportaransas.org for further information. Braille is not available. The City of Port Aransas reserves the right to convene into Closed Session under Government Code 551.071-551-074 and 551-086.

CERTIFICATION

I certify that a copy of the December 30th, 2013 agenda of items to be considered by the Planning and Zoning Commission was posted on the City Hall bulletin board on December 27th, 2013 @ 2:30pm.

Irma G. Parker

Irma G. Parker, City Secretary

I certify that the attached notice and agenda of items to be considered by the Planning and Zoning Commission was removed by me from the City Hall bulletin board on the _____ day of _____, 2013.

By: _____ Title: _____

CITY OF PORT ARANSAS
Planning and Zoning
Agenda Item # 3A
December 30th, 2013

Item/Subject: Discussion of Harbor Island and Harbor Island District Uses

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Initiating Department: Administration

(Nicole Hammock, Permit Clerk)

Associated Information: Proposed Allowable Uses (from Staff), Pages 7 & 21 from WAID Environmental's Eric Kaysen's presentation (12/19/13), Permitted/Non-Permitted Uses from POCC (12/26/13), pages 2 & 3 from Martin Resource Management's Harbor Island Project Review (2/7/13), Various Additional Information on Condensate

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PROPOSED ALLOWABLE USES (From Staff)

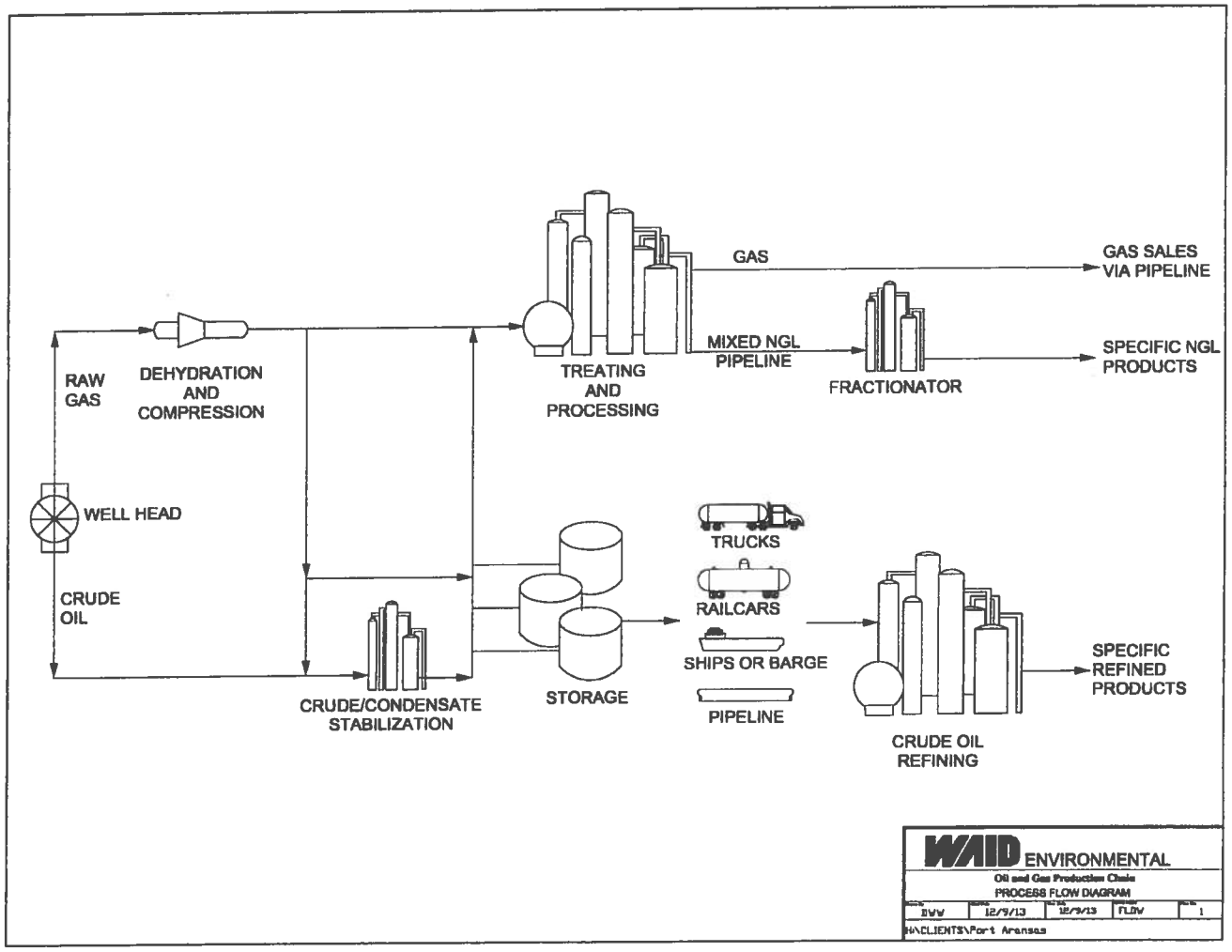
- ***Light manufacturing*** is a light industrial business where all processing, fabricating, assembly, or disassembly of items takes place wholly within an enclosed building. Typical items for processing, fabricating, assembly, or disassembly include but are not limited to: apparel, home accessories, hardware, food, clothing accessories, instruments, computers and electronic devices.
- ***Marine Terminal*** is a building or complex of buildings, structures, docks and wharf facilities for docking, cargo handling, and storage of maritime transported goods. *Issue: This may be too open ended, might allow for some items that could be detrimental to the city such as Petroleum coke, or coal loading and unloading.*
- ***Storage Facilities for oil and/or gas products*** are any aboveground container(s) that is used or intended to be used for the storage or supply of oil and/or gas and the associated transportation of such oil and/or gas. *Issue: Is flaring or other process required for loading/unloading?*
- ***Ship yards*** are places or facilities for the building, maintenance, and repair of ships (ship breaking, ship demolition, or ship salvaging uses are prohibited uses and are excluded from this allowable use).
- ***Fabrication yards*** are areas of land and associated buildings, structures, docks, and wharf facilities used in the construction and assembly of items built from raw materials.
- ***Offshore oil/gas support services*** are areas of land and associated buildings, structures, docks and wharf facilities used to support the near shore offshore oil/gas industry.
- ***Cruise Ship Terminal*** is a building or complex of buildings, structures, docks and support facilities associated with cruise ship industry uses. *Issue: industry impacts on community*
- ***Research and Testing Laboratories*** are a complex of buildings and structures associated with the experimental study in a science or for testing and analysis. *Issue: PETA?*
- ***Aquaculture Farms*** are areas of land and associated buildings, structures, docks, and wharf facilities used in the farming and cultivation of aquatic organisms such as fish, shellfish and plants. *Issue: smells?*
- ***Communication Towers*** are any towers erected for the purpose of supporting, including but not limited to, one or more antenna designed to transmit or receive: television, AM/FM radio, digital, microwave, cellular telephone or similar form of electronic communication (See Sec. 25-153 for additional requirements).
- ***Concrete/Asphalt Batch Plant*** are areas of land and associated buildings and structures used as a mixing plant that produces batches of concrete or aggregate-asphalt mixture.
- ***Seafood processing, packaging and storage*** is a complex of buildings and structures associated with the industry of processing seafood and seafood products between the time the seafood is harvested, and the time the final product is delivered to the customer. *Issue: smells?*
- ***Dwelling for resident watchmen/caretakers*** provided they are clearly incidental and secondary to the main use to which the property is put.

