

SiteLine

Joffre Site Community News

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Special Edition: Annual Environment Review

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Taking Care: A way to think... a way to work

As some things change during our 35th anniversary year, other things — the Responsible Care[®] values at the foundation of our business — are largely unchanged.

The Joffre Site skyline is different this Fall. Early in July, a pair of large-scale cranes working in perfect unison hoisted into place our new 280-tonne, 38-metre-high polyethylene reactor (the third production train in our Polyethylene 1 facility. We expect the completion of the PE1 Expansion Project by the end of Summer 2016 — a slight delay but still well ahead of the majority of North American industry polyethylene expansion. (See more page 6.)

We're pleased to be able to provide the community the 13th annual report on our environmental performance and goals for continuous improvement — particularly in light of our growth initiatives. Our environmental systems and programs have grown in sophistication over the years and this year we introduced the Taking Care model (page 2) as our particular approach for putting Responsible Care into practice. But Taking Care has been a way to think, and a way to work at NOVA Chemicals since 35 years ago. That's when the first molecules of on-specification ethylene were shipped by pipeline from the Joffre Site to our then sole customer.

Taking Care is an integral part of our company's value system — and I know a major contributor to our continued business success. This way of long-

term thinking translates into all kinds of actions that do make a difference: minimizing the impact on our land, air and water, working collaboratively with stakeholders, and empowering our Enviro-Action Team to promote everything from car pooling to eco-friendly paint products in our facilities.



Taking Care also means playing an active role in our community and getting behind projects that enhance the lives of Central Albertans. On the occasion of our 35th anniversary, we have added the sponsorship of the Waskasoo Environmental Education Society's Imagination Grove (page 7) to the roster of great community resources we have proudly helped to make a reality.

During the next few weeks, we will be receiving the environmental studies related to our potential Ethylene 2 Debottleneck (E2DB) Project which we told you about earlier this year. We hope you will join us at the October Community Open House (page 8) to review these study results, and to discuss any aspect of our environmental performance. We look forward to seeing you there.

Rick Van Hemmen, Joffre Site Leader

About our environment report and a look to the future

This annual *SiteLine* environment report provides our community and stakeholders with an overview of our performance in the important areas of water, air, greenhouse gas (GHG) emissions and noise management. It also highlights our involvement in various community projects dedicated to making a difference and improving the quality of life in Central Alberta.

NOVA Chemicals Taking Care model, shown below, frames our unique approach to Responsible Care® and sustainability. It provides the “umbrella” for our Joffre Site environmental management system and programs. We remain focused on meeting all regulatory requirements and ensuring emissions are below all regulatory compliance limits. We strive for continuous improvement in our performance.

Considering Joffre Site growth

Our growth strategy also reflects our commitment to continuous improvement. Our current initiatives — the PE1 Expansion Project and associated rail yard expansion and the Ethylene 2 (E2) Furnace Refurbishment Project — provide opportunities for updating equipment and other improvements that align with our Taking Care model.

We have always been proactive in updating and refining our environmental management systems to keep ahead of growth in our operations and opportunities for increased production. Over the years our monitoring and testing programs have grown in sophistication, helping us to achieve our environmental performance goals and meet our commitments to Responsible Care.

This report includes a look to the future with a forecast in many of the performance areas related to our expanded polyethylene operations scheduled for commissioning in 2016. The forecast, based on modeling conducted for this project's environmental studies, helps to show the modest change to our industrial footprint.



Environmental studies for possible debottleneck

As you are aware, environmental studies are also underway for a possible E2DB Project including air dispersion modeling, site water quality screening and noise modeling. We will provide an overview of the study results at our October 15 Open House (see invitation and regulatory update on page 8) for your review and input.

Taking Care

Our work at NOVA Chemicals results in plastic products that take care of food, water and other goods vital to life. To enable these products, we must first take care of the people, places, materials and processes that make them possible. We take care with respect to our operations, communities, products and the environment. Taking Care is a way to think and a way to work. It's our particular approach for putting Responsible Care® into practice.



