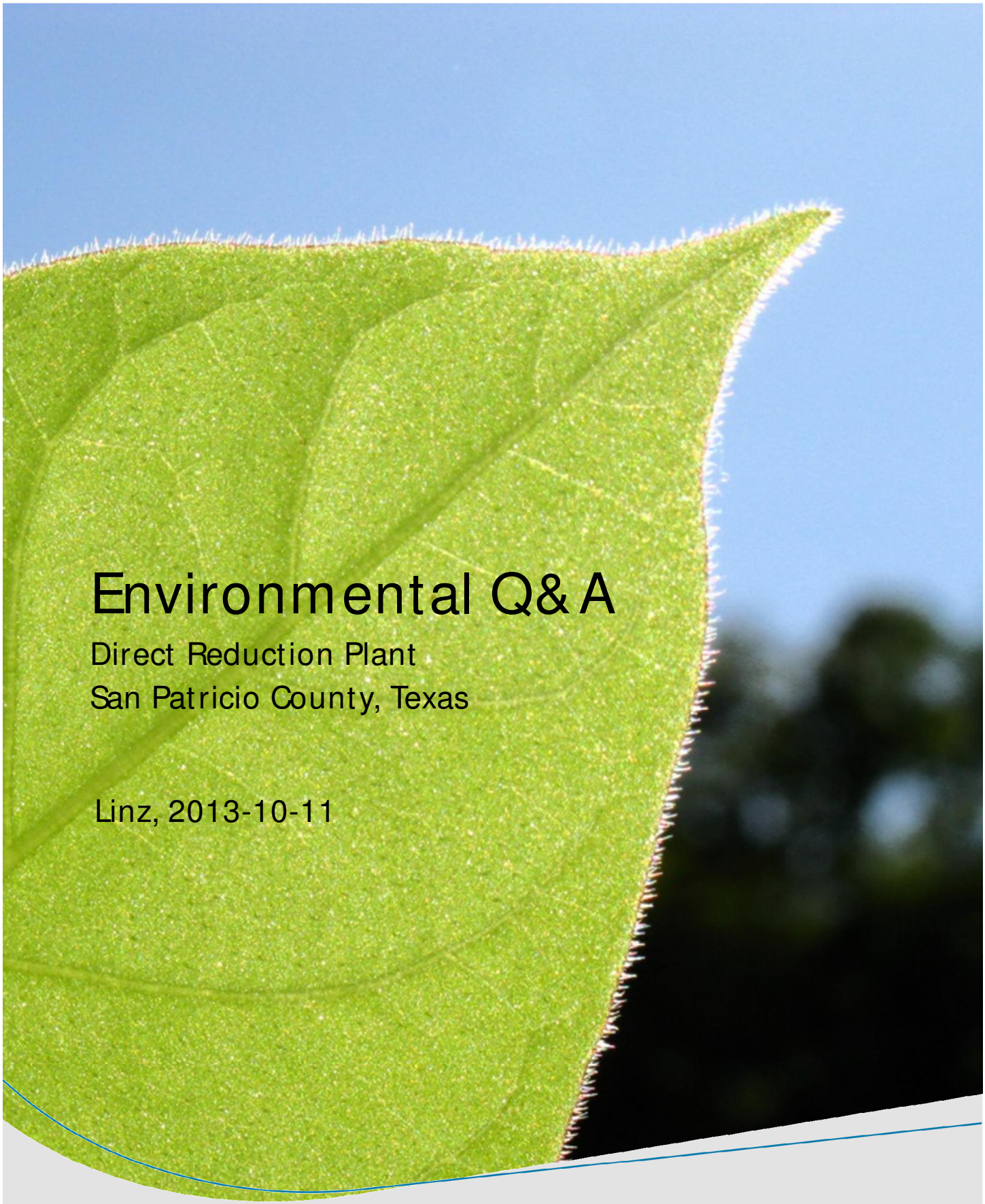


Environmental Q&A

Direct Reduction Plant
San Patricio County, Texas

Linz, 2013-10-11

voestalpine
ONE STEP AHEAD.