Other uses to consider:

Gaming/Gambling

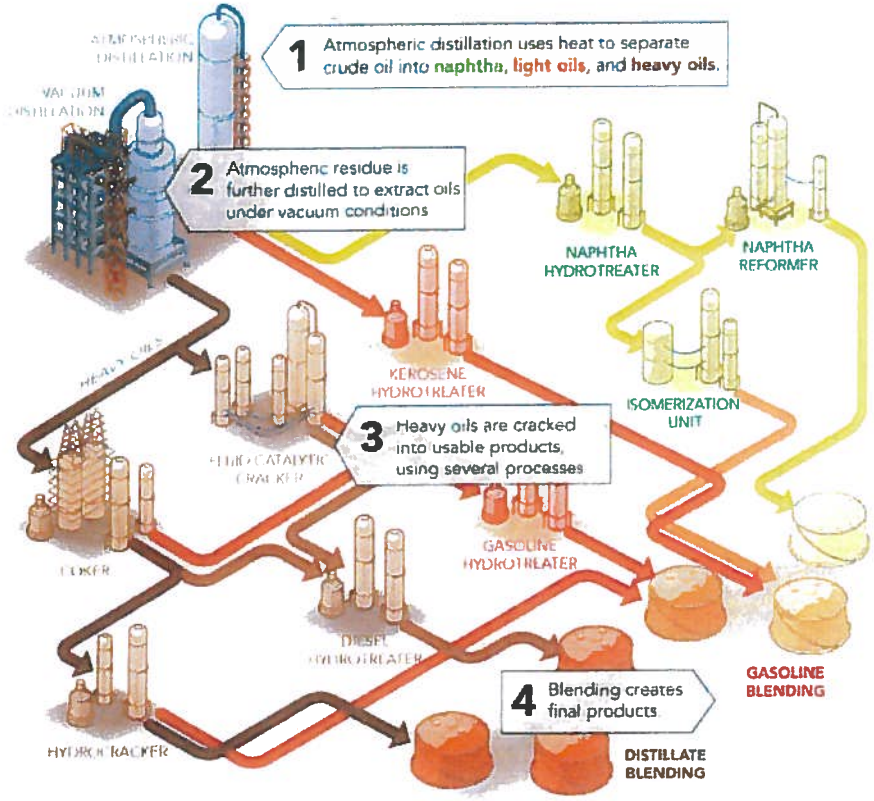
Dredge Material Placement areas

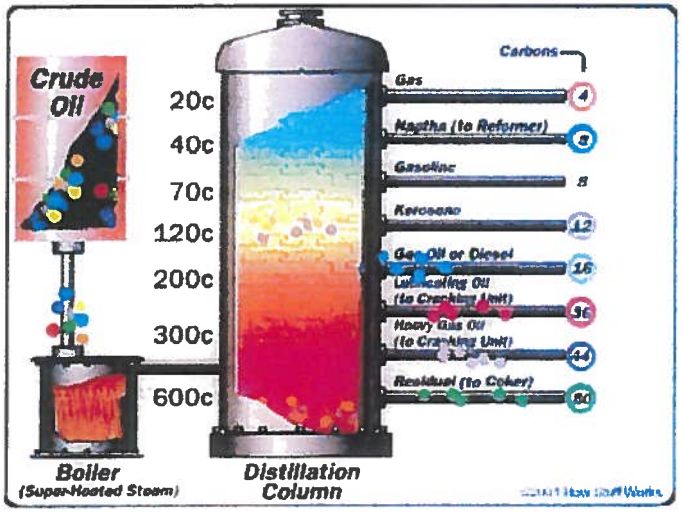
Oil and Gas Production Chain

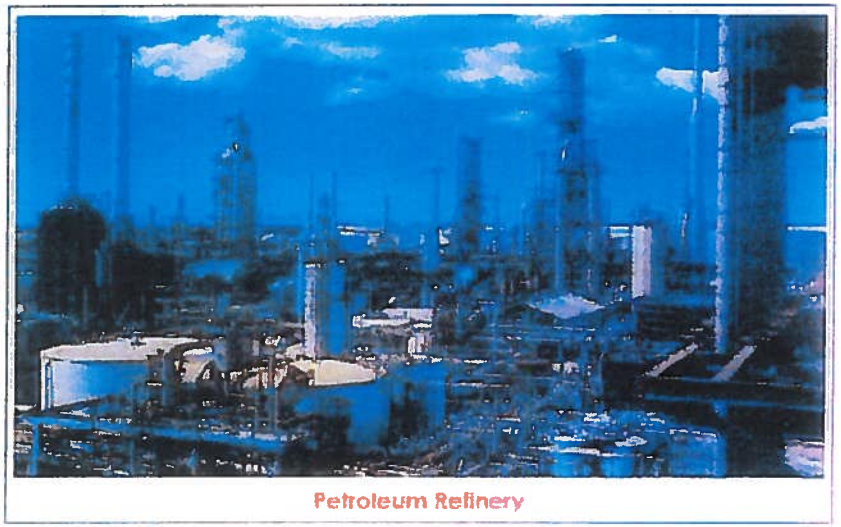


Petroleum Refining

Crude Oil Refining







Petroleum Refinery

From P.O.C.C. on 12-26-2013

HARBOR ISLAND

Permitted Uses:

1. Crude Oil, Petrochemical and petroleum products storage facilities (i.e. tank farms)
2. Liquid cargo dock loading and unloading.
3. Offshore Supply boat support facility for loading and unloading personnel, equipment, water, fuel, drilling mud and other materials used in the offshore exploration industry.
4. Drilling Rig fabrication facility for the offshore oil and gas industry (similar to McDermott's prior activities or like Kiewit currently does at Ingleside
5. Dredge Material Placement Area
6. Gaming Ship or Cruise Terminal
7. Condensate Splitter
8. Crude Oil Fractionator

Non Permitted Uses:

1. Ship Breaking (disassembly, salvaging or recycling)
2. LNG Liquefaction or Regasification Facility (Import or Export)
3. Crude Oil Cracking, Coking, Desulfurizing Facility
4. Petroleum Coke Loading or Unloading Facility
5. Coal Import or Export Facility

HARBOR ISLAND PROJECT OVERVIEW

Martin is pursuing three distinct opportunities at Harbor Island

- Processing of Eagle Ford condensate/light crude oil in two 50,000 BPD Splitters
  - Naphtha
  - Jet Fuel
  - Diesel Fuel
  - Fuel Oil
- NGL fractionator to fractionate light ends from Martin's Harbor Island splitters, third party Eagle Ford topping units, and third party y-grade NGLs to produce export grade:
  - Propane
  - Butane
  - Natural Gasoline
- LPG/Refined Products Terminal to facilitate export of:
  - Refined products from Harbor Island topping unit
  - Export grade LPGs from the Harbor Island fractionator
  - Third party export grade LPGs
- Pipeline
  - Condensate Pipeline to move condensate from Victoria to Harbor Island and an alternative to barge movements of same

PROJECT PHASES

Phase 1

- Acquire pressure barges for temporary LPG storage ✓
  - Purchase and sale agreement executed
  - Perform due diligence – ongoing
  - Acquisition will close by 3/1/2013
- Begin trucking LPGs to HI
  - Can proceed under PBR
  - Subject to approval by Coast Guard

Phase 2

- Install fractionator on existing property under PBR

Phase 3

- Acquire additional Harbor Island property from the POCC (254 acres).
  - Execute option agreement for property purchase - complete
  - Perform due diligence - ongoing
  - Public announcement