Operations

In our operations, we take care to attract and develop talented people committed to the safety and well-being of themselves and others. We foster relationships that promote community safety and other social and environmental values.



Communities

In our communities, we take care to be a neighbor that promotes conversation, understanding and involvement. We contribute positively to community development, public policy and reporting.



Products

In our products and those we enable, we innovate to improve people's lives. We take care to promote the safety, security and value of products throughout their life cycle.



Environment

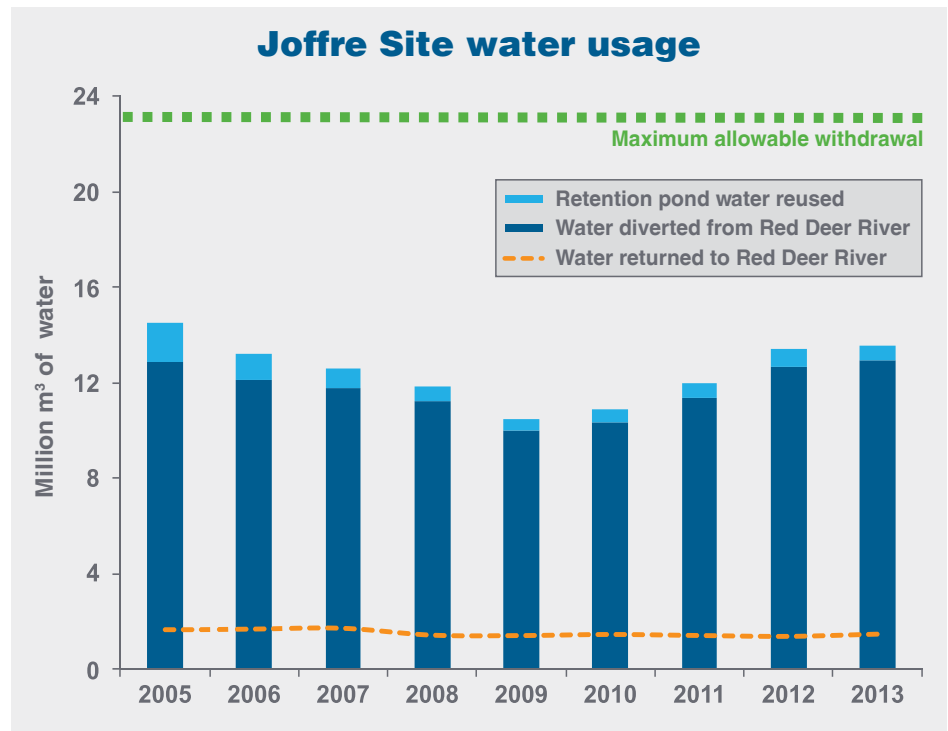
In our environment, we take care to conserve, protect and enhance natural resources. Through innovation, operational effectiveness and environmental stewardship, we seek to protect life and to continuously improve our environmental performance.

Minimizing our impact on water resources

Water is important to Joffre Site operations, and our management programs focus on minimizing our impact on this valuable resource.

The Red Deer River has an annual flow of roughly two billion cubic metres (m³). NOVA Chemicals has water licences for approximately 23 million m³ per year, which is just over 1% of the annual flow in the river. In 2013, we withdrew almost 13 million m³ or 56% of our allotment from the river. We also collected and used 0.6 million m³ from surface runoff. The predicted usage from the PE1 Expansion once in operation is an approximate increase of 10%.

The majority of water used in our manufacturing facilities is returned to the environment through evaporation in cooling tower plumes. The amount of water vapour released back to the ecosystem is about 80% of our intake. Water returned to the river goes through extensive testing to meet regulatory obligations and strict environmental standards before discharge.



This graph shows the amount of water used at the Joffre Site. The greater the production rate, the greater the water usage.