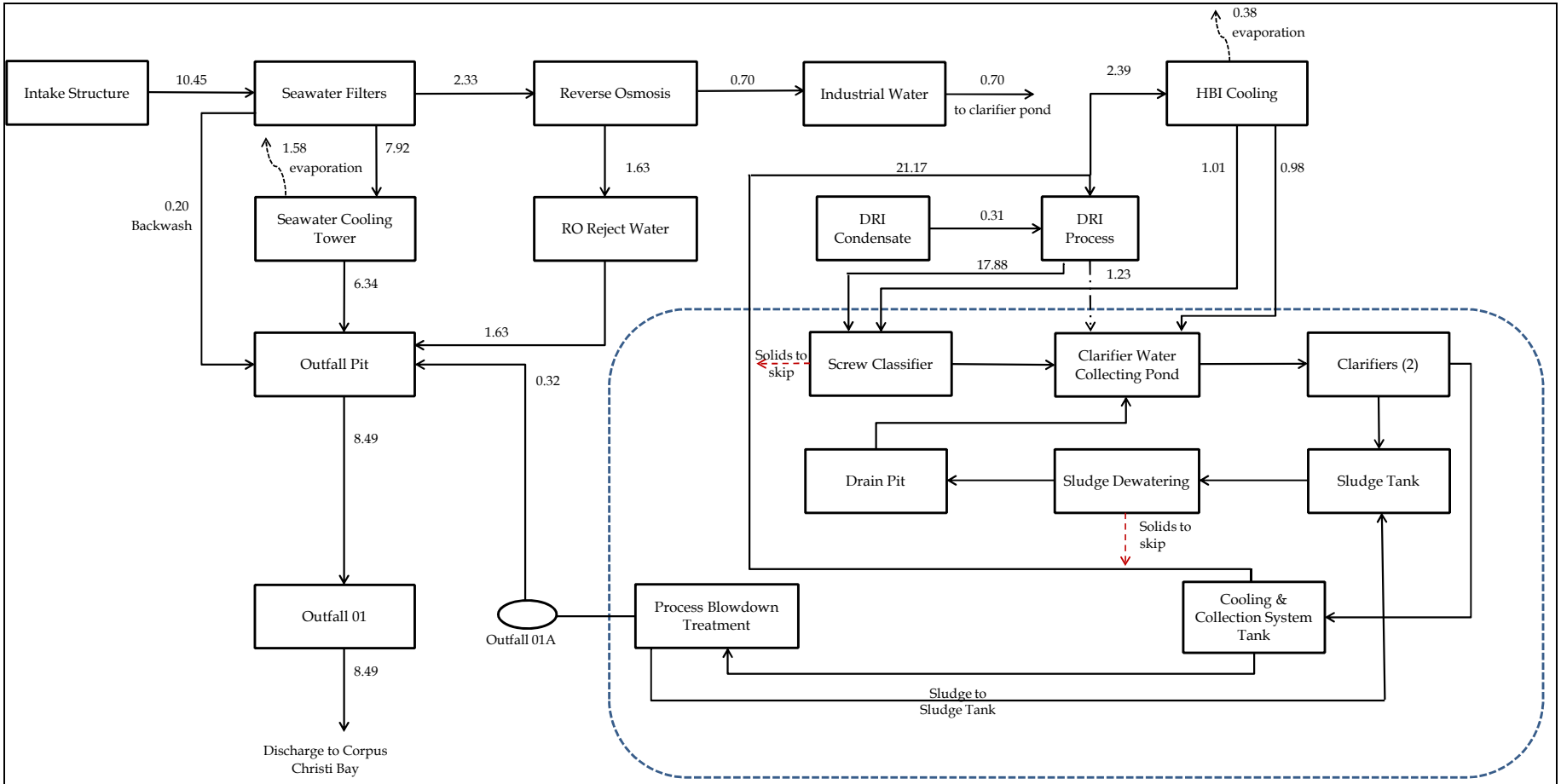
Q: What quantity of wastewater will be discharged and where? What pollutants will it contain and at what levels/concentrations?

