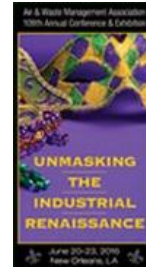


The Environmental Challenge International

...a student team competition



THE PROBLEM

The Purpose

The Environmental Challenge International gives student teams the opportunity to develop solutions to a mock environmental problem and have the experience of presenting their solution to a panel of environmental professionals. We do not give you a lot of numbers to crunch. We are more interested to hear about the issues involved, how you interpreted the problem, how you got to your conclusions, and how well you can communicate your thoughts. We want you to have fun! This exercise gives everyone attending the conference a chance to participate and gets the professionals of tomorrow interacting with the professionals of today.

The Problem

The town of Quaintville is located in a beautiful coastal parish in Louisiana. For decades, it has drawn those who seek deep blue skies, the clear and calm waters of the Gulf of Mexico, and the sounds of nature. Recently, the town was even named one of the top places to vacation and eat in *Vittles and Vino* magazine. What was once a quiet town is now seeing more and more tourism because of its pristine natural beauty and burgeoning elegant culinary scene. However, not all are welcoming of tourism. Many believe it's simply a fad and will soon fade and many of the "old" locals want to ensure the locals can sustain the recent influx of high-priced VRBO rentals and the slowly escalating prices of goods.

Quaintville wins this year's award for "Must Visit Up-and-Coming Culinary Meccas." Only recently did we stumble upon this soon-to-be hip and trendy town in Louisiana. The old rustic town, located on the stunningly beautiful coastline, is welcoming and charming. Not only is the food great, and the people friendly, but you'll see flora and fauna that you've never seen elsewhere!

-Vittles and Vino Magazine

Those who live in Quaintville are, or have been, employed within the fossil fuel industry that has slowed down in recent years. Many thought they'd soon have to leave the area or relocate to regions where their skills can be utilized so that they can make a living. Just recently, the Mayor Middle announced that ReFuel, an energy company, has expressed interest in constructing and operating a natural gas liquefaction (NGL) facility in Quaintville. Those who once feared the likelihood of having to leave their beautiful quaint town are fully supportive of what could provide steady employment with well-paying jobs that would utilize existing skilled labor and provide a sustainable industry.

We have lived in Quaintville for decades. My father lived here, his father lived here, and so did his father. We have been fortunate to live in such a beautiful area that we'd not otherwise be able to live in if it weren't for the good paying jobs supported by companies like ReFuel. This is what we've done for decades and really there is nothing else that would support this town. People are hopeful that the Vittles and Vino article will bring new business, but in reality it will only be temporary.

- S. Imphy Nough, Quaintville Citizen of 37 years

The proposed project is located within 20 miles of a Federal Class I area, and would require an approval be obtained by the Federal Land Manager. The proposed site is located in an old dock and warehouse area which was used by an oil well drilling company to refurbish drill pipe. The site has been long abandoned. ReFuel currently owns and operates another facility in the area and has experienced issues with the local and national non-governmental organizations (NGOs). The local NGOs have organized to oppose the construction of the NGL facility in Quaintville, citing that the project is not needed to meet regional energy demands and that the group is opposed to exporting NGLs to a foreign country. Additionally, the Sierra Society is opposing all NGL facilities since the organization considers NGL facilities to be major emitters of greenhouse gases.

The Louisiana coast and the town of Quaintville is one of the most pristine natural estuaries in the nations. An area that was once plagued by industry has rebounded and is home to some of the most diverse species in the area. Species that were once threatened now thrive, land that was once bleak and industrial is now blossoming with beauty, and thousands travel to the area to experience this amazing natural setting that is found only here - Quaintville. You'd think the long-time citizens would have learned from the past and the impacts of heavy industry and are now welcoming of a budding natural environment that draws people from throughout the world.

- Save our Coast (SOC)

As part of the siting and permitting process, there is a beehive of activity collecting information on the property and surrounding areas. Preliminary borings have been drilled and an old landfill associated with the previous warehouse and docks was discovered. The drill cuttings smell like old dead fish. The landfill area is thought to be about 100 feet by 100 feet by 8 to 10 feet deep.

A key component to this project is that the company has to consider whether it is more economically and environmentally beneficial to have power provided from the electrical grid or by constructing power turbines on site. Using the grid will require that additional transmission facilities be built to bring the power to the site.

The coastal parish is currently in attainment with the 75 ppb ozone standard. However, as of October 2015 the ozone standard was lowered to 70 ppb and the area monitors are hovering just below 70 ppb. If the monitors show an average ozone reading about 70 ppb, the area could be designated as nonattainment and then emission reduction credits must be obtained and lowest achievable emission rate technology will have installed.