Noise management strategy encompasses site growth



Our noise management strategy is constantly being updated and adapted to reflect site changes. The overall goal, however, remains the same: to mitigate site operating noise impacts on our neighbours.

Current mitigation projects encompass site growth:

- The E2 Furnace Refurbishment Project is using silencers on the new induced and forced draft furnace fans.
- We are developing the north rail yard noise abatement strategy which we will share with Lacombe County as part of our development permit commitments. The strategy will be implemented as the new yard is phased into operation during 2015 - 2016. The main focus is on operational changes with more activity during the day in order to

maintain a north end, north rail yard curfew of 10 p.m. to 7 a.m. We have added staff support who ensure day-to-day noise impacts are considered in operations. The purchase of a new locomotive will allow us to handle more activity during the day. We will continue to report on our performance.

- Noise sources from the PE1 Expansion Project will be validated once construction is complete in 2016.
- We also anticipate opportunities to further reduce site ambient noise as part of the possible E2DB project through additional noise silencers on furnace fans.
- Other mitigation projects underway in 2014 involve the Ethylene 3 (E3) flare stack blower frequency drive and Polyethylene 2 (PE2) agitator gearbox acoustic treatment.

Our annual community noise survey was conducted this Summer at five residences near the Joffre Site. Preliminary results will be available at the October Community Open House.

We recently enhanced our sound measurement analyzers surrounding the site.

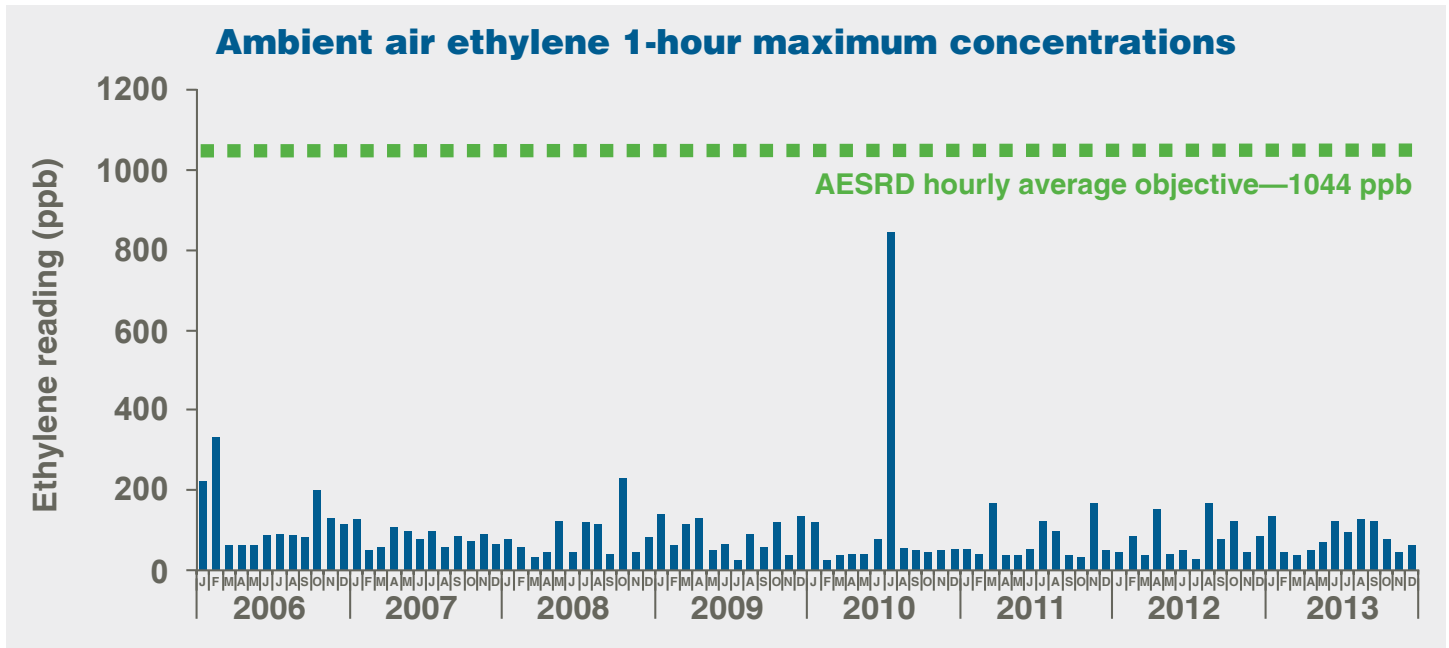
8,000 and growing!