  - Close on property
- Install two 50,000 BPD splitters, additional fractionator, feed storage and finished product storage, and upgrade ship dock
- Barge crude/condensate from Victoria to Harbor Island

Phase 4

- Install pipeline from Victoria to Harbor Island

Like A Box of Chocolates – The Condensate Dilemma

published by Sandy Fielden on Thu, 10/17/2013 - 20:00

When Forrest Gump famously said, "Life is Like a Box of Chocolates – you never know what you are going to get", he might as well have been talking about condensates. The shale revolution has doubled US condensate production since 2011 and we expect those numbers to continue to increase. And like chocolates, condensates come in many varieties. Not just field condensate production from oil and gas wells in basins like the Eagle Ford, but its cousins natural gasoline from natural gas liquids (NGL) processing plants and light naphtha from petroleum refineries. These growing volumes of light hydrocarbons are joined at the hip by their "C5" chemistry and finding a home for them all is proving disruptive to traditional supply/demand patterns.

This is Part 1 of a two part series looking at the gap between surging condensate supplies and market demand. In this episode we start with a few definitions and then detail growing US condensate production. In Part 2 we tackle the demand side of the equation. Much of the material in this blog is adapted from a presentation Rusty made to the 3rd Annual Platts NGL Conference in Houston at the end of September (2013).

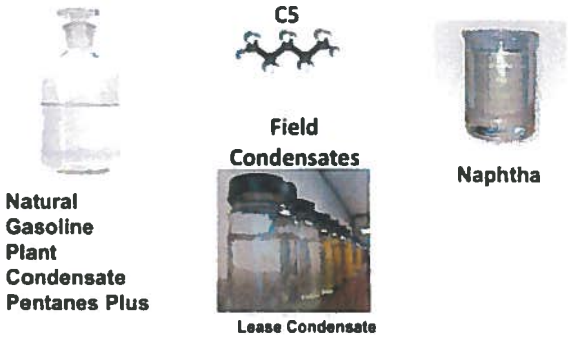
If you are new to condensates then before we get going we should point out a number of previous RBN Energy posts on this topic that you might want to check out in conjunction with this one. At the end of last year we provided some early definitions and looked at regulatory issues around condensates in our "Fifty Shades of Condensate" series including "Which One Did You Mean?", "What Should be Done With Condensates?" and "Where is All This Condensate Going?" Earlier this year Al Troner of APPEC consulting contributed a couple of blogs on the market for condensates outside the US including some comprehensive definitions (see Through The Looking Glass). And there have been others on specific topics that (as usual) we will provide links to as we go along.

Condensate Selection

First to make sure that we are all on the same page we provide basic definitions and describe each of the three branches of the family of hydrocarbons known collectively as condensates.