The Project will require approximately 10.45 MGD of saline surface water that will be diverted via a seawater intake structure located at a depth of approximately 15 ft below mean sea level in Corpus Christi Bay. The diversion will be located at the western portion of a wharf at coordinates 27.880181, -97.278464. Diverted water will travel through piping approximately 50 feet upward to the wharf, then 90 feet north to the northern edge of the wharf, then 1,000 feet east along the wharf and then 2,000 feet north to its point of use at the plant. Actual diversions and discharge will be measured with totalizing flow meters. The water intake structure (CWIS) design and operation will fall under the authority of section 316(b) of the Clean Water Act (40 CFR 122.21(r)).

The majority of the seawater diversion will be utilized for non-contact cooling water in a heat exchanger loop with cooling towers and a filter backwash system. The remainder of the diversion will be routed to a desalination/reverse osmosis (RO) system that will produce 0.70 MGD of desalinated water that is used for makeup to the recirculating industrial process water system (optional: raw water supply + RO for make-up water). The desalinated water is routed to a clarifier water collecting pond where it is used as make-up water for the process water treatment unit. The process water treatment unit is comprised of a screw classifier, clarifier water collecting pond, two clarifiers, a sludge tank, sludge dewatering, drain pit, cooling and collection system tank, and process blow down treatment.

The process water treatment unit supplies all water to the industrial processes at the facility. The two main industrial processes that utilize water at the facility are the DRI process and HBI cooling process**. Approximately 0.32 MGD of the industrial make-up water circulated through the HBI cooling and DRI processes is discharged to the outfall, and the remaining 0.38 MGD is lost to evaporation.** The DRI process also generates condensate that is incorporated back into the industrial process water system. The majority of the DRI and HBI process water will be recirculated through the process water treatment units, cooling tower water heat exchangers, and back into the processes.

The process water blowdown will have a totalizing flowmeter and dedicated sampling point for verification of compliance with categorical discharge limits. This effluent will then combine with cooling tower, filter backwash and RO reject blowdowns and discharge through a common outfall structure back into the bay. **Approximately 8.49 MGD of return flow will be discharged at the eastern edge of the wharf at coordinates 27.880670, -97.278464. A totalizing flow monitoring and sampling station will be provided for the combined discharge for purposes of compliance sampling as well as to monitor water usage**.



Environmental Resources Management

DESIGN: K. MARSH	DRAWN: K. MARSH	CHKD.: P. FLAHERTY
DATE: 8/8/2013	SCALE: N/A	REVISION: 3
File: S:\voestalpine\New TPDES Draft\Submittal		

ATTACHMENT 6
PROCESS FLOW DIAGRAM AND WATER BALANCE
LaQuinta Plant - TPDES Permit Application
voestalpine Texas LLC
San Patricio and Nueces Counties, TX

ERM

The concentration of pollutants will be well below the following limits:

		CC Bay, Chronic (beyond mixing zone)	CC Bay, Acute (at end of pipe)
Zinc	mg/l	< 0.0842	< 0.0927
Nickel	mg/l	< 0.0131	< 0.118
Chromium	mg/l	< 0.0496 (hex)	< 1.090 (hex)
Mercury	mg/l	< 0.0011	< 0.0021
Total Copper	mg/l	< 0.0036 (dissolved)	< 0.0135 (dissolved)
Lead	mg/l	< 0.0053	< 0.133
TSS	mg/l		< 10
BOD	mg/l		< 20
COD	mg/l		< 100
TOC	mg/l		< 10
pH			<6.5 - 9

Q: How is the RO's brine handled and will it adversely affect fauna and flora?

With the current design, voestalpine will have a combined return flow into the bay of 8.49 MGD. This flow comprises of cooling water (6.34 MGD), treated process water (0.32 MGD), backwash (0.2 MGD) and the RO reject water (1.63 MGD). The RO reject water will hence be diluted to a concentration factor of approx. 1.35 before the discharge through the common outfall structure.