As part of the City of Red Deer's Urban Forestry Program, our site volunteers have planted more than 8,000 seedlings since the project began 16 years ago. This Spring 30 of our volunteers took up spades and shovels for this growing cause.

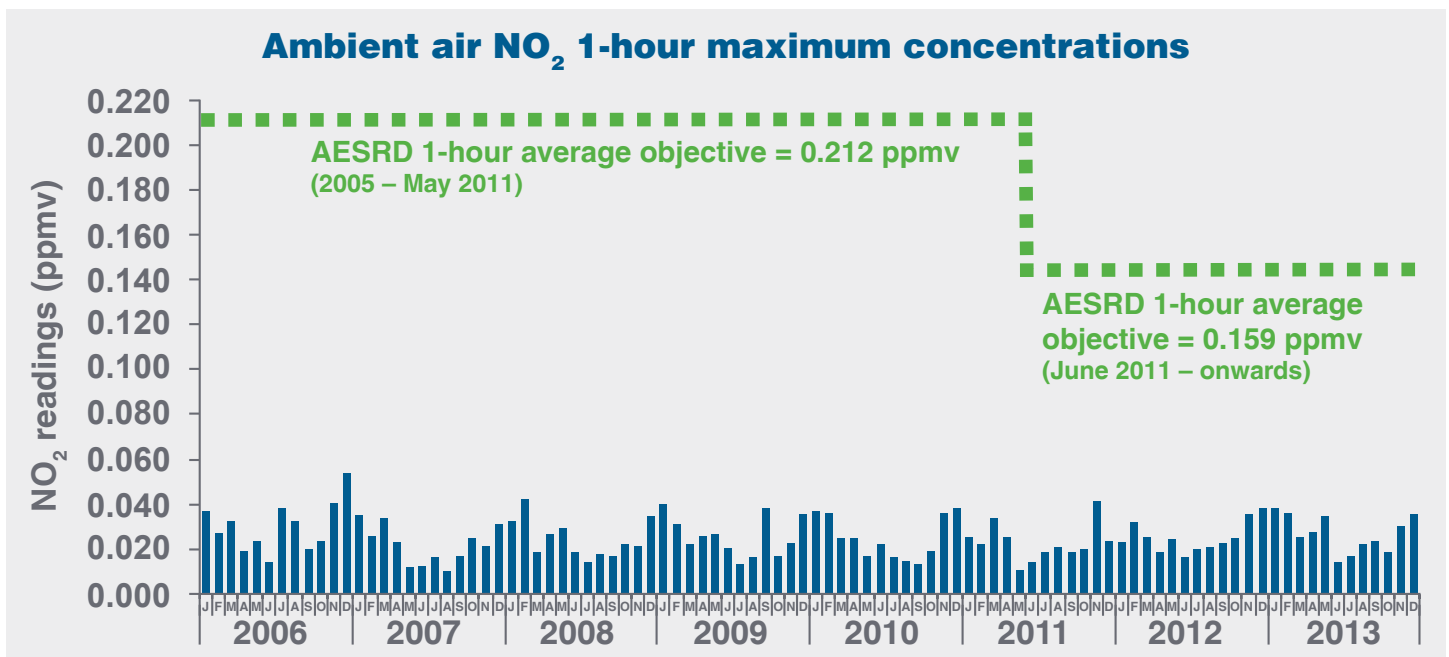
Ensuring air emissions meet Alberta quality objectives

Air quality management is a priority for NOVA Chemicals. Through the Joffre Site Air Emissions Management Program we strive to reduce emissions, monitor impacts and continuously review our performance. We remain focused on ensuring air emissions are below all regulatory compliance limits and air quality objectives set out by Alberta Environment and Sustainable Resource Development (AESRD).