In the U.S. when we use the word condensate we are usually talking about field condensates (also called lease condensates), generally produced near the wellhead by running natural gas through a stabilizer or similar piece of equipment. Field condensates – the first branch of our condensate family - run the quality gamut, from super light crude, black in color all the way to a clear liquid basically the color of crème soda. In US markets because of Energy Information Administration (EIA) convention, field condensates are classified as crude oil. The second branch of the family is plant condensates, which also go by the name natural gasoline and pentanes plus. We think of these as a natural gas liquid (NGL), because they are produced from a natural gas processing plant – along with ethane, propane and butanes (see How Rich is Rich – Part 2 for a primer on NGL Processing). And the final branch of the condensate family is light naphtha, which is a refined product - output from crude refining.

What all these products have in common is chemistry. A significant percentage of each of these products is made up of a hydrocarbon with 5 carbon molecules - generally abbreviated to C5 or pentane – both normal pentane and isopentane. They are not 100 percent pentane, but they contain a lot of pentane, and that's what makes them part of the condensate family. Next we'll look at a little more closely at where supplies for each branch of the condensate family come from.



Source: RBN Energy (Click to Enlarge)

Field Condensate

What defines a Field Condensate? They are the most mysterious members of the condensate family because there are no generally accepted standards or definitions for them. They might be defined according to where they come from. Some condensate exits the wellhead as a gas and then condenses to a liquid at atmospheric pressure and temperature. But they can also remain suspended in the gas stream and be extracted by a stabilizer located at or close to the wellhead (more about stabilizers in a moment). Alternatively you can define condensate according to its characteristics - a light liquid hydrocarbon as measured by API gravity – lighter than light crude oils. Unfortunately there is no accepted standard API gravity point that separates condensate from light crude oil. Some might use 45 degrees API- where many bend-over posting deducts start. [Bend-over posting deducts are discounts that crude buyers apply to the price they pay for crude – for every 10th of a degree API over 45 – see Don't Let Your Crude Oils Grow Up to be Condensates[. Generally the industry uses 50 degrees API to define condensates but some companies use 55 degrees API to separate condensate from super-light crude (42-55 API). And then there is the Energy Information Administration (EIA) that basically calls condensate crude. They bundle condensate in with their weekly crude oil production statistics. EIA do produce annual field condensate production statistics but these are just estimates. In the old days when condensates were an afterthought, it didn't matter. Today it does, but the EIA survey process has yet to catch up.

Stabilizers

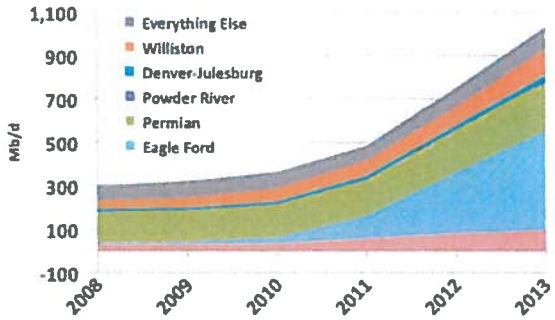
Most field condensates are extracted using stabilizers. Liquids rich hydrocarbons coming out of the wellhead are first separated at atmospheric pressure into liquids and gas. Then a stabilizer is used to treat the stream of gas, which still has liquids suspended in it. The stabilizer separates

out lighter, more volatile components in the stream from heavier liquids. There is usually some heat involved in the process - to flash the lighter ends into a vapor that is collected from the top of the stabilizer. These lighter components continue into the wet gas gathering system that is sent to a natural gas processing plant. Condensates drop to the bottom of the stabilizer and go into pipelines or tanks to be picked up by trucks or shipped out via pipeline. Stabilizers are getting much more sophisticated these days, like the multiphase stabilizers from Exterran in the picture below. Multiphase stabilizers operate more like a splitter than a stabilizer with a tower that separates the condensate (more about splitters when we talk about naphtha below). Suffice to say that with increasing field condensate production from liquids rich plays, more of these stabilizers are showing up the field level, at or near the wellhead.

Source: Exterran (Click to Enlarge)

Field Condensate Production

Field condensate production has increased from somewhere in the low 300Mb/d range in 2010, up to about 1 MMb/d this year (see chart below). Plays like the Williston, the Permian and Anadarko basins are seeing growth, but it is clear that the big Kahuna is the Eagle Ford - making up just under half of the total. Producers have concentrated on the crude and NGL windows in that play. On the NGL side, the wet gas comes along with a lot of condensate. On the crude side – a lot of the crude IS condensate. Either way, the numbers are getting very big, very fast.



Source: RBN Energy (Click to Enlarge)

Plant Condensate

As we described above, the gas stream coming out of the wellhead is separated into liquid condensates that condense out at atmospheric pressure and temperature or that collect in the bottom of a stabilizer and a "wet" gas stream that consists of dry gas (methane) and various quantities of NGLs suspended in the gas. The wet gas stream is sent to a natural gas processing plant. Here the NGLS and dry gas are separated out and the gas is sent to distribution pipeline systems. The remaining mixed stream of gas liquids or Y-grade NGLs is then transported to a fractionator for separation into one of five purity products (ethane, propane, butane, isobutane and natural gasoline). That fractionator may be at the processing plant location, but in the U.S. is usually some distance away. As discussed on many occasions in RBN blogs, by far the largest NGL fractionation center in the U.S. is at Mont Belvieu, Texas.

So plant condensate or natural gasoline is an NGL purity product. Since it comes from a processing plant, it is considered a processed product. Plant condensate production is increasing with the surge in NGLs from growing natural gas production that we have covered in a number of blogs (see for example Can Mont Belvieu Handle The NGL Surge). Natural gasoline is made up of components similar to a middle-of-the-road field condensate – lots of pentanes (C5s), some hexanes (C6s) and very small quantities of the heavier hydrocarbons. Because natural gasoline is the product of a processing plant, its qualities (specifications) are in tighter ranges than field condensates.