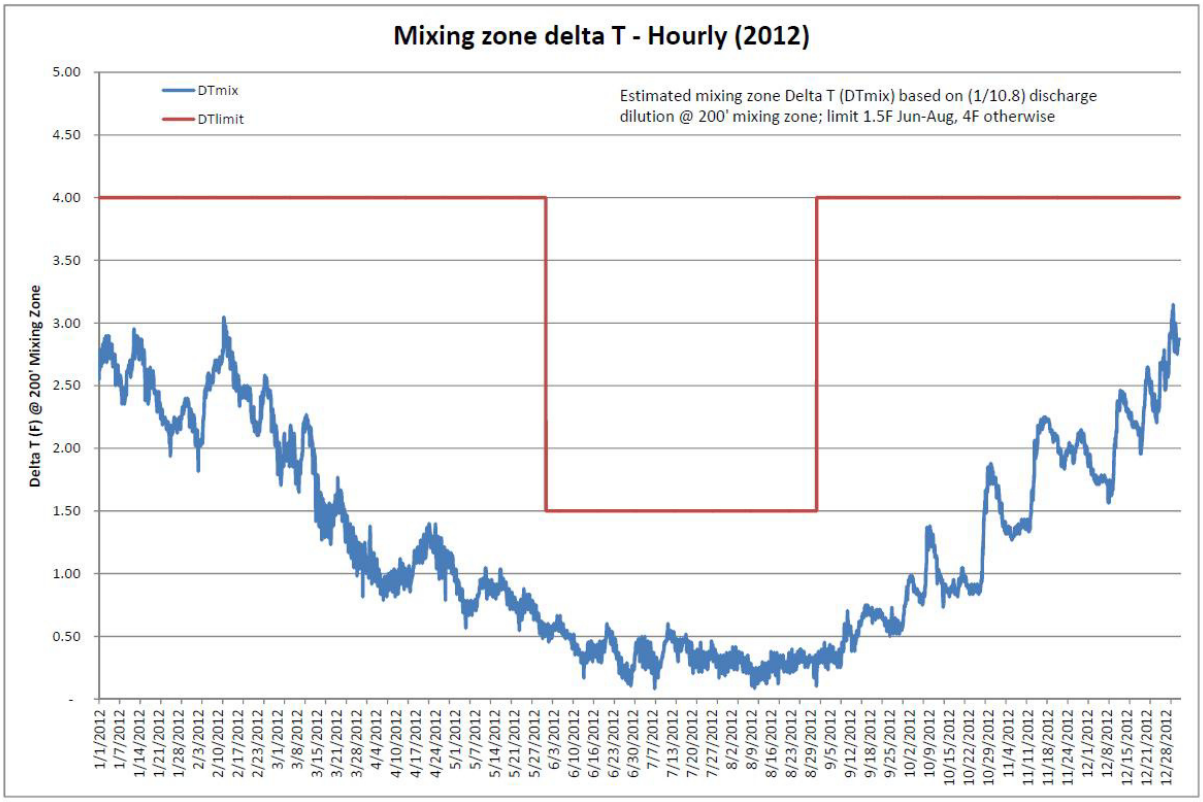
A totalizing flow monitoring and sampling station will be provided for the combined discharge for purposes of compliance sampling as well as to monitor water usage.

These facts were discussed during the Essential Fish and Habitat Assessment, which showed high levels of dissolved oxygen in the northern portion of Corpus Christi Bay. This and the increased ship traffic associated with the La Quinta Channel – which improves mixing – ensure that there will be no adverse effect on marine habitat.

Q: What is the discharge temperature of and will it adversely affect marine habitat?

voestalpine has done extensive temperature and mixing zone simulations. The models show that the maximimum temperature difference between discharge and ambient water will be well below the TCEQ limit values at the edge of the mixing zone (please see chart below).

According to TCEQ guidelines, the edge of the mixing zone is defined as **200 feet** from the point of discharge. Other mixing zones are often defined as 5 times the water depth. Since the water depth at this discharge point varies with the tide, and given a nominal depth of 40 feet, a mixing zone five times that depth, or 200 feet, is consistent with typical practice. The mixing zone is defined as the radial area within 200 feet of the end of the discharge pipe.