Data related to a variety of air quality parameters, as shown in the graphs below and on page 5, indicates our concentrations and readings are consistently below established guidelines. The PE1 Expansion is not yet in operation, however, predictions show an increase in ambient ethylene concentrations by 0.5% and ambient oxides of nitrogen (NO₂) concentrations by 0.4% at the fence line.

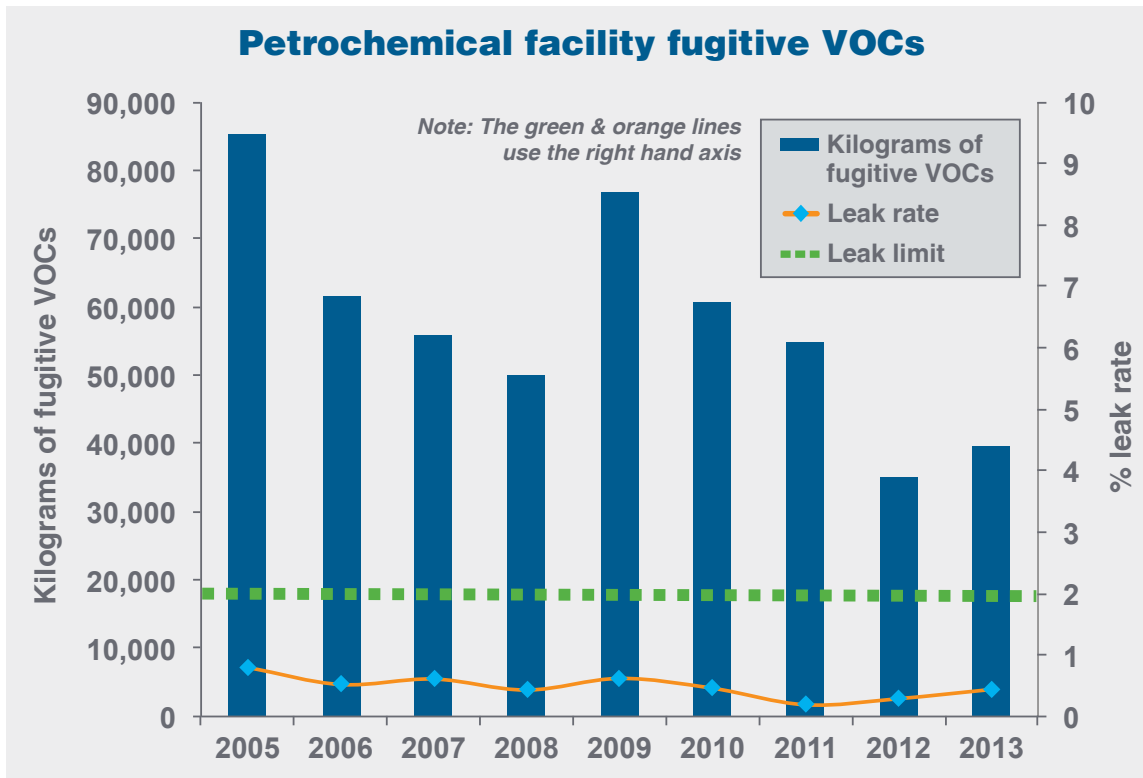


Ambient ethylene (1-hour maximum) concentrations are well below the AESRD Hourly Average Objective of 1,044 parts per billion (ppb). (The spike in 2010 was the result of a leak in an INEOS LAO facility exchanger, which was promptly repaired with no adverse environmental impacts indicated through ongoing atmospheric monitoring.)