There are mixed emotions among the town's residents. Many are savoring the new hip opportunity to create an eclectic artsy community thriving on the areas natural beauty and culinary uprising. Conversely, those who have lived in the area and have reaped the rewards of the other fossil fuel industries want to maintain that existing lifestyle and see it as a sustainable future for generations to come. The mayor, knowing that it is an election year for him and two of the five council members (who are all employed within the fossil fuel industry), isn't sure what decision might make the most sense to sustainability of Quintville, and more importantly his re-election success.

I have lived in Quintville for the last decade, and I have seen the decline in heavy industry and have seen the importance and support it provides to the people of this beautiful town. This town has survived because of the skilled labor that industry has brought to this area and without it this town may never have been placed on the map. However, that was then, and this is now. We have an opportunity to thrive off another type of green, our natural environment. But can we make this change or can we continue to coexist with an industry that has damaged this area and may not be sustainable?

- Mayor Middle

Your Assignment

The Mayor of Quintville and the divided council has hired you, a team of renowned and unbiased environmental consultants, to identify and educate them on alternatives that will minimize environmental impacts of the ReFuel NGL plant. More importantly, they are looking to you for guidance regarding whether they should support the project at all and if there is a way for the NGL plant to exist without impacting the natural environment and the potential up-and-coming culinary scene? The Mayor and the Council want a solution that is environmentally and socially responsible, while also promoting economic growth within Quintville that meets their voter's desires.

Your proposal will identify your recommended plan for how Quintville will proceed with allowing or disallowing NGL, and will consist of a written submittal, poster presentation, and a public presentation.

There is no easy answer that will please everyone completely. You must do your best to build public support and articulate how your plan provides the most tangible environmental, economic, and social benefits to enable the Mayor and Council Members

of Quaintville to make a decision and confidently discuss project options with their constituents and project proponent.

To be successful, you must tactfully and eloquently articulate solutions, issues, concerns, unknowns, and recommendations for your proposal. There is no easy answer that will please everyone completely.

At a minimum, you should consider at least three alternatives that weigh environmental, social, and economic interests. You should have a preferred alternative to present to the mayor and councilmen. You should also address the following questions:

The company has hired your firm to evaluate key environmental issues that may be sensitive to the public. Your evaluation must include the following:

- 1) What is the best available control technology as well as the lowest achievable control technology for each of the emissions sources (a list of the emission sources as well as pollutants emitted from each type of source is attached)?
- 2) Carbon sequestration is becoming an increasingly viable control technology for GHGs. Address carbon sequestration options and whether these options are viable for this project.
- 3) The community is concerned that the proposed use of onsite power generation using natural gas as a fuel will contribute excessive emissions at the site. The NGOs are concerned that energy from off- site power generation may be from coal-fired power generation and will contribute to excess emissions from off-site power. Determine the best options for this project and present your determination.
- 4) What waste might be found in the landfill and what are the assessment and remedial options?
- 5) The regulators and community are concerned about the old docks and building that remain on site; what issues might be of concern and how should they be addressed?
- 6) Permitting is often a challenge; what agencies would be involved and what documents would be generated in order to obtain a permit? Because time is money, what is a likely timeline for obtaining permits?
- 7) What are the primary environmental issues to the community and how will you communicate your findings in advance of a final decision?