Natural gasoline production has been growing along with all NGLs. From about 270 Mb/d in the 2007-2010 timeframe, natural gasoline production started ramping up in 2011, getting up to 360 Mb/d this past June (2013). For the rest of this year, natural gasoline production will fall back just like it does every year. That is because when temperatures are lower, less natural gasoline remains in the wet gas stream (and more stays in the field condensate pool).

Refinery Light Naphtha

Most refinery naphtha is produced from crude oil in the first step of the refining process – distillation. We discussed distillation in our blog series on refining (see Complex Refining 101 – Distillation). Light naphthas are made up mostly of C5s, C6s and portions of the heavier hydrocarbons.

Another source of naphtha is condensate. Some field condensates are processed through a splitter (effectively a stand-alone, small crude oil distillation tower) that separates the naphtha range materials from lighter NGLs and heavier hydrocarbons to yield naphtha and distillates. An increasing number of these condensate splitters are showing up in the US these days. The most prominent example is Kinder Morgan's 100 Mb/d splitter project at their Houston Ship Channel Galena Park facility. Phase 1 of which (50 Mb/d) will come on line in 1Q 2014.

Refinery naphtha production statistics are hard to come by because is used as a blending component – primarily in the gasoline pool. As a result, the EIA data do not isolate naphtha as a finished product except for the volumes that feed petrochemical plants. However, we do know that the quantity of light naphtha components in refineries is increasing. That is because the shale crudes showing up at refineries these days contain a lot more light naphtha components than conventional crudes (see Charge of the Light Brigade). There is also an increasing volume of light hydrocarbons showing up at refineries in the shape of diluent blended into heavy bitumen crudes from Canada to enable them to flow in pipelines (see Heat It!).

And that covers condensate supplies from the three branches of the condensate family. Next time we will cover the demand side of the equation and how supplies are starting to outpace demand leaving a dilemma for producers, plant operators and refiners going forward.

How much is the shale oil windfall really worth?

(December 3, 2013 – EnergyWire) How much is the shale oil windfall really worth? SEC and analysts ask (By Peter Behr)

http://www.eenews.net/stories/1059991160

The hydrocarbon production pouring in from the Eagle Ford Shale formation in South Texas is being hailed as a great new American crude oil bonanza. And it is, analysts agree – except that a third or more of the production isn't crude oil at all.

It is a lighter cousin of crude called lease or field condensate, and its surprising abundance in the Eagle Ford play is straining the oil refining and transportation infrastructure there. It is also complicating investors' assessments of producers' oil reserves, analysts and industry executives say.

Accounting rules permit producers to lump crude and condensate together in reporting proved reserves, disclosing them publicly as a single number. But condensates aren't worth as much as crude along the U.S. Gulf Coast, where refineries are set up to run heavier oil. As the output of condensates increases, the price gap with crude is likely to widen.

Proved reserves of the two hydrocarbons taken together reached 29 billion barrels at the end of 2011, a 15 percent increase from the year before, the Energy Information Administration reported in August. It was the highest level of U.S. proved reserves since 1985.

But if condensate prices continue to fall away from crude, the high presence of condensates reported in the Eagle Ford crude production will tend to overstate the value of companies' estimates of proved reserves, notes Sandy Fielden, director of energy analytics at Houston-based RBN Energy.

"From an investor perspective, if you're investing in a region where there's much more condensate, it's in your interest to know that," Fielden said. "By not being transparent in how they define it at the surface, it makes the reserves more difficult to interpret."

There are other issues in valuing the shale gas and oil windfalls of an industry still in its infancy, experts say.

Don't Let Your Crude Oils Grow Up to be Condensates – API Creep in the Eagle Ford

published by **Sandy Fielden** on Wed 02/20/2013 - 20:00

Last week (February 2013) EOG Resources told analysts that most Eagle Ford oil production should be classified as condensate rather than crude oil. They backed up their assertion with a chart of production quantity and API quality indicating 70 percent of production is condensate. Current forecasts indicate that translates to condensate production of over 500Mb/d in South Texas during 2013. Today we examine the evidence that EOG presented.

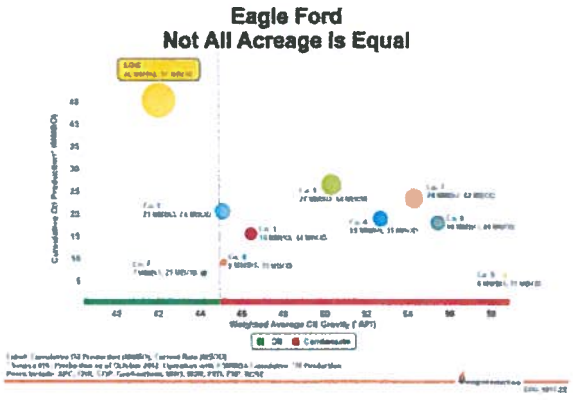
As we have discussed previously in RBN Energy blogs, condensate is lighter than crude oil. Whereas a conventional light sweet US crude like the US Midwest pricing benchmark West Texas Intermediate (WTI) crude has an API gravity of 39 and heavy crudes like Mexican Maya have an API gravity of 20, condensates have an API gravity between 45 and 70. [API gravity is a measure of density relative to water where liquids that sink in water have an API of 10 or lower and liquids that float on water have an API greater than 10]. The generally accepted delineation between condensate and crude oil is 45 API. However, the lack of an agreed standard definition for Condensate is a challenge for the industry (see "Neither Fish Nor Fowl" and "Fifty Shades of Condensate – Which One Did You Mean?")

Growing US domestic crude oil production - up by about 0.9 Mb/d during 2012 is mostly being produced by horizontal drilling and hydraulic fracturing techniques applied in shale deposits. The shale crude output is lighter in quality than most of the crude recovered using conventional drilling methods. In fact an increasing part of the shale crude oil output can be classified as condensate. The Energy Information Administration (EIA) estimates about 11 percent of US crude production in 2010 was condensate. That percentage could increase in 2013 to about 14 percent of production or close to 1 MMb/d.

