

# Working with Worley

Delivering a more  
sustainable world

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Prepared for:



April 21, 2021

# Agenda

- Introductions
- Safety Moment
- Worley Overview & Capabilities
- Previous Projects in Saskatchewan
- Ongoing/ Upcoming Projects in Saskatchewan
- Near-term procurement needs
- How to find out more and/or become a supplier



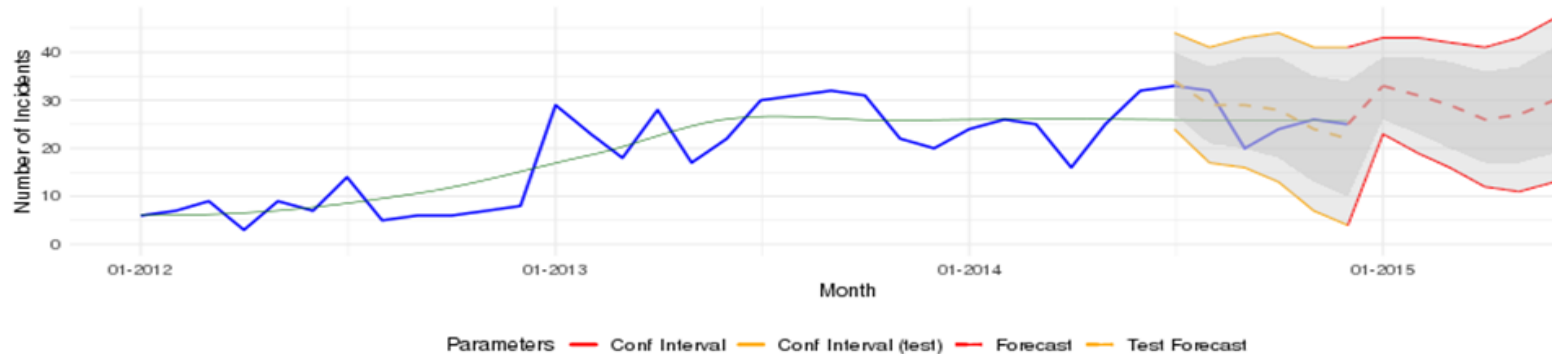


# Safety Moment

## Connected Worker and Safety

- Covid 19 contact tracing
- GPS Personnel Location - Mandown notification
- GeoFencing and Internet of Behavior Analytics (unauthorized areas, confined space, vehicle onboard diagnostics)
- Wearable gas detectors
- Digital Mustering
- Site evacuation mapping
- Drone Inspection
- Augmented Reality – Virtual Site/Shop Visits
- Virtual Reality - Training
- Electronic Forms (safety observation, audits, permitting, shift turnover, LOTO...)
- Human Factor Analytics (SaltGrid)
- Data Aggregation and Analytics