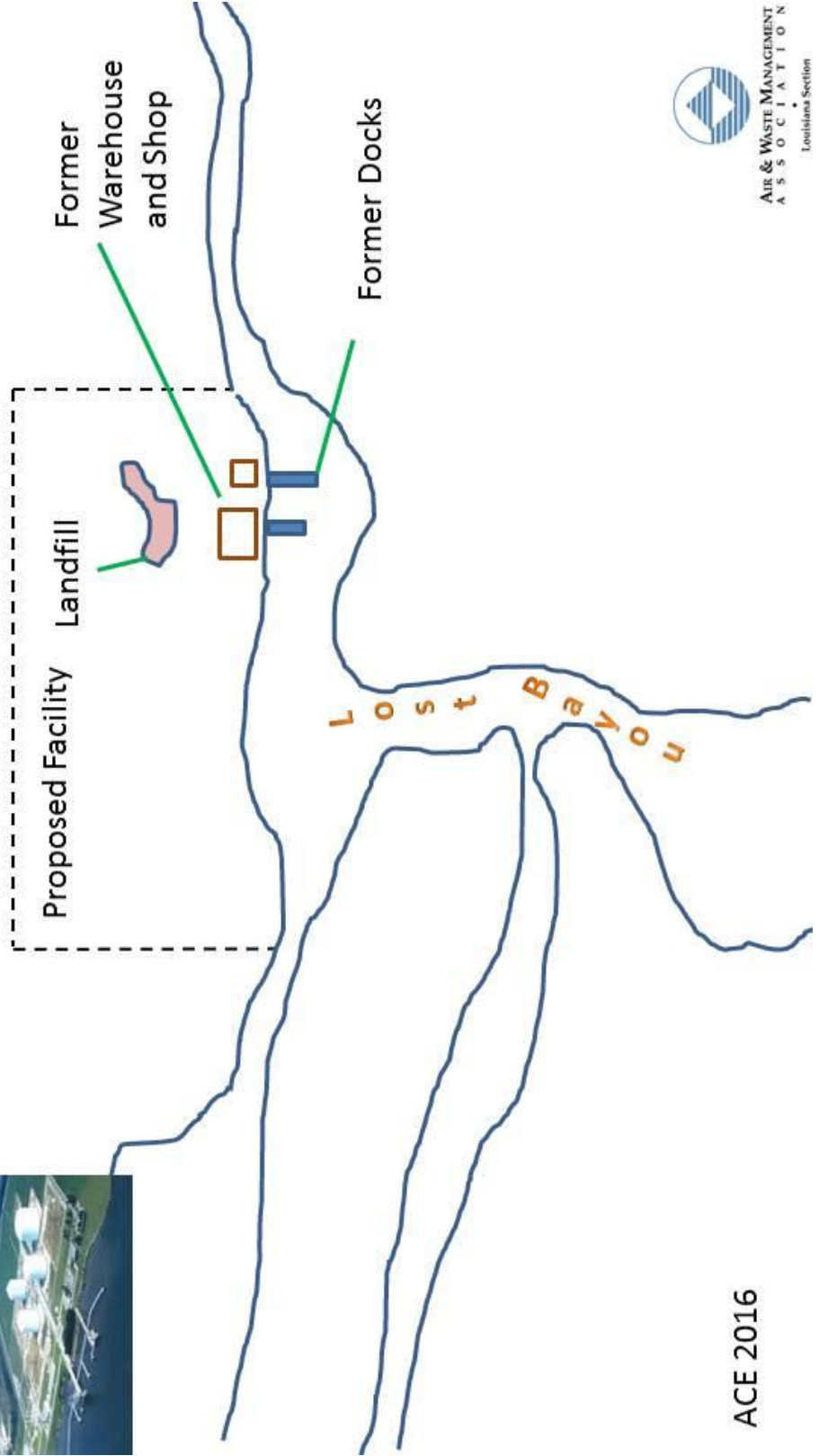
TABLE 1**LNG Liquefaction
(TPY)**

Source ID No.	Emission Source Description	PM₁₀/ PM_{2.5}	SO₂	NO_x	CO	VOC	CO_{2e}
1-16	Emergency Fire Water Pump 460 HP (Diesel fired)	0.01	<0.01	0.15	0.13	0.15	26
2-16	Emergency River Water Pump 460 HP (Diesel fired)	0.01	<0.01	0.15	0.13	0.15	26
3-16	Emergency Generator 3353 HP (Diesel fired)	0.06	<0.01	1.76	0.96	1.76	192
4-16	Thermal Oxidizer (Natural gas fired pilot)	2.81	7.16	37.49	30.74	28.46	1,249,213
5-16	Refrigeration Compressor Turbine (Natural gas fired)	37.46	0.81	255.98	155.84	8.76	489,968
6-16	Refrigeration Compressor Turbine (Natural gas fired)	37.46	0.81	255.98	155.84	8.76	489,968
7-16	Condensate Storage Tank [965K Gallons]	-	-	-	-	-	-
8-16	Condensate Loading	-	-	-	-	2.21	
9-16	Ground Flare (Natural gas fired pilots)	2.97	0.24	27.10	147.47	11.12	49,130
10-16	Fugitive Emissions	-	-	-	-	2.40	240
	TOTAL EMISSIONS (TPY)	80.78	9.05	578.61	491.11	63.77	2,278,763
		PM₁₀/ PM_{2.5}	SO₂	NO_x	CO	VOC	CO_{2e}

FIGURE 1

Louisiana Parish NGL Facility Development

Existing Facility



ACE 2016



The Tweak:

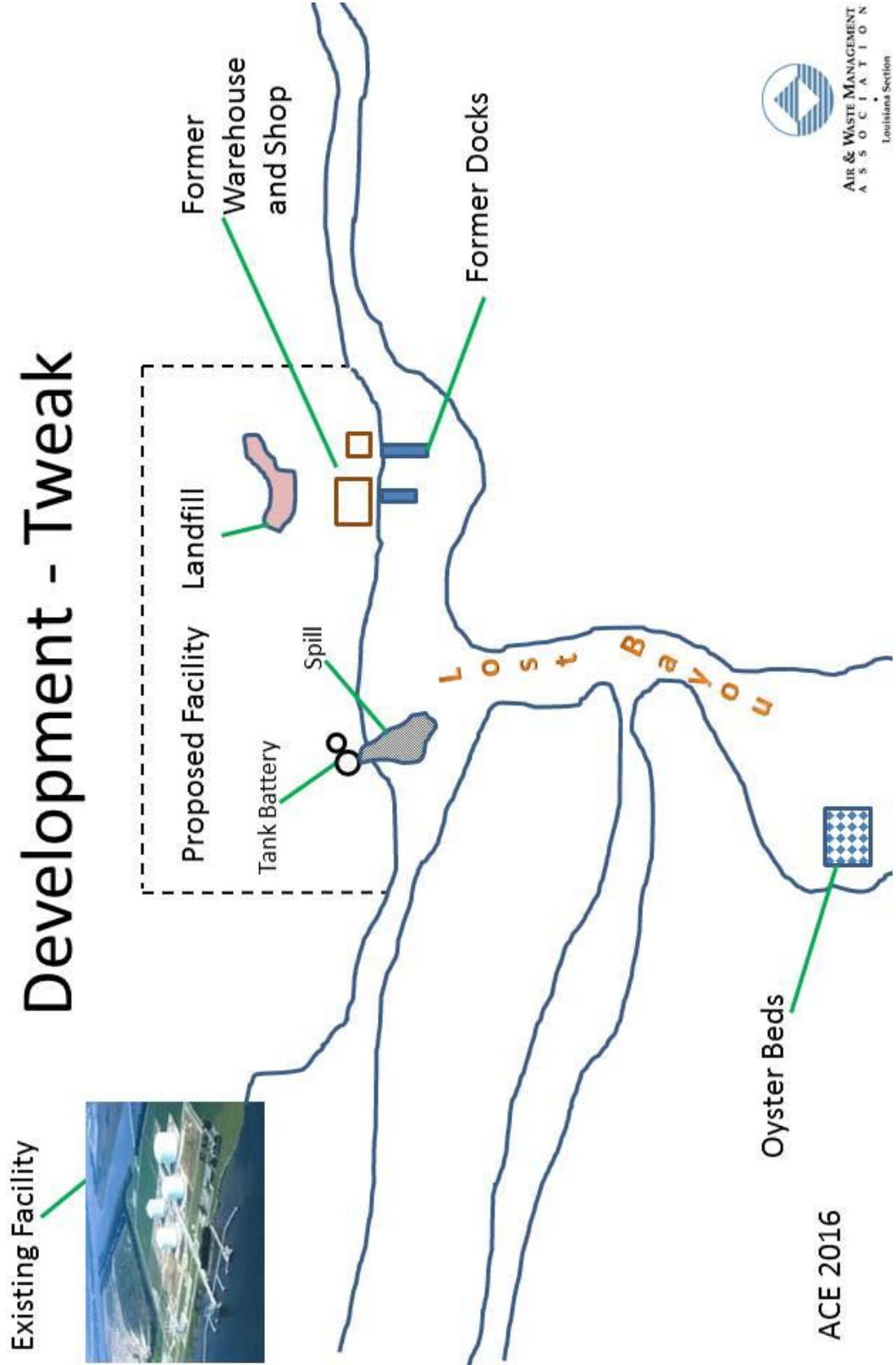
During the preliminary construction efforts, the contractor had located his temporary above ground storage tanks at the site in the Tank Battery area. The hurricane yesterday destroyed the Tank Battery causing one 2,000-gallon gasoline and one 5,000-gallon diesel tank to leak. The spills carried into the adjacent bayou, which leads to commercial oyster beds that are just 2 miles away.

Think about what you would do to address the release. What is your first response and subsequent actions? What would you do to remedy the situation – on land, in the water, in the sediment, and with wildlife and humans? What could have been done to prevent the release are then any applicable requirements or regulations?

Please use Figure 2 below that depicts the information from the Tweak:

FIGURE 2:

Louisiana Parish NGL Facility Development - Tweak



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