Q: What are the projected air emissions (types of pollutants and tons of each per year)?

Most relevant Air-Emissions

Pollutant	**Most relevant Emission sources**	**Facility-Wide Emission Rate** (TPY)	**Abatement Technique** (according BAT see topic ad 2)
Particulate Matter (PM) Particulate Matter < 10µm (PM10) Particulate Matter < 2.5 µm (PM2.5)	• Dock Ore Unloading / Product Loading Gantry Crane • Oxide Unloading Bin & Dedusting • Oxide Pellet Pile Transfer & Dedusting • Oxide & Remet Screening & Dedusting • Furnace Charge Hopper Loading Silos • Furnace Dedusting • Reformer Main Flue Ejector Stack • Briquetter Dedusting • Transfer & Product Screening Station • Product Storage Piles • Remet / Fines Storage	105.42 91.44 65.94	• Fabric filters • Wet scrubbers • Wetting agents • Enclosed conveyors • Good combustion practice • Surface treatment such as wetting with water and/or chemical wetting agents, vehicle restrictions, surface improvement for unpaved roads • Wind erosion abatement
Sulfur Dioxide (SO2)	• Reformer Main Flue Ejector Stack	34.82	• Purchase natural gas containing no more than 2,000 gr sulfur /mmscf.
Nitrogen Oxides (NOx)	• Reformer Main	415.03	• Use of low NOX

Pollutant	Most relevant Emission sources	Facility-Wide Emission Rate (TPY)	Abatement Technique (according BAT see topic ad 2)
	Flue Ejector Stack		burner • good combustion practices
Carbon Monoxide (CO)	• Reformer Main Flue Ejector Stack	713.35	• good combustion practices
Volatile Organic Compounds (VOC)	• Reformer Main Flue Ejector Stack	37.64	• good combustion practices
Heavy metals		0.42	• sole use of natural based input-material like iron ore and natural gas

Greenhouse Gases (GHG) - Emissions:

Pollutant	Most relevant Emission sources	Facility-Wide Emission Rate (TPY)	Abatement Technique (according BAT see topic ad 2)
Greenhouse Gases (GHG) as CO2e	• Reformer Main Flue Ejector Stack • Seal Gas • Flare • Emergency Generator • Fire Pumps	1,820,610	• CO2e Limit – no more than 13 MMBtu (decatherms) of natural gas/tonne HBI produced (Energy integration through combustion of spent reducing gas. Use of low-carbon fuel (natural gas). Limit total quantity of natural gas consumption per metric ton of product • Good combustion practices and proper maintenance • Use of natural gas fuel for the flare's pilot and as supplemental fuel (if needed) • Engines for Fire Pumps and Emergency Generators

			Engines must comply with NSPS (New Source Performance Standard) Subpart IIII based on manufacturer's specifications • Utilize mechanical conveyors, heat recovery, and other energy efficiencies as appropriate to the facility's design • Utilize preventive maintenance, energy monitoring and management, high efficiency motors, variable speed drives, high efficiency fans, optimized compressed air systems, and efficient lighting systems as appropriate to the facility's design

Q: What measures will voestalpine undertake to protect the environment or conserve resources that go beyond the requirements set by EPA and TCEQ?

Measures to meet and exceed air emission requirements (examples)

- **Particulate fabric filters** will have a performance guaranteed at 0.002 grains per dry standard cubic foot (gr/dscf) of exhaust gas
- **Wet scrubbers** will have a performance guaranteed at 0.0079 gr/dscf (18 mg/Nm3) of exhaust gas
- **Sole use of natural gas** to limit emissions of other criteria and toxic pollutants (sulfur dioxide, nitrogen oxides, lead, etc) as compared to other direct reduced iron plants using coke as the reduction gas raw material
- The facility will demonstrate that emissions will be **below the significant impact level (criteria pollutants) or the TCEQ effects screening levels (toxics)** thus demonstrating the downwind concentrations of pollutants should not adversely affect human health or welfare or have adverse flora and fauna impacts.