Concentrations of oxides of nitrogen, specifically NO₂, are consistently below regulatory limits. The potential E2DB Project offers us opportunities to reduce NO_x through next generation low NO_x burners and operational control improvements. We have a committee focusing on a site NO_x strategy, and our Corporate Environmental Strategy also has goals for NO_x emissions reductions.

Petrochemical facility fugitive VOCs



Volatile Organic Carbons (VOCs) emissions are hydrocarbons that can affect air quality. Our site's comprehensive Leak Detection and Repair (LDAR) program is fully implemented according to the Canadian Council of Ministers of the Environment Code of Practice. While the Code states that leaks over 10,000 ppm must be repaired, we schedule prompt maintenance for any leak over 1,000 ppm.

Efficiencies help reduce GHG emissions intensity

Our ongoing investments in the Joffre Site facilities provide us with an excellent opportunity to improve our processes and operations — and in turn our greenhouse gas (GHG) emissions profile.

Equipment and process updates, as well as our access to secure new feedstock supplies allow us to operate our plants at closer to optimal conditions. This improves production and energy efficiencies and correspondingly our overall GHG emissions intensities.

By 2013, we had achieved a 6.3% reduction in our GHG emissions intensity as compared to the average emissions intensity in 2003 - 2005. We purchase offsets for our Joffre Site to meet our provincial compliance obligations. These offsets support the building of organic carbon in soil through low and zero-tillage practices and assist the agricultural community in advancing sustainable practices.

We continue to work with provincial and federal governments to advance offset and other opportunities related to flexible compliance options.

Taking Care with our wildlife resources

Interactions between wildlife, industrial activities and adjacent farmland must be thoughtfully managed. Our strategy is to impact wildlife as little as possible: unless there is a safety risk or a danger to wildlife we leave them alone. For example, with beavers we choose to manage water levels using culverts through the dams rather than manage the beavers.

We have a formal support relationship with the Medicine River Wildlife Centre. They provide us advice on any wildlife-related issues.

Our community focus related to wildlife resources also encompasses projects such as:

- **The NOVA Chemicals Community Nature Trail** — an environmental legacy project complementing our PE1 expansion. Construction on the 89-hectare (220-acre) project will soon begin and help recognize how wildlife habitat,



A few years ago we installed a number of beaver culverts in Jones Creek adjacent to the site. The culverts help to minimize the flooding associated with beaver dams that can negatively impact adjacent farmland used by our neighbours.

agriculture, industrial and recreational land uses can exist harmoniously together.

- **Partnerships and support** for Earth Rangers' programs to teach children environment stewardship through live animal shows, and for the Medicine River Wildlife Centre's Otis the Owl's new environmental educational book "Tangled in Trash."

PE1 Expansion Project

Key component now in place

This Summer the polyethylene reactor, a key component of the PE1 Expansion Project expansion, was lifted into place. This new reactor is the third "polyethylene production train" in this facility. The addition will allow us to increase our polyethylene production capacity by about 40% once the expansion is commissioned and operating in 2016.

The Fall / Winter workforce will reach about 400 as construction is now moving into installing structural steel, mechanical equipment and piping systems. Mechanical and underground utilities work is progressing on schedule. By year-end concrete foundations, piperack and structural modules, the cooling tower and all pre-engineered buildings will be substantially complete. The new electricity substation is also underway with a year-end completion schedule.

The rail track work related to the expansion is now underway as well with completion expected by year end.



Early in July a pair of large-scale cranes working in perfect unison hoisted our new 280-tonne, 38-metre-high polyethylene reactor into place.

Recycling on a big scale

Recycling the plastic film from a hoarding tent used during the winter concrete pours for the PE1 Expansion Project is one example of how our project team takes care to integrate responsible and sustainable action into our daily activities. Three tonnes of film were diverted from the landfill enabling that material to be reused to create new products like plastic lumber, trash cans or plastic furniture.