By all accounts the crude oil basin producing the most condensate is the Eagle Ford. However data telling us the proportion of crude oil to condensate in the Eagle Ford is deceiving at best and downright confusing at worst. A new analysis made available this past week by one of the largest producer in the Eagle Ford – EOG Resources - throws a curve ball into the ongoing debate about how much condensate is being produced in Eagle Ford. The "official" score keepers of the Eagle Ford production data are the Texas Rail Road Commission (RRC). The latest RRC statistics tell us that January to November 2012 Eagle Ford production averaged 340 Mb/d of crude and 72 Mb/d of condensate or 17.5 percent condensate. Most observers including the RBN team believe that these numbers do not reflect reality. They are far too low.

For one thing, the statistics averages for the year to November 2012 and they are based on data known to lag actual production for months because of late reporting. It is also the case that the RRC data is based on the honor system – and lets just say that could lead to some producers being "economical with the truth" about their condensate. That is because crude marketers who buy at the wellhead discount condensate. The posted price for 60 API Eagle Ford condensate averaged $17.5/Bbl below 40 API crude during 2012 (Source Plains postings - see Knocking on Heaven's Door Part I for a full explanation of the posted price discount mechanism). As a result, producers are nervous about telling investors that their output is condensate because that makes it less valuable than crude oil. Up until now we had heard estimates that Eagle Ford production might actually be as much as 40 to 50 percent condensate. Finally, a lot of Eagle Ford condensate seems to 'disappear' – blended off into the crude oil stream. To the extent that happens it would show up on the RRC statistics as crude oil, not condensate. For all these reasons we have discounted the RRC numbers. But if we can't rely on the State of Texas, who can we rely on?

How about EOG? Last week one of the largest producers in the Eagle Ford, EOG Resources, presented a chart at their quarterly earnings conference call implying that 7 out of 10 production companies surveyed were actually producing 100 percent condensate in the Eagle Ford – i.e. no crude oil. The data EOG presented (originating from a survey carried out by IHS) said that for these 10 producers condensate represents 70 percent of their total crude and condensate production. We reproduce the chart below.

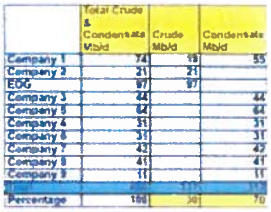


Source: EOG Earnings Conference Call Feb 2013 (Click to Enlarge)

The chart shows cumulative oil production on the right axis and the API gravity of the production along the bottom scale. The black dotted line on the chart is at the 45 API point that generally distinguishes crude oil from condensate. To the left of the dotted line the production is crude (red baseline) and to the right it is condensate (green baseline). The data on the chart is plotted as a series of colored dots representing EOG (large yellow dot) and 9 competitor Eagle Ford producers (Co 1 to Co 9). The height of the colored dots indicates the cumulative Eagle Ford production volume measured on the left axis – also written beside the dot. The horizontal position of the dot is the average gravity of that company's crude and condensate production. Basically the chart is saying that every company except EOG and two competitors has produced all their crude and condensate from the Eagle Ford as condensate.

The data is easier to interpret in a table form. Below we list the unidentified companies and their current daily Eagle Ford production as of October 2012 from the chart. If the company is to the left of the dotted line we counted the daily production as crude and it if was to the right we

counted it as condensate. Our method is not 100 percent accurate since the API level indicated on the chart is based on total cumulative production, not current production. However for our purpose we will assume that current production reflects the historical average API level – that is if they have been producing condensate all along then they will continue to do so. What the table shows is that including EOG these companies were producing between them 456 Mb/d in October 2012 and that 7 out of the 10 companies were producing condensate – a total of 319 Mb/d or 70 percent of output – leaving only 30 percent of output or 137 Mb/d as crude oil.



	Total Crude & Condensate Mb/d	Crude Mb/d	Condensate Mb/d
Company 1	74	19	55
Company 2	21	21	
EOG	97	97	
Company 3	44		44
Company 5	42		42
Company 4	31		31
Company 6	31		31
Company 7	42		42
Company 8	41		41
Company 9	11		11
Percentage	100	30	70

(Click to Enlarge)

The companies used in the IHS survey are not named (except for EOG), but the October 2012 current production volume estimates on the chart (456 Mb/d) exceed the "official" RRC production numbers for YTD November 2012 – so the companies do represent a significant chunk of Eagle Ford production.

In effect EOG was telling investors listening in last week on the earnings call that most producers in the Eagle Ford with the exception of EOG and two other companies are just producing condensate with no crude oil.

If the data from IHS that EOG presented is accurate then the percentage of Eagle Ford crude that is condensate is much higher than previously assumed by the market. That means there will be a lot more condensate showing up in Houston and Corpus Christi from the Eagle Ford than expected. Even if we assume that there was some attempt to make EOG look better with these numbers by averaging cumulative production rather than just looking at current output it would still be the case that the API gravity of Eagle Ford production is increasing more than most everyone thought.

What are the implications? First – as EOG implied on its earnings call – the returns for Eagle Ford condensate producers are likely to be lower than they would be if more of their production was crude. Second all the production from the Eagle Ford that makes its way to Gulf Coast refineries will be very light and will challenge refineries equipped to handle heavier crudes or even "conventional" light sweet crudes (for more on this issue see Turner Mason and the Goblet of Light and Heavy). In response to the light crude challenge refiners are already making new investments. In January 2013, Valero announced a refinery upgrade due online in 2015 at their 160 Mb/d Houston refinery to allow it to run additional light Eagle Ford crude. The refinery already runs light sweet crude but Valero is investing in a 90 Mb/d crude topper unit to separate out crude components that are too light before they enter the crude unit. Flint Hills is making a similar investment at their Corpus Christi refinery.