GHG BACT Determinations

- Using DRI (Direct-Reduced-Iron) – Technology in steelmaking route requires **less energy and produces lower CO_2-emission** than traditional integrated steelmaking (i.e., sinter, coke battery, blast furnes, BOF)

- Proposed BACT-PSD: CO2e Limit – no more than 13 MMBtu (decatherms) of natural gas/tonne HBI produced (Energy integration through combustion of spent reducing gas. Use of low-carbon fuel (natural gas). Limit total quantity of natural gas consumption per metric ton of product

- Good combustion practices and proper maintenance.

- Engines for Fire Pumps and Emergency Generators Engines must comply with NSPS (New Source Performance Standard) Subpart IIII based on manufacturer's specifications

- Utilize mechanical conveyors, heat recovery, and other energy efficiencies as appropriate to the facility's design

- Utilize preventive maintenance, energy monitoring and management, high efficiency motors, variable speed drives, high efficiency fans, optimized compressed air systems, and efficient lighting systems as appropriate to the facility's design.

Measures to meet and exceed water discharge and conservation requirements

- Processes designed to **reuse** as much water as possible
- The voestalpine facility will utilize several of the management practices described in the Texas Water Development Board's February 2013 publication titled **"Best Management Practices (BMPs) for Industrial Water Users"** to promote water conservation.

The design of the voestalpine facility already incorporates the Reuse of Process Water BMP. The **saline diversion, recycling of process water, and use of DRI condensate for process water** each comply with this BMP.

The main conservation measure described in the Water Treatment BMP implemented at the voestalpine facility is the **reuse of process water** via the process water treatment plant.

Additional measures once the facility is operational include maintaining the water treatment process efficiency by keeping equipment in good repair and by using proper flow rates, equipment size, and settings.

The main conservation measure described in the Cooling Systems BMP implemented at the voestalpine facility is the **utilization of recirculating and recycling water systems**. The use of condensate, saline water, and water used in other onsite processes is also in alignment with this BMP. Additional measures once the facility is operational include operation of water-cooled equipment in an efficient manner and keeping equipment in optimal operating condition.

The main conservation measure described in the Cooling Towers BMP implemented at the voestalpine facility is the utilization of saline water. Additional measures include monitoring cooling tower efficiency, optimizing blowdown, and using appropriate automated control procedures.

The water conservation initiatives described above align with voestalpine's ambitious internal energy efficiency and environmental stewardship objectives, which include sustainable production processes, responsible conservation of resources, and the implementation of state-of-the-art technologies.

Q: What types and quantities of hazardous wastes will be generated? Will they be stored in drums, totes, lagoons, piles?

No hazardous wastes or by-products will be generated in the process.

Overview of most relevant by-products and waste:

Oxides Fines

- fine-fraction from raw-material pre-processing (< 3mm)
- oxide fines are non-toxic and valuable (since they have the same characteristics as iron oxides)
- we are considering an on-site briquetting plant to facilitate fines recycling

- additionally we are investigating opportunities to sell oxide fines as a feedstock for other metallurgical plants
- capacity of intermediate storage not decided yet; the estimated annual tonnage is approx. 40-50,000 t

Product Fines/Process Classifier Solids

- fine-fraction from product-screening/classification
- product fines are non-toxic and have a high Fe content; hence the product fines will be recycled in the plant
- capacity of intermediate storage not decided yet

Filter Cake

- filter cake from our process water treatment plant
- process water treatment plant is an integral part of our plant configuration
- process water is used in wet-scrubbers (process gas cleaning)
- typical filter cakes consist of iron oxide fines (FeO,Fe_2O_3,Fe_3O_4) and product fines (i.e. fines from direct reduced iron with a Fe content of > 90 %)
- due to our process conditions and the used natural raw material (natural gas and iron oxides) no additional contamination occurs
- capacity of intermediate storage not decided yet; the estimated annual tonnage is approx. 60-75,000 t (80 % Total Suspended Solids)

Used Grease and Oil

- conventional industrial residue/waste from maintenance
- Recycling by possible other industrial consumers or waste management companies
- capacity of intermediate storage not decided yet; the estimated annual tonnage is approx. 0.3 t

All storage areas will be designed to avoid adverse impacts on air, water and soil.