Total Incident Forecast By Month



# Our strategic portfolio

## Upstream & Midstream



Onshore



Offshore



LNG



Pipelines  
& terminals



Hydrogen



CCUS

## Refining & Chemicals



Petro-  
chemicals



Refining



Chemicals



Speciality  
Chemicals



Circular  
economy



Future  
fuels

## Mining (U/G & Open Cut), Minerals & Metals



Bulk  
commodities



Base/precious  
metals



Mined  
fertilizers



MM&M  
Sustainable Growth



MM&M  
Technology



Uranium & Potash



Green fertilizers

## Power



Combustion  
energy



Nuclear  
power



New energy  
& networks



Offshore  
wind



Industrial  
water



Low carbon  
hydrogen



Distributed  
energy systems

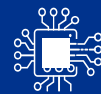
## Digital



Automated  
company



Product & technology  
portfolio company

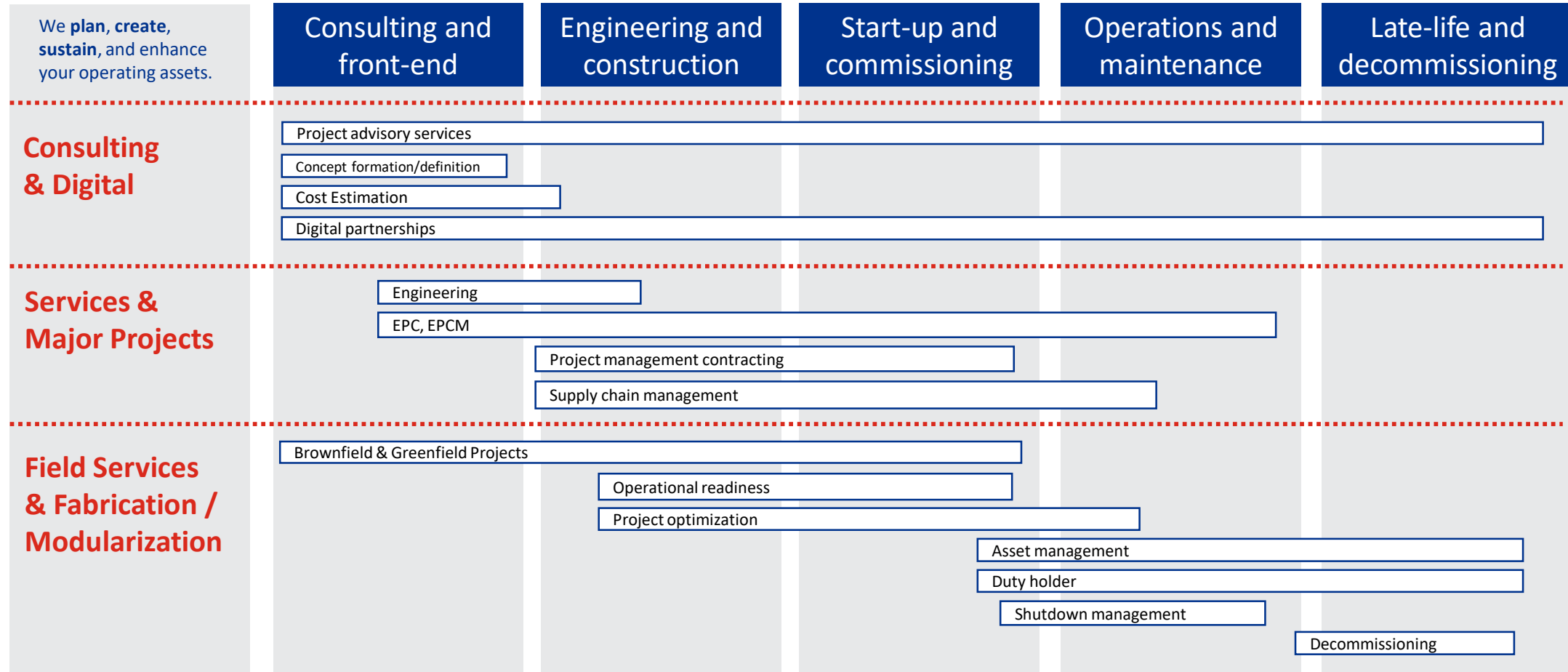


Data science &  
software company

Energy Transition