Under the circumstances the best market for US condensate today appears to be exporting it to Canada as diluent for heavy Canadian bitumen crude (see Plains Trains and Diluent Deals and It's a Kinder Magic). That market is expanding with increased bitumen production but transporting enough condensate to meet Canadian demand requires new pipeline capacity – some of which is being built and some is of which is still waiting for permitting. We will look more closely at the Canadian diluent supply situation in an upcoming blog.

Meantime as 2013 unfolds we will see more Eagle Ford crude/condensate arriving at the doorsteps of Gulf Coast refiners (and increasingly East Coast refiners by tanker). To start with – and this is already happening – refiners will blend the light crude with heavier crude to make it palatable for their refineries (see Heaven Sent Blend). Other companies like BP have committed to using the Kinder Morgan Galena Park condensate splitter (due online in 2014) to process condensate into distillate and naphtha fractions – probably for export. That tactic neatly sidesteps federal regulations prohibiting the export of wellhead condensate (see "Fifty Shades Lighter").

If the IHS study that EOG presented last week is accurate then the volume of condensate on its way to the Gulf will overwhelm existing refining capacity sooner rather than later. Production forecasts by the end of 2013 from the Eagle Ford range from 850 Mb/d from RBC to over 1 MMb/d from Bentek. In either case even 60 percent of that volume as condensate would see 400 – 500 Mb/d of condensate hitting the market. In the event - excess condensate will have to find its way to Canada – using rail if pipeline capacity is not available.

So is all this fuss about crude or condensate based on the API gravity worth worrying about? If the IHS data that EOG presented is to be believed then at least some companies are being "economical with the truth" about how much condensate they are producing. If that is the case then clearly it is more than just a storm in a teacup. The significant overhaul of US crude oil infrastructure that is underway as new Canadian and domestic production makes its way to the Gulf Coast is complex and expensive enough. We are pretty sure that refiners and shippers would prefer to have a better understanding of how much crude or condensate is coming their way than the current guessing games suggest is the case.

We're Jammin' – But Can All Dat' Crude Get Through? - Corpus Christi Terminals

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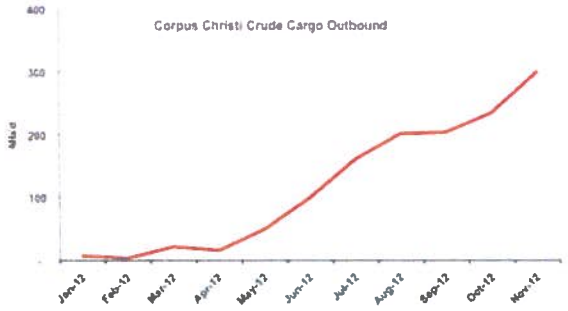
Total crude oil shipped out from the South Texas Port of Corpus Christi increased 19 fold between November 2011 and November 2012 from 2.1 MMBbl to 36 MMBbl. All of that crude is coming from the Eagle Ford shale oil basin 70 miles north of Corpus in the form of light crude or condensate via pipeline. Six marine terminals have been built or expanded at Corpus but can they handle the traffic jam? Today we review how the Port is coping.

We have previously described the Eagle Ford crude and condensate basin that is currently producing as much as 800 Mb/d (see Knocking on Heaven's Door Part I, Part II and Part III). More recently we discussed Eagle Ford crude takeaway capacity (see Too Much Too Soon?) and learned that all the region's new pipelines could transport more than twice the current production. About 1.25 MMb/d of pipeline capacity out of Eagle Ford production areas heads south to Corpus Christi where local refineries can currently consume 172 Mb/d. That leaves a potential 1.1 MMb/d of crude and condensate to be transported to market through the Port of Corpus Christi (PCC). The chart below shows the escalating volumes of crude oil outbound from Corpus over the past year. The volume increased from a trickle in the first quarter of 2012 to reach 300 Mb/d by November 2012 – the latest data available.



Source: Port of Corpus Christi (Click to Enlarge)

All of that crude is currently destined for US ports because of rules that forbid US crude oil exports without special permits (see Fifty Shades Lighter – The Condensate Export Problem). Shipments to US Ports have to use so-called Jones Act vessels because of another set of regulations that we described in The Sea and Mr. Jones. As a result the majority of the crude and condensate arriving at Corpus marine terminals from the Eagle Ford is loaded onto US flagged barges and tankers for transport to refineries in Houston, Beaumont-Port Arthur, Lake Charles and St. James, LA. As far as we understand the majority of these coastal shipments are taking place on barges. The tank barges used for coastwise crude shipment are typically about 180 MBbl in size but can be as large as 185 MBbl or as small as 30 MBbl (see "A Good Year for the Barges"). In addition several US-flagged Panamax (350 MBbl) and Medium Range 2 (200 MBbl) tankers have moved Eagle Ford crude to the US Atlantic Coast market. The only exception to the "no export" rule so far is refiner Valero that was recently granted an export certificate to move crude from Corpus Christi to its refinery in Quebec, Canada – although they have yet to ship a cargo.

To handle the actual and potential flow of crude and condensate from the Eagle Ford into the Port 6 marine terminals have been built or expanded in Corpus, belonging to Flint Hills (Ingleside), Nustar (North Beach), Trafigura (Texas Dock and Rail), Martin Midstream, Magellan Midstream and Plains All American. The table below lists the terminals and their storage and throughput capacities. In addition to these terminals that have been purpose built or adapted to handle the flow of Eagle Ford crude there are several private crude docks in Corpus that belong to local refiners Citgo, Valero and Flint Hills. In all the Port of Corpus has 14 public oil docks and a further 17 private oil docks. Here's what we know about each of the facilities in the table.