Q: Will any wetlands or other critical habitat be displaced during the construction or operation of the plant? If so, how and where will mitigation be done?

The only impacted wetlands are located along the shoreline of Corpus Christi Bay. There are no jurisdictional wetlands on the site itself.

The construction of the deep water port / wharf in this area is necessary for both the planned container port (by others) and the project facility to have connectivity to the La Quinta channel. Thus, wetland impacts are considered unavoidable with the current design.
The Port of Corpus Christi Authority (POCCA) included wetlands mitigation features as part of the permitted construction of the shipping channel extension and new deep water port / wharf. Wetland impacts associated with the construction of the wharf / dock structure to be utilized by the voestalpine project have already been permitted by the USACE under permit #23269, which was amended in 2011 as permit SWG-2001-02261.

As a condition of the permit, a **200-acre beneficial use and mitigation site planted with over 25 acres of seagrass, smooth cordgrass, and black mangrove will be created just south of the La Quinta Channel.** The mitigation site and planted area are each far larger than the area of wetlands impacted (33.5 acres, 2.4 acres of which is seagrass), thus no adverse effects and potential beneficial effects on wetlands are anticipated.

Q: Will any steps be taken to maintain or enhance natural habitat on the property?

To get a clear understanding of the existing natural habitats on the La Quinta property, voestalpine has performed both, a Biological and an Essential Fish Habitat assessment.

Biological Assessment

The purpose of this Biological Assessment (BA) was to provide the results of an assessment of the potential impacts of the proposed Project on species protected by the Endangered Species Act (ESA) as outlined in the requirements for GHG permit applications.

The information provided in this BA is presented for utilization in informal consultations with federal agencies. Accordingly, this analysis provides information and recommendations on the U.S. Fish and Wildlife Service (USFWS) and/or National Marine Fisheries Service (NMFS) determinations of effect for each federally listed species, were outlined in the report.

Findings

The BA Assessment shows that the proposed facility is implementing the best available control technologies and is to not likely adversely affect species and habitats, as explained below:

- The physical footprint of the project is located primarily in cultivated cropland habitat, which provides little to no habitat for protected species.
- The area of coastal marsh and aquatic habitats impacted by the Project will be minimized to the extent practical, and will be mitigated in accordance with appropriate wetlands permitting requirements.
- The Port of Corpus Christi Authority is planning on constructing a shipping container terminal south of Project gowest; POCCA has received its own permits for construction and wetland delineation.
- The Project area has been sited to avoid impacts to any designated federal critical habitat;
- No detrimental or adverse effects from dust on threatened or endangered species or critical habits are anticipated as a result of Project gowest. voestalpine will use dust control measures during construction of the Project to minimize generation of fugitive dust

Essential Fish Habitat Assessment

The purpose of this Essential Fish Habitat (EFH) Assessment is to provide the results of an assessment of the potential impacts of the proposed Project on habitat designated as EFH as defined by the 1996 amendment to the Magnuson-Stevens Fishery Conservation and Management Act (MSA).

The information provided in this assessment is presented for utilization in informal consultations between federal agencies as outlined in the requirements for GHG permit applications. Accordingly, this analysis provides information and recommendations on the National Marine Fisheries Service (NMFS) determinations of effect on EFH by the proposed Project.

Findings

The EFH Assessent shows that the proposed facility is implementing the best available control technologies and is to not likely adversely affect EFH species, as explained below:

- Temporary adverse effects to EFH are anticipated during construction and intermittent dredging associated with the Project. These effects include the disruption of the substrate, temporary impairment of water quality due to turbidity, and the increase of suspended solids. These effects are expected to be marginal.
- No indirect effects to water quality or operational impacts to EFH are expected. A determination of may affect, but is not likely to adversely affect was reached for six of the eight EFH species analyzed in this report. The other two species will not be affected by the proposed Project. In light of the anticipated impacts, use of best management practices, and mitigations projects, the overall determination for the EFH in the Action Area is “may affect, but is not likely to adversely affect”.