# Worley Capabilities

## End to End Solutions

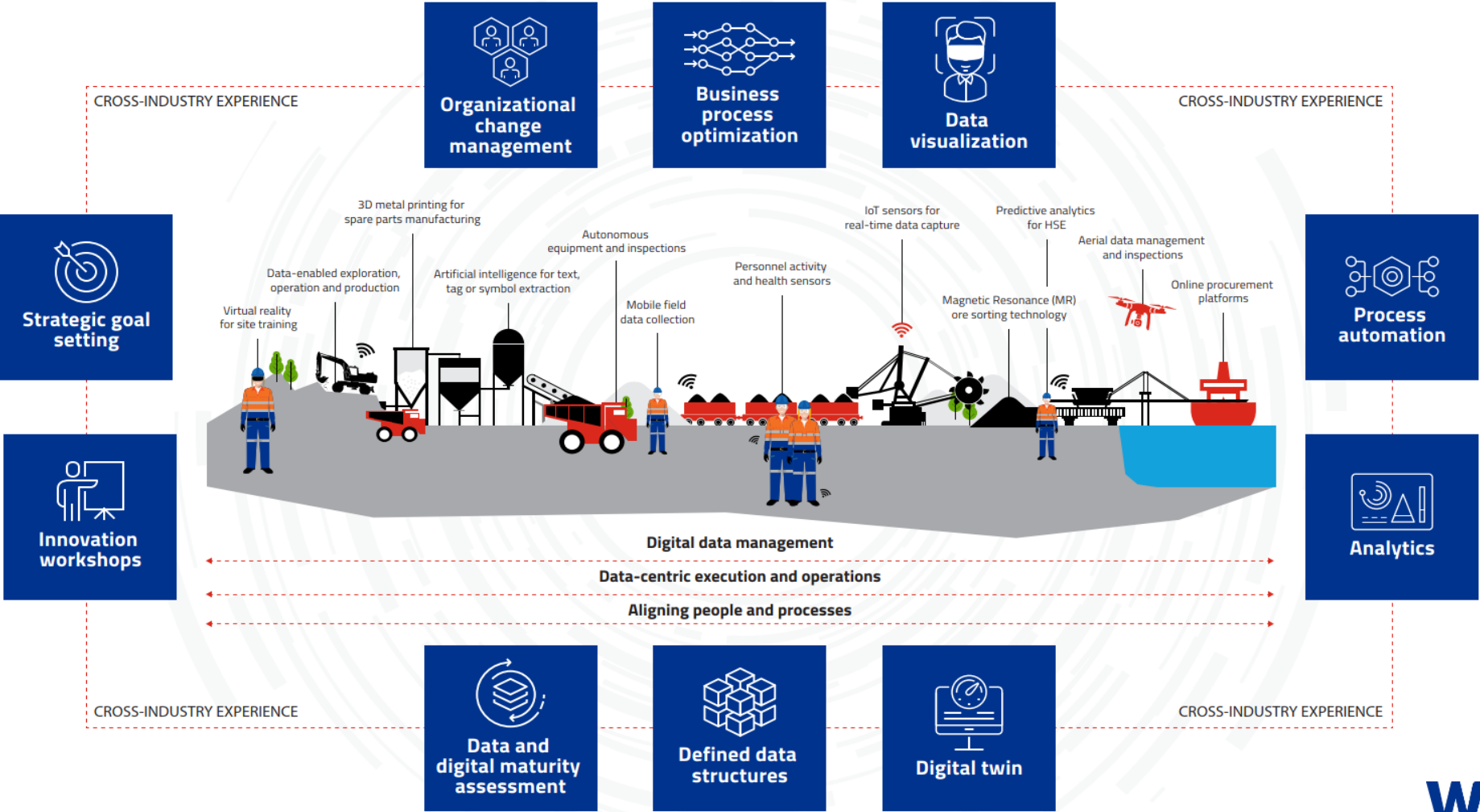


# Applied Digital Mining

**Digital and data can give you reduced costs, increased throughput and improved safety**

Complete, consistent and validated data  
Adequate access to up-to-date information  
Efficient access and retrieval of data and documents  
Consistent information shared between stakeholders

**...but you need a practical and strategic end-to-end approach**





The digital twin connects the asset information to the frontline workers in engineering, maintenance and operations.

A digital model of a physical asset, integrating data into a structured information model providing users access to navigate and engage with the asset information.

Accessibility to engineering data, vendor data, maintenance data, and operations data.

The digital twin provides value savings in Engineering, Maintenance, Operations and Supply Chain.

