



Billings Refinery

June 2, 2014

Dear Council Member.

The minutes from our May 13, 2013 CAC meeting are attached. The next CAC meeting will be on **TUESDAY, JUNE 10, 2014** at the Phillips 66 Learning Center, our usual location. Dinner will be served from 5:00 to 5:30 and the meeting will run from 5:30 to 7:30 p.m.

Sincerely,

Ann L. Clancy, Ph.D.
Meeting Facilitator
Meeting Facilitator

**Meeting Location:
Phillips 66 Learning Center
415 South 24th Street**

**PHILLIPS 66 BILLINGS REFINERY
CITIZENS ADVISORY COUNCIL
May 13, 2014**

MEETING MINUTES

- Present:** Council members Bob Carr, Joshua Juarez, Bruce MacIntyre, Paul Miller, Eileen Morris, John Pulasky, Melanie Schwarz, Emily Shaffer
Phillips 66 management Randall Richert
Facilitator: Ann Clancy
- Absent:** Ken Ard, Keith Beartusk, Paul Dextras, Colin Franks, Mark Hilbert, Lance Johnson, Ralph Hanser, Shirley McDermott, Mark Pagano, Melissa Patton, Ray Rigdon, Jim Ronquillo, Andrew Sullivan, Dolores Terpstra, Michele Zahn, Mike Yakawich, Stella Ziegler
- Guests:** Process Plant Technology Students. Rancy Freeman, Arthur Kestner, Josiah Laszloffy, Roxsard Reichert, Robert Ross, Nik Sinhold, Austin Wyss

AGENDA

- Welcome/Introductions
- Farewell to CAC Member Paul Miller, YVCC Representative
- Refinery 101 Presentation
- Refinery Bus Tour
- Community & Refinery Updates
- Next Meeting: June 10

WELCOME/INTRODUCTIONS

Randall Richert reported that Ray Rigdon and Colin Franks were unable to attend the CAC meeting because they were meeting with senior corporate executives who were present for an annual onsite visit to the refinery. During the visit, the executives review the refinery's business plans and budget, look at upcoming projects, check on refinery safety and reliability, and focus on refinery performance metrics.

Randall welcomed 7 students from the Process Plant technology program.

The following Philips 66 refinery representatives were present at the meeting to assist with the Refinery 101 presentation and as refinery tour guides.

- Ron Gonzales, Business Team Lead
- Mark Cohn, Environmental
- Brady Hobsu, Project Manager

Farewell to CAC Member Paul Miller

Randall honored CAC member Paul Miller with a plaque for his three and half years of service on the CAC as a representative of the Yellowstone Valley Citizens Council. Paul was

instrumental in having the 14th annual Neighborhood Eat & Meet event take place at the Northern Plains Resource Council building grounds in 2012

He will be replaced by Eileen Morris, who was present at the meeting. Eileen was a founding member of the CAC in 1990. She returns after many years to again represent the Yellowstone Valley Citizens Council, of which she was also a founding member in the 1980s.

REFINERY 101 PRESENTATION & REFINERY TOUR

Before the presentation, Randall Richert showed a safety video as part of the safety protocol for all individuals entering the refinery gates. Ron Gonzales, Business Team Lead, gave the Refinery 101 presentation in anticipation of the refinery bus tour. As part of the presentation, he passed around samples of the refining process products and catalysts.

Refinery History and Capacity

The Billings refinery opened in 1949 and has been expanded seven times over the years, which has increased production from 7,500 barrels/day to 60,000 barrels/day.

1949 Start-up	7,500 barrels/day
1956 Expansion	10,200
1963 Expansion	32,000
1967 Expansion	52,500
1992 Coker Project	
1994 FCC Feed Hydrotreater	
2006 Ultra Low Sulfur Diesel	
2009 Low Sulfur Gasoline	
Currently at 60,000 barrels/day	

He described the refinery as an “integrated” business with a value chain that involves crude oil supply and other feedstock, crude oil storage, crude oil pipelines, the refining process, product storage, product terminals and retail stores. He noted that the value chain, from oil well to the gas pump, has to be balanced to succeed.

He talked about the crude oil pipelines that are necessary to the functioning of the refinery. The two main pipeline systems are the Express and Glacier pipelines which bring crude oil down from Canada. There are also the Rockies product pipelines, which move finished products from the refinery to the markets. These include the Yellowstone and Seminoe pipelines, which are also Phillips 66 assets. About 80% of the products go west to Washington. The refinery is heavily dependent on pipelines. This is an advantage as it allows for an integrated value chain for the company.

Chemistry of Refining

Crude oil is a mixture of hydrocarbons:

- Smallest (Methane) $C + 2H_2 = CH_4$
- Bigger (Propane) $3C + 4H_2 = C_3H_8$
- Bigger (Gasoline) $8C + 9H_2 = C_8H_{18}$
- Biggest (Asphalt) $\sim 100C + 101H_2 = C_{100}H_{202}$

Each crude is unique - characterized by region, density, sulfur, and acid content. Each crude also has its own “fingerprint.” The poorer the crude quality, the more complex the refinery.

What do Refineries Do?

Refineries, such as Billings, convert crude oil into a wide array of products:

- Fuel Gas (Consumed)
- LPG (Propane & Butane)
- Gasoline
- Jet Fuel (Kerosene)
- Diesel Fuel
- Coke (Fuel & Specialty)

The Refiner's Challenge

Less than a third of each crude oil barrel is directly useable as a motor fuel.