The project team also recently donated leftover pipe and other high density polyethylene materials to the Habitat for Humanity ReStore in Red Deer. Habitat will use what they can and sell what they can't, to help sustain their operating costs. Actions like these by our project team bring to life the commitments we have to promote the value of plastic products throughout their life cycle and to conserve and protect our natural resources.



Supporting the work of the Red Deer River Watershed Alliance (RDRWA)

This spring NOVA Chemicals provided \$20,000 towards RDRWA's Integrated Watershed Management Plan project. These funds are helping with the final phase of the plan and its future implementation. The fourth and final round of public and stakeholder sessions was completed this Summer. The plan identifies problems and issues impacting the natural resources of the watershed and recommends management solutions that will benefit the community, the economy and the environment.

Buffer zone update

It is NOVA Chemicals' goal to keep as much of the 890-hectare (2,200-acre) buffer zone around the Joffre Site in agricultural production.

We are currently assessing the requirements to reclaim the former greenhouse property located in the buffer zone to the south of the Joffre Site. Our plan is to find uses for the building and other materials where possible to avoid waste. The area is being used in the short-term for equipment laydown during site expansion work.

The northeast camp property, that we originally planned to reclaim in the next few years, is being re-evaluated for potential non-industrial use.

In order to have subsoil available for future reclamation, we have been collecting soil from hydrovacating activities on the northeast corner of our developed site. To make room for future hydrovacating and soil reclamation, the current soil will be moved to the east of the current location, which will require the plant fence line to be adjusted. Approximately 0.6 hectares (1.4 acres) will be needed.

More information on buffer zone plans will be provided in future issues of *SiteLine*.



Making a difference: from vehicle emissions to lighting improvements

NOVA Chemicals commitment to Responsible Care is not only reflected in our company activities — the principles extend to our employee- and contractor-driven initiatives.

The Joffre Site's Enviro-Action Team, for example, is committed to making a difference beyond the typical operating environmental focus. This dedicated

team of volunteers successfully sponsors an Idle Free worksite, a workforce carpool program and ongoing site promotions and community vehicle emissions testing clinics. The Enviro-Action Team also recently established new best practices for site building renovations ensuring the use of eco-friendly paint products, low-flush toilets, touchless concept taps, breezeways versus doors and an auto-on lighting system.



The vehicle emissions testing events spearheaded by the Joffre Site Enviro-Action Team together with our Parkland Airshed Management Zone (PAMZ) partner have proved to be very popular throughout the community. A total of 67 vehicles were tested on Clear Air Day in June through an event that also included AESRD, the City of Red Deer and Parkland Mall.



On the occasion of our 35th anniversary, here are some more Joffre Site milestones (see previous 2014 issues for earlier years):

The 2000s

- 2000** Cogeneration facility synchronized to Provincial power grid and official opening. E3 start of initial operations.
- 2001** PE2 start-up.
- 2002** Altgas Liquids Inc. / Taylor Operations start-up the Joffre Ethane Extraction Plant (JEEP) increasing Joffre Site's ethane supply.
- 2004** Site 25th anniversary celebrations.
- 2005** Added the 1,300-km Alberta Ethane Gathering System, a key component of Alberta's energy infrastructure, to our pipeline operating responsibilities. New Joffre Feedstock Pipeline delivers first propane providing feedstock flexibility.
- 2006** Delivery of carbon dioxide to Glencoe Resources for use in enhanced oil recovery. A \$1-million investment in Red Deer College expansion helps address demand for skilled trades.
- 2007** E2 successfully extends major turnaround (maintenance and renewal) to a five-year run cycle.
- 2008** Commissioned a new packaging line with the capacity to process 2,000 bags per hour of polyethylene pellets.
- 2009** NOVA Chemicals now 100% owned by the International Petroleum Investment Company (IPIC). Site celebrates 30th anniversary.



Watch for more milestones in the December issue.