Once the digital twin is operational continued savings can be realized for the facility for the lifecycle of the assets.

The diagram illustrates the Digital Transformation of an Oil Refinery, showing the integration of physical and digital layers.

**Physical Layer (Bottom):** Represented by a blue refinery schematic. It is labeled "Physical" vertically on the right.

**Digital Layer (Top):** Represented by a grey cloud containing a digital refinery schematic. It is labeled "Digital" vertically on the right. The cloud is secured by two blue padlocks.

**Data Flow and Interactions:**

- Real Time Data:** Flows from the Physical layer into the Digital cloud.
- Engineering:** Interacts with the Digital cloud through:
  - Maintenance History** and **Operational History** (output from the cloud).
  - Real Time Data** (input to the cloud).
  - FEA Model** and **CAD Model** (input to the cloud).
- Digital Field:** Interacts with the Digital cloud through:
  - Real Time Simulation** and **IoT Sensors** (output from the cloud).
- Operations:** Interacts with the Digital cloud through:
  - Virtual Model** and **AI** (output from the cloud).
  - Real Time Financial Modelling** (input to the cloud).

**Collaboration:** Curved blue arrows at the top indicate collaboration between Engineering, Digital Field, and Operations.

The data lives in multiple systems but the access is through a single visual platform.

This platform is accessible through remote systems, tablets and phones providing real time data for critical decision making.

**Worley**  
energy | chemicals | resources





# Drone Progressing and O&M Inspections

## Drone Progressing

Program a Drone to do scheduled flyovers to build a 3d model from the site for each flyover. This becomes the data for an advanced analytics platform that provides near real time progress of the construction activities. This progress can be viewed visually in 3D providing the project team the ability to modify tasks and project plans. The data can be integrated with the project schedule to remove the large manual component of updates.

## Predictive Analytics for O&M inspections

Following construction, the drone program can continue to provide inspections for incremental changes in roads, mine, tailings. The drones can identify key areas to focus maintenance activities savings thousands of hours from a traditional approach.



*5x savings over the cost  
of implementation*

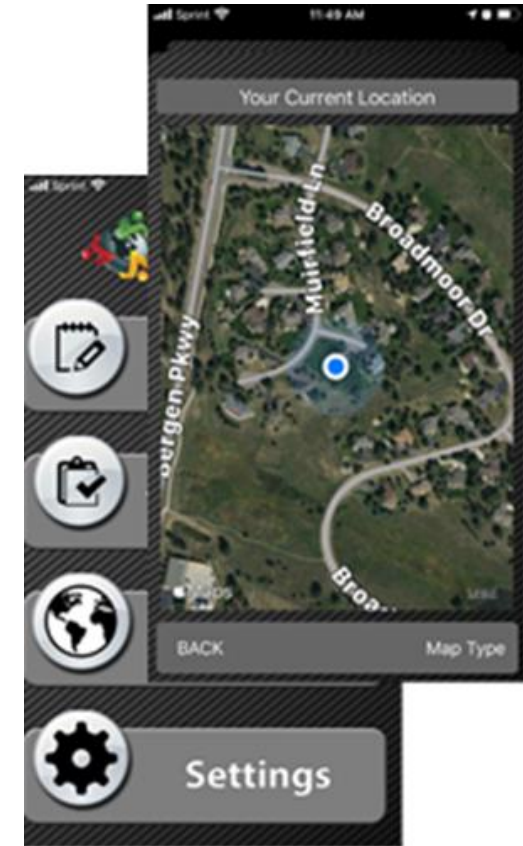
# Personnel Location Tracking / COVID-19 Contact Tracking

## Capabilities

- GPS Personnel Location
- GeoFencing and Internet of Behavior Analytics
- RFID Asset Tracking
- AR / VR devices
- IPads and Smart devices
- Electronic Forms
- Data Aggregation and Analytics