Company	Terminal	Storage (MMBbl)	Throughput Volume (Mb/d)
Flint Hills/Koch	Ingleside	2.6	50
Plains All American	Viola Barge Dock	1.5	75
Martin Midstream	Martin	0.9	45
Magellan	Magellan	0.5	25
NuStar	North Beach	1.6	
Trafigura	Texas Dock & Rail	0.6	30
	Total	7.7	

Source: RBN Energy (Click to Enlarge)

Flint Hills/Koch: Koch is a large private refining and trading company that owns two Flint Hills refineries (300 Mb/d combined capacity) in Corpus. Koch operates two pipelines that flow crude from the Eagle Ford into Corpus with 280 Mb/d capacity. The Flint Hills refineries consume about 140 Mb/d of Eagle Ford crude leaving another 140 Mb/d outbound from Corpus. To facilitate these shipments Flint Hills invested $48MM to convert a pier from the former Naval Station at Ingleside, Corpus into an Oil Dock that can ship up to 200,000 bbl/d of production via barge and tanker. Koch is shipping oil by Jones Act tanker to the Phillips 66 Linden, NJ refinery. The Ingleside terminal and existing Flint Hills crude storage facilities are 2.6 MMBbl.

Plains All American: Plains is a large US midstream player that was building its own 300 Mb/d pipeline from Gardendale to Corpus before teaming up with Enterprise Product Partners in August 2012 to jointly develop that pipeline and a link to Enterprise's Eagle Ford Crude pipeline to Houston. When the project is completed in June 2013 it will carry as much as 350 Mb/d of crude and condensate to Corpus. Plains is

building out a marine terminal at the Viola Barge Dock in Corpus that they have leased from the PCC. Plains are installing utilities and equipment to load up to four 30 MBbl tank barges at a time from the dock. The dock will remain public meaning that other companies can use it. We previously described Plains plans to facilitate condensate shipments from Corpus to St. James, LA for onward shipment up the Capline and Southern Lights pipelines to Western Canada as diluent (see Plains Trains and Diluent Deals).

Martin Midstream Partners LP: Martin is a Gulf Coast midstream company that operates petroleum storage and distribution terminals. Martin's Corpus Christi crude terminal is located at the termination point of the Harvest Gardendale Pipeline that delivers up to 150 Mb/d of crude and condensate. The terminal has 600 MBbl barrel storage tanks (expandable to 900 MBbl) and pipeline connections to barge and deep-water marine tanker docks with loading rates up to 30,000 barrels per hour.

Magellan Midstream: Magellan is another logistics company with petroleum storage and distribution terminals throughout the US. Magellan has had a terminal at Corpus for some years and their facility has 3 MMBbl of storage primarily used for refinery feedstocks and heavy oils. The Magellan terminal is well connected to Corpus refineries and petrochemical plants. Magellan's terminal is the end point of the Double Eagle pipeline bringing up to 100 Mb/d of condensate to Corpus from Gardendale (expected online 1Q 2013). The Double Eagle pipeline is a joint venture between Magellan and Copano Energy - that has recently been acquired by Kinder Morgan (January 2013). As a part of the Double Eagle project Magellan is building 0.5 MMBbl of condensate storage.

NuStar Energy LP: NuStar is a growing midstream supply logistics company with a strong presence in the Eagle Ford and Gulf Coast region. The company was originally founded with assets owned by Valero who have 2 Eagle Ford refineries at Corpus and Three Rivers. NuStar operates several pipelines between Corpus and Three Rivers and recently acquired the assets of TexStar (a crude and natural gas liquids gathering company) in November 2012. Two NuStar crude and condensate pipelines from Three Rivers to Corpus have capacity to ship up to 240 Mb/d to the company's North Beach terminal in Corpus. The North Beach terminal has 2 MMBbl of storage and can load 200-400 Mb/d onto barges. Like Plains, NuStar have a storage terminal at St. James, LA that they can use to supply Louisiana refineries.

Trafigura: Trafigura is a large international commodity trading company with worldwide operations. In January 2012 the company purchased the Texas Dock and Rail facility in Corpus an 85 acre dockside facility with 600 MBbl of crude and condensate storage. The terminal has a deep water dock that can accommodate tanker vessels. Union Pacific and BNSF rail lines connections run alongside the terminal to the south. At the time that they purchased the terminal Trafigura entered into an alliance with Energy Transfer Partners to .... "optimize logistics opportunities for Eagle Ford producers and provide them with the ability to access one of the deepest private water docks in the region". The extent of this alliance is not yet clear since both sides have maintained radio silence since the initial announcement. Energy Transfer is the largest midstream petroleum company without an Eagle Ford infrastructure presence so we expect them to either build or buy additional assets to deliver crude to the Trafigura terminal.

Barge costs from Corpus to St. James, LA are about $2.70/Bbl and $1.40/Bbl to Houston. The freight cost to move crude by tanker from Corpus to US East Coast ports (e.g. to Philadelphia or New Jersey refineries) is about $4/Bbl. The shipping cost to Canada is lower ($2/Bbl) because there is no requirement to use Jones Act vessels.

The biggest constraint at the moment in getting barrels out of Corpus Christi and on their way to Houston or St. James is the lack of available barges. We learned from our "Good Year for The Barges" blog series that tank barge utilization rates are over 90 percent for coastal waters. There are also only a limited number of Jones Act tankers that can carry larger quantities of crude or condensate further afield. The PCC is not accustomed to all the new barge traffic. Larger barges can take up as much space as an 800-foot ship. Environmental requirements such as vapor recovery systems mean that barges must be loaded at rates five to six times slower than a tanker. That has led to docking congestion.

The 1.25 MMb/d of pipeline capacity built in the last two years to deliver Eagle Ford crude and condensate towards Corpus Christi is now up and running. The Port is reeling from a 19-fold increase in outbound crude traffic. The six marine terminals built or expanded in the last year are constrained by the slow loading of barges and the lack of qualified Jones Act vessels. At the moment Eagle Ford production is lagging behind pipeline capacity and that might turn out to be the only thing preventing supplies backing up at Corpus. Along with the current congestion in Houston at the delivery end of the Seaway pipeline we are starting to see the US Gulf infrastructure creaking under the strain of increased domestic production. I hope you like jammin' too?