Sponsorship of NOVA Chemicals Imagination Grove celebrates our 35th anniversary

On the occasion of the 35th anniversary of Joffre Site operations, we were pleased to become the signature corporate sponsor of the Waskasoo Environmental Education Society's Imagination Grove outdoor classroom and natural learning play-space located at the Kerry Wood Nature Centre.

A grand opening event is planned for Fall 2014 to showcase the Imagination Grove. It provides a "bridge" between the urban

environment and the natural world with outdoor classroom and natural structures designed for collaborative play that stretch youngsters' imaginations while providing fun and exercise in a safe and mostly natural environment.

The Imagination Grove is a perfect demonstration of our community and environmental Responsible Care goals.

Community Activity Centre officially opened

On August 7, 2014, more than 60 people took part in the official opening of the NOVA Chemicals Community Activity Centre. The Joffre Community Society, Lacombe County and NOVA Chemicals are proud sponsors of the all-season, multi-use facility in the Hamlet of Joffre.

Also in attendance were Hamlet of Joffre Community Society President Mike Marshall, past Lacombe County Councillor Cliff Soper, Lacombe County Councillor Barb Shepherd and a Joffre Site leader Scott Kay.

The activity centre includes an Olympic-size skating rink and an outdoor facility supporting a variety of activities such as hockey and skating, ringette, basketball, volleyball, badminton, community events and more.

"I'm impressed by the community support and outstanding outcome after so many volunteer hours — a great example of the community coming together," said Scott Kay at the event.

Largest turnout ever

In conjunction with the NOVA Chemicals Community Activity Centre grand opening, the Joffre Site hosted its third annual Emergency Preparedness Awareness Community BBQ. About 130 community members attended.

Information booths — Safety City on farm safety and Safe Communities Coalition of Central Alberta on swimming safety — and tours of our site emergency equipment were included. Neighbours were able to ask questions and validate their emergency response contact information with EMIC Corp., which manages our resident contact information for emergency purposes. Site personnel were on hand to discuss with neighbours any areas of interest.



SiteLine is published by NOVA Chemicals Corporation

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For more information, please see these websites:

- www.novachemicals.com | www.novachemicals.com/Joffre
- Chemistry Industry Association of Canada: www.canadianchemistry.ca
- American Chemistry Council: www.americanchemistry.com



Regulatory update

Proposed Ethylene 2 Debottleneck (E2DB) — (Please see July *SiteLine* regulatory update for project background). We anticipate completing environmental / regulatory studies by Fall 2014 with results available at the October 15 Open House. A traffic study will follow when workforce estimates are available. With Board approval to move ahead, we expect to submit a regulatory application to AESRD by year end; we anticipate this as an amendment to our site operating approval. An application to Lacombe County for a Development Permit will follow.

Our site leadership is moving forward through the design and approval phase with a "medium production case" for the potential project. This scenario would provide for an approximate 25% increase in the E2 production capacity, or about a 6% increase in overall site ethylene production. We are incorporating noise mitigation, water conservation and air emissions reduction measures into the early designs. Our studies also factor in related potential minor production increases at PE2.

Our consultation program proactively addresses growth issues and opportunities we understand are of interest to stakeholders. We look forward to your input at the Open House or at any time.



Community Open House

Date: Wednesday, October 15, 2014
Time: 5:30 to 6:30 p.m. "Drop in to Chat"
6:30 to 7:30 p.m. Presentation/Discussion
Place: Hayne's Hall (located on the corner of Hayne's Highway [Range Road 24-4] and Township Road 39-0)

Refreshments will be served

- Agenda:**
- Get business and facility operations updates
 - Review the annual Environment Report
 - Review the environmental studies for the potential Ethylene 2 Debottleneck Project
 - Get updates on the Polyethylene 1 Expansion Project
 - View the Red Deer River Watershed Alliance display — including interactive models and water games for kids
 - Discuss any topic of interest
 - Provide your input and suggestions

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