## Benefits

- Provides COVID-19 contact tracking to minimize rapid spread of virus across job site
- Provides near real time physical status of via geolocation fencing providing supervisors have visibility to make decisions on setting the priority of the job tasks.
- Evaluates contractor mobility and efficiency of movement to enable modifications of the site materials and laydown areas for increased productivity



*7x savings over the cost of implementation*

# RFID Tracking and Material Management

## Capabilities

- RFID passive and active tracking
- QR and barcode scanning
- Drone, gate and handheld readers
- Integrate with AR and productivity
- Full lifecycle for key assets tying project to O&M

## Benefits

- Eliminates the antiquated process of paperwork, email updates, and manual data inputs
- Provides transparent and clear inventory information
- Addresses any material shortages in a timely manner
- Provides progressing status of materials against work package installation
- Reduces the level of effort time spent investigating material status
- Provides a virtual laydown yard with real time visibility to material status
- Reduces transaction time of materials being supplied from laydown yard or warehouse. This also eliminate down time for craft waiting on materials that are not available or delayed in being moved from the laydown yard or warehouse to the location of installation.



*5x savings over the cost of implementation*

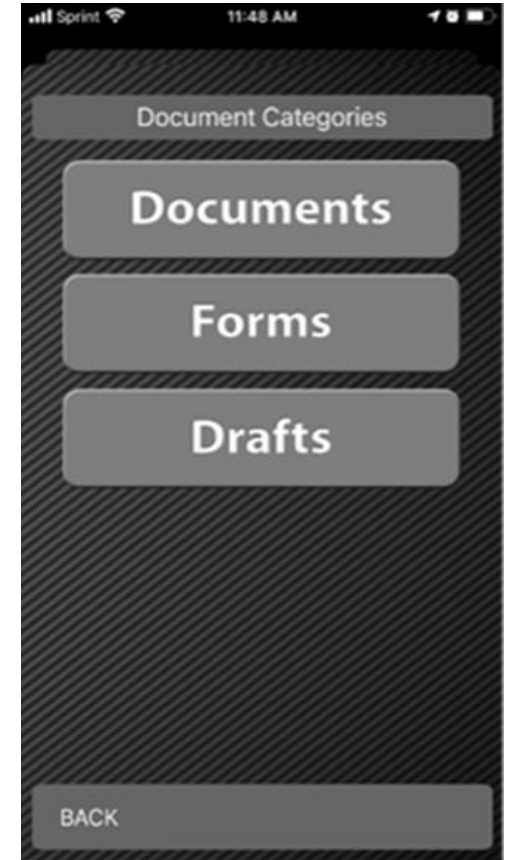
# Digital Quality Inspections, Document Access and HSE Reports

## *Solutions*

- **Quality Inspection Digital Forms** – Allow inspector to quickly document and validate the installation process with checklist, pictures and sign off all electronically and with electronic notifications to key stakeholders.
- **Digital Construction Documents** – Access to all construction documents on the phone or tablet with searching capability, which allows for quick retrieval of key installation data
- **Digital HSE Reporting and Tracking** – HSE forms for safety observations, near miss and all critical safety information announcements. The digital forms collect the data and provide it back to the team in near real time so this critical information can be quickly distributed as required
- **Custom Forms** – Provides the ability to build out any project form for quality, productivity or safety
- **Digital Dashboard** – A dashboard aggregates all data from forms for reporting and status. Analytics provide the ability to track and trend against KPIs

## *Benefits*

- Streamlines and reduces the manual inspection checklist effort, and work procedure for sign off
- Near real time status of safety observations so there is no delay in providing a safer workplace
- Reduced manual input and transferring of data
- Clarity and organization of HSE data



*5x savings over the cost of implementation*



# Previous Project Experience

## CRC Refinery Expansion and Revamp (2007 – 2012)

**Customer:** Co-op Refinery Complex

**Location:** Regina, Saskatchewan

CRC's major refinery expansion / revamp goal: process low sulfur synthetic crude produced from Athabasca bitumen.