Q: Would voestalpine engage with the other facilities to work on a plan to define their cumulative impacts and then work on solutions to reduce them?

voestalpine has identified and discussed this particular topic with EPA, USFWS and NOAA at an early stage of the permitting process.

During these discussions EPA had voestalpine not consider the cumulative impact of CO_2 emissions and specifically told voestalpine not to address the cumulative and global impact aspects of CO_2.

Nevertheless voestalpine had the environmental consulting firm Environmental Resources Management (ERM) investigate potential cumulative impacts.

Findings:

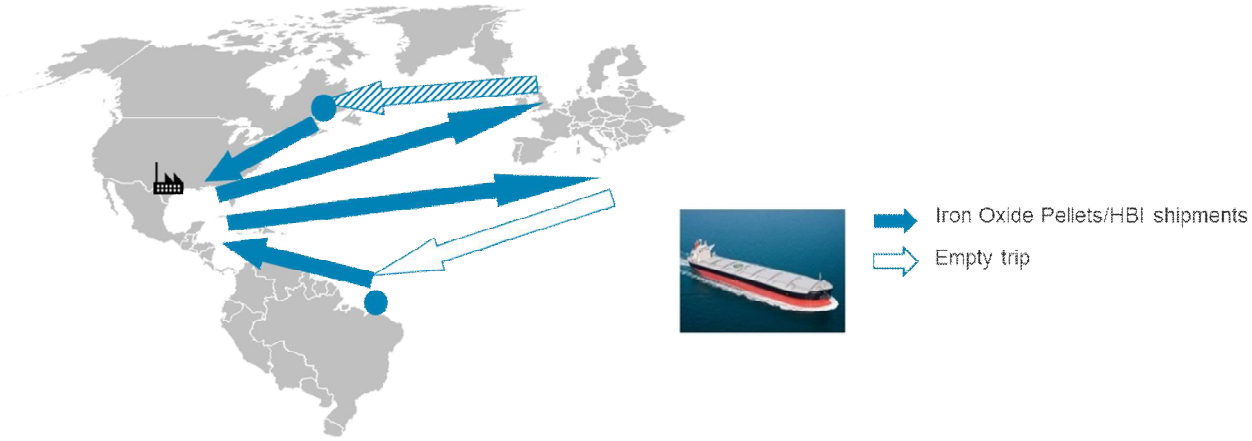
- Cumulative and global impacts of this project lead to net reduction of CO_2 in the steel industry (natural gas vs. coke)
- Proposed worst case emission levels from the proposed facility have impacts less than the Significant Impact Level*. **Thus, the project will not significantly contribute to the degradation of air quality.**

  *The Significant Impact Level is an ambient concentration at which the EPA has determined that, regardless of other impacts, voestalpine's emissions will not significantly contribute to the degradation of air quality on the local scale.

Q: How will the increased ship traffic impact the ambient air quality? Has the shipping information been brought into the air quality equation?

voestalpine has developed a progressive shipping concept that incorporates
round trip shippings
use of Eco-Design Vessels

The round-trip shipping concept minimizes empty trips by reloading incoming ships with HBI (Hot Briquetted Iron). Compared to conventional shipping, voestalpine related ship traffic in Corpus Christi region can therefore be reduced by approx. 40 %.



Moreover, voestalpine is dedicated to use Eco-Design Vessels. These particular vessels are designed to reduce aerodynamic drag and feature high-efficiency engines and propellers. Conservative estimates expect a fuel consumption and emission reduction by approx.10 %.

voestalpine has shared information with US EPA, US FWS and NOAA on ship traffic. The competent authorities deemed these emissions as non-relevant.

Contact

Active environmental protection is firmly anchored in our corporate philosophy. For us, this means maintenance of a continuous improvement process and compliance with environmental provisions.

voestalpine stands for:

- Holistic responsibility for products
- Optimization of production processes
- Establishment of environmental management systems
- Employee integration and environmentally aware behavior by all
- Open and objective dialogues

voestalpine – One Step Ahead in Environmental Stewardship

Please feel free to contact us anytime in case of questions:

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