Gasoline	10%
Jet fuel	5%
<u>Diesel</u>	<u>15%</u>
Total light oils	30%

As a result, the challenge of the refinery is to use chemistry in a variety of different refining processes so that the refinery can make the most of the refining process by transforming 94% of each barrel of crude into more valuable fuels, such as gasoline (55%), jet fuel (7%) and diesel (32%) There are six different processes using a complex mixture of hydrocarbon molecules.

- *Sorting – fractional distillation.* crude oil is heated to 750 degrees; the fractionator separates into rough “cuts” according to boiling point ranges; the lightest compounds (fuel gas) vaporize and rise to the top of the fractionator, the heaviest materials (asphalt/residuals) remain a liquid and drop to the bottom
- *Breaking – cracking & coking* fluidized catalytic cracking converts low-valued heavy fuel oil into gasoline, diesel and alkylation feedstock; it uses a powdered catalyst that acts like a liquid when fluidized with air; delayed coking converts residue (asphalt) into gasoline and diesel, petroleum coke is a solid byproduct blended with coal for use as fuel
- *Rearranging – reforming & isomerization:* catalytic reforming rearranges the shape of a gasoline molecule to improve the octane and liberate hydrogen; it uses a precious metal catalyst
- *Recombining – alkylation* HF alkylation combines isobutene and olefins (from FCC & Coker) into high octane gasoline; it uses a hydrofluoric acid catalyst
- *Purifying – desulfurization & treating.* in these purifying processes impurities are removed using heat, pressure, hydrogen and catalyst in order to reduce harmful emissions from vehicles and refineries and to recover sulfur to use in other products like fertilizers
- *Product blending:* this combines “intermediate” products from fractionation, cracking, coking, alkylation, reforming and treating units into finished products, this process must meet product specifications such as octane, cetane, sulfur content, vapor pressure, flash temperature and boiling points

Even though a smaller plant, the Billings refinery has full conversion capacity for all of the above processes.

Interesting Facts

- *How much gasoline is in our largest storage tank?* 120,000 barrels or 5 million gallons converting to 333,333 fill-ups (a lifetime supply for 100 individuals)

- *How high is the pressure in our hydro treating units?* 1200 pounds per square inch (like a large cow standing on your thumb)
- *Besides fuels, what are some other uses for oil?* Producing petrochemicals such as synthetic fibers in clothing, waxes in candy bars, vinyl seat covers, lip gloss make-up, plastics, Teflon cooking wear, chewing gum, detergents, and medicines

CAC Member Questions

- *Do you ship ethanol and gas separately through the pipelines?* We don't ship any ethanol, nor do we bring any ethanol into the refinery.
- *Do you expect an increase in the cost of crude oil?* Yes, the price will go up, with Canadian product as well.
- *Were the pipelines built the same time as the refinery in 1949?* No, the refinery did not initially operate with crude oil from Canada
- *Which mode of transportation is cheapest, pipelines or trucks?* Pipeline is by far the cheapest and safest

Refinery Tour

Following the presentation, CAC members were taken on a bus tour of the refinery.

COMMUNITY UPDATES

Emily Shaffer announced that the North Park Neighborhood Task Force is planning on holding a meeting in June after being dormant for the past few years.

Melanie Schwarz gave an update on the progress of the Industrial Park Feasibility Study, which is now initiating meetings with interested companies. She announced that Big Sky Economic Development plans to hold a Business Health Care Summit in Billings on July 9th and 10th. The event will show how the healthcare industry affects small businesses, the local community, and its economy. Presentations will be given from a national and local perspective on the healthcare industry.

Melanie and Bruce MacIntyre reported that efforts continue in support of the State Workforce Training Grant which is providing funding for the number one concern of many employers – ensuring a trained workforce. It is considered by the Chamber to also be a critical need for the future as the unemployment rate in the area continues to decrease. This issue has been flagged again for the 2015 Legislature to support continued publicly funding worker training in order for Montana to remain competitive for industry retention and expansion and new industry recruitment.

REFINERY UPDATE

Randall Richert reported on the refinery update:

Operations: There was a 10 day partial shutdown to replace some catalyzers which necessitated bringing in extra contract workers who worked 24/7 to safely and successfully complete the operation. Some flaring occurred during the operation which the refinery internal environmental group tracked and sampled. It was determined to be below the threshold of state or federal reporting obligations. The refinery is running at full rates now and will continue through the summer driving season.

Safety: There were no safety recordable incidents in April with either employees or contractors. There were only a few minor first aid cases involving one contractor and three employees.

Environmental: There was a short term environmental incident during which a leak was detected resulting in an increase in H2S levels exceeding the 3-hour monitoring limit.

People: The refinery hired 12 new operators in April who are in the process of being integrated and it is expected they will be qualified to work by fall 2014. A new posting has gone out for another round of operations personnel. On the professional side, there have been no new hires in the last month.

NEXT MEETING: JUNE 10

- Welcome/Introductions
- Billings Police Department Update
- Activity & Issues for Energy Exploration & Production in MT
- Subteam Updates & Planning for 25th CAC anniversary
- Community Updates
- Refinery & Transportation Updates
- Next Meeting. Meet in the Park event on September 4