### **Services:**

Worley was chosen to provide FEED and EDS services, and subsequently full EPCM services. Worley scope was CAD\$1.6 billion.



## CRC Tier III Gasoline Desulphurization Project (2016 – 2019)

**Customer:** Co-op Refinery Complex

**Location:** Regina, Saskatchewan

### **Services:**

Front-End Engineering Design (FEED), Detailed Engineering, Procurement services and Construction engineering technical support for Modifications in the Gasoline Desulfurization Unit (GDS – Unit 20), Addition of an i-C5 Feed Surge Drum, Addition of a feed filter in the GDS and Installation of two new 150,000 bbl gross capacity storage tanks.

## Detail Design Unit 16 Sulphur Degass Project (2016 – 2019)

**Customer:** Co-op Refinery Complex

**Location:** Regina, Saskatchewan

Project 08185, Liquid Sulphur Degasification is a project to reduce the concentration of hydrogen, sulphide and polysulphides in liquid sulphur using the D'GAASS sulphur degasification process patented by Goar, Allison and Associates (GAA).

### **Services:**

Worley scope development of the FEED Phase was completed on October 2016. The FEED Phase encompassed the development of a Class III Estimate, procurement support in securing firm quotations for major equipment-instrumentation and subsequent recommendation to purchase.

# Previous Project Experience – con't.

## Kronau Potash Solution Mine

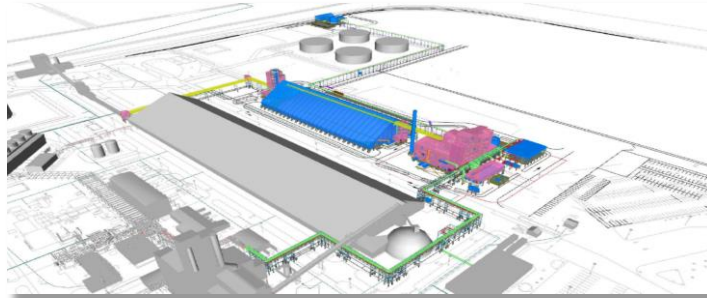
**Customer:** Vale Potash Canada Ltd (now Mosaic)

**Location:** Saskatchewan, Canada

- Front End Engineering for Solution mine, process plant, and infrastructure

### Services

- Update Cogen Trade-off Study
- Cost Estimate (+/- 10%) and Schedule
- FEL 1/2 – FEL 3 Engineering Design and SP3D Model
- Develop comprehensive PEP for Project Execution Phase



## Yara Belle Plaine Expansion Project

**Customer:** Yara

**Location:** Saskatchewan, Canada

- Front End Engineering for 1,000 tpd expansion to existing fertilizer complex including storage and loadout facilities

### Services

- HAZOP Report
- Class 2 TIC estimate & Level 3 schedule for DDE phase
- Develop comprehensive PEP for Project Execution Phase
- FEL3 Deliverables Package to support Project Sanction

## Independent Engineering Audit – Major Expansion of the Potash Rocanville Facility

**Customer:** Canpotex Ltd.

**Location:** Rocanville, Saskatchewan

- Worley (Advisian) was requested to undertake an independent engineering audit regarding the major expansion of the PotashCorp (now Nutrien) Rocanville Facility. The assessment determined the annual productive capacity for the three major areas of the facility: mine, hoists and mills.



# Ongoing Projects

*Our field services business has a long history working in Saskatchewan, where we have been involved in maintenance and turnaround activities since 1964.*

## Mosaic Belle Plain – Belle Plain, Saskatchewan - Canada



Our relationship with this facility goes back to **October 1964**. We maintain a regular workforce of 150 craft personnel for the routine maintenance program, peaking at approximately 300 during turnarounds and project work. We provide maintenance, turnaround, capital projects, scaffolding and project management

## Cooperative Refinery – Regina, Saskatchewan – Canada



In 2018, Worley became CCRL's primary turnaround contractor providing turnaround services to the facility. Based on the size and scope of the turnaround Worley executes between 200,000 and 400,000 person hours per turnaround.

## Nouryon – Saskatoon, Saskatchewan - Canada



Nouryon (formley AkzoNobel) is a leading global paints and coatings company and a major producer of specialty chemicals. We have a small amount of craft onsite doing steady state maintenance.



# Upcoming Projects



## FEED Support Sulphur Reaction Furnace and Waste Heat Boiler Replacement Project (2020 – 2022)

**Customer:** Co-op Refinery Complex

**Location:** Regina, Saskatchewan

### *Services:*

Worley is currently supporting CRC's FEED phase for the Sulphur Reaction Furnace and Waste Heat Boiler Replacement Project. Upon completion of the FEED Phase, this will form the basis to define the scope of services for the Detail Design Phase.

## FEED Support Unit 2 Crude and Vac Heater Component Upgrade Project (2020 – 2021)

**Customer:** Co-op Refinery Complex

**Location:** Regina, Saskatchewan

### *Services:*

Worley is supporting CRC's FEED phase for the Unit 2 Crude and Vac Heater Component Upgrade Project. Upon completion of the FEED Phase, this will form the basis to define the scope of services for the Detail Design Phase.

## Potential Upcoming Opportunities

Worley has numerous potential upcoming projects that are currently classified as discreet / confidential and are still going through the tender process. We will not be able to disclose particular details in this regard but as high level overview projects will potentially include:

- Uranium
- Power
- Pulp & Paper





# Near-Term Procurement Needs

## *Field Services*

The following scopes of work are portions of our Field Services that we subcontract:

### Subcontracted Services

- Quality Control (Non-destructive testing)
- Cold Cutting, Hot and Cold Tapping/Stopples
- Heat Tracing (Post weld heat treatment stress relieving)
- Asbestos Removal
- Site Grading
- Piling
- Concrete and Foundations
- Field-Erection Buildings/Office Trailers
- Heavy Lift
- Torqueing and Tensioning
- Bussing / Transportation
- Heavy Haul
- Site Communications
- Equipment for temporary power, utilities and heat
- Rope Access
- Structural Steel
- Paint, Coatings, Sandblasting
- Pressure Testing

## *Other Services*

Since most of our opportunities are still in the tender process, Worley will only be able to identify the potential procurement needs once the contracts get awarded

# How to find out more and/or become a supplier



## The supply chain and commerce platform

Requis connects buyers and sellers, enabling enterprises to procure, manage, and dispose of assets with greater visibility, simplicity and capital efficiency.

In collaboration with Ebay, Worley have revolutionised the supply chain experience. Through the creation of the premier industrial marketplace, Requis provides the opportunity for expansion of existing networks, unlocking access to suppliers and buyers across the globe. Requis was designed by Worley project procurement and operations specialists to streamline complex procurement processing and release the value of surplus materials lying idle in warehouses.

### Go to:

<https://www.worley.com/site-services/suppliers-and-contractors>

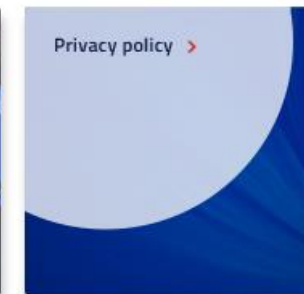


Register on our global supplier portal and join our network of procurement professionals around the world.

With a global presence across the energy and resources sectors, we give you the opportunity to join our world-class team of procurement professionals and services.

Our global supplier portal provides our buyers with an online search tool with up-to-date information on all available suppliers. Any supplier is free to register ensuring your information is accessible to potential buyers from around the world.

Registration is easy. Please ensure you have read our Supply chain code of conduct and access our [global supplier portal here